

AN INDEPENDENT AGENCY OF THE COMMONWEALTH OF VIRGINIA

ethics

integrity

accountability

confidentiality

inclusivity



Virginia  
Retirement  
System

**Virginia Retirement System**  
**Comprehensive Annual Financial Report**  
For the Year Ended June 30, 2017

**VIRGINIA RETIREMENT SYSTEM**  
**FINANCIAL AND STATISTICAL HIGHLIGHTS – ALL PENSION TRUST FUNDS**

(DOLLARS IN THOUSANDS)

	2017	2016	% Change
<b>Activity for the Year:</b>			
Contributions	\$ 3,242,396	\$ 3,375,057	-3.9%
Investment Income (Net of Investment Expenses)	\$ 8,014,834	\$ 1,136,898	605.0%
Retirement Benefits	\$ 4,518,958	\$ 4,356,978	3.7%
Refunds	\$ 119,705	\$ 104,552	14.5%
Administrative and Other Expenses (Net of Miscellaneous Income)	\$ 57,620	\$ 42,137	36.7%
Increase (Decrease) in Net Assets Held in Trust for Pension Benefits	\$ 6,560,947	\$ 8,288	
Retirement Benefits as a Percentage of Contributions	139.4%	129.1%	
Retirement Benefits as a Percentage of Contributions and Investment Income	40.1%	96.6%	
<b>Net Position Held in Trust for Benefits at Fiscal Year-End:</b>			
Virginia Retirement System (VRS)	\$ 70,342,933	\$ 64,028,909	9.9%
State Police Officers' Retirement System (SPORS)	\$ 796,073	\$ 730,688	8.9%
Virginia Law Officers' Retirement System (VaLORS)	\$ 1,345,887	\$ 1,211,446	11.1%
Judicial Retirement System (JRS)	\$ 515,399	\$ 468,302	10.1%
<b>Investment Performance:</b>			
One-Year Return on Investments	12.1%	1.9%	
Three-Year Return on Investments	6.2%	7.3%	
Five-Year Return on Investments	9.1%	7.0%	
<b>Participating Employers:</b>			
Counties/Cities/Towns	254	254	
Special Authorities	206	202	
School Boards*	145	145	
State Agencies	227	226	
Total Employers	832	827	0.6%
<b>Members/Retirees:</b>			
Active Members	341,200	341,671	-0.1%
Retired Members	199,388	192,411	3.6%

\* Of the 145 school boards, 133 also provide coverage for non-professional employees.

Investment return calculations were prepared using a time-weighted return methodology based on market value and net of investment expenses.



# Virginia Retirement System

Comprehensive Annual Financial Report  
For the Year Ended June 30, 2017

## VRS CODE OF ETHICS

The VRS Code of Ethics is built on our commitment to upholding the highest standards of integrity, ethical principles and professional conduct.

### INTEGRITY

Integrity is the ability to act with honesty and be consistent in administering benefits and managing investments. Integrity serves as the foundation for building trust with the public, retirees, members and employers as we provide services.

### ACCOUNTABILITY

Accountability is being responsible for decisions made, actions taken and assignments completed. Accountability reinforces our commitment to ethically perform our duties to meet the goals of the agency.

### CONFIDENTIALITY

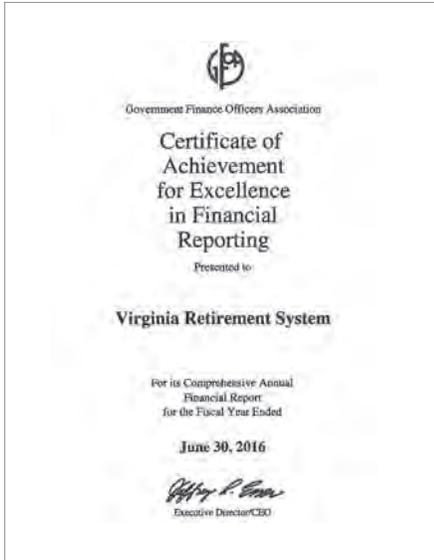
Confidentiality is exercising discretion and performing our ethical duty to protect the personal information of our members, retirees, beneficiaries and employers. We safeguard personal data and sensitive VRS information that is viewed, acquired or otherwise accessible during the course of VRS employment.

### INCLUSIVITY

Inclusivity is embracing a diversity of thinking that helps us reach solutions that achieve excellence and meet the needs of our customers. We encourage an open work environment and an ethical culture in which colleagues are treated with respect and are free to raise issues or concerns without fear of retaliation.

## AN INDEPENDENT AGENCY OF THE COMMONWEALTH OF VIRGINIA

This report was prepared by the financial, administrative and investment staff of the Virginia Retirement System.

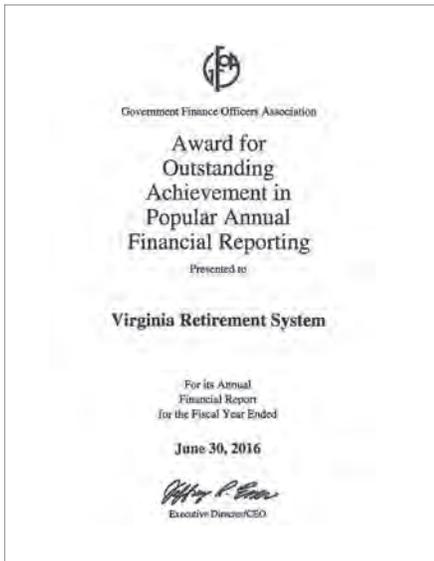


**Certificate of Achievement for Excellence in Financial Reporting, Comprehensive Annual Financial Report (CAFR)**

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the Virginia Retirement System for its *Comprehensive Annual Financial Report* (CAFR) for the fiscal year ended June 30, 2016. This was the 35th consecutive year that VRS achieved this prestigious recognition.

To be awarded the certificate, a government unit must publish an easily readable and efficiently organized comprehensive annual report. This report must satisfy both generally accepted accounting principles and applicable legal requirements. The certificate is valid for a period of one year.

The VRS CAFR for fiscal year 2017 continues to conform to the Certificate of Achievement Program requirements and will be submitted to GFOA to determine its eligibility for another certificate.

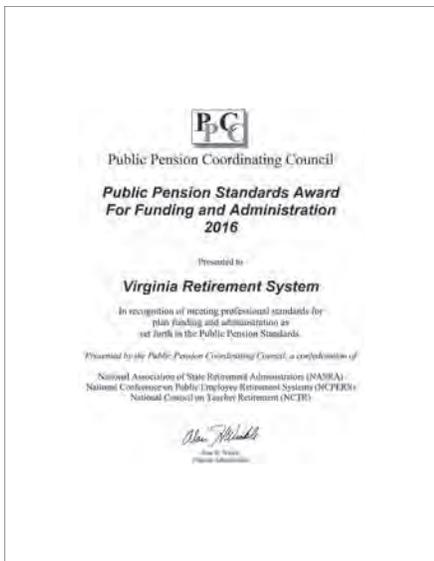


**Certificate of Achievement for Excellence in Financial Reporting, Popular Annual Financial Report (PAFR)**

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the Virginia Retirement System for its *Popular Annual Financial Report* (PAFR) for the fiscal year ended June 30, 2016. This was the first year of publication for which VRS was eligible to achieve this prestigious recognition.

To be awarded the certificate, a government unit must publish an easily readable and efficiently organized comprehensive annual report. This report must satisfy both generally accepted accounting principles and applicable legal requirements. The certificate is valid for a period of one year.

The VRS PAFR for fiscal year 2017 continues to conform to the Certificate of Achievement Program requirements and will be submitted to GFOA to determine its eligibility for another certificate.



**Public Pension Coordinating Council Recognition Award for Administration**

VRS received the 2016 Recognition Award for Administration from the Public Pension Coordinating Council (PPCC) in recognition of the agency’s fulfillment of the public pension standards. Developed by PPCC, these standards are the benchmark for measuring excellence in defined benefit plan administration. This is the system’s 13th award from PPCC.

The purpose of the PPCC’s awards program is to promote high professional standards for public employee retirement systems and publicly commend systems that adhere to these standards. The PPCC is a coalition of the National Association of State Retirement Administrators (NASRA), the National Conference on Public Employee Retirement Systems (NCPERS) and the National Council on Teacher Retirement (NCTR).

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At VRS, we value

# ETHICS *ethics*

The VRS Code of Ethics is built on our commitment to upholding the highest core principles of integrity, ethical principles and professional conduct.

Our code includes four standards:

- Integrity
- Accountability
- Confidentiality
- Inclusivity

# Introductory Section 1

## Introductory Section

Chairman's Letter

Board of Trustees

VRS Organization

Investment Advisory Committee

Defined Contribution Plans Advisory Committee

Executive Administrative Team

Executive Investment Team

Professional Consultants

Letter of Transmittal

## Chairman's Letter



**Mitchell L. Nason**, Chairman  
**Patricia S. Bishop**, Director  
**Ronald D. Schmitz**, Chief Investment Officer

P.O. Box 2500 • 1200 East Main Street  
Richmond, Virginia 23218-2500  
Toll-free: 1-888-827-3847 • TDD: 804-289-5919

December 18, 2017

### **The Honorable Terence R. McAuliffe, Governor of Virginia, and Members of the General Assembly:**

I am pleased to present the Virginia Retirement System (VRS) *Comprehensive Annual Financial Report* for fiscal year 2017. VRS achieved a 12.1% net return on its investment portfolio, exceeding the 11.8% policy benchmark and the 7.0% assumed rate of return, allowing the trust fund to end the year on a historic high.

The VRS investment team generated a meaningful return amid a strong market environment with overall positive relative performance. As of June 30, 2017, the private equity program returned 20.6%; the public equity program returned 17.7%; the real assets program returned 10.8%; the credit strategies program returned 10.1%; the strategic opportunities portfolio returned 8.2%; and the fixed income program returned 0.5%. The portfolio included \$30.7 billion in public equity, \$13.1 billion in credit strategies, \$12.4 billion in fixed income, \$9.4 billion in real assets, \$6.5 billion in private equity and \$1.8 billion in the strategic opportunities portfolio.

Approximately 35% of the fund is managed in-house and 65% is managed externally under VRS supervision. The VRS investment team's expertise provides considerable added value and fee savings for members, retirees and beneficiaries. CEM Benchmarking, a firm specializing in benchmarking pension funds and other large pools of capital, reports that the VRS is a low-cost, value-added pension plan in comparison to its public fund peers. Our experienced investment professionals bring a high level of knowledge and strategic positioning to the fund, and we commend their outstanding efforts on behalf of all VRS members.

In addition, your commitment as Governor and as members of the General Assembly to accelerate full funding of contribution rates for statewide retirement plans has strengthened the fund. Accelerating the statutory schedule for paying the actuarially calculated and Board-certified contribution rates will save an estimated \$232 million in contributions over the next 20 years across all statewide plans.

Accelerated payment of deferred contributions from the 2010-2012 biennium is another key action that moderates future contribution rates by eliminating approximately \$26.5 million in interest costs for the state employee, state police

officers, Virginia law officers and judicial plans, and by saving employers approximately \$34 million in plan costs for the teacher plan.

These initiatives have resulted in a long-term strategy to address liabilities, a commitment to fully fund the contribution rates, a plan to pay down the unfunded liability and a savings impact that will be realized as more participants enter the Hybrid Retirement Plan. These efforts, along with an improvement in the economy, have resulted in the aggregate funded status for all VRS retirement plans over the last four years increasing from 65.4% to 74.5%.

Likewise, the Commonwealth has undertaken a series of major pension-reform initiatives and addressed plan costs and liabilities by implementing plan design changes, including the introduction of the Hybrid Retirement Plan. These initiatives reduced the normal cost of the plans to employers and also introduced risk sharing with employees. Savings from pension reform will be fully realized as the hybrid plan becomes the dominant plan.

Just as we have moved forward with pension reform and funding, VRS has continued its Modernization journey and shaped our online solutions with myVRS, which now provides one unified system for members, retirees and employers.

Our efforts have resulted in an enhanced myVRS portal, offering members and retirees secure online accounts, plus a wealth of retirement benefit information and new educational features and resources. This past year, we launched the following features:

- A new goal-based Retirement Planner and a refreshed Benefit Estimator that help members project their income and expenses in retirement and take a broader view of life after work.
- A self-service purchase of prior service component, complete with “how-to” video clips.
- Security enhancements and new features for retirees, including educational offerings and intuitive navigation.
- New tools to help college and university faculty members compare their retirement plan options online.

Our work continues as we gear up to accept retirement applications and beneficiary changes online in the next biennium.

Although the replacement of legacy technology has meant a considerable investment of time and resources across the agency, we know future delivery of retirement benefits requires flexible and intuitive systems with a high degree of self-service. myVRS now incorporates educational resources and just-in-time counseling tips designed to help members take a more active role in preparing for the future and to assist retirees in maximizing their VRS benefits in their post-work years.

Other projects completed this past year included the restructuring of the Optional Retirement Plan for Higher Education (ORPHE) to add an unbundled investment option of VRS-managed investments, record-kept by ICMA-RC. We're pleased to provide another investment choice for higher education members in the optional plan. The unbundled option (which follows the industry best practice of separating record-keeping and management fees) consists of 12 investment choices including a series of target date portfolios and a self-directed brokerage account. ORPHE plan members also may choose from two bundled record-keeper arrangements maintained by TIAA and Fidelity. VRS developed a new ORPHE website with online tools to support plan comparison and selection.

In all of our efforts, VRS' greatest strength is its people. Not only do we have a staff dedicated to providing excellent service and working together to make our goals reality, but we also have more than 800 participating employers who help us carry out our work across the commonwealth every day. Through our partnership with these employers, we are able to provide services and benefits to thousands of members and retirees. On behalf of VRS, I thank them for their dedicated work as partners in our efforts to serve those who serve others.

Participating employers were key to the successful implementation of the first voluntary contribution auto-escalation for Hybrid Retirement Plan members. This accomplishment was bolstered by the collaboration of VRS staff and ICMA-RC in developing resources for employers to counsel members on the importance of increasing voluntary contributions. The defined contribution component of the Hybrid Retirement Plan includes an auto-escalation feature that automatically increases member contributions (for those not deferring the maximum) every three years, subject to opt-out by the member. The first auto-escalation took place on January 1, 2017, with only 3.1% of eligible members opting out of the 0.5% increase in voluntary contributions, well below the industry rate of 20%. As of June 30, 2017, approximately 75.42% of hybrid members are making voluntary contributions, and 20.53% have actively made a voluntary election above the auto-escalation percentage of 0.5%.

VRS and its staff were recognized several times this year. The agency received a Communicator Award of Distinction for marketing effectiveness and content marketing from the International Academy of Interactive & Visual Arts (AIVA). The award honors creative excellence in communications for the Hybrid 457 Deferred Compensation Plan's auto-escalation campaign. It recognizes the collaborative effort of our defined contribution plans and public relations staff, and our plan record-keeper, ICMA-RC.

Denise Rasmussen, deputy chief of technology and security officer, received the Governor's Award for Innovation as part of the Governor's Awards for Public Service, which celebrate the outstanding achievements of state employees. Through her leadership, VRS' modernization effort has already resulted in significant improvements for employers, members and employees by using technology to advance customer service and operating efficiency.

For the 35th consecutive year, VRS received a Certificate of Achievement from the Government Finance Officers Association (GFOA) – the highest form of recognition in governmental accounting and financial reporting for the *Comprehensive Annual Financial Report* (CAFR) for the fiscal year ended June 30, 2016. VRS also received a Certificate of Achievement from GFOA for its first-ever *Popular Annual Financial Report* (PAFR), a concise eight-page summary of our organization, services, financial results and investments, all of which were reported in more detail in the 2016 CAFR.

In addition, VRS received a 2016 Public Pension Standards Award for Funding and Administration from the Public Pension Coordinating Council (PPCC). This is the 13th award VRS has received recognition from PPCC.

In May 2017, I was appointed VRS Board Chairman after serving on the board since 2008. As a lieutenant in the Prince William County Fire Department and future beneficiary, I am honored to serve in this leadership role and am grateful for the opportunity to assist my fellow members and retirees as they plan their tomorrows, today.

In closing, on behalf of the Board of Trustees and the VRS staff, I thank you for your leadership and continuing commitment to VRS members, retirees and beneficiaries. Your demonstrated commitment to fund 100% of actuarially determined contributions and accelerating repayment of the deferred contributions improves the health of the plan, avoids adding future costs and ensures soundness of the plan going forward. Through our collaborative efforts, we will strive to ensure that all those served by VRS will enjoy these benefits for many years to come.

Sincerely,

A handwritten signature in black ink, appearing to read 'M L Nason', with a long horizontal flourish extending to the right.

Mitchell L. Nason  
Chairman  
Virginia Retirement System

## Board of Trustees

### COMPOSITION OF THE BOARD

Nine members serve on the VRS Board of Trustees. Their appointment is shared between the executive and legislative branches of state government. The Governor appoints five members, including the chairman. The Joint Rules Committee of the Virginia General Assembly appoints four members. The General Assembly confirms all appointments.

Of the nine Board members, four must be investment experts, one must be experienced in employee benefit plans, one must be a local government employee, one must be an employee of a Virginia public institution of higher education, one must be a state employee and one must be a public school teacher. The public employee members may be either active or retired.



**Mitchell L. Nason, Chairman**  
Prince William County  
Department of Fire and Rescue  
Local Government Employee  
Appointed by Governor  
*Term Expires: 2/28/2018*  
*As Chairman: 2/28/2018*  
*Committee Assignments:* Administration & Personnel (Chairman), Audit & Compliance, Investment Policy (Chairman)



**William H. Leighty**  
Virginia Tech  
Higher Education Representative  
Appointed by Governor  
*Term Expires: 2/28/2019*  
*Committee Assignments:* Audit & Compliance (Chairman), Investment Policy



**Diana F. Cantor, Vice Chairman**  
Alternative Investment Management  
Investment Professional  
Appointed by Governor  
*Term Expires: 2/29/2020*  
*Committee Assignments:* Administration & Personnel (Vice Chairman), Audit & Compliance (Vice Chairman), Investment Policy (Vice Chairman)



**Kelly E. McWilliams III**  
Gordon & Rees LLP  
Employee Benefit Plans Professional  
Appointed by Governor  
*Term Expires: 2/28/2022*  
*Committee Assignments:* Benefits & Actuarial, Investment Policy



**The Hon. J. Brandon Bell II, CRPC**  
Brandon Bell Financial Partners  
Investment Professional  
Appointed by Governor  
*Term Expires: 2/28/2021*  
*Committee Assignments:* Defined Contribution Plans Advisory (Vice Chairman), Investment Policy



**Joseph W. Montgomery**  
The Optimal Service Group, Wells Fargo Advisors  
Investment Professional  
Appointed by Joint Rules Committee  
*Term Expires: 2/28/2019*  
*Committee Assignments:* Administration & Personnel, Investment Policy



**Wallace G. "Bo" Harris, Ph.D.**  
University of Richmond  
State Employee  
Appointed by Joint Rules Committee  
*Term Expires: 2/28/2021*  
*Committee Assignments:* Administration & Personnel, Benefits & Actuarial (Chairman), Investment Policy



**Troilen Gainey Seward, Ed.S.**  
Dinwiddie County Public Schools  
School Superintendent  
Appointed by Joint Rules Committee  
*Term Expires: 2/28/2022*  
*Committee Assignments:* Benefits & Actuarial (Vice Chairman), Investment Policy



**W. Brett Hayes**  
Wells Fargo Advisors Financial Network  
Investment Professional  
Appointed by Joint Rules Committee  
*Term Expires: 2/28/2018*  
*Committee Assignments:* Defined Contribution Plans Advisory (Chairman), Investment Policy

# VRS Organization

## BOARD OF TRUSTEES



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Director



**Ronald D. Schmitz**  
Chief Investment Officer



**Jennifer P. Schreck**  
Internal Audit Director

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University of Virginia Investment Management Company  
*Term Expires: 2/16/2019*  
*As Chairman: 5/31/2019*

**Hance West**, *Vice Chairman*  
Chief Investment Officer and Managing Director  
Investure  
*Term Expires: 12/31/2017*

**Deborah Allen Hewitt, Ph.D.**  
Clinical Professor  
The College of William and Mary  
*Term Expires: 10/16/2018*

**Michael Beasley**  
Retired Chairman Emeritus  
Strategic Investment Solutions, Inc.  
*Term Expires: 6/20/2019*

**Théodore Economou**  
Chief Investment Officer, Multi-Asset  
Lombard Odier Asset Management  
(Switzerland) SA  
*Term Expires: 9/13/2018*

**Thomas S. Gayner**  
President and Chief Investment Officer  
Markel Corporation  
*Term Expires: 2/19/2019*

**W. Bryan Lewis**  
Chief Investment Officer  
Pennsylvania State Employees' Retirement System  
*Term Expires: 3/31/2018*

**Rod Smyth**  
Chief Investment Strategist  
RiverFront Investment Group  
*Term Expires: 6/20/2019*

### DEFINED CONTRIBUTION PLANS ADVISORY COMMITTEE

**W. Brett Hayes**, *Chairman*  
Member, VRS Board of Trustees  
Wells Fargo Advisors Financial Network  
*Term Expires: 2/28/2018*

**The Hon. J. Brandon Bell II**, *Vice Chairman*  
Member, VRS Board of Trustees  
Brandon Bell Financial Partners  
*Term Expires: 2/28/2021*

**Robert C. Carlson**  
Editor and Publisher, Retirement Watch Newsletter  
*Term Expires: 6/20/2019*

**Shannon T. Irvin**  
Assistant Superintendent for Administration  
Nelson County Public Schools  
*Term Expires: 6/20/2019*

**Rick Larson**  
Assistant Vice President for Human Resources, Training  
and Performance, James Madison University  
*Term Expires: 6/20/2019*

**Margaret M. Maslak**  
Benefits Analyst, MeadWestvaco  
*Term Expires: 6/20/2018*

**Patricia A. Phillips**  
Director of Finance, City of Virginia Beach  
*Term Expires: 6/20/2018*

**Tracey A. Ray, CFA**  
Former Chief Investment Officer, Federal Retirement  
Thrift Investment Board  
*Term Expires: 6/20/2018*

**David A. Winter**  
Owner, Winter HR Consulting, LLC  
*Term Expires: 6/20/2019*

## Executive Administrative Team

**Patricia S. Bishop**

Director

**L. Farley Beaton Jr.**

Chief Technology Officer

**Jeanne L. Chenault**

Director of Public Relations

**Michael P. Cooper**

Chief Operating Officer

**Barry C. Faison**

Chief Financial Officer

**Robert L. Irving**

Director of Customer Services

**LaShaunda B. King**

Executive Assistant

**Jennifer P. Schreck**

Internal Audit Director

**Capri M. Stanley-Smith**

Director of Human Resources

**Cynthia D. Wilkinson**

Director of Policy, Planning and Compliance

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## Executive Investment Team

**Ronald D. Schmitz**

Chief Investment Officer

**John P. Alouf, CFA**

Director, Private Equity

**Bryan R. Gardiner, CFA**

Director, Internal Fixed Income Management

**John T. Grier, CFA**

Managing Director, Internal Asset Management

**Kenneth C. Howell, CFA**

Managing Director, Global Investments

**Ross M. Kasarda, CFA**

Director, Risk Management

**Kristina P. Koutrakos, CAIA**

Director, Portfolio Strategy

**Matthew L. Lacy, CFA**

Director, Internal Equity Management

**Curtis M. Mattson, CPA**

Chief Administrative Officer

**Stephen R. McClelland, CFA, CAIA**

Director, Credit Strategies

**Walker Noland, CFA**

Director, Real Assets

**Steven P. Peterson, Ph.D.**

Director, Research

**Daniel B. Whitlock, CFA, CAIA**

Director, Global Equity

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## Professional Consultants

ACTUARY

**Thomas J. Cavanaugh, FSA, FCA, EA, MAAA**

Chief Executive Officer, Cavanaugh Macdonald Consulting, LLC

AUDITOR

**Martha S. Mavredes, CPA**

Auditor of Public Accounts, Commonwealth of Virginia

COMMONWEALTH OF VIRGINIA

DEFERRED COMPENSATION PLAN

**Rod Alcázar**

ICMA-RC

COMMONWEALTH OF VIRGINIA VOLUNTARY

GROUP LONG-TERM CARE INSURANCE PROGRAM

**Becky Ball**

Genworth Financial

LEGAL COUNSEL

**Office of the Attorney General**

Commonwealth of Virginia

LIFE INSURANCE CARRIER

**Joseph K.W. Chang**

Minnesota Life Insurance Company

MASTER CUSTODIAN

**BNY Mellon**

VIRGINIA SICKNESS AND DISABILITY PROGRAM

AND VIRGINIA LOCAL DISABILITY PROGRAM

**Sally P. Kennedy**

Reed Group

# Letter of Transmittal



**Patricia S. Bishop**, Director  
**Barry C. Faison**, Chief Financial Officer

P.O. Box 2500 • 1200 East Main Street  
Richmond, Virginia 23218-2500  
Toll-free: 888-827-3847 • TDD: 804-289-5919

December 18, 2017

## To the Members of the Board of Trustees:

We are pleased to submit the *Comprehensive Annual Financial Report* (CAFR) of the Virginia Retirement System (the System) for the fiscal year ended June 30, 2017. In addition to the Introductory Section, the System's CAFR contains a Financial Section, Investment Section, Actuarial Section and Statistical Section. VRS' *Comprehensive Annual Financial Report* for fiscal year 2017 has been prepared in accordance with Section 51.1-1003 of the *Code of Virginia* (1950), as amended, which requires every retirement system to publish an annual report, and Section 4-11.00 of Chapter 665 of the 2015 Virginia Acts of Assembly, which requires an annual detailed statement of financial condition. The report has been mailed to the Governor, members of the Cabinet and the members of the Virginia General Assembly. The report also is available on the VRS website at [www.varetire.org](http://www.varetire.org).

## VRS Overview

**Administration:** VRS is an independent state agency. As provided under the *Constitution of Virginia*, VRS funds are separate from other state funds and can be used only to administer and pay benefits for members, retirees and beneficiaries. The Board of Trustees administers and is trustee of the funds of:

- the Virginia Retirement System Trust, including Plan 1, Plan 2, the defined benefit component of the Hybrid Retirement Plan, and Plan 1 and Plan 2 hazardous duty benefits for political subdivision employees;
- the State Police Officers' Retirement System Trust, including Plan 1 and Plan 2; the Virginia Law Officers' Retirement System Trust, including Plan 1 and Plan 2;
- the Judicial Retirement System Trust, including Plan 1 and Plan 2, and the defined benefit component of the Hybrid Retirement Plan for judges;
- the Virginia Sickness and Disability Program (VSDP) Trust for state employees, including VSDP long-term care;
- the Virginia Local Disability Program (VLDP) Trust for eligible school division and political subdivision employees, including VLDP long-term care;
- a disability retirement option for certain members not covered under VSDP or VLDP;
- the Hybrid 457 Deferred Compensation Plan;
- the Hybrid 401(a) Cash Match Plan;
- the Optional Retirement Plan for Political Appointees, the Optional Retirement Plan for School Superintendents and the Optional Retirement Plan for Higher Education (ORPHE);
- the Commonwealth of Virginia 457 Deferred Compensation Plan;
- the Virginia Cash Match Plan;
- the Virginia Supplemental Retirement Plan;
- the Group Life Insurance Program;
- the Retiree Health Insurance Credit Program; and
- the Line of Duty Death and Health Benefits Trust Fund.

In addition, the Board administers or has substantial oversight responsibilities for the Benefit Restoration Plan, the Commonwealth of Virginia Voluntary Group Long Term Care Insurance Program, and the Volunteer Firefighters' and Rescue Squad Workers' Service Award Fund Program, as well as benefit eligibility determinations under the Line of Duty Act in Title 9.1.

More than 800 employers participate in VRS on behalf of their employees. They include state agencies, public colleges and universities, school boards, political subdivisions and special authorities.

## Fiduciary Responsibility of the Board

The VRS Board of Trustees (the Board) has full power to invest and reinvest the trust funds of the System.

To fulfill its responsibility, the Board has adopted various investment policies and guidelines. The Board's investment objective for the VRS portfolio is to maximize long-term investment returns while targeting an acceptable level of risk. Primary risk measures are volatility in the plan's assets, funded status and contribution rates. As set forth in Section 11 of Article X of the *Constitution of Virginia*, the funds of the retirement system shall be deemed separate and independent trust funds; shall be segregated from all other funds of the Commonwealth; and shall be invested and administered solely in the interests of members, retirees and beneficiaries. The Board retains a professional investment staff, as well as outside managers, to advise and assist in the implementation of these policies and objectives.

The assets of the System are invested in a prudent manner that is intended to provide for the adequate funding of VRS' pension liability. Section 51.1-124.30(C) of the *Code of Virginia* states that "... the Board shall invest the assets of the Retirement System with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims."

Accordingly, the Board must sufficiently diversify the portfolio to minimize the risk of large losses unless, under the circumstances, it is clearly prudent not to do so.

## Accounting System and Internal Control

The financial statements included in the CAFR for fiscal year 2017 are the responsibility of the System's management and have been prepared in accordance with generally accepted accounting principles (GAAP) for government accounting and reporting under the Governmental Accounting Standards Board (GASB) and the Financial Accounting Standards Board (FASB).

### VRS Milestones (1908-1990)

**1908** Retired Teachers Fund created.

**1942** Virginia Retirement System (VRS) created for teachers and state employees.

**1944** Political subdivisions have the option to join VRS.

**1950** State Police Officers' Retirement System (SPORS) created.

**1960** Group Life Insurance Program created.

**1970** Cost-of-Living Adjustment (COLA) established; Judicial Retirement System (JRS) created.

**1990** Health Insurance Credit for state retirees established.

The accrual basis of accounting is used in the preparation of the financial statements. Revenues are taken into account when they are earned and become measurable; expenses are recorded when the liabilities are incurred.

Investments are reported at fair value as determined by the System's master custodian. Capital assets are recorded at cost and depreciated over their estimated useful life.

Contributions to the System are based on the principle of level-cost funding and are developed using the entry age normal cost method, with current service financed on a current basis and prior service amortized over a 20-year closed period. Legacy unfunded liability as of June 30, 2013, is being amortized over a 30-year closed period, while deferred contributions from the 2010-2012 biennium are being recognized over a 10-year closed period. In management's opinion, the financial statements fairly present the plan net position of the System at June 30, 2017, and the changes in its plan net position for the period then ended.

GASB Statement Number 34 requires the System to include additional information in the CAFR. This information is provided in Management's Discussion and Analysis (MD&A) and includes an introduction as well as an overview and analysis of the System's financial activities for the current fiscal year and the two preceding years. The Letter of Transmittal is designed to complement and should be read in conjunction with the MD&A, found in the Financial Section immediately following the report of the independent auditor.

GASB Statement Number 67 addressed financial reporting for state and local pension administrators and is addressed in the Financial Section. GASB Statement Number 68 establishes new accounting and financial reporting requirements for state and local governments that provide their employees with pensions and prepare annual financial statements. To assist employers in meeting the GASB 68 standard, VRS developed a resource center available to employers via the VRS website. The online resources included GASB 68 audit opinions and disclosure guidance, contribution rates, valuation reports and GASB guidance documents.

The System's management is responsible for maintaining a system of adequate internal accounting controls designed to provide reasonable assurance that transactions are executed in accordance with management's general or specific authorization, and are recorded as necessary to maintain accountability for assets and to permit preparation of financial statements in accordance with GAAP. The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits that are likely to be derived from that control. The internal control system includes the organizational plan; the appropriate segregation of duties and responsibilities and sound practices in the performance of duties; and personnel with capabilities commensurate with their responsibilities.

#### VRS Milestones (1992-2017)

**1992** Health Insurance Credit for retired teachers and political subdivision employees established.

**1995** Optional Group Life Insurance Program established.

**1999** Virginia Sickness and Disability Program (VSDP) for state employees established; Virginia Law Officers' Retirement System (VaLORS) created.

**2002** VSDP Long-Term Care Plan established.

**2010** VRS Plan 2 created for members hired or rehired on or after July 1, 2010.

**2012** General Assembly passes legislation creating a Hybrid Retirement Plan with implementation in 2014; Virginia Local Disability Program (VLDP) created as a benefit for political subdivisions and schools with implementation in 2014.

**2014** VRS Hybrid Retirement Plan, a combined defined benefit and defined compensation plan, becomes the retirement plan for new members (with the exception of hazardous duty members) hired on or after January 1, 2014.

**2015** VRS adds a Roth option to the Commonwealth of Virginia 457 Deferred Compensation Plan and the General Assembly permits school divisions the option to offer an employer-sponsored hybrid 403(b) plan for Hybrid Retirement Plan voluntary contributions.

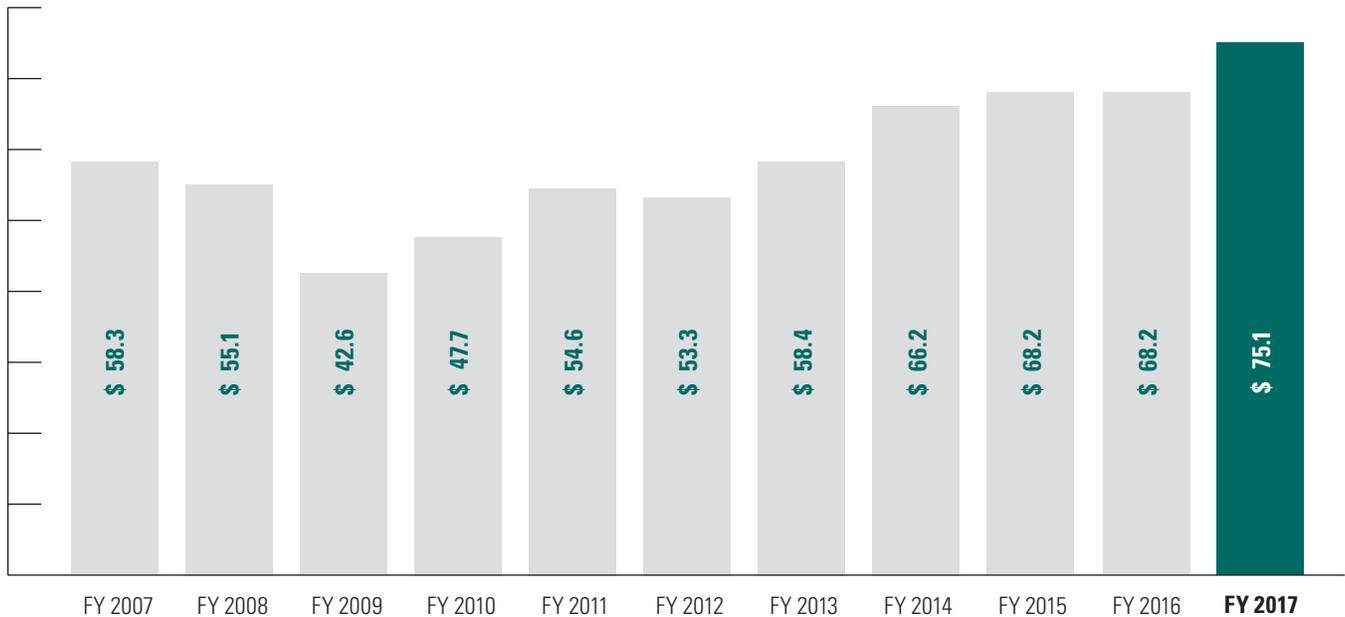
**2016** The enhanced myVRS is launched, increasing self-service functionality for members.

**2017** myVRS adds self-service purchase of prior service, enhanced security and features for retirees and tools to help college and university faculty members compare and contrast retirement plan options.

## PLAN NET POSITION RESTRICTED FOR BENEFITS

AS OF JUNE 30

(EXPRESSED IN BILLIONS)



The System also has an internal audit program that reports to the Audit Committee of the Board of Trustees, and the budget for the System's administrative expenses is approved by the Board and appropriated by the Virginia General Assembly.

The retirement funds held by the System are constitutionally established as independent trust funds dedicated to the exclusive benefit of its members, retirees and beneficiaries. In management's opinion, the internal controls in effect during the fiscal year ended June 30, 2017, adequately safeguard the System's assets and provide reasonable assurance regarding the proper recording of financial transactions.

## Funding

### PENSION PLANS

Calculations for the System's defined benefit pension plans for financial reporting purposes were made in accordance with Governmental Accounting Standards Board Statement No. 67, *Financial Reporting for Pension Plans*. The most recent valuation for this presentation was prepared as of June 30, 2017. The total pension liability was determined based on the actuarial valuation as of June 30, 2016, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2017.

Based on these calculations, the Plan Fiduciary Net Position as a percentage of the Total Pension Liability was 75.33% for the VRS State Plan, 72.92% for the VRS Teacher Plan, and 89.27% for the aggregate total of the VRS Political Subdivision Plans. For the SPORS, VaLORS and JRS plans, the Plan Fiduciary Net Position as a percentage of the Total Pension Liability was 76.00%, 67.22% and 79.34%, respectively.

For the VRS State Plan, the VRS Teacher Plan and the aggregate total of the VRS Political Subdivision Plans, there was an increase from their June 30, 2016, measurement date values of 71.29%, 68.28% and 83.67%, respectively. For SPORS, VaLORS and JRS, there was also an increase from their values of 67.22%, 61.01% and 75.19% at June 30, 2015. The improvement in the Plan Fiduciary Net Position as a percentage of the Total Pension Liability is attributable to the increased contributions and the higher market value of investments at June 30, 2017. Further information on this valuation is included in the Financial Section and the Actuarial Section. Contributions for fiscal year 2017 were based on the June 30, 2015, actuarial valuation. The contribution phase-in schedule included in the 2015 Appropriations Act required the General Assembly to fund roughly 90% of the VRS Board-certified rates for fiscal year 2017. However, the Governor and General Assembly accelerated the funding rate for the state, SPORS, VaLORS, and JRS plans to 100% of the Board-certified rates. The teacher plan remained at the approximately 90% funding level for the fiscal year 2017. Retirement contribution rates are discussed in further detail in the Financial Section.

## OPEB PLANS

Calculations for the System's Other Post-Employment Benefit (OPEB) plans for financial reporting purposes were made in accordance with Governmental Accounting Standards Board Statement No. 74, *Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans*. The most recent valuation for this presentation was prepared as of June 30, 2017. The total OPEB liability was determined based on the actuarial valuation as of June 30, 2016, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2017.

Based on these calculations, the plan fiduciary net position as a percentage of the total OPEB liability was 48.86% for the Group Life Insurance Fund, 8.03% for the state employee Health Insurance Credit, 7.04% for the teacher employee Health Insurance Credit, 56.63% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 8.61% for the state-funded Health Insurance Credit for constitutional officers, 7.90% for the state-funded Health Insurance Credit for social services employees, and 6.54% for the state-funded Health Insurance Credit for Registrars. In addition the plan fiduciary net position as a percentage of the total OPEB liability was 186.63% for the Disability Insurance Program, 31.96% for the teacher employee segment of the Virginia Local Disability Program, 38.40% for the political subdivision segment of the Virginia Local Disability Program, and 1.30% for the Line of Duty Act plan.

This compares to the opening plan fiduciary net position as a percentage of the total OPEB liability at June 30, 2016, of 41.18% for the Group Life Insurance Fund, 6.95% for the state employee Health Insurance Credit, 6.13% for the teacher employee Health Insurance Credit, 50.55% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 5.32% for the state-funded Health Insurance Credit for constitutional officers, 6.28% for the state-funded Health Insurance Credit for social services employees and 2.16% for the state-funded Health Insurance Credit for registrars. In addition, the plan fiduciary net position as a percentage of the total OPEB liability was 169.30% for the Disability Insurance Program and 0.96% for the Line of Duty Act Program. The Virginia Local Disability Program plans for teachers and political subdivisions was 0.00%, since neither plan had actuarially significant assets at June 30, 2016. Further information on this valuation is included in the Financial Section and the Actuarial Section.

**35 Years of Excellence in Financial Reporting.** The *VRS Comprehensive Annual Financial Report* for fiscal year 2016 marked the 35th year of recognition from the Government Finance Officers Association of the United States and Canada (GFOA) for excellence in financial reporting.

Contributions for fiscal year 2017 were based on the June 30, 2015, actuarial valuation. The rates certified by the VRS Board of Trustees for the OPEB plans were not fully funded by the Governor and General Assembly. Contribution rates for each of these OPEB plans are discussed in further detail in the Financial Section.

## Investments

At June 30, 2017, the total value of the VRS managed investment portfolio was \$76.6 billion, an increase from the investment balance of \$68.9 billion at June 30, 2016. The increase was due to increased contributions and gains in public equities and strategic opportunities. Private equity, real assets and investment-grade fixed income all exceeded the benchmarks set for those classes.

The System's net position restricted for benefits at June 30, 2017, totaled \$75.1 billion, representing an increase from the net position of \$68.2 billion as of June 30, 2016.

## Legislative Initiatives

During the 2017 session, the Virginia General Assembly enacted the following bills that affect the Virginia Retirement System and retirees covered under VRS.

### 2017 BILLS

**HOUSE BILL 1768: STRESS TESTING AND REPORTING.** This bill codifies practices VRS is already following in stress testing and investment reporting. VRS already provides much of this information on its website at [www.varetire.org](http://www.varetire.org) or in its Comprehensive Annual Financial Report (CAFR).

**HOUSE BILL 2243: LINE OF DUTY ACT.** This bill amends certain provisions of the Line of Duty Act, including:

- Clarifies that suspension or reinstatement of health insurance benefits begins or ends at the beginning of a health insurance plan year, rather than in the middle of a plan year.
- Clarifies the current practice of the Line of Duty Act administrator to provide training materials.
- Grandfathers surviving spouses of deceased persons who remarry prior to July 1, 2017, so they would not lose health insurance benefits.
- Clarifies that the suspension of LODA health insurance coverage due to excess earned income does not apply to someone whose coverage is based on a death or disability that occurred before July 1, 2017.
- Clarifies that a child qualifies as an “eligible dependent” for purposes of LODA benefits only if the child is born as the result of a pregnancy, adoption or pre-adoptive agreement prior to the time of the employee's death or disability.
- Codifies existing Appropriation Act language.

**SENATE BILL 896:** Volunteer Firefighters’ and Rescue Squad Workers’ Service Award Fund Board; meetings. This bill requires the Volunteer Firefighters’ and Rescue Squad Workers’ Service Award Fund (VOLSAP) Board to meet at least annually. Current law requires the Board to meet at least quarterly.

**SENATE BILL 1118: LINE OF DUTY ACT.** This bill clarifies existing law. Firefighter trainees enrolled in a Fire Service Training course offered by the Virginia Department of Fire Programs, or any other required training course, are covered under the Line of Duty Act.

**MEMBER AND RETIREE HIGHLIGHTS.** The total VRS membership increased from 678,263 members, retirees and beneficiaries in fiscal year 2016 to 687,818 in fiscal year 2017, representing an increase of 1.41%.

The following are highlights from the fiscal year:

- The number of active VRS members decreased 0.14%, from 341,671 to 341,200.
- The number of retirees and beneficiaries increased 3.63% from 192,411 to 199,388.
- VRS paid \$4,519.0 million during fiscal year 2017, compared to \$4,356.9 million in retirement benefits in fiscal year 2016.
- The number of inactive and deferred members increased 2.11% from 144,181 to 147,230.
- A total of 77,623 members held accounts through the Commonwealth of Virginia Deferred Compensation Plan at the end of the fiscal year. Of these participants, 70,201 received a cash match through the Virginia Cash Match Plan.

**EXCEEDING BENCHMARKS.** VRS personnel continued to satisfy or exceed benchmarks for operating standards, as the following highlights show:

OPERATING STANDARDS	BENCHMARK	FY 2017 RESULT
<b>Retiree Payroll</b> ( <i>benefits paid each month to retirees and other annuitants</i> )	100% of all monthly retirement payrolls run no later than the first day of the month.	100.0% of monthly payrolls ran on time.
<b>Customer Counseling Center Abandoned Call Rate</b> ( <i>rate of incoming calls going unanswered</i> )	The averaged abandoned call rate is no greater than 10% for the first six months of fiscal year 2017.	The averaged abandoned call rate was 5.5%.
	The averaged abandoned call rate is no greater than 6.5% for the last six months of fiscal year 2017.	The averaged abandoned call rate was 4.8%.
<b>Service Retirements</b>	Service retirement applications are processed in an average of 45 days with a 95% accuracy rate.	Service retirement applications were processed in an average of 18 days with a 99.9% accuracy rate.
<b>Disability Retirements</b>	98% of disability retirement applications are processed within 40 days of approval by the VRS Medical Board.	100.0% of disability retirement applications were processed within 12.4 days of approval by the VRS Medical Board.

OPERATING STANDARDS	BENCHMARK	FY 2017 RESULT
<b>Refunds</b>	95% of refunds of member contributions are processed within 10 days in the first six months of fiscal year 2017.	98.9% of refunds were processed within 1 day in the first six months of fiscal year 2017.
	95% of refunds of member contributions are processed within 10 days in the last six months of fiscal year 2017.	97.8% of refunds were processed within 1 day in the last six months of fiscal year 2017.
<b>Workflow Imaging</b>	98% of documents VRS receives are imaged and available to customer service and operations personnel within 24 hours (one business day).	99.9% of documents were imaged and available within 24 hours.
<b>System Availability</b>	99.5% of planned system availability for all critical systems.	The system was available 99.9% of the time.

## Education & Counseling

In addition to these achievements, VRS staff provided counseling, education, workshops and training opportunities for members and employers throughout the state:

- The Member Counseling Team assisted 4,316 members and retirees, responded to 7,353 emails and conducted 286 retirement education and group counseling sessions, special presentations, videoconferences, webinars and benefit fairs, reaching 17,775 members around the state.
- The Hybrid Counseling Team held 36 sessions and webinars, attended by 464 Hybrid Retirement Plan members; the team responded to 301 myVRS online assistance and 171 hybrid-related emails during fiscal year 2017.
- Both teams participated in the 2017 ICMA-RC Realize Retirement tour at 15 locations, attended by 925 Virginia Defined Contribution Plan and Hybrid Retirement Plan participants throughout the state.
- In fiscal year 2017, the Employer Representatives continued to organize employer roundtables and conduct employer site visits, which focus on the full scope of VRS products and services. In total, they conducted 30 employer site visits and 43 roundtables, with 956 participants.
- In addition, the Employer Representatives assisted one state agency and two political subdivisions joining VRS; two employers electing the Group Life Insurance Program; five employers electing the enhanced benefit for hazardous duty employees; five employers electing the enhanced retirement multiplier for hazardous duty employees; two employers electing the health insurance credit; four employers electing to offer the Commonwealth of Virginia Deferred Compensation Plan; one employer electing to offer the Virginia Cash Match Plan; three employers electing to offer tax-deferred purchase of prior service; and one employer electing to offer the Optional Retirement Plan for School Superintendents.
- During fiscal year 2017, there were approximately 1,337,966 total page views of the VRS website at [www.varetire.org](http://www.varetire.org), reflecting an almost 3% increase over the 1,301,837 total page views in fiscal year 2016. myVRS, the secure online system, led again as one of the top destinations.

- The average “open rate” for Employer Update was 34%, well above the government industry average.
- At the end of fiscal year 2017, Member News had 52,435 subscribers, a 2% increase over the previous year, which resulted in 3% more opens.

## Innovations

Fiscal year 2017 was a time of transition for myVRS, as VRS continued Phase 4 of Modernization by releasing new functionality and features throughout the year. As of February 2017, members could use a redesigned retirement planner that helps them project their post-work income and expenses and a refreshed estimator that allows members to create VRS retirement benefit estimates based on different retirement dates or payout options.

Other additions to myVRS during the fiscal year included a self-service purchase of prior service component, complete with instructive videos; enhanced security, intuitive navigation and informational resources for retirees; and new comparison tools to help college and university faculty members consider and contrast retirement plan options.

Because of the system’s robust security, both first-time and returning users had to authenticate their registrations for myVRS via a multi-tiered security approach. An alternate security process enabled VRS representatives to assist members who had difficulty registering.

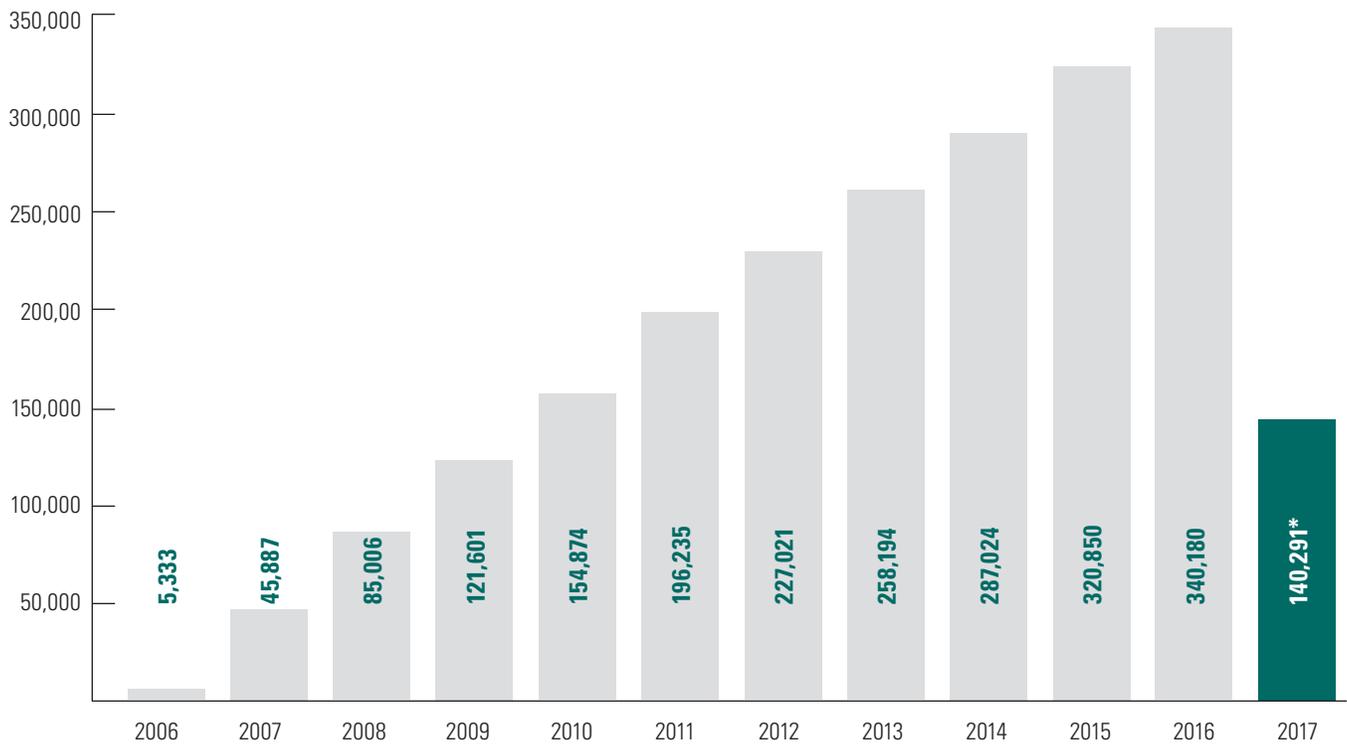
myVRS offers information and counseling to educate members and retirees as they review their accounts, conduct online transactions and adjust their retirement goals. These features provide education and outreach to VRS members, wherever they live, so that they can visualize future income needs and develop strategies for retirement planning.

By enhancing myVRS to deliver benefits and education in a more efficient manner, VRS continued to advance its mission of helping members understand their future income needs, envision a successful retirement lifestyle and develop a retirement strategy beginning at any point in their careers.

myVRS continues to attract users. During the fiscal year, the secure online myVRS system continued to serve as a valuable resource for members, retirees and employers:

- During fiscal year 2017, 34,290 first-time users and 84,994 returning users had authenticated for the new myVRS, first released in February 2016. With the 21,007 users authenticated during fiscal year 2016, the total number of registered users as of June 30, 2017, was 140,291.
- Members put myVRS planning tools to good use during the fiscal year, creating 273,070 estimates through the redesigned myVRS Benefit Estimator and 67,742 retirement plans through the new myVRS Retirement Planner.
- Since 2008, when myVRS was opened to retirees, there have been 90,665 retiree registrations. Retirees completed more than 3,911 income tax transactions through the myVRS retiree tax tool during the fiscal year.
- As of June 30, 2017, more than 3,738 participating employer contacts were authorized to access member information. During the fiscal year, employers created 70,984 estimates to help counsel employees getting ready to retire.

## myVRS MEMBER USERS



\* First-time and returning users of myVRS who registered via the enhanced security features in fiscal year 2017.

## Acknowledgments

VRS continues to focus on providing efficient service and delivery of benefits while being an accountable steward of the funds in our care on behalf of our members, retirees and beneficiaries. These responsibilities remain integral to our mission in an era when retirement plans are rapidly changing.

Over the last several years, VRS has implemented a variety of pension-reform initiatives. The Hybrid Retirement Plan introduced defined contribution accounts to accompany the defined benefit component provided by VRS. The plan also provides opportunities for hybrid members to take an active role in retirement planning, by making voluntary contributions to retirement savings and selecting investment portfolios that best meet their needs. At the same time, VRS is grateful for the steadfast commitment of the Governor and General Assembly to increase contributions to the plans at a more rapid pace than anticipated.

Advancements gained from this multifaceted approach to pension reform are coalescing to improve the overall funded status of the plan, positioning VRS to serve its members for years to come.

This progress is made possible with the strong dedication and initiative exhibited by the VRS staff, the support of VRS' participating employers and business partners, and the guidance and perseverance of the Board of Trustees. We express our sincere thanks to each of these remarkable individuals and representatives.

Finally, we wish to thank Governor Terence R. McAuliffe and the members of the Virginia General Assembly for their continued commitment to the financial security of the members, retirees and beneficiaries of the Virginia Retirement System.

Respectfully submitted,



Patricia S. Bishop  
Director



Barry C. Faison  
Chief Financial Officer

At VRS, we value

# INTEGRITY

*integrity*

Integrity is the ability to act with honesty and be consistent in administering benefits and managing investments. Integrity serves as the foundation for building trust with the public, retirees, members and employers as we provide services.

## Financial Section

Independent Auditor's Report

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# Commonwealth of Virginia

*Auditor of Public Accounts*

Martha S. Mavredes, CPA  
Auditor of Public Accounts

P.O. Box 1295  
Richmond, Virginia 23218

December 15, 2017

The Honorable Terence R. McAuliffe  
Governor of Virginia

The Honorable Robert D. Orrock, Sr.  
Chairman, Joint Legislative Audit  
And Review Commission

Board of Trustees  
Virginia Retirement System

## INDEPENDENT AUDITOR'S REPORT

### Report on Financial Statements

We have audited the accompanying financial statements of the Virginia Retirement System (System) as of and for the year ended June 30, 2017, and the related notes to the financial statements, which collectively comprise the System's basic financial statements as listed in the table of contents.

### Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall financial statement presentation.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a reasonable basis for our audit opinion.

## Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Virginia Retirement System as of June 30, 2017, and the changes in fiduciary net position for the year then ended, in accordance with accounting principles generally accepted in the United States of America.

## Emphasis of Matter

### **Relationship to the Commonwealth of Virginia**

As discussed in Note 1, the basic financial statements of the System are intended to present the financial position and the changes in financial position of only that portion of the aggregate remaining fund information of the Commonwealth of Virginia that is attributable to the transactions of the System.

They do not purport to, and do not, present fairly the Commonwealth of Virginia's overall financial position as of June 30, 2017, and the changes in its financial position and its cash flows, where applicable, for the year then ended in conformity with accounting principles generally accepted in the United States of America. Our opinion is not modified with respect to this matter.

### **Change in Accounting Principles**

As discussed in Note 1 to the financial statements, the System implemented Governmental Accounting Standards Board (GASB) Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*. Our opinion is not modified with respect to this matter.

## Other Matters

### **Prior-Year Summarized Comparative Information**

We have previously audited the System's 2016 financial statements, and we expressed an unmodified audit opinion on the respective financial statements in our report dated December 15, 2016.

In our opinion, the summarized comparative information presented herein as of and for the year ended June 30, 2016, is consistent, in all material respects, with the audited financial statements from which it has been derived.

### **Required Supplementary Information**

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis on pages 31 through 41 and the Schedules of Changes in Employers' Net Pension Liability, Schedule of Employer Contributions for pension plans, Schedule of Investment Returns, Schedule of Changes in Employers' Net OPEB Liability and Related Ratios, Schedule of Employer Contributions for other post-employment benefit plans on pages 108 through 119 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of the financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### **Supplementary and Other Information**

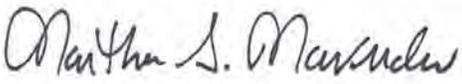
Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the System's basic financial statements. The accompanying supplementary information, such as the Schedules of Administrative Expenses, Professional and Consulting Services, and Investment Expenses, and other information, such as the Introductory, Investment, Actuarial, and Statistical sections, are presented for the purpose of additional analysis and are not a required part of the basic financial statements.

The Schedules of Administrative Expenses, Professional and Consulting Services, and Investment Expenses are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedules of Administrative Expenses, Professional and Consulting Services, and Investment Expenses are fairly stated, in all material respects, in relation to the basic financial statements taken as a whole.

The Introductory, Investment, Actuarial, and Statistical sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

### Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated December 15, 2017, on our consideration of the System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements, and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the System's internal control over financial reporting and compliance.



AUDITOR OF PUBLIC ACCOUNTS

**T**he Virginia Retirement System (the System) administers pension and other employee benefit plans for approximately 687,000 members, retirees and beneficiaries. The purpose of the Financial Section is to present the plans' net position and changes in net position for the fiscal year through the audited Basic Financial Statements. In support of this information, the Financial Section includes Management's Discussion and Analysis of activity affecting the plans and the operations of the System during the current and previous fiscal years. It also includes the Notes to Financial Statements, providing additional detail about the statements, as well as required schedules regarding historical information and the administration of the plans.

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## Management's Discussion and Analysis (Unaudited)

Management's Discussion and Analysis provides highlights of the funding of the plans and the performance and operations of the System for the fiscal year ended June 30, 2017. The information provided in the Introductory, Investment, Actuarial and Statistical sections complements this discussion.

The System administers two defined benefit retirement benefit structures, Plan 1 and Plan 2, and a hybrid retirement benefit structure. While all of the following systems have employees with Plan 1 and Plan 2 benefits, only the VRS and JRS systems have employees with hybrid benefits. All of these systems are defined as pension trust funds:

- Virginia Retirement System (VRS) for state employees, teachers, other eligible school division employees, employees of participating political subdivisions and other qualifying employees.
- State Police Officers' Retirement System (SPORS) for state police officers.
- Virginia Law Officers' Retirement System (VaLORS) for non-local government Virginia law officers other than state police officers.
- Judicial Retirement System (JRS) for judges of state courts of record, state district courts and other qualifying employees.

The System also administers the Group Life Insurance Fund, Retiree Health Insurance Credit Fund, a Disability Insurance Trust Fund for state employees, a Disability Insurance Trust Fund for local government employees and the funding of the Line of Duty Act Trust Fund. All of these funds are defined as other employee benefit trust funds. Both the pension and other employee benefit trust funds are classified as fiduciary funds.

### FINANCIAL HIGHLIGHTS

- The combined total net position of the trust funds restricted for benefits was \$75.1 billion at June 30, 2017, representing an increase of \$6.8 billion, or 10.0%, from the net position as of June 30, 2016. The increase was due to higher contribution rates and investment income; however, these were partially offset by increased expenses for benefit payments.
- The System's rate of return on investments during the fiscal year ended June 30, 2017, was 12.1% compared to a return of 1.9% for the fiscal year ending June 30, 2016. The increase was due primarily to the improved performance of the public equity investments in the portfolio.
- The latest valuations of the pension plans were performed by Cavanaugh Macdonald Consulting, LLC, using the new GASB Statement No. 67 calculation processes. Using the June 30, 2016, data, rolled forward to June

30, 2017, the plan fiduciary net position as a percentage of the total pension liability was 75.33% for the VRS state plan, 72.92% for the VRS teacher plan, 89.27% for the aggregate total of the VRS political subdivision plans, 76.00% for SPORS, 67.22% for VaLORS and 79.34% for JRS. This compares to the June 30, 2015, data, rolled forward to June 30, 2016, when the plan fiduciary net position as a percentage of the total pension liability was 71.29% for the VRS state plan, 68.28% for the VRS teacher plan, 83.67% for the aggregate total of the VRS political subdivision plans, 67.22% for SPORS, 61.01% for VaLORS and 75.19% for JRS.

- Cavanaugh Macdonald Consulting, LLC also performed the latest actuarial valuations for the Other Post-Employment Benefit (OPEB) plans using the new GASB Statement No. 74 calculation processes. Using the June 30, 2016, data, rolled forward to June 30, 2017, the plan fiduciary net position as a percentage of the total OPEB liability was 48.86% for the Group Life Insurance Fund, 8.03% for the state employee Health Insurance Credit, 7.04% for the teacher employee Health Insurance Credit, 56.63% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 8.61% for the state-funded Health Insurance Credit for constitutional officers, 7.90% for the state-funded Health Insurance Credit for social services employees, and 6.54% for the state-funded Health Insurance Credit for registrars. In addition the plan fiduciary net position as a percentage of the total OPEB liability was 186.63% for the Disability Insurance Program, 31.96% for the teacher employee segment of the Virginia Local Disability Program, 38.40% for the political subdivision segment of the Virginia Local Disability Program, and 1.30% for the Line of Duty Act plan.
- This compares to the opening plan fiduciary net position as a percentage of the total OPEB liability at June 30, 2016, of 41.18% for the Group Life Insurance Fund, 6.95% for the state

employee Health Insurance Credit, 6.13% for the teacher employee Health Insurance Credit, 50.55% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 5.32% for the state-funded Health Insurance Credit for constitutional officers, 6.28% for the state-funded Health Insurance Credit for social services employees, and 2.16% for the state-funded Health Insurance Credit for Registrars. In addition, the plan fiduciary net position as a percentage of the total OPEB liability was 169.30% for the Disability Insurance Program, and 0.96% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions was 0.00% since neither plan had actuarially significant assets at June 30, 2016.

## Overview of the Financial Statements and Accompanying Information

The pension components of the fiscal year 2017 VRS financial statements, notes to the financial statements and required supplementary information were prepared in conformity with GASB Statement No. 67, *Financial Reporting for Pension Plans*, as modified by GASB Statement No. 82, *Pension Issues*. The Other Post-Employment Benefit (OPEB) components of the fiscal year 2017 financial statements, notes to the financial statements and required supplementary information were prepared in conformity with GASB Statement No. 74, *Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans*.

**BASIC FINANCIAL STATEMENTS.** The System presents the Basic Financial Statements for the year ended June 30, 2017, with comparative information from the previous fiscal year. In addition, a set of combining statements is now added to show the amounts attributable to the state, teacher and local plans included in the VRS totals. The statements were prepared on the accrual basis of accounting and are used to account for the resources the System administers on behalf of plan members and beneficiaries. These statements include:

- **Statement of Fiduciary Net Position: Pension and Other Employee Benefit Trust Funds.** This statement reflects the balance of the resources available to pay benefits to members, retirees and beneficiaries at the end of the fiscal year.
- **Statement of Changes in Fiduciary Net Position: Pension and Other Employee Benefit Trust Funds.** This statement reflects the changes in the resources available to pay benefits to members, retirees and beneficiaries during the fiscal year.

A summary of the Basic Financial Statements is presented in Figures 2.1 and 2.2. The full statements follow Management's Discussion and Analysis.

**NOTES TO FINANCIAL STATEMENTS.** The Notes to Financial Statements provide detailed information and are integral to the Basic Financial Statements.

**REQUIRED SUPPLEMENTARY SCHEDULES.** These schedules include:

- Required Supplementary Schedule of Changes in Employers' Net Pension Liability
- Required Supplementary Schedule of Employer Contributions: Pension Plans
- Required Supplementary Schedule of Investment Returns
- Required Supplementary Schedule of Changes in Employers' Net Other Post-Employment Benefit Liability
- Required Supplementary Schedule of Employer Contributions: Other Post-Employment Benefit Plans

**ADDITIONAL FINANCIAL INFORMATION.** The following schedules provide additional information not included in the Basic Financial Statements:

- Schedule of Administrative Expenses
- Schedule of Professional and Consulting Services
- Schedule of Investment Expenses

**FIGURE 2.1: SUMMARY OF FIDUCIARY NET POSITION**

AT JUNE 30

(EXPRESSED IN MILLIONS)

	2017	Increase (Decrease)	2016	Increase (Decrease)	2015
<b>Assets:</b>					
Cash, Receivables and Capital Assets	\$ 1,953.7	\$ (314.7)	\$ 2,268.4	\$ 63.5	\$ 2,204.9
Investments	76,797.7	7,871.1	68,926.6	776.5	68,150.1
Security Lending Collateral	4,796.9	(226.1)	5,023.0	1,644.8	3,378.2
<b>Total Assets</b>	<b>\$83,548.3</b>	<b>\$ 7,330.3</b>	<b>\$ 76,218.0</b>	<b>\$ 2,484.8</b>	<b>\$ 73,733.2</b>
<b>Liabilities:</b>					
Accounts Payable	352.4	(499.1)	851.5	104.1	747.4
Investment Purchases Payable	3,313.4	1,217.9	2,095.5	670.8	1,424.7
Obligations Under Securities Lending	4,796.9	(226.1)	5,023.0	1,644.0	3,379.0
<b>Total Liabilities</b>	<b>\$ 8,462.7</b>	<b>\$ 492.7</b>	<b>\$ 7,970.0</b>	<b>\$ 2,418.9</b>	<b>\$ 5,551.1</b>
<b>Total Net Position – Restricted for Benefits</b>	<b>\$75,085.6</b>	<b>\$ 6,837.6</b>	<b>\$ 68,248.0</b>	<b>\$ 65.9</b>	<b>\$ 68,182.1</b>

**FIGURE 2.2: SUMMARY OF CHANGES IN FIDUCIARY NET POSITION**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2017	Increase (Decrease)	2016	Increase (Decrease)	2015
<b>Additions:</b>					
Member Contributions	\$ 1,060.4	\$ 90.4	\$ 970.0	\$ 63.9	\$ 906.1
Member Contributions Paid by Employer	2.3	(23.5)	25.8	(27.7)	53.5
Employer Contributions	2,624.5	(157.6)	2,782.1	105.2	2,676.9
Net Investment Income	8,241.3	7,071.5	1,169.8	(1,828.3)	2,998.1
Miscellaneous Revenue & Transfers	3.7	1.2	2.5	0.4	2.1
<b>Total Additions</b>	<b>\$11,932.2</b>	<b>\$ 6,982.0</b>	<b>\$ 4,950.2</b>	<b>\$ (1,686.5)</b>	<b>\$ 6,636.7</b>
<b>Deductions:</b>					
Retirement Benefits	4,518.9	161.9	4,357.0	242.8	4,114.2
Refunds of Member Contributions	119.7	15.1	104.6	(1.6)	106.2
Insurance Premiums and Claims	184.1	10.3	173.8	(1.9)	175.7
Retiree Health Insurance Credit					
Reimbursements	159.0	5.1	153.9	5.9	148.0
Disability Insurance Benefits	38.9	(0.4)	39.3	1.6	37.7
Line of Duty Act Reimbursements	10.3	1.8	8.5	0.3	8.2
Administrative and Other Expenses	63.7	16.5	47.2	0.9	46.3
<b>Total Deductions</b>	<b>\$ 5,094.6</b>	<b>\$ 210.3</b>	<b>\$ 4,884.3</b>	<b>\$ 248.0</b>	<b>\$ 4,636.3</b>
<b>Net Increase (Decrease) in Net Position</b>	<b>\$ 6,837.6</b>	<b>\$ 6,771.7</b>	<b>\$ 65.9</b>	<b>\$ (1,934.5)</b>	<b>\$ 2,000.4</b>
Net Position – Beginning of Year	68,248.0	65.9	68,182.1	2,000.4	66,181.7
<b>Net Position – End of Year</b>	<b>\$75,085.6</b>	<b>\$ 6,837.6</b>	<b>\$ 68,248.0</b>	<b>\$ 65.9</b>	<b>\$ 68,182.1</b>

## Analysis of Financial Activities – Pension Plans

The System's funding objective is to meet its long-term benefit obligations through investment income and contributions. Accordingly, the collection of contributions and the income from investments provide the reserves needed to finance the benefits provided under the plans.

## MEMBERS, RETIREES, BENEFICIARIES AND EMPLOYERS

Approximately 341,200 active members were employed with 832 VRS-participating employers as of June 30, 2017. The number of retirees and other annuitants totaled approximately 199,388 at year-end. The distribution of active members, retirees and beneficiaries, and employers is shown in Figures 2.3, 2.4 and 2.5.

### FIGURE 2.3: DISTRIBUTION OF ACTIVE MEMBERS

AT JUNE 30

	2017		2016		2015	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
State Employees (VRS)	77,617	22.7%	77,651	22.7%	78,204	23.0%
Teachers (VRS)	146,090	42.9%	146,854	43.0%	145,758	42.7%
Political Subdivision Employees (VRS)	106,524	31.2%	105,654	30.9%	105,431	31.0%
State Police Officers (SPORS)	1,877	0.6%	1,947	0.6%	2,000	0.6%
Virginia Law Officers (VaLORS)	8,673	2.5%	9,147	2.7%	8,779	2.6%
Judges (JRS)	419	0.1%	418	0.1%	404	0.1%
<b>Total Members</b>	<b>341,200</b>	<b>100.0%</b>	<b>341,671</b>	<b>100.0%</b>	<b>340,576</b>	<b>100.0%</b>

Additional information about the membership is presented in Note 2 and in the Statistical Section.

### FIGURE 2.4: DISTRIBUTION OF RETIREES AND BENEFICIARIES

AT JUNE 30

	2017		2016		2015	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
State Employees (VRS)	55,427	27.7%	54,034	28.1%	52,521	28.4%
Teachers (VRS)	86,652	43.4%	83,738	43.5%	80,436	43.5%
Political Subdivision Employees (VRS)	51,147	25.7%	48,827	25.4%	46,300	25.1%
State Police Officers (SPORS)	1,300	0.7%	1,242	0.6%	1,234	0.7%
Virginia Law Officers (VaLORS)	4,355	2.2%	4,066	2.1%	3,781	2.0%
Judges (JRS)	507	0.3%	504	0.3%	497	0.3%
<b>Total Members</b>	<b>199,388</b>	<b>100.0%</b>	<b>192,411</b>	<b>100.0%</b>	<b>184,769</b>	<b>100.0%</b>

Additional information about retirees and beneficiaries is presented in the Statistical Section.

### FIGURE 2.5: DISTRIBUTION OF EMPLOYERS

AT JUNE 30

	2017	2016	2015
Cities and Towns	161	161	162
Counties	93	93	93
School Boards*	145	145	145
Special Authorities	206	202	200
State Agencies	227	226	227
<b>Total Employers</b>	<b>832</b>	<b>827</b>	<b>827</b>

\* Of the 145 school boards, 133 also provide coverage for non-professional employees and are treated as political subdivisions. A list of VRS-participating employers and additional employer information is presented in the Statistical Section.

## CONTRIBUTIONS AND INVESTMENT EARNINGS

The retirement benefits provided by the plans are funded from pension trust fund revenue. As shown in Figure 2.6, the primary sources of revenue are contributions for active members made by members or their employers, contributions from employers and investment income generated from the investment of plan assets.

Total contributions and investment earnings for the year ended June 30, 2017, amounted to \$11,259.0. This was an increase of \$6,745.3 million when compared with the activity for fiscal year 2016. It was also greater than the contributions and investments earnings of \$6,171.9 million recorded in fiscal year 2015.

Total member contributions increased by \$48.8 million. The portion members paid increased by \$72.3 million. This was due primarily to a continuation in implementation of the statutory shift from employer-paid to member-paid contributions.

For fiscal year 2017, employer contributions decreased by \$181.4 million due primarily to the absence of the special contributions for the state employee groups received in 2016, a reduction in the actuarial rates being contributed for the state employees and many of the political subdivision employer groups, offset by

a slight increase in the covered payroll for the state, teacher and political subdivision employer groups. The total of all contributions represented a decrease of \$132.6 million from fiscal year 2016. Employer contributions for pensions are discussed further in Notes 2 and 12.

During fiscal year 2016, the System experienced an increase in total member contributions of \$32.6 million and an increase in employer contributions of \$92.8 million. This increase reflects some payroll growth, the addition of some new local government employers and the election of enhanced hazardous duty or other coverage by some local governments and the increase in the statutory percentage being contributed for state employee groups.

## INVESTMENTS

The System holds contributions from members and employers in a commingled pool, which is invested to provide for the payment of current and future benefits to members when they retire. Each plan – state, teacher, political subdivisions, SPORS, VaLORS and JRS – owns an equity position in the pool and receives a proportionate share of the total investment income or loss from the pool on a monthly basis.

**FIGURE 2.6: SUMMARY OF PENSION CONTRIBUTIONS, INVESTMENT EARNINGS AND MISCELLANEOUS REVENUES**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2017	Increase (Decrease)	2016	Increase (Decrease)	2015
Member Contributions	\$ 914.4	\$ 72.3	\$ 842.1	\$ 60.3	\$ 781.8
Member Contributions Paid by Employers	2.3	(23.5)	25.8	(27.7)	53.5
Employer Contributions	2,325.7	(181.4)	2,507.1	92.8	2,414.3
Net Investment Income	8,014.8	6,877.9	1,136.9	(1,783.7)	2,920.6
Miscellaneous Revenue and Transfers	1.8	0.0	1.8	0.1	1.7
<b>Total Members</b>	<b>\$ 11,259.0</b>	<b>\$ 6,745.3</b>	<b>\$ 4,513.7</b>	<b>\$ (1,658.2)</b>	<b>\$ 6,171.9</b>

As shown in Figure 2.6, net investment income for fiscal year 2017 of \$8,014.8 million represented an increase of \$6,877.9 million from fiscal year 2016. This compares with the net investment income decrease of \$1,783.7 million in fiscal year 2016. Total pension trust fund investments were \$74,617.7 million at fair value at June 30, 2017. This was an increase of \$7,552.2 million from the fair value of \$67,065.5 million at June 30, 2016. The total pension trust fund investments also increased in fiscal year 2016 by \$701.1 million from their fair value of \$66,364.4 million at June 30, 2015. The total return on pension trust fund investments for the year ended June 30, 2017, was 12.1%. This represents an annualized return of 6.2% over the past three years and 9.1% over the past five years. An explanation of investment policies and strategies as well as the portfolio's composition is included in the Investment Section. A review of investment activity and results for fiscal year 2017 also is provided in that section.

#### EXPENSES – DEDUCTIONS FROM PLAN NET POSITION

As shown in Figure 2.7, the primary expenses of the pension trust funds include annuity benefits for retirees and beneficiaries, refunds of contributions to former members and expenses associated with the administration of the retirement plans. Expenses for fiscal year 2017 totaled \$4,698.0 million, an increase of \$192.5 million, or 4.3%, over the 2016 period.

Benefit payments were \$4,518.9 million in fiscal year 2017. This is an increase of \$161.9 million compared to an increase of \$242.8 million in fiscal

year 2016. The increase in fiscal year 2017 was due to continued growth in the number of retirees and beneficiaries receiving benefits. The fiscal year 2017 benefit payments also reflect a 0.12% cost-of-living adjustment (COLA) effective July 1, 2016, for Plan 1 retirees and Plan 2 retirees.

Refunds of contributions to members who terminated employment during fiscal year 2017 amounted to \$119.7 million (12,460 refunds), compared with \$104.6 million refunded (12,288 refunds) during fiscal year 2016 and \$106.2 million refunded (10,405 refunds) during fiscal year 2015.

The change during fiscal year 2017 reflects an increase in the volume of refunds and an increase in the average refund amount compared to fiscal year 2016.

Administrative and other expenses for fiscal year 2017 were \$59.4 million, compared with \$43.9 million for fiscal year 2016 and \$42.8 million for fiscal year 2015.

Administrative and other expenses increased by \$15.5 million for fiscal year 2017. This compares to an increase in fiscal year 2016 of \$1.1 million. The increase for fiscal year 2017 reflects an increase in administrative expenses combined with an increase in the other expenses categories. This increase in administrative expenses includes increases in personal services costs, increases in data processing costs, additional depreciation of the capitalized software created as part of Modernization and pension reform,

**FIGURE 2.7: SUMMARY OF PENSION PLAN PRIMARY EXPENSES**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2017	Increase (Decrease)	2016	Increase (Decrease)	2015
Benefits	\$ 4,518.9	\$ 161.9	\$ 4,357.0	\$ 242.8	\$ 4,114.2
Refunds	119.7	15.1	104.6	(1.6)	106.2
Administrative and Other Expenses	59.4	15.5	43.9	1.1	42.8
<b>Total Primary Expenses</b>	<b>\$ 4,698.0</b>	<b>\$ 192.5</b>	<b>\$ 4,505.5</b>	<b>\$ 242.3</b>	<b>\$ 4,263.2</b>

an increase in furniture and equipment related to the renovations of the VRS office, and slight increases in some of the other administrative expense categories. These were partially offset by software development costs that were capitalized in fiscal year 2017. Other expenses increased because of larger investment income distributions to the other accounts managed by the System. Further details are provided in the Schedule of Administrative Expenses following the Required Supplementary Schedules.

### RETIREMENT RESERVES

The funds accumulated by the pension plans to meet current and future obligations to retirees and beneficiaries are derived from the excess of revenues over expenses. The higher the level of funding a plan achieves, the larger the accumulation of assets and the greater the investment income potential. As shown in Figure 2.8, revenues exceeded expenses for fiscal year 2017, leading to a net increase of \$6,561.0 million in the retirement reserves held by the plans.

This follows an increase of \$8.2 million in the retirement reserves in fiscal year 2016. The increase for fiscal year 2017 reflects a decline in contributions and an increase in investment income partially offset by an increase in benefit expenses.

### ACTUARIAL VALUATIONS AND FUNDING PROGRESS – PENSION PLANS

The System’s actuarial firm performs actuarial valuations of VRS, SPORS, VaLORS and JRS at least every two years to determine funding requirements. The funding policy provides for periodic employer contributions at actuarially determined rates that will remain relatively level over time as a percentage of payroll and will accumulate sufficient assets to meet the costs of all benefits when due.

The latest valuations of the pension plans were performed by Cavanaugh Macdonald Consulting, LLC, using the GASB Statement No. 67 calculation processes. Using the June 30, 2016, data, rolled

### PENSION PLAN ACTIVITY

FISCAL YEAR 2017

(EXPRESSED IN MILLIONS)



FIGURE 2.8: SUMMARY OF PENSION PLAN RESERVE BALANCES

AT JUNE 30

(EXPRESSED IN MILLIONS)

	2017	Increase (Decrease)	2016	Increase (Decrease)	2015
Member Reserves	\$ 13,452.2	\$ 483.0	\$ 12,969.2	\$ 403.2	\$ 12,566.0
Employer Reserves	59,548.1	6,078.0	53,470.1	(395.0)	53,865.1
<b>Total</b>	<b>\$ 73,000.3</b>	<b>\$ 6,561.0</b>	<b>\$ 66,439.3</b>	<b>\$ 8.2</b>	<b>\$ 66,431.1</b>

*These balances also reflect transfers between the Member and Employer Reserves for interest credited to member accounts and member contributions transferred to the Employer Reserve upon a member’s retirement. For fiscal year 2017, the amount of interest credited to member accounts was \$489.1 million, and the amount of member balances transferred to the Employer Reserve for retirements was \$842.6 million. For fiscal year 2016, the interest and retirement transfers were \$475.7 million and \$864.2 million, respectively.*

forward to June 30, 2017, the plan fiduciary net position as a percentage of the total pension liability was 75.33% for the VRS state plan, 72.92% for the VRS teacher plan, 89.27% for the aggregate total of the VRS political subdivision plans, 76.00% for SPORS, 67.22% for VaLORS and 79.34% for JRS. The valuations reflect full pre-funding of the statutory cost-of-living adjustment (COLA) for retirees as well as other changes required in GASB Statement No. 67. Additional information on plan funding is presented in Note 2 and in the Actuarial Section.

## Analysis of Financial Activities – Other Employee Benefit Plans

### GROUP LIFE INSURANCE PROGRAM

The Group Life Insurance Program provides basic group life insurance coverage for natural death, accidental death, accidental dismemberment and other life insurance benefits to the majority of members covered under the pension plans, as well as to other qualifying employees. Employers and their covered employees pay the premiums for group life insurance coverage; many employers pay the employee's portion.

During fiscal year 2017, the System remitted \$184.1 million to the insurer for claims and administrative costs. This is an increase from the \$173.8 million remitted for fiscal year 2016. Approximately 359,386 active members were covered under the Group Life Insurance Program at June 30, 2017.

The difference between the amounts collected and paid by the System is added to the reserve established to pre-fund group life insurance coverage for retirees.

The reserve had a fiduciary net position restricted for benefits of \$1,437.6 million at June 30, 2017.

Investment income, including net securities lending income, was \$158.4 million during the fiscal year. For fiscal year 2016, this reserve had investment income of \$23.4 million and ended the year with a reserve

balance of \$1,224.9 million, a slight increase from the balance of \$1,162.6 million at June 30, 2015.

For fiscal year 2017, the increase in the reserve balance was primarily the result of an increase in contributions, an increase in investment income, partially offset by an increase in the program's claims. Employer contributions for the Group Life Insurance Program are discussed further in Note 12.

Approximately 176,107 retirees were covered under the Group Life Insurance Program at June 30, 2017.

Members covered under the Basic Group Life Insurance Program are eligible to elect additional coverage through the Optional Group Life Insurance Program. This program provides life insurance, accidental death and accidental dismemberment coverage as a supplement to the basic group plan. Members also may cover their spouses and dependent children. Members pay the premiums through payroll deduction. Approximately 68,377 active members and 2,980 retirees were enrolled in the Optional Group Life Insurance Program at June 30, 2017. Additional information about the Group Life Insurance Program is provided in Note 3.

### RETIREE HEALTH INSURANCE CREDIT PROGRAM

The Retiree Health Insurance Credit Program provides a tax-free reimbursement for the portion of health insurance premiums eligible retirees pay for single coverage under qualifying health insurance plans. During fiscal year 2017, the System collected \$168.3 million in retiree health insurance credit contributions from participating employers and provided reimbursements to retirees of \$159.0 million. During fiscal year 2016, the System collected \$151.9 million in retiree health insurance credit contributions from participating employers and provided reimbursements of \$153.9 million.

There was an increase in the contribution rates for all of the employer groups in fiscal year 2017. Employer contributions for the Retiree Health Insurance Credit Program are discussed further in Note 12. The growth in Health Insurance Credit reimbursements reflects an increase in the number of eligible retirees.

The Retiree Health Insurance Credit Fund reserve had a fiduciary net position restricted for benefits of \$201.3 million at June 30, 2017. Investment income, including net securities lending income, was \$19.1 million for the fiscal year. The reserve balances at June 30, 2016, and June 30, 2015, were \$173.2 million and \$173.2 million, respectively. Approximately 120,304 retirees were receiving the Health Insurance Credit at June 30, 2017. Additional information is provided in Note 3.

#### VIRGINIA SICKNESS AND DISABILITY PROGRAM

The Virginia Sickness and Disability Program (VSDP), also known as the Disability Insurance Trust Fund, provides eligible state employees with sick, family and personal leave, and short-term and long-term disability benefits for non-work-related and work-related illnesses and injuries. The System is responsible for administering the disability program and the payment of long-term disability benefits. Employers are responsible for administering the leave program and the payment of short-term disability benefits.

During fiscal year 2017, the System collected \$24.1 million in VSDP contributions from participating employers and paid disability premiums and benefits of \$37.7 million. This was a slight decrease from \$38.0 million in benefits paid in fiscal year 2016.

Administrative and other expenses decreased from fiscal year 2016. Employer contributions for VSDP are discussed further in Note 12.

The benefit costs reflect continued stability in the number of members receiving long-term disability benefits, the amount of these benefits, the costs of the long-term care benefits and the operating costs of the program. The Disability Insurance Trust Fund reserve had a fiduciary net position restricted for benefits of \$442.3 million at June 30, 2017. Investment income, including net securities lending income, was \$48.2 million during the fiscal year. The reserve balances at June 30, 2016, and June 30, 2015, were \$407.8 million and \$414.5 million, respectively. At June 30, 2017, approximately 74,944 active members were

participating in the program and approximately 2,785 former members were receiving benefits. Additional information is provided in Note 3.

#### LINE OF DUTY ACT PROGRAM

The Line of Duty Act Program was a new program for the System in fiscal year 2011. The System is responsible for identifying eligible individuals, having the VRS actuary prepare an actuarial valuation, collecting contributions, reimbursing the Commonwealth of Virginia's Department of Accounts (DOA) for claims and administrative costs and managing the assets of the program. DOA is responsible for the administration of the benefits under the program and the payment of claims for death benefits and health insurance reimbursements for eligible state employees and local government employees, including volunteers, who die or become disabled as the result of the performance of their duties as a public safety officer.

During fiscal year 2017, the System collected \$11.0 million in contributions and paid out \$10.3 million in benefits provided by this program. This is a slight increase from the \$10.9 million in contributions received in fiscal year 2016 and an increase in benefit costs from the \$8.5 million for fiscal year 2016. This reflects the impact of the continuation of the stabilization of the program's participation and claims levels. The reserve balance at June 30, 2017, was \$3.5 million, an increase over the reserve balance of \$2.7 million at June 30, 2016. Additional information is provided in Note 3.

#### VIRGINIA LOCAL DISABILITY PROGRAM

The Virginia Local Disability Program (VLDP) was a new program for the System in fiscal year 2014. The program provides eligible local government employees who are members of the Hybrid Retirement Plan with sick, family and personal leave and short-term and long-term disability benefits for non-work-related and work-related illnesses and injuries. The System is responsible for administering the disability program and the payment of long-term disability benefits. Employers are responsible for

administering the leave program and the payment of short-term disability benefits.

During fiscal year 2017, the System collected \$1.3 million in contributions and paid out \$1.2 million in benefits provided by this program. During fiscal year 2016, the System collected \$1.3 million in contributions and paid out \$1.3 million in benefits provided by the program. At June 30, 2017, approximately 13,370 active members were participating in the program and approximately four former members were receiving benefits. Additional information is provided in Note 3.

### ACTUARIAL VALUATIONS AND FUNDING PROGRESS – OTHER EMPLOYEE BENEFIT PLANS

The System’s actuarial firm performs actuarial valuations of the Group Life Insurance Program, the Retiree Health Insurance Credit Program, the Disability Insurance Program, the Virginia Local Disability Program and the Line of Duty Act Program at least every two years to determine funding requirements. The funding policy provides for periodic employer contributions at actuarially determined rates that will remain relatively level over time as a percentage of payroll and will accumulate sufficient assets to meet the costs of all benefits when due.

The latest valuations of the Other Post-Employment Benefit (OPEB) plans were performed by Cavanaugh Macdonald Consulting, LLC, using the new GASB Statement No. 74 calculation processes. Using the June 30, 2016, data, rolled forward to June 30, 2017, the plan fiduciary net position as a percentage of the total OPEB liability was 48.86% for the Group Life Insurance Fund, 8.03% for the state employee Health Insurance Credit, 7.04% for the teacher employee Health Insurance Credit, 56.63% for the aggregate total of the political subdivision plans for Health Insurance Credit, 8.61% for the state-funded Health Insurance Credit for constitutional officers, 7.90% for the state-funded Health Insurance Credit for social services employees, and 6.54% for the state-funded Health Insurance Credit for Registrars. In addition, the plan fiduciary net position as a percentage

of the total OPEB liability was 186.63% for the Disability Insurance Program, 31.96% for the teacher employee segment of VLDP, 38.40% for the political subdivision segment of VLDP, and 1.30% for the Line of Duty Act Program. The valuations reflect all of the changes required in GASB Statement No. 74.

### Market Volatility

The System’s investment performance for the fiscal year ended June 30, 2017, was 12.1%, and contributed to an increase in the net position restricted for benefits. As noted in this section, in the Introductory Section and in the Chief Investment Officer’s letter in the Investment Section, the investment markets continue to be extremely volatile. The amount of assets and reserves required to meet future obligations is based, in part, on estimated or expected long-term investment returns. Although management cannot predict future market returns, the changes in assets reflect the volatility in the market.

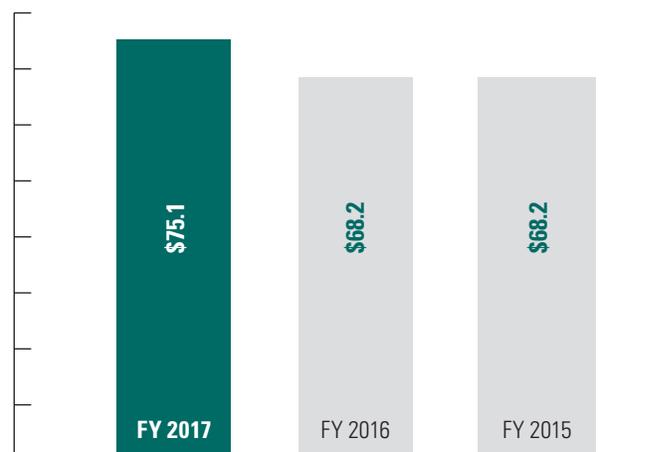
### REQUEST FOR INFORMATION

This financial report is designed to provide an overview of the System’s finances. Questions concerning the information provided in this report or requests for additional information should be addressed to the Chief Financial Officer, Virginia Retirement System, P.O. Box 2500, Richmond, VA 23218-2500.

### SYSTEM NET ASSETS

AT JUNE 30

(EXPRESSED IN BILLIONS)



**VIRGINIA RETIREMENT SYSTEM STATEMENT OF FIDUCIARY NET POSITION:  
DEFINED BENEFIT PENSION TRUST FUNDS AND OTHER EMPLOYEE BENEFIT TRUST FUNDS**

AS OF JUNE 30, 2017, WITH COMPARATIVE INFORMATION AS OF JUNE 30, 2016

	Pension Trust Funds				
	Virginia Retirement System	State Police Officers' Retirement System	Virginia Law Officers' Retirement System	Judicial Retirement System	Total Pension Trust Funds
<b>Assets:</b>					
Cash (Note 5)	\$ 51,421	\$ 413	\$ 698	\$ 266	\$ 52,798
Receivables:					
Contributions	242,786	1,424	4,813	1,310	250,333
Interest and Dividends	218,231	2,494	4,212	1,607	226,544
Receivable for Security Transactions	1,237,615	14,148	23,890	9,114	1,284,767
Other Investment Receivables	12,153	139	235	88	12,615
Other Receivables	706	37	–	–	743
<b>Total Receivables</b>	<b>1,711,491</b>	<b>18,242</b>	<b>33,150</b>	<b>12,119</b>	<b>1,775,002</b>
Investments: (Note 5)					
Bonds and Mortgage Securities	20,552,929	234,906	396,664	151,326	21,335,825
Stocks	22,769,492	260,239	439,443	167,646	23,636,820
Fixed Income Commingled Funds	1,078,029	12,321	20,806	7,937	1,119,093
Index and Pooled Funds	9,012,750	103,010	173,943	66,358	9,356,061
Real Assets	7,748,423	88,559	149,542	57,050	8,043,574
Private Equity	10,402,163	118,889	200,757	76,589	10,798,398
Short-Term Investments	140,238	1,603	2,706	1,033	145,580
Hybrid Defined Contribution Investments	179,766	–	–	2,602	182,368
<b>Total Investments</b>	<b>71,883,790</b>	<b>819,527</b>	<b>1,383,861</b>	<b>530,541</b>	<b>74,617,719</b>
Collateral on Loaned Securities	4,489,405	51,311	86,644	33,054	4,660,414
Property, Plant, Furniture and Equipment (Note 6)	35,360	–	–	–	35,360
<b>Total Assets</b>	<b>78,171,467</b>	<b>889,493</b>	<b>1,504,353</b>	<b>575,980</b>	<b>81,141,293</b>
<b>Liabilities:</b>					
Retirement Benefits Payable	49,568	4,682	8,615	3,416	66,281
Refunds Payable	3,654	–	7	–	3,661
Accounts Payable and Accrued Expenses	29,115	277	469	179	30,040
Compensated Absences Payable	2,516	–	–	–	2,516
Insurance Premiums and Claims Payable	–	–	–	–	–
Payable for Security Transactions	3,101,001	35,442	59,848	22,832	3,219,123
Other Investment Payables	149,397	1,708	2,883	1,100	155,088
Other Payables	3,878	–	–	–	3,878
Obligations Under Security Lending Program	4,489,405	51,311	86,644	33,054	4,660,414
<b>Total Liabilities</b>	<b>7,828,534</b>	<b>93,420</b>	<b>158,466</b>	<b>60,581</b>	<b>8,141,001</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$ 70,342,933</b>	<b>\$ 796,073</b>	<b>\$ 1,345,887</b>	<b>\$ 515,399</b>	<b>\$ 73,000,292</b>

The accompanying Notes to Financial Statements are an integral part of this statement.

(EXPRESSED IN THOUSANDS)

Other Employee Benefit Trust Funds						Totals	
Group Life Insurance	Retiree Health Insurance Credit	Disability Insurance Trust Fund	Line of Duty Act Trust Fund	Virginia Local Disability Program	Total Other Employee Benefit Plans	2017	2016
\$ 768	\$ 104	\$ 225	\$ 2	\$ –	\$ 1,099	\$ 53,897	\$ 172,338
20,209	14,256	1,566	–	161	36,192	286,525	305,531
4,639	625	1,358	11	2	6,635	233,179	219,464
26,313	3,545	7,703	61	9	37,631	1,322,398	1,211,865
258	35	76	1	–	370	12,985	319,098
–	–	8,661	–	10	8,671	9,414	8,046
<b>51,419</b>	<b>18,461</b>	<b>19,364</b>	<b>73</b>	<b>182</b>	<b>89,499</b>	<b>1,864,501</b>	<b>2,064,004</b>
436,894	58,869	127,910	1,017	167	624,857	21,960,682	20,806,279
484,011	65,219	141,704	1,127	184	692,245	24,329,065	21,219,259
22,916	3,088	6,709	53	9	32,775	1,151,868	1,179,229
191,584	25,815	56,091	446	74	274,010	9,630,071	8,481,970
164,708	22,194	48,222	383	63	235,570	8,279,144	7,666,278
221,119	29,796	64,737	515	84	316,251	11,114,649	9,053,853
2,981	402	873	7	1	4,264	149,844	445,787
–	–	–	–	–	–	182,368	73,913
<b>1,524,213</b>	<b>205,383</b>	<b>446,246</b>	<b>3,548</b>	<b>582</b>	<b>2,179,972</b>	<b>76,797,691</b>	<b>68,926,568</b>
95,431	12,859	27,940	222	36	136,488	4,796,902	5,023,017
–	–	–	–	–	–	35,360	32,097
<b>1,671,831</b>	<b>236,807</b>	<b>493,775</b>	<b>3,845</b>	<b>800</b>	<b>2,407,058</b>	<b>83,548,351</b>	<b>76,218,024</b>
–	–	–	–	–	–	66,281	348,637
–	222	–	–	–	222	3,883	5,420
515	13,099	3,272	1	–	16,887	46,927	44,721
–	–	–	–	–	–	2,516	2,455
69,205	–	–	–	–	69,205	69,205	64,856
65,918	8,882	19,299	154	25	94,278	3,313,401	2,095,503
3,176	428	930	7	1	4,542	159,630	368,680
–	2	–	–	108	110	3,988	16,718
95,431	12,859	27,940	222	36	136,488	4,796,902	5,023,018
<b>234,245</b>	<b>35,492</b>	<b>51,441</b>	<b>384</b>	<b>170</b>	<b>321,732</b>	<b>8,462,733</b>	<b>7,970,008</b>
<b>\$ 1,437,586</b>	<b>\$ 201,315</b>	<b>\$ 442,334</b>	<b>\$ 3,461</b>	<b>\$ 630</b>	<b>\$ 2,085,326</b>	<b>\$ 75,085,618</b>	<b>\$ 68,248,016</b>

**VIRGINIA RETIREMENT SYSTEM STATEMENT OF CHANGES IN FIDUCIARY NET POSITION:  
DEFINED BENEFIT PENSION TRUST FUNDS AND OTHER EMPLOYEE BENEFIT TRUST FUNDS**

FOR THE YEAR ENDED JUNE 30, 2017, WITH COMPARATIVE INFORMATION FOR THE YEAR ENDED JUNE 30, 2016

	Pension Trust Funds				
	Virginia Retirement System	State Police Officers' Retirement System	Virginia Law Officers' Retirement System	Judicial Retirement System	Total Pension Trust Funds
<b>Additions:</b>					
Contributions:					
Members	\$ 888,870	\$ 5,701	\$ 17,598	\$ 2,225	\$ 914,394
Member Paid by Employers	115	–	–	2,209	2,324
Employers	2,191,935	31,888	73,816	28,039	2,325,678
<b>Total Contributions</b>	<b>3,080,920</b>	<b>37,589</b>	<b>91,414</b>	<b>32,473</b>	<b>3,242,396</b>
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	1,233,848	13,985	23,379	8,979	1,280,191
Net Appreciation/(Depreciation) in Fair Value of Investments	6,853,287	77,381	129,494	49,830	7,109,992
Securities Lending Income	59,725	677	1,134	435	61,971
Total Investment Income Before Investment Expenses	8,146,860	92,043	154,007	59,244	8,452,154
<b>Investment Expenses:</b>					
Direct Investment Expenses	(397,821)	(4,510)	(7,517)	(2,892)	(412,740)
Securities Lending Management Fees and Borrower Rebates	(23,689)	(268)	(451)	(172)	(24,580)
Total Investment Expenses	(421,510)	(4,778)	(7,968)	(3,064)	(437,320)
<b>Net Investment Income</b>	<b>7,725,350</b>	<b>87,265</b>	<b>146,039</b>	<b>56,180</b>	<b>8,014,834</b>
Miscellaneous Revenue	1,798	–	–	–	1,798
Transfers In	–	–	–	–	–
<b>Total Additions</b>	<b>10,808,068</b>	<b>124,854</b>	<b>237,453</b>	<b>88,653</b>	<b>11,259,028</b>
<b>Deductions:</b>					
Retirement Benefits	4,324,025	57,814	96,224	40,895	4,518,958
Refunds of Member Contributions	114,137	630	4,938	–	119,705
Insurance Premiums and Claims	–	–	–	–	–
Retiree Health Insurance Reimbursements	–	–	–	–	–
Disability Insurance Premiums and Benefits	–	–	–	–	–
Line of Duty Benefits	–	–	–	–	–
Administrative Expenses	44,955	926	1,540	594	48,015
Other Expenses	10,927	99	310	67	11,403
Transfers Out	–	–	–	–	–
<b>Total Deductions</b>	<b>4,494,044</b>	<b>59,469</b>	<b>103,012</b>	<b>41,556</b>	<b>4,698,081</b>
Net Increase (Decrease)	6,314,024	65,385	134,441	47,097	6,560,947
Net Position – Restricted for Benefits – Beginning of Year	64,028,909	730,688	1,211,446	468,302	66,439,345
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 70,342,933</b>	<b>\$ 796,073</b>	<b>\$ 1,345,887</b>	<b>\$ 515,399</b>	<b>\$ 73,000,292</b>

The accompanying Notes to Financial Statements are an integral part of this statement.

(EXPRESSED IN THOUSANDS)

Other Employee Benefit Trust Funds						Totals	
Group Life Insurance	Retiree Health Insurance Credit	Disability Insurance Trust Fund	Line of Duty Act Trust Fund	Virginia Local Disability Program	Total Other Employee Benefit Plans	2017	2016
\$ 146,002	\$ —	\$ —	\$ —	\$ —	\$ 146,002	\$ 1,060,396	\$ 969,985
—	—	—	—	—	—	2,324	25,812
94,082	168,271	24,130	11,024	1,329	298,836	2,624,514	2,782,152
<b>240,084</b>	<b>168,271</b>	<b>24,130</b>	<b>11,024</b>	<b>1,329</b>	<b>444,838</b>	<b>3,687,234</b>	<b>3,777,949</b>
25,239	3,029	7,730	110	—	36,108	1,316,299	1,301,878
140,485	16,946	42,748	606	—	200,785	7,310,777	238,685
1,231	148	373	6	—	1,758	63,729	35,214
166,955	20,123	50,851	722	—	238,651	8,690,805	1,575,777
(8,033)	(951)	(2,497)	(37)	—	(11,518)	(424,258)	(399,999)
(492)	(59)	(148)	(2)	—	(701)	(25,281)	(4,514)
(8,525)	(1,010)	(2,645)	(39)	—	(12,219)	(449,539)	(404,513)
<b>158,430</b>	<b>19,113</b>	<b>48,206</b>	<b>683</b>	<b>—</b>	<b>226,432</b>	<b>8,241,266</b>	<b>1,171,264</b>
—	—	638	584	664	1,886	3,684	2,458
—	—	—	—	—	—	—	—
<b>398,514</b>	<b>187,384</b>	<b>72,974</b>	<b>12,291</b>	<b>1,993</b>	<b>673,156</b>	<b>11,932,184</b>	<b>4,951,671</b>
—	—	—	—	—	—	4,518,958	4,356,978
—	—	—	—	—	—	119,705	104,552
184,092	—	—	—	—	184,092	184,092	173,843
—	158,965	—	—	—	158,965	158,965	153,914
—	—	37,695	—	1,173	38,868	38,868	39,309
—	—	—	10,320	—	10,320	10,320	8,545
31	294	717	739	190	1,971	49,986	43,156
1,731	21	54	479	—	2,285	13,688	5,472
—	—	—	—	—	—	—	—
<b>185,854</b>	<b>159,280</b>	<b>38,466</b>	<b>11,538</b>	<b>1,363</b>	<b>396,501</b>	<b>5,094,582</b>	<b>4,885,769</b>
212,660	28,104	34,508	753	630	276,655	6,837,602	65,902
1,224,926	173,211	407,826	2,708	—	1,808,671	68,248,016	68,182,114
<b>\$ 1,437,586</b>	<b>\$ 201,315</b>	<b>\$ 442,334</b>	<b>\$ 3,461</b>	<b>\$ 630</b>	<b>\$ 2,085,326</b>	<b>\$ 75,085,618</b>	<b>\$ 68,248,016</b>

## VIRGINIA RETIREMENT SYSTEM COMBINING STATEMENT OF FIDUCIARY NET POSITION

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Hybrid Defined Contribution Plan	Total VRS Plans
<b>Assets:</b>					
Cash (Note 5)	\$ 13,051	\$ 24,253	\$ 14,117	\$ –	\$ 51,421
Receivables:					
Contributions	44,802	141,052	51,460	5,472	242,786
Interest and Dividends Receivable for Security Transactions	55,388	102,930	59,913	–	218,231
Other Investment Receivables	314,169	583,829	339,831	(214)	1,237,615
Other Receivables	3,085	5,732	3,336	–	12,153
	179	333	193	1	706
<b>Total Receivables</b>	<b>417,623</b>	<b>833,876</b>	<b>454,733</b>	<b>5,259</b>	<b>1,711,491</b>
Investments: (Note 5)					
Bonds and Mortgage Securities	5,216,461	9,693,910	5,642,558	–	20,552,929
Stocks	5,779,038	10,739,365	6,251,089	–	22,769,492
Fixed Income Commingled Funds	273,610	508,459	295,960	–	1,078,029
Index and Pooled Funds	2,287,492	4,250,917	2,474,341	–	9,012,750
Real Assets	1,966,598	3,654,589	2,127,236	–	7,748,423
Private Equity	2,640,133	4,906,241	2,855,789	–	10,402,163
Short-Term Investments	35,593	66,144	38,501	–	140,238
Hybrid Defined Contribution Investments	–	–	–	179,766	179,766
<b>Total Investments</b>	<b>18,198,925</b>	<b>33,819,625</b>	<b>19,685,474</b>	<b>179,766</b>	<b>71,883,790</b>
Collateral on Loaned Securities	1,139,439	2,117,454	1,232,512	–	4,489,405
Property, Plant, Furniture and Equipment (Note 6)	8,975	16,678	9,707	–	35,360
<b>Total Assets</b>	<b>19,778,013</b>	<b>36,811,886</b>	<b>21,396,543</b>	<b>185,025</b>	<b>78,171,467</b>
<b>Liabilities:</b>					
Retirement Benefits Payable	14,150	24,621	10,797	–	49,568
Refunds Payable	1,002	1,285	1,367	–	3,654
Accounts Payable and Accrued Expenses	7,390	13,732	7,993	–	29,115
Compensated Absences Payable	639	1,186	691	–	2,516
Insurance Premiums and Claims Payable	–	–	–	–	–
Payable for Security Transactions	787,053	1,462,605	851,343	–	3,101,001
Other Investment Payables	37,918	70,464	41,015	–	149,397
Other Payables	534	994	578	1,772	3,878
Obligations Under Security Lending Program	1,139,439	2,117,454	1,232,512	–	4,489,405
<b>Total Liabilities</b>	<b>1,988,125</b>	<b>3,692,341</b>	<b>2,146,296</b>	<b>1,772</b>	<b>7,828,534</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$17,789,888</b>	<b>\$33,119,545</b>	<b>\$19,250,247</b>	<b>\$ 183,253</b>	<b>\$70,342,933</b>

The accompanying Notes to Financial Statements are an integral part of this statement.

## VIRGINIA RETIREMENT SYSTEM COMBINING STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Hybrid Defined Contribution Plan	Total VRS Plans
<b>Additions:</b>					
Contributions:					
Members	\$ 201,267	\$ 392,742	\$ 238,633	\$ 56,228	\$ 888,870
Member Paid by Employers	124	(12)	3	–	115
Employers	535,424	1,137,976	477,563	40,972	2,191,935
<b>Total Contributions</b>	<b>736,815</b>	<b>1,530,706</b>	<b>716,199</b>	<b>97,200</b>	<b>3,080,920</b>
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	314,255	581,266	338,291	36	1,233,848
Net Appreciation/(Depreciation) in Fair Value of Investments	1,741,670	3,221,495	1,874,883	15,239	6,853,287
Securities Lending Income	15,212	28,137	16,376	–	59,725
Total Investment Income Before Investment Expenses	2,071,137	3,830,898	2,229,550	15,275	8,146,860
<b>Investment Expenses:</b>					
Direct Investment Expenses	(101,292)	(187,447)	(109,082)	–	(397,821)
Securities Lending Management Fees and Borrower Rebates	(6,034)	(11,160)	(6,495)	–	(23,689)
Total Investment Expenses	(107,326)	(198,607)	(115,577)	–	(421,510)
<b>Net Investment Income</b>	<b>1,963,811</b>	<b>3,632,291</b>	<b>2,113,973</b>	<b>15,275</b>	<b>7,725,350</b>
Miscellaneous Revenue	455	852	491	–	1,798
Transfers In	–	–	–	–	–
<b>Total Additions</b>	<b>2,701,081</b>	<b>5,163,849</b>	<b>2,830,663</b>	<b>112,475</b>	<b>10,808,068</b>
<b>Deductions:</b>					
Retirement Benefits	1,234,388	2,147,781	941,856	–	4,324,025
Refunds of Member Contributions	30,837	39,521	42,068	1,711	114,137
Insurance Premiums and Claims Retiree Health Insurance Reimbursements	–	–	–	–	–
Disability Insurance Premiums and Benefits	–	–	–	–	–
Line of Duty Benefits	–	–	–	–	–
Administrative Expenses	11,612	21,123	12,220	–	44,955
Other Expenses	2,198	4,090	2,378	2,261	10,927
Transfers Out	–	–	–	–	–
<b>Total Deductions</b>	<b>1,279,035</b>	<b>2,212,515</b>	<b>998,522</b>	<b>3,972</b>	<b>4,494,044</b>
Net Increase (Decrease)	1,422,046	2,951,334	1,832,141	108,503	6,314,024
Net Position – Restricted for Benefits – Beginning of Year	16,367,842	30,168,211	17,418,106	74,750	64,028,909
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 17,789,888</b>	<b>\$ 33,119,545</b>	<b>\$ 19,250,247</b>	<b>\$ 183,253</b>	<b>\$ 70,342,933</b>

The accompanying Notes to Financial Statements are an integral part of this statement.

## JUDICIAL RETIREMENT SYSTEM COMBINING STATEMENT OF FIDUCIARY NET POSITION

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Judicial Retirement System	Hybrid Defined Contribution Plan	Total JRS Plans
<b>Assets:</b>			
Cash (Note 5)	\$ 266	\$ —	\$ 266
Receivables:			
Contributions	1,262	48	1,310
Interest and Dividends	1,607	—	1,607
Receivables for Security Transactions	9,114	—	9,114
Other Investment Receivables	88	—	88
<b>Total Receivables</b>	<b>12,071</b>	<b>48</b>	<b>12,119</b>
Investments: (Note 5)			
Bonds and Mortgage Securities	151,326	—	151,326
Stocks	167,646	—	167,646
Fixed Income Commingled Funds	7,937	—	7,937
Index and Pooled Funds	66,358	—	66,358
Real Assets	57,050	—	57,050
Private Equity	76,589	—	76,589
Short-Term Investments	1,033	—	1,033
Hybrid Defined Contribution Investments		2,602	2,602
<b>Total Investments</b>	<b>527,939</b>	<b>2,602</b>	<b>530,541</b>
Collateral on Loaned Securities	33,054	—	33,054
Property, Plant, Furniture and Equipment (Note 6)	—	—	—
<b>Total Assets</b>	<b>573,330</b>	<b>2,650</b>	<b>575,980</b>
<b>Liabilities:</b>			
Retirement Benefits Payable	3,416	—	3,416
Refunds Payable	—	—	—
Accounts Payable and Accrued Expenses	179	—	179
Compensated Absences Payable	—	—	—
Insurance Premiums and Claims Payable	—	—	—
Payable for Security Transactions	22,832	—	22,832
Other Investment Payables	1,100	—	1,100
Other Payables	—	—	—
Obligations Under Security Lending Program	33,054	—	33,054
<b>Total Liabilities</b>	<b>60,581</b>	<b>—</b>	<b>60,581</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$ 512,749</b>	<b>\$ 2,650</b>	<b>\$ 515,399</b>

The accompanying Notes to Financial Statements are an integral part of this statement.

## JUDICIAL RETIREMENT SYSTEM COMBINING STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Judicial Retirement System	Hybrid Defined Contribution Plan	Total JRS Plans
<b>Additions:</b>			
Contributions:			
Members	\$ 1,063	\$ 1,162	\$ 2,225
Member Paid by Employers	2,209	–	2,209
Employers	27,612	427	28,039
<b>Total Contributions</b>	<b>30,884</b>	<b>1,589</b>	<b>32,473</b>
<b>Investment Income:</b>			
Interest, Dividends and Other Investment Income	8,978	1	8,979
Net Appreciation/(Depreciation) in Fair Value of Investments	49,680	150	49,830
Securities Lending Income	435	–	435
Total Investment Income Before Investment Expenses	59,093	151	59,244
<b>Investment Expenses:</b>			
Direct Investment Expenses	(2,892)	–	(2,892)
Securities Lending Management Fees and Borrower Rebates	(172)	–	(172)
Total Investment Expenses	(3,064)	–	(3,064)
<b>Net Investment Income</b>	<b>56,029</b>	<b>151</b>	<b>56,180</b>
Miscellaneous Revenue	–	–	–
Transfers In	–	–	–
<b>Total Additions</b>	<b>86,913</b>	<b>1,740</b>	<b>88,653</b>
<b>Deductions:</b>			
Retirement Benefits	40,895	–	40,895
Refunds of Member Contributions	–	–	–
Insurance Premiums and Claims	–	–	–
Retiree Health Insurance Reimbursements	–	–	–
Disability Insurance Premiums and Benefits	–	–	–
Line of Duty Benefits	–	–	–
Administrative Expenses	594	–	594
Other Expenses	64	3	67
Transfers Out	–	–	–
<b>Total Deductions</b>	<b>41,553</b>	<b>3</b>	<b>41,556</b>
Net Increase (Decrease)	45,360	1,737	47,097
Net Position – Restricted for Benefits – Beginning of Year	467,389	913	468,302
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 512,749</b>	<b>\$ 2,650</b>	<b>\$ 515,399</b>

The accompanying Notes to Financial Statements are an integral part of this statement.

# Notes to Financial Statements

JUNE 30, 2017 AND 2016

## 1. Summary of Significant Financial Policies, Administration and Management

### A. FINANCIAL REPORTING ENTITY

The Virginia Retirement System (the System) is an independent agency of the Commonwealth of Virginia. The System administers two defined benefit retirement benefit structures, Plan 1 and Plan 2, and a hybrid retirement benefit structure. Although all of the following systems have employees with Plan 1 and Plan 2 benefits, only the VRS and JRS systems have employees with hybrid benefits. All of these systems are defined as pension trust funds:

- Virginia Retirement System (VRS) for state employees, teachers, other eligible school division employees, employees of participating political subdivisions and other qualifying employees.
- State Police Officers' Retirement System (SPORS) for state police officers.
- Virginia Law Officers' Retirement System (VaLORS) for non-local government Virginia law officers other than state police officers.
- Judicial Retirement System (JRS) for judges of state courts of record, state district courts and other qualifying employees.

The System also administers the Group Life Insurance Fund, Retiree Health Insurance Credit Fund, a Disability Insurance Trust Fund for state employees, the Virginia Local Disability Program Trust Fund and the funding of the Line of Duty Act Trust Fund. All of these funds are defined as other employee benefit trust funds. Both the pension and other employee benefit trust funds are classified as

fiduciary funds and are included in the basic financial statements of the Commonwealth of Virginia. As required by generally accepted accounting principles (GAAP), the System's financial statements include all funds for which financial transactions are recorded in its accounting system and for which the Board of Trustees exercises administrative responsibility. Effective January 1, 1997, the *Constitution of Virginia* was amended to strengthen the independence of the System. As set forth in Section 11 of Article X, the funds of the retirement system shall be deemed separate and independent trust funds, segregated from all other funds of the Commonwealth, and invested and administered solely in the interests of members, retirees and beneficiaries.

### B. ADMINISTRATION AND MANAGEMENT

#### 1. Pension Plans and Other Employee Benefit Plans.

The Board of Trustees (the Board) is responsible for the general administration and operation of the pension plans and other employee benefit plans. The Board has full power to invest and reinvest the trust funds of the System through the adoption of investment policies and guidelines that fulfill the Board's investment objective to maximize long-term investment returns while targeting an acceptable level of risk.

The Board consists of five members appointed by the Governor and four members appointed by the Joint Rules Committee of the Virginia General Assembly, all subject to confirmation by the General Assembly. The Board appoints a director to serve as the chief administrative officer of the System and a chief investment officer to direct, manage and administer the investment of the System's funds. The Board also retains outside managers to advise and assist in the implementation of these policies. The Board of Trustees has appointed BNY Mellon as the custodian of designated assets of the System.

The Virginia Retirement System (VRS), the State Police Officers' Retirement System (SPORS), the Virginia Law Officers' Retirement System (VaLORS) and the Judicial Retirement System (JRS) are administered in accordance with Title 51.1, Chapters 1, 2, 2.1, 3 and 4, respectively, of the *Code of Virginia* (1950), as amended. The Group Life Insurance Fund, the Retiree Health Insurance Credit Fund, the Disability Insurance Trust Fund for state employees and the Virginia Local Disability Program Trust Fund are administered in accordance with Title 51.1, Chapters 5, 14, 11 and 11.1, respectively, of the *Code of Virginia* (1950), as amended. The Line of Duty Act Trust Fund was created by and is administered in accordance with the provisions of the 2010 Appropriation Act (Item 258, Chapter 874, 2010 Virginia Acts of Assembly) and most recently confirmed in the 2016 Appropriation Act (Item 269, Chapter 780, 2016 Virginia Acts of Assembly). The Optional Life Insurance Fund is administered in accordance with Sections 51.1-512 and 51.1-512.1 of the *Code of Virginia* (1950), as amended. Optional life insurance is an insured product, and the premium collection is handled by the insurer. The Board provides only oversight for the program with limited administrative responsibility. State statutes governing the plans administered by the System may be amended only by the General Assembly of Virginia. Additional information about the plans is provided in Notes 2 and 3.

### **Fiduciary Responsibility of the VRS**

**Board of Trustees** – As stated in Section 51.1-124.30(C) of the *Code of Virginia*:

“...the Board shall invest the assets of the Retirement System with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims.” Accordingly, the Board must sufficiently diversify the portfolio to minimize the risk of large losses unless, under the circumstances, it is clearly prudent not to do so. Primary risk measures are volatility in the plan's assets, funded status and contribution rates.

of the Board's limited role, the financial transactions of these other plans are not recorded in the System's financial statements. Therefore, these programs are not included in the System's Basic Financial Statements:

- Commonwealth of Virginia 457 Deferred Compensation Plan and the Virginia Cash Match Plan for state employees and employees of participating political subdivisions. Additional information about the 457 and Cash Match Plans is provided in the Statistical Section.

**2. Other Plans Established by the Commonwealth of Virginia.** The Board has oversight, but limited administrative and investment responsibility, for several other plans of the Commonwealth. Because

- Commonwealth of Virginia (COV) Voluntary Group Long-Term Care Insurance Program, an employee-paid program for eligible employees.
- Defined contribution plans, referred to as the Optional Retirement Plans 1 and 2 for political appointees, certain employees of public institutions of higher education and certain employees of public school divisions and teaching hospitals.
- Commonwealth Health Research Fund, which provides financial support for human health research on behalf of citizens of the Commonwealth.
- Commonwealth's Attorneys Training Fund, which provides financial support for the training of Commonwealth's Attorneys and their staffs.
- Volunteer Firefighters' and Rescue Squad Workers' Service Award Fund, which provides service awards to eligible volunteer firefighters and rescue squad workers.

### C. ACCOUNTING BASIS

The accounting and presentation of the pension plans and other employee benefit plans use the flow of economic resources measurement focus and the accrual basis of accounting. Under the accrual basis, revenues are recognized when earned, and expenses are recognized when liabilities are incurred, regardless of the timing of related cash flows. Member and employer contributions are recognized as revenues when due, pursuant to formal commitments as well as statutory or contractual requirements. Investment income is recognized as earned by the plans. Benefits and refunds are recognized when due and payable in accordance with the terms of the plans.

### D. ACTUARIAL BASIS AND CONTRIBUTION RATES

The funding policy for the pension plans provides for periodic employer contributions at actuarially determined rates, which will remain relatively level over time as a percentage of payroll and will accumulate sufficient assets to meet the cost of all benefits when due. Member and employer contributions are required by Title 51.1 of the *Code of Virginia* (1950), as amended.

Contribution rates are developed using the entry age normal cost method for both normal cost and amortization of the unfunded actuarial accrued liability. Gains and losses are reflected in the unfunded Actuarial Accrued Liability (AAL), which is being amortized as a level percentage of covered payroll within 30 years or less.

In addition to determining contribution requirements, actuarial computations present an estimate of the discounted present value of the prospective accrued liability contributions that employers will have to pay to ensure that such contributions – when combined with the assets on hand, the normal contributions to be made in the future by employers and members, and investment income – will be sufficient to pay all benefits due to current members in the future as well as to annuitants and designated beneficiaries.

Actuarial valuations estimate the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include future employment, mortality and the use of the benefit. Actuarially determined amounts are subject to revision as actual results are compared with past expectations and new estimates are made about the future. The Required Supplementary Schedules follow the Notes to Financial Statements. For pension plans, the schedules present historical information about the increase or decrease in the employer's fiduciary net position over time related to the employer's net pension liability. For other employee benefit plans, the schedules present historical information about the increase or decrease of the actuarial values of the plans' assets over time relative to the AAL for benefits.

### E. GOVERNMENTAL ACCOUNTING STANDARDS BOARD (GASB) STATEMENTS

- Governmental Accounting Standards Board (GASB) Statement No. 40, *Deposit and Investment Risk Disclosures*, requires disclosures related to deposits, authorized investments and investment risk. Required investment risk disclosures address interest rate risk; credit risk, to include custodial credit risk and concentrations of credit risk; and foreign currency risk. The statement also requires disclosures of custodial credit risk and foreign currency risk for depository accounts. Information about the System's deposits and investment risk is provided in Note 5.
- GASB Statement No. 51, *Accounting and Financial Reporting for Intangible Assets*, establishes a "specific conditions" approach to recognizing intangible assets, specifically computer software. The statement became effective beginning with the fiscal year ended June 30, 2010. Capitalized costs are incurred during the Application Development Stage and consist of design of chosen path, including software configuration and software interfaces; coding; installation of hardware; testing;

including the parallel processing phase; and data conversion to the extent that the data are necessary to make the computer software operational. Other costs incurred before or after the Application Development Stage are expensed when incurred. Additional disclosures resulting from the implementation of this statement are presented in Note 6.

- GASB Statement No. 53, *Accounting and Financial Reporting for Derivative Instruments*, establishes accounting and financial reporting standards for governments that enter into derivative instruments. The statement became effective beginning with the fiscal year ended June 30, 2010. The objective of the statement is to enhance the usefulness and comparability of derivative financial instrument information reported by state and local governments. It provides a comprehensive framework for the measurement, recognition and disclosure of derivative instrument transactions. Additional disclosures resulting from the implementation of this statement are presented in Note 5.
  - GASB Statement No. 59, *Financial Instruments Omnibus*, clarifies the definition of items that should be included in the reporting required by Statement No. 53. The statement became effective beginning with the fiscal year ended June 30, 2010. This is reflected in the disclosures in Note 5.
  - GASB Statement No. 63, *Financial Reporting of Deferred Outflows of Resources, Deferred Inflows of Resources and Net Position*, establishes standards for reporting deferred outflows of resources, deferred inflows of resources and net position. The statement became effective beginning with the fiscal year ended June 30, 2013. The financial statement presentations have been updated to reflect the impact of this standard.
  - GASB Statement No. 64, *Derivative Instruments: Application of Hedge Accounting Termination Provisions – An Amendment of GASB Statement*
- No. 53, clarifies the circumstances in which hedge accounting should continue when a swap counterparty, or a swap counterparty's credit support provider, is replaced. The statement became effective beginning with the fiscal year ended June 30, 2012. This is reflected in the disclosures in Note 5.
- GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaces the requirements of Statements No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, and No. 50, *Pension Disclosures*, as they relate to pension plans that are administered through trusts and that meet certain criteria. The statement became effective beginning with the fiscal year ended June 30, 2014, and required changes in the presentation of the financial statements, notes to the financial statements and required supplementary information. Significant changes include an actuarial calculation of total and net pension liability. These are presented in Note 2.C. The changes also include comprehensive footnote disclosure regarding the pension liability, the sensitivity of the net pension liability to the discount rate and increased investment activity disclosures. The implementation of GASB Statement No. 67 did not significantly impact the accounting for accounts receivable and investment balances.
  - GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, an amendment of GASB Statement No. 27. The statement became effective for fiscal years beginning after June 30, 2014, and required changes in the presentation of the financial statements, notes to the financial statements and required supplementary information for the employers that participate in the VRS-administered pension plans. The information reported by the employers is their share of the information reported by VRS in fiscal year 2014 under GASB Statement No. 67.

- GASB Statement No. 71, *Pension Transition for Contributions Made Subsequent to the Measurement Date*, an amendment of GASB Statement No. 68, became effective simultaneously with the provision of GASB Statement No. 68. The statement clarified the adjustments necessary to the beginning deferred outflows of resources and limited that adjustment to contributions made subsequent to the measurement date.
- GASB Statement No. 72, *Fair Value Measurement and Application*. The statement became effective for the fiscal years beginning after June 15, 2015. The statement addresses accounting and financial reporting issues related to fair value measurements. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The statement provides guidance for determining a fair value measurement for financial reporting purposes. It also provides guidance for applying fair value to certain investments and disclosures related to all fair value measurements. This new information is presented in Note 5.B.2 and Figures 2.16 and 2.17.
- GASB Statement No. 74, *Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans*, replaces the requirements of Statement No. 43, *Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans*. The statement became effective beginning with the fiscal year ended June 30, 2017, and required changes in the presentation of the financial statements, notes to the financial statements and required supplementary information. Significant changes include an actuarial calculation of total and net OPEB liability. These are presented in Note 3.B. The changes also include comprehensive footnote disclosure regarding the liability for OPEB plans, the sensitivity of the net OPEB liability to the discount rate and increased investment activity disclosures. The implementation of GASB Statement No. 74 did not significantly impact the accounting for accounts receivable and investment balances.
- GASB Statement No. 75, *Accounting and Financial Reporting for Post-Employment Benefits Other Than Pensions*. The statement is effective for fiscal years beginning after June 15, 2017, and requires changes in the presentation of the financial statements, notes to the financial statements and required supplementary information for the employers that participate in the VRS-administered OPEB plans. The information reported by the employers will be their share of the information reported by VRS in fiscal year 2017 under GASB Statement No. 74.
- GASB Statement No. 79, *Certain External Investment Pools and Pool Participants*. The statement became effective for the fiscal years beginning after June 30, 2015. The statement addresses accounting and financial reporting for certain external investment pool and pool participants. Specifically, it establishes criteria for an external investment pool to qualify for making the election to measure all investments at amortized cost for financial reporting purposes. This statement impacts the VRS presentations related to the short-term investments in the Commonwealth of Virginia's Local Government Investment Pool.
- GASB Statement No. 82, *Pension Issues*, an amendment of GASB Statements No. 67, No. 68 and No. 73. This statement addressed certain issues that were raised during the implementation of these standards. Specifically, the statement addresses the issues regarding (1) the presentation of payroll-related measures in the required

supplementary information, (2) the selection of assumptions and the treatment of deviations from guidance in an Actuarial Standard of Practice for financial reporting purposes, and (3) the classification of payments made by employers to satisfy employee (plan member) contribution requirements. Although this statement was effective for reporting periods beginning after June 15, 2016, VRS has elected to implement it early and provide disclosure guidance to participating employers.

## F. INVESTMENTS

**1. Investment Valuation.** Cash equivalents and other short-term, highly liquid investments of the System are reported at amortized cost as follows:

- 1) Money market investments and participating interest-earning investment contracts that have a remaining maturity at the time of purchase of one year or less are reported at amortized cost.
- 2) The System is a party to short-term contracts to buy and sell securities known as repurchase and reverse repurchase agreements. Agreements to repurchase securities that have been sold to a counterparty are valued at the contract price, exclusive of interest, at which the securities will be repurchased. Securities purchased pursuant to agreements to resell are carried at fair value.
- 3) The System participates in the Commonwealth's Local Government Investment Pool (LGIP), which is managed by the State Treasurer. The State Treasurer reports that the LGIP complies with or exceeds all of the criteria in GASB Statement No. 79, *Accounting and Reporting for Certain External Investment Pools and Pool Participants*, to be eligible to use amortized cost for financial reporting and transacting shares. The System likewise measures its investment in the LGIP at amortized cost as per Statement 79. The LGIP imposes no limitations or restrictions on the System's ability to withdraw invested funds.

Long-term investments of the System are reported at fair value. Fair value is the amount that one can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller; that is, other than a forced or liquidation sale. The fair value for the System's defined benefit investments is determined by the System's master custodian, BNY Mellon, from its Global Pricing System. This system assigns a price source, based on asset type and the vendor pricing products to which the master custodian subscribes, for every security held immediately following its acquisition. The master custodian monitors prices supplied by these sources daily.

When a pricing source is unable to provide a price, quotes are sought from major investment brokers and market-making dealers; or internal calculations are applied, if feasible. As a last resort, the master custodian will contact investment managers for a price. The master custodian prices commingled funds, partnerships and real assets from statements received from the funds, partnerships or investment managers.

The pricing sources used by the master custodian provide daily prices for equity securities; corporate, government and mortgage-backed fixed income securities; private placement securities; futures and options on futures; open-ended funds; and foreign exchange rates. Depending on the vendor, collateralized mortgage obligations (CMOs), adjustable rate mortgages (ARMs) and asset-backed securities are priced daily, weekly or twice a month as well as at month-end. Municipal fixed income securities and options on U.S. Treasury/GNMA securities are priced at month end.

Defined contribution plan assets for hybrid plan members are held in self-directed investments for both the member and employer contributions. Contributions must be invested in the investment accounts approved by the VRS Board of Trustees.

**2. Investment Transactions and Income.** Security transactions and related gains and losses are recorded on a trade-date basis. The cost of investments sold is the average cost of the aggregate holding of the specific investment sold. Dividend income is recorded on the ex-dividend date, and interest income is accrued as earned. Futures contracts are valued daily, with the resulting adjustments recorded as realized gains or losses arising from the daily settlement of the variation margin. Gains and losses related to forward contracts and options are recognized at the time the contracts are settled. Investments in limited partnerships are accounted for on the equity method of accounting, and their earnings or losses for the period are included in investment income using the equity method.

**3. Investment Policy.** The System's defined benefit assets are pooled for investment purposes in a Pooled Assets portfolio. The allocation of investment assets within the Pooled Assets portfolio is approved by the Board of Trustees as outlined in the Board's Investment Policy. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit plans.

**4. Rate of Return.** For the fiscal year ended June 30, 2017, the annual money-weighted rate of return for the Pooled Assets portfolio, net of investment expenses, was 12.13%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested. For the VRS Pooled Assets portfolio, the fiscal year 2017 money-weighted rate of return differs only slightly from the time-weighted rate of return because the flow of cash for contributions and benefit payments is fairly consistent over the fiscal year.

## **G. PROPERTY, PLANT, FURNITURE, EQUIPMENT AND INTANGIBLE ASSETS**

Tangible capital assets are recorded at cost at the time of acquisition and are reported net of accumulated depreciation. The System capitalizes all property, plant and equipment that have a cost or value greater than \$5,000. Depreciation is computed on the straight-line basis over the estimated useful life of the property, ranging from five years to 40 years. Intangible capital assets for the System include internal and external costs incurred during VRS' current Application Development Stage. These costs are being depreciated over the software's useful life, which is estimated at seven years.

## **H. ACCUMULATED LEAVE AND DISABILITY CREDITS**

Employees of the System participate in the Commonwealth's annual leave program and in its sick leave program or the Virginia Sickness and Disability Program (VSDP), which is administered by the System. Additional information about VSDP is presented in Note 3. Unused annual leave may be accumulated and is paid at the time of permanent separation from service up to the maximum calendar-year limit. For vested employees who are not covered under VSDP, unused sick leave is paid at a rate of 25% of the amount accumulated, not to exceed \$5,000, at the time of permanent separation. VSDP-covered employees with unused disability credits converted from sick leave at the time of enrollment may be paid in the same manner as for non-VSDP employees or may convert these credits to service credit at a rate of 173 disability credits to one month of service.

The accrued liability for unused annual leave, sick leave and disability credits for System employees at June 30, 2017 and 2016, was computed using salary rates in effect at those times and represents annual and sick leave earned up to the allowable ceilings

as well as unused, converted disability credits. This information is included in the Statement of Fiduciary Net Position: Pension and Other Employee Benefit Trust Funds.

#### I. ADMINISTRATIVE EXPENSES AND BUDGET

The Board of Trustees approves expenses related to the administration and management of the trust fund. These expenses are included in a budget prepared in compliance with the Commonwealth's biennial budgetary system (cash basis).

Appropriations are controlled at the program level and lapse at the end of the fiscal year. Administrative expenses are funded exclusively from investment income. Expenses for goods and services received but not paid for prior to the System's fiscal year-end are accrued for financial reporting purposes in accordance with generally accepted accounting principles (GAAP). A reconciliation of the difference between the GAAP basis and budgeted basis is presented in the Schedule of Administrative Expenses following the Required Supplementary Schedules.

#### J. INVESTMENT INCOME ALLOCATION

Income earned on investments is distributed monthly to the VRS, SPORS, VaLORS and JRS retirement plans; the Group Life Insurance Fund; the Retiree Health Insurance Credit Funds; the Disability Insurance Trust Fund; the Line of Duty Trust Fund; and the Virginia Local Disability Program.

Distribution of investment income is based on the respective equity of each trust fund in the common investment pool.

The retirement plans distribute their cumulative investment income, net of administrative expenses, in the following manner:

- Investment income is distributed to each individual member contribution account based on a rate of 4.00% applied to each member's cumulative balance as of the close of the preceding fiscal year.
- The remaining portion is allocated monthly to the participating employers' retirement allowance accounts based on the ratio of their member account and employer account balances to the total of all such balances.

#### K. USE OF ESTIMATES

The preparation of financial statements, in conformity with accounting principles generally accepted in the United States of America, requires management to make estimates and assumptions that affect the reported amounts of net position restricted for benefits at June 30, 2017. Actual results could differ from those estimates.

#### L. SUMMARIZED COMPARATIVE DATA/ RECLASSIFICATIONS

The Basic Financial Statements include certain prior year summarized comparative information in total, but not at the level of detail required for a presentation in conformity with generally accepted accounting principles. Accordingly, such information should be read in conjunction with the System's financial statements for the year ended June 30, 2016, from which the summarized information was derived.

## 2. Pension Plans

### A. PLAN DESCRIPTIONS

**1. Establishment of the System.** The Virginia Retirement System (the System) was established March 1, 1952, as the administrator of governmental retirement plans qualified under Section 401(a) of the Internal Revenue Code. Its mission is to provide retirement benefits for state employees, teachers, other eligible school employees and employees of political subdivisions that elect to participate in the System.

The System is comprised of the following pension trust funds:

- The Virginia Retirement System (VRS), established March 1, 1952, as the Virginia Supplemental Retirement System, was renamed VRS in 1990 in response to the Federal Tax Reform Act of 1986. VRS includes a single-employer plan for state employees, a multiple-employer cost-sharing plan for teachers and an agent multiple-employer plan for employees of participating political subdivisions.
- State Police Officers' Retirement System (SPORS), established July 1, 1950, is a single-employer plan for state police officers.
- Virginia Law Officers' Retirement System (VaLORS), established October 1, 1999, is a single-employer plan for non-local government Virginia law officers other than state police.
- Judicial Retirement System (JRS), established July 1, 1970, is a single-employer plan for judges of a court of record or a district court of the state and other eligible judicial employees.

The System is required by law to use the plans' accumulated assets to pay benefits when due to eligible members, retirees and beneficiaries. Full-time permanent, salaried employees of participating employers are covered automatically under VRS, SPORS, VaLORS or JRS upon employment; some part-time permanent, salaried state employees also are covered under VRS. Information regarding the membership is presented in Figure 2.9. Teaching, research and administrative faculty of the state's public colleges and universities who elect an optional retirement plan, as well as permanent, salaried employees of the state's two public teaching hospitals, are not covered under the VRS retirement plans.

All full-time, salaried permanent (professional) employees of state agencies, public school divisions and employees of participating employers are automatically covered by a pension plan upon employment. Members qualify for retirement when they become vested and meet the age and service requirements for their plan, as shown in the following table. The System administers three different benefit structures for government employees: Plan 1, Plan 2 and the Hybrid Retirement Plan. Each of these is called a plan in statute and each has different provisions with a specific eligibility and benefit structure. These different benefit structures are set out in the following table:

**FIGURE 2.9: ACTIVE, RETIRED AND TERMINATED MEMBERS AND BENEFICIARIES**

AT JUNE 30

	VRS State Employees	VRS Teachers	VRS Political Subdivision Employees	SPORS	VaLORS	JRS	2017 Total	2016 Total
Retirees and Beneficiaries Receiving Benefits	55,427	86,652	51,147	1,300	4,355	507	199,388	192,411
Terminated Employees Entitled to Benefits but not Receiving Them	11,184	25,341	12,577	123	704	3	49,932	46,644
<b>Total Assets</b>	<b>66,611</b>	<b>111,993</b>	<b>63,724</b>	<b>1,423</b>	<b>5,059</b>	<b>510</b>	<b>249,320</b>	<b>239,055</b>
Active Members:								
Vested	54,527	105,083	69,582	1,519	5,257	322	236,290	238,304
Non-Vested	23,090	41,007	36,942	358	3,416	97	104,910	103,367
<b>Total</b>	<b>77,617</b>	<b>146,090</b>	<b>106,524</b>	<b>1,877</b>	<b>8,673</b>	<b>419</b>	<b>341,200</b>	<b>341,671</b>

**2. Pension Plan Provisions and Requirements.** Under Plan 1, Plan 2 and the Hybrid Retirement Plan, members are vested in the defined benefit pension after attaining five years of service credit. They become eligible to retire with an unreduced or reduced benefit when they meet the age and service requirements for their plan. The unreduced benefit is actuarially reduced to calculate the reduced benefit amount. A cost-of-living adjustment (COLA), based on changes in the Consumer Price Index for all Urban Consumers, is granted on July 1 of the second calendar year after retirement and is effective each July 1 thereafter, when provided.

Members not covered under the Virginia Sickness and Disability Program (VSDP) for state employees (see Note 3) or the Virginia Local Disability Program (VLDP) for local government employees are eligible to be considered for disability retirement.

If a member dies while in active service, his or her beneficiary or survivor may qualify for a death-in-service benefit. Provisions for the retirement plans are presented in Figure 2.10.

## FIGURE 2.10: RETIREMENT PLAN PROVISIONS

AS ESTABLISHED BY TITLE 51.1 OF THE *CODE OF VIRGINIA* (1950), AS AMENDED

RETIREMENT PLAN PROVISIONS		
PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<p><b>About Plan 1</b> Plan 1 is a defined benefit plan. The retirement benefit is based on a member's age, creditable service and average final compensation at retirement using a formula.</p>	<p><b>About Plan 2</b> Plan 2 is a defined benefit plan. The retirement benefit is based on a member's age, creditable service and average final compensation at retirement using a formula.</p>	<p><b>About the Hybrid Retirement Plan</b> The Hybrid Retirement Plan combines the features of a defined benefit plan and a defined contribution plan. The defined benefit is based on a member's age, creditable service and average final compensation at retirement using a formula.</p> <ul style="list-style-type: none"> <li>• The benefit from the defined contribution component of the plan depends on the member and employer contributions made to the plan and the investment performance of those contributions.</li> <li>• In addition to the monthly benefit payment payable from the defined benefit plan at retirement, a member may start receiving distributions from the balance in the defined contribution account, reflecting the contributions, investment gains or losses and any required fees.</li> </ul>
<p><b>Eligible Members</b> Members are in Plan 1 if their membership date is prior to July 1, 2010, they were vested before January 1, 2013, and they have not taken a refund.</p> <p><b>Hybrid Opt-In Election</b> VRS non-hazardous duty-covered Plan 1 members were allowed to make an irrevocable decision to opt into the Hybrid Retirement Plan during a special election window held January 1 through April 30, 2014. The Hybrid Retirement Plan's effective date for eligible Plan 1 members who opted in was July 1, 2014.</p> <p>If eligible deferred members returned to work during the election window, they were also eligible to opt into the Hybrid Retirement Plan.</p> <p>Members who were eligible for an optional retirement plan (ORP) and had prior service under Plan 1 were not eligible to elect the Hybrid Retirement Plan, and remain as Plan 1 or ORP.</p>	<p><b>Eligible Members</b> Members are in Plan 2 if their membership date is from July 1, 2010, to December 31, 2013, and they have not taken a refund. Additionally, members are covered under Plan 2 if they have a membership date prior to July 1, 2010, but were not vested before January 1, 2013.</p> <p><b>Hybrid Opt-In Election</b> Eligible Plan 2 members were allowed to make an irrevocable decision to opt into the Hybrid Retirement Plan during a special election window held January 1 through April 30, 2014. The Hybrid Retirement Plan's effective date for eligible Plan 2 members who opted in was July 1, 2014.</p> <p>If eligible deferred members returned to work during the election window, they were also eligible to opt into the Hybrid Retirement Plan.</p> <p>Members who were eligible for an optional retirement plan (ORP) and have prior service under Plan 2 were not eligible to elect the Hybrid Retirement Plan, and remain as Plan 2 or ORP.</p>	<p><b>Eligible Members</b> Employees are in the Hybrid Retirement Plan if their membership date is on or after January 1, 2014. This includes:</p> <ul style="list-style-type: none"> <li>• State employees*</li> <li>• School division employees</li> <li>• Political subdivision employees*</li> <li>• Judges appointed or elected to an original term on or after January 1, 2014, regardless if vested to VRS Plan 1 or VRS Plan 2.</li> <li>• Members in Plan 1 or Plan 2 who elected to opt into the plan during the election window held January 1-April 30, 2014; the plan's effective date for opt-in members was July 1, 2014.</li> </ul> <p><b>*Non-Eligible Members</b> Some employees are not eligible to participate in the Hybrid Retirement Plan. They include:</p> <ul style="list-style-type: none"> <li>• Members of the State Police Officers' Retirement System (SPORS)</li> <li>• Members of the Virginia Law Officers' Retirement System (VaLORS)</li> <li>• Political subdivision employees who are covered by enhanced benefits for hazardous duty employees</li> </ul> <p>Those employees eligible for an optional retirement plan (ORP) must elect the ORP or the Hybrid Retirement Plan. If these members are credited with service that was earned, purchased or granted prior to January 1, 2014, they are not eligible to elect the Hybrid Retirement Plan, and must select Plan 1 or Plan 2 (as applicable) or ORP.</p>

FIGURE 2.10: RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<p><b>Retirement Contributions</b>            State employees, excluding state elected officials, judges in Plan 1 or Plan 2 and optional retirement plan participants, contribute 5% of their compensation each month to their member contribution account through a pre-tax salary reduction. Some school divisions and political subdivisions elected to phase in the required 5% member contribution; all employees pay the full 5% as of July 1, 2016. Member contributions are tax-deferred until they are withdrawn as part of a retirement benefit or as a refund. The employer makes a separate actuarially determined contribution to VRS for all covered employees. VRS invests both member and employer contributions to provide funding for the future benefit payment.</p>	<p><b>Retirement Contributions</b>            State employees contribute 5% of their compensation each month to their member contribution account through a pre-tax salary reduction. Some school divisions and political subdivisions elected to phase in the required 5% member contribution; all employees pay the full 5% as of July 1, 2016.</p>	<p><b>Retirement Contributions</b>            A member's retirement benefit is funded through mandatory and voluntary contributions made by the member and the employer to both the defined benefit and the defined contribution components of the plan. Mandatory contributions are based on a percentage of the employee's creditable compensation and are required from both the member and the employer. Additionally, members may choose to make voluntary contributions to the defined contribution component of the plan, and the employer is required to match those voluntary contributions according to specified percentages. Mandatory member contributions and the employer match on the mandatory and voluntary member contributions are recorded in a 401(a) account, along with the accrued net investment income. The voluntary member contributions and accrued net investment income are recorded in a 457(b) account. Members are responsible for investing their accounts using the various investment options that are available.</p>
<p><b>Creditable Service</b>            Creditable service includes active service. Members earn creditable service for each month they are employed in a covered position. It also may include credit for prior service the member has purchased or additional creditable service the member was granted. A member's total creditable service is one of the factors used to determine eligibility for retirement and to calculate the retirement benefit. It also may count toward eligibility for the health insurance credit in retirement, if the employer offers the health insurance credit.</p>	<p><b>Creditable Service</b>            Same as Plan 1.</p>	<p><b>Creditable Service</b>  <i>Defined Benefit Component:</i>            Under the defined benefit component of the plan, creditable service includes active service. Members earn creditable service for each month they are employed in a covered position. It also may include credit for prior service the member has purchased or additional creditable service the member was granted. A member's total creditable service is one of the factors used to determine eligibility for retirement and to calculate the retirement benefit. It also may count toward eligibility for the health insurance credit in retirement, if the employer offers the health insurance credit.</p> <p><i>Defined Contribution Component:</i>            Under the defined contribution component, creditable service is used to determine vesting for the employer contribution portion of the plan.</p>
<p><b>Vesting</b>            Vesting is the minimum length of service a member needs to qualify for a future retirement benefit. Members become vested when they have at least five years (60 months) of creditable service. Vesting means members are eligible to qualify for retirement if they meet the age and service requirements for their plan. Members also must be vested to receive a full refund of their member contribution account balance if they leave employment and request a refund. Members are always 100% vested in the contributions that they make.</p>	<p><b>Vesting</b>            Same as Plan 1.</p>	<p><b>Vesting</b>  <i>Defined Benefit Component:</i>            Defined benefit vesting is the minimum length of service a member needs to qualify for a future retirement benefit. Members are vested under the defined benefit component of the Hybrid Retirement Plan when they reach five years (60 months) of creditable service. Plan 1 or Plan 2 members with at least five years (60 months) of creditable service who opted into the Hybrid Retirement Plan remain vested in the defined benefit component.</p>

FIGURE 2.10: RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
		<p><i>Vesting, cont.</i></p> <p><i>Defined Contribution Component:</i>                      Defined contribution vesting refers to the minimum length of service a member needs to be eligible to withdraw the employer contributions from the defined contribution component of the plan. Members are always 100% vested in the contributions that they make. Upon retirement or leaving covered employment, a member is eligible to withdraw a percentage of employer contributions to the defined contribution component of the plan, based on service.</p> <ul style="list-style-type: none"> <li>• After two years, a member is 50% vested and may withdraw 50% of employer contributions.</li> <li>• After three years, a member is 75% vested and may withdraw 75% of employer contributions.</li> <li>• After four or more years, a member is 100% vested and may withdraw 100% of employer contributions.</li> </ul> <p>Distribution is not required by law until age 70½.</p>
<p><b>Calculating the Benefit</b>                      The Basic Benefit is calculated based on a formula using the member’s average final compensation, a retirement multiplier and total service credit at retirement. It is one of the benefit payout options available to a member at retirement.</p> <p>An early retirement reduction factor is applied to the Basic Benefit if the member retires with a reduced retirement benefit or selects a benefit payout option other than the Basic Benefit.</p>	<p><b>Calculating the Benefit</b>                      See definition under Plan 1.</p>	<p><b>Calculating the Benefit</b>  <i>Defined Benefit Component:</i>                      See definition under Plan 1.</p> <p><i>Defined Contribution Component:</i>                      The benefit is based on contributions made by the member and any matching contributions made by the employer, plus net investment earnings on those contributions.</p>
<p><b>Average Final Compensation</b>                      A member’s average final compensation is the average of the 36 consecutive months of highest creditable compensation as a covered employee.</p>	<p><b>Average Final Compensation</b>                      A member’s average final compensation is the average of the 60 consecutive months of highest creditable compensation as a covered employee.</p>	<p><b>Average Final Compensation</b>                      Same as Plan 2. It is used in the retirement formula for the defined benefit component of the plan.</p>
<p><b>Service Retirement Multiplier</b>                      VRS Plan 1: The retirement multiplier is a factor used in the formula to determine a final retirement benefit. The retirement multiplier for non-hazardous duty members is 1.70%.                      SPORS, sheriffs and regional jail superintendents: The retirement multiplier is 1.85%.                      VaLORS: The retirement multiplier is 1.70% or 2.00%.</p> <ul style="list-style-type: none"> <li>• Members hired before July 1, 2001, have a 1.70% multiplier and are eligible for a hazardous duty supplement. They also had the option to elect the 2.00% multiplier and no supplement.</li> <li>• Members hired on or after July 1, 2001, have a 2.00% multiplier and no supplement.</li> </ul> <p>Political subdivision hazardous duty employees: The retirement multiplier for eligible political subdivision hazardous duty employees other than sheriffs and regional jail superintendents is 1.70% or 1.85% as elected by the employer.</p>	<p><b>Service Retirement Multiplier</b>                      VRS Plan 2: Same as Plan 1 for service earned, purchased or granted prior to January 1, 2013.                      For non-hazardous duty members, the retirement multiplier is 1.65% for creditable service earned, purchased or granted on or after January 1, 2013.                      SPORS, sheriffs and regional jail superintendents: Same as Plan 1.                      VaLORS: The retirement multiplier is 2.00%.                      Political subdivision hazardous duty employees: Same as Plan 1.                      JRS Plan 2: Same as Plan 1.</p>	<p><b>Service Retirement Multiplier</b>  <i>Defined Benefit Component:</i>                      VRS: The retirement multiplier for the defined benefit component is 1.00%.                      For members who opted into the Hybrid Retirement Plan from Plan 1 or Plan 2, the applicable multipliers for those plans will be used to calculate the retirement benefit for service credited in those plans.                      SPORS, sheriffs and regional jail superintendents: Not applicable.                      VaLORS: Not applicable.                      Political subdivision hazardous duty employees: Not applicable.</p>

**FIGURE 2.10: RETIREMENT PLAN PROVISIONS, cont.**

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<p><i>Service Retirement Multiplier, cont.</i></p> <p>JRS Plan 1: If appointed or elected to an original term prior to January 1, 2013, the retirement multiplier is 1.70%.</p> <p>If appointed or elected to an original term between January 1, 2013, and December 31, 2013, the retirement multiplier is 1.70% on non-JRS service earned, purchased or granted before the date of appointment or election to an original term, and 1.65% on JRS service earned, purchased or granted on or after the date of appointment or election to an original term.</p>		<p><i>Service Retirement Multiplier, cont.</i></p> <p>JRS: The retirement multiplier for the defined benefit component is 1.00%, beginning on the date of appointment or election to an original term. The member will retain the applicable multiplier on any covered service outside JRS.</p> <p><i>Defined Contribution Component:</i> Not applicable.</p>
<p><b>Normal Retirement Age</b></p> <p>VRS: Age 65.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Age 60.</p> <p>JRS: Age 65; mandatory retirement age is 73.</p>	<p><b>Normal Retirement Age</b></p> <p>VRS: Normal Social Security retirement age.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1.</p> <p>JRS: Same as Plan 1.</p>	<p><b>Normal Retirement Age</b></p> <p><i>Defined Benefit Component:</i></p> <p>VRS: Same as Plan 2.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Not applicable.</p> <p>JRS: Same as Plan 1.</p> <p><i>Defined Contribution Component:</i></p> <p>Members are eligible to receive distributions upon leaving employment, subject to restrictions.</p>
<p><b>Earliest Unreduced Retirement Eligibility</b></p> <p>VRS: Age 65 with at least five years (60 months) of creditable service or at age 50 with at least 30 years of creditable service.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Age 60 with at least five years of creditable service or age 50 with at least 25 years of creditable service.</p> <p>JRS: Age 65 with at least five years of weighted service credit, or at age 60 with at least 30 years of weighted service credit.</p> <p>Service earned under JRS is weighted. The weighting factors for a judge appointed prior to July 1, 2010, are as follows:</p> <ul style="list-style-type: none"> <li>• 3.5 for JRS members appointed or elected to an original term before January 1, 1995.</li> <li>• 2.5 for JRS members appointed or elected to an original term on or after January 1, 1995, but before July 1, 2010.</li> </ul> <p>For members appointed or elected to an original term between July 1, 2010, and December 31, 2013, the weighting factors are:</p> <ul style="list-style-type: none"> <li>• 1.5 if appointed or elected to an original term before age 45.</li> <li>• 2.0 if appointed or elected to an original term between ages 45 and 54.</li> <li>• 2.5 if appointed or elected to an original term at age 55 or older.</li> </ul>	<p><b>Earliest Unreduced Retirement Eligibility</b></p> <p>VRS: Normal Social Security retirement age with at least five years (60 months) of creditable service or when their age and service equal 90.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1.</p> <p>JRS: Age 65, with at least five years of weighted service credit, or age 60 with at least 30 years of weighted service credit.</p> <p>Service earned under JRS is weighted. The weighting factors under Plan 2 are:</p> <ul style="list-style-type: none"> <li>• 1.5 for JRS members appointed or elected to an original term before age 45.</li> <li>• 2.0 for JRS members appointed or elected to an original term between ages 45 and 54.</li> <li>• 2.5 for JRS members appointed or elected to an original term at age 55 or older.</li> </ul>	<p><b>Earliest Unreduced Retirement Eligibility</b></p> <p><i>Defined Benefit Component:</i></p> <p>VRS: Normal Social Security retirement age and have at least five years (60 months) of creditable service or when their age and service equal 90.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Not applicable.</p> <p>JRS: Same as Plan 2.</p> <p><i>Defined Contribution Component:</i></p> <p>Members are eligible to receive distributions upon leaving employment, subject to restrictions.</p>

FIGURE 2.10: RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<p><b>Earliest Reduced Retirement Eligibility</b>  VRS: Age 55 with at least five years (60 months) of creditable service or age 50 with at least 10 years of creditable service.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Age 50 with at least five years of creditable service.</p> <p>JRS: Age 55, with at least five years of creditable service.</p>	<p><b>Earliest Reduced Retirement Eligibility</b>  VRS: Age 60 with at least five years (60 months) of creditable service.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1.</p> <p>JRS: Same as Plan 1.</p>	<p><b>Earliest Reduced Retirement Eligibility</b>  <i>Defined Benefit Component:</i>  VRS: Age 60 with at least five years (60 months) of creditable service.</p> <p>SPORS, VaLORS and political subdivision hazardous duty employees: Not applicable.</p> <p>JRS: Same as Plan 1.</p> <p><i>Defined Contribution Component:</i>  Members are eligible to receive distributions upon leaving employment, subject to restrictions.</p>
<p><b>Cost-of-Living Adjustment (COLA) in Retirement</b>  The Cost-of-Living Adjustment (COLA) matches the first 3% increase in the Consumer Price Index for all Urban Consumers (CPI-U) and half of any additional increase (up to 4%) up to a maximum COLA of 5%.</p> <p><i>Eligibility:</i>  For members who retire with an unreduced benefit or with a reduced benefit with at least 20 years of creditable service, the COLA will go into effect on July 1 after one full calendar year from the retirement date.</p> <p>For members who retire with a reduced benefit and who have fewer than 20 years of creditable service, the COLA will go into effect on July 1 after one calendar year following the unreduced retirement eligibility date.</p> <p><i>Exceptions to COLA Effective Dates:</i>  The COLA is effective July 1 following one full calendar year (January 1 to December 31) under any of the following circumstances:</p> <ul style="list-style-type: none"> <li>• The member is within five years of qualifying for an unreduced retirement benefit as of January 1, 2013.</li> <li>• The member retires on disability.</li> <li>• The member is involuntarily separated from employment for causes other than job performance or misconduct and is eligible to retire under the Workforce Transition Act or the Transitional Benefits Program.</li> <li>• The member dies in service and the member's survivor or beneficiary is eligible for a monthly death-in-service benefit.</li> </ul>	<p><b>Cost-of-Living Adjustment (COLA) in Retirement</b>  The Cost-of-Living Adjustment (COLA) matches the first 2% increase in the CPI-U and half of any additional increase (up to 2%), for a maximum COLA of 3%.</p> <p><i>Eligibility:</i>  Same as Plan 1.</p> <p><i>Exceptions to COLA Effective Dates:</i>  Same as Plan 1.</p>	<p><b>Cost-of-Living Adjustment (COLA) in Retirement</b>  <i>Defined Benefit Component:</i>  Same as Plan 2.</p> <p><i>Defined Contribution Component:</i>  Not applicable.</p> <p><i>Eligibility:</i>  Same as Plan 1.</p> <p><i>Exceptions to COLA Effective Dates:</i>  The COLA is effective July 1 following one full calendar year (January 1 to December 31) under any of the following circumstances:</p> <ul style="list-style-type: none"> <li>• The member is within five years of qualifying for an unreduced retirement benefit as of January 1, 2013.</li> <li>• The member retires directly from short-term or long-term disability under the Virginia Local Disability Program (VLDP) or employer opt-out plan.</li> <li>• The member is involuntarily separated from employment for causes other than job performance or misconduct and is eligible to retire under the Workforce Transition Act or the Transitional Benefits Program.</li> <li>• The member dies in service and the member's survivor or beneficiary is eligible for a monthly death-in-service benefit.</li> </ul>

**FIGURE 2.10: RETIREMENT PLAN PROVISIONS, cont.**

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<p><b>Disability Coverage</b>                      For members who are eligible to be considered for disability retirement and retire on disability, the retirement multiplier is 1.70% on all service, regardless of when it was earned, purchased or granted.</p> <p>Most state employees are covered under the Virginia Sickness and Disability Program (VSDP) and are not eligible for disability retirement.</p> <p>VSDP members are subject to a one-year waiting period before becoming eligible for non-work-related disability benefits.</p>	<p><b>Disability Coverage</b>                      For members who are eligible to be considered for disability retirement and retire on disability, the retirement multiplier is 1.65% on all service, regardless of when it was earned, purchased or granted.</p> <p>Most state employees are covered under the Virginia Sickness and Disability Program (VSDP) and are not eligible for disability retirement.</p> <p>VSDP members are subject to a one-year waiting period before becoming eligible for non-work-related disability benefits.</p>	<p><b>Disability Coverage</b>                      Employees of political subdivisions and school divisions (including Plan 1 and Plan 2 opt-ins) participate in the Virginia Local Disability Program (VLDP) unless their local governing body provides an employer-paid comparable program for its members.</p> <p>State employees (including Plan 1 and Plan 2 opt-ins) participating in the Hybrid Retirement Plan are covered under the Virginia Sickness and Disability Program (VSDP), and are not eligible for disability retirement.</p> <p>Hybrid members (including Plan 1 and Plan 2 opt-ins) covered under VSDP or VLDP are subject to a one-year waiting period before becoming eligible for non-work-related disability benefits.</p>
<p><b>Purchase of Prior Service</b>                      Members may be eligible to purchase service from previous public employment, active duty military service, an eligible period of leave or VRS refunded service as creditable service in their plan. Prior creditable service counts toward vesting, eligibility for retirement and the health insurance credit, if offered by the employer. Only active members are eligible to purchase prior service. Members also may be eligible to purchase periods of leave without pay.</p>	<p><b>Purchase of Prior Service</b>                      Same as Plan 1.</p>	<p><b>Purchase of Prior Service</b>  <i>Defined Benefit Component:</i>                      Same as Plan 1, with the following exception: Hybrid Retirement Plan members are ineligible for ported service.</p> <p><i>Defined Contribution Component:</i>                      Not applicable.</p>

**B. CONTRIBUTIONS**

Members and employers are required to contribute to the retirement plans as provided by Title 51.1 of the *Code of Virginia* (1950), as amended. The member contribution is 5.00% of compensation, contributed by members or employers each month to members’ contribution accounts. Members leaving covered employment are eligible to request a refund of their member contribution account balance. Vested members and those involuntarily separated from employment for causes other than job performance or misconduct are eligible for a full refund. Non-vested members are eligible for a refund of their account balance, excluding any member contributions made by employers to their accounts after July 1, 2010, and the interest on those contributions.

Each participating employer is required to contribute the remaining amounts necessary to fund the pension plans using the entry age normal actuarial cost method adopted by the Board of Trustees. The System’s actuary, Cavanaugh Macdonald Consulting, LLC, computed the amount of contributions to be provided by state agency, state police and Virginia law officer employers; each participating political subdivision employer; and state judicial employers.

The contribution rates for fiscal year 2017 were based on the actuary’s valuation as of June 30, 2015, and the contribution rates for fiscal year 2016 were based on the actuary’s valuation as of June 30, 2013. In addition, the actuary computed a separate contribution requirement for the employers in the teacher cost-sharing pool for each year using the same valuation dates.

As shown in Figure 2.11, contributions for the fiscal years ended June 30, 2017 and 2016, totaled \$3,242,396,000 and \$3,375,057,000, respectively, in accordance with statutory requirements.

Employer contributions to the VRS cost-sharing pool for teachers represented 14.66% of covered payrolls. Employer contributions for state employees represented 13.49% of covered payrolls. Each political subdivision's contributions ranged from zero (0.00%) to 33.04% of covered payrolls. State employer contributions to SPORS, VaLORS and

JRS represented 28.54%, 21.05% and 41.97%, respectively for the fiscal year. For state and teacher employers and a majority of the political subdivisions, these rates reflected the normal cost and the amortization of a portion of the unfunded actuarial accrued liability of each of the plans based on the June 30, 2015, actuarial valuation. For a small number of political subdivisions the rates reflect modified actuarial assumptions. This is discussed further in Note 12. Member contributions for both years represented 5.00% of covered payrolls.

**FIGURE 2.11: MEMBER AND EMPLOYER CONTRIBUTIONS**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

Fiscal Year	System/Plan	Member Contributions*	Member Contributions Paid By Employer	Employer Contributions*	Total
<b>2017</b>	VRS – State	\$ 219,001	\$ 124	\$ 546,959	\$ 766,084
	VRS – Teacher	416,433	(12)	1,157,008	1,573,429
	VRS – Political Subdivisions	253,436	3	487,968	741,407
	<b>Total VRS</b>	<b>888,870</b>	<b>115</b>	<b>2,191,935</b>	<b>3,080,920</b>
	SPORS	5,701	–	31,888	37,589
	VaLORS	17,598	–	73,816	91,414
	JRS	2,225	2,209	28,039	32,473
	<b>Total</b>	<b>\$ 914,394</b>	<b>\$ 2,324</b>	<b>\$2,325,678</b>	<b>\$ 3,242,396</b>
<b>2016</b>	<b>Total</b>	<b>\$ 842,139</b>	<b>\$ 25,812</b>	<b>\$2,507,106</b>	<b>\$ 3,375,057</b>

\* For fiscal year 2017, member and employer contributions for the VRS plans include \$56,228,000 and \$40,972,000 respectively in Hybrid Defined Contribution Plan contributions. Member and employer contributions for the JRS plan includes \$1,162,000 and \$427,000 respectively in Hybrid Defined Contribution Plan contributions. This compares with fiscal year 2016 member contributions for the VRS plans and the JRS plan of \$28,683,000 and \$267,000, respectively, and fiscal year 2016 employer contributions of \$23,248,000 and \$407,000, respectively, for the VRS plans and the JRS plan.

### C. EMPLOYERS' NET PENSION LIABILITY: PENSION PLANS

The most recent actuarial valuation to determine the net pension liabilities for the VRS pension plans was prepared as of June 30, 2017. The total pension

liability was determined based on an actuarial valuation as of June 30, 2016, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2017.

## SCHEDULE OF EMPLOYERS' NET PENSION LIABILITY BY SYSTEM AND PLAN

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Employers' Net Pension Liability/ (Asset) (a-b)	Plan Fiduciary Net Position as a % of the Total Pension Liability (b/a)	Covered Payroll (c)	Net Pension Liability/ (Asset) as a % of the Covered Employee Payroll (a-b)/(c)
<b>Virginia Retirement System:</b>						
State	\$ 23,617,412	\$ 17,789,888	\$ 5,827,524	75.33%	\$ 4,020,893	144.93%
Teacher	45,417,520	33,119,545	12,297,975	72.92%	7,891,783	155.83%
Political Subdivision*	21,564,004	19,250,247	2,313,757	89.27%	4,765,842	48.55%
<b>Total Virginia Retirement System</b>	<b>90,598,936</b>	<b>70,159,680</b>	<b>20,439,256</b>		<b>16,678,518</b>	
State Police Officers' Retirement System	1,047,402	796,073	251,329	76.00%	111,395	225.62%
Virginia Law Officers' Retirement System	2,002,184	1,345,887	656,297	67.22%	344,468	190.52%
Judicial Retirement System	646,275	512,749	133,526	79.34%	66,826	199.81%
<b>Grand Total</b>	<b>\$94,294,797</b>	<b>\$ 72,814,389</b>	<b>\$21,480,408</b>		<b>\$ 17,201,207</b>	

\* Political subdivision data is from the consolidated report provided by Cavanaugh Macdonald Consulting, Inc.

## SCHEDULE OF ACTUARIAL METHODS AND SIGNIFICANT ASSUMPTIONS – PENSION PLANS

	VRS					
	State	Teacher	Political Subdivisions	SPORS	VaLORS	JRS
<b>Valuation Date</b>	June 30, 2016	June 30, 2016	June 30, 2016	June 30, 2016	June 30, 2016	June 30, 2016
<b>Actuarial Cost Method</b>	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
<b>Actuarial Assumptions:</b>						
Investment Rate of Return*	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
Projected Salary Increases:*						
State Employees/ Teachers	3.50% to 5.35%	3.50% to 5.95%	N/A	3.50% to 4.75%	3.50% to 4.75%	4.50%
Political Subdivision – Non-Hazardous Duty Employees	N/A	N/A	3.50% to 5.35%	N/A	N/A	N/A
Political Subdivision – Hazardous Duty Employees	N/A	N/A	3.50% to 4.75%	N/A	N/A	N/A
Post-Retirement Benefits Increases**						
Plan 1	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Plan 2	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%

\* Includes inflation at 2.50%.

\*\* Compounded annually.

Note: Additional information regarding mortality rate assumptions and experience studies can be found in the Actuarial Assumptions and Methods presentation in the Actuarial Section of the CAFR.

#### D. CHANGES IN DISCOUNT RATE

The discount rate used to measure the total pension liability was 7.00%. The projection of cash flows used to determine the discount rate assumed that contributions from participating employers will be based on the actuarially determined rates based on the Board's funding policy, which certifies the required rates under Title 51.1 of the *Code of Virginia* (1950), as amended. Based on those assumptions, the fiduciary net position was projected to be available to make all of the projected future benefit payments of current plan members. Therefore, the long-term

expected rate of return on pension plan investments was applied to all periods of the projected benefit payments to determine the total pension liability. In accordance with GASB Statement No. 67, regarding the disclosure of the sensitivity of the net pension liability to changes in the discount rate, the table below presents the employers' net pension liability for each of the plans calculated using the discount rate of 7.00%, as well as what the employers' net pension liability would be if it were calculated using a discount rate that is 1.00% lower (6.00%) or 1.00% higher (8.00%) than the current rate.

#### SCHEDULE OF IMPACT OF CHANGES IN DISCOUNT RATE – PENSION PLANS

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

System/Plan	Net Pension Liability		
	1.00% Decrease (6.00%)	Current Discount Rate (7.00%)	1.00% Increase (8.00%)
Virginia Retirement System			
State	\$ 8,608,043	\$ 5,827,524	\$ 3,492,489
Teacher	18,364,993	12,297,975	7,279,318
Political Subdivision	5,104,178	2,313,757	(6,847)
Total Virginia Retirement System	32,077,214	20,439,256	10,764,960
State Police Officers' Retirement System	376,219	251,329	146,086
Virginia Law Officers' Retirement System	915,578	656,297	441,935
Judicial Retirement System	192,949	133,526	81,927
<b>Grand Total</b>	<b>\$ 33,561,960</b>	<b>\$ 21,480,408</b>	<b>\$ 11,434,908</b>

### 3. Other Employee and Post-Employment Benefit Plans (OPEBs)

#### A. PLAN DESCRIPTIONS

The System administers other employee and post-employment benefit plans for active, deferred and retired members of VRS, SPORS, VaLORS and JRS. These plans are the Group Life Insurance Program, the Retiree Health Insurance Credit Program, the Virginia Sickness and Disability Program (VSDP) and the Virginia Local Disability Program (VLDP).

The System also manages the assets of the Line of Duty Act Fund; the Department of Accounts (DOA) administers the benefits and payment of claims under the program.

Contributions and payments for other employee benefit plans for active members occur on a current basis; therefore, the System does not record the net position of these plans and is not required to report their funding progress and employer contributions. However, the System does record

plan net position and reports funding progress and employer contributions for post-employment benefit plans. This information is provided in the Required Supplementary Schedules following the Notes to Financial Statements. Additional information also is presented in the Statistical Section.

**1. Group Life Insurance Program.** The Group Life Insurance Program is a cost-sharing, multiple-employer plan. Members whose employers participate in the Group Life Insurance Program are covered automatically under the Basic Group Life Insurance Program upon employment. They also are eligible to elect additional coverage for themselves as well as a spouse or dependent children through the Optional Group Life Insurance Program.

Participating employers and covered employees are required by Title 51.1 of the *Code of Virginia* (1950), as amended, to contribute to the cost of group life insurance benefits. Employers may assume employees' contributions. The premium contributions collected during members' active careers, less the amount required to cover current life insurance premiums and claims plus administrative and other expenses, are retained in the Group Life Insurance Advance Premium Deposit Reserve to fund the claims for eligible retired and deferred members. Approximately 359,386 active members and 176,107 retirees were covered under the Basic Group Life Insurance Program at June 30, 2017.

For members who elect optional group life insurance coverage, the insurer bills employers directly for the premiums. Employers deduct the premiums from members' paychecks and pay the premiums to the insurer. Premiums are based on members' ages and are approved by the Board of Trustees. Any differences and adjustments are settled between the employer and the insurer. Approximately 68,377 active members and 2,980 retirees were covered under the Optional Group Life Insurance Program at June 30, 2017.

**2. Retiree Health Insurance Credit Program.** The Retiree Health Insurance Credit Program is composed of a single-employer plan for state employees; a cost-sharing, multiple-employer plan for teachers; three cost-sharing, multiple-employer plans for constitutional officers, social services employees and registrars; and an agent, multiple-employer plan for political subdivisions electing coverage. It provides eligible retirees a tax-free reimbursement for health insurance premiums for single coverage under qualifying health plans, including coverage under a spouse's plan, not to exceed the amount of the monthly premium or the maximum credit, whichever is less. Premiums for health plans covering specific conditions are ineligible for reimbursement. Employers are required by Title 51.1 of the *Code of Virginia* (1950), as amended, to contribute to the program. The amount is financed based on employer contribution rates determined by the System's actuary. Approximately 120,304 retirees were covered under the Health Insurance Credit program at June 30, 2017.

**3. Virginia Sickness and Disability Program.** The Virginia Sickness and Disability Program (VSDP) is a single-employer plan. It provides state employees with sick, family and personal leave and short-term and long-term disability benefits. State agencies are required by Title 51.1 of the *Code of Virginia* (1950), as amended, to contribute to the cost of providing long-term disability benefits and administering the program. Approximately 74,944 members were covered under VSDP at June 30, 2017, and approximately 2,785 former members were receiving benefits from the program during the fiscal year.

**4. Virginia Local Disability Program.** The Virginia Local Disability Program (VLDP) is composed of two multiple-employer cost-sharing pools, one for teachers and one for employees of political subdivisions. It provides eligible employees with short-term and long-term disability benefits. Local government employers are required by Title 51.1 of the *Code of Virginia* (1950), as amended, to provide long-term disability benefits for their Hybrid employees, either through a local plan or through VLDP. Approximately 13,370 members were covered under VLDP at June 30, 2017, and four former members received benefits from the program during the fiscal year.

**5. Commonwealth of Virginia (COV) Voluntary Group Long-Term Care Insurance Program.** The COV Voluntary Group Long-Term Care Insurance Program is a participant-paid long-term care insurance program for eligible VRS members, retirees and family members. The program provides a maximum monthly allowance for covered long-term care expenses such as nursing home care, adult day care, in-home care or assistance with other activities

of daily living. Approximately 13,015 members, retirees and their eligible family members were covered under the program at June 30, 2017.

**6. Line of Duty Act Program.** The Line of Duty Act Program is a cost-sharing, multiple-employer plan. It provides death and health insurance reimbursement benefits to eligible state employees and local government employees, including volunteers, who die or become disabled as a result of the performance of their duties as a public safety officer.

As required by statute, the System is responsible for managing the assets of the program. Participating employers made contributions to the program beginning in fiscal year 2012. The employer contribution rate was determined by the System's actuary using the anticipated program costs and the number of covered individuals associated with all participating employers. Provisions for other employee benefit and post-employment benefit plans are presented in Figure 2.12.

## SCHEDULE OF PARTICIPATING EMPLOYERS: OPEB PLANS

AT JUNE 30, 2017

OPEB Plan	Number of Participating Employers			
	State	Teachers	Political Subdivisions	Total
Group Life Insurance	220	145	542*	907
Retiree Health Insurance Credit	220	145	123*	488
Disability Insurance Trust Fund	213	—	—	213
Virginia Local Disability Program	—	36	177*	213
Line of Duty Act Trust Fund	69	—	56	125

\* Also includes school division non-professional employers, as applicable.

## FIGURE 2.12: OTHER EMPLOYEE BENEFIT AND POST-EMPLOYMENT BENEFIT PLAN PROVISIONS

AS ESTABLISHED BY TITLE 51.1 OF THE *CODE OF VIRGINIA* (1950), AS AMENDED

	<b>Eligible Employees</b>	<b>Coverage</b>
<p><b>VRS Group Life Insurance Program: Basic Coverage</b></p>	<p>The VRS Group Life Insurance Program was established July 1, 1960, for state employees, teachers and employees of political subdivisions that elect the program, including the following employers that do not participate in VRS for retirement:</p> <p>City of Richmond, City of Portsmouth, City of Roanoke, City of Norfolk and Roanoke City School Board.</p> <p>Basic group life insurance coverage is automatic upon employment. Coverage ends for employees who leave their position before retirement eligibility or who take a refund of their member contributions and accrued interest.</p>	<ul style="list-style-type: none"> <li>• Natural death benefit equal to the employee’s compensation rounded to the next highest thousand and then doubled.</li> <li>• Accidental death benefit, which is double the natural death benefit.</li> <li>• Accidental dismemberment benefit, safety belt benefit, repatriation benefit, felonious assault benefit and accelerated death benefit option.</li> <li>• Continuation of death benefit and accelerated death benefit option for employees who retire or who have met the age and service requirements for separation from employment.</li> </ul> <p>Coverage begins to reduce by 25% on the January 1 following one calendar year of separation and reduces by 25% each January 1 until it reaches 25% of its original value.</p> <p>If a member has at least 30 years of creditable service, coverage cannot reduce below \$8,111. This minimum will be increased annually based on the VRS Plan 2 cost-of-living adjustment calculation.</p>
<p><b>Optional Group Life Insurance Program</b></p>	<p>Employees covered under the VRS Group Life Insurance Program are eligible to elect additional coverage for themselves as well as a spouse or dependent children through the Optional Group Life Insurance Program. Employees pay the premiums through payroll deduction.</p> <p>Spousal coverage ends if the employee’s coverage ends or the couple divorce.</p> <p>Coverage for dependent children ends if the employee’s coverage ends or when the children marry, become self-supporting, reach age 21 or reach age 25 as a dependent attending college full time.</p> <p>Coverage continues for dependent unmarried children who are disabled.</p>	<p>The program provides natural death and accidental death or dismemberment coverage:</p> <ul style="list-style-type: none"> <li>• Employees select one, two, three or four times their compensation, not to exceed \$750,000.</li> <li>• Spouses may be covered for up to half the maximum amount of the employees’ coverage, not to exceed \$375,000. Dependent children who are at least 15 days old may be covered for \$10,000, \$20,000 or \$30,000, depending on the option employees select.</li> <li>• Accidental death and dismemberment coverage ends upon retirement. A retired employee may elect within 31 days of retirement to continue optional life coverage provided he or she has 60 months of coverage prior to leaving service. As a retiree, the participant can elect either one or two times his or her compensation, not to exceed \$275,000 or the amount of coverage in place when the employee left service.</li> </ul>

FIGURE 2.12: OTHER EMPLOYEE BENEFIT AND POST-EMPLOYMENT BENEFIT PLAN PROVISIONS, cont.

Eligible Employees	Coverage
	<p><i>Service Retirement Multiplier, cont.</i></p> <ul style="list-style-type: none"> <li>• Coverage begins to reduce beginning with the retiree’s normal retirement age under his or her plan and all coverage ends at age 80. Upon retirement, spouse coverage can continue at one-half the amount of the retiree’s coverage and dependent coverage can continue at the same level previously covered prior to retirement. Premiums for coverage are at the same rates as active employees. If the retiree previously had coverage exceeding \$275,000, he or she can elect to convert the excess over this amount to an individual policy with individual rates.</li> <li>• If an employee terminates with fewer than 60 months of optional life coverage, he or she may convert the policy and any spouse and/or dependent coverage to an individual policy (without evidence of insurability if done within 31 days of termination). However, it may be at higher premiums than those paid by active employees.</li> </ul>

**Retiree Health Insurance Credit Program**

The Retiree Health Insurance Credit Program was established January 1, 1990, for retired state employees covered under VRS, SPORS, VaLORS and JRS who retire with at least 15 years of service credit. The program was opened to teachers and eligible employees of participating political subdivisions on July 1, 1993. The health insurance credit is a tax-free reimbursement in an amount set by the General Assembly for each year of service credit against qualified health insurance premiums retirees pay for single coverage, excluding any portion covering a spouse or dependents. The credit cannot exceed the amount of the premiums and ends upon the retiree’s death.

**Health Insurance Credit Dollar Amounts at Retirement**

	Amount per Year of Service	Maximum Credit per Month*
State employees	\$ 4.00	No Cap
Teachers and other professional school employees	\$ 4.00	No Cap
General registrars and their employees, constitutional officers and their employees, and local social service employees	\$ 1.50	\$ 45.00
General registrars and their employees, constitutional officers and their employees and local social service employees, if the political subdivision elects the \$1.00 enhancement	\$ 2.50	\$ 75.00
Other political subdivision employees as elected by the employer	\$ 1.50	\$ 45.00

**FIGURE 2.12: OTHER EMPLOYEE BENEFIT AND POST-EMPLOYMENT BENEFIT PLAN PROVISIONS, cont.**

**Health Insurance Credit Dollar Amounts at Disability Retirement and for VSDP and VLDP Long-Term Disability**

Employees who retire on disability or go on long-term disability under the Virginia Sickness and Disability Program (VSDP) or the Virginia Local Disability Program (VLDP) are eligible for the health insurance credit.\*\*

<b>Eligible Employees</b>	<b>Coverage</b>
State employees other than state police officers	\$120 per month or \$4 per year of service credit per month, whichever is higher.
State police officers	Non-work-related disability: \$120 per month or \$4 per year of service credit per month, whichever is higher. Work-related disability: No health insurance credit for premiums qualified under the Virginia Line of Duty Act; may receive the credit for premiums paid for other qualified health plans.
Teachers and other professional school employees	Either (a) \$4 multiplied by twice the amount of service credit per month; or (b) \$4 multiplied by the amount of service earned had the employee been active until age 60 per month, whichever is lower.
Political subdivision employees as elected by the employer	\$45 per month. No health insurance credit premiums for premiums qualified under LODA. May receive the credit for premiums paid for other qualified health plans.

\* Not to exceed the individual premium amount.

\*\* Not to exceed the individual premium amount. Employees who retire from being on long-term disability under VSDP or VLDP must have at least 15 years of service credit to qualify for the health insurance credit as a retiree.

<b>Eligible Employees</b>	<b>Coverage</b>
<p><b>Virginia Sickness and Disability Program (VSDP)</b></p> <p>VSDP, also known as the Disability Insurance Trust Fund, was established January 1, 1999, to provide short-term and long-term disability benefits for non-work-related and work-related disabilities.</p> <p>Eligible employees are enrolled automatically upon employment. They include:</p> <ul style="list-style-type: none"> <li>• Full-time and part-time permanent, salaried state employees covered under VRS, SPORS and VaLORS (members new to VaLORS following its creation on October 1, 1999, have been enrolled since the inception of VSDP).</li> <li>• State employees hired before January 1, 1999, who elected to transfer to VSDP rather than retain their eligibility to be considered for VRS disability retirement.</li> </ul>	<ul style="list-style-type: none"> <li>• Sick, family and personal leave.</li> <li>• Short-term disability benefit beginning after a seven-calendar-day waiting period from the first day of disability. The benefit provides income replacement beginning at 100% of the employee's pre-disability income, reducing to 80% and then 60%.</li> <li>• Long-term disability benefit beginning after 125 workdays of short-term disability and continuing until the employee reaches his or her normal retirement age. The benefit provides income replacement of 60% of the employee's pre-disability income. If an employee becomes disabled within five years of his or her normal retirement age, the employee will receive up to five years of VSDP benefits, provided he or she remains medically eligible.</li> </ul>

FIGURE 2.12: OTHER EMPLOYEE BENEFIT AND POST-EMPLOYMENT BENEFIT PLAN PROVISIONS, cont.

	<b>Eligible Employees</b>	<b>Coverage</b>
	<p><i>VSDP, cont.</i></p> <ul style="list-style-type: none"> <li>Public college and university faculty members who elect the VRS defined benefit plan. They may participate in VSDP or their institution’s disability program, if offered. If the institution does not offer the program or the faculty member does not make an election, he or she is enrolled in VSDP.</li> </ul>	<ul style="list-style-type: none"> <li>Income replacement adjustment to 80% for catastrophic conditions.</li> <li>VSDP Long-Term Care Plan, a self-funded program that assists with the cost of covered long-term care services.</li> </ul>
<p><i>Note:</i></p>		
<ul style="list-style-type: none"> <li>Employees hired or rehired on or after July 1, 2009, must satisfy eligibility periods before becoming eligible for non-work-related short-term disability coverage and certain income-replacement levels.</li> <li>A state employee who is approved for VSDP benefits on or after the date that is five years prior to his or her normal retirement date is eligible for five years of VSDP benefits.</li> <li>Employees on work-related short-term disability receiving only a workers’ compensation payment may be eligible to purchase service credit for this period if retirement contributions are not being withheld from the workers’ compensation payment. The rate will be based on 5.00% of the employee’s compensation.</li> </ul>		
	<b>Eligible Employees</b>	<b>Coverage</b>
<p><b>Virginia Local Disability Program (VLDP)</b></p>	<p>VLDP was implemented January 1, 2014, to provide short-term and long-term disability benefits for non-work-related and work-related disabilities. Eligible employees are enrolled automatically upon employment, unless their employer has elected to provide comparable coverage.</p> <p>Eligible employees include:</p> <ul style="list-style-type: none"> <li>Teacher or other professional employee of a local public school division</li> <li>General employee of a VRS-participating political subdivision such as a city, county, town, authority or commission</li> <li>Local law enforcement officer, firefighter or emergency medical technician if the employer does not provide enhanced hazardous duty benefits.</li> </ul>	<p>Short-term disability benefit beginning after a seven-calendar day waiting period from the first day of disability. Employees become eligible for non-work-related short-term disability coverage after one year of continuous participation in VLDP with their current employer.</p> <ul style="list-style-type: none"> <li>Eligibility for work-related short-term disability coverage begins upon employment.</li> <li>During the first five years of continuous participation in VLDP with their current employer, employees are eligible for 60% of their pre-disability income if they go on non-work-related or work-related short-term disability.</li> <li>Once the eligibility period is satisfied, employees are eligible for higher income-replacement levels.</li> </ul>

FIGURE 2.12: OTHER EMPLOYEE BENEFIT AND POST-EMPLOYMENT BENEFIT PLAN PROVISIONS, cont.

Eligible Employees	Coverage
	<p><i>VLDP, cont.</i></p> <ul style="list-style-type: none"> <li>• VLDP long-term benefit beginning after 125 workdays of short-term disability. Members are eligible if they are unable to work at all or are working fewer than 20 hours a week.</li> <li>• Members approved for long-term disability will receive 60% of their pre-disability income. If approved for work-related long-term disability, the VLDP benefit will be offset by the workers' compensation benefit. Members will not receive a VLDP benefit if their workers' compensation is greater than the VLDP benefit amount.</li> <li>• Members approved for short-term or long-term disability at age 60 or older will be eligible for a benefit, provided they remain medically eligible.</li> <li>• VLDP Long-Term Care Plan, a self-funded program that assists with the cost of covered long-term care services</li> </ul>
Eligible Employees	Coverage
<p><b>Commonwealth of Virginia (COV) Voluntary Group Long-Term Care Insurance Program</b></p> <p>The following members between the ages of 18 and 79 were eligible to apply through December 31, 2016*:</p> <ul style="list-style-type: none"> <li>• State employees and public college and university faculty members</li> <li>• Employees of school divisions and political subdivisions whose employers have elected to participate in the program</li> <li>• Vested deferred members and retirees (their employers are not required to have elected the program)</li> <li>• Select family members of eligible members</li> </ul> <p><i>*Genworth Life Insurance Company no longer accepts new enrollees in the Commonwealth of Virginia (COV) Voluntary Long-Term Care Insurance program. This change is a result of parent company Genworth Financial Inc.'s ongoing restructuring plan.</i></p>	<p>The program provides assistance with covered long-term care expenses at group rates. Active members pay the premiums for themselves and any covered family members through payroll deduction or directly to Genworth Life Insurance Company, the insurer, provided the employer has arranged for payroll deductions with Genworth Life. All other participants pay the premiums directly to Genworth.</p>

FIGURE 2.12: OTHER EMPLOYEE BENEFIT AND POST-EMPLOYMENT BENEFIT PLAN PROVISIONS, cont.

	Eligible Employees	Coverage
	<p><i>COV, cont.</i></p> <p><i>In 2010, VRS entered into an agreement for the COV long-term care plan with Genworth. That agreement remains in place at this time, and Genworth has confirmed it will honor the terms of all current policies received through December 31, 2016. VRS is engaged in discussions with Genworth regarding a replacement long-term care program offering.</i></p>	
	Eligible Employees	Coverage
<p><b>Line of Duty Act (LODA) Program</b></p>	<p>Paid employees and volunteers in hazardous duty positions in Virginia localities, including hazardous duty employees covered under VRS, SPORS and VaLORS.</p>	<p>Coverage provides death and health insurance benefits.</p> <p>The LODA death benefit is a one-time payment made to the beneficiary or beneficiaries. Amounts vary as follows:</p> <ul style="list-style-type: none"> <li>• \$100,000 when a death occurs as the direct or proximate result of performing duty as of January 1, 2006, or after</li> <li>• \$25,000 when the cause of death is attributed to one of the applicable presumptions and occurred earlier than five years after the retirement date</li> <li>• An additional \$20,000 benefit is payable when certain members of the National Guard and U.S. military reserves are killed in action in any armed conflict on or after October 7, 2001</li> </ul> <p>The System is responsible for managing the assets of the Line of Duty Act Fund.</p>
<p><b>Cost-of-Living Adjustments (COLA) for OPEB Plans</b></p>	<p><b>Adjustments</b></p> <ul style="list-style-type: none"> <li>• <b>VRS Group Life Insurance Program, Basic Coverage:</b> If a member has at least 30 years of creditable service, coverage cannot reduce below \$8,111. This minimum will be increased annually based on the VRS Plan 2 COLA calculation.</li> <li>• <b>Optional Group Life Insurance:</b> The actuary reviews the maximum coverage levels every five years for possible increases.</li> <li>• <b>Virginia Sickness and Disability Program (VSDP):</b> <ul style="list-style-type: none"> <li>○ During periods an employee receives long-term disability benefits, the COLA may be increased annually by an amount recommended by the actuary and approved by the Board.</li> <li>○ For participating full-time employees taking a service retirement, the COLA may be increased annually by an amount recommended by the actuary and approved by the Board, from the date of the commencement of the disability to the date of retirement.</li> <li>○ For participating full-time employees receiving supplemental (work-related) disability benefits, the COLA may be increased annually by an amount recommended by the actuary and approved by the Board, from the date of the commencement of the disability to the date of retirement.</li> </ul> </li> </ul>	

## B. EMPLOYERS' NET OPEB LIABILITY – OTHER POST-EMPLOYMENT BENEFIT PLANS

The most recent actuarial valuation to determine the net OPEB liabilities for the OPEB plans was prepared as of June 30, 2017. The total OPEB liability was determined based on an actuarial valuation as of June 30, 2016, using updated actuarial assumptions, applied to all periods included in the measurement

and rolled forward to the measurement date of June 30, 2017.

Actuarial methods and assumptions for the OPEB plans are presented in the Actuarial Section. The following schedule presents selected information as of the latest actuarial valuation:

### SCHEDULE OF EMPLOYERS' NET OPEB LIABILITY BY PROGRAM AND PLAN

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Total OPEB Liability (a)	Plan Fiduciary Net Position (b)	Employers' Net OPEB Liability/ (Asset) (a-b)	Plan Fiduciary Net OPEB as a % of the Total OPEB Liability (b/a)	Covered Payroll (c)	Net OPEB Liability/ (Asset) as a % of the Covered Payroll (a-b)/(c)
<b>Group Life Insurance Fund</b>	<b>\$ 2,942,426</b>	<b>\$ 1,437,586</b>	<b>\$ 1,504,840</b>	<b>48.86%</b>	<b>\$18,473,085</b>	<b>8.15%</b>
<b>Health Insurance Credit Fund:</b>						
State	990,028	79,516	910,512	8.03%	6,489,070	14.03%
Teacher	1,364,702	96,091	1,268,611	7.04%	7,892,011	16.07%
Political Subdivisions*	39,124	22,156	16,968	56.63%	966,611	1.76%
Constitutional Officers	28,193	2,427	25,766	8.61%	633,397	4.07%
Social Services Employees	13,816	1,091	12,725	7.90%	251,084	5.07%
Registrars	520	34	486	6.54%	1,047	4.40%
<b>Total Health Insurance Credit</b>	<b>2,436,383</b>	<b>201,315</b>	<b>2,235,068</b>		<b>16,243,220</b>	
<b>Disability Insurance Trust Fund</b>	<b>237,013</b>	<b>442,334</b>	<b>(205,321)</b>	<b>186.63%</b>	<b>3,799,590</b>	<b>-5.40%</b>
<b>Virginia Local Disability Program:</b>						
Teacher	873	279	594	31.96%	282,200	0.21%
Political Subdivisions	914	351	563	38.40%	183,629	0.31%
<b>Total Virginia Local Disability Program</b>	<b>1,787</b>	<b>630</b>	<b>1,157</b>		<b>465,829</b>	
<b>Line of Duty Act Trust Fund</b>	<b>266,252</b>	<b>3,461</b>	<b>262,791</b>	<b>1.30%</b>	<b>**</b>	<b>N/A</b>
<b>Grand Total</b>	<b>\$ 5,883,861</b>	<b>\$ 2,085,326</b>	<b>\$ 3,798,535</b>		<b>\$38,981,724</b>	

\* Political subdivision data is from the consolidated report provided by Cavanaugh Macdonald Consulting, Inc.

\*\* Contributions into the Line of Duty Trust Fund are based on the number of participants in the program using a per capita-based contribution versus a payroll-based contribution.

**SCHEDULE OF ACTUARIAL METHODS AND SIGNIFICANT ASSUMPTIONS: OTHER POST-EMPLOYMENT BENEFIT PLANS**

	Group Life Insurance Fund	Retiree Health Insurance Credit Fund	Disability Insurance Fund Trust Fund	Line of Duty Act Trust Fund	Virginia Local Disability Program
<b>Valuation Date</b>	June 30, 2016	June 30, 2016	June 30, 2016	June 30, 2016	June 30, 2016
<b>Actuarial Cost Method</b>	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
<b>Amortization Method</b>	Level Percent of Pay Closed	Level Percent of Pay Closed	Level Percent of Pay Closed	Level Percent of Pay Open	Level Percent of Pay Closed
<b>Payroll Growth Rate:</b>					
State Employees	3.00%	3.00%	3.00%	3.00%	N/A
Teachers	3.00%	3.00%	N/A	N/A	3.00%
Political Subdivision Employees	3.00%	3.00%	N/A	3.00%	3.00%
State Police and Virginia Law Officers	3.00%	3.00%	3.00%	3.00%	N/A
Judges	3.00%	3.00%	N/A	N/A	N/A
<b>Effective Amortization Period*</b>					
State Employees	27.5 Years	27.0 Years	24.5 Years	30 Years	N/A
Teachers	27.5 Years	26.7 Years	N/A	N/A	18.7 Years
Political Subdivision Employee	27.5 Years	26.3 Years	N/A	30 Years	19.8 Years
<b>Asset Valuation Method</b>					
State Employees and Teachers	5-Year, Smoothed Market	5-Year, Smoothed Market	5-Year, Smoothed Market	Market Value	5-Year, Smoothed Market
Political Subdivision Employees and State-Funded Local Employees	5-Year, Smoothed Market	Market Value	N/A	Market Value	5-Year, Smoothed Market
<b>Actuarial Assumptions</b>					
Investment Rate of Return**	7.00%	7.00%	7.00%	4.75%	7.00%
Projected Salary Increases:***					
State Employees	3.50% to 5.35%	3.50% to 5.35%	3.50% to 5.35%	N/A	N/A
Teachers	3.50% to 5.95%	3.50% to 5.95%	N/A	N/A	3.50% to 5.95%
Political Subdivision Non-Hazardous Duty Employees	3.50% to 5.35%	3.50% to 5.35%	N/A	N/A	3.50% to 5.35%
Political Subdivision Hazardous Duty Employees	3.50% to 4.75%	3.50% to 4.75%	N/A	N/A	N/A
State Police and Virginia Law Officers					N/A
Judges	4.50%	4.50%	N/A	N/A	N/A
Medical Trend Assumptions (Under Age 65)	N/A	N/A	N/A	7.75% to 5.00%	N/A
Medical Trend Assumptions (Ages 65 and Older)	N/A	N/A	N/A	5.75% to 5.00%	N/A
Year of Ultimate Trend Rate	N/A	N/A	N/A	Fiscal Year Ended 2023	N/A

\* The amortization period of the Unfunded Actuarial Accrued Liability (UAAL) was a closed 30-year period for the June 30, 2013, balance and closed 20-year period for each subsequent year. The Line of Duty Act Program amortization period is 30 years for the UAAL.

\*\* Includes inflation at 2.50%. The Line of Duty Act Program uses 4.25% for the investment rate of return.

\*\*\* Projected salary increases for the Retiree Health Insurance Credit Fund are used in the application of the actuarial cost method. Projected salary increase factors are not applicable to the Line of Duty Act Program since neither the benefit nor the cost is salary-based.

### C. CHANGES IN DISCOUNT RATE

The discount rate used to measure the total OPEB liability was 7.00% for the prefunded plans. These include the Group Life Insurance Program, the Retiree Health Insurance Program, the Disability Insurance Program and the Virginia Local Disability Program. The projection of cash flows used to determine the discount rate assumed that contributions from participating employers will be based on the actuarially determined rates based on the Board's funding policy, which certifies the required rates under Title 51.1 of the *Code of Virginia* (1950), as amended. Based on those assumptions, the fiduciary net position was projected to be available to make all of the projected future benefit payments of current plan members. Therefore, the long-term

expected rate of return on pension plan investments was applied to all periods of the projected benefit payments to determine the total OPEB liability. In accordance with GASB Statement No. 74, regarding the disclosure of the sensitivity of the net pension liability to changes in the discount rate, the table below presents the employers' net pension liability for each of the plans calculated using the discount rate of 7.00%, as well as what the employers' net pension liability would be if it were calculated using a discount rate that is 1.00% lower (6.00%) or 1.00% higher (8.00%) than the current rate. The Line of Duty Act Program is funded on a pay-as-you-go basis. As a result, the liabilities are valued using a discount rate of 3.56%, which approximates the risk-free rate of return.

#### SCHEDULE OF IMPACT OF CHANGES IN DISCOUNT RATE: LODA PLAN

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

System/Plan	1.00% Decrease (2.56%)	Current Discount Rate (3.56%)	1.00% Increase (4.56%)
Net LODA OPEB Liability	\$ 297,986	\$ 262,791	\$ 233,356

#### SCHEDULE OF IMPACT OF CHANGES IN HEALTH CARE TREND RATE: LODA PLAN

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

System/Plan	1.00% Decrease (6.75% decreasing to 4.00%)	Healthcare Cost Trend Rates (7.75% decreasing to 5.00%)	1.00% Increase (8.75% decreasing to 6.00%)
Net LODA OPEB Liability	\$ 222,981	\$ 262,791	\$ 312,133

#### SCHEDULE OF IMPACT OF CHANGES IN DISCOUNT RATE: NON-LODA OPEB PLANS

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

System/Plan	Net OPEB Liability		
	1.00% Decrease (6.00%)	Current Discount Rate (7.00%)	1.00% Increase (8.00%)
<b>Group Life Insurance Fund</b>	\$ 1,946,356	\$ 1,504,840	\$ 1,146,924
<b>Health Insurance Credit Fund:</b>			
State	1,006,798	910,512	827,718
Teacher	1,415,909	1,268,611	1,143,425
Political Subdivisions	21,074	16,968	13,500
Constitutional Officers	28,778	25,766	23,205
Social Services Employees	14,081	12,725	11,561
Registrars	535	486	444
<b>Total Health Insurance Credit</b>	<b>2,487,175</b>	<b>2,235,068</b>	<b>2,019,853</b>
<b>Disability Insurance Trust Fund</b>	(195,422)	(205,321)	(222,484)
<b>Virginia Local Disability Program:</b>			
Teacher	686	594	495
Political Subdivisions	642	563	491
<b>Total Virginia Local Disability Program</b>	<b>1,328</b>	<b>1,157</b>	<b>986</b>
<b>Grand Total</b>	<b>\$ 4,239,437</b>	<b>\$ 3,535,744</b>	<b>\$ 2,945,279</b>

#### 4. Reserve Accounts

The reserve account balances available for benefits at June 30, 2017 and 2016, are presented in Figure 2.13. These funds are required by Titles 51.1 and 2.2 of the *Code of Virginia* (1950), as amended, to provide for the payment of current and future benefits as follows:

- Member and employer contributions and investment income fund the member and employer reserves. Each member has a member contribution account that accumulates member contributions plus annual interest of 4.00%. Each employer has a retirement allowance account that accumulates employer contributions, transfers of investment income less administrative expenses incurred in operating the retirement plans and transfers of member contributions and accrued interest upon a member's retirement. Benefit payments are charged to employers' retirement allowance accounts.
- The Group Life Insurance Advance Premium Deposit Reserve accumulates a portion of insurance premium contributions collected during members' active careers and their investment earnings, and is charged for life insurance benefits paid and expenses incurred in operating the Group Life Insurance Program.
- Employer contributions and investment income fund the Retiree Health Insurance Credit Reserve. It is charged for credit reimbursements applied to the monthly health insurance premiums of eligible retired members and expenses incurred in operating the Retiree Health Insurance Credit Program.
- Employer contributions and investment income fund the Disability Insurance Trust Fund. It is charged for long-term disability benefits and expenses incurred in operating the Virginia Sickness and Disability Program (VSDP).
- Employer contributions and investment income fund the Line of Duty Act Trust Fund. It is charged for Line of Duty Act death and health insurance benefits and expenses incurred in operating the Line of Duty Act Program.

- Employer contributions and investment income fund the Local Disability Insurance Trust Fund. It is charged for long-term disability benefits and expenses incurred in operating the Virginia Local Disability Program (VLDP). The program was new in fiscal year 2014 and has no net position.

**FIGURE 2.13: NET POSITION RESTRICTED FOR BENEFITS**

	(EXPRESSED IN THOUSANDS)	
	2017	2016
<b>Virginia Retirement System</b>		
Member Reserve	\$13,070,300	\$12,592,933
Employer Reserve	57,272,633	51,435,976
<b>Total VRS</b>	<b>70,342,933</b>	<b>64,028,909</b>
<b>State Police Officers' Retirement System</b>		
Member Reserve	99,643	100,291
Employer Reserve	696,430	630,397
<b>Total SPORS</b>	<b>796,073</b>	<b>730,688</b>
<b>Virginia Law Officers' Retirement System</b>		
Member Reserve	240,517	237,416
Employer Reserve	1,105,370	974,030
<b>Total VaLORS</b>	<b>1,345,887</b>	<b>1,211,446</b>
<b>Judicial Retirement System</b>		
Member Reserve	41,754	38,561
Employer Reserve	473,645	429,741
<b>Total JRS</b>	<b>515,399</b>	<b>468,302</b>
<b>Group Life Insurance Advance Premium Deposit Reserve</b>	<b>1,437,586</b>	<b>1,224,926</b>
<b>Retiree Health Insurance Credit Reserve</b>	<b>201,315</b>	<b>173,211</b>
<b>Disability Insurance Trust Fund (VSDP)</b>	<b>442,334</b>	<b>407,826</b>
<b>Line of Duty Act Trust Fund</b>	<b>3,461</b>	<b>2,708</b>
<b>Disability Insurance Trust Fund (VLDP)</b>	<b>630</b>	–
<b>Total Pension and Other Employee Benefit Reserves</b>	<b>\$75,085,618</b>	<b>\$68,248,016</b>

## 5. Deposits and Investment Risk Disclosures

### A. DEPOSITS

Deposits of the System maintained by the Treasurer of Virginia at June 30, 2017 and 2016, as shown in Figure 2.14, were entirely insured under the Virginia Security for Public Deposits Act, Section 2.2-4400 et seq. of the *Code of Virginia* (1950), as amended, which provides for an assessable, multiple financial institution collateral pool. Deposits with the System's master custodian, BNY Mellon, were entirely insured by federal depository insurance coverage.

**FIGURE 2.14: DEPOSITS**

AT JUNE 30

(EXPRESSED IN THOUSANDS)

	2017 Carrying Amount	2016 Carrying Amount
Treasurer of Virginia	\$ 37,482	\$ 90,549
Master Custodian	16,415	81,789
<b>Total Deposits</b>	<b>\$ 53,897</b>	<b>\$172,338</b>

### B. INVESTMENTS

**1. Authorized Investments.** The Board of Trustees of the System has full power to invest and reinvest the trust funds in accordance with Section 51.1-124.30 of the *Code of Virginia* (1950), as amended. This section requires the Board to discharge its duties solely in the interests of members, retirees and beneficiaries. It also requires the Board to invest the assets with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims.

Investment value and earnings of the investment pool are proportionally allocated among the System's trust funds on the basis of each fund's equity interest in the common investment pool. An Investment Summary is included in the Investment Section. The equity interest of each fund as of June 30, 2017 and 2016, is presented in Figure 2.15.

**FIGURE 2.15: EQUITY INTERESTS**

AT JUNE 30

Fund	2017	2016
Virginia Retirement System	93.59%	93.76%
State Police Officers' Retirement System	1.07%	1.07%
Virginia Law Officers' Retirement System	1.81%	1.78%
Judicial Retirement System	0.69%	0.69%
Group Life Insurance Fund	1.99%	1.86%
Retiree Health Insurance Credit Fund	0.27%	0.25%
Disability Insurance Trust Fund (VSDP)	0.58%	0.59%
Line of Duty Act Trust Fund	0.00%	0.00%
Virginia Local Disability Program	0.00%	0.00%
<b>Total Equity Interests</b>	<b>100.00%</b>	<b>100.00%</b>

**2. Fair Value Measurements.** The System categorizes the fair value measurements within the hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements).

The System's master custodian uses a proprietary matrix based on asset class as the basis for the Fair Value Hierarchy, which utilizes industry standard asset categories to assign a fair value level to each investment.

**Level 1:** Unadjusted quoted prices for identical instruments in active markets.

**Level 2:** Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-driven valuations in which all significant inputs are observable.

**Level 3:** Valuations derived from valuation techniques in which significant inputs are unobservable.

Investments that are measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy. Cash equivalent investments that are measured at amortized cost also are not classified in the fair value hierarchy.

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant in the valuation. The System's assessment of significant particular inputs to these fair value measurements requires judgment and considers factors specific to each asset or liability. Figure 2.16 shows the fair value leveling of the investments for the System and the following recurring fair value measurements as of June 30, 2017, and June 30, 2016:

**FIGURE 2.16: INVESTMENTS AND DERIVATIVE INSTRUMENTS MEASURED AT FAIR VALUE**

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	June 30, 2017	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Investments By Fair Value Level:</b>				
Debt Securities:				
U.S. Government Securities	\$ 3,497,512	\$ 3,103,632	\$ 393,880	\$ —
Agencies	3,849,029	—	3,849,029	—
Municipal Securities	151,679	—	151,679	—
Supranational & Non-U.S. Government Bonds	2,581,562	72,542	2,509,020	—
Asset-Backed Securities	687,880	—	684,728	3,152
Collateralized Mortgage Obligations	208,342	—	208,342	—
Commercial Mortgages	216,871	—	216,871	—
Corporate and Other Bonds	7,606,701	—	7,606,701	—
Fixed Income Mutual and Commingled Funds	36,686	14,376	—	22,310
<b>Total Debt Securities</b>	<b>18,836,262</b>	<b>3,190,550</b>	<b>15,620,250</b>	<b>25,462</b>
Equity Securities:				
Common and Preferred Stocks	24,329,445	24,221,968	102,915	4,562
<b>Total Equity Securities</b>	<b>24,329,445</b>	<b>24,221,968</b>	<b>102,915</b>	<b>4,562</b>
Hedge Funds	876,200	—	—	876,200
Credit Strategies Funds	170,401	—	—	170,401
Private Equity Funds	707,029	—	—	707,029
Equity International Commingled Funds	278,654	—	—	278,654
Real Estate and Real Asset Funds	2,085,695	—	—	2,085,695
<b>Total Investments by Fair Value Level</b>	<b>47,283,686</b>	<b>27,412,518</b>	<b>15,723,165</b>	<b>4,148,003</b>
<b>Investments Measured at the Net Asset Value (NAV):</b>				
Hedge Funds	7,192,715			
Credit Strategies Funds	4,400,193			
Private Equity Funds	5,837,025			
Equity International Commingled Funds	1,282,503			
Fixed Income Mutual and Commingled Funds	1,115,182			
Real Estate and Real Asset Funds	6,193,449			
<b>Total Investments Measured at the NAV</b>	<b>26,021,067</b>			
<b>Total Investments Measured at Fair Value</b>	<b>73,304,753</b>			
<b>Investment Derivative Instruments:</b>				
Foreign Currency Forwards	\$ (18,792)	\$ —	\$ (18,792)	
Foreign Currency Options	272	—	272	
Futures Contracts	(2,206)	(2,206)	—	
Credit Default Swaps	(757)	—	(757)	
Interest Rate Swaps	1,136	—	1,136	
Total Return Swaps	2,449	—	2,449	
<b>Total Investment Derivative Instruments</b>	<b>\$ (17,898)</b>	<b>\$ (2,206)</b>	<b>\$ (15,692)</b>	

FIGURE 2.16: INVESTMENTS AND DERIVATIVE INSTRUMENTS MEASURED AT FAIR VALUE, cont.

AS OF JUNE 30, 2016

(EXPRESSED IN THOUSANDS)

	June 30, 2016	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Investments By Fair Value Level:</b>				
Debt Securities:				
U.S. Government Securities	\$ 3,724,823	\$ 3,301,632	\$ 423,191	\$ —
Agencies	3,253,654	—	3,253,654	—
Municipal Securities	160,388	—	160,388	—
Asset-Backed Securities	651,664	—	651,664	—
Collateralized Mortgage Obligations	256,314	—	256,314	—
Commercial Mortgages	271,303	—	271,303	—
Corporate and Other Bonds	10,280,499	16,359	10,261,984	2,156
Fixed Income Mutual and Commingled Funds	196,848	—	—	196,848
<b>Total Debt Securities</b>	<b>18,795,493</b>	<b>3,317,991</b>	<b>15,278,498</b>	<b>199,004</b>
Equity Securities:				
Common and Preferred Stocks	21,212,117	21,087,991	123,415	711
<b>Total Equity Securities</b>	<b>21,212,117</b>	<b>21,087,991</b>	<b>123,415</b>	<b>711</b>
Credit Strategies Funds	69,122	—	—	69,122
Private Equity Funds	844,964	—	—	844,964
Real Estate and Real Asset Funds	3,243,646	—	—	3,243,646
<b>Total Investments by Fair Value Level</b>	<b>44,165,342</b>	<b>24,405,982</b>	<b>15,401,913</b>	<b>4,357,447</b>
<b>Investments Measured at the Net Asset Value (NAV):</b>				
Hedge Funds	7,195,859			
Credit Strategies Funds	3,761,182			
Private Equity Funds	4,378,586			
Equity International Commingled Funds	1,286,111			
Fixed Income Mutual and Commingled Funds	994,895			
Real Estate and Real Asset Funds	4,422,633			
<b>Total Investments Measured at the NAV</b>	<b>22,039,266</b>			
<b>Total Investments Measured at Fair Value</b>	<b>\$66,204,608</b>			
<b>Investment Derivative Instruments:</b>				
Foreign Currency Forwards	\$ 51,100	\$ —	\$ 51,100	
Futures Contracts	9,913	9,913	—	
Credit Default Swaps	(494)	—	(494)	
Interest Rate Swaps	(21,871)	—	(21,871)	
Total Return Swaps	(100)	—	(100)	
<b>Total Investment Derivative Instruments</b>	<b>\$ 38,548</b>	<b>\$ 9,913</b>	<b>\$ 28,635</b>	

## Description of Investments Measured at Fair Value

Equity and debt securities classified in Level 1 are valued using quoted prices in active markets for those securities. Debt securities classified in Level 2 are valued using a proprietary matrix pricing technique. This pricing technique defines a primary source and secondary sources to be used if the primary pricing source does not provide a value. Typically, these securities are valued using bid evaluations. Valuation techniques may include market participants' assumptions, quoted prices for similar assets, benchmark yield curves, market corroborated inputs and other data inputs. Those classified in Level 3 are valued using proprietary information.

Equity securities in Level 2 are typically valued using quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; or model-driven valuations in which all significant inputs are observable. Equity securities in Level 3 are valued using proprietary information.

Credit Strategies mezzanine funds have been assigned a Level 3, as they have unobservable inputs. When observable inputs are not available for these securities, one or more valuation techniques (e.g., the market approach and/or the income approach) are used for which sufficient and reliable data is available.

Within Level 3, the use of the market approach generally consists of the net present value of the estimated future cash flows. See further details below for Credit Strategies measured at NAV.

A majority of Private Equity values are characterized as Level 3, since they have unobservable inputs. Private Equity consists of many fund categories including Venture Capital, Buyout, Subordinated Debt, Growth Capital, Turnaround, and Energy and Special Situations.

These Level 3 investments may include common and preferred equity securities, corporate debt, partnership and member interests and other privately issued securities.

When observable inputs are not available for these securities, one or more valuation techniques (e.g., the market approach and/or the income approach) are used for which sufficient and reliable data is available. Within Level 3, the use of the market approach generally consists of using comparable market transactions or other data, while the use of the income approach generally consists of the net present value of estimated future cash flows. See further details below for Private Equities measured at the NAV.

Real Assets have been assigned a Level 3, as they have unobservable inputs. They consist of many fund categories including Private Investment Real Estate, Infrastructure and Natural Resources. When observable inputs are not available for these securities, one or more valuation techniques (e.g., the market approach and/or the income approach) are used for which sufficient and reliable data is available. Within Level 3, the use of the market approach generally consists of using comparable market transactions or other data, while the use of the income approach generally consists of the net present value of estimated future cash flows. See further details below for Real Assets measured at the NAV.

Derivative instruments classified as Level 1 of the Fair Value Hierarchy are valued using prices quoted in active markets for those securities. The derivative instruments in Level 1 consist of futures contracts on U.S. Treasury bonds and notes and futures contracts on U.S. equity indexes. Derivative instruments classified as Level 2 are valued using a number of modeling approaches that take into account observable market levels, benchmark rates and foreign exchange rates.

**FIGURE 2.17: INVESTMENTS MEASURED AT THE NAV**

AT JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
<b>Hedge Funds:</b>				
Equity Long/Short Funds			Monthly, Quarterly, Semi-Annually, Annually	30-90 Days
Equity Long-Only Funds	\$ 4,397,164	\$ 100,000	Quarterly	90 Days
Credit Funds	531,240		Quarterly, Annually	45-90 Days
Multi-Strategy Funds	847,548		Monthly	30-90 Days
Terminated Funds	1,390,132		N/A	N/A
	26,631			
<b>Total Hedge Funds</b>	<b>7,192,715</b>	<b>100,000</b>		
<b>Credit Strategies Funds:</b>				
Bank Loan and Direct Lending	2,336,664	341,660		
Distressed Debt Funds	287,019	300,167		
Mezzanine Debt Funds	353,082	323,824		
Multi-Strategy Funds	477,678	1,079,014		
Opportunistic Funds	945,750	189,715		
<b>Total Credit Strategies Funds</b>	<b>4,400,193</b>	<b>2,234,380</b>		
<b>Private Equity Funds:</b>				
Buyout Funds	2,867,157	1,696,326		
Energy Funds	520,519	320,361		
Growth Funds	559,147	563,660		
International Buyout Funds	472,882	196,167		
Special Situations Funds	848,113	761,387		
Subordinated Debt Funds	59,651	58,706		
Turnaround Funds	418,150	279,988		
Venture Capital Funds	91,406	13,194		
<b>Total Private Equity Funds</b>	<b>5,837,025</b>	<b>3,889,789</b>		
<b>Equity International Commingled Funds</b>	<b>1,282,503</b>			
<b>Fixed Income Mutual and Commingled Funds</b>	<b>1,115,182</b>			
<b>Real Estate and Real Asset Funds:</b>				
Infrastructure Funds	1,002,126	421,310		
Natural Resource Funds	452,604	108,144		
Private Investment Real Estate	4,532,300	522,325		
Real Estate Investment Trusts	206,419	—		
<b>Total Real Estate and Real Asset Funds</b>	<b>6,193,449</b>	<b>1,051,779</b>		
<b>Total Investments Measured at the NAV</b>	<b>\$26,021,067</b>	<b>\$7,275,948</b>		

FIGURE 2.17: INVESTMENTS MEASURED AT THE NAV, cont.

AT JUNE 30, 2016

(EXPRESSED IN THOUSANDS)

	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
<b>Hedge Funds:</b>				
Equity Long/Short Funds			Monthly, Quarterly, Semi-Annually, Annually	45-90 Days
Equity Long-Only Funds	\$ 3,973,154		Daily, Quarterly	14-90 Days
Credit Funds	1,151,966		Annually	45-90 Days
Multi-Strategy Funds	888,274		Monthly	30-90 Days
Terminated Funds	1,166,652		N/A	N/A
	15,813			
<b>Total Hedge Funds</b>	<b>7,195,859</b>			
<b>Credit Strategies Funds:</b>				
Bank Loan and Direct Lending	2,190,795	\$ 350,598		
Distressed Debt Funds	267,520	298,521		
Mezzanine Debt Funds	322,837	339,830		
Multi-Strategy Funds	217,299	1,044,191		
Opportunistic Funds	762,731	137,907		
<b>Total Credit Strategies Funds</b>	<b>3,761,182</b>	<b>2,171,047</b>		
<b>Private Equity Funds:</b>				
Buyout Funds	2,207,355	1,393,401		
Energy Funds	264,948	457,769		
Growth Funds	397,214	61,080		
International Buyout Funds	408,991	283,327		
Special Situations Funds	821,817	882,983		
Subordinated Debt Funds	67,104	32,924		
Turnaround Funds	107,280	176,222		
Venture Capital Funds	103,877	15,789		
<b>Total Private Equity Funds</b>	<b>4,378,586</b>	<b>3,303,495</b>		
<b>Equity International Commingled Funds</b>	<b>1,286,111</b>			
<b>Fixed Income Mutual and Commingled Funds</b>	<b>994,895</b>			
<b>Real Estate and Real Asset Funds:</b>				
Infrastructure Funds	574,413	192,796		
Natural Resource Funds	357,055	141,353		
Private Investment Real Estate	3,202,191	297,996		
Real Estate Investment Trusts	288,974	—		
<b>Total Real Estate and Real Asset Funds</b>	<b>4,422,633</b>	<b>632,145</b>		
<b>Total Investments Measured at the NAV</b>	<b>\$22,039,266</b>	<b>\$6,106,687</b>		

## Description of Investments Measured at the NAV

Figure 2.17 presents the investments measured at the net asset value (NAV) per share (or its equivalent). Below are the valuation methods used for those investments:

### HEDGE FUNDS:

- **Equity Long/Short Hedge Funds:** This type included investments in 11 hedge funds at both June 30, 2017, and June 30, 2016, which invest in global long and short equity positions. Management of each hedge fund has the ability to invest from value to growth strategies, from small to large capitalization stocks and may vary net exposure considerably. The fair values of the investments in this type have been determined using the NAV per share of the investments. Investments representing approximately 53% of the value of the investments in this type of fund cannot be redeemed because the investments include restrictions that do not allow redemption in the first 12 to 60 months after acquisition. The restriction period for the remaining investments ranged from one to 11 months at June 30, 2017.
- **Equity Long-Only Hedge Funds:** This type included investments in one hedge fund at June 30, 2017, and three hedge funds at June 30, 2016, which invest in global long-only equity positions. These hedge funds are generally fully invested and only very occasionally take short positions for hedging purposes. The fair values of the investments in this type have been determined using the NAV per share of the investments. At June 30, 2017, investments representing approximately 38% of the value of the investments in this type of fund cannot be redeemed because the investments include restrictions that do not allow redemption in the first 12 to 60 months after acquisition.
- **Credit Hedge Funds:** This type included investments in two hedge funds at June 30, 2017, and three hedge funds at June 30, 2016, which invest in event-driven, distressed and special situation credit opportunities. The fair values of the investments in this type have been determined using the NAV per share of the investments. At June 30, 2017, investments representing approximately 15% of the value of the investments in this type of fund cannot be redeemed because the investments include restrictions that do not allow redemptions in the first 12 to 24 months after acquisition. The remaining restriction period for these investments was less than 12 months at June 30, 2017.
- **Multi-Strategy Hedge Funds:** This type included investments in five hedge funds at June 30, 2017, and four hedge funds at June 30, 2016, which invest in multiple asset classes, combining exposure to balance risks. Such exposure can include traditional and alternative investments. The fair values of the investments in this type have been determined using the NAV per share of the investments. Investments representing approximately 47% of the value of the investments in this type of fund cannot be redeemed because the investments include restrictions that do not allow redemption in the first 60 months after acquisition. The remaining restriction period for these investments was one to six months at June 30, 2017.
- **Terminated Hedge Funds:** This type included investments in two hedge funds at June 30, 2017, and three hedge funds at June 30, 2016, from which the System is awaiting final payment of redemption proceeds. Liquidity is not applicable for these funds because the System has already submitted redemption requests. The fair values of the investments in this type have been determined using the NAV per share of the investments.

- **Credit Strategies Funds:** This type consists of many fund categories, including bank loan and direct lending funds, distressed debt funds, mezzanine debt funds, multi-strategy funds and opportunistic funds. The fair value of the investments in these funds have been determined using the NAV per share of the investments. The nature of the investments in this type is that distributions are received through the liquidation of the underlying assets in the fund. If these investments were held, it is expected that the underlying assets in the fund would be liquidated over three to five years.
  - **Private Equity Funds:** This type consists of many fund categories including Venture Capital, Buyout, Subordinated Debt, Growth Capital, Turnaround, Energy and Special Situations. The fair value of the investments in these funds have been determined using the NAV per share of the investments. The nature of the investments involves receiving distributions through liquidation of the underlying fund assets. It is expected that hold periods for the underlying fund assets will range from three to eight years.
  - **Equity International Commingled Funds:** This type includes investments in three institutional investment funds at June 30, 2017, which invest in international equities. One fund employs a long/short strategy in global equities; a second fund employs a long-only strategy in companies whose prospects are linked to the internal growth of emerging markets; and a third fund invests in international frontier markets. The fair values of the investments in these funds have been determined using the NAV per share of the investments. Redemptions can be made from these funds, given the appropriate notice, any regular trading day on the NYSE.
  - **Fixed Income Mutual and Commingled Funds:** This type consists of two institutional investment funds that invest in investment-grade and high-yield U.S. private placements. The fair values of the investments in these funds have been determined using the NAV per share of the investments.
  - **Real Assets:** This type includes investments in many fund categories including Private Investment Real Estate, Real Estate Investment Trusts, Infrastructure and Natural Resources. The fair value of the investments in these funds have been determined using the NAV per share of the investments. The nature of the investments in this type is that distributions are received through the liquidation of the underlying assets in the fund. If these investments were held, it is expected that the underlying assets of the funds would be liquidated over one to 14 years.
- 3. Interest Rate Risk.** Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. The risk is managed within the portfolio using the effective duration or option-adjusted methodology. It is widely used in the management of fixed income portfolios in that it quantifies, to a much greater degree, the risk of interest rate changes. The methodology takes into account optionality on bonds and scales the risk of price changes on bonds depending on the degree of change in rates and the slope of the yield curve. All of the System's fixed-income portfolios are managed in accordance with investment guidelines, most of which are specific as to the degree of interest rate risk that can be taken.

As of June 30, 2017, the System's investments include securities that are highly sensitive to interest rate fluctuations, as they are subject to early payment in a period of declining interest rates (i.e., collateralized and mortgage pass-through). The resulting reduction in expected total cash flows affects the fair value of these securities.

The following table presents the weighted average effective duration for the System's investments subject to interest rate risk as of June 30, 2017:

**FIGURE 2.18: DEBT SECURITIES SUBJECT TO INTEREST RATE RISK**

AT JUNE 30 (EXPRESSED IN THOUSANDS)

Investment Type	Market Value	Weighted Average Effective Duration
U.S. Government Agencies	\$ 3,497,512	6.79
Municipal Securities	3,849,029	3.86
Asset-Backed Securities	151,679	8.43
Collateralized Mortgage Obligations	687,880	1.26
Commercial Mortgages	208,342	1.21
Corporate Bonds and Notes	216,871	4.81
Fixed Income Commingled Funds	7,606,701	5.61
Fixed Income Derivatives*	1,151,868	5.71
Supranational & Non-U.S. Government Bonds	1,696	—
Cash Equivalents**	2,581,562	6.56
	3,238,271	0.30
<b>Total Debt Securities</b>	<b>\$23,191,411</b>	<b>4.74</b>

\* Effective durations for fixed-income derivatives are unavailable.

\*\*This category consists mainly of commercial paper and institutional negotiable certificates of deposit.

Through its Securities Lending program, the System receives cash collateral from borrowers that is reported in the statement of net position as an asset with an offsetting liability. The cash collateral held at June 30, 2017, was reinvested in short-term cash equivalents which carry little interest rate risk as shown in the following Figure 2.18a:

**FIGURE 2.18a: SECURITIES LENDING COLLATERAL SUBJECT TO INTEREST RATE RISK**

AT JUNE 30 (EXPRESSED IN THOUSANDS)

Investment Type	Carrying Amount	Weighted Average Effective Duration
Cash Equivalents*	\$ 496,225	0.01
Corporate Bonds and Notes	3,208,586	0.09
<b>Total**</b>	<b>\$3,704,811</b>	<b>0.08</b>

\* Includes \$225,791 in debt security repurchase agreements and \$270,434 in time deposits.

\*\* This figure does not include \$1,092,091 in equity repurchase agreements that are not subject to GASB 40 disclosure. The total of the investments in the securities lending collateral portfolio is \$4,796,902.

**4. Credit Risk.** Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations to the System. As of June 30, 2017, the System's fixed income assets that are not government-guaranteed represented 85% of the fixed income assets.

The System's policy for credit risk is based on the concept of a risk budget rather than specific limitations related to the rating of an individual security. The System's risk budget is allocated among the different investment strategies. The System's fixed income portfolio credit quality and exposure levels as of June 30, 2017, are summarized in Figure 2.19. Credit risk for derivative instruments held by the System results from counterparty risk assumed by the System. This is essentially the risk that the borrower will be unable to meet its obligation. Information regarding the System's credit risk related to derivatives is provided in Note 5.B.8. Policies related to credit risk pertaining to the System's securities lending program are provided in Note 5.B.6. A summary of the ratings of the reinvested securities lending cash collateral subject to credit risk is provided in Figure 2.20.

**FIGURE 2.19: CREDIT QUALITY AND EXPOSURE LEVELS OF NON-GOVERNMENT-GUARANTEED SECURITIES\***

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

## Carrying Amount by Most Conservative Credit Rating – Moody's/S&amp;P/Fitch

U.S. Government and Short-Term Debt	Aaa/AAA	Aa/AA	A	Baa/BBB	P/A-1, AAAm/F**	Less than Investment Grade	Unrated	Totals
U.S. Government Agencies:								
FHLB	–	51,321	–	–	–	–	–	51,321
FHLMC	–	521,898	3,328	–	–	–	799,600	1,324,826
FNMA	–	1,246,267	–	–	–	–	1,284,388	2,530,655
Other Agencies	19,688	51,094	–	–	–	–	1,138	71,920
Short-Term Debt:								
Cash Equivalents***	–	117,137	209,765	–	2,515,060	–	396,309	3,238,271
<b>Total U.S. Government and Short-Term Debt</b>	<b>19,688</b>	<b>1,987,717</b>	<b>213,093</b>	<b>–</b>	<b>2,515,060</b>	<b>–</b>	<b>2,481,435</b>	<b>7,216,993</b>
Long-Term Debt								
Municipal Securities	10,754	140,925	–	–	–	–	–	151,679
Supranational and Non-U.S. Government Bonds								
	127,360	125,500	218,253	738,530	–	1,322,636	49,283	2,581,562
Corporate Bonds and Notes								
	30,729	269,955	1,182,310	2,592,024	16,250	2,053,272	1,462,161	7,606,701
Asset-Backed Securities								
	339,015	50,353	40,978	9,994	–	197,268	50,272	687,880
Collateralized Mortgage Obligations								
	216	–	–	–	–	64,367	17,394	81,977
Commercial Mortgages								
	210,398	–	–	–	–	3,145	–	213,543
Fixed Income Derivatives & Swaps								
	–	–	–	–	–	–	1,696	1,696
Fixed Income Commingled Funds								
	–	1,057	24,578	1,125,895	–	–	338	1,151,868
<b>Total Long-Term Debt</b>	<b>718,472</b>	<b>587,790</b>	<b>1,466,119</b>	<b>4,466,443</b>	<b>16,250</b>	<b>3,640,688</b>	<b>1,581,144</b>	<b>12,476,906</b>
<b>Total</b>	<b>\$ 738,160</b>	<b>\$ 2,575,507</b>	<b>\$ 1,679,212</b>	<b>\$ 4,466,443</b>	<b>\$ 2,531,310</b>	<b>\$ 3,640,688</b>	<b>\$ 4,062,579</b>	<b>\$ 19,693,899</b>

\* Excludes investments that are obligations of the U.S. government or obligations explicitly guaranteed by the U.S. government that are not subject to the GASB 40 credit-quality disclosures.

\*\* Investment-grade credit ratings for short-term debt.

\*\*\* This category consists mainly of commercial paper and institutional certificates of deposit.

**FIGURE 2.20: SECURITIES LENDING COLLATERAL SUBJECT TO CREDIT RISK**

AT JUNE 30

(EXPRESSED IN THOUSANDS)

Carrying Amount by Most Conservative Credit Rating – Moody's/S&P/Fitch					
Investment Type	Aa/AA	A	P/A-1, AAAm/F	Unrated	Totals
Cash Equivalents*	\$ –	\$ –	\$ 270,434	\$ 225,791	\$ 496,225
Corporate Bonds and Notes	917,392	2,065,116	226,078	–	3,208,586
<b>Total**</b>	<b>\$ 917,392</b>	<b>\$ 2,065,116</b>	<b>\$ 496,512</b>	<b>\$ 225,791</b>	<b>\$ 3,704,811</b>

\* Includes \$225,791 in debt security repurchase agreements and \$270,434 in time deposits.

\*\* This figure does not include \$1,092,091 in equity repurchase agreements that are not subject to GASB 40 disclosure. The total of the investments in the securities lending collateral portfolio is \$4,796,902.

- **Concentration of Credit Risk.** This is the risk of loss that may be attributed to the magnitude of a government's investment in a single issue. The System's investment guidelines for each specific portfolio limits investments in any corporate entity to no more than 5.00% of the market value of the account for both the internally and externally managed portfolios. The System has no investments in any commercial or industrial organization whose fair value equals 5.00% or more of the System's net fiduciary position.
- **Custodial Credit Risk.** This is the risk that in the event of the failure of the counterparty, the System will not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. As of June 30, 2017, investment securities (excluding cash equivalents and repurchase agreements held as

securities lending collateral) were registered and held in the name of the System for the benefit of the System's trust funds and were not exposed to custodial credit risk. It is the standard practice and policy of the System, through the relevant provisions in its contracts and agreements with third parties, to minimize all known custodial credit risks.

**5. Foreign Currency Risk.** Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment. The System's currency risk exposures, or exchange rate risk, primarily exist in the international and global equity investment holdings. The System's exposure to foreign currency risk as of June 30, 2017, is highlighted in Figure 2.21.

**FIGURE 2.21: CURRENCY EXPOSURES BY ASSET CLASS**

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

Currency	Cash and Cash Equivalents	Equity	Fixed Income	Private Equity	Real Assets	International Funds	Forward Contracts	Total
Euro Currency Unit	\$ 27,477	\$ 2,295,596	\$ 22,544	\$720,087	\$232,868	\$ –	\$(1,588,781)	\$1,709,791
U.S. Dollar	–	–	–	–	–	1,561,157	–	1,561,157
Japanese Yen	14,410	2,036,996	(7)	–	1,186	–	(805,597)	1,246,988
Hong Kong Dollar	5,825	998,128	–	–	1,376	–	(176,555)	828,774
Pound Sterling	9,196	1,289,865	980	–	107,499	–	(665,167)	742,373
Canadian Dollar	7,813	816,910	–	–	47,429	–	(407,942)	464,210
South Korean Won	1,770	507,589	23	–	–	–	(59,726)	449,656
Indian Rupee	5,422	255,787	5,683	–	–	–	114,256	381,148
Swiss Franc	10,968	638,432	–	–	1,450	–	(383,256)	267,594
Brazil Real	3,360	140,341	91,824	–	4	–	21,746	257,275
South African Rand	425	178,411	76,188	–	–	–	(16,381)	238,643
Turkish Lira	95	89,837	48,527	–	–	–	97,448	235,907
Mexican Peso	240	30,941	58,008	–	3,852	–	118,591	211,632
New Taiwan Dollar	914	231,863	–	–	–	–	(25,373)	207,404
Indonesian Rupiah	1,669	47,040	84,306	–	–	–	66,146	199,161
Polish Zloty	22	29,019	60,577	–	–	–	75,693	165,311
Malaysian Ringgit	5,757	62,980	59,572	–	–	–	4,761	133,070
Thailand Baht	513	93,757	15,771	–	–	–	10,599	120,640
Swedish Krona	668	216,522	–	–	–	–	(134,039)	83,151
Czech Koruna	282	698	2,810	–	–	–	73,218	77,008
Danish Krone	740	144,807	–	–	1,614	–	(75,801)	71,360
Singapore Dollar	2,376	168,156	–	–	–	–	(108,040)	62,492
Russian Ruble (New)	315	18,829	39,826	–	–	–	3,463	62,433
Colombian Peso	1,959	4,358	35,487	–	–	–	16,850	58,654
Australian Dollar	1,245	484,639	–	–	2,235	–	(430,248)	57,871
Chilean Peso	604	27,366	3,550	–	–	–	10,231	41,751
Argentine Peso	457	–	18,898	–	–	–	17,266	36,621
Egyptian Pound	10,628	6,077	–	–	–	–	(550)	16,155
Romanian Leu	236	–	17,202	–	–	–	(2,477)	14,961
Sri Lanka Rupee	–	–	5,619	–	–	–	–	5,619
Ghanaian Cedi	–	–	5,287	–	–	–	–	5,287
Qatari Riyal	157	5,128	–	–	–	–	–	5,285
Uruguayan Peso	–	–	4,802	–	–	–	–	4,802
UAE Dirham	52	4,246	–	–	–	–	–	4,298
Israeli Shekel	158	31,717	3,481	–	–	–	(32,378)	2,978
Moroccan Dirham	1	–	–	–	–	–	–	1
Philippines Peso	138	8,833	849	–	–	–	(13,496)	(3,676)
Peruvian Nuevo Sol	18	52	23,381	–	–	–	(29,411)	(5,960)
Hungarian Forint	657	11,545	27,985	–	–	–	(57,483)	(17,296)
Chinese Yuan Renminbi	–	2	(56)	–	–	–	(27,929)	(27,983)
Norwegian Krone	527	111,985	–	–	–	–	(148,092)	(35,580)
New Zealand Dollar	(92)	25,628	–	–	1,473	–	(81,318)	(54,309)
<b>Total</b>	<b>\$ 117,002</b>	<b>\$11,014,080</b>	<b>\$ 713,117</b>	<b>\$ 720,087</b>	<b>\$ 400,986</b>	<b>\$ 1,561,157</b>	<b>\$(4,639,772)</b>	<b>\$ 9,886,657</b>

**6. Securities Lending.** Under authorization of the Board, the System lends its fixed income and equity securities to various broker-dealers on a temporary basis. This program is administered through an agreement with the System's custodial agent bank.

All security loan agreements are collateralized by cash, securities or an irrevocable letter of credit issued by a major bank, and have a fair value equal to at least 102% of the fair value for domestic securities and 105% for international securities. Securities received as collateral cannot be pledged or sold by the System unless the borrower defaults. Contracts require the lending agents to indemnify the System if the borrowers fail to return the securities lent and related distributions and if the collateral is inadequate to replace the securities lent. All securities loans can be terminated on demand by either the System or the borrowers. The majority of loans are open loans, meaning the rebate is set daily. This results in a maturity of one or two days on average, although securities are often on loan for longer periods. The maturity of loans generally does not match the maturity of collateral investments, which averages 23 days. At year-end, the System had no credit risk exposure to borrowers because the amounts it owes the borrowers exceeded the amounts the borrowers owe the System. All securities are marked to market daily and carried at fair value. The fair value of securities on loan at June 30, 2017 and 2016, was \$8,069,337,000 and \$8,258,416,000, respectively. The June 30, 2017 and 2016, balances were composed of U.S. government and agency securities of \$2,541,872,000 and \$2,561,950,000, respectively; corporate and other bonds of \$1,554,588,000 and \$1,676,673,000, respectively; and common and preferred stocks of \$3,827,747,000 and \$4,019,793,000, respectively. At June 30, 2017, the balance also included \$145,130,000 of supranational and non-U.S. government bonds.

The value of collateral (cash and non-cash) at June 30, 2017 and 2016, was \$8,519,839,000 and \$8,691,451,000, respectively. Securities on loan are included with investments on the statement of plan

net position. The invested cash collateral is included in the statement of plan net position as an asset and corresponding liability.

At June 30, 2017, the invested cash collateral had a cost of \$4,796,902,000 and was composed of time deposits of \$270,434,000, floating rate notes of \$3,208,586,000, and repurchase agreements of \$1,317,882,000.

**7. Accounts Receivable/Accounts Payable for Security Transactions.** In addition to unsettled purchases and sales, accounts receivable and accounts payable for security transactions at June 30, 2017 and 2016, included (1) receivables for deposits with brokers for securities sold short of \$619,864,000 and \$501,360,000, respectively; and (2) payables for securities sold short and not covered with fair values of \$610,426,000 and \$483,054,000, respectively.

**8. Derivative Financial Instruments.** Derivative instruments are financial contracts whose values depend on the values of one or more underlying assets, reference rates or financial indexes. All derivatives held by the System are considered investments. The fair value of all derivative financial instruments is reported on a net basis on the Statement of Fiduciary Net Position. The derivative instruments are either subject to an enforceable master netting arrangement or similar agreement. The master netting arrangements allow the System to net applicable liabilities or payment obligations to counterparties to the derivative contracts against amounts owed to the System by the counterparties.

The System holds investments in swaps, options and futures and enters into forward foreign currency exchange contracts. Futures, currency forwards and options contracts provide the System with the opportunity to build passive benchmark positions, manage portfolio duration in relation to various benchmarks, adjust portfolio yield curve exposure and gain market exposure to various indexes in a more efficient way and at lower transaction costs. Derivatives that are exchange-traded are not subject

to credit risk, but all over-the-counter derivatives, such as swaps and currency forwards, do expose the System to counterparty credit risk. Counterparty credit risk for the System's investments in derivatives instruments is summarized in Figure 2.26. Market risks arise from adverse changes in market prices,

interest rates and foreign exchange rates. The System's level of exposure to interest rate risk through derivative instruments is shown in Figure 2.23. The System's investments in derivative instruments at June 30, 2017, are summarized in Figure 2.22.

**FIGURE 2.22: DERIVATIVE INSTRUMENTS SUMMARY**

(EXPRESSED IN THOUSANDS)

Investment	Net Appreciation/ (Depreciation) in Fair Value for the Fiscal Year Ended June 30, 2017		Fair Value June 30, 2017	
Derivatives (by Type)	Amount	Classification	Amount	Notional (Dollars)
Credit Default Swaps Bought	(544)	Debt Securities	109	13,886
Credit Default Swaps Written	284	Debt Securities	(866)	99,084
Fixed Income Futures Long	(29,643)	Debt Securities	728	804,112
Fixed Income Futures Short	27,006	Debt Securities	(693)	(464,286)
Foreign Currency Futures Short	51	Equity Securities	51	(10,838)
Foreign Currency Options Bought	(1,864)	Equity Securities	326	203,300
Foreign Currency Options Written	211	Equity Securities	(54)	(6,600)
FX Forwards	(69,888)	Investment Sales/Purchases	(18,792)	4,587,464
Index Futures Long	(9,481)	Equity Securities	(2,292)	778,652
Index Futures Short	(53)	Equity Securities	—	—
Pay Fixed Interest Rate Swaps	22,824	Debt Securities	(24)	244,357
Receive Fixed Interest Rate Swaps	179	Debt Securities	1,160	360,603
Total Return Bond Index Swaps	0	Debt Securities	—	125,000
Total Return Equity Index Swaps	2,549	Equity Securities	2,449	700,002
<b>Total</b>	<b>(\$58,369)</b>		<b>(\$17,898)</b>	

**FIGURE 2.23: DERIVATIVE INSTRUMENTS SUBJECT TO INTEREST RATE RISK**

(EXPRESSED IN THOUSANDS)

Investment Type	Fair Value June 30, 2017	Investment Maturities (in years)			
		Under-1	1-5	6-10	Greater than 10
Credit Default Swaps Bought	109	—	109	—	—
Credit Default Swaps Written	(866)	67	(933)	—	—
Pay Fixed Interest Rate Swaps	(24)	(311)	(622)	671	238
Receive Fixed Interest Rate Swaps	1,160	(19)	1,150	(407)	436
Total Return Equity Index Swaps	536	536	—	—	—
<b>Total</b>	<b>\$ 915</b>	<b>\$ 273</b>	<b>\$ (296)</b>	<b>\$ 264</b>	<b>\$ 674</b>

**9. Futures.** Futures contracts are contracts to deliver or receive securities at a specified future date and at a specified price or yield. Futures contracts are traded on organized exchanges (exchange-traded) and require an initial margin (collateral) in the form of cash or marketable securities. The net change in the futures contract value is settled daily, in cash, with the exchanges. The net gains or losses resulting from the daily settlements are included in the System's Statement of Changes in Fiduciary Net Position. Holders of futures contracts look to the exchange for performance under the contract and not to the entity holding the offsetting futures position. Accordingly, the amount at risk posed by nonperformance of counterparties to futures contracts is minimal. Information on the System's investments in fixed income, foreign currency and equity index futures at June 30, 2017, is shown in Figure 2.22.

**10. Currency Forwards.** Currency forwards represent foreign exchange contracts and are used by the System to effect settlements and to protect the base currency (\$U.S.) value of portfolio assets denominated in foreign currencies against fluctuations in the exchange rates of those currencies. A forward foreign currency exchange contract is a commitment to purchase or sell a foreign currency at a future date at a negotiated price. The credit risk of currency contracts that are exchange-traded lies with the clearinghouse of the exchange where the contracts are traded. The credit risk of currency contracts traded over the counter lies with the counterparty, and exposure usually is equal to the unrealized profit on in-the-money contracts. The market risk in foreign currency contracts is related to adverse movements in currency exchange rates. The gain or loss arising from the difference between the original contracts and the closing of such contracts is included in the net realized gains or losses on foreign currency-related transactions in the Statement of Changes in Fiduciary Net Position. Information on the System's currency forward contracts at June 30, 2017, is shown in Figures 2.22 and 2.24.

## FIGURE 2.24: CURRENCY FORWARDS

AS OF JUNE 30

(EXPRESSED IN THOUSANDS)

Currency	Cost	Pending Foreign Exchange Purchases	Pending Foreign Exchange Sales	Fair Value 2017	Fair Value 2016
Argentina Peso	\$ 17,289	\$ 19,510	\$ (2,244)	\$ 17,266	\$ 2,302
Australian Dollar	(429,746)	205,034	(635,226)	(430,192)	(290,945)
Brazil Real	12,368	76,085	(65,010)	11,075	(42,227)
British Pound Sterling	(671,643)	434,138	(1,102,244)	(668,106)	(805,547)
Canadian Dollar	(405,405)	410,142	(816,515)	(406,373)	(473,045)
Chilean Peso	10,219	16,391	(6,160)	10,231	(3,358)
Chinese Yuan Renminbi	(27,088)	34,522	(62,452)	(27,930)	(46,331)
Colombian Peso	17,618	20,750	(3,900)	16,850	8,724
Czech Koruna	75,316	77,799	(300)	77,499	(23,679)
Danish Krone	(75,829)	38,063	(114,225)	(76,162)	(68,873)
Euro Currency Unit	(1,589,708)	614,462	(2,224,882)	(1,610,420)	(1,397,874)
Hong Kong Dollar	(176,314)	19,324	(195,649)	(176,325)	(126,135)
Hungarian Forint	(56,482)	11,145	(68,952)	(57,807)	(14,311)
Indian Rupee	114,365	121,871	(7,615)	114,256	12,431
Indonesian Rupiah	66,376	82,995	(16,849)	66,146	(1,327)
Israeli Shekel	(32,260)	8,063	(40,441)	(32,378)	(69,070)
Japanese Yen	(806,713)	622,388	(1,426,510)	(804,122)	(693,343)
Malaysian Ringgit	4,457	16,165	(11,828)	4,337	25,536
Mexican Peso	118,656	145,622	(26,137)	119,485	33,285
Moroccan Dirham	—	—	—	—	12,478
New Taiwan Dollar	(25,026)	2,374	(27,387)	(25,013)	(10,961)
New Zealand Dollar	(78,576)	338,569	(419,887)	(81,318)	(60,171)
Norwegian Krone	(146,992)	197,943	(346,019)	(148,076)	(68,755)
Peruvian Sol	(27,849)	4,731	(32,781)	(28,050)	3,345
Philippines Peso	(13,636)	5,307	(18,803)	(13,496)	7,621
Polish Zloty	73,095	86,047	(11,003)	75,044	7,431
Romanian Leu	(2,581)	6,414	(9,154)	(2,740)	(1,639)
Russian Ruble (New)	3,410	23,011	(19,748)	3,263	17,751
Saudi Arabia Riyal	15	6,314	(6,314)	—	(5,572)
Singapore Dollar	(106,296)	241,690	(348,385)	(106,695)	(190,456)
South African Rand	(16,811)	15,832	(32,736)	(16,904)	(5,778)
South Korean Won	(63,124)	2,626	(65,323)	(62,697)	431
Swedish Krona	(134,248)	131,866	(266,136)	(134,270)	(101,214)
Swiss Franc	(382,946)	89,529	(472,629)	(383,100)	(369,354)
Thailand Baht	10,314	38,017	(27,626)	10,391	17,755
Turkish Lira	91,156	128,626	(36,584)	92,042	1,674
U.S. Dollar	4,655,497	8,691,478	(4,035,981)	4,655,497	4,770,298
<b>Total Forwards subject to foreign currency risk</b>				<b>\$ (18,792)</b>	<b>\$ 51,097</b>

**11. Options.** Options may be either exchange-traded or negotiated directly between two counterparties over the counter. Options grant the holder the right, but not the obligation, to purchase (call) or sell (put) a financial instrument at a specified price and within a specified period of time from the writer of the option.

As a purchaser of options, the System typically pays a premium at the outset. This premium is reflected as an asset on the financial statements. The System then retains the right, but not the obligation, to exercise the options and purchase the underlying financial instrument. Should the option not be exercised, it expires worthless, and the premium is recorded as a loss.

A writer of options assumes the obligation to deliver or receive the underlying financial instrument on exercise of the option. Certain option contracts may involve cash settlements based on specified indexes such as stock indexes. As a writer of options, the System receives a premium at the outset. This premium is reflected as a liability on the financial statements, and the System bears the risk of an unfavorable change in the price of the financial instrument underlying the option. Information on the System's investments in foreign currency options at June 30, 2017, is shown in Figure 2.22.

**12. Swap Agreements.** Swaps are negotiated contracts between two counterparties for the exchange of payments at certain intervals over a predetermined timeframe. The payments are based on a notional principal amount and calculated using either fixed or floating interest rates or total returns from certain instruments or indexes. Swaps are used to manage risk and enhance returns. To reduce the risk of counterparty nonperformance, the system generally requires collateral on any material gains from these transactions. During fiscal year 2017, the System had activity in credit default, interest rate and total return swaps. Gains and losses on swaps are determined based on fair values and are recorded in the Statement of Changes in Fiduciary Net Position. Information on the System's swap balances at June 30, 2017, is shown in Figure 2.22, and the terms, fair values and notional values of the System's investments in swap agreements that are highly sensitive to interest rate changes are disclosed in Figure 2.25.

**FIGURE 2.25: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES**

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2017	Notional Amount
Interest Rate Swaps	Receive Fixed 12.20%, Pay Variable Brazil 1-day CDI	107	2,294
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 12.23%	(90)	2,052
Interest Rate Swaps	Receive Fixed 5.00%, Pay Variable 28-day MTIIE	(8)	563
Interest Rate Swaps	Receive Fixed 3.98%, Pay Variable China Yuan 7-day fixing repo rate	21	2,360
Interest Rate Swaps	Receive Fixed 6.65%, Pay Variable India Rupee MIBOR	6	330
Interest Rate Swaps	Receive Variable South Korea 3-month CD Rate, Pay Fixed 1.66%	21	5,616
Interest Rate Swaps	Receive Variable South Korea 3-month CD Rate, Pay Fixed 1.74%	3	4,368
Interest Rate Swaps	Receive Fixed 6.18%, Pay Variable India Rupee MIBOR	30	10,129
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 12.36%	1	112
Interest Rate Swaps	Receive Fixed 1.00%, Pay Variable Czech Krona 6-month PRIBOR	(218)	8,875
Interest Rate Swaps	Receive Variable Czech Krona 6-month PRIBOR, Pay Fixed 1.09%	179	11,194
Interest Rate Swaps	Receive Fixed 1.50%, Pay Variable Czech Krona 6-month PRIBOR	202	11,246
Interest Rate Swaps	Receive Variable Czech Krona 6-month PRIBOR, Pay Fixed 1.36%	(79)	8,875
Interest Rate Swaps	Receive Variable 6-month EURIBOR, Pay Fixed 1.50%	48	2,053
Interest Rate Swaps	Receive Fixed 5.84%, Pay Variable 28-day MTIIE	(65)	1,901
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 6.71%	51	978
Interest Rate Swaps	Receive Fixed 5.62%, Pay Variable 28-day MTIIE	(93)	3,044
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 5.94%	39	785
Interest Rate Swaps	Receive Fixed 8.28%, Pay Variable 28-day MTIIE	101	1,370
Interest Rate Swaps	Receive Fixed 7.15%, Pay Variable 28-day MTIIE	(53)	26,973
Interest Rate Swaps	Receive Fixed 8.31%, Pay Variable 28-day MTIIE	283	3,663
Interest Rate Swaps	Receive Fixed 7.79%, Pay Variable 28-day MTIIE	81	1,972
Interest Rate Swaps	Receive Fixed 8.32%, Pay Variable 28-day MTIIE	290	3,492
Interest Rate Swaps	Receive Fixed 7.51%, Pay Variable 28-day MTIIE	13	436
Interest Rate Swaps	Receive Fixed 7.37%, Pay Variable 28-day MTIIE	45	3,193
Interest Rate Swaps	Receive Fixed 7.47%, Pay Variable 28-day MTIIE	77	2,724
Interest Rate Swaps	Receive Fixed 3.125%, Pay Variable Poland Zloty 6-month rate	5	189
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 9.50%	(91)	908
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.50%	(16)	473
Interest Rate Swaps	Receive Fixed 8.00%, Pay Variable 3-month JIBAR	23	1,023
Interest Rate Swaps	Receive Fixed 8.25%, Pay Variable 3-month JIBAR	4	267
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 7.50%	(17)	2,839
Interest Rate Swaps	Receive Fixed 8.30%, Pay Variable 3-month JIBAR	66	3,419
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.25%	(1)	31
Interest Rate Swaps	Receive Fixed 8.00%, Pay Variable 3-month JIBAR	(9)	1,587
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.50%	956	57,655
Interest Rate Swaps	Receive Fixed 1.75%, Pay Variable 3-month LIBOR	207	149,922

FIGURE 2.25: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES, cont.

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2017	Notional Amount
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.50%	(792)	50,733
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 1.25%	141	4,200
Interest Rate Swaps	Receive Fixed 1.50%, Pay Variable 3-month LIBOR	(597)	8,300
Interest Rate Swaps	Receive Fixed 1.75%, Pay Variable 3-month LIBOR	(446)	2,500
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 1.10%	26	19,100
Interest Rate Swaps	Receive Fixed 10.14%, Pay Variable 3-month LIBOR	(11)	28,500
Interest Rate Swaps	Receive Variable 3-month LIBOR+100 bps, Pay Fixed 1.75%	27	600
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 13.315%	(184)	2,505
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 15.96%	(3)	30
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 12.06%	83	2,535
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 14.14%	(30)	936
Interest Rate Swaps	Receive Fixed 12.80%, Pay Variable Brazil 1-day CDI	30	543
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 12.15%	(538)	16,177
Interest Rate Swaps	Receive Fixed 12.29%, Pay Variable Brazil 1-day CDI	125	2,354
Interest Rate Swaps	Receive Fixed 10.85%, Pay Variable Brazil 1-day CDI	53	4,346
Interest Rate Swaps	Receive Fixed 10.13%, Pay Variable Brazil 1-day CDI	(44)	3,018
Interest Rate Swaps	Receive Fixed 9.76%, Pay Variable Brazil 1-day CDI	(5)	181
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.64%	2	755
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.36%	41	7,274
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.29%	(32)	10,051
Interest Rate Swaps	Receive Fixed 10.30%, Pay Variable Brazil 1-day CDI	(16)	1,932
Interest Rate Swaps	Receive Fixed 7.41%, Pay Variable 28-day MTIIE	59	2,767
Interest Rate Swaps	Receive Fixed 7.40%, Pay Variable 28-day MTIIE	247	8,845
Interest Rate Swaps	Receive Fixed 7.37%, Pay Variable 28-day MTIIE	64	2,399
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 11.75%	613	13,401
Interest Rate Swaps	Receive Fixed 12.23%, Pay Variable Brazil 1-day CDI	(167)	4,105
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 14.72%	(69)	1,606
Interest Rate Swaps	Receive Fixed 2.78%, Pay Variable 6-month Thai Baht fixing rate	26	740
Interest Rate Swaps	Receive Fixed 2.10%, Pay Variable 6-month Thai Baht fixing rate	9	1,707
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 12.36%	10	2,387
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 16.59%	(216)	3,048
Interest Rate Swaps	Receive Fixed 12.85%, Pay Variable Brazil 1-day CDI	20	284
Interest Rate Swaps	Receive Fixed 6.12%, Pay Variable 1-day Colombia IBR	21	778
Interest Rate Swaps	Receive Fixed 5.29%, Pay Variable 1-day Colombia IBR	13	1,319
Interest Rate Swaps	Receive Fixed 5.32%, Pay Variable 1-day Colombia IBR	2	196

FIGURE 2.25: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES, cont.

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2017	Notional Amount
Interest Rate Swaps	Receive Fixed 5.00%, Pay Variable 28-day MTIIE	(41)	1,055
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 5.25%	(20)	608
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable 6-month Thai Baht fixing rate	7	336
Interest Rate Swaps	Receive Fixed 2.175%, Pay Variable 6-month Thai Baht fixing rate	—	18
Interest Rate Swaps	Receive Fixed 2.02%, Pay Variable 6-month Thai Baht fixing rate	4	559
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable 6-month Thai Baht fixing rate	8	447
Interest Rate Swaps	Receive Fixed 2.20%, Pay Variable 6-month Thai Baht fixing rate	5	344
Interest Rate Swaps	Receive Fixed 1.93%, Pay Variable 6-month Thai Baht fixing rate	4	1,147
Interest Rate Swaps	Receive Fixed 3.37%, Pay Variable 6-month Thai Baht fixing rate	1	29
Interest Rate Swaps	Receive Fixed 3.39%, Pay Variable 6-month Thai Baht fixing rate	2	59
Interest Rate Swaps	Receive Fixed 3.41%, Pay Variable 6-month Thai Baht fixing rate	8	147
Interest Rate Swaps	Receive Fixed 3.41%, Pay Variable 6-month Thai Baht fixing rate	8	147
Interest Rate Swaps	Receive Fixed 7.16%, Pay Variable 28-day MTIIE	12	3,744
Interest Rate Swaps	Receive Fixed 7.16%, Pay Variable 28-day MTIIE	23	6,695
Interest Rate Swaps	Receive Fixed 10.85%, Pay Variable Brazil 1-day CDI	51	4,286
Interest Rate Swaps	Receive Fixed 3.54%, Pay Variable Chilean Peso 6-month CLICP	6	4,618
Interest Rate Swaps	Receive Fixed 3.94%, Pay Variable Chilean Peso 6-month CLICP	(11)	2,783
Interest Rate Swaps	Receive Fixed 1.07%, Pay Variable Brazil 1-day CDI	177	2,415
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable China Yuan 7-day fixing repo rate	(77)	1,758
Interest Rate Swaps	Receive Fixed 6.20%, Pay Variable 1-day Colombia IBR	8	232
Interest Rate Swaps	Receive Fixed 2.1225%, Pay Variable 6-month Thai Baht fixing rate	1	109
Interest Rate Swaps	Receive Fixed 2.505%, Pay Variable 6-month Thai Baht fixing rate	7	474
Interest Rate Swaps	Receive Fixed 2.04%, Pay Variable 6-month Thai Baht fixing rate	19	2,208
Interest Rate Swaps	Receive Fixed 2.20%, Pay Variable 6-month Thai Baht fixing rate	1	53
Interest Rate Swaps	Receive Fixed 2.55%, Pay Variable 6-month Thai Baht fixing rate	11	913
Interest Rate Swaps	Receive Fixed 6.70%, Pay Variable India Rupee MIBOR	91	4,354
Interest Rate Swaps	Receive Variable 6-month EURIBOR, Pay Fixed 1.00%	(19)	3,992
Interest Rate Swaps	Receive Variable Japan Yen 6-month LIBOR, Pay Fixed 0.30%	(6)	3,026
Interest Rate Swaps	Receive Fixed 12.56%, Pay Variable Brazil 1-day CDI	335	5,885
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 11.68%	(55)	3,290
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 5.25%	(5)	166
<b>Subtotal Interest Rate Swaps</b>		<b>\$ 1,136</b>	<b>\$ 604,960</b>

FIGURE 2.25: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES, cont.

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2017	Notional Amount
Total Return Bond Index Swaps	Receive Variable Barclays Capital U.S. Aggregate Index/ Pay Variable 1-month LIBOR	\$ —	\$ 25,000
Total Return Bond Index Swaps	Receive Variable Barclays Capital U.S. Aggregate Index/Pay Variable 1-month LIBOR - 5 bps	—	50,000
Total Return Bond Index Swaps	Receive Variable Barclays Capital U.S. Aggregate Index/ Pay Variable 1-month LIBOR	—	50,000
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI/ Pay Variable 3-month LIBOR + 34 bps	—	2
Total Return Equity Index Swaps	Receive Variable S&P 500 Total Return Index/ Pay Variable 3-month LIBOR + 26 bps	536	350,000
Total Return Equity Index Swaps	Receive Variable MSCI Emerging Markets Index/ Pay Variable 3-month LIBOR + 51 bps	1,913	350,000
<b>Subtotal Total Return Swaps</b>		<b>\$ 2,449</b>	<b>\$ 825,002</b>
<b>TOTAL</b>		<b>\$ 3,585</b>	<b>\$1,429,962</b>

FIGURE 2.26: DERIVATIVE INSTRUMENTS SUBJECT TO COUNTERPARTY CREDIT RISK

Counterparty	Percentage of Net Exposure	Moody's Ratings	S&P Ratings	Fitch Ratings
Barclays Bank, PLC	76.02%	A1	A-	A
Bank of New York Mellon Corp./London	18.91%	Aa1	AA-	—
HSBC Securities, Inc.	1.89%	—	AA-	—
BNP Paribas, SA/London	1.47%	—	A	—
Citibank, NA	1.07%	A1	A+	A+
Goldman Sachs Bank, USA/New York, NY	0.64%	A1	A+	A+
<b>Total</b>	<b>100.00%</b>			

**13. Asset Allocation.** The long-term expected rate of return on the System’s investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target

asset allocation percentage and by adding expected inflation. The target allocations are based on the Strategic Asset Allocation Implementation Schedule and Allowable Ranges document, which was approved by the VRS Board of Trustees on June 7, 2016. Best estimates of arithmetic real rates of return for each major asset class included in the System’s target asset allocation for fiscal year 2017 are summarized in Figure 2.27.

**FIGURE 2.27: ASSET ALLOCATION**

FOR THE YEAR ENDED JUNE 30, 2017

Asset Class (Strategy)	Target Allocation	Arithmetic Long-Term Expected Rate of Return	Average Long-Term Expected Rate of Return*
Public Equity	40.00%	4.54%	1.82%
Fixed Income	15.00%	0.69%	0.10%
Credit Strategies	15.00%	3.96%	0.59%
Real Assets	15.00%	5.76%	0.86%
Private Equity	15.00%	9.53%	1.43%
<b>Total</b>	<b>100.00%</b>		<b>4.80%</b>
		Inflation	2.50%
		* Expected arithmetic nominal return	7.30%

\* The above allocation provides a one-year expected return of 7.30%. However, one-year returns do not take into account the volatility present in each of the asset classes. In setting the long-term expected return for the pension system, stochastic projections are employed to model future returns under various economic conditions. The results provide a range of returns over various time periods that ultimately provide a median return of 6.83%, including expected inflation of 2.50%.

## 6. Capital Assets

The System's non-depreciable and depreciable capital assets for the year ended June 30, 2017, and the

changes by category from the prior fiscal year-end are presented in Figure 2.28.

**FIGURE 2.28: PROPERTY, PLANT, FURNITURE, EQUIPMENT AND INTANGIBLE ASSETS**

FOR THE YEAR ENDED JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Balance June 30, 2016	Increases	Decreases	Balance June 30, 2017
<b>Non-Depreciable Capital Assets:</b>				
Land	\$ 1,368	\$ –	\$ –	\$ 1,368
Construction in progress (Admin 17)	9,633	8,153	2,412	15,374
<b>Total Non-Depreciable Capital Assets</b>	<b>11,001</b>	<b>8,153</b>	<b>2,412</b>	<b>16,742</b>
<b>Depreciable Capital and Intangible Assets:</b>				
Building (Admin 6)	4,632	–	–	4,632
Furniture and Equipment (Admin 11)	7,145	513	576	7,082
Intangible Assets (Admin 17A)	32,831	2,412	–	35,243
<b>Total Depreciable Capital Assets</b>	<b>44,608</b>	<b>2,925</b>	<b>576</b>	<b>46,957</b>
<b>Less Accumulated Depreciation:</b>				
Building (Admin 6)	2,084	116	–	2,200
Furniture and Equipment (Admin 11)	5,531	355	568	5,318
Intangible Assets (Admin 11A)	15,897	4,924	–	20,821
<b>Total Accumulated Depreciation</b>	<b>23,512</b>	<b>5,395</b>	<b>568</b>	<b>28,339</b>
<b>Total Depreciable Capital Assets – Net</b>	<b>21,096</b>	<b>(2,470)</b>	<b>8</b>	<b>18,618</b>
<b>Total Net Capital Assets</b>	<b>\$ 32,097</b>	<b>\$ 5,683</b>	<b>\$ 2,420</b>	<b>\$ 35,360</b>

Depreciation expense amounted to \$5,395,000 and \$5,124,000 in 2017 and 2016, respectively.

## 7. Operating Leases

The System has commitments under various operating leases for office space and parking. In general, the leases are for a 10-year term. In most cases, the System expects that in the normal course of business, these leases will be replaced by similar leases. Total rental expense for the year ended June 30, 2017, was \$2,810,000. The System's total future minimum rental payments as of June 30, 2017, are presented in Figure 2.29.

**FIGURE 2.29: OPERATING LEASES – FUTURE PAYMENTS**

AT JUNE 30, 2017		(EXPRESSED IN THOUSANDS)
Year		Amount
2018		\$ 1,298
2019		1,341
2020		1,384
2021		1,428
2022		1,471
2023-2024		3,076
<b>Total Future Minimum Rental Payments</b>		<b>\$ 9,998</b>

## 8. System Employee Benefit Plan Obligations

All full-time permanent, salaried employees of the System are employees of the Commonwealth of Virginia and included in the Commonwealth's participation as an employer in VRS. The Commonwealth, not the System, has overall responsibility for contributions to the VRS pension trust fund as well as other employee benefit and post-employment benefit trust funds for System employees. The state's pension contribution requirement for general employees was 13.49% for the fiscal year ended June 30, 2017. This is compared to 12.33% for July 2015, 13.28% for August 2015 and 14.22% for the remainder of the fiscal year ended June 30, 2016.

There were approximately 55,427 state retirees, including System retirees, at June 30, 2017. Note 2.B provides information on the state's contribution toward funding the defined benefit plan for state employees for fiscal year 2017 and fiscal year 2016.

The System's contribution requirement for its employees for fiscal year 2017 and fiscal year 2016 was \$3,584,000 and \$3,658,000, respectively.

The System's financial obligations for other employee benefit and post-employment benefit plans were as follows:

- The state's contribution requirement for the Group Life Insurance Program for the year ended June 30, 2017 was 1.31% and for the year ended June 30, 2016, was 1.19% of covered payroll. There were approximately 89,933 active state employees and 52,785 state retirees, including System employees and retirees, eligible for group life insurance coverage at June 30, 2017. The System's contribution requirement for its employees and retirees for fiscal year 2017 and fiscal year 2016 was \$365,000 and \$319,000, respectively.
- The state's contribution requirement for the Retiree Health Insurance Credit Program for the year ended June 30, 2017 was 1.18% of covered payroll, and for the year ended June 30, 2016, was 1.05% of covered payroll. There were approximately 45,458 state retirees, including System retirees, receiving the health insurance credit at June 30, 2017. The System's contribution requirement for its employees for fiscal year 2017 and fiscal year 2016 was \$328,000 and \$282,000, respectively.

- The state's contribution requirement for the Virginia Sickness and Disability Program (VSDP) for the years ended June 30, 2017, and June 30, 2016, was 0.66%. There were approximately 74,944 state employees, including System employees, enrolled in VSDP at June 30, 2017. The System's contribution requirement for its employees for fiscal year 2017 and fiscal year 2016 was \$179,000 and \$171,000, respectively. Information regarding the Commonwealth's funding progress is presented in the Commonwealth's Comprehensive Annual Financial Report. Information about the pension plans is provided in Note 2; information about other employee and post-employment benefit plans is provided in Note 3.

## 9. Litigation

The System, including its Board of Trustees, officers and employees, is a defendant in claims and lawsuits that are pending, are in progress or have been settled since June 30, 2017. The Attorney General and outside counsel have reviewed the status of these claims, lawsuits and the System's potential liability arising from them. Based on their review, it is the opinion of management that such liability, if any, would have no material adverse effect on the System's financial condition.

## 10. Risk Management

To cover its exposure to various risks of loss, the System, as an independent agency of the Commonwealth of Virginia, participates in the Commonwealth's self-insurance programs for state employee health care and risk management. The latter program includes property, general (tort) liability, medical malpractice and automobile plans.

The System's employees are covered by the Virginia Workers' Compensation Program administered by the Department of Human Resource Management. In addition, the System is self-insured for fiduciary liability as well as directors' and officers' liability

under a program administered by the Commonwealth's Division of Risk Management. There were no claims in excess of coverage and no reductions in coverage during fiscal year 2017 and the three preceding fiscal years.

## 11. Commitments

The System extends investment commitments in the normal course of business. At June 30, 2017 and 2016, these commitments amounted to \$11,622,731,000 and \$10,213,640,000, respectively.

## 12. Statutory Contribution Adjustment

For fiscal year 2016, pension contributions due or required were based on the June 30, 2013, actuarial valuation, which used an 8-year funding period for the deferred contributions from fiscal year 2011 and fiscal year 2012 and a 30-year funding period for the remaining balance of the UAAL at June 30, 2013. The actuarial rate for judges was reduced from 57.84% to 55.55% because of the impact of Senate Bill 1196 that increased the mandatory retirement age for judges from 70 to 73. The actuarial rate for teachers was reduced from 18.20% to 17.64% because of a one-time payment of \$192,884,000 from the Literary Fund authorized in Item 136 C2c of Chapter 665 of the 2015 Virginia Acts of Assembly. The General Assembly, in accordance with Section 51.1-145(K1) of the *Code of Virginia*, again funded the employer retirement contribution rates for state employees and teachers at less than the rate determined by the actuary and certified by the VRS Board of Trustees or the revised actuarial rates noted above. The percentage of the certified rate funded for fiscal year 2016 was 78.02% for state employees, 79.69% for teachers, 83.90% for SPORS, 83.88% for VaLORS and 89.32% for JRS. During the budget development, the funding for the state employee groups was increased to 90% effective August 10, 2015.

As a result, the fiscal year 2016 employer retirement contribution rate for state employees was reduced from actuarially determined rate of 15.80% to a funded rate of 12.33% for July 2015, 13.28% for August 2015 and 14.22% for the remainder of the fiscal year. The rate for teachers from the revised actuarial rate of 17.64% to a funded rate of 14.06%. Additionally, the employer retirement contribution rates for SPORS, VaLORS and JRS were reduced from their original or revised actuarial rates of 30.78%, 21.06% and 55.55% to funded rates of 25.82%, 17.67% and 49.62%, respectively, for July 2015; funded rates of 26.83%, 18.34% and 49.82%, respectively, for August 2015; and funded rates of 27.83%, 19.00% and 50.02%, respectively, for the remainder of fiscal year 2016. There was no adjustment to the employer contribution rates for political subdivision employers or to the member contribution rate of 5.00%.

For fiscal year 2016, other post-employment benefit plan contributions due or required also were based on the June 30, 2013, actuarial valuation, which used a 30-year funding period for the UAAL. The General Assembly again funded less than the rates determined by the actuary by establishing the funding level at 90% of the certified rates. As a result, the fiscal year 2016 rate for the Group Life Insurance Program was reduced from 1.32% to 1.19% and for VSDP from 0.73% to 0.66%. Additionally, for the Retiree Health Insurance Credit Program, the state employer rate was reduced from 1.17% to 1.05% and the teacher employer rate from 1.18% to 1.06%.

There was no adjustment to the Retiree Health Insurance Credit Program employer contribution rates for political subdivision employers or the VLDP employer contribution rates set for teachers and political subdivision employers.

For fiscal year 2017, pension contributions due or required were based on the June 30, 2015, actuarial valuation, adjusted to reflect the impact of the one-time payment of \$192,884,000 from the Literary Fund authorized in Item 136 C2c of Chapter 665 of the 2015 Virginia Acts of Assembly for teachers and the transfer of appropriations of general fund and

unobligated non-general fund cash balances in June 2016 of \$162,406,000, \$2,119,000, \$16,492,000 and \$8,466,000 for state employee, SPORS, VaLORS and JRS, respectively, as an accelerated payback of the deferred contribution in the 2010-12 biennium. The transfers for the state employee groups were set out on Item 467(Z), Item 3-1.01(DDD)(1), and Item 3-1.01(DDD)(2) of Chapter 732 of the 2016 Virginia Acts of Assembly.

For fiscal year 2017, the employer retirement contribution rate for state employees was 13.49% and the employer retirement contribution rate for teachers was 14.66%. While the state employee rate was 100% of the adjusted actuarially determined rate, the teacher rate was only 89.84% of the adjusted actuarially determined rate of 16.32% based on the provisions of Section 51.1-145(K1) of the *Code of Virginia*. Additionally, the employer retirement contribution rates for SPORS, VaLORS and JRS were funded at 100% of the adjusted actuarially determined rate and were 28.54%, 21.05% and 41.97%, respectively. There was no adjustment to the employer contribution rates for political subdivision employers or to the member contribution rate of 5.00%.

For fiscal year 2017, other post-employment benefit plan contributions due or required also were based on the June 30, 2015, actuarial valuation, which used a 30-year funding period for the UAAL. The General Assembly funded 100% of the contribution rates for all programs except the teacher Health Insurance Credit. The rates for Group Life Insurance was 1.31%, the rate for the Retiree Health insurance Credit Program for state employees was 1.18% and the VSDP rate was 0.66%. The rate for the Retiree Health Insurance Credit Program for teachers was reduced from 1.23% to 1.11%.

There was no adjustment to the Retiree Health Insurance Credit Program employer contribution rates for political subdivision employers or the VLDP employer contribution rates set for teachers and political subdivision employers.

**REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY:  
VRS STATE**

(EXPRESSED IN THOUSANDS)

	<b>VRS State</b>			
	2017	2016	2015	2014
<b>Total pension liability:</b>				
Service cost	\$ 370,235	\$ 369,779	\$ 375,149	\$ 369,120
Interest	1,562,819	1,533,764	1,482,951	1,436,064
Benefit changes	–	–	–	–
Difference between actual and expected experience	(85,975)	(245,642)	59,923	–
Assumption changes	76,965	–	–	–
Benefit payments	(1,234,388)	(1,195,198)	(1,136,102)	(1,081,866)
Refunds of contributions	(30,837)	(25,240)	(27,724)	(25,036)
Net change in total pension liability	658,819	437,463	754,197	698,282
<b>Total pension liability – beginning</b>	<b>22,958,593</b>	<b>22,521,130</b>	<b>21,766,933</b>	<b>21,068,651</b>
<b>Total pension liability – ending (a)</b>	<b>\$ 23,617,412</b>	<b>\$ 22,958,593</b>	<b>\$ 22,521,130</b>	<b>\$ 21,766,933</b>
<b>Plan fiduciary net position:</b>				
Contributions – employer	\$ 535,424	\$ 722,617	\$ 480,657	\$ 343,259
Contributions – member	201,391	200,184	195,582	198,035
Net investment income	1,963,811	277,166	728,083	2,243,999
Benefit payments	(1,234,388)	(1,195,198)	(1,136,102)	(1,081,866)
Refunds of contributions	(30,837)	(25,240)	(27,724)	(25,036)
Administrative expense	(11,612)	(10,140)	(10,302)	(12,341)
Other	(1,743)	(122)	(154)	123
Net change in plan fiduciary net position	1,422,046	(30,733)	230,040	1,666,173
<b>Plan fiduciary net position – beginning</b>	<b>16,367,842</b>	<b>16,398,575</b>	<b>16,168,535</b>	<b>14,502,362</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 17,789,888</b>	<b>\$ 16,367,842</b>	<b>\$ 16,398,575</b>	<b>\$ 16,168,535</b>
<b>Net pension liability – ending (a-b)</b>	<b>\$ 5,827,524</b>	<b>\$ 6,590,751</b>	<b>\$ 6,122,555</b>	<b>\$ 5,598,398</b>
Plan fiduciary net position as a percentage of the total pension liability (b/a)	75.33%	71.29%	72.81%	74.28%
Covered payroll (c)	\$ 4,020,893	\$ 3,977,759	\$ 3,878,632	\$ 3,861,712
Net pension liability as a percentage of covered payroll ((a-b)/c)	144.93%	165.69%	157.85%	144.97%

Note: This schedule should present 10 years of data, however, the information prior to fiscal year 2014 is not available.

**REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY:  
VRS TEACHER**

(EXPRESSED IN THOUSANDS)

	<b>VRS Teacher</b>			
	2017	2016	2015	2014
<b>Total pension liability:</b>				
Service cost	\$ 830,475	\$ 828,856	\$ 828,901	\$ 831,501
Interest	3,016,207	2,931,065	2,834,138	2,722,788
Benefit changes	—	—	—	—
Difference between actual and expected experience	(642,745)	(391,881)	(212,089)	—
Assumption changes	218,559	—	—	—
Benefit payments	(2,147,781)	(2,081,069)	(1,980,353)	(1,874,636)
Refunds of contributions	(39,521)	(35,067)	(36,058)	(36,103)
Net change in total pension liability	1,235,194	1,251,904	1,434,539	1,643,550
<b>Total pension liability – beginning</b>	<b>44,182,326</b>	<b>42,930,422</b>	<b>41,495,883</b>	<b>39,852,333</b>
<b>Total pension liability – ending (a)</b>	<b>\$ 45,417,520</b>	<b>\$44,182,326</b>	<b>\$42,930,422</b>	<b>\$41,495,883</b>
<b>Plan fiduciary net position:</b>				
Contributions – employer	\$ 1,137,976	\$ 1,062,338	\$ 1,267,250	\$ 853,634
Contributions – member	392,730	380,314	373,525	371,241
Net investment income	3,632,291	516,704	1,327,047	4,042,441
Benefit payments	(2,147,781)	(2,081,069)	(1,980,353)	(1,874,636)
Refunds of contributions	(39,521)	(35,067)	(36,058)	(36,103)
Administrative expense	(21,123)	(18,859)	(18,238)	(22,036)
Other	(3,238)	(222)	(284)	217
Net change in plan fiduciary net position	2,951,334	(175,861)	932,889	3,334,758
<b>Plan fiduciary net position – beginning</b>	<b>30,168,211</b>	<b>30,344,072</b>	<b>29,411,183</b>	<b>26,076,425</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 33,119,545</b>	<b>\$ 30,168,211</b>	<b>\$ 30,344,072</b>	<b>\$ 29,411,183</b>
<b>Net pension liability – ending (a-b)</b>	<b>\$ 12,297,975</b>	<b>\$ 14,014,115</b>	<b>\$ 12,586,350</b>	<b>\$ 12,084,700</b>
Plan fiduciary net position as a percentage of the total pension liability (b/a)	72.92%	68.28%	70.68%	70.88%
Covered payroll (c)	\$ 7,891,783	\$ 7,624,612	\$ 7,434,932	\$ 7,313,025
Net pension liability as a percentage of covered payroll ((a-b)/c)	155.83%	183.80%	169.29%	165.25%

Note: This schedule should present 10 years of data, however, the information prior to fiscal year 2014 is not available.

REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY:  
VRS POLITICAL SUBDIVISIONS

(EXPRESSED IN THOUSANDS)

	<b>VRS Political Subdivisions</b>			
	2017	2016	2015	2014
<b>Total pension liability:</b>				
Service cost	\$ 541,594	\$ 535,322	\$ 530,945	\$ 524,758
Interest	1,422,753	1,362,892	1,309,484	1,243,386
Benefit changes	36,652	2,053	1,135	—
Difference between actual and expected experience	(205,649)	(87,268)	(185,419)	—
Assumption changes	(64,510)	—	—	—
Benefit payments	(941,856)	(893,585)	(819,201)	(754,706)
Refunds of contributions	(42,068)	(37,380)	(36,898)	(36,876)
Net change in total pension liability	746,916	882,034	800,046	976,562
<b>Total pension liability – beginning</b>	<b>20,817,088</b>	<b>19,935,054</b>	<b>19,135,008</b>	<b>18,158,446</b>
<b>Total pension liability – ending (a)</b>	<b>\$21,564,004</b>	<b>\$20,817,088</b>	<b>\$19,935,054</b>	<b>\$19,135,008</b>
<b>Plan fiduciary net position:</b>				
Contributions – employer	\$ 477,563	\$ 543,947	\$ 533,877	\$ 539,366
Contributions – member	238,636	231,934	227,060	225,555
Net investment income	2,113,973	300,995	761,164	2,272,284
Benefit payments	(941,856)	(893,585)	(819,201)	(754,706)
Refunds of contributions	(42,068)	(37,380)	(36,898)	(36,876)
Administrative expense	(12,220)	(10,696)	(10,358)	(12,153)
Other	(1,887)	(130)	(162)	120
Net change in plan fiduciary net position	1,832,141	135,085	655,482	2,233,590
<b>Plan fiduciary net position – beginning</b>	<b>17,418,106</b>	<b>17,283,021</b>	<b>16,627,539</b>	<b>14,393,949</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$19,250,247</b>	<b>\$ 17,418,106</b>	<b>\$17,283,021</b>	<b>\$16,627,539</b>
<b>Net pension liability – ending (a-b)</b>	<b>\$ 2,313,757</b>	<b>\$ 3,398,982</b>	<b>\$ 2,652,033</b>	<b>\$2,507,469</b>
Plan fiduciary net position as a percentage of the total pension liability (b/a)	89.27%	83.67%	86.70%	86.90%
Covered payroll (c)	\$ 4,765,842	\$ 4,628,806	\$ 4,513,335	\$ 4,434,764
Net pension liability as a percentage of covered payroll ((a-b)/c)	48.55%	73.43%	58.76%	56.54%

Note: This schedule should present 10 years of data, however, the information prior to fiscal year 2014 is not available.

## REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY: SPORS

(EXPRESSED IN THOUSANDS)

	<b>SPORS</b>			
	2017	2016	2015	2014
<b>Total pension liability:</b>				
Service cost	\$ 18,880	\$ 18,700	\$ 18,847	\$ 18,341
Interest	74,042	72,618	70,350	67,978
Benefit changes	—	—	—	—
Difference between actual and expected experience	(5,327)	(14,711)	(2,890)	—
Assumption changes	(68,707)	—	—	—
Benefit payments	(57,814)	(53,515)	(53,338)	(50,467)
Refunds of contributions	(630)	(584)	(375)	(685)
Net change in total pension liability	(39,556)	22,508	32,594	35,167
<b>Total pension liability – beginning</b>	<b>1,086,958</b>	<b>1,064,450</b>	<b>1,031,856</b>	<b>996,689</b>
<b>Total pension liability – ending (a)</b>	<b>\$ 1,047,402</b>	<b>\$ 1,086,958</b>	<b>\$ 1,064,450</b>	<b>\$ 1,031,856</b>
<b>Plan fiduciary net position:</b>				
Contributions – employer	\$ 31,888	\$ 33,655	\$ 28,427	\$ 42,683
Contributions – member	5,701	5,759	5,680	5,646
Net investment income	87,265	12,634	32,466	98,682
Benefit payments	(57,814)	(53,515)	(53,338)	(50,467)
Refunds of contributions	(630)	(584)	(375)	(685)
Administrative expense	(926)	(590)	(471)	(431)
Other	(99)	(23)	(27)	—
Net change in plan fiduciary net position	65,385	(2,664)	12,362	95,428
<b>Plan fiduciary net position – beginning</b>	<b>730,688</b>	<b>733,352</b>	<b>720,990</b>	<b>625,562</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 796,073</b>	<b>\$ 730,688</b>	<b>\$ 733,352</b>	<b>\$ 720,990</b>
<b>Net pension liability – ending (a-b)</b>	<b>\$ 251,329</b>	<b>\$ 356,270</b>	<b>\$ 331,098</b>	<b>\$ 310,866</b>
Plan fiduciary net position as a percentage of the total pension liability (b/a)	76.00%	67.22%	68.89%	69.87%
Covered payroll (c)	\$ 111,395	\$ 114,395	\$ 110,059	\$ 112,010
Net pension liability as a percentage of covered payroll ((a-b)/c)	225.62%	311.44%	300.84%	277.53%

Note: This schedule should present 10 years of data, however, the information prior to fiscal year 2014 is not available.

REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY: VaLORS

(EXPRESSED IN THOUSANDS)

	<b>VaLORS</b>			
	2017	2016	2015	2014
<b>Total pension liability:</b>				
Service cost	\$ 47,189	\$ 45,608	\$ 47,531	\$ 46,504
Interest	135,453	129,756	124,579	119,040
Benefit changes	—	—	—	—
Difference between actual and expected experience	(1,457)	4,997	(4,849)	—
Assumption changes	(63,457)	—	—	—
Benefit payments	(96,224)	(92,270)	(84,990)	(78,412)
Refunds of contributions	(4,938)	(4,524)	(4,797)	(4,665)
Net change in total pension liability	16,566	83,567	77,474	82,467
<b>Total pension liability – beginning</b>	<b>1,985,618</b>	<b>1,902,051</b>	<b>1,824,577</b>	<b>1,742,110</b>
<b>Total pension liability – ending (a)</b>	<b>\$ 2,002,184</b>	<b>\$ 1,985,618</b>	<b>\$ 1,902,051</b>	<b>\$ 1,824,577</b>
<b>Plan fiduciary net position:</b>				
Contributions – employer	\$ 73,816	\$ 79,392	\$ 62,084	\$ 67,483
Contributions – member	17,598	17,574	17,081	17,908
Net investment income	146,039	20,899	52,312	156,786
Benefit payments	(96,224)	(92,270)	(84,990)	(78,412)
Refunds of contributions	(4,938)	(4,524)	(4,797)	(4,665)
Administrative expense	(1,540)	(940)	(743)	(681)
Other	(310)	(38)	(44)	—
Net change in plan fiduciary net position	134,441	20,093	40,903	158,419
<b>Plan fiduciary net position – beginning</b>	<b>1,211,446</b>	<b>1,191,353</b>	<b>1,150,450</b>	<b>992,031</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 1,345,887</b>	<b>\$ 1,211,446</b>	<b>\$ 1,191,353</b>	<b>\$ 1,150,450</b>
<b>Net pension liability – ending (a-b)</b>	<b>\$ 656,297</b>	<b>\$ 774,172</b>	<b>\$ 710,698</b>	<b>\$ 674,127</b>
Plan fiduciary net position as a percentage of the total pension liability (b/a)	67.22%	61.01%	62.64%	63.05%
Covered payroll (c)	\$ 344,468	\$ 345,504	\$ 338,562	\$ 352,492
Net pension liability as a percentage of covered payroll ((a-b)/c)	190.52%	224.07%	209.92%	191.25%

Note: This schedule should present 10 years of data, however, the information prior to fiscal year 2014 is not available.

## REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY: JRS

(EXPRESSED IN THOUSANDS)

	<b>JRS</b>			
	2017	2016	2015	2014
<b>Total pension liability:</b>				
Service cost	\$ 22,144	\$ 21,978	\$ 23,254	\$ 24,024
Interest	42,081	42,820	41,759	40,013
Benefit changes	—	(15,552)	—	—
Difference between actual and expected experience	(14,774)	(18,681)	(9,107)	—
Assumption changes	16,114	—	—	—
Benefit payments	(40,895)	(41,341)	(40,205)	(37,984)
Refunds of contributions	—	—	—	—
Net change in total pension liability	24,670	(10,776)	15,701	26,053
<b>Total pension liability – beginning</b>	<b>621,605</b>	<b>632,381</b>	<b>616,680</b>	<b>590,627</b>
<b>Total pension liability – ending (a)</b>	<b>\$ 646,275</b>	<b>\$ 621,605</b>	<b>\$ 632,381</b>	<b>\$ 616,680</b>
<b>Plan fiduciary net position:</b>				
Contributions – employer	\$ 27,612	\$ 41,502	\$ 31,503	\$ 27,727
Contributions – member	3,272	3,236	3,015	3,051
Net investment income	56,029	8,112	20,051	60,833
Benefit payments	(40,895)	(41,341)	(40,205)	(37,984)
Refunds of contributions	—	—	—	—
Administrative expense	(594)	(363)	(283)	(268)
Other	(64)	(15)	(17)	—
Net change in plan fiduciary net position	45,360	11,131	14,064	53,359
<b>Plan fiduciary net position – beginning</b>	<b>467,389</b>	<b>456,258</b>	<b>442,194</b>	<b>388,835</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 512,749</b>	<b>\$ 467,389</b>	<b>\$ 456,258</b>	<b>\$ 442,194</b>
<b>Net pension liability – ending (a-b)</b>	<b>\$ 133,526</b>	<b>\$ 154,216</b>	<b>\$ 176,123</b>	<b>\$ 174,486</b>
Plan fiduciary net position as a percentage of the total pension liability (b/a)	79.34%	75.19%	72.15%	71.71%
Covered payroll (c)	\$ 66,826	\$ 66,621	\$ 61,092	\$ 61,020
Net pension liability as a percentage of covered payroll ((a-b)/c)	199.81%	231.48%	288.29%	285.95%

Note: This schedule should present 10 years of data, however, the information prior to fiscal year 2014 is not available.

REQUIRED SUPPLEMENTARY SCHEDULE OF EMPLOYER CONTRIBUTIONS: PENSION PLANS

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution	Contributions Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
VIRGINIA RETIREMENT SYSTEM (VRS) – STATE					
2017	\$ 542,418	\$ 542,418	\$ –	\$ 4,020,893	13.49%
2016	628,486	557,160	71,326	3,977,759	14.01%
2015	612,824	478,235	134,589	3,878,632	12.33%
2014	504,726	338,286	166,440	3,861,712	8.76%
2013	485,577	325,452	160,125	3,715,205	8.76%
2012	309,930	117,696	192,234	3,663,475	3.21%
2011	294,363	74,113	220,250	3,479,484	2.13%
2010	285,209	176,751	108,458	3,556,222	4.97%
2009	290,653	225,782	64,871	3,624,109	6.23%
2008	260,965	218,954	42,011	3,560,228	6.15%
VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER					
2017	\$1,287,939	\$1,156,935	\$ 131,004	\$ 7,891,783	14.66%
2016	1,344,981	1,072,020	272,961	7,624,612	14.06%
2015	1,353,158	1,078,065	275,093	7,434,932	14.50%
2014	1,226,394	852,699	373,695	7,313,025	11.66%
2013	1,203,856	837,028	366,828	7,178,629	11.66%
2012	903,655	443,078	460,577	6,999,653	6.33%
2011	891,237	271,306	619,931	6,903,465	3.93%
2010	839,550	450,218	389,332	7,090,791	6.35%
2009	845,999	629,497	216,502	7,145,260	8.81%
2008	766,559	7 06,222	60,337	6,856,523	10.30%
VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS					
2017	\$ 487,067	\$ 487,702	\$ (635)	\$ 4,765,841	10.22%
2016	554,335	549,408	4,927	4,628,806	11.87%
2015	540,859	535,919	4,940	4,513,335	11.87%
2014	551,822	539,131	12,691	4,434,764	12.16%
2013	537,657	525,385	12,272	4,321,565	12.16%
2012	400,879	400,879	–	4,142,150	9.68%
2011	391,531	391,531	–	4,078,580	9.60%
2010	363,982	363,982	–	4,125,087	8.82%
2009	364,366	364,366	–	4,144,638	8.79%
2008	351,469	351,469	–	3,960,566	8.87%

**REQUIRED SUPPLEMENTARY SCHEDULE OF EMPLOYER CONTRIBUTIONS: PENSION PLANS, cont.**

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution	Contributions Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>					
2017	\$ 31,792	\$ 31,792	\$ —	\$ 111,395	28.54%
2016	35,211	31,561	3,650	114,395	27.59%
2015	33,876	28,417	5,459	110,059	25.82%
2014	36,538	27,711	8,827	112,010	24.74%
2013	34,535	26,193	8,342	105,872	24.74%
2012	26,250	11,441	14,809	102,701	11.14%
2011	24,570	7,460	17,110	96,128	7.76%
2010	23,791	15,714	8,077	98,757	15.91%
2009	24,241	20,175	4,066	100,626	20.05%
2008	22,941	20,989	1,952	101,106	20.76%
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>					
2017	\$ 72,511	\$ 72,511	\$ —	\$ 344,468	21.05%
2016	72,763	65,101	7,662	345,504	18.84%
2015	71,301	59,824	11,477	338,562	17.67%
2014	68,806	52,169	16,637	352,492	14.80%
2013	66,463	50,392	16,071	340,489	14.80%
2012	55,306	24,481	30,825	347,181	7.05%
2011	53,686	17,255	36,431	337,010	5.12%
2010	57,894	39,027	18,867	345,020	11.31%
2009	60,059	50,932	9,127	357,922	14.23%
2008	61,325	55,929	5,396	352,643	15.86%
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>					
2017	\$ 28,047	\$ 28,047	\$ —	\$ 66,826	41.97%
2016	37,008	33,291	3,717	66,621	49.97%
2015	35,336	31,560	3,776	61,092	51.66%
2014	33,018	27,728	5,290	61,020	45.44%
2013	32,185	27,028	5,157	59,481	45.44%
2012	27,631	18,907	8,724	59,053	32.02%
2011	28,101	17,303	10,798	60,058	28.81%
2010	23,638	17,065	6,573	62,139	27.46%
2009	23,148	21,000	2,148	60,853	34.51%
2008	23,600	22,386	1,214	58,896	38.01%

**REQUIRED SUPPLEMENTAL SCHEDULE OF INVESTMENT RETURNS**

	VRS Pooled Asset Portfolio*			
	2017	2016	2015	2014**
Annual money-weighted rate of return, net of investment expense	12.13%	1.83%	4.72%	15.67%

\* Investments for all plans are pooled for investing purposes. Therefore, a money-weighted rate of return, net of investment expense, is only available for the pool and not for each individual plan.

\*\* Data is not available for a full 10-year trend. Therefore, only the years with available data are presented.

REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET OPEB LIABILITY  
AND RELATED RATIOS

(EXPRESSED IN THOUSANDS)

	Virginia Local Disability Program					
	Group Life Insurance Fund	Disability Insurance Trust Fund	Teacher	Political Subdivisions	Total	Line of Duty Trust Fund
Change in the Net OPEB Liability	2017	2017	2017	2017	2017	2017
<b>Total OPEB liability:</b>						
Service cost	\$ 81,479	\$ 27,884	\$ 389	\$ 664	\$ 1,053	\$ 17,648
Interest	201,770	15,810	29	25	54	8,305
Changes in benefit terms	—	—	—	—	—	—
Difference between actual and expected experience	(39,461)	—	—	—	—	—
Changes of assumptions	(91,738)	(17,511)	53	(110)	(57)	(30,500)
Benefit payments	(184,092)	(30,056)	(36)	(44)	(80)	(10,255)
Net change in total OPEB liability	(32,042)	(3,873)	435	535	970	(14,802)
<b>Total OPEB liability – beginning</b>	<b>2,974,468</b>	<b>240,886</b>	<b>438</b>	<b>379</b>	<b>817</b>	<b>281,054</b>
<b>Total OPEB liability – ending (a)</b>	<b>\$ 2,942,426</b>	<b>\$ 237,013</b>	<b>\$ 873</b>	<b>\$ 914</b>	<b>\$ 1,787</b>	<b>\$ 266,252</b>
<b>Plan fiduciary net position:</b>						
Contributions – employer	\$ 94,082	\$ 24,130	\$ 589	\$ 740	\$ 1,329	\$ 11,024
Contributions – member	146,002	—	—	—	—	—
Net investment income	158,430	48,206	—	—	—	683
Benefit payments	(184,092)	(30,056)	(36)	(44)	(80)	(10,255)
Third-party administrator charges	—	(7,001)	(484)	(609)	(1,093)	—
Administrative expense	(31)	(717)	(84)	(106)	(190)	(1,283)
Other	(1,731)	(54)	294	370	664	584
Net change in plan fiduciary net position	212,660	34,508	279	351	630	753
<b>Plan fiduciary net position – beginning</b>	<b>1,224,926</b>	<b>407,826</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,708</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 1,437,586</b>	<b>\$ 442,334</b>	<b>\$ 279</b>	<b>\$ 351</b>	<b>\$ 630</b>	<b>\$ 3,461</b>
<b>Net OPEB liability – ending (a-b)</b>	<b>\$ 1,504,840</b>	<b>\$ (205,321)</b>	<b>\$ 594</b>	<b>\$ 563</b>	<b>\$ 1,157</b>	<b>\$ 262,791</b>
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	48.86%	186.63%	31.96%	38.40%	35.25%	1.30%
Covered employee payroll (c)	\$ 18,473,085	\$ 3,799,590	\$ 282,200	\$ 183,629	\$ 465,829	*
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	8.15%	-5.40%	0.21%	0.31%	0.25%	N/A

\* Contributions to the Line of Duty Trust fund are based on the number of participants in the program using a per-capita-based contribution versus a payroll based contribution.

Note: This schedule should present 10 years of data; however, the information prior to 2017 is unavailable.

**REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET OPEB LIABILITY AND RELATED RATIOS, cont.**

(EXPRESSED IN THOUSANDS)

Change in the Net OPEB Liability	Health Insurance Credit							Total 2017
	State 2017	Teacher 2017	Political Subdivisions 2017	Constitutional Officers 2017	Social Services Employees 2017	Registrars 2017		
<b>Total OPEB liability:</b>								
Service cost	\$ 19,231	\$ 20,351	\$ 972	\$ 671	\$ 263	\$ 12	\$	41,500
Interest	66,641	91,661	2,618	1,890	928	35		163,773
Changes in benefit terms	–	–	–	–	–	–	–	–
Difference between actual and expected experience	–	–	–	–	–	–	–	–
Changes of assumptions	(12,229)	(15,003)	(1,015)	(578)	(162)	(10)		(28,997)
Benefit payments	(71,256)	(83,510)	(1,676)	(1,568)	(928)	(27)		(158,965)
Net change in total OPEB liability	2,387	13,499	899	415	101	10		17,311
<b>Total OPEB liability – beginning</b>	<b>987,641</b>	<b>1,351,203</b>	<b>38,225</b>	<b>27,778</b>	<b>13,715</b>	<b>510</b>		<b>2,419,072</b>
<b>Total OPEB liability – ending (a)</b>	<b>\$ 990,028</b>	<b>\$ 1,364,702</b>	<b>\$ 39,124</b>	<b>\$ 28,193</b>	<b>\$ 13,816</b>	<b>\$ 520</b>		<b>\$ 2,436,383</b>
<b>Plan fiduciary net position:</b>								
Contributions – employer	\$ 75,058	\$ 87,613	\$ 2,164	\$ 2,320	\$ 1,069	\$ 47	\$	168,271
Net investment income	7,706	8,818	2,273	215	98	3		19,113
Benefit payments	(71,256)	(83,510)	(1,676)	(1,568)	(928)	(27)		(158,965)
Administrative expense	(131)	(120)	(37)	(4)	(2)	–		(294)
Other	(546)	436	111	(15)	(7)	–		(21)
<b>Net change in plan fiduciary net position</b>	<b>10,831</b>	<b>13,237</b>	<b>2,835</b>	<b>948</b>	<b>230</b>	<b>23</b>		<b>28,104</b>
<b>Plan fiduciary net position – beginning</b>	<b>68,685</b>	<b>82,854</b>	<b>19,321</b>	<b>1,479</b>	<b>861</b>	<b>11</b>		<b>173,211</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 79,516</b>	<b>\$ 96,091</b>	<b>\$ 22,156</b>	<b>\$ 2,427</b>	<b>\$ 1,091</b>	<b>\$ 34</b>		<b>\$ 201,315</b>
<b>Net OPEB liability – ending (a-b)</b>	<b>\$ 910,512</b>	<b>\$ 1,268,611</b>	<b>\$ 16,968</b>	<b>\$ 25,766</b>	<b>\$ 12,725</b>	<b>\$ 486</b>		<b>\$ 2,235,068</b>
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	8.03%	7.04%	56.63%	8.61%	7.90%	6.54%		8.26%
Covered employee payroll (c)	\$ 6,489,069	\$ 7,892,011	\$ 966,611	\$ 633,397	\$ 251,084	\$ 11,047	\$	16,243,219
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	14.03%	16.07%	1.76%	4.07%	5.07%	4.40%		13.76%

Note: This schedule should present 10 years of data; however, the information prior to 2017 is unavailable.

**REQUIRED SUPPLEMENTARY SCHEDULE OF EMPLOYER CONTRIBUTIONS:  
OTHER POST-EMPLOYMENT BENEFIT PLANS**

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution	Contributions Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
<b>GROUP LIFE INSURANCE FUND</b>					
2017	\$ 241,997	\$ 241,997	\$ 23,396	\$18,473,085	1.31%
2016	237,558	214,162	19,396	17,996,821	1.19%
2015	231,283	208,505	22,778	17,521,463	1.19%
2014	228,086	205,623	22,463	17,279,273	1.19%
2013	221,622	199,796	21,826	16,884,223	1.19%
2012	181,527	47,293	134,234	16,446,009	0.31%
2011	177,378	44,744	132,634	15,980,013	0.28%
2010	145,228	95,185	50,043	16,317,768	0.58%
2009	146,545	135,019	11,526	16,465,749	0.82%
2008	158,740	158,740	–	15,873,980	1.00%
<b>DISABILITY INSURANCE TRUST FUND</b>					
2017	\$ 25,077	\$ 25,077	–	\$ 3,799,590	0.66%
2016	27,187	24,580	2,607	3,724,248	0.66%
2015	26,244	23,728	2,516	3,595,080	0.66%
2014	20,610	16,701	3,909	3,553,444	0.47%
2013	21,032	17,043	3,989	3,626,208	0.47%
2012	30,285	1,096	29,189	4,037,955	0.03%
2011	28,646	–	28,646	3,819,462	0.00%
2010	76,530	30,861	45,669	3,904,606	0.79%
2009	78,120	71,344	6,776	3,985,719	1.79%
2008	97,975	78,380	19,595	3,918,989	2.00%
<b>VIRGINIA LOCAL DISABILITY PROGRAM – TEACHER</b>					
2017	\$ 875	\$ 875	\$ –	\$ 282,200	0.31%
2016	536	536	–	184,729	0.29%
2015	276	276	–	95,328	0.29%
2014*	10	10	–	3,549	0.29%
<b>VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS</b>					
2017	\$ 1,102	\$ 1,102	\$ –	\$ 183,629	0.60%
2016	741	741	–	123,509	0.60%
2015	377	377	–	62,801	0.60%
2014*	41	41	–	6,818	0.60%
<b>LINE OF DUTY TRUST FUND</b>					
2017	\$ 23,503	\$ 10,785	\$ 12,718	\$ N/A	N/A
2016	23,328	9,756	13,572	N/A	N/A
2015	23,847	9,974	13,873	N/A	N/A
2014	22,103	10,381	11,722	N/A	N/A
2013	21,895	9,341	12,554	N/A	N/A
2012	25,033	8,323	16,710	N/A	N/A
2011**	N/A	N/A	N/A	N/A	N/A

**REQUIRED SUPPLEMENTARY SCHEDULE OF EMPLOYER CONTRIBUTIONS: OTHER POST-EMPLOYMENT BENEFIT PLANS, cont.**

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution	Contributions Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
<b>HEALTH INSURANCE CREDIT – STATE</b>					
2017	\$ 76,571	\$ 76,571	\$ –	\$ 6,489,069	1.18%
2016	73,961	66,375	7,586	6,321,454	1.05%
2015	71,522	64,186	7,336	6,112,951	1.05%
2014	63,385	60,367	3,018	6,036,629	1.00%
2013	59,618	56,779	2,839	5,677,848	1.00%
2012	60,222	7,686	52,536	5,681,295	0.14%
2011	57,193	5,395	51,798	5,395,598	0.10%
2010	66,523	43,195	23,328	5,452,717	0.79%
2009	67,137	64,935	2,202	5,502,925	1.18%
2008	64,383	64,383	–	5,365,245	1.20%
<b>HEALTH INSURANCE CREDIT – TEACHER</b>					
2017	\$ 97,072	\$ 87,601	\$ 9,471	\$ 7,892,011	1.11%
2016	89,976	80,826	9,150	7,625,071	1.06%
2015	87,739	78,817	8,922	7,435,548	1.06%
2014	85,571	81,183	4,388	7,313,792	1.11%
2013	83,763	79,468	4,295	7,159,267	1.11%
2012	75,999	42,222	33,777	7,036,940	0.60%
2011	74,522	41,401	33,121	6,900,183	0.60%
2010	79,407	53,135	26,272	7,089,930	0.75%
2009	80,004	77,147	2,857	7,143,255	1.08%
2008	79,498	79,498	–	6,853,273	1.16%
<b>HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS</b>					
2017	\$ 2,088	\$ 2,088	\$ –	\$ 966,611	0.22%
2016	1,923	1,923	–	921,923	0.21%
2015	1,859	1,859	–	886,366	0.21%
2014	1,875	1,875	–	859,540	0.22%
2013	2,035	2,035	–	1,019,421	0.20%
2012	1,974	1,974	–	980,836	0.20%
2011	1,940	1,940	–	965,450	0.20%
2010	3,026	3,026	–	971,042	0.31%
2009	2,907	2,907	–	919,830	0.32%
2008	3,643	3,643	–	822,423	0.44%
<b>HEALTH INSURANCE CREDIT – CONSTITUTIONAL OFFICERS</b>					
2017	\$ 2,280	\$ 2,280	\$ –	\$ 633,397	0.36%
2016***	1,950	1,830	120	609,359	0.30%
<b>HEALTH INSURANCE CREDIT – SOCIAL SERVICES EMPLOYEES</b>					
2017	\$ 1,055	\$ 1,055	\$ –	\$ 251,084	0.42%
2016***	961	824	137	240,250	0.34%
<b>HEALTH INSURANCE CREDIT – REGISTRARS</b>					
2017	\$ 45	\$ 45	\$ –	\$ 11,047	0.41%
2016***	36	30	6	9,987	0.30%

\* Fiscal year 2014 was the first year for the Virginia Local Disability Program.

\*\* Fiscal year 2011 was the first year for the Line of Duty Act Trust Fund. It was funded by a loan from the Group Life Insurance Trust Fund. As a result, there were no contributions required or paid during the fiscal year. Contributions of \$10,678,000 were recorded for fiscal year 2011; however, VRS did not receive contributions under the program until fiscal year 2012. Contributions into the Line of Duty Act Trust Fund are based on the number of participants in the program using a per-capita-based contribution versus a payroll-based contribution.

\*\*\* Although the Health Insurance Credit program for constitutional officers, social services employees and registrars existed prior to fiscal year 2016, the program was funded in a different manner and the results do not provide comparability with the current presentations.

## SCHEDULE OF ADMINISTRATIVE EXPENSES

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2017	2016
<b>Personnel Services:</b>		
Salaries and Wages	\$ 36,751	\$ 34,567
Per Diem Services	337	332
Retirement Contributions	3,688	3,764
Social Security	2,185	2,048
Group Life and Medical Insurance	5,006	4,286
Compensated Absences	309	(152)
<b>Total Personnel Services</b>	<b>48,276</b>	<b>44,845</b>
<b>Professional Services:</b>		
Data Processing	19,073	16,923
Actuarial and Consulting Services	2,144	1,897
Legal Services	634	630
Medical Review Services	670	688
Management Services	644	464
Personnel Development Services	93	154
<b>Total Professional Services</b>	<b>23,258</b>	<b>20,756</b>
<b>Communication Services:</b>		
Media Services	32	13
Printing	763	557
Postage and Delivery Services	687	571
Telecommunications	742	807
<b>Total Communication Services</b>	<b>2,224</b>	<b>1,948</b>
<b>Rentals:</b>		
Business Equipment	—	—
Office Space	2,810	3,095
<b>Total Rentals</b>	<b>2,810</b>	<b>3,095</b>
<b>Other Services and Charges:</b>		
Skilled and Clerical Services	475	449
Depreciation	5,395	5,124
Dues and Membership	126	122
Equipment	5,613	1,542
Insurance	41	72
Repairs and Maintenance	94	13
Supplies and Materials	243	257
Travel and Transportation	789	683
Miscellaneous	225	108
<b>Total Other Services and Charges</b>	<b>13,001</b>	<b>8,370</b>
<b>Total Administrative Expenses</b>	<b>89,569</b>	<b>79,014</b>
Adjustment for capitalization of expenses	(8,153)	(6,653)
<b>Total Administrative Expenses (GAAP Basis)</b>	<b>81,416</b>	<b>72,361</b>

## SCHEDULE OF ADMINISTRATIVE EXPENSES, cont.

	2017	2016
Adjustments Necessary to Convert Administrative Expenses on the GAAP Basis to the Budgetary Basis at Year End (Net)	3,107	2,549
<b>Administrative Expenses (Budgetary Basis)</b>	<b>\$ 84,523</b>	<b>\$ 74,910</b>
<b>Administrative Expenses Appropriated</b>	<b>\$ 90,565</b>	<b>\$ 78,569</b>
<b>Distribution of Administrative Expenses</b>		
Total Administrative Expenses	\$ 81,416	\$ 72,361
Less In-House Investment Management	(31,430)	(29,205)
<b>Net Administrative Expenses</b>	<b>\$ 49,986</b>	<b>\$ 43,156</b>

## SCHEDULE OF PROFESSIONAL AND CONSULTING SERVICES

FOR THE YEAR ENDED JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

### Actuarial, Legal and Oversight Services:

Cavanaugh MacDonald	Actuarial Services and Benefits Consulting	1,148.6
Challa Law Offices	Legal Services	17.3
Ice Miller LLP	Legal Services	38.4
Joint Legislative Audit Review Commission	Oversight Responsibilities	115.7
Reed Smith	Legal Services	2.6
Troutman Sanders, LLP	Legal Services	15.4

### Total Actuarial, Legal and Oversight Services

**\$ 1,338.0**

### Consulting Services:

Advantage 2000	Social Security Advocacy and Disability Tracking	118.6
Advent Software Inc.	Investment Recordkeeping System	44.4
Albourne America, LLC	Investment Consultant Services	400.0
BCA Research	Research & Advisory	49.0
CEM Benchmarking Inc.	Benchmarking Analysis	75.0
FX Transparency LLC	Investment Advisory Services	20.0
Gallagher Benefit Services	Recruitment Consulting	21.1
Gartner Group Inc.	Research & Advisory	51.0
Genex	Job Analysis	2.6
Harrison & Turk, PC	Fact-Finding Hearing Officer for Disability Cases	77.6
Hewitt Associates	Retirement Benefits Planning Tool	35.1
Inrarv Enterprises	Fact-Finding Hearing Officer for Disability Cases	1.9
Katzen & Frye PC	Fact-Finding Hearing Officer for Disability Cases	238.6
Life Status 360 LLC	Location Services	12.6
McGinley, Elsberg & Hutcheson, PLC	Fact-Finding Hearing Officer for Disability Cases	25.1
McLagan Partners, Inc.	Investment Compensation Study	9.5
Mercer Investment	Consulting Services for Hybrid Plan	2.4

## SCHEDULE OF PROFESSIONAL AND CONSULTING SERVICES, cont.

Property & Portfolio Research, Inc.	Investment Consulting Services	103.2
Sagitec Solutions, LLC	VRS Modernization Project Solution Vendor	1,262.1
Torreycove Capital	Investment Consulting Services	50.0
Townsend Group	Investment Consulting Services	170.0
United Review Services, Inc.	Medical Board Review and Examinations	669.9
Waters & Company	Executive Recruitment	36.0
Wells Fargo Bank NA	Recordkeeping Services	31.6
Yardeni Research	Research & Advisory	15.0
<b>Total Consulting Services</b>		<b>\$ 3,522.3</b>
<b>Total Professional and Consulting Services</b>		<b>\$ 4,860.3</b>

## SCHEDULE OF INVESTMENT EXPENSES

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2017	2016
<b>Management Fees:</b>		
Public Equity Managers	\$ 52,086	\$ 50,000
Fixed Income Managers	1,205	977
Credit Strategies Managers	57,135	50,753
Real Assets Managers	83,737	77,013
Private Equity Managers	94,367	76,135
Hedge Fund Managers	76,374	81,873
Strategic Opportunity Portfolio	15,386	8,882
Currency Managers	2,842	2,498
<b>Total Management Fees</b>	<b>383,132</b>	<b>348,131</b>
<b>Performance Fees</b>	<b>2,485</b>	<b>16,982</b>
<b>Miscellaneous Fees and Expenses:</b>		
Custodial Fees	4,500	4,500
Legal Fees	676	715
Other Fees and Expenses	2,035	466
<b>Total Miscellaneous Fees and Expenses</b>	<b>7,211</b>	<b>5,681</b>
<b>In-House Investment Management</b>	<b>31,430</b>	<b>29,205</b>
<b>Total Investment Expenses</b>	<b>\$ 424,258</b>	<b>\$ 399,999</b>

At VRS, we value

# ACCOUNTABILITY

*accountability*

Accountability is being responsible for decisions made, actions taken and assignments completed. Accountability reinforces our commitment to ethically perform our duties to meet the goals of the agency.



# Investment Section

## Investment Section

Chief Investment Officer's Letter

Investment Account

Portfolio Highlights

VRS Money Managers

Public Equity Commissions

Schedule of Investment Expenses

Investment Summary: Defined Benefit Plans

Description of Hybrid Defined Contribution Plan

Description of Defined Contribution Plans Investment Options

Investment Option Performance Summary:  
Defined Contribution Plans

## Chief Investment Officer's Letter



**Ronald D. Schmitz**, Chief Investment Officer

P.O. Box 2500 • 1200 East Main Street  
Richmond, Virginia 23218-2500

Toll-free: 1-888-827-3847 • TDD: 804-344-3190

September 15, 2017

### **To: Members of the Board of Trustees and Participants of the Virginia Retirement System**

Fiscal year 2017 continued to bring positive global economic growth, even as developed economies grew more slowly than their pre-crisis levels and continued to lag growth rates in emerging economies. After a brief slowdown following last summer's Brexit vote in Britain, the results of the U.S. presidential election seemed to trigger a surge in U.S. equity prices. Market participants appeared to assume that the White House and Congress would pass meaningful tax reform, infrastructure investment and regulatory rollbacks. By spring 2017, markets began wrestling with the possibility that these hopes may have been priced in prematurely. Nevertheless, even as uncertainty surrounding policy choices and global political events continued to intensify, ample liquidity and risk appetites won out in the end as investors continued to seek yield and the U.S. stock market posted a robust return for the year. Global markets also performed well.

### **PERFORMANCE OVERVIEW**

The VRS portfolio is positioned to provide diversification across a variety of asset classes in addition to global stocks. Four of the five primary asset classes used in the VRS portfolio posted double-digit returns for the year. These were Public Equity at 17.7%, Credit Strategies at 10.1%, Real Assets at 10.8% and Private Equity at 20.6%. And although high-quality Fixed Income underperformed the other asset classes in absolute terms at +0.5%, the program outperformed its benchmark. In fact, all primary asset classes outperformed the Board-approved benchmarks for the year with the exception of Public Equity, which essentially matched its index, and the Strategic Opportunities Portfolio, which lagged its benchmark but returned a respectable 8.2%. The Total Fund return for the year, as well as the longer-term periods, also continues to exceed the Board's benchmark:

#### **Annualized Return for Periods Ended June 30, 2017:**

	<b>1 Year</b>	<b>3 Years</b>	<b>5 Years</b>	<b>10 Years</b>	<b>15 Years</b>	<b>20 Years</b>	<b>25 Years</b>
VRS Total Fund	12.1%	6.2%	9.1%	4.9%	7.5%	7.0%	8.3%
Benchmark*	11.8%	5.7%	8.5%	4.5%	6.9%	6.4%	7.9%

\* The VRS Total Fund Benchmark is a blend of the asset class benchmarks at policy weights. Benchmarks are selected with the help of a third-party investment consultant.

Figures 3.1 and 3.2 (at the end of this letter) show the asset allocation of the fund at June 30, 2017, as well as performance for various periods ended on that date. In general, private market assets have outperformed traditional allocations to stocks and bonds for longer-term periods (three, five and 10 years for our purposes) with Private Equity leading the way followed by Real Assets (real estate, infrastructure and natural resources). Among publicly traded assets classes, stocks outperformed high-quality bonds and the Credit Strategies portfolio over three- and five-year horizons. However, over the 10-year period, Fixed Income and Credit Strategies both exceeded the stock market return due to deep equity losses during the financial crisis of 2008-09.

The table below summarizes asset class performance (with excess returns generated by VRS investment staff shown in italics) along with a high-level explanation of what has helped and

	Recent Years			Longer-Term (Full Cycle)	
	+	-		+	-
<b>Public Equity</b>	Hedge Funds (relative) Long-Only Equity	U.S. Active Equity (relative) Regional Views		Hedge Funds Long-Only Equity Low-Volatility Strategies	Regional Views Global Financial Crisis
	1-year: 17.7% <i>(-3 bps)</i>	3-year: 6.3% <i>(+66 bps)</i>	5-year: 11.6% <i>(+74 bps)</i>	10-year: 4.5% <i>(+44 bps)</i>	
<b>Fixed Income</b>	Spread Compression Sector Allocation	Low-Risk Positioning Spread Volatility		Spread Compression Sector Allocation	Liquidity Global Financial Crisis
	1-year: 0.5% <i>(+76 bps)</i>	3-year: 3.0% <i>(+55 bps)</i>	5-year: 2.8% <i>(+55 bps)</i>	10-year: 5.2% <i>(+59 bps)</i>	
<b>Credit Strategies</b>	Liquid Markets (1-, 5-year) Convertibles	Government Bond Yields		Government Bond Yields	Credit Spreads
	1-year: 10.1% <i>(+109 bps)</i>	3-year: 4.1% <i>(+3 bps)</i>	5-year: 6.9% <i>(+78 bps)</i>	10-year: 5.7% <i>(+93 bps)</i>	
<b>Real Assets</b>	Private Real Estate Private Infrastructure	REITs Public Real Assets		Post-Global Financial Crisis Recovery	Opportunistic Real Estate Global Financial Crisis
	1-year: 10.8% <i>(+320 bps)</i>	3-year: 11.4% <i>(+200 bps)</i>	5-year: 11.8% <i>(+170 bps)</i>	10-year: 6.2% <i>(+7 bps)</i>	
<b>Private Equity</b>	Earnings Growth Distributions/Net Cash Flows Co-Investments Energy (last year)	Entry Prices Competition/Fundraising Currency Energy (3-5 years)		Earnings Growth Distributions/Net Cash Flows Debt	Competition/Fundraising
	1-year: 20.6% <i>(+74 bps)</i>	3-year: 11.7% <i>(+211 bps)</i>	5-year: 13.9% <i>(+88 bps)</i>	10-year: 10.2% <i>(+140 bps)</i>	
<b>Strategic Opportunities Portfolio</b>	Strong Markets Global Macro	Defensive Exposure Managed Futures		N/A	N/A
	1-year: 8.2% <i>(-212 bps)</i>	3-year: 2.8% <i>(-138 bps)</i>	5-year: N/A	10-year: N/A	

*bps = basis point*

hindered value creation over both the short- and long-term. This tracks closely the overview provided by our staff to the Investment Advisory Committee – a group of outside investment and finance professionals that performs an “eyes and ears” function for the Board.

This table provides some insight into the benefits of a diversified asset allocation. For example, while Fixed Income has been a lower absolute performer in recent years, over the past decade it outperformed Public Equity due to the drop in interest rates during and following the global financial crisis. This table also gives a view of the complexity and breadth of conditions and investments that affect the overall VRS plan.

With respect to the Strategic Opportunities Portfolio (SOP), it should be mentioned that performance is not the only metric we use to measure success. This segment of the fund is intended to provide insights and information transfer with regard to management techniques, macroeconomics and newly emerging market opportunities. Contributions in these areas are more difficult to measure, but we believe they will contribute to the success of the total fund. In these qualitative areas, we are quite pleased with the progress of the SOP.

## MARKET OUTLOOK

As economic conditions continue to improve, so does market sentiment and consumer confidence. Over the past year, there is a sense that momentum in the economy is starting to build. However, caution is still in the air. All investment markets are expensive when looking at historical levels and, therefore, somewhat vulnerable to negative developments and/or a change in investor sentiment. The prospect of rising interest rates off their historical lows contributes to that anxiety, especially if central banks tighten too fast or inflation exceeds expectations. The keys here are clear monetary forward guidance and meaningful fiscal reforms that are necessary to maintain momentum.

As we did last year, staff conducted a scenario analysis exercise that looked at symmetrical near-term shifts in projected inflation and economic growth. Given the historically high current asset valuations across all asset classes, this exercise indicated a negatively skewed outcome. That is, positive scenarios did not provide as strong an increase in returns as negative results caused price declines.

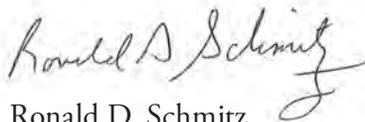
In addition, we analyzed a series of scenarios as defined by various external vendors. Like the symmetrical shifts in the first exercise, the outcomes were negatively skewed – not just in the pattern of returns but also in the likelihood of occurrence.

Given these exercises, the portfolio is positioned somewhat defensively as compared to the policy portfolio. At this point in the business cycle, we don't believe that the fund would be adequately compensated for taking additional risk. Therefore, we are slightly underweight in equities as compared to the policy portfolio. Further, we have lightened up on U.S.

equities in particular, as valuation levels are well above long-term norms when compared to more reasonable valuation metrics in the rest of the world. Given this, we are overweight in both non-U.S. and emerging markets equities.

The VRS investment staff continues to generate good performance and has added real dollars to the fund through its investment activity compared to passive alternatives. Consistent performance over the past 10 years has generated more than an additional \$2 billion for the plan. I am particularly pleased that this favorable performance extends across the investment portfolio as all asset class teams have delivered added value over the long term.

Sincerely,

A handwritten signature in black ink that reads "Ronald D. Schmitz". The signature is written in a cursive style with a large, stylized initial "R".

Ronald D. Schmitz  
Chief Investment Officer

The Investment Section provides detailed information regarding the structure of the investment portfolio. This information includes performance, asset allocations, portfolio highlights, a list of VRS' money managers and public equity commissions for the fiscal year. The section also presents the System's investment management fees and expenses and an investment summary.

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## Investment Account

The VRS Board of Trustees has fiduciary responsibility to invest the fund solely in the interest of the beneficiaries of the System. As established by the *Code of Virginia*, "the Board shall invest the assets of the Retirement System with the care, skill, prudence and due diligence that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims."

Benefit payments are projected to occur over a long period of time, allowing VRS to adopt a long-term investment horizon and asset allocation policy for the management of fund assets. Asset allocation policy is critical because it defines the basic risk and return characteristics of the VRS investment portfolio. Asset allocation targets are established using an asset-liability analysis designed to assist the Board in determining an acceptable volatility target for the fund and an optimal asset allocation policy mix. The asset-liability analysis considers both sides of the VRS balance sheet in order to estimate the potential impact of various asset class mixes on key measures of total plan risk, including the resulting estimated impact on funded status and contribution rates.

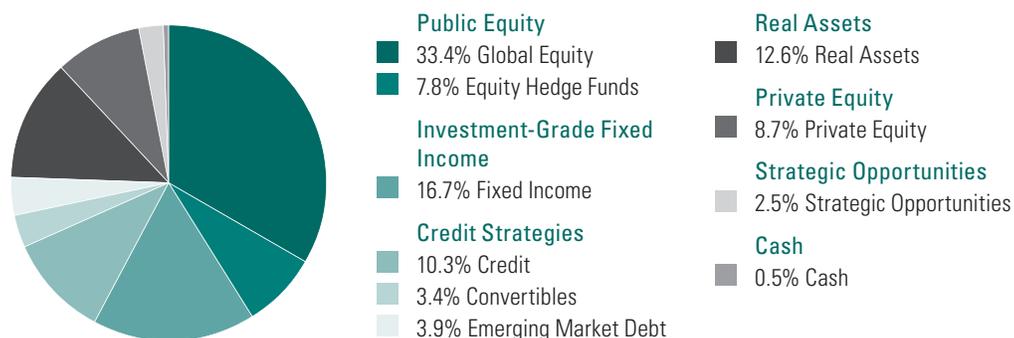
The Chief Investment Officer has been delegated authority by the Board to allocate the System's investments within the approved asset allocation policy and within the Board-approved active risk budget. The total fund active risk budget describes the degree of tolerance for yearly variation in the fund's performance relative to the Total Fund VRS Custom Benchmark. The primary risk measure used for this purpose is Total Fund Tracking Error, calculated as the standard deviation of the difference between the fund's return and the return of the Total Fund VRS Custom Benchmark. From this measure, probability estimates can be derived to help the Board estimate the risk of underperforming the benchmark by certain margins.

The investment staff manages the VRS portfolio on a day-to-day basis according to policies and guidelines established by the Board. The staff manages assets on a direct basis and through outside investment managers. Managers employ both active and passive investment strategies. The Board has established various performance benchmarks to serve as tools for measuring progress toward the achievement of long-term investment goals.

The asset allocation mix of the VRS fund as of June 30, 2017, is shown in Figure 3.1:

### FIGURE 3.1: ASSET ALLOCATION MIX

AS OF JUNE 30, 2017



### FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY

ANNUALIZED DATA FOR THE PERIOD ENDING JUNE 30, 2017

	1 Year	3 Years	5 Years	10 Years
<b>1. Total Fund</b>				
VRS	12.1%	6.2%	9.1%	4.9%
VRS Custom Benchmark <sup>1</sup>	11.8%	5.7%	8.5%	4.5%
<b>2. Total Public Equity</b>				
VRS	17.7%	6.3%	11.6%	4.5%
Custom Benchmark <sup>2</sup>	17.7%	5.7%	10.9%	4.1%
<b>3. Total Investment-Grade Fixed Income</b>				
VRS	0.5%	3.0%	2.8%	5.2%
Custom Benchmark <sup>3</sup>	-0.3%	2.5%	2.2%	4.6%
<b>4. Total Credit Strategies</b>				
VRS	10.1%	4.1%	6.9%	5.7%
Custom Benchmark <sup>4</sup>	9.0%	4.0%	6.1%	4.8%
<b>5. Total Real Assets</b>				
VRS	10.8%	11.4%	11.8%	6.2%
Custom Benchmark <sup>5</sup>	7.6%	9.4%	10.1%	6.1%
<b>6. Total Private Equity</b>				
VRS	20.6%	11.7%	13.9%	10.2%
Custom Benchmark <sup>6</sup>	19.9%	9.6%	13.0%	8.8%
<b>7. Total Strategic Opportunities</b>				
VRS	8.2%	2.8%	n/a	n/a
Custom Benchmark <sup>7</sup>	10.4%	4.2%	n/a	n/a

Investment return calculations were prepared using a time-weighted return methodology based on market value, net of investment expenses.

## FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY, cont.

- <sup>1</sup> The VRS Custom Benchmark is a blend of the Asset Class Benchmarks at policy weights.
- <sup>2</sup> Effective July 2015, the Public Equity Custom Benchmark is a blend of the MSCI ACWI IMI with developed market currencies 50% hedged (net VRS tax rates) index (80%) and the Credit Suisse Equity Long/Short Broad Index (20%).
- <sup>3</sup> Effective July 2014, the Investment-Grade Fixed Income Custom Benchmark consists of the Bloomberg Barclays Capital U.S. Aggregate Index.
- <sup>4</sup> Effective July 2012, the Credit Strategies Custom Benchmark is the weighted average of the Citigroup Broad Investment-Grade Index (10%), the Bank of America Merrill Lynch BB-B Constrained Index (20%), the S&P Performing Loan Index (30%), the Emerging Market Debt Custom Benchmark (20%), and the Bank of America Merrill Lynch All U.S. Convertibles Index (20%). For the four years prior to July 2012, the risk-adjusted benchmark is the weighted average of the Bank of America Merrill Lynch U.S. High Yield BB-B Constrained Index and the Bank of America All Convertibles Index.
- <sup>5</sup> Effective July 2014, the Real Assets Custom Benchmark is the market value weighted blend of the Total Real Estate Benchmark, of which 85% is the NCREIF Private Real Estate Benchmark (ODCE Index (net) lagged by three months) and 15% is the Total REIT Benchmark (FTSE/EPRA/NAREIT Developed REIT Index) and the Other Real Assets Custom Benchmark (the CPI-U Index plus 400 basis points per annum lagged by three months) with modified benchmarking for Other Real Assets during the increased allocation period.
- <sup>6</sup> Effective July 2013, the Private Equity Custom Benchmark is the MSCI ACWI IMI with the Developed Market Currencies 50% Hedged customized for the VRS dividend withholding tax rates lagged by three months plus 250 basis points per annum with modified benchmarking during the increased allocation period.
- <sup>7</sup> Effective January 2015, the Strategic Opportunities Portfolio Custom Benchmark is the market value weighted average of the benchmarks of the mandates within the program

## Portfolio Highlights

### PUBLIC EQUITY

The market value of the Total Public Equity Program as of June 30, 2017, was \$30.7 billion, representing approximately 41% of the total fund. The program is dominated by traditional strategies valued at \$24.9 billion or 81.1%. The program also employs equity-oriented hedge fund strategies valued at \$5.8 billion or 18.9%. The objective of the portfolio is to exceed the Custom Benchmark over longer-term periods, net of all costs. The Custom Benchmark is comprised of 80% MSCI All Country World Index (ACWI) IMI with developed currencies 50% hedged and 20% Credit Suisse Equity Long/Short Broad Index.

The Traditional Public Equity portfolio had 50% invested in domestic equity and 50% in international equity. Less than 1% was invested in passive strategies and 41% was managed internally. At fiscal year-end, the ACWI IMI benchmark was comprised of 52.2% of the MSCI U.S. Investible Market Index (IMI), 36.5% of the MSCI World excluding U.S. IMI (50% hedged) and 11.3% in the MSCI Emerging IMI.

Traditional Public Equity versus the MSCI ACWI IMI strategic sectors and region weights are as follows:

**FIGURE 3.3: TRADITIONAL EQUITY CUSTOM BENCHMARK SECTORS AND REGIONS**

Strategic Sectors	VRS	MSCI ACWI IMI	Regions	VRS	MSCI ACWI IMI
Consumer Discretionary	11.37%	12.40%	North America	53.38%	55.52%
Consumer Staples	8.66%	8.77%	Europe/Middle East/Africa	22.34%	22.79%
Energy	4.71%	5.74%	Asia Pacific	23.20%	20.39%
Financials	18.05%	17.91%	Latin and South America	1.08%	1.30%
Health Care	11.49%	11.17%		100.00%	100.00%
Industrials	12.15%	11.74%			
Information Technology	17.76%	16.50%			
Materials	4.70%	5.59%			
Real Estate	3.08%	4.15%			
Telecommunication Services	3.93%	2.91%			
Utilities	4.10%	3.12%			
	100.00%	100.00%			

Based on Barra's classification of sectors and regions and excludes cash.

The top 10 holdings in the Total Public Equity Program comprised 5.9% of the program at fiscal year-end. Three companies, Verizon Communications, AT&T and GlaxoSmithKline,

were replaced by Alphabet Inc., Samsung Electronics and Berkshire Hathaway Inc. on this year's schedule.

**FIGURE 3.4: PUBLIC EQUITY – TOP 10 EXPOSURES**

AS OF JUNE 30, 2017

Company	Fair Value	Shares
Apple Inc.	\$ 281,788,812	1,956,595
Alphabet Inc.	255,243,076	278,192
Microsoft Corp.	247,673,555	3,593,117
Johnson & Johnson	210,756,887	1,593,143
Roche Holding AG	145,721,852	571,460
Samsung Electronics	142,755,251	79,112
Facebook Inc.	141,121,308	934,702
Amazon.com Inc.	140,875,944	145,533
Berkshire Hathaway Inc.	128,532,691	758,887
Exxon Mobil Corp.	125,220,707	1,551,105

Aggregated various share classes based on parent company.

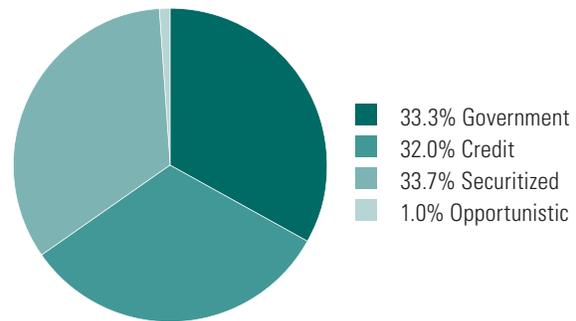
## FIXED INCOME

VRS invests a portion of its portfolio in fixed income investments to reduce total fund volatility, produce income and provide for some protection in the event of a deflationary environment. The market value of the Fixed Income Program as of June 30, 2017, was \$12.4 billion, representing 16.7% of the total fund.

The Fixed Income Program is internally invested in a diversified portfolio of high-quality assets, such as government securities, corporate securities and mortgage-backed securities. The objective of the program is to exceed the return of the Bloomberg Barclays U.S. Aggregate Index, while staying in compliance with risk limits. For fiscal year 2017, the return of the program was 0.5% versus a return of -0.3% for the benchmark.

**FIGURE 3.5: FIXED INCOME PORTFOLIO BY SECTOR ALLOCATION**

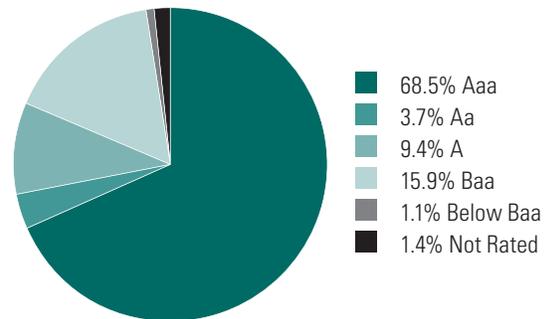
AS OF JUNE 30, 2017



**FIGURE 3.6: FIXED INCOME PORTFOLIO BY CREDIT QUALITY BREAKDOWN**

AS OF JUNE 30, 2017

Source: Moody's Credit Rating Service



**FIGURE 3.7: FIXED INCOME – TOP 10 HOLDINGS BY MARKET VALUE**

AS OF JUNE 30, 2017

Security	Par Value	Fair Value
TREASURY NOTE	\$ 160,000,000	\$ 160,151,322
TREASURY NOTE	127,000,000	128,265,706
TREASURY NOTE	115,000,000	115,921,034
TREASURY NOTE	115,000,000	115,244,460
TREASURY NOTE	112,000,000	112,448,340
TREASURY BOND	111,300,000	111,269,005
TREASURY NOTE	103,000,000	103,234,889
FHLMC MBS	95,335,803	95,894,842
TREASURY NOTE	85,000,000	85,269,920
TREASURY BOND	60,000,000	78,062,883

### SHORT-TERM INVESTMENTS

Generally, VRS desires to remain fully invested at all times and seeks to minimize its holdings of cash investments. Temporary cash balances are invested in short-term money market instruments with the goal of maintaining high credit quality and liquidity.

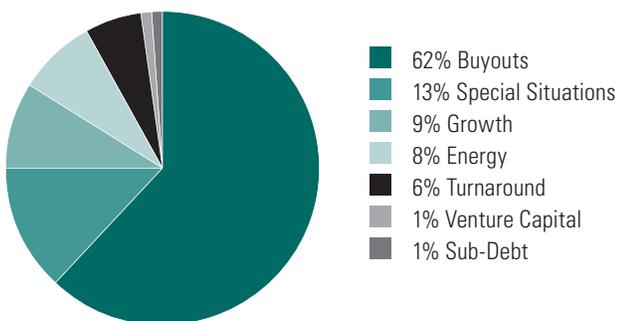
### PRIVATE EQUITY

VRS invests in private equity to achieve returns greater than those available in the public equity markets. Specifically, the program seeks to outperform the Morgan Stanley Capital International – All Country World Index (MSCI ACWI) by 2.5% per year. Program returns are calculated on both a time-weighted basis and a dollar-weighted or internal rate-of-return (IRR) basis. On a time-weighted basis, the program return for fiscal year 2017 was 20.6%. On a dollar-weighted or IRR basis, the private equity one-year return was 19.3% as of March 31, 2017.

As of June 30, 2017, the carrying value of the program was approximately \$6.5 billion. Most of the program is invested in limited partnerships. Sectors in which the program invests include leveraged buyouts, venture capital, growth, sub-debt, turnaround, energy and special situations. The Private Equity Program’s market value by subclass was as follows:

**FIGURE 3.8: PRIVATE EQUITY PROGRAM**

AS OF JUNE 30, 2017



### REAL ASSETS

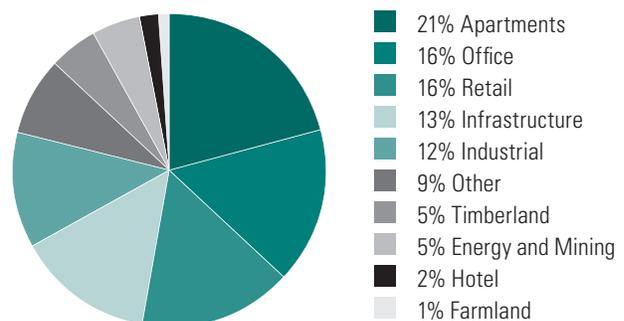
A portion of the VRS portfolio is invested in real assets to help diversify the total fund by providing exposure to asset classes and sectors that offer low historical correlations with the public markets and with the additional objectives of generating competitive risk-adjusted returns, significant operating cash flows and inflation linkages. The portfolio continued to grow in fiscal year 2017, producing a 10.8% return and outperforming the benchmark by 320 basis points. The private real estate portfolio delivered a 10.7% return while the real estate investment trusts (REITs) produced a total return of 1.5%. Investments in infrastructure, natural resources, timberland and farmland produced a 15.5% return for the fiscal year.

The percentage of the total fund represented by the real assets portfolio decreased slightly over the course of the year from 12.9% to 12.6%, due largely to the growth of the overall fund. In dollar terms, the real asset portfolio grew \$640 million due primarily to asset income and appreciation, with distributions from investments outpacing new contributions.

At fiscal year-end, the portfolio was composed of approximately 64.6% private real estate, 11.2% REITs, 13.5% infrastructure, 5.4% timberland, 4.7% energy and mining and 0.6% farmland. Portfolio leverage as a percentage of total real assets was 28.5% as of June 30, 2017.

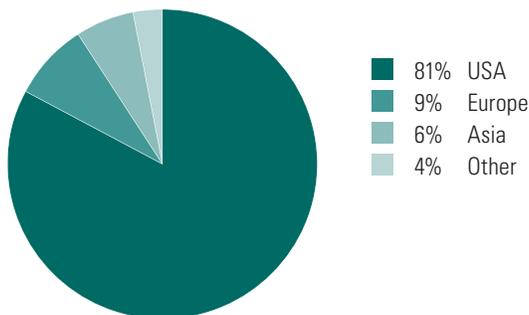
**FIGURE 3.9: REAL ASSETS BY SECTOR**

AS OF JUNE 30, 2017



**FIGURE 3.10: REAL ASSETS BY GEOGRAPHIC REGION**

AS OF JUNE 30, 2017

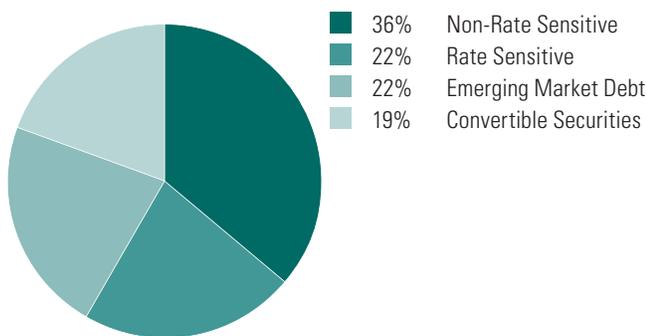


**CREDIT STRATEGIES**

VRS allocates a portion of the portfolio to credit-related investments. The Credit Strategies program provides an alternative arena for generating attractive returns for the plan. The objective of the program is to provide attractive returns relative to the Custom Credit Strategies benchmark. For the fiscal year, the program returned 10.1%, while the program’s custom benchmark returned 9.0%.

**FIGURE 3.11: CREDIT STRATEGIES PROGRAM**

AS OF JUNE 30, 2017



**CURRENCY**

VRS has currency risk due to its investments in non-dollar denominated assets. To help control this risk, VRS has a Currency Program that uses a combination of internal hedging strategies and external managers. The external currency management part aims to lower overall Fund volatility and provide diversified alpha across the Fund. Investments include constrained positions in developed and emerging market currencies. The currency positions are typically traded on a forward basis and thus no capital is necessary at the time of the trade. At forward settlement date, gains and losses are received/paid out against a notional value. The current notional value, as of June 30, 2017, was \$2.6 billion. For the fiscal year, it returned 0.9% versus a zero benchmark.

**STRATEGIC OPPORTUNITIES PORTFOLIO**

The Board of Trustees approved the Strategic Opportunities Portfolio on January 1, 2013, to manage strategies that staff believes would add value to the total fund but would otherwise not fit in individual program mandates or benchmarks. As of June 30, 2017, the portfolio had a market value of \$1.8 billion and was invested with three multi-asset class public investments managers and two multi-asset class private investments managers. During the fiscal year, it returned 8.2% against the program’s custom benchmark, which returned 10.4%.

**MORE INFORMATION**

A complete list of the investment portfolio is available upon request. Address requests to the VRS FOIA Coordinator, Virginia Retirement System, P.O. Box 2500, Richmond, VA 23218-2500. More information is available at [www.varetire.org/legal/foia.asp](http://www.varetire.org/legal/foia.asp).

## VRS Money Managers

The diversified investment structure as of June 30, 2017, is reflected in the following tables, which list

VRS managers by investment program and style.

### PUBLIC EQUITY MONEY MANAGERS

External Managers – Top 10 Managers	Style Description
Acadian Asset Management	Emerging, Non-U.S. Small
Ariel	Global
Arrowstreet Capital	Global
Baillie Gifford	Global
Epoch	Global
J.P. Morgan	U.S. Large Cap
LSV Asset Management	Global, Non-U.S. Small
Nordea	Emerging, Global
Select	U.S. Small Cap
TimesSquare	U.S. Small Cap
Internal Portfolios	Style Description
Afton	U.S. Small
Matoaka	Non-U.S. Large
Mobjack	U.S. Large
Piedmont	Non-U.S. Large
Potomac	U.S. Large
Tuckahoe	Emerging
VRS Energy	Overlay Global Energy
Top 10 Equity Hedge Funds	Style Description
Cevian	Activist
Eminence	Long/Short
Glenhill Capital	Long/Short
Kylin	Long/Short
Lansdowne Partners	Long/Short
Maverick Capital	Long/Short
New Mountain Capital	Long/Short
Select – Cooper Square	Long/Short
Theleme	Long/Short
ValueAct Capital	Activist

### FIXED INCOME

Internal Portfolios	Style Description
VRS Credit	High-Quality Corporates
VRS Fixed Income Opportunistic	Various Fixed Income Related Assets
VRS Government	Treasuries, Agencies and other Government-Related
VRS Securitized	Mortgage and other Asset-Backed Securities

## PRIVATE EQUITY – TOP 10 MANAGERS

### Style Description

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Apax Partners	Buyout
First Reserve Corporation	Energy
Grosvenor	Customized Separate Account
Hellman and Friedman	Buyout
Littlejohn & Co.	Turnaround
Natural Gas Partners	Energy
Nordic Capital	Buyout
Olympus Partners	Buyout
TA Associates	Growth
TPG Partners	Buyout

## CREDIT STRATEGIES – TOP 10 MANAGERS

### Style Description

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Advent Capital	Convertibles
Anchorage Capital	Hedge Fund, Opportunistic
Beach Point Capital Management	Distressed, Leveraged Loans, Opportunistic
BlueBay Asset Management	Emerging Market Debt
Oaktree Capital Management	Convertibles, Distressed, High-Yield, Mezzanine
Pacific Investment Management Company	Emerging Market Debt, High-Yield
Payden & Rygel	Emerging Market Debt
Prudential	High-Yield, Investment-Grade, Mezzanine
Solus	Hedge Fund, Opportunistic
Zazove Associates	Convertibles

## STRATEGIC OPPORTUNITIES PORTFOLIO

### Style Description

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AQR	Multi-Asset Class Public Investments
Bridgewater	Multi-Asset Class Public Investments
Farallon	Multi-Asset Class Public Investments
Carlyle	Multi-Asset Class Private Investments
KKR	Multi-Asset Class Private Investments

## CURRENCY

### Style Description

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FDO	Developed and Emerging
First Quadrant	Developed

## REAL ASSETS – TOP 10 MANAGERS

### Style Description

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Blackstone Real Estate Partners	Core, Enhanced Core, Opportunistic Real Estate & REITs
Clarion Partners	Enhanced Core Real Estate
Industry Funds Management	Global Infrastructure
J.P. Morgan Asset Management, Inc.	Core Real Estate
LaSalle Investment Management	Core & Opportunistic Real Estate
Morgan Stanley	Core, Enhanced Core, Opportunistic Real Estate, International REITs & Global Infrastructure
PGIM	Core & Enhanced Core Real Estate
Pritzker Realty Group	Opportunistic Real Estate
Stonepeak	U.S. Infrastructure
VRS – Internal Equity Management	U.S. REITs

## Public Equity Commissions

AS OF JUNE 30, 2017

Broker	Commission	Broker	Commission
National Financial Services Corp., New York	\$ 1,200,412.06	UBS Securities LLC, Stamford	\$ 202,192.57
Credit Suisse, New York (CSUS)	\$ 963,289.75	Pershing LLC, Jersey City	\$ 184,940.00
Goldman Sachs & Co., New York	\$ 701,580.20	Citigroup Global Markets, Inc., New York	\$ 164,213.52
Merrill Lynch Pierce Fenner & Smith Inc., New York	\$ 452,541.03	Goldman Sachs International, London (GSILGB2X)	\$ 108,769.37
Deutsche Bank Securities, Inc., New York (NWSCUS33)	\$ 398,413.20	Jefferies & Co. Inc., New York	\$ 106,570.29
Morgan Stanley & Co., Inc., New York	\$ 347,104.34	Other Brokers	\$ 2,408,739.93
Instinet Europe Limited, London	\$ 285,282.33		
Merrill Lynch International London Equities	\$ 274,562.53	<b>Total FY 2017</b>	<b>\$ 8,030,366.50</b>
Sanford C. Bernstein & Co., New York	\$ 231,755.38		

## SCHEDULE OF INVESTMENT EXPENSES

FOR THE YEAR ENDED JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Assets Under Management	Management Fees and Expenses
<b>External Asset Management:</b>		
Public Equity Managers	\$ 12,113,196	\$ 52,086
Fixed Income Managers	3,364,503	1,205
Credit Strategies Managers	7,876,252	57,135
Real Assets Managers	11,576,907	86,222
Private Equity Managers	8,598,335	94,367
Hedge Funds Managers	6,955,297	76,374
Strategic Opportunity Portfolio	1,567,488	15,386
Currency Managers*	—	2,842
<b>Internal Management:</b>	24,484,483	31,430
<b>Miscellaneous Fees and Expenses:</b>		
Custodial Fees	—	4,500
Legal Fees	—	676
Other Fees and Expenses	—	2,035
<b>Total</b>	<b>\$ 76,536,461</b>	<b>\$ 424,258</b>

\* The fees related to Active Currency Overlay Program are based on the managers' notional account values. The total notional value at June 30, 2017, was \$2.6 billion.

## Investment Summary: Defined Benefit Plans

In accordance with Section 51.1-124.31 of the *Code of Virginia* (1950), as amended, the Board of Trustees has pooled substantially all defined benefit plan assets of the Virginia Retirement System, the State Police Officers' Retirement System, the Judicial Retirement System, the Group Life Insurance Fund

and the Retiree Health Insurance Credit Fund into a common investment pool. The common investment pool of the pension trust funds and other trust funds held the following composition of investments at June 30, 2017 and 2016:

	(EXPRESSED IN THOUSANDS)			
	2017 Fair Value	Percent of Total Value	2016 Fair Value	Percent of Total Value
<b>Bonds and Mortgage Securities:</b>				
U.S. Government and Agencies	\$ 3,840,770	5.01%	\$ 4,200,844	6.10%
Mortgage Securities	4,165,151	5.44%	3,521,350	5.11%
Corporate and Other Bonds	13,954,761	18.21%	13,084,085	19.00%
<b>Total Bonds and Mortgage Securities</b>	<b>21,960,682</b>	<b>28.66%</b>	<b>20,806,279</b>	<b>30.22%</b>
<b>Common and Preferred Stocks</b>	<b>24,329,065</b>	<b>31.75%</b>	<b>21,219,259</b>	<b>30.82%</b>
<b>Index and Pooled Funds</b>				
Equity Index and Pooled Funds	9,630,071	12.57%	8,481,970	12.32%
Fixed Income Commingled Funds	1,151,868	1.50%	1,179,229	1.71%
<b>Total Index and Pooled Funds</b>	<b>10,781,939</b>	<b>14.07%</b>	<b>9,661,199</b>	<b>14.03%</b>
<b>Real Assets</b>	<b>8,279,144</b>	<b>10.81%</b>	<b>7,666,278</b>	<b>11.13%</b>
<b>Private Equity</b>	<b>11,114,649</b>	<b>14.51%</b>	<b>9,053,853</b>	<b>13.15%</b>
<b>Short-Term Investments</b>				
Treasurer of Virginia – LGIP Investment Pool	78,861	0.11%	306,875	0.45%
TBC Pooled Employee Trust Fund	–	0.00%	64,709	0.09%
Foreign Currencies	70,983	0.09%	74,203	0.11%
<b>Total Short-Term Investments</b>	<b>149,844</b>	<b>0.20%</b>	<b>445,787</b>	<b>0.65%</b>
<b>Total Investments</b>	<b>\$ 76,615,323</b>	<b>100.00%</b>	<b>\$ 68,852,654</b>	<b>100.00%</b>

## Description of Hybrid Defined Contribution Plan

Defined contribution plan assets for Hybrid Retirement Plan members are maintained in two separate accounts. The Hybrid 401(a) account contains the hybrid plan member and employer mandatory contributions and the employer match on the voluntary member contributions. The

Hybrid Deferred Compensation Plan (457) contains the hybrid plan member's voluntary member contributions. The schedule below shows the assets in each investment option and the accumulated plan assets in each option.

### HYBRID PARTICIPANT ACCOUNT PLAN ASSETS BY FUND OPTION

AS OF JUNE 30, 2017

Fund Name	Hybrid 401(a)	Hybrid 457	Total
Retirement Portfolio	\$ 1,354,221	\$ 537,775	\$ 1,891,996
Target Date 2020 Portfolio	5,277,819	2,542,927	7,820,746
Target Date 2025 Portfolio	8,487,572	3,647,531	12,135,103
Target Date 2030 Portfolio	11,067,189	5,639,530	16,706,719
Target Date 2035 Portfolio	13,366,272	6,326,225	19,692,497
Target Date 2040 Portfolio	13,441,582	4,989,054	18,430,636
Target Date 2045 Portfolio	15,799,719	5,670,924	21,470,643
Target Date 2050 Portfolio	20,151,700	5,858,486	26,010,186
Target Date 2055 Portfolio	33,164,822	7,132,686	40,297,508
Target Date 2060 Portfolio	5,039,058	1,087,099	6,126,157
Money Market Fund	1,017,177	135,770	1,152,947
Stable Value Fund	243,040	384,940	627,980
Bond Fund	180,424	232,435	412,859
Inflation-Protected Bond Fund	55,251	83,222	138,473
High-Yield Bond Fund	173,319	379,155	552,474
Stock Fund	2,157,288	2,719,193	4,876,481
Small/Mid-Cap Stock Fund	911,284	1,117,180	2,028,464
International Stock Fund	543,935	732,760	1,276,695
Global Real Estate Fund	277,875	345,367	623,242
VRS Investment Portfolio – Interim Account	7,177	3,428	10,605
VRS Investment Portfolio	33,530	28,955	62,485
Self-Directed Brokerage	18,842	3,821	22,663
<b>Total Plan Assets</b>	<b>\$132,769,096</b>	<b>\$49,598,463</b>	<b>\$182,367,559</b>

## Description of Defined Contribution Plans Investment Options

Participants with the System's Hybrid Retirement Plan benefit structure have access to a number of core investment options for contributions to their defined contribution plans. These options are intended to provide participants with a variety of investment choices while controlling the costs associated with those choices. In addition to the option-specific annual operating expense detailed in the Investment Option Performance Summary, participants pay an annual record-keeping fee of \$30.50 that is deducted from their accounts on a monthly basis (approximately \$2.54 per month).

Participants with multiple accounts in the Plan pay only one annual fee of \$30.50. At June 30, 2017, the plans provided the following core investment options to plan participants. *Note: Some sector allocations may not total 100% due to rounding.*

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### DO-IT-FOR-ME FUNDS

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**Retirement Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that object, the portfolio will be broadly diversified across global asset classes.

U.S. Bonds: 51.1% U.S. Large-Cap Stocks: 20.6% International Stocks: 11.4%  
U.S. Inflation-Index Bonds: 8.6% U.S. Small/Mid-Cap Stocks: 4.2%  
Commodities: 3.7% Developed Real Estate: 0.5%

**Target Date 2020 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Bonds: 44.1% U.S. Large-Cap Stocks: 24.7% International Stocks: 14.6%  
U.S. Inflation-Index Bonds: 7.1% U.S. Small/Mid-Cap Stocks: 3.7%  
Commodities: 3.7% Developed Real Estate: 2.1%

**Target Date 2025 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Bonds: 33.8% U.S. Large-Cap Stocks: 30.6% International Stocks: 18.5%  
U.S. Inflation-Index Bonds: 5.3% Developed Real Estate: 5.1%  
Commodities: 3.7% U.S. Small/Mid-Cap Stocks: 3.0%

**Target Date 2030 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 35.7% U.S. Bonds: 24.8% International Stocks: 21.8%  
Developed Real Estate: 7.7% Commodities: 3.8%  
U.S. Inflation-Index Bonds: 3.7% U.S. Small/Mid-Cap Stocks: 2.4%

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**Target Date 2035 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 40.7% International Stocks: 25.1% U.S. Bonds: 16.1%  
Developed Real Estate: 10.3% Commodities: 3.9%  
U.S. Inflation-Index Bonds: 2.3% U.S. Small/Mid-Cap Stocks: 1.8%

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**Target Date 2040 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 44.9% International Stocks: 28.0%  
Developed Real Estate: 12.6% U.S. Bonds: 8.3% Commodities: 4.0%  
U.S. Small/Mid-Cap Stocks: 1.3% U.S. Inflation-Index Bonds: 1.0%

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**Target Date 2045 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 46.8% International Stocks: 30.2%  
Developed Real Estate: 14.5% Commodities: 4.3% U.S. Bonds: 2.8%  
U.S. Small/Mid-Cap Stocks: 1.2% U.S. Inflation-Index Bonds: 0.3%

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**Target Date 2050 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 47.5% International Stocks: 30.9% Developed Real Estate: 15.1%  
Commodities: 4.4% U.S. Small/Mid-Cap Stocks: 1.1% U.S. Bonds: 1.0%

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**Target Date 2055 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 47.5% International Stocks: 30.9% Developed Real Estate: 15.1%  
Commodities: 4.4% U.S. Small/Mid-Cap Stocks: 1.1% U.S. Bonds: 1.0%

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**Target Date 2060 Portfolio:** Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large-Cap Stocks: 47.4% International Stocks: 30.9% Developed Real Estate: 15.1%  
Commodities: 4.4% U.S. Small/Mid-Cap Stocks: 1.1% U.S. Bonds: 1.1%

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## HELP-ME-DO-IT FUNDS

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**Money Market Fund:** Seeks to provide a high level of current income as is consistent with liquidity and stability of principal.

Other Repurchase Agreement: 39.9% Asset-Backed Commercial Paper: 17.1%  
Time Deposits: 14.4% Commercial Paper: 12.8% Certificate of Deposit: 9.3%  
Government Agency Debt: 3.4% Government Agency Repurchase Agreement: 2.1%  
Treasury Debt: 0.6% Treasury Repurchase Agreement: 0.4%

**Stable Value Fund:** Seeks to provide safety of principal, while earning a reasonable level of interest income consistent with an underlying portfolio of short- to intermediate-duration high-quality fixed income (bond) securities, and liquidity to accommodate participant transactions.

Corporates: 26.2% Agency MBS: 23.1% Asset-Backed: 15.3% U.S. Treasury/Agency: 12.5%  
Cash/Equivalents: 8.7% Other U.S. Government: 5.4% CMBS: 5.0%  
Taxable Municipals: 3.1% Non-Agency MBS 0.7% Municipal MBS: 0.1%

**Bond Fund:** Seeks to track the performance of the Bloomberg Barclays Aggregate Bond Index. The index is an unmanaged index that represents the broad U.S. investment-grade bond market and is comprised of U.S. treasury securities, government agency bonds, corporate bonds, mortgage-backed securities, asset-backed securities and a small amount of foreign bonds traded in the U.S.

Treasury: 37.1% Mortgages: 27.9% Industrials: 15.4% Financials: 7.8%  
Non-U.S. Credit: 4.6% Agencies: 2.1% CMBS: 1.8% Utilities: 1.7%  
Taxable Municipals: 0.6% Asset-Backed Securities: 0.5% Cash: 0.3% Hybrid ARM: 0.1%

**Inflation-Protected Bond Fund:** Seeks to track the performance of the Bloomberg Barclays U.S. Treasury Inflation-Protected Securities Index. The index is an unmanaged index that represents the U.S. Treasury Inflation-Protection Securities (TIPS) market. The index includes investment-grade TIPS with one or more years to final maturity.

U.S. Treasury: 98.2% Cash: 1.8%

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**High-Yield Bond Fund:** Seeks to achieve returns that exceed, over time, its benchmark, the Bank of America (BofA) Merrill Lynch U.S. High-Yield BB-B Rated Constrained Index. The index is an unmanaged index of BB-B rated securities that caps any single issuer exposure to 2.0%. The index is indicative of the higher quality high-yield bond market.

Communications: 26.0% Consumer Non-Cyclical: 14.8% Consumer Cyclical: 14.8%  
Energy: 10.8% Technology: 10.3% Capital Goods: 7.3% Other/Cash: 4.8% Basic Industry: 4.1%  
Financial/REIT: 2.1% Other Industrial: 2.0% Transportation: 2.0% Utilities: 1.0%

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**Stock Fund:** Seeks to track the performance of the Standard & Poor's 500 Index. The index is an unmanaged index that represents the broad large-capitalization U.S. stock market and is comprised of 500 widely held U.S. stocks chosen by Standard & Poor's.

Information Technology: 22.3% Financials: 14.6% Health Care: 14.5% Consumer Discretionary: 12.3%  
Industrials: 10.3% Consumer Staples: 9.1% Energy: 6.0%  
Utilities: 3.2% Materials: 2.9% Real Estate: 2.9% Telecommunications Services: 2.1%

---

**Small/Mid-Capitalization Stock Fund:** Seeks to track the performance of the Russell 2500 Index. The index is an unmanaged index that represents the broad middle- to smaller-capitalization U.S. stock market.

Financials: 16.4% Information Technology: 16.0% Industrials: 15.5%  
Consumer Discretionary: 12.9% Health Care: 11.9% Real Estate: 10.0% Materials: 5.9%  
Energy: 4.3% Utilities: 3.8% Consumer Staples: 2.9% Telecommunication Services: 0.6%

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**International Stock Fund:** Seeks to track the performance of the MSCI ACWI ex-U.S. IMI Index. The index is an unmanaged index that represents the equity performance of large, mid- and small-cap segments of developed and emerging markets, excluding the U.S.

Financials: 21.5% Industrials: 13.2% Consumer Discretionary: 11.8% Information Technology: 11.0%  
Consumer Staples: 9.5% Materials: 8.0% Health Care: 8.0% Energy: 5.9%  
Real Estate: 4.2% Telecommunication Services: 3.9% Utilities: 3.1%

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**Global Real Estate Fund:** Seeks to track the performance of the FTSE EPRA/NAREIT Developed Index. The index is an unmanaged index that is designed to reflect the performance of listed real estate companies worldwide including the U.S.

Retail REITs: 20.6% Office REITs: 11.5% Diversified REITs: 10.9% Residential REITs: 10.1%  
Specialized REITs: 9.6% Diversified Real Estate Activities: 9.2%  
Real Estate Operating Companies: 8.2% Health Care REITs: 7.4% Industrial REITs: 6.5%  
Hotel & Resort REITs: 3.7% Real Estate Development: 2.1% Health Care Facilities: 0.2%  
Hotels, Resorts & Cruise Lines: 0.1% Asset Management & Custody Banks: 0.1%

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**VRS Investment Portfolio (VRSIP):** Seeks to maximize return while managing risk within an acceptable range. Due to the long-term nature of the defined benefit plan's liabilities, the horizon for investment decisions is generally defined as 10 years or longer.

Public Equity: 41.2% Credit Strategies: 17.6% Fixed Income: 16.7% Real Assets: 12.6%  
Private Equity: 8.7% Strategic Opportunities Portfolio: 2.5% Cash: 0.5%

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#### DO-IT-MYSELF FUNDS

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**Self-Directed Brokerage Account (SDBA):** Allows investors to select from thousands of publicly traded mutual funds, exchange-traded funds (ETFs) and individual securities in addition to the available core investment options. The SDBA option is offered through TD Ameritrade. The SDBA option is for knowledgeable investors who acknowledge and understand the risks and costs associated with the investments contained in this option. In addition to the annual record-keeping fee and operating expenses, this option is subject to transaction fees charged by TD Ameritrade and investment management-related fees and expenses for the funds or investments selected. ICMA-RC charges a \$50 setup fee when a member establishes a SDBA and deducts the fee from the member's ICMA-RC account.

## Investment Option Performance Summary: Defined Contribution Plans

AS OF JUNE 30, 2017

(RETURNS GREATER THAN ONE YEAR ARE ANNUALIZED)

DO-IT-FOR-ME PATH: TARGET DATE PORTFOLIOS

Investment Options	Inception Date	1 Year	3 Years	5 Years	10 Years or Since Inception	Total Annual Operating Expenses	
						As a %	Per \$1,000
<b>Retirement Portfolio</b> Custom Benchmark <sup>1</sup>	<b>08/01/05</b>	<b>6.12%</b> 6.08%	<b>3.27%</b> 3.24%	<b>5.21%</b> 5.16%	<b>4.80%</b> 4.77%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2020 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>08/01/05</b>	<b>7.68%</b> 7.62%	<b>3.60%</b> 3.53%	<b>6.43%</b> 6.37%	<b>4.29%</b> 4.27%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2025 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>07/05/06</b>	<b>9.51%</b> 9.41%	<b>4.00%</b> 3.92%	<b>7.26%</b> 7.19%	<b>4.38%</b> 4.33%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2030 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>08/01/05</b>	<b>11.19%</b> 11.04%	<b>4.38%</b> 4.26%	<b>8.01%</b> 7.92%	<b>4.43%</b> 4.37%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2035 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>07/05/06</b>	<b>12.81%</b> 12.62%	<b>4.71%</b> 4.57%	<b>8.68%</b> 8.57%	<b>4.47%</b> 4.39%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2040 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>08/01/05</b>	<b>14.26%</b> 14.02%	<b>4.99%</b> 4.83%	<b>9.28%</b> 9.15%	<b>4.48%</b> 4.38%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2045 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>07/05/06</b>	<b>15.11%</b> 14.84%	<b>5.15%</b> 4.96%	<b>9.78%</b> 9.64%	<b>4.45%</b> 4.34%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2050 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>09/30/07</b>	<b>15.38%</b> 15.11%	<b>5.18%</b> 4.99%	<b>10.15%</b> 10.02%	<b>4.50%</b> 4.39%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2055 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>05/19/10</b>	<b>15.36%</b> 15.11%	<b>5.11%</b> 4.94%	<b>10.45%</b> 10.32%	<b>10.23%</b> 10.12%	<b>0.08%</b>	<b>\$0.80</b>
<b>Target Date 2060 Portfolio</b> Custom Benchmark <sup>1</sup>	<b>11/17/14</b>	<b>15.36%</b> 15.11%	<b>N/A</b> N/A	<b>N/A</b> N/A	<b>6.12%</b> 5.91%	<b>0.08%</b>	<b>\$0.80</b>

HELP-ME-DO-IT PATH: INDIVIDUAL OPTIONS

Investment Options	Inception Date	Total Annual Operating Expenses					
		1 Year	3 Years	5 Years	10 Years or Since Inception	As a %	Per \$1,000
<b>Money Market Fund</b>	<b>11/01/99</b>	<b>0.83%</b>	<b>0.34%</b>	<b>0.21%</b>	<b>0.72%</b>	<b>0.08%</b>	<b>\$0.80</b>
Benchmark: Bloomberg Barclays 3-Month Treasury Bill Index							
		0.50%	0.25%	0.19%	0.62%		
Yield as of June 30, 2017 was 1.25%							
<b>Stable Value Fund</b>	<b>02/01/95</b>	<b>1.74%</b>	<b>1.59%</b>	<b>1.70%</b>	<b>2.61%</b>	<b>0.28%</b>	<b>\$2.80</b>
Custom Benchmark <sup>2</sup>							
		1.45%	1.49%	1.32%	1.67%		
Yield as of June 30, 2017 was 1.84%							
<b>Bond Fund</b>	<b>11/01/99</b>	<b>-0.26%</b>	<b>2.55%</b>	<b>2.31%</b>	<b>4.57%</b>	<b>0.04%</b>	<b>\$0.40</b>
Benchmark: Bloomberg Barclays U.S. Aggregate Bond Index							
		-0.31%	2.48%	2.21%	4.48%		
<b>Inflation-Protected Bond Fund</b>	<b>07/30/02</b>	<b>-0.43%</b>	<b>0.72%</b>	<b>0.35%</b>	<b>4.35%</b>	<b>0.03%</b>	<b>\$0.30</b>
Benchmark: Bloomberg Barclays U.S. Treasury Inflation-Protected Securities Index							
		-0.63%	0.63%	0.27%	4.27%		
<b>High-Yield Bond Fund</b>	<b>05/31/04</b>	<b>11.33%</b>	<b>4.91%</b>	<b>6.78%</b>	<b>7.54%</b>	<b>0.40%</b>	<b>\$4.00</b>
Benchmark: BofA Merrill Lynch U.S. High-Yield BB-B Constrained Index							
		11.15%	4.56%	6.67%	7.14%		
<b>Stock Fund</b>	<b>11/01/99</b>	<b>17.91%</b>	<b>9.65%</b>	<b>14.67%</b>	<b>7.23%</b>	<b>0.02%</b>	<b>\$0.20</b>
Benchmark: S&P 500 Index							
		17.90%	9.61%	14.63%	7.18%		
<b>Small/Mid-Cap Stock Fund</b>	<b>11/01/99</b>	<b>19.97%</b>	<b>7.10%</b>	<b>14.17%</b>	<b>7.59%</b>	<b>0.04%</b>	<b>\$0.40</b>
Benchmark: Russell 2500 Index <sup>3</sup>							
		19.84%	6.93%	14.04%	7.46%		
<b>International Stock Fund</b>	<b>11/01/99</b>	<b>20.56%</b>	<b>1.18%</b>	<b>8.59%</b>	<b>1.11%</b>	<b>0.10%</b>	<b>\$1.00</b>
Benchmark: MSCI ACWI ex-U.S. IMI Index <sup>4</sup>							
		20.30%	0.90%	8.29%	0.84%		
<b>Global Real Estate Fund</b>	<b>10/01/02</b>	<b>1.46%</b>	<b>4.64%</b>	<b>8.27%</b>	<b>4.95%</b>	<b>0.11%</b>	<b>\$1.10</b>
Benchmark: FTSE EPRA/NAREIT Developed Index <sup>5</sup>							
		0.21%	3.67%	7.50%	4.70%		
<b>VRS Investment Portfolio (VRSIP)</b>	<b>07/01/08</b>	<b>12.13</b>	<b>6.15</b>	<b>9.12</b>	<b>4.87</b>	<b>0.58%</b>	<b>\$5.80</b>
VRS Custom Benchmark <sup>6</sup>							
		11.77	5.67	8.51	4.46		

<sup>1</sup> Benchmarks are calculated using blended returns of third-party indices that proportionately reflect the respective weightings of the Portfolios' asset classes. Weightings are adjusted quarterly to reflect the Portfolios' asset allocation shifts over time. Indices currently used to calculate the custom benchmarks are Russell 1000 Index, Russell 2000 Index, MSCI ACWI ex-U.S. IMI Index, Bloomberg Barclays U.S. Aggregate Bond Index, Bloomberg Barclays U.S. Treasury Inflation-Protected Securities Index, FTSE EPRA/NAREIT Developed Index and the Bloomberg Commodity Index Total Return.

<sup>2</sup> Effective August 2016, the benchmark represents a hypothetical return generated by the monthly yields of actively traded U.S. Treasuries based on [50% 2-year maturity + 50% 3-year maturity] plus an annualized spread of 0.25% and is representative of the Fund's expected return profile, given how the Fund is managed and book value accounting treatment. Prior to August 2016, the custom benchmark was based on the monthly yield of actively traded U.S. Treasuries with a 3-year maturity plus an annualized spread of 0.50%. The benchmark returns are linked.

<sup>3</sup> Effective July 2012, the performance benchmark is the Russell 2500 Index. Prior to July 2012, the performance benchmark was the Russell Small-Cap Completeness Index. The benchmark returns are linked.

<sup>4</sup> Effective August 2016, the performance benchmark is the MSCI ACWI ex-U.S. IMI Index. It was the MSCI World ex-U.S. Index from July 2012 through July 2016, and prior to July 2012, it was the MSCI EAFE Index. The benchmark returns are linked.

<sup>5</sup> Effective July 2012, the performance benchmark is the FTSE EPRA/NAREIT Developed Index. Prior to July 2012, the performance benchmark was the Dow Jones U.S. Select REIT Index. The benchmark returns are linked.

<sup>6</sup> The VRS Custom Benchmark is a blend of the asset class benchmarks at policy weights.

At VRS, we value

# CONFIDENTIALITY

*confidentiality*

Confidentiality is exercising discretion and performing our ethical duty to protect the personal information of our members, retirees, beneficiaries and employers. We safeguard personal data and sensitive VRS information that is viewed, acquired or otherwise accessible during the course of VRS employment.

# 4 Actuarial Section

## Actuarial Section

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Actuary's Certification Letter:  
Pension Plans



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December 16, 2016

**Board of Trustees**

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

Dear Trustees:

We are pleased to submit the results of the annual actuarial valuation for the following divisions of the Virginia Retirement System (VRS), prepared as of June 30, 2016.

- State Employees
- Teachers
- State Police (SPORS)
- Judicial
- Virginia Law Officers (VaLORS)

In addition, this report includes information in aggregate on the actuarial valuations of the political subdivisions participating in VRS as of June 30, 2016. We have prepared, and provided separately, actuarial valuation reports for each of the political subdivisions. Please refer to the individual reports for the valuation results, summary of actuarial assumptions and methods, and plan provisions for each of the political subdivision plans.

The purpose of this report is to provide a summary of the funded status of VRS as of June 30, 2016, and to recommend rates of contribution. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The asset values used to determine unfunded liabilities are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

The valuation results indicate that the full employer contribution rates shown in the table below are sufficient to fund the normal cost for all members and finance the unfunded accrued liability of the plans. We also present the expected employer contributions to be actually funded based on the percentage of the full rate adopted by the General Assembly. For comparison, in the table below we present the employer contribution

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144  
Phone (678) 388-1700 • Fax (678) 388-1730  
[www.CavMacConsulting.com](http://www.CavMacConsulting.com)



rates based on the June 30, 2016, actuarial valuation, the employer contribution rates approved by the General Assembly for fiscal years ending 2015 and 2016, and the employer contribution rates approved by the General Assembly for fiscal years ending in 2017 and 2018. Contribution rates for VRS employers are established every two years. The actuarially calculated employer contribution rates based on the June 30, 2016, valuation presented in this report are for informational purposes only. The total employer rates include the average employer rate for the defined contribution component of the Hybrid Retirement Plan.

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

Rates Adopted by General Assembly Fiscal Year 2016

System	July 2015	August 2015	Sept. 2015 - June 2016
State	12.33%	13.28%	14.22%
Teachers	14.06%	14.06%	14.06%
SPORS	25.82%	26.83%	27.83%
ValORS	17.67%	18.34%	19.00%
Judicial	49.62%	49.82%	50.02%

The promised benefits of VRS are included in the calculated contribution rates, which are developed using the entry age normal cost method. The valuation takes into account the differentiation between Plan 1 vested members; Plan 1 non-vested members as of January 1, 2013, resulting from House Bill 1130 and Senate Bill 498; Plan 2 members; and the Hybrid Retirement Plan. Five-year smoothed market value of assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded accrued liability. In accordance with the supplemental contribution provision under the 2011 Appropriation Act,



Item 469(l)(6), the portion of the unfunded accrued liability with respect to deferred contributions for the 2010-2012 biennium is amortized using a level-dollar, closed, 10-year period beginning June 30, 2011. Amendments to the 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions to all plans except teachers. In accordance with the funding policy adopted by the Board of Trustees in 2013, the balance of the unfunded accrued liability as of June 30, 2013, is being amortized by regular annual contributions as a level percentage of payroll over a closed 27-year period, and changes in the unfunded accrued liability since June 30, 2013, are amortized over a closed 20-year period. The amortization of the unfunded accrued liability assumes that payroll will increase by 3% annually and the amortization period will decrease by one year until reaching 0 years. The assumptions recommended by the actuary and adopted by the Board are in the aggregate reasonably related to the experience under the Fund and to reasonable expectations of anticipated experience under the Fund.

We have prepared several supporting schedules shown in the actuarial section of the Comprehensive Annual Financial Report, including the Schedule of Active Member Data and the Analysis of Financial Experience. For completeness, the table of Changes in Unfunded Actuarial Accrued Liabilities in Section VI and the Retiree and Beneficiary Data in Schedule I include the information with respect to the political subdivisions participating in VRS.

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

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

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



The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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

Respectfully submitted,

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

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

A handwritten signature in black ink, appearing to read 'John J. Garrett'.

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

A handwritten signature in black ink, appearing to read 'Micki R. Taylor'.

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

The Actuarial Section presents information about the assumptions adopted by the Board of Trustees and used by the VRS actuary to evaluate the funded status of the pension plans. This information includes trend data about retirements, disabilities, terminations and salary increase rates. The section also provides summaries of the pension plans administered by the System and any changes.

## SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS: PENSION PLANS

	2007-2008	2009	2010	2011-2012	2013	2014-2016
Investment Rate of Return	7.50%	7.50%	7.00%	7.00%	7.00%	7.00%
Inflation Assumption	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Cost of Living (COLA) Assumption						
Plan 1	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Plan 2	N/A	N/A	N/A	2.25%	2.25%	2.25%
Actuarial Cost Method	Entry Age Normal					
Change in Decremental Assumptions	No	Yes	No	No	Yes	No
Value of Ancillary Benefits Included	Yes	Yes	Yes	Yes	Yes	Yes
Value of Post-Retirement Adjustments to Date Included	Yes	Yes	Yes	Yes	Yes	Yes
Assets Valuation Method	5-Year Smoothed Market	5-Year Smoothed Market	5-Year Smoothed Market	5-Year Smoothed Market	5-Year Smoothed Market	5-Year Smoothed Market

**SOLVENCY TEST: PENSION PLANS**

(EXPRESSED IN THOUSANDS)

Valuation Date (June 30)	Aggregate Accrued Liabilities for				Valuation Assets	Portion of Accrued Liabilities Covered by Assets		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members*	(1)		(2)	(3)	
<b>VIRGINIA RETIREMENT SYSTEM (VRS)</b>								
2016	\$ 12,518,183	\$ 48,717,939	\$ 25,882,870	\$ 65,203,736	100.00%	100.00%	15.33%	
2015	12,176,530	46,783,519	25,751,093	62,083,601	100.00%	100.00%	12.13%	
2014	11,819,771	44,469,489	25,794,124	57,144,567	100.00%	100.00%	3.32%	
2013	11,420,836	42,383,697	25,273,058	52,124,581	100.00%	96.00%	0.00%	
2012	9,479,988	39,996,442	28,382,426	51,211,915	100.00%	100.00%	6.11%	
2011	9,116,662	37,539,539	28,528,577	52,558,997	100.00%	100.00%	20.69%	
2010	9,246,421	35,117,915	28,436,065	52,728,575	100.00%	100.00%	29.41%	
2009	8,876,564	31,589,747	25,856,699	53,185,033	100.00%	100.00%	49.19%	
2008	8,389,773	29,225,652	24,939,054	52,548,375	100.00%	100.00%	59.88%	
2007	8,154,046	23,339,386	23,623,041	47,815,450	100.00%	100.00%	56.39%	
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>								
2016	\$ 100,291	\$ 585,837	\$ 395,852	\$ 744,656	100.00%	100.00%	14.79%	
2015	95,394	586,984	368,323	710,864	100.00%	100.00%	7.73%	
2014	92,637	562,413	374,105	662,244	100.00%	100.00%	1.92%	
2013	88,814	548,115	359,761	591,983	100.00%	91.80%	0.00%	
2012	78,465	563,612	371,201	587,160	100.00%	90.30%	0.00%	
2011	74,943	540,097	370,664	616,603	100.00%	100.00%	0.42%	
2010	77,759	510,491	360,642	633,415	100.00%	100.00%	12.52%	
2009	74,662	474,622	329,896	646,960	100.00%	100.00%	29.61%	
2008	71,160	444,025	329,010	646,277	100.00%	100.00%	39.84%	
2007	70,796	408,085	327,147	594,985	100.00%	100.00%	35.49%	
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>								
2016	\$ 237,416	\$ 1,160,507	\$ 586,334	\$ 1,235,490	100.00%	86.00%	0.00%	
2015	232,824	1,088,742	585,155	1,155,767	100.00%	84.77%	0.00%	
2014	230,522	977,848	611,675	1,058,010	100.00%	84.60%	0.00%	
2013	223,467	916,886	601,757	941,933	100.00%	78.40%	0.00%	
2012	176,172	861,342	715,499	909,399	100.00%	85.10%	0.00%	
2011	174,963	763,631	744,597	926,082	100.00%	98.40%	0.00%	
2010	186,792	682,378	710,151	925,443	100.00%	100.00%	7.92%	
2009	181,760	581,887	648,197	912,922	100.00%	100.00%	23.03%	
2008	173,039	510,878	597,560	873,473	100.00%	100.00%	31.72%	
2007	169,393	458,383	538,203	766,243	100.00%	100.00%	25.73%	
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>								
2016	\$ 37,648	\$ 395,698	\$ 174,452	\$ 476,321	100.00%	100.00%	24.63%	
2015	36,784	390,690	172,914	442,250	100.00%	100.00%	8.55%	
2014	38,522	370,265	199,382	406,053	100.00%	99.30%	0.00%	
2013	38,439	360,470	191,717	368,671	100.00%	91.60%	0.00%	
2012	38,578	335,501	208,377	361,097	100.00%	96.10%	0.00%	
2011	37,981	312,423	219,091	371,051	100.00%	100.00%	9.42%	
2010	43,217	310,305	206,398	372,096	100.00%	100.00%	9.00%	
2009	41,793	287,543	192,127	378,212	100.00%	100.00%	25.44%	
2008	38,785	271,276	184,707	373,850	100.00%	100.00%	34.54%	
2007	38,675	242,825	160,998	340,200	100.00%	100.00%	36.46%	

\* Employer-financed portion.

Aggregate Accrued Liabilities are determined under the entry age normal cost method (System-funded method used to determine employer contribution requirements).

The progress of a retirement system in accumulating assets to pay benefits when due can be measured by examining the extent to which assets accumulated for benefits cover 1) active member contributions to the System; 2) liabilities for future benefits to retirees and beneficiaries; and 3) liabilities for the employer-financed portion of service already rendered by active members. In a system receiving actuarially determined employer contributions, the liabilities for member contributions and future benefits to retirees and beneficiaries will generally be fully covered by accumulated assets. In addition, the liabilities for service already rendered will be partially covered by the remainder of the accumulated assets and will increase over time.

**SOLVENCY TEST: VRS PENSION PLANS**

(EXPRESSED IN THOUSANDS)

Valuation Date (June 30)	Aggregate Accrued Liabilities for				Portion of Accrued Liabilities		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members*	Valuation Assets	(1)	(2)	(3)
	VRS – STATE						
2016	\$ 3,324,003	\$ 13,408,506	\$ 6,145,734	\$ 16,672,776	100.00%	99.55%	0.00%
2015	3,267,188	12,960,842	6,063,528	15,881,597	100.00%	97.33%	0.00%
2014	3,202,604	12,433,349	6,186,983	14,826,208	100.00%	93.50%	0.00%
2013	3,113,926	11,954,023	6,000,702	13,714,404	100.00%	88.70%	0.00%
2012	2,559,930	11,363,015	7,021,313	13,740,366	100.00%	98.40%	0.00%
2011	2,475,123	10,844,164	7,088,671	14,406,275	100.00%	100.00%	15.33%
2010	2,511,650	10,279,653	6,748,150	14,700,854	100.00%	100.00%	28.30%
2009	2,501,163	9,024,592	6,400,124	15,049,901	100.00%	100.00%	55.06%
2008	2,398,033	8,411,441	6,287,468	15,046,348	100.00%	100.00%	67.39%
2007	2,361,187	7,707,539	6,211,055	13,857,242	100.00%	100.00%	61.00%
VRS – TEACHER							
2016	\$ 5,871,258	\$ 24,559,074	\$ 13,151,297	\$ 30,768,277	100.00%	100.00%	2.57%
2015	5,679,555	23,776,912	13,107,711	29,441,485	100.00%	99.94%	0.00%
2014	5,494,752	22,720,375	13,082,542	27,026,576	100.00%	94.80%	0.00%
2013	5,310,701	21,627,490	12,914,143	24,724,679	100.00%	89.80%	0.00%
2012	4,573,244	20,361,089	14,156,075	24,391,761	100.00%	97.30%	0.00%
2011	4,394,657	19,066,272	14,310,803	25,166,124	100.00%	100.00%	11.92%
2010	4,376,385	17,935,907	14,776,284	25,447,677	100.00%	100.00%	21.22%
2009	4,155,034	16,383,311	13,322,169	25,764,665	100.00%	100.00%	39.23%
2008	3,922,647	15,181,246	12,854,428	25,502,482	100.00%	100.00%	49.78%
2007	3,826,300	13,670,111	12,173,427	23,204,871	100.00%	100.00%	46.89%
VRS – POLITICAL SUBDIVISIONS							
2016	\$ 3,322,922	\$ 10,750,359	\$ 6,585,839	\$ 17,762,683	100.00%	100.00%	56.02%
2015	3,229,787	10,045,765	6,579,854	16,760,519	100.00%	100.00%	52.96%
2014	3,122,415	9,315,765	6,524,599	15,291,783	100.00%	100.00%	43.74%
2013	2,996,209	8,802,184	6,358,213	13,685,498	100.00%	100.00%	29.68%
2012	2,346,814	8,272,338	7,205,038	13,079,788	100.00%	100.00%	34.15%
2011	2,246,882	7,629,103	7,129,103	12,986,598	100.00%	100.00%	43.63%
2010	2,358,386	6,902,355	6,911,631	12,580,044	100.00%	100.00%	48.02%
2009	2,220,367	6,181,844	6,134,406	12,370,467	100.00%	100.00%	64.69%
2008	2,069,093	5,632,966	5,797,158	11,999,545	100.00%	100.00%	74.13%
2007	1,966,559	4,961,736	5,238,559	10,753,337	100.00%	100.00%	73.02%
VRS – TOTAL							
2016	\$ 12,518,183	\$ 48,717,939	\$ 25,882,870	\$ 65,203,736	100.00%	100.00%	15.33%
2015	12,176,530	46,783,519	25,751,093	62,083,601	100.00%	100.00%	12.13%
2014	11,819,771	44,469,489	25,794,124	57,144,567	100.00%	100.00%	3.32%
2013	11,420,836	42,383,697	25,273,058	52,124,581	100.00%	96.00%	0.00%
2012	9,479,988	39,996,442	28,382,426	51,211,915	100.00%	100.00%	6.11%
2011	9,116,662	37,539,539	28,528,577	52,558,997	100.00%	100.00%	20.69%
2010	9,246,421	35,117,915	28,436,065	52,728,575	100.00%	100.00%	29.41%
2009	8,876,564	31,589,747	25,856,699	53,185,033	100.00%	100.00%	49.19%
2008	8,389,773	29,225,652	24,939,054	52,548,375	100.00%	100.00%	59.88%
2007	8,154,046	26,339,386	23,623,041	47,815,450	100.00%	100.00%	56.39%

\* Employer-financed portion.

Aggregate Accrued Liabilities are determined under the entry age normal cost method (System-funded method used to determine employer contribution requirements).

The progress of a retirement system in accumulating assets to pay benefits when due can be measured by examining the extent to which assets accumulated for benefits cover 1) active member contributions to the System; 2) liabilities for future benefits to retirees and beneficiaries; and 3) liabilities for the employer-financed portion of service already rendered by active members. In a system receiving actuarially determined employer contributions, the liabilities for member contributions and future benefits to retirees and beneficiaries will generally be fully covered by accumulated assets. In addition, the liabilities for service already rendered will be partially covered by the remainder of the accumulated assets and will increase over time.

**SCHEDULE OF FUNDING (ACTUARIAL VALUE OF ASSETS BASIS): ALL PENSION PLANS**

(DOLLARS IN THOUSANDS)

Actuarial Valuation Date June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) – Entry Age (b)	Net Pension Liability (AAL-MVA) (b-a)	Funded Ratio Funded (MVA/AAL) (a/b)	Covered Payroll (c)	Net Pension Liability as a Percentage of Covered Payroll (b-a)/(c)
<b>VIRGINIA RETIREMENT SYSTEM (VRS)**</b>						
2016	\$ 65,203,736	\$ 87,118,992	\$ 21,915,256	74.8%	\$16,325,998	134.2%
2015	62,083,601	84,711,142	22,627,541	73.3%	15,901,380	142.3%
2014	57,144,567	82,083,384	24,938,817	69.6%	15,671,359	159.1%
2013*	52,124,581	79,077,591	26,953,010	65.9%	15,269,079	176.5%
2012	51,211,915	77,858,856	26,646,941	65.8%	14,880,275	179.1%
2011	52,558,997	75,184,760	22,625,763	69.9%	14,708,859	153.8%
2010	52,728,575	72,800,401	20,071,826	72.4%	14,757,790	136.0%
2009*	53,185,033	66,323,011	13,137,978	80.2%	14,947,644	87.9%
2008	52,548,375	62,554,479	10,006,104	84.0%	14,558,592	68.7%
2007	47,815,450	58,116,473	10,301,023	82.3%	13,834,022	74.5%
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>						
2016	\$ 744,656	\$ 1,081,980	\$ 337,324	68.8%	\$ 114,877	293.6%
2015	710,864	1,050,701	339,837	67.7%	110,543	307.4%
2014	662,244	1,029,155	366,911	64.3%	112,303	326.7%
2013*	591,983	996,690	404,707	59.4%	109,006	371.3%
2012	587,160	1,013,278	426,118	57.9%	104,189	409.0%
2011	616,603	985,704	369,101	62.6%	99,669	370.3%
2010	633,415	948,892	315,477	66.8%	97,601	323.2%
2009*	646,960	879,180	232,220	73.6%	100,974	230.0%
2008	646,277	844,195	197,918	76.6%	102,466	193.2%
2007	594,985	806,028	211,043	73.8%	100,785	209.4%
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>						
2016	\$ 1,235,490	\$ 1,984,257	\$ 748,767	62.3%	\$ 352,677	212.3%
2015	1,155,767	1,906,721	750,954	60.6%	330,397	227.3%
2014	1,058,010	1,820,045	762,035	58.1%	352,709	216.1%
2013*	941,933	1,742,110	800,177	54.1%	342,154	233.9%
2012	909,399	1,753,014	843,615	51.9%	344,616	244.8%
2011	926,082	1,683,191	757,109	55.0%	356,240	212.5%
2010	925,443	1,579,321	653,878	58.6%	346,040	189.0%
2009*	912,922	1,411,844	498,922	64.7%	359,070	138.9%
2008	873,473	1,281,477	408,004	68.2%	368,255	110.8%
2007	766,243	1,165,979	399,736	65.7%	341,035	117.2%
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>						
2016	\$ 476,321	\$ 607,798	\$ 131,477	78.4%	\$ 65,524	200.7%
2015	442,250	600,388	158,138	73.7%	61,881	255.6%
2014	406,053	608,169	202,116	66.8%	59,373	340.4%
2013*	368,671	590,626	221,955	62.4%	57,110	388.6%
2012	361,097	582,456	221,359	62.0%	56,958	388.6%
2011	371,051	569,494	198,443	65.2%	58,919	336.8%
2010	372,096	559,920	187,824	66.5%	61,021	307.8%
2009*	378,212	521,463	143,251	72.5%	62,709	228.4%
2008	373,850	494,768	120,918	75.6%	60,486	199.9%
2007	340,200	442,498	102,298	76.9%	57,687	177.3%

\* Revised economic and demographic assumptions due to experience study.

\*\* The breakdown of VRS data into state, teacher and political subdivisions is also presented in the Statistical Section.

**SCHEDULE OF FUNDING (ACTUARIAL VALUE OF ASSETS BASIS): VRS PENSION PLANS**

(EXPRESSED IN THOUSANDS)

Actuarial Valuation Date June 30	Actuarial Value of Assets (a)	Actuarial Liability (AAL) – Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/(c)
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – STATE</b>						
2016	\$ 16,672,776	\$22,878,243	\$ 6,205,467	72.9%	\$ 4,002,477	155.0%
2015	15,881,597	22,291,558	6,409,961	71.2%	3,872,724	165.5%
2014	14,826,208	21,822,936	6,966,728	67.9%	3,854,779	181.5%
2013*	13,714,404	21,068,651	7,354,247	65.1%	3,716,548	197.9%
2012	13,740,366	20,944,258	7,203,892	65.6%	3,713,119	194.0%
2011	14,406,275	20,407,958	6,001,683	70.6%	3,686,259	162.8%
2010	14,700,854	19,539,453	4,838,599	75.2%	3,514,396	137.7%
2009*	15,049,901	17,925,879	2,875,978	84.0%	3,619,478	79.5%
2008	15,046,348	17,096,942	2,050,594	88.0%	3,640,692	56.3%
2007	13,857,342	16,279,781	2,422,439	85.1%	3,467,388	69.9%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER</b>						
2016	\$30,768,277	\$43,581,629	\$12,813,352	70.6%	\$ 7,666,824	167.1%
2015	29,441,485	42,564,178	13,122,693	69.2%	7,488,507	175.2%
2014	27,026,576	41,297,669	14,271,093	65.4%	7,362,793	193.8%
2013*	24,724,679	39,852,334	15,127,655	62.0%	7,211,543	209.8%
2012	24,391,761	39,090,408	14,698,647	62.4%	7,004,577	209.8%
2011	25,166,124	37,771,732	12,605,608	66.6%	6,922,130	182.1%
2010	25,447,677	37,088,576	11,640,899	68.6%	7,119,889	163.5%
2009*	25,764,665	33,860,514	8,095,849	76.1%	7,160,842	113.1%
2008	25,502,482	31,958,321	6,455,839	79.8%	6,896,432	93.6%
2007	23,204,871	29,669,838	6,464,967	78.2%	6,604,643	97.9%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS</b>						
2016	\$ 17,762,683	\$20,659,120	\$ 2,896,437	86.0%	\$ 4,656,697	62.2%
2015	16,760,519	19,855,406	3,094,887	84.4%	4,540,149	68.2%
2014	15,291,783	18,962,779	3,670,996	80.6%	4,453,787	82.4%
2013*	13,685,498	18,156,606	4,471,108	75.4%	4,340,988	103.0%
2012	13,079,788	17,824,190	4,744,402	73.4%	4,162,579	114.0%
2011	12,986,598	17,005,070	4,018,472	76.4%	4,100,470	98.0%
2010	12,580,044	16,172,372	3,592,328	77.8%	4,123,505	87.1%
2009*	12,370,467	14,536,618	2,166,151	85.1%	4,167,324	52.0%
2008	11,999,545	13,499,216	1,499,671	88.9%	4,021,468	37.3%
2007	10,753,237	12,166,854	1,413,617	88.4%	3,761,991	37.6%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TOTAL</b>						
2016	\$65,203,736	\$87,118,992	\$21,915,256	74.8%	\$ 16,325,998	134.2%
2015	62,083,601	84,711,142	22,627,541	73.3%	15,901,380	142.3%
2014	57,144,567	82,083,384	24,938,817	69.6%	15,671,359	159.1%
2013*	52,124,581	79,077,591	26,953,010	65.9%	15,269,079	176.5%
2012	51,211,915	77,858,856	26,646,941	65.8%	14,880,275	179.1%
2011	52,558,997	75,184,760	22,625,763	69.9%	14,708,859	153.8%
2010	52,728,575	72,800,401	20,071,826	72.4%	14,757,790	136.0%
2009*	53,185,033	66,323,011	13,137,978	80.2%	14,947,644	87.9%
2008	52,548,375	62,554,479	10,006,104	84.0%	14,558,592	68.7%
2007	47,815,450	58,116,473	10,301,023	82.3%	13,834,022	74.5%

\* Revised economic and demographic assumptions due to experience study.

## SCHEDULE OF ACTIVE MEMBER VALUATION DATA: PENSION PLANS

Valuation Date (June 30)	Active Members				
	Number	Annual Payroll (000s)	Average Annual Pay	Annualized % Change in Average Pay	Number of Employers
VIRGINIA RETIREMENT SYSTEM (VRS)					
2016	330,257	\$ 16,325,998	\$ 49,434	2.2%	606
2015	328,833	15,901,380	48,357	1.4%	602
2014	328,494	15,671,359	47,707	2.6%	601
2013	328,277	15,269,079	46,513	2.6%	599
2012	328,385	14,880,275	45,314	0.5%	599
2011	326,357	14,708,859	45,070	0.6%	594
2010	329,374	14,757,790	44,806	-0.2%	592
2009	333,049	14,947,644	44,881	2.3%	587
2008	331,851	14,558,592	43,871	3.5%	583
2007	326,218	13,834,022	42,407	4.4%	578
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2016	1,940	\$ 114,877	\$ 59,215	6.8%	1
2015	1,994	110,543	55,438	-0.7%	1
2014	2,011	112,303	55,844	2.6%	1
2013	2,002	109,006	54,449	-1.7%	1
2012	1,881	104,189	55,390	-3.4%	1
2011	1,738	99,669	57,347	3.8%	1
2010	1,767	97,601	55,235	0.0%	1
2009	1,828	100,974	55,237	-0.2%	1
2008	1,852	102,466	55,327	3.8%	1
2007	1,890	100,785	53,325	2.1%	1
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2016	9,106	\$ 352,677	38,730	3.4%	1
2015	8,820	330,397	37,460	0.1%	1
2014	9,429	352,709	37,407	2.5%	1
2013	9,372	342,154	36,508	-0.6%	1
2012	9,383	344,616	36,728	-0.7%	1
2011	9,631	356,240	36,989	4.0%	1
2010	9,734	346,040	35,550	-0.1%	1
2009	10,087	359,070	35,597	0.2%	1
2008	10,370	368,255	35,512	6.3%	1
2007	10,213	341,035	33,392	3.1%	1
JUDICIAL RETIREMENT SYSTEM (JRS)					
2016	416	\$ 65,524	\$ 157,510	2.1%	1
2015	401	61,881	154,317	0.1%	1
2014	385	59,373	154,216	2.9%	1
2013	381	57,110	149,895	0.0%	1
2012	380	56,958	149,889	0.2%	1
2011	394	58,919	149,541	0.0%	1
2010	408	61,021	149,561	0.4%	1
2009	421	62,709	148,952	1.5%	1
2008	412	60,486	146,811	7.9%	1
2007	424	57,687	136,054	4.0%	1

## SCHEDULE OF ACTIVE MEMBER VALUATION DATA: VRS PENSION PLANS

Valuation Date (June 30)	Active Members				
	Number	Annual Payroll (000s)	Average Annual Pay	Annualized % Change in Average Pay	Number of Employers
VRS – STATE					
2016	74,968	\$ 4,002,477	\$ 53,389	3.7%	1
2015	75,256	3,872,724	51,461	1.1%	1
2014	75,730	3,854,779	50,902	3.9%	1
2013	75,879	3,716,548	48,980	0.6%	1
2012	76,274	3,713,119	48,681	0.1%	1
2011	75,820	3,686,259	48,619	5.2%	1
2010*	76,033	3,514,396	46,222	N/A	1
VRS – TEACHER					
2016	149,018	\$ 7,666,824	\$ 51,449	1.4%	145
2015	147,645	7,488,507	50,720	1.2%	145
2014	146,977	7,362,793	50,095	2.3%	145
2013	147,257	7,211,543	48,972	2.9%	145
2012	147,216	7,004,577	47,580	0.5%	144
2011	146,152	6,922,130	47,363	-1.2%	144
2010*	148,462	7,119,889	47,958	N/A	144
VRS – POLITICAL SUBDIVISIONS					
2016	106,271	\$ 4,656,697	\$ 43,819	2.2%	460
2015	105,932	4,540,149	42,859	1.8%	456
2014	105,787	4,453,787	42,101	2.0%	455
2013	105,141	4,340,988	41,287	4.0%	453
2012	104,895	4,162,579	39,683	1.0%	454
2011	104,385	4,100,470	39,282	-0.1%	449
2010*	104,879	4,123,505	39,317	N/A	447
VRS – TOTAL					
2016	330,257	\$ 16,325,998	\$ 49,434	2.2%	606
2015	328,833	15,901,380	48,357	1.4%	602
2014	328,494	15,671,359	47,707	2.6%	601
2013	328,277	15,269,079	46,513	2.6%	599
2012	328,385	14,880,275	45,314	0.5%	599
2011	326,357	14,708,859	45,070	0.6%	594
2010*	329,374	14,757,790	44,806	N/A	592

\* Plan-level statistics for this presentation are not available for years prior to 2010.

## SCHEDULE OF RETIREE AND BENEFICIARY VALUATION DATA: PENSION PLANS

### Retirees and Beneficiaries

Valuation Date (June 30)	Added to Rolls		Removed from Rolls		Rolls at End of Year		Annualized % Increase in Annual Allowances	Average Annual Allowance
	Number	Allowances*	Number	Allowances	Number	Allowances		
VIRGINIA RETIREMENT SYSTEM (VRS)								
2016	12,444	\$ 272,010,000	4,944	\$93,004,000	187,468	4,033,957,000	4.6%	21,518
2015	12,348	313,032,000	5,067	90,733,000	179,968	3,854,951,000	6.1%	21,420
2014	11,912	289,092,000	4,719	89,997,000	172,687	3,632,652,000	5.8%	21,036
2013	11,297	303,240,000	4,574	83,618,000	165,494	3,433,557,000	6.8%	20,747
2012	10,493	305,440,000	4,411	91,446,000	158,771	3,213,935,000	7.1%	20,243
2011	11,630	248,784,000	4,210	31,978,000	152,689	2,999,941,000	7.8%	19,647
2010	10,780	234,416,000	4,011	65,755,000	145,269	2,783,135,000	6.5%	19,158
2009	9,474	278,307,000	4,202	63,388,000	138,500	2,614,474,000	9.0%	18,877
2008	9,610	284,577,000	3,869	68,575,000	133,228	2,399,555,000	9.9%	18,011
2007	9,475	277,466,000	3,774	66,307,000	127,487	2,183,553,000	10.7%	17,128
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)								
2016	45	\$ 1,775,000	36	1,512,000	1,280	51,432,000	0.5%	40,181
2015	66	3,871,000	34	1,555,000	1,271	51,169,000	4.7%	40,259
2014	55	2,972,000	24	1,124,000	1,239	48,853,000	3.9%	39,429
2013	44	2,652,000	36	1,491,000	1,208	47,005,000	2.5%	38,912
2012	54	3,619,000	20	1,543,000	1,200	45,844,000	4.7%	38,203
2011	68	2,954,000	24	412,000	1,166	43,768,000	6.2%	37,537
2010	62	2,450,000	22	1,085,000	1,122	41,226,000	3.4%	36,743
2009	72	3,604,000	23	777,000	1,082	39,861,000	7.6%	36,840
2008	68	4,207,000	26	548,000	1,033	37,034,000	11.0%	35,851
2007	52	3,292,000	18	1,311,000	991	33,375,000	6.3%	33,678
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)								
2016	365	\$ 8,051,000	67	\$ 2,737,000	4,124	89,700,000	6.3%	21,751
2015	397	10,242,000	36	2,006,000	3,826	84,386,000	10.8%	22,056
2014	311	7,736,000	59	6,956,000	3,465	76,150,000	1.0%	21,977
2013	336	8,561,000	34	(2,847,000)**	3,213	75,370,000	17.8%	23,458
2012	347	9,437,000	37	2,505,000	2,911	63,962,000	12.2%	21,973
2011	316	6,677,000	33	1,145,000	2,601	57,030,000	10.7%	21,926
2010	281	6,667,000	24	932,000	2,318	51,498,000	12.5%	22,216
2009	264	6,903,000	17	671,000	2,061	45,763,000	15.8%	22,204
2008	224	5,774,000	28	3,817,000	1,814	39,531,000	5.2%	21,792
2007	253	7,118,000	16	1,393,000	1,618	37,574,000	18.0%	23,222
JUDICIAL RETIREMENT SYSTEM (JRS)								
2016	26	\$ 2,332,000	20	\$ 1,317,000	517	39,788,000	2.6%	76,959
2015	40	3,844,000	34	2,147,000	511	38,773,000	4.6%	75,877
2014	32	2,952,000	16	2,045,000	505	37,076,000	2.5%	73,418
2013	40	3,483,000	14	205,000	489	36,169,000	10.0%	73,966
2012	34	3,354,000	17	1,022,000	463	32,891,000	7.6%	71,039
2011	25	1,717,000	30	1,514,000	446	30,559,000	0.7%	68,518
2010	29	2,116,000	17	1,022,000	451	30,356,000	3.7%	67,308
2009	36	2,919,000	20	1,491,000	439	29,262,000	5.1%	66,657
2008	36	3,567,000	17	1,746,000	423	27,834,000	7.0%	65,802
2007	24	2,831,000	19	1,723,000	404	26,013,000	4.4%	64,390

\* Additions to allowances include added retirees and the annual COLA provided to existing retirees and beneficiaries.

\*\* Reflects adjustment to benefits attributable to this plan. Adjustment of prior amounts removed from payroll.

## SCHEDULE OF RETIREE AND BENEFICIARY VALUATION DATA: VRS PENSION PLANS

### Retirees and Beneficiaries

Valuation Date (June 30)	Added to Rolls		Removed from Rolls		Rolls at End of Year		Annualized % Increase in Annual Allowances	Average Annual Allowance
	Number	Allowances*	Number	Allowances	Number	Allowances		
VRS – STATE								
2016	3,338	\$ 78,366,000	1,734	\$ 32,636,000	54,306	1,172,004,000	4.1%	21,581
2015	3,263	89,596,000	1,824	31,662,000	52,702	1,126,274,000	5.4%	21,371
2014	3,152	80,896,000	1,718	34,128,000	51,263	1,068,340,000	4.6%	20,840
2013	2,864	81,985,000	1,650	28,163,000	49,829	1,021,572,000	5.6%	20,502
2012	2,739	85,005,000	1,618	30,250,000	48,615	967,750,000	6.0%	19,906
2011	2,994	66,569,000	1,564	14,936,000	47,494	912,995,000	6.0%	19,223
2010**	3,728	88,557,000	1,432	22,536,000	46,064	861,362,000	N/A	18,699
VRS – TEACHER								
2016	5,085	\$ 115,790,000	1,733	\$ 38,675,000	84,069	2,000,999,000	4.0%	23,802
2015	5,135	140,493,000	1,816	38,434,000	80,717	1,923,884,000	5.6%	23,835
2014	5,086	135,345,000	1,596	32,303,000	77,398	1,821,825,000	6.0%	23,538
2013	4,929	142,836,000	1,607	35,947,000	73,908	1,718,783,000	6.6%	23,256
2012	4,520	147,153,000	1,550	36,908,000	70,586	1,611,894,000	7.3%	22,836
2011	5,291	123,035,000	1,433	14,549,000	67,616	1,501,649,000	7.8%	22,208
2010**	4,045	95,290,000	1,432	28,977,000	63,758	1,393,163,000	N/A	21,851
VRS – POLITICAL SUBDIVISIONS								
2016	4,021	\$ 77,854,000	1,477	\$ 21,693,000	49,093	860,954,000	7.0%	17,537
2015	3,950	82,943,000	1,427	20,637,000	46,549	804,793,000	8.4%	17,289
2014	3,674	72,851,000	1,405	23,566,000	44,026	742,487,000	7.1%	16,865
2013	3,504	78,419,000	1,317	19,508,000	41,757	693,202,000	9.3%	16,601
2012	3,234	73,282,000	1,243	24,288,000	39,570	634,291,000	8.4%	16,030
2011	3,345	59,180,000	1,213	2,493,000	37,579	585,297,000	10.7%	15,575
2010**	3,007	50,569,000	1,147	14,242,000	35,447	528,610,000	N/A	14,913
VRS – TOTAL								
2016	12,444	\$ 272,010,000	4,944	\$ 93,004,000	187,468	4,033,957,000	4.6%	21,518
2015	12,348	313,032,000	5,067	90,733,000	179,968	3,854,951,000	6.1%	21,420
2014	11,912	289,092,000	4,719	89,997,000	172,687	3,632,652,000	5.8%	21,036
2013	11,297	303,240,000	4,574	83,618,000	165,494	3,433,557,000	6.8%	20,747
2012	10,493	305,440,000	4,411	91,446,000	158,771	3,213,935,000	7.1%	20,243
2011	11,630	248,784,000	4,210	31,978,000	152,689	2,999,941,000	7.8%	19,647
2010**	10,780	234,416,000	4,011	65,755,000	145,269	2,783,135,000	N/A	19,158

\* Additions to Allowances include added retirees and the annual COLA provided to existing retirees and beneficiaries.

\*\* Plan-level statistics for this presentation are not available for years prior to 2010.

## FIGURE 4.1: ANALYSIS OF ACTUARIAL GAINS AND LOSSES – PENSION PLANS

FOR THE YEAR ENDED JUNE 30, 2016

(EXPRESSED IN THOUSANDS)

	VRS	SPORS	VaLORS	JRS	Total
<b>A. Calculation of Expected Unfunded Actuarial Accrued Liability (UAAL)</b>					
1. UAAL as of June 30, 2015	\$22,627,541	\$ 339,837	\$ 750,954	\$ 158,138	\$23,876,470
2. Normal Cost for Previous Year	1,620,521	17,477	42,624	20,540	1,701,162
3. Actual Contributions During the Year	(3,101,165)	(38,801)	(95,988)	(44,360)	(3,280,314)
4. Interest at Previous Year's Rate of 7.00%					
a. On UAAL	1,583,928	23,789	52,567	11,070	1,671,354
b. On Normal Cost	113,436	1,223	2,984	1,438	119,081
c. On contributions	(108,541)	(1,358)	(3,360)	(1,553)	(114,812)
<b>d. Total</b>	<b>1,588,823</b>	<b>23,654</b>	<b>52,191</b>	<b>10,955</b>	<b>1,675,623</b>
5. Expected UAAL as of June 30, 2016 (A1+A2+A3+A4)	22,735,720	342,167	749,781	145,273	23,972,941
6. Actual UAAL as of June 30, 2016	21,915,256	337,324	748,767	131,477	23,132,824
<b>7. Total Gain/(Loss) (A5-A6)</b>	<b>820,464</b>	<b>4,843</b>	<b>1,014</b>	<b>13,796</b>	<b>840,117</b>
<b>B. Calculation of Asset Gain / (Loss)</b>					
1. Actuarial Value of Assets (AVA) as of June 30, 2015	62,083,601	710,864	1,155,767	442,250	64,392,482
2. Contributions During the Year	3,101,165	38,801	95,988	44,360	3,280,314
3. Benefit Payments During the Year	(4,267,539)	(54,099)	(96,794)	(41,341)	(4,459,773)
4. Interest at Previous Year's Rate of 7.00%					
a. On AVA at Beginning of Year	4,345,852	49,760	80,904	30,958	4,507,474
b. On Contributions	108,541	1,358	3,360	1,553	114,812
c. On Benefit Payments	(149,364)	(1,893)	(3,388)	(1,447)	(156,092)
<b>d. Total</b>	<b>4,305,029</b>	<b>49,225</b>	<b>80,876</b>	<b>31,064</b>	<b>4,466,194</b>
5. Expected AVA as of June 30, 2016 (B1+B2+B3+B4)	65,222,256	744,791	1,235,837	476,333	67,679,217
6. Actual AVA as of June 30, 2016	65,203,736	744,656	1,235,490	476,321	67,660,203
<b>7. Total Gain/(Loss) on Assets (B6-B5)</b>	<b>(18,520)</b>	<b>(135)</b>	<b>(347)</b>	<b>(12)</b>	<b>(19,014)</b>
<b>C. Calculation of Liability Gain/(Loss)</b>					
1. Gain/(Loss) Due to Changes in Actuarial Assumptions	–	–	–	–	–
2. Gain/(Loss) Due to Plan Amendments	(32,877)	–	–	–	(32,877)
3. Gain/(Loss) Due to Change in Asset Method	–	–	–	–	–
<b>4. Liability Experience Gain/(Loss) (A7-B7-C1-C2-C3)</b>	<b>\$ 871,861</b>	<b>\$ 4,978</b>	<b>\$ 1,361</b>	<b>\$ 13,808</b>	<b>\$ 892,008</b>

## FIGURE 4.2: ANALYSIS OF ACTUARIAL GAINS AND LOSSES – VRS PENSION PLANS

FOR THE YEAR ENDED JUNE 30, 2016

(EXPRESSED IN THOUSANDS)

	State	Teacher	Political Subdivisions	Total
<b>A. Calculation of Expected Unfunded Actuarial Accrued Liability (UAAL)</b>				
1. UAAL as of June 30, 2014	\$ 6,409,961	\$ 13,122,693	\$ 3,094,887	\$ 22,627,541
2. Normal Cost for Previous Year	345,588	774,632	500,301	1,620,521
3. Actual Contributions During the Year	(912,539)	(1,423,571)	(765,055)	(3,101,165)
4. Interest at Previous Year's Rate of 7.00%				
a. On UAAL	448,697	918,589	216,642	1,583,928
b. On Normal Cost	24,191	54,224	35,021	113,436
c. On Contributions	(31,939)	(49,825)	(26,777)	(108,541)
<b>d. Total</b>	<b>440,949</b>	<b>922,988</b>	<b>224,886</b>	<b>1,588,823</b>
5. Expected UAAL as of June 30, 2015 (A1+A2+A3+A4)	6,283,959	13,396,742	3,055,019	22,735,720
6. Actual UAAL as of June 30, 2015	6,205,467	12,813,352	2,896,437	21,915,256
<b>7. Total Gain/(Loss) (A5-A6)</b>	<b>78,492</b>	<b>583,390</b>	<b>158,582</b>	<b>820,464</b>
<b>B. Calculation of Asset Gain / (Loss)</b>				
1. Actuarial Value of Assets (AVA) as of June 30, 2014	15,881,597	29,441,485	16,760,519	62,083,601
2. Contributions During the Year	912,539	1,423,571	765,055	3,101,165
3. Benefit Payments During the Year	(1,220,438)	(2,116,136)	(930,965)	(4,267,539)
4. Interest at Previous Year's Rate of 7.00%				
a. On AVA at Beginning of Year	1,111,712	2,060,904	1,173,236	4,345,852
b. On Contributions	31,939	49,825	26,777	108,541
c. On Benefit Payments	(42,715)	(74,065)	(32,584)	(149,364)
<b>d. Total</b>	<b>1,100,936</b>	<b>2,036,664</b>	<b>1,167,429</b>	<b>4,305,029</b>
5. Expected AVA as of June 30, 2015 (B1+B2+B3+B4)	16,674,634	30,785,584	17,762,038	65,222,256
6. Actual AVA as of June 30, 2015	16,672,776	30,768,277	17,762,683	65,203,736
<b>7. Total Gain/(Loss) on Assets (B6-B5)</b>	<b>(1,858)</b>	<b>(17,307)</b>	<b>645</b>	<b>(18,520)</b>
<b>C. Calculation of Liability Gain/(Loss)</b>				
1. Gain/(Loss) Due to Changes in Actuarial Assumptions	—	—	—	—
2. Gain/(Loss) Due to Plan Amendments	—	—	(32,877)	(32,877)
3. Gain/(Loss) Due to Change in Asset Method	—	—	—	—
<b>4. Liability Experience Gain/(Loss) (A7-B7-C1-C2-C3)</b>	<b>\$ 80,350</b>	<b>\$ 600,697</b>	<b>\$ 190,814</b>	<b>\$ 871,861</b>

## Actuarial Assumptions and Methods

On June 20, 2013, the VRS Board of Trustees adopted most of the actuarial assumptions and methods on the recommendation of its actuary. The assumptions for the pension plans include the Virginia Retirement System (VRS), the State Police Officers' Retirement System (SPORS), the Virginia Law Officers' Retirement System (VaLORS) and the Judicial Retirement System (JRS). They were based on an analysis of plan experience for the four-year period July 1, 2008, through June 30, 2012, and were used for the June 30, 2016, valuation.

### ACTUARIAL ASSUMPTIONS AND METHODS: PENSION PLANS

FOR THE JUNE 30, 2016, VALUATION

**Investment Return Rate:** 7.00% per annum, compounded annually, composed of an assumed 2.50% inflation rate and a 4.50% real rate of return. Benefits are assumed to increase annually by 2.50% for Plan 1 retirees and by 2.25% for Plan 2 retirees due to the cost-of-living adjustment (COLA).

#### Mortality Rates

**Pre-Retirement:** RP-2000 Employee Mortality Table Projected With Scale AA to 2020:

- State – Males set forward 2 years and females set back 3 years
- Teachers – Males set back 3 years and females set back 5 years
- State Police – Males set forward 5 years and females set back 3 years
- VaLORS – Males set forward 5 years and females set back 3 years
- Judicial – Males set forward 2 years and females set back 3 years
- Political subdivisions, Non-LEOS – Males set forward 4 years and females set back 2 years
- Political subdivisions, LEOS – Males set back 2 years and females set back 2 years

**Post-Retirement:** RP-2000 Combined Mortality Table Projected With Scale AA to 2020:

- State – Females set back 1 year
- Teachers – Males set back 2 years and females set back 3 years
- State Police – Females set back 1 year
- VaLORS – Females set back 1 year
- Judicial – Females set back 1 year
- Political subdivisions, Non-LEOS – Males set forward 1 year
- Political subdivisions, LEOS – Males set forward 1 year

**Post-Disablement:** RP-2000 Disability Life Mortality Table:

- State – Males set back 3 years and no provision for future mortality improvement
- Teachers – Males set back 1 year and no provision for future mortality improvement
- State Police – Males set back 3 years and no provision for future mortality improvement
- VaLORS – Males set back 3 years and no provision for future mortality improvement
- Judicial – Males set back 3 years and no provision for future mortality improvement
- Political subdivisions, Non-LEOS – Males set back 3 years and no provision for future mortality improvement
- Political subdivisions, LEOS – Males set back 3 years and no provision for future mortality improvement

**FIGURE 4.3: RETIREMENT RATES – PENSION PLANS**

Sample rates of retirement for members eligible to retire are shown below.

**State Employees**

Plan 1

Age	Retirement With Less Than 30 Years of Service		Retirement With 30 or More Years of Service	
	Male	Female	Male	Female
50	3.00%	3.20%	10.00%	10.00%
55	5.00%	5.00%	10.00%	10.00%
59	5.00%	5.50%	10.00%	10.00%
60	5.00%	5.50%	10.00%	15.00%
61	10.00%	10.00%	15.00%	20.00%
62	15.00%	15.00%	25.00%	30.00%
64	15.00%	15.00%	20.00%	20.00%
65	30.00%	30.00%	30.00%	40.00%
67	30.00%	30.00%	25.00%	25.00%
> = 70	100.00%	100.00%	100.00%	100.00%

Plan 2 and Hybrid – Males  
Years of Service

Age	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	35.00%
55	0.00%	0.00%	0.00%	35.00%	10.00%	10.00%	10.00%
59	0.00%	35.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	35.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
61	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
62	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
64	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
65	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	25.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 35.00% when age plus service equals 90.

**FIGURE 4.3: RETIREMENT RATES – PENSION PLANS, cont.**

Sample rates of retirement for members eligible to retire are shown below.

**State Employees**

Plan 2 and Hybrid – Females							
Years of Service							
Age	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	35.00%
55	0.00%	0.00%	0.00%	35.00%	10.00%	10.00%	10.00%
59	0.00%	35.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	50.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
61	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
62	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
65	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	25.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*Rate is 35.00% when age plus service equals 90.*

**Teachers**

Plan 1				
Age	Retirement With Fewer Than 30 Years of Service		Retirement With 30 or More Years of Service	
	Male	Female	Male	Female
50	2.00%	2.00%	17.50%	15.00%
55	5.70%	6.10%	22.50%	22.50%
59	7.00%	7.50%	22.50%	22.50%
60	7.50%	8.50%	22.50%	22.50%
61	11.00%	12.00%	30.00%	30.00%
62	17.00%	17.00%	35.00%	35.00%
64	18.00%	16.50%	30.00%	35.00%
65	30.00%	30.00%	40.00%	35.00%
67	30.00%	30.00%	40.00%	35.00%
> = 70	100.00%	100.00%	100.00%	100.00%

**FIGURE 4.3: RETIREMENT RATES – PENSION PLANS, cont.**

Sample rates of retirement for members eligible to retire are shown below.

**Teachers**

Plan 2 and Hybrid – Males  
Years of Service

Age	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%
55	0.00%	0.00%	0.00%	40.00%	22.50%	22.50%	22.50%
59	0.00%	40.00%	22.50%	22.50%	22.50%	22.50%	22.50%
60	40.00%	22.50%	22.50%	22.50%	22.50%	22.50%	22.50%
61	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
62	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
64	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
65	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
67	30.00%	30.00%	40.00%	40.00%	40.00%	40.00%	40.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 40.00% when age plus service equals 90.

Plan 2 and Hybrid – Females  
Years of Service

Age	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	35.00%
55	0.00%	0.00%	0.00%	35.00%	22.50%	22.50%	22.50%
59	0.00%	35.00%	22.50%	22.50%	22.50%	22.50%	22.50%
60	35.00%	22.50%	22.50%	22.50%	22.50%	22.50%	22.50%
61	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
62	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
64	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
65	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 35.00% when age plus service equals 90.

**FIGURE 4.3: RETIREMENT RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Age	Plan 1				Plan 2			
	Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
50	3.50%	3.50%	13.00%	15.60%	0.00%	0.00%	13.00%	15.60%
55	5.00%	5.00%	11.50%	14.30%	0.00%	0.00%	11.50%	14.30%
59	4.50%	6.00%	13.50%	13.40%	0.00%	0.00%	13.50%	13.40%
60	6.00%	7.50%	17.00%	12.80%	6.00%	7.50%	17.00%	12.80%
61	10.50%	10.00%	19.00%	17.70%	10.50%	10.00%	19.00%	17.70%
62	17.50%	15.50%	31.00%	28.00%	17.50%	15.50%	31.00%	28.00%
64	16.50%	17.00%	29.00%	18.30%	16.50%	17.00%	29.00%	18.30%
65	30.00%	30.00%	41.00%	29.60%	30.00%	30.00%	41.00%	29.60%
67	30.00%	30.00%	24.00%	33.20%	30.00%	30.00%	24.00%	33.20%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Age	Plan 1				Plan 2			
	Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
50	5.00%	4.00%	9.00%	8.00%	0.00%	0.00%	9.00%	8.00%
55	5.00%	5.50%	14.00%	11.50%	0.00%	0.00%	14.00%	11.50%
59	6.00%	5.00%	11.00%	11.50%	0.00%	0.00%	11.00%	11.50%
60	6.00%	7.50%	11.00%	13.00%	6.00%	7.50%	11.00%	13.00%
61	10.00%	7.50%	25.00%	17.50%	10.00%	7.50%	25.00%	17.50%
62	17.00%	17.00%	35.00%	25.00%	17.00%	17.00%	35.00%	25.00%
64	15.00%	13.00%	27.00%	17.50%	15.00%	13.00%	25.00%	25.00%
65	30.00%	30.00%	33.00%	40.00%	30.00%	30.00%	25.00%	25.00%
67	30.00%	30.00%	20.00%	25.00%	30.00%	30.00%	33.00%	40.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	9.00%	25.00%
55	8.50%	18.00%
59	13.50%	31.50%
60	20.00%	35.00%
> = 65	100.00%	100.00%

**FIGURE 4.3: RETIREMENT RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	8.50%	25.00%
55	8.50%	17.50%
59	11.50%	28.50%
60	20.00%	35.00%
> = 65	100.00%	100.00%

**State Police Officers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	10.00%	15.00%
55	10.00%	15.00%
59	12.00%	20.00%
60	25.00%	40.00%
> = 64	100.00%	100.00%

**Virginia Law Officers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	9.20%	25.00%
55	9.50%	25.00%
59	12.00%	40.00%
60	20.00%	40.00%
> = 65	100.00%	100.00%

**Judges – All Plans**

Age	Service Credit Weighting = 1.5* Years of Service			Service Credit Weighting = 2.0* Years of Service		
	2-19	20	> = 21	2-14	15	> = 16
60	0.00%	50.00%	50.00%	0.00%	50.00%	50.00%
65	50.00%	50.00%	15.00%	50.00%	50.00%	15.00%
69	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
> = 73	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Age	Service Credit Weighting = 2.5* Years of Service			Service Credit Weighting = 3.5* Years of Service		
	2-11	12	> = 13	1-8	9	> = 10
60	0.00%	50.00%	50.00%	0.00%	50.00%	50.00%
65	50.00%	50.00%	15.00%	50.00%	50.00%	15.00%
69	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
> = 73	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

\* Plan 1 members appointed or elected to an original term before July 1, 2010:

- 3.5, if appointed or elected to an original term before January 1, 1995
- 2.5, if appointed or elected to an original term on or after January 1, 1995, but before July 1, 2010

Plan 1 and Plan 2 members appointed or elected to an original term between July 1, 2010, and December 31, 2013, and Hybrid Retirement Plan members appointed or elected to an original term on or after January 1, 2014:

- 1.5, if appointed or elected to an original term and less than 45 years old
- 2.0, if appointed or elected to an original term and at least 45 years old but less than 55 years old
- 2.5, if appointed or elected to an original term and at least 55 years old

For judges who retire from the judicial system or from another VRS-covered position, the portion of the retirement benefit relating to judicial system service cannot exceed 78% of average final compensation.

**FIGURE 4.4: DISABILITY RATES – PENSION PLANS**

As shown below for selected ages.

**State Employees**

14% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0900%	0.0100%
30	0.1800%	0.1500%
40	0.1800%	0.2900%
50	0.4500%	0.5500%
60	0.7200%	1.0000%

**Teachers**

5% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0000%	0.0000%
30	0.0100%	0.0100%
40	0.0210%	0.0360%
50	0.1330%	0.0900%
60	0.3080%	0.2400%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

14% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0000%	0.0000%
30	0.0600%	0.0500%
40	0.1800%	0.0500%
50	0.2400%	0.1800%
60	0.7200%	0.4500%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

14% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0200%	0.0100%
30	0.0600%	0.0200%
40	0.1400%	0.0800%
50	0.3100%	0.2700%
60	0.8200%	0.7000%

**FIGURE 4.4: DISABILITY RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

60% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0000%	0.0000%
30	0.0500%	0.0500%
40	0.1800%	0.2400%
50	0.4000%	0.5300%
60	0.6500%	0.8100%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

60% of disability cases are assumed to be service-related.

Age	Rate
20	0.0000%
30	0.0300%
40	0.1100%
50	0.3800%
60	0.6400%

**State Police Officers**

60% of disability cases are assumed to be service-related.

Age	Rate
20	0.0000%
30	0.0280%
40	0.2100%
50	0.6750%
60	0.0000%

**Virginia Law Officers**

50% of disability cases are assumed to be service-related.

Age	Rate
20	0.1500%
30	0.6000%
40	0.8000%
50	1.2000%
60	1.0000%

**FIGURE 4.4: DISABILITY RATES – PENSION PLANS, cont.**

**Judges**

5% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0000%	0.0000%
30	0.0070%	0.0070%
40	0.1420%	0.0900%
50	0.4800%	0.3970%
60	0.0000%	0.0000%

**FIGURE 4.5: TERMINATION RATES – PENSION PLANS**

Withdrawal rates are based on age and years of service credit. Sample rates for selected ages and years of service are shown below for causes other than death, disability or retirement.

**State Employees – Plan 1**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males				Years of Service – Females			
	0-2	3-4	5-9	10+	0-2	3-4	5-9	10+
25	22.10%	13.00%	13.00%	0.00%	25.60%	15.70%	15.70%	0.00%
35	16.70%	9.30%	9.30%	4.50%	17.80%	11.00%	11.00%	5.00%
45	12.90%	7.00%	7.00%	2.30%	13.90%	7.40%	7.40%	2.50%
55	10.20%	6.00%	6.00%	0.00%	12.50%	8.60%	0.00%	0.00%
65	11.30%	11.00%	0.00%	0.00%	14.00%	12.00%	0.00%	0.00%

**State Employees – Plan 2 and Hybrid**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males				Years of Service – Females			
	0-2	3-4	5-9	10+	0-2	3-4	5-9	10+
25	22.10%	13.00%	13.00%	0.00%	25.60%	15.70%	15.70%	0.00%
35	16.70%	9.30%	9.30%	4.50%	17.80%	11.00%	11.00%	5.00%
45	12.90%	7.00%	7.00%	2.30%	13.90%	7.40%	7.40%	2.50%
55	10.20%	6.00%	6.00%	0.40%	12.50%	6.00%	6.00%	0.40%
65	11.30%	11.00%	0.00%	0.00%	14.00%	12.00%	0.00%	0.00%

**Teachers – Plan 1**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males				Years of Service – Females			
	0-2	3-4	5-9	10+	0-2	3-4	5-9	10+
25	15.40%	11.80%	11.80%	0.80%	14.60%	12.00%	12.00%	15.00%
35	14.10%	7.30%	7.30%	3.10%	14.90%	9.00%	9.00%	3.90%
45	14.70%	7.50%	7.50%	1.90%	11.70%	6.40%	6.40%	2.10%
55	14.30%	7.00%	0.00%	0.00%	12.40%	5.80%	0.00%	0.00%
65	17.00%	8.30%	0.00%	0.00%	13.00%	8.00%	0.00%	0.00%

**FIGURE 4.5: TERMINATION RATES – PENSION PLANS, cont.**

**Teachers – Plan 2 and Hybrid**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males				Years of Service – Females			
	0-2	3-4	5-9	10+	0-2	3-4	5-9	10+
25	15.40%	11.80%	11.80%	0.80%	14.60%	12.00%	12.00%	15.00%
35	14.10%	7.30%	7.30%	3.10%	14.90%	9.00%	9.00%	3.90%
45	14.70%	7.50%	7.50%	1.90%	11.70%	6.40%	6.40%	2.10%
55	14.30%	7.00%	7.00%	0.30%	12.40%	5.80%	5.80%	0.30%
65	17.00%	8.30%	0.00%	0.00%	13.00%	8.00%	0.00%	0.00%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	21.80%	13.70%	0.00%	23.30%	16.70%	0.00%
35	17.20%	9.70%	5.80%	18.60%	10.60%	5.10%
45	14.30%	7.10%	2.90%	14.80%	7.70%	2.80%
55	10.90%	5.30%	0.70%	11.90%	6.30%	0.00%
65	13.60%	8.20%	0.00%	12.60%	8.20%	0.00%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	23.50%	14.00%	0.00%	25.50%	16.50%	0.00%
35	18.50%	10.50%	5.50%	19.00%	11.50%	6.00%
45	15.50%	8.00%	3.00%	15.00%	8.00%	3.50%
55	12.00%	6.50%	1.00%	12.50%	6.50%	0.00%
65	12.00%	8.00%	0.00%	13.00%	9.00%	0.00%

**FIGURE 4.5: TERMINATION RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	7.80%	6.80%	0.00%	7.80%	6.80%	0.00%
35	8.00%	4.40%	2.40%	8.00%	4.40%	2.40%
45	9.20%	4.60%	1.50%	9.20%	4.60%	1.50%
55	8.30%	6.30%	0.00%	8.30%	6.30%	0.00%
60	8.70%	6.50%	0.00%	8.70%	6.50%	0.00%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	13.00%	8.50%	0.00%	13.00%	10.00%	0.00%
35	11.00%	7.00%	3.80%	14.00%	8.00%	4.50%
45	13.00%	6.00%	2.40%	12.00%	6.00%	3.50%
55	15.00%	8.00%	0.50%	12.00%	5.00%	0.50%
60	11.00%	10.00%	0.50%	12.00%	5.00%	0.50%

**State Police Officers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males				Years of Service – Females			
	0-2	3-4	5-9	10+	2	5	9	10+
25	7.50%	5.50%	5.50%	3.00%	10.80%	10.50%	5.40%	4.40%
35	7.50%	4.80%	4.80%	2.40%	12.10%	7.40%	6.00%	6.10%
45	10.00%	4.50%	4.50%	1.40%	10.80%	8.20%	6.40%	5.90%
55	10.00%	6.70%	0.00%	0.00%	7.40%	12.60%	6.70%	4.10%
65	10.00%	7.50%	0.00%	0.00%	1.50%	20.50%	6.90%	0.60%

**Virginia Law Officers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	20.00%	15.00%	5.00%	20.00%	15.00%	7.50%
35	20.00%	12.50%	5.00%	20.00%	12.50%	6.00%
45	15.00%	10.50%	4.00%	17.50%	8.00%	4.00%
55	12.00%	6.50%	4.00%	10.00%	12.00%	4.00%
65	15.00%	7.00%	4.00%	10.00%	10.00%	4.00%

### Judges – All Plans

There are no assumed rates of withdrawal prior to service retirement for causes other than death, disability or retirement.

### FIGURE 4.6: SALARY INCREASE RATES – PENSION PLANS

Sample salary increase rates are shown below.

#### State Employees

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown. It is assumed state employees who are covered under the Virginia Sickness and Disability Program (VSDP) receive a 3.50% annual increase in pay while disabled. This adjusted pay is used to determine deferred retirement benefits payable from the System.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.85%	5.35%
3	1.25%	4.75%
6	0.95%	4.45%
9	0.50%	4.00%
11	0.15%	3.65%
15	0.15%	3.65%
19	0.15%	3.65%
20 or more	0.00%	3.50%

#### Teachers

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	2.45%	5.95%
3	2.35%	5.85%
6	1.95%	5.45%
9	1.85%	5.35%
11	1.35%	4.85%
15	1.15%	4.65%
19	0.95%	4.45%
20 or more	0.00%	3.50%

**FIGURE 4.6: SALARY INCREASE RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.85%	5.35%
3	1.25%	4.75%
6	0.95%	4.45%
9	0.50%	4.00%
11	0.15%	3.65%
15	0.15%	3.65%
19	0.15%	3.65%
20 or more	0.00%	3.50%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.85%	5.35%
3	1.25%	4.75%
6	0.95%	4.45%
9	0.50%	4.00%
11	0.15%	3.65%
15	0.15%	3.65%
19	0.15%	3.65%
20 or more	0.00%	3.50%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**FIGURE 4.6: SALARY INCREASE RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**State Police Officers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown. It is assumed state police officers who are covered under the Virginia Sickness and Disability Program (VSDP) receive a 3.50% annual increase in pay while disabled. This adjusted pay is used to determine deferred retirement benefits payable from the System.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**Virginia Law Officers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown. It is assumed Virginia law officers who are covered under the Virginia Sickness and Disability Program (VSDP) receive a 3.50% annual increase in pay while disabled. This adjusted pay is used to determine deferred retirement benefits payable from the System.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**Judges**

Salary increase rates are 4.50%.

## ADDITIONAL INFORMATION ABOUT ACTUARIAL ASSUMPTIONS AND METHODS: PENSION PLANS

**Percent Electing a Refund or Deferred Annuity (excluding JRS Members).** Terminating members are assumed to elect a refund of their member contributions and accrued interest or a deferred annuity based on the option any given member would consider most valuable at the time of termination. The deferred annuity, if elected, is assumed to commence at the age at which the member first becomes eligible for an unreduced benefit.

**Provision for Expense.** The assumed investment return represents the anticipated net rate of return after payment of all administrative expenses.

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

**Actuarial Cost Method.** The valuation was prepared using the entry age normal actuarial cost method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contributions that – if applied to the compensation of the average new member during the entire period of his or her anticipated covered service – would be required in addition to the contributions of the member to meet the cost of all benefits payable on the member’s behalf.

The unfunded actuarial accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from VRS. The accrued liability contribution amortizes the balance of the unfunded accrued liability over a period of years from the valuation date.

**Actuarial Gains and Losses.** Actuarial gains and losses are reflected in the unfunded actuarial accrued liability and are amortized as part of that balance.

**Payroll Growth Rates.** For state employees, teachers and members of SPORS, VaLORS and JRS, the payroll growth rate is assumed to be 3.00% based on a zero population growth assumption. For political subdivision employees, the payroll growth rate also is assumed to be 3.00% based on a zero population growth assumption.

**Funding Period.** The legacy unfunded actuarial accrued liability, less the deferred contribution as of June 30, 2013, is amortized over a closed 30-year period from June 30, 2013. The amortization period of the unfunded, less the deferred contribution, will decrease by one each year until reaching 0 years. The deferred contribution, as defined under the 2011 Appropriations Act, Item 469(I)(6), is to be amortized using a level-dollar, closed 10-year period beginning June 30, 2011. The actuarial gains and losses and other changes in the unfunded due to benefits and actuarial assumption and method changes for each valuation subsequent to the June 30, 2013, valuation will be amortized over a closed 20-year period.

**Cost-of-Living Adjustment (COLA).** For Plan 1 employees receiving benefits or vested as of January 1, 2013, the COLA is assumed to be 2.50% per year compounded annually for the Basic Benefit option. The hazardous duty supplement for Plan 1 SPORS members, VaLORS members and political subdivision employees receiving enhanced hazardous duty benefits is assumed to increase at an inflation rate of 2.50% per year compounded annually. For Plan 1 employees who were not vested as of January 1, 2013, Plan 2 employees and hybrid plan employees, the COLA is assumed to be 2.25% per year compounded annually.

## Summary of Pension Plan Provisions

### Retirement Plans

#### ADMINISTRATION

The Virginia Retirement System (the System) pension Plan 1, Plan 2 and Hybrid Retirement Plan are administered by the Board of Trustees of the System. Plan 2 was established during the 2010 session of the General Assembly, and its provisions were effective for members hired between July 1, 2010, and December 31, 2013. In addition, Plan 1 members who were not vested as of January 1, 2013, are also in Plan 2. The hybrid plan was established for all non-hazardous duty employees hired on or after January 1, 2014.

#### TYPES OF PLANS

**1. Virginia Retirement System (VRS), effective March 1, 1952.** VRS is a qualified governmental pension system that administers two defined benefit structures, Plan 1 and Plan 2, and a Hybrid Retirement Plan with a benefit structure that combines both defined benefit and defined contribution features. The Governmental Accounting Standards Board (GASB) defines VRS as an agent multiple-employer public employee retirement system. Covered employees include full-time permanent, salaried state employees;

faculty members of the state's public colleges and universities who do not elect to participate in an optional retirement plan; teachers and administrative employees of the state's local public school divisions; and employees of Virginia cities, towns, counties and other political subdivisions that have elected to participate in VRS. Some part-time permanent, salaried state employees also are covered under VRS. VRS has separate cost-sharing pools for state and school employers.

Members are covered under Plan 1, Plan 2 or the hybrid plan according to their membership date:

- **Plan 1:** Membership date is July 1, 2010, with at least five years of service on January 1, 2013, and have not taken a refund. Members are covered under Optional Retirement Plan 1 if they have an ORP membership date before July 1, 2010, and maintain an account balance. If the member had a pre-July 1, 2010, ORP account balance and moved to a defined benefit plan, the member must have any combination of VRS creditable service and/or ORP participation that totals five years as of January 1, 2013, to be considered a Plan 1 member.
- **Plan 2:** Membership date is from July 1, 2010, to December 31, 2013, and have not taken a refund. Additionally, members are covered under Plan 2 if they have a membership date prior to July 1, 2010, but were not vested before January 1, 2013. Members are covered under Optional Retirement Plan 2 if they have an ORP membership date after July 1, 2010, and maintain an account balance. If a member of VaLORS or SPORS, or an employee of a political subdivision that provides enhanced hazardous duty benefits or the hazardous duty alternate option under VRS, and was hired on or after July 1, 2010, the member is in Plan 2, even if the membership date is after December 31, 2013.

- **Hybrid Retirement Plan:** Membership date is on or after January 1, 2014, or is a Plan 1 or Plan 2 member who elected, during a one-time opt-in period, to be covered under the hybrid plan. Employees in positions with hazardous duty benefits are not eligible to participate in the hybrid plan and become members of Plan 2. If the member was hired on or after January 1, 2014, and was eligible for an Optional Retirement Plan, the member must elect the ORP or the hybrid plan. If the member has prior service under Plan 1 or Plan 2, the member is not eligible to elect the hybrid plan and will choose between the ORP or the applicable VRS defined benefit plan.

**2. Single-Employer Public Employee Retirement Systems as Defined by GASB.** The provisions for the Plan 1 and Plan 2 benefit structures for the following systems are the same as those for VRS:

- State Police Officers' Retirement System (SPORS) established July 1, 1950, for full-time permanent, salaried state police officers.
- Virginia Law Officers' Retirement System (VaLORS) established October 1, 1999, for full-time permanent, salaried Virginia law officers other than state police.
- Judicial Retirement System (JRS) established July 1, 1970, for full-time permanent, salaried state judges and other qualifying employees. Members hired on or after January 1, 2014, are covered under the hybrid plan.

## MEMBER CONTRIBUTIONS

Member contributions vary by plan.

**Defined Benefit:** Active members in Plan 1 and Plan 2 contribute 5% of their creditable compensation per year. Active members in the hybrid plan contribute 4% of their creditable compensation per year. Contributions paid by employers on behalf of employees are governed by Section 414(h) of the Internal Revenue Code.

**Defined Contribution:** Active members in the hybrid plan are required to contribute 1% of their creditable compensation per year to the defined contribution component of the hybrid plan. Active members can make additional voluntary contributions of up to 4% of their creditable compensation. Members' contribution accounts accrue 4.00% interest each year, calculated on the balance as of the previous June 30.

## CREDITABLE COMPENSATION

Creditable compensation is the member's salary reported to VRS by the employer. It does not include payments for overtime, temporary employment, extra duties or other additional payments.

## AVERAGE FINAL COMPENSATION

Average final compensation is one of the factors used to calculate the member's retirement benefit.

**Plan 1.** Average of the member's 36 consecutive months of highest creditable compensation as a covered employee.

**Plan 2 and Hybrid Retirement Plan.** Average of the member's 60 consecutive months of highest creditable compensation as a covered employee.

## VESTING

VRS members become vested after accumulating five years of service credit.

## SERVICE CREDIT

**1. VRS; SPORS and VaLORS Members in Plan 1 and Plan 2; and Hybrid Retirement Plan.** These members receive one month of service credit for each month they are employed in a covered position and the employer is contributing to the System.

**2. JRS Members in Plan 1.** Judges appointed or elected to an original term before January 1, 1995, receive one month of service credit multiplied by a weighting factor of 3.5 for each month they are employed in a JRS-covered position and the employer is contributing to the System. The weighting factor for judges appointed or elected on or after January 1, 1995, but before July 1, 2010, is 2.5. Judges appointed or elected to an original term between July 1, 2010, and December 31, 2013, receive one month of service credit multiplied by a weighting factor of 2.5 if appointed or elected to an original term and were at least 55 years old; 2.0 if appointed or elected to an original term and were at least 45 years old but less than 55 years old; or 1.5, if appointed or elected to an original term and were less than 45 years old.

**3. JRS Members in Plan 2 and Hybrid Retirement Plan.** Judges appointed or elected to an original term between July 1, 2010, and December 31, 2013, receive one month of service credit multiplied by a weighting factor of 2.5 if appointed or elected to an original term and were at least 55 years old; 2.0 if appointed or elected to an original term and were at least 45 years old but less than 55 years old; or 1.5, if appointed or elected to an original term and were less than 45 years old.

#### **PRIOR SERVICE CREDIT**

Members may purchase prior service as credit in their plan. Eligible prior service includes active duty military service; full-time salaried federal service; full-time salaried public service with an employer or school system of another state or United States territory, or with a Virginia public employer that does not participate in VRS; non-covered service with a VRS-participating employer; approved leave from a VRS-covered position for the birth, adoption or death of a child; Family and Medical Leave Act (FMLA) leave for a serious health condition (as defined under FMLA) of the member or an immediate family member, also as

defined under FMLA; approved educational leave; unused sick leave at retirement, if the member is eligible; and VRS-refunded service. Members also can apply for no-cost military leave, provided they are not dishonorably discharged, return to covered employment within one year of discharge and do not take a refund of their member contributions and interest.

Prior service credit counts toward vesting, eligibility for retirement and eligibility for the health insurance credit, if offered by the employer. Prior service credit for refunded VRS hazardous duty service or for an eligible period of leave while covered under VRS in a hazardous duty position also counts toward the hazardous duty supplement for eligible members, provided they purchase or, in the case of no-cost military leave, are granted this service. Other types of prior service credit, such as active duty military service or hazardous duty service with a non-VRS participating employer, do not count toward the supplement.

Members may arrange to purchase prior service through a lump-sum payment using a personal check, a trustee-to-trustee transfer of funds or a pre-tax rollover of funds; an after-tax payroll deduction agreement or a pre-tax salary reduction agreement (if the employer offers the pre-tax salary reduction option); or a combination of these methods. Other special rules and limits govern the purchase of prior service.

The cost basis and eligibility periods for members are as follows:

**VRS Refunded Service.** The purchase cost is based on the refund amount, plus interest compounded annually from the date of the refund to the date the member buys back the service. The interest rate is 7 percent, which is the assumed rate of return of the VRS fund. The member may purchase all refunded service or a portion at any time while an active VRS member.

**Other Types of Eligible Service.** The two-year cost window to purchase most types of service at approximate normal cost begins upon employment in a VRS-covered position or following an eligible period of leave. If the member does not purchase prior service within the two-year window and leaves

employment or takes a leave of absence without pay, the window temporarily closes until the member returns to active VRS-covered employment. If the member does not purchase the service within the two-year window, the cost shifts to an actuarial equivalent cost.

**NORMAL (UNREDUCED) AND REDUCED RETIREMENT ELIGIBILITY AND BENEFIT CALCULATIONS**

**EARLIEST UNREDUCED RETIREMENT ELIGIBILITY**

<b>PLAN 1</b>	<b>PLAN 2 &amp; HYBRID PLAN</b>	<b>BENEFIT CALCULATIONS</b>
<p>VRS: Age 65 with at least five years of service credit, or age 50 with at least 30 years of service credit.</p> <p><i>Note: Some political subdivisions require employees to reach age 55 with at least 30 years of creditable service.</i></p>	<p>Normal Social Security retirement age with at least five years of service credit or when age and service equal 90. Example: Age 60 with 30 years of service credit.</p>	<ul style="list-style-type: none"> <li>• Plan 1: 1.70% of average final compensation X years of service.</li> <li>• Plan 2: 1.65% of average final compensation X years of service.</li> <li>• Hybrid Retirement Plan: 1.00% of average final compensation X years of service.</li> </ul> <p>NOTE: Plan 2 and Hybrid Retirement Plan members could have a bifurcated multiplier. For example, Plan 2 members with a membership date prior to July 1, 2010, have a 1.70% multiplier on any service earned, purchased or granted prior to January 1, 2013, and a 1.65% multiplier on any service earned purchased or granted on or after January 1, 2013.</p>
<p>SPORS, VaLORS and political subdivision hazardous duty covered employees: Age 60 with at least five years of service credit or age 50 with at least 25 years of service credit.</p>	<p>SPORS, VaLORS and political subdivision hazardous duty covered employees: Age 60 with at least five years of service credit or age 50 with at least 25 years of service credit. (Hybrid plan not applicable.)</p>	<ul style="list-style-type: none"> <li>• SPORS, sheriffs and regional jail superintendents: 1.85% of average final compensation for each year of service credit.</li> <li>• VaLORS: 1.70% (if membership date in VaLORS was before July 1, 2001, and member has at least 20 years of service credit) or 2.00% of average final compensation for each year of service credit as elected by the member. Note: VaLORS members retiring under the 2.00% multiplier are not eligible for the hazardous duty supplement.</li> <li>• All other VaLORS members receive 2.00% of average final service X years of hazardous duty service plus 1.70% of average final compensation X years of non-hazardous service. NOTE: VaLORS members retiring under the 2.00% multiplier are not eligible for the hazardous duty supplement.</li> <li>• Political subdivision hazardous duty employees: 1.70% or 1.85% of average final compensation for each year of service credit, as elected by the employer.</li> </ul>

**NORMAL (UNREDUCED) AND REDUCED RETIREMENT ELIGIBILITY AND BENEFIT CALCULATIONS, cont.**

**EARLIEST UNREDUCED RETIREMENT ELIGIBILITY**

<p>JRS: Age 65 with at least five years of weighted service credit or age 60 with at least 30 years of weighted service credit.</p>	<p>Same as Plan 1.</p>	<p>Plan 1 and Plan 2</p> <ul style="list-style-type: none"> <li>• If appointed or elected to an original term prior to January 1, 2013: 1.70% of average final compensation for each year of service credit.</li> <li>• If appointed or elected to an original term between January 1, 2013, and December 31, 2013: 1.70% on non-JRS service earned, purchased or granted before the date of appointment or election to an original term and 1.65% on JRS service earned, purchased or granted on or after the date of appointment or election to an original term.</li> </ul> <p>Hybrid Retirement Plan</p> <ul style="list-style-type: none"> <li>• 1.00% of average final compensation for each year of service credit beginning on the date of appointment or election to an original term.</li> </ul>
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**EARLIEST REDUCED RETIREMENT ELIGIBILITY**

<b>PLAN 1</b>	<b>PLAN 2 &amp; HYBRID PLAN</b>	<b>BENEFIT CALCULATIONS</b>
<p>VRS: Age 55 with at least five years of service credit or age 50 with at least 10 years of service credit.</p> <p>SPORS, VaLORS and political subdivision hazardous duty covered employees: Age 50 with at least five years of service credit.</p> <p>JRS: Age 55 with at least five years of weighted service credit.</p>	<p>Age 60 with at least five years of service credit.</p> <p>Same as Plan 1.</p> <p>Same as Plan 1.</p>	<ul style="list-style-type: none"> <li>• VRS Plan 1, JRS Plan 1, JRS Plan 2 and JRS Hybrid, SPORS, VaLORS and political subdivision hazardous duty covered Plan 1 and Plan 2 members who are at least age 55 (age 50 for SPORS, VaLORS and political subdivision hazardous duty covered members): A reduction is applied of 0.50% per month for the first 60 months and 0.40% for the next 60 months the member is away from meeting unreduced retirement eligibility.</li> <li>• For VRS Plan 1 members, an additional reduction of 0.60% is applied for each month the member's age precedes age 55.</li> <li>• Plan 2 and Hybrid Retirement Plan: Calculated the same as a normal retirement benefit, using actual service at retirement and multiplied by an actuarially equivalent reduction factor. No reduction applies if the sum of the member's age and service equals 90 or the member is eligible for normal retirement.</li> </ul>

## BENEFIT PAYOUT OPTIONS

VRS members eligible for retirement must elect one of the following benefit payout options when they apply for retirement. This election is irrevocable, except for the Survivor Option under certain circumstances. These options are available on an actuarially equivalent basis:

**1. Basic Benefit.** Members may choose the Basic Benefit, which is the unreduced benefit amount. An early retirement reduction factor is applied for the reduced benefit. The Basic Benefit does not provide a continuation of a lifetime monthly benefit to a survivor.

**2. Survivor Option.** Members may choose a whole percentage of their benefit, between 10% and 100%, to continue as a lifetime benefit to a survivor upon their death. The member's benefit is actuarially reduced accordingly.

**3. Partial Lump-Sum Option Payment (PLOP).** Members who are in active service for one or more years beyond the date they become eligible for an unreduced retirement benefit may elect a partial lump-sum payment of their member contributions and accrued interest equal to one, two or three times their annual retirement benefit, depending on how long they work beyond their unreduced retirement eligibility date. The monthly benefit is actuarially reduced accordingly. This option is available with the Basic Benefit and the Survivor Option.

**4. Advance Pension Option.** With this option, members elect to receive a temporary higher benefit until an age selected by the member, between age 62 and the normal retirement age under Social Security. At that point, the monthly benefit is permanently reduced on an actuarially equivalent basis. The benefit can never be reduced by more than 50%. The Advance Pension Option does not provide a continuation of a benefit to a survivor.

## PAYMENT FORM

The retirement benefit is paid as a lifetime monthly annuity. Upon the member's death in retirement, the member's beneficiary receives a lump-sum payment of any remaining member contributions and accrued interest in the member's account. If the member has elected the Survivor Option, a lifetime monthly benefit is paid to his or her survivor instead of a lump-sum payment.

## HAZARDOUS DUTY SUPPLEMENT

An annual supplement is payable to members of SPORS and VRS political subdivision members eligible for enhanced hazardous duty coverage who retire with at least 20 years of eligible hazardous duty service credit. The supplement begins when they retire and continues until they reach their normal retirement age under Social Security. VaLORS members retiring under the 1.70% multiplier who have at least 20 years of eligible hazardous duty service credit receive the supplement beginning when they retire and continuing until age 65; VaLORS members retiring under the 2.00% multiplier are not eligible for the supplement. Vested members hired in eligible hazardous duty positions before July 1, 1974, are not required to have 20 years of hazardous duty service credit to qualify for the supplement, provided they take an immediate annuity.

The supplement is a dollar amount added to the member's monthly retirement benefit payment. It is adjusted biennially based on increases in Social Security benefits during interim periods, as determined by the VRS actuary.

## COST-OF-LIVING ADJUSTMENT (COLA)

The cost-of-living adjustment (COLA) is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within five years of eligibility for unreduced retirement as of January 1, 2013, and to members who retire with 20 or more

years of service. The COLA is effective each July 1 thereafter, when provided. During periods of no inflation or deflation, the COLA is zero (0.00%).

The COLA is calculated based on changes in the Consumer Price Index for all Urban Consumers (CPI-U) as follows:

1. The CPI-U for the most recent calendar year used to determine the VRS COLA is subtracted from the most recent average annual CPI-U to arrive at the index point change.
2. The index point change is divided by the CPI-U for the most recent calendar year in which a COLA was paid.
3. The result is multiplied by 100 to convert it to a percentage. Under Plan 1, automatic cost-of-living increases are calculated as the first 3.00% of the increase of the CPI-U, plus half of each percentage increase from 3.00% to 7.00%. Under Plan 2 and the Hybrid Retirement Plan, automatic cost-of-living increases are calculated as the first 2.00% of the increase of the CPI-U, plus half of each percentage increase from 2.00% to 4.00%, with a maximum COLA increase of 3.00%.

## Refunds and Deferred Membership

**1. Refunds.** Vested members in Plan 1, Plan 2 and the Hybrid Retirement Plan who leave or are involuntarily separated from employment for causes other than job performance or misconduct are eligible for a full refund of their member contribution account balance, including accrued interest. Non-vested members are eligible for a refund of the balance, excluding any employer-paid member contributions made to their accounts after July 1, 2010, and the accrued interest on these contributions.

Hybrid plan members are also immediately vested to any funds they contribute to the defined contribution component of their plan. They become

vested over a four-year period to the funds their employer contributes on their behalf. Members with fewer than two years of creditable service forfeit the employer contributions.

Taking a refund cancels membership and eligibility for any future benefits under the retirement plans. Members who take a refund and return to covered employment will be rehired under the currently applicable plan. They are then eligible to purchase their VRS refunded service as credit in their plan.

**2. Deferred membership.** Members separating from employment have the option to leave their funds with VRS and become deferred members. If they are vested or involuntarily separated from employment, they may be eligible for a future retirement benefit if they meet the age and service requirements for their plan. The benefit is calculated based on the member's service credit and average final compensation at the time of separation. Upon the member's death, the member's beneficiary receives a lump-sum payment of any remaining member contributions and accrued interest. If the member retires and elects the Survivor Option, a lifetime monthly benefit is paid to the survivor upon the member's death.

Deferred members remain eligible to receive a full or partial refund of their member contribution account balance, depending on whether or not they are vested. If a deferred member returns to covered employment, member contributions and the service credit the member earns upon reemployment are added to the member's record.

## Death-in-Service Benefit

If a member dies while in active service, his or her named beneficiary or spouse, natural or legally adopted minor child or parent may be eligible for a death-in-service benefit in addition to VRS life insurance benefits, if applicable.

## NON-WORK-RELATED CAUSE OF DEATH

If the member dies from a non-work-related cause, the member's named beneficiary will be eligible for a refund of any funds remaining in the member's contribution account. If the member is vested at the time of death and his or her spouse, natural or legally adopted minor child or parent is one of the member's named beneficiaries or is the beneficiary based on order of precedence, he or she will be eligible for a refund or a monthly benefit to the exclusion of all other primary beneficiaries. Any benefits minor children receive will end when they reach age 18. If the member is not vested at the time of death, his or her spouse, natural or legally adopted minor child or parent will be eligible for a refund only, which will be shared with any other primary beneficiaries the member has designated, if applicable.

The monthly non-work-related benefit is a lifetime monthly annuity based on the 100% Survivor Option. Members covered under Plan 1 who die before age 55 are assumed to be age 55 at the time of death for the purpose of calculating the benefit. The calculation for members covered under Plan 2 and the Hybrid Retirement Plan uses age 60. The calculation for Plan 1 and Plan 2 members of SPORS and VaLORS, and for VRS members eligible for enhanced hazardous duty coverage, uses age 50.

## WORK-RELATED CAUSE OF DEATH

If the member dies from a work-related cause, the member's named beneficiary will be eligible for a lump-sum payment of any funds remaining in the member's contribution account. In addition, the member's spouse, natural or legally adopted minor child or parent will be eligible for a monthly benefit, whether or not this individual is a named beneficiary.

The monthly work-related benefit is a lifetime monthly annuity based on 33 $\frac{1}{3}$ % of the member's average final compensation if the spouse, minor child or parent qualifies for Social Security survivor benefits, or 50% of the member's average final compensation if the spouse, minor child or parent does not qualify for Social Security survivor benefits. The benefit is then adjusted by any workers' compensation survivor benefits.

## Disability Benefits

### DISABILITY RETIREMENT

Plan 1 and Plan 2 members who are not covered under the Virginia Sickness and Disability Program (VSDP) are eligible to apply for disability retirement from the first day of covered employment if they have a physical or cognitive disability that prevents them from performing their job and is likely to be permanent. Members covered under Plan 1 and Plan 2 who retire on disability before age 60 are credited with the lesser of (1) twice their total service credit at disability retirement; or (2) their total service credit plus the number of years remaining between their age at disability retirement and age 60.

The disability benefit for non-vested members is the minimum guaranteed benefit, which is either (1) 50% of the member's average final compensation (66 $\frac{2}{3}$ % if the disability is work-related) if the member does not qualify for primary Social Security benefits; or (2) 33 $\frac{1}{3}$ % of average final compensation (50% if the disability is work-related) if the member qualifies for primary Social Security benefits.

Vested members receive the greater of the minimum guaranteed benefit or 1.70% of average final compensation for each year of service credit at the time of disability retirement. The benefit for members retiring on work-related disability is reduced by any workers' compensation benefits. The payout options available to members retiring on disability are the Basic Benefit and Survivor Option.

#### **VIRGINIA SICKNESS AND DISABILITY PROGRAM**

The Virginia Sickness and Disability Program (VSDP) was established on January 1, 1999, to provide income protection to state employees covered under VRS, SPORS and VaLORS if they suffer a non-work-related or work-related illness or injury. Enrollment in VSDP is automatic upon employment. State employees hired before January 1, 1999, had the option to elect VSDP or retain their eligibility to be considered for disability retirement. Employees enrolled in VSDP are not eligible to retire on disability. Additional information about VSDP is provided in the "Summary of Other Post-Employment Benefit (OPEB) Plan Provisions" in the next discussion on OPEBs. Additional information also is provided in the Financial Section.

#### **VIRGINIA LOCAL DISABILITY PROGRAM**

The Virginia Local Disability Program (VLDP) was implemented January 1, 2014, to provide Hybrid

Retirement Plan members short-term and long-term disability benefits for non-work-related and work-related disabilities. Eligible employees are enrolled automatically upon employment, unless their employer has elected to provide comparable coverage. Eligible employees include:

- Teachers or other professional employees of a local public school division.
- General employees of a VRS-participating political subdivision, such as a city, county, town, authority or commission.
- Local law enforcement officers, firefighters or emergency medical technicians if the employer does not provide enhanced hazardous duty benefits.

Additional information about VLDP is provided in the "Summary of Other Post-Employment Benefit (OPEB) Plan Provisions" in the next discussion on OPEBs. Additional information also is provided in the Financial Section.

## Summary of Pension Plan Changes

The following actuarially material changes have occurred to the pension plan provisions in recent years.

**2006 VALUATION:** No actuarially material changes are made to the plan provisions.

**2007 VALUATION:** The retirement multiplier for VRS-covered sheriffs and SPORS members changes from 1.70% to 1.85% of average final compensation, effective July 1, 2008.

**2008 VALUATION:** No actuarially material changes are made to the plan provisions.

**2009 VALUATION:** No actuarially material changes are made to the plan provisions. There are three changes of note:

1. On April 16, 2009, the Board adopts the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2008 experience study.
2. The temporary retirement supplement for SPORS members, VaLORS members and political subdivision employees eligible for enhanced hazardous duty coverage changes from \$11,508 to \$12,456 annually.
3. For the June 30, 2009, valuation, the Board suspends application of the 80% to 120% market value-of-assets corridor on the actuarial value of assets.

**2010 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

1. For the June 30, 2010, valuation, the application of the 80% to 120% market value-of-assets corridor on the actuarial value of assets is reinstated.

2. The Board reduces the investment rate-of-return assumption from 7.50% to 7.00%.

**2011 VALUATION:** In 2010, VRS adopts a second retirement plan, Plan 2. All employees hired on or after July 1, 2010, are automatically enrolled in this plan. The differences between Plan 1 and Plan 2 are listed below:

1. Under Plan 2, average final compensation is based on the highest 60 consecutive months of service.
2. The Plan 2 cost-of-living adjustment (COLA) is based on the first 2.00% increase in the Consumer Price Index for all Urban Consumers (CPI-U) plus half of each percent from 2.00% to 10.00%, with a maximum COLA of 6.00%.
3. Under Plan 2, normal retirement age is Social Security normal retirement age with at least five years of service credit. A Plan 2 member is eligible for unreduced early retirement when the sum of his or her age plus service credit is 90 (Rule of 90). Eligibility for reduced early retirement is at age 60 with five years of service credit.
4. Weighted service factors for first-term Plan 2 judges are 1.5 for judges less than age 45; 2.0 for judges age 45-54; and 2.5 for judges age 55 or older.

New general state employees, teachers and general political subdivision employees under VRS are subject to changes 1, 2 and 3 above. New state police officers (SPORS), Virginia law officers (VaLORS) and political subdivision employees eligible for enhanced hazardous duty coverage (VRS) are subject to changes 1 and 2 above. New employees covered under JRS are subject to changes 1, 2 and 4 above.

**2012 VALUATION:** In 2012 House Bill 1130/Senate Bill 498 was enacted and was effective on January 1, 2013. The changes resulting from this legislation are as listed below:

1. Active non-vested members of Plan 1 have their Average Final Compensation based on the highest 60 consecutive months of service instead of the highest 36 consecutive months of service. This provision applies to all plans.

2. Active non-vested members of Plan 1 and all Plan 2 members accrue benefits at 1.65% as of the effective date.

This provision applies to the state and teacher plans and to members in political subdivision plans who are not covered by hazardous duty benefits.

3. Active members in the judicial plan hired after January 1, 2013, accrue benefits at 1.65%.

4. Active non-vested members of Plan 1 have to satisfy the Rule of 90 (sum of age and service is at least 90) or reach their Social Security normal retirement age to be eligible for unreduced retirement. These same members must attain age 60 with five years of service to be eligible for early retirement. This provision applies to the state and teacher plans and to members of political subdivision plans who are not covered by hazardous duty benefits.

5. Non-vested members of Plan 1 and all members of Plan 2 have a maximum cost-of-living adjustment (COLA) of 3.00%. This provision applies to all plans.

6. All active employees not within five years of eligibility for an unreduced retirement as of January 1, 2013, and retiring with fewer than 20 years of service have their cost-of-living adjustment (COLA) deferred to one year following their unreduced retirement date after beginning to receive benefits. All active employees within five years

of eligibility for unreduced retirement as of January 1, 2013, are grandfathered into the old provisions with no deferral of the COLA.

**2013 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

1. On June 20, 2013, the Board adopts the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2012 experience study.

2. Changes noted in the 2012 valuation information, with effective dates in fiscal year 2013, were implemented.

**2014 VALUATION:** No actuarially material changes are made to the plan provisions. The 2014 valuation includes Hybrid Retirement Plan members for the first time. The hybrid plan covers eligible employees hired on or after January 1, 2014, in the state, teacher and judicial plans or Plan 1 and Plan 2 members who elected, during a one-time opt-in period, to be covered under the hybrid plan. The hybrid plan does not apply to members in the SPORS and VaLORS plans. The hybrid plan consists of defined benefit plan and defined contribution plan components.

**2015 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

1. An administrative expense charge was added to the employer contribution rates to cover administrative expenses.

2. The retirement rates for the judicial plan were extended to age 73 to reflect the change in the mandatory retirement age to 73.

**2016 VALUATION:** No actuarially material changes are made to the plan provisions.

Actuary's Certification Letter:  
OPEB Plans



**Cavanaugh Macdonald**  
CONSULTING, LLC  
*The experience and dedication you deserve*

December 20, 2016

**Board of Trustees**

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

Dear Trustees:

We are pleased to submit the results of the annual actuarial valuation for the following other post-employment benefits plans (OPEB Plans) of the Virginia Retirement System (VRS), prepared as of June 30, 2016:

- Group Life Insurance Program (GLI)
- Health Insurance Credit Program (HIC)
  - State Employees (HIC – State Employees)
  - Teachers (HIC – Teachers)
- Participating Political Subdivisions in Aggregate (HIC – Political Subdivisions)
- Special Coverage Groups (HIC – Special Coverage Groups)
  - Constitutional Officers (HIC – Constitutional Officers)
  - Social Service Employees (HIC – State Employees)
  - Registrars (HIC – Registrars)
- Virginia Sickness and Disability Program (VSDP)
- Virginia Local Disability Program (VLDP)
  - Teachers (VLDP – Teachers)
- Political Subdivisions (VLDP – Political Subdivisions)

As described above, this report includes information, in aggregate, on the actuarial valuations of the Health Insurance Credit Program for participating political subdivisions as of June 30, 2016. We have prepared and provided separately, actuarial valuation reports for each of the participating political subdivisions. Please refer to the individual reports for the valuation results, summary of actuarial assumptions and methods, and plan provisions for each of the participating political subdivision plans.

Governmental Accounting Standards Board Statements No. 43 and No. 45 (GASB 43 and 45) require actuarial valuations of retiree health care and other post-employment benefits (OPEB). Cavanaugh Macdonald Consulting, LLC (CMC), is submitting the results of the annual actuarial valuation of the OPEB plans of VRS prepared as of June 30, 2016. While not verifying the data at source, the actuary

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144  
Phone (678) 388-1700 • Fax (678) 388-1730  
[www.CavMacConsulting.com](http://www.CavMacConsulting.com)



performed tests for consistency and reasonability. The asset values used to determine unfunded liabilities are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

Contribution rates for Virginia Retirement System (VRS) employers are established every two years. The actuarially calculated employer contribution rates based on the current valuation are for informational purposes only.

The valuation results indicate that the full employer contribution rates shown in the following table are sufficient to fund the normal cost for all members and finance the unfunded accrued liability of the indicated OPEB Plans. For comparison, in the following table, we present the employer contribution rates based on the June 30, 2015, actuarial valuation, the employer contribution rates approved by the General Assembly for fiscal years ending 2017 and 2018, and the employer contribution rates based on the June 30, 2016, actuarial valuation.

OPEB Plan	FISCAL YEARS 2017 & 2018		2016 Valuation (Informational Only)
	Board Approved	General Assembly Approved	
	2015 Valuation		
GLI*	1.31%	1.31%	1.31%
HIC – State Employees	1.18%	1.18%	1.15%
HIC – Teachers	1.23%	1.11%/1.23%	1.25%
HIC – Participating Political Subdivisions**	0.31%	0.31%	0.32%
HIC – Constitutional Officers	0.36%	0.36%	0.37%
HIC – Social Service Employees	0.42%	0.42%	0.42%
HIC – Registrars	0.41%	0.41%	0.40%
VSDP	0.66%	0.66%	0.63%
VLDP – Teachers	0.31%	0.31%	0.32%
VLDP – Political Subdivisions	0.60%	0.60%	0.62%

\* The contribution rate for GLI includes an adjustment of 0.34% for active group life insurance; see Section I for additional detail.

\*\* Arithmetic average of individual employer rates.

The promised post-employment benefits of the OPEB Plans are included in the actuarially calculated contribution rates, which are developed using the entry age normal cost method with projected benefits. The valuation takes into account the differentiation between Plan 1 vested members; Plan 1 non-vested members as of January 1, 2013, resulting from House Bill 1130 and Senate Bill 498; Plan 2 members; and Hybrid Retirement Plan members. Five-year smoothed market value of assets is used for actuarial valuation purposes (with the exception of HIC – Political Subdivisions and HIC – Special Coverage Groups). GASB 43 and 45 require the discount rate used to value a plan be based on the likely return of the assets used to pay benefits. As of June 30, 2016, the plan has assets in trust solely to provide benefits to eligible recipients. Therefore, the discount rate has been set at 7.00%. In accordance with the funding policy adopted by the Board of



Trustees, the unfunded liability is being amortized by regular annual contributions as a level percentage of payroll within a closed 30-year period for the unfunded liability as of July 1, 2013, and gains and losses in subsequent years are amortized within a closed 20-year period, on the assumption that payroll will increase by 3% annually and the amortization period will decrease by one each year until reaching 0 years. In the event that the funding policy produces an effective amortization period of greater than 30 years, a 30-year amortization period is used in accordance with GASB 43 and 45. The assumptions recommended by the actuary and adopted by the Board are in the aggregate reasonably related to the experience under the OPEB Plans and to reasonable expectations of anticipated experience under the OPEB Plans and meet the parameters for the disclosures under GASB 43 and 45.

The annual required contribution was determined in accordance with the accounting requirements under GASB 43 and 45.

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 OPEB Plans 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: Experience of the OPEB Plans 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 OPEB Plans' funded status); and changes in the provisions of the OPEB Plans or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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

Respectfully submitted,

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

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

Andrew A. Paine, ASA, FCA, MAAA  
Senior Actuary

Brian C. Nichols, EA, FCA, MAAA  
Senior Actuary

Actuary's Certification Letter:  
OPEB Plans – Line of Duty Act Fund



**Cavanaugh Macdonald**  
CONSULTING, LLC  
*The experience and dedication you deserve*

December 20, 2016

**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 post-employment 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 Act Program (LODA Program) provided by § 9.1-400 of the *Code of Virginia* (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 VRS and inactive data provided by the Commonwealth of Virginia Department 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 population: state employees and political subdivision employees. State employees include state employees, Virginia law officers (VaLORS), state police (SPORS), Department of Motor Vehicles 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

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144  
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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 House Bill 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 on 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 information 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 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). 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 House Bill 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 adjustments 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 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 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 black ink, appearing to read 'Jose I. Fernandez'.

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

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

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

**T**he Actuarial Section for VRS-administered Other Post-Employment Benefit (OPEB) Plans presents information about the assumptions adopted by the Board of Trustees and used by the VRS actuaries to evaluate the funded status of these plans. This information includes assumptions about retirements, disabilities, terminations and salary increase rates. The section also provides a summary of OPEB plan provisions and changes.

## Summary of Actuarial Assumptions and Methods

On June 20, 2013, the VRS Board of Trustees adopted most of the actuarial assumptions and methods on the recommendation of its actuary. The following assumptions include the Group Life Insurance Program, the Retiree Health Insurance Credit Program, the Virginia Sickness and

Disability Program, the Virginia Local Disability Program and the Line of Duty Act Program. They were based on an analysis of plan experience for the four-year period July 1, 2008, through June 30, 2012, and were used for the June 30, 2016, valuation.

### SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS: OTHER POST-EMPLOYMENT BENEFIT (OPEB) PLANS

FOR THE JUNE 30, 2016, ACTUARIAL VALUATION

Actuarial Assumptions and Methods	Group Life Insurance Program	Retiree Health Insurance Credit Program	Virginia Sickness and Disability Program	Line of Duty Act Program	Virginia Local Disability Program
Valuation Interest Rate	7.00%	7.00%	7.00%	4.75%	7.00%
Salary Scale Inflation Factor	2.50%	2.50%	2.50%	2.50%	2.50%
Actuarial Cost Method	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
Effective Amortization Period – State	27.5 Years	27.0 Years	24.5 Years	30 Years	N/A
Effective Amortization Period – Teacher	27.5 Years	26.7 Years	N/A	N/A	18.7 Years
Effective Amortization Period – Political Subdivisions	27.5 Years	26.4 Years	N/A	30 Years	19.8 Years
Amortization Method	Level Percent of Pay	Level Percent of Pay	Level Percent of Pay	Level Percent of Pay	Level Percent of Pay
	Closed	Closed	Closed	Open	Closed
Payroll Growth Rate	3.00%	3.00%	3.00%	3.00%	3.00%
Assets Valuation Method – State and Teacher	5-Year Smoothed Market	5-Year Smoothed Market	5-Year Smoothed Market	Market Value	5-Year Smoothed Market
Assets Valuation Method – Political Subdivisions	5-Year Smoothed Market	Market Value*	N/A	Market Value	5-Year Smoothed Market

\* Includes state-funded retiree health insurance for certain local government employees.

**SOLVENCY TEST: OPEB PLANS**

(EXPRESSED IN THOUSANDS)

Valuation Date (June 30)	Aggregate Accrued Liabilities for			Valuation Assets	Portion of Accrued Liabilities Covered by Assets		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members*		(1)	(2)	(3)
<b>GROUP LIFE INSURANCE</b>							
2016	N/A	\$ 1,749,825	\$ 1,224,643	\$ 1,247,564	N/A	71.30%	0.00%
2015	N/A	1,633,937	1,195,167	1,128,876	N/A	69.09%	0.00%
2014	N/A	1,522,758	1,178,751	992,221	N/A	65.16%	0.00%
2013	N/A	1,422,423	1,149,268	836,547	N/A	58.81%	0.00%
2012	N/A	1,308,096	1,150,214	755,889	N/A	57.79%	0.00%
2011	N/A	1,228,335	1,130,642	852,424	N/A	69.40%	0.00%
2010	N/A	1,140,158	1,105,157	928,920	N/A	81.47%	0.00%
2009	N/A	995,206	999,593	967,188	N/A	97.18%	0.00%
2008***	N/A	912,508	858,862	974,869	N/A	100.00%	7.26%
<b>RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES**</b>							
2016	N/A	\$ 610,570	\$ 377,071	\$ 70,798	N/A	11.60%	0.00%
2015	N/A	594,098	382,428	67,164	N/A	11.31%	0.00%
2014	N/A	577,291	384,851	60,645	N/A	10.51%	0.00%
2013	N/A	562,448	382,134	54,773	N/A	9.74%	0.00%
2012	N/A	542,874	374,294	55,510	N/A	10.23%	0.00%
2011	N/A	530,461	366,099	110,791	N/A	20.89%	0.00%
2010	N/A	521,153	373,888	159,163	N/A	30.54%	0.00%
2009	N/A	466,457	375,654	169,287	N/A	36.29%	0.00%
2008***	N/A	422,996	379,164	153,738	N/A	36.35%	0.00%
<b>RETIREE HEALTH INSURANCE CREDIT – TEACHERS</b>							
2016	N/A	\$ 811,164	\$ 540,039	\$ 86,701	N/A	10.69%	0.00%
2015	N/A	786,781	538,634	85,379	N/A	10.85%	0.00%
2014	N/A	761,301	536,420	79,177	N/A	10.40%	0.00%
2013	N/A	728,612	529,180	67,012	N/A	9.20%	0.00%
2012	N/A	732,146	536,924	58,286	N/A	7.96%	0.00%
2011	N/A	707,436	522,769	85,933	N/A	12.15%	0.00%
2010	N/A	666,263	536,175	108,187	N/A	16.24%	0.00%
2009	N/A	614,050	494,120	115,880	N/A	18.87%	0.00%
2008***	N/A	554,541	523,484	98,266	N/A	17.72%	0.00%
<b>RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS</b>							
2016	N/A	\$ 24,167	\$ 17,836	\$ 2,351	N/A	9.73%	0.00%
2015	N/A	22,440	18,172	2,042	N/A	9.10%	0.00%
2014	N/A	21,179	18,120	4,145	N/A	19.57%	0.00%
2013	N/A	20,001	17,794	1,510	N/A	7.55%	0.00%
2012	N/A	19,817	18,456	1,807	N/A	9.12%	0.00%
2011	N/A	18,271	18,406	2,338	N/A	12.80%	0.00%
2010	N/A	17,045	17,724	2,743	N/A	16.09%	0.00%
2009	N/A	15,289	16,049	3,040	N/A	19.88%	0.00%
2008***	N/A	14,960	19,726	3,311	N/A	22.13%	0.00%

**SOLVENCY TEST: OPEB PLANS, cont.**

(EXPRESSED IN THOUSANDS)

Valuation Date (June 30)	Aggregate Accrued Liabilities for			Valuation Assets	Portion of Accrued Liabilities Covered by Assets			
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members*		(1)	(2)	(3)	
<b>RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS</b>								
2016	N/A	\$ 20,216	\$ 18,026	\$ 19,337	N/A	95.65%	0.00%	
2015	N/A	19,286	17,626	19,348	N/A	100.00%	0.35%	
2014	N/A	17,371	17,826	18,605	N/A	100.00%	6.92%	
2013	N/A	16,268	17,036	16,137	N/A	99.19%	0.00%	
2012	N/A	15,054	16,369	14,275	N/A	94.83%	0.00%	
2011	N/A	14,503	15,688	13,918	N/A	95.97%	0.00%	
2010	N/A	13,223	16,861	11,218	N/A	84.84%	0.00%	
2009	N/A	11,943	13,548	8,332	N/A	69.76%	0.00%	
2008***	N/A	15,388	12,722	8,553	N/A	55.58%	0.00%	
<b>VIRGINIA SICKNESS AND DISABILITY PROGRAM – LTD BENEFITS</b>								
2016****	N/A	\$ 156,449	\$ 84,437	\$ 416,248	N/A	100.00%	307.68%	
2015****	N/A	156,796	78,451	398,609	N/A	100.00%	308.23%	
2014	N/A	138,511	50,027	325,354	N/A	100.00%	373.48%	
2013	N/A	132,842	50,104	313,480	N/A	100.00%	360.53%	
2012	N/A	125,578	136,151	305,170	N/A	100.00%	131.91%	
2011	N/A	123,339	139,505	330,079	N/A	100.00%	148.20%	
2010	N/A	133,728	148,251	302,683	N/A	100.00%	113.97%	
2009	N/A	120,811	146,773	266,635	N/A	100.00%	99.35%	
2008***	N/A	147,518	215,357	286,164	N/A	100.00%	64.38%	
<b>VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS</b>								
2016****	N/A	\$ 132	\$ 307	\$ 57	N/A	43.18%	0.00%	
2015****	N/A	15	162	48	N/A	100.00%	20.37%	
2014***	N/A	N/A	N/A	N/A	N/A	0.00%	0.00%	
<b>VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS</b>								
2016****	N/A	\$ 135	\$ 243	\$ 52	N/A	38.52%	0.00%	
2015****	N/A	30	106	30	N/A	100.00%	0.00%	
2014***	N/A	N/A	N/A	N/A	N/A	0.00%	0.00%	
<b>LINE OF DUTY ACT PROGRAM</b>								
2016	N/A	\$ 192,578	\$ 32,105	\$ 1,900	N/A	0.99%	0.00%	
2015	N/A	169,288	76,520	696	N/A	0.41%	0.00%	
2014	N/A	152,120	73,696	6,914	N/A	4.55%	0.00%	
2013	N/A	139,835	64,249	10,084	N/A	7.21%	0.00%	
2012	N/A	131,501	94,673	6,052	N/A	4.60%	0.00%	
2011	N/A	207,186	191,770	–	N/A	0.00%	0.00%	
2010***	N/A	200,908	375,134	–	N/A	0.00%	0.00%	

\* Employer-financed portion.

\*\* State employees includes state, SPORS, JRS, VaLORS, ORP and UVA.

\*\*\* Data for prior fiscal years is unavailable.

\*\*\*\* Includes Long-Term Care. Values prior to 6/30/2015 reflect Long-Term Disability only.

The progress of a plan in accumulating assets to pay benefits when due can be measured by examining the extent to which assets accumulated for benefits cover 1) any active member contributions to the plan; 2) liabilities for future benefits to retirees and beneficiaries; and 3) liabilities for the employer-financed portion of service already rendered by active members. In a plan receiving actuarially determined employer contributions, the liabilities for future benefits to retirees and beneficiaries will generally be fully covered by accumulated assets. In addition, the liabilities for service already rendered will be partially covered by the remainder of the accumulated assets and will increase over time.

## SCHEDULE OF ACTIVE MEMBER VALUATION DATA: OPEB PLANS

Valuation Date (June 30)	Active Members			
	Number	Annual Payroll (000s)	Average Annual Pay	Annualized % Change in Average Pay
GROUP LIFE INSURANCE				
2016	362,678	\$ 18,321,880	\$ 50,518	2.34%
2015	360,873	17,813,570	49,362	1.44%
2014	360,855	17,559,285	48,660	2.56%
2013	361,080	17,132,176	47,447	2.47%
2012	360,602	16,696,961	46,303	0.36%
2011	358,536	16,542,753	46,140	0.97%
2010	361,644	16,526,260	45,698	-0.10%
2009	365,682	16,728,060	45,745	2.67%
2008**	365,103	16,267,352	44,556	N/A
RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES*				
2016	107,840	\$ 6,319,509	\$ 58,601	3.74%
2015	107,200	6,055,429	56,487	1.73%
2014	106,815	5,930,862	55,525	3.57%
2013	106,780	5,724,611	53,611	1.22%
2012	106,517	5,641,862	52,967	-0.91%
2011	105,186	5,622,425	53,452	5.21%
2010	105,106	5,340,134	50,807	0.45%
2009	107,791	5,452,111	50,580	0.79%
2008**	104,774	5,257,958	50,184	N/A
RETIREE HEALTH INSURANCE CREDIT – TEACHERS				
2016	149,018	\$ 7,666,824	\$ 51,449	1.44%
2015	147,645	7,488,507	50,720	1.25%
2014	146,977	7,362,793	50,095	2.61%
2013	147,257	7,188,884	48,819	2.60%
2012	147,216	7,004,577	47,580	0.46%
2011	146,152	6,922,130	47,363	-1.24%
2010	148,462	7,119,889	47,958	-0.37%
2009	148,762	7,160,842	48,136	3.29%
2008**	147,833	6,889,702	46,605	N/A
RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS				
2016	18,006	\$ 856,824	\$ 47,585	1.37%
2015	17,535	823,153	46,943	0.79%
2014	16,894	786,875	46,577	1.00%
2013	16,093	742,121	46,115	4.07%
2012	16,175	716,748	44,312	1.13%
2011	16,894	740,253	43,818	-0.02%
2010	17,021	745,952	43,825	-0.34%
2009	17,052	749,841	43,974	1.53%
2008**	16,168	700,231	43,310	N/A

**SCHEDULE OF ACTIVE MEMBER VALUATION DATA: OPEB PLANS, cont.**

Valuation Date (June 30)	Active Members			
	Number	Annual Payroll (000s)	Average Annual Pay	Annualized % Change in Average Pay
RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS				
2016	21,846	\$ 943,186	\$ 43,174	2.32%
2015	21,339	900,390	42,195	0.83%
2014	20,921	875,485	41,847	1.51%
2013	20,534	846,523	41,225	3.92%
2012	20,416	809,905	39,670	0.43%
2011	19,861	784,481	39,499	2.44%
2010**	21,528	830,090	38,559	N/A
VIRGINIA SICKNESS AND DISABILITY PROGRAM				
2016	75,410	\$ 3,815,678	\$ 50,599	3.74%
2015	74,367	3,627,297	48,776	1.21%
2014	74,399	3,585,486	48,193	2.94%
2013	74,178	3,472,669	46,815	0.50%
2012	73,707	3,433,322	46,581	0.08%
2011	72,440	3,371,773	46,546	5.10%
2010	71,529	3,167,849	44,288	0.04%
2009	73,003	3,231,897	44,271	0.15%
2008**	72,854	3,220,489	44,205	N/A
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS				
2016	5,001	\$ 193,042	\$ 38,601	3.69%
2015	2,796	104,087	37,227	13.53%
2014**	282	9,247	32,791	N/A
VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS				
2016	4,675	\$ 147,729	\$ 31,600	4.33%
2015	2,917	88,350	30,288	3.67%
2014**	845	24,688	29,217	N/A

\* State employees includes state, SPORS, JRS, VaLORS, ORP and University of Virginia.

\*\* Data for prior fiscal years is unavailable.

**SCHEDULE OF RETIREE AND BENEFICIARY VALUATION DATA: OPEB PLANS**

**GROUP LIFE INSURANCE**

Valuation Date (June 30)	Retirees					Current Total Total Life Insurance Amount	Annualized % Increase in Life Insurance Amount	Average Life Insurance Credit
	Added to Rolls		Removed From Rolls		Total			
	Number	Amount	Number	Amount				
2016	11,550	\$1,324,900,000	4,564	\$895,728,000	173,134	\$8,232,852,000	5.50%	47,552
2015	11,429	1,275,150,000	4,519	840,576,000	166,148	7,803,680,000	5.90%	46,968
2014	10,922	1,206,647,000	4,306	843,669,000	159,238	7,369,106,000	5.18%	46,277
2013	10,511	1,148,100,000	4,203	800,829,000	152,622	7,006,128,000	5.22%	45,905
2012	9,828	1,064,957,000	3,905	773,058,000	146,314	6,658,865,000	4.58%	45,511
2011	11,216	1,205,369,000	4,325	714,803,000	140,391	6,366,958,000	8.35%	45,352
2010	10,048	1,074,004,000	2,577	614,199,000	133,500	5,876,393,000	8.49%	44,018
2009**	8,296	N/A	10,816	N/A	126,029	5,416,588,000	8.66%	42,979
2008***	N/A	N/A	N/A	N/A	128,549	4,984,937,000	N/A	38,778

**RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES\***

Valuation Date (June 30)	Retirees					Current Total Annual Health Insurance Credit	Annualized % Increase in Health Insurance Credit	Average Annual Health Insurance Credit
	Added to Rolls		Removed From Rolls		Total			
	Number	Amount	Number	Amount				
2016	2,881	\$4,332,000	1,663	\$2,369,000	44,658	\$66,499,000	3.06%	1,489
2015	2,869	4,226,000	1,618	2,357,000	43,440	64,524,000	2.98%	1,485
2014	2,652	4,044,000	1,548	2,212,000	42,189	62,655,000	3.01%	1,485
2013	2,542	3,765,000	1,503	2,112,000	41,085	60,823,000	2.79%	1,480
2012	2,539	3,784,000	1,453	2,065,000	40,046	59,170,000	2.99%	1,478
2011	2,684	4,009,000	1,986	2,841,000	38,960	57,451,000	2.08%	1,475
2010	3,521	5,685,000	1,279	1,784,000	38,262	56,283,000	7.45%	1,471
2009**	3,201	N/A	1,368	N/A	36,020	52,382,000	8.98%	1,454
2008***	N/A	N/A	N/A	N/A	34,187	48,067,000	N/A	1,406

**RETIREE HEALTH INSURANCE CREDIT – TEACHERS**

Valuation Date (June 30)	Retirees					Current Total Annual Health Insurance Credit	Annualized % Increase in Health Insurance Credit	Average Annual Health Insurance Credit
	Added to Rolls		Removed From Rolls		Total			
	Number	Amount	Number	Amount				
2016	3,649	\$4,913,000	1,329	\$1,795,000	62,413	\$86,073,000	3.76%	1,379
2015	3,465	4,714,000	1,493	2,016,000	60,093	82,955,000	3.36%	1,380
2014	3,729	5,075,000	1,291	1,752,000	58,121	80,257,000	4.32%	1,381
2013	3,557	5,016,000	1,389	1,918,000	55,683	76,934,000	4.20%	1,382
2012	3,240	4,426,000	1,214	1,649,000	53,515	73,836,000	3.91%	1,380
2011	4,073	5,776,000	1,163	1,568,000	51,489	71,059,000	6.29%	1,380
2010	3,216	4,545,000	1,101	1,483,000	48,579	66,851,000	4.80%	1,376
2009**	5,375	N/A	1,002	N/A	46,464	63,789,000	9.90%	1,373
2008***	N/A	N/A	N/A	N/A	42,091	58,045,000	N/A	1,379

**SCHEDULE OF RETIREE AND BENEFICIARY VALUATION DATA: OPEB PLANS, cont.**

RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS								
Valuation Date (June 30)	Retirees					Current Total Annual Health Insurance Credit	Annualized % Increase in Health Insurance Credit	Average Annual Health Insurance Credit
	Added to Rolls		Removed From Rolls		Total			
	Number	Amount	Number	Amount				
2016	518	\$270,000	152	\$78,000	5,201	\$2,644,000	7.83%	508
2015	410	206,000	123	60,000	4,835	2,452,000	6.33%	507
2014***	N/A	N/A	N/A	N/A	4,548	2,306,000	N/A	507

RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS								
Valuation Date (June 30)	Retirees					Current Total Annual Health Insurance Credit	Annualized % Increase in Health Insurance Credit	Average Annual Health Insurance Credit
	Added to Rolls		Removed From Rolls		Total			
	Number	Amount	Number	Amount				
2016	400	\$198,000	140	\$70,000	4,602	\$2,275,000	5.96%	494
2015	448	219,000	130	63,000	4,342	2,147,000	7.84%	494
2014***	N/A	N/A	N/A	N/A	4,024	1,991,000	N/A	495

VIRGINIA SICKNESS AND DISABILITY PROGRAM								
Valuation Date (June 30)	Retirees					Current Total Annual LTD Payments	Annualized % Increase in LTD Payments	Average Annual LTD Payment
	Added to Rolls		Removed From Rolls		Total			
	Number	Amount	Number	Amount				
2016	377	\$6,507,000	423	\$6,734,000	2,796	\$30,899,000	-0.73%	11,051
2015	466	7,293,000	325	4,112,000	2,842	31,126,000	13.95%	10,952
2014	369	6,103,000	305	4,567,000	2,701	27,315,000	5.96%	10,113
2013	401	6,256,000	434	4,707,000	2,637	25,779,000	6.39%	9,776
2012	424	6,438,000	374	5,635,000	2,670	24,230,000	3.43%	9,075
2011	411	6,262,000	365	6,252,000	2,620	23,427,000	0.04%	8,942
2010	445	6,902,000	265	4,972,000	2,574	23,417,000	8.98%	9,098
2009**	377	N/A	297	N/A	2,394	21,487,000	-3.64%	8,975
2008***	N/A	N/A	N/A	N/A	2,314	22,299,000	N/A	9,637

\* State employees includes state, SPORS, JRS, VaLORS, ORP and UVA.

\*\* Details of retirees added to and removed from the rolls were not available for these periods.

\*\*\* Data for prior fiscal years is unavailable.

## FIGURE 4.7: RETIREMENT RATES – OPEB PLANS

Sample rates of retirement for members eligible to retire are shown below. For the Retiree Health Insurance Credit, 95% of the state employees, teachers, state police officers, Virginia law officers and judges who retire with 15 or more years of service will utilize the benefit. For all political subdivision employees, 85% of the employees with 15 or more years of service will utilize the benefit.

### State Employees

#### Plan 1

Age	Retirement With Fewer Than 30 Years of Service		Retirement With 30 or More Years of Service	
	Male	Female	Male	Female
50	3.00%	3.20%	10.00%	10.00%
55	5.00%	5.00%	10.00%	10.00%
59	5.00%	5.50%	10.00%	10.00%
60	5.00%	5.50%	10.00%	15.00%
61	10.00%	10.00%	15.00%	20.00%
62	15.00%	15.00%	25.00%	30.00%
64	15.00%	15.00%	20.00%	20.00%
65	30.00%	30.00%	30.00%	40.00%
67	30.00%	30.00%	25.00%	25.00%
> = 70	100.00%	100.00%	100.00%	100.00%

#### Plan 2 and Hybrid – Males

Age	Years of Service						
	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	35.00%
55	0.00%	0.00%	0.00%	35.00%	10.00%	10.00%	10.00%
59	0.00%	35.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	5.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
61	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
62	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
64	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
65	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	25.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 35.00% when age plus service equals 90.

**FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.**

**Plan 2 and Hybrid – Females**

Age	Years of Service						
	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	35.00%
55	0.00%	0.00%	0.00%	35.00%	10.00%	10.00%	10.00%
59	0.00%	35.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	35.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
61	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
62	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
65	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	25.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*Rate is 35.00% when age plus service equals 90.*

**Teachers**

**Plan 1**

Age	Retirement With Fewer Than 30 Years of Service		Retirement With 30 or More Years of Service	
	Male	Female	Male	Female
50	2.00%	2.00%	17.50%	15.00%
55	5.70%	6.10%	22.50%	22.50%
59	7.00%	7.50%	22.50%	22.50%
60	7.50%	8.50%	22.50%	22.50%
61	11.00%	12.00%	30.00%	30.00%
62	17.00%	17.00%	35.00%	35.00%
64	18.00%	16.50%	30.00%	35.00%
65	30.00%	30.00%	40.00%	35.00%
67	30.00%	30.00%	40.00%	35.00%
> = 70	100.00%	100.00%	100.00%	100.00%

**FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.**

**Plan 2 and Hybrid – Males**

Age	Years of Service						
	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%
55	0.00%	0.00%	0.00%	40.00%	22.50%	22.50%	22.50%
59	0.00%	40.00%	22.50%	22.50%	22.50%	22.50%	22.50%
60	40.00%	22.50%	22.50%	22.50%	22.50%	22.50%	22.50%
61	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
62	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
64	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
65	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
67	30.00%	30.00%	40.00%	40.00%	40.00%	40.00%	40.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 40.00% when age plus service equals 90.

**Plan 2 and Hybrid – Females**

Age	Years of Service						
	30	31	33	35	37	39	> = 40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	35.00%
55	0.00%	0.00%	0.00%	35.00%	22.50%	22.50%	22.50%
59	0.00%	35.00%	22.50%	22.50%	22.50%	22.50%	22.50%
60	35.00%	22.50%	22.50%	22.50%	22.50%	22.50%	22.50%
61	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
62	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
64	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
65	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 35.00% when age plus service equals 90.

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Age	Plan 1				Plan 2 and Hybrid			
	Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
50	3.50%	3.50%	13.00%	15.60%	0.00%	0.00%	13.00%	15.60%
55	5.00%	5.00%	11.50%	14.30%	0.00%	0.00%	11.50%	14.30%
59	4.50%	6.00%	13.50%	13.40%	0.00%	0.00%	13.50%	13.40%
60	6.00%	7.50%	17.00%	12.80%	6.00%	7.50%	17.00%	12.80%
61	10.50%	10.00%	19.00%	17.70%	10.50%	10.00%	19.00%	17.70%
62	17.50%	15.50%	31.00%	28.00%	17.50%	15.50%	31.00%	28.00%
64	16.50%	17.00%	29.00%	18.30%	16.50%	17.00%	29.00%	18.30%
65	30.00%	30.00%	41.00%	29.60%	30.00%	30.00%	41.00%	29.60%
67	30.00%	30.00%	24.00%	33.20%	30.00%	30.00%	24.00%	33.20%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Age	Plan 1				Plan 2 and Hybrid			
	Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
50	5.00%	4.00%	9.00%	8.00%	0.00%	0.00%	9.00%	8.00%
55	5.00%	5.50%	14.00%	11.50%	0.00%	0.00%	14.00%	11.50%
59	6.00%	5.00%	11.00%	11.50%	0.00%	0.00%	11.00%	11.50%
60	6.00%	7.50%	11.00%	13.00%	6.00%	7.50%	11.00%	13.00%
61	10.00%	7.50%	25.00%	17.50%	10.00%	7.50%	25.00%	17.50%
62	17.00%	17.00%	35.00%	25.00%	17.00%	17.00%	35.00%	25.00%
64	15.00%	13.00%	27.00%	17.50%	15.00%	13.00%	25.00%	25.00%
65	30.00%	30.00%	33.00%	40.00%	30.00%	30.00%	25.00%	25.00%
67	30.00%	30.00%	20.00%	25.00%	30.00%	30.00%	33.00%	40.00%
> = 70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	9.00%	25.00%
55	8.50%	18.00%
59	13.50%	31.50%
60	20.00%	35.00%
> = 65	100.00%	100.00%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	8.50%	25.00%
55	8.50%	17.50%
59	11.50%	28.50%
60	20.00%	35.00%
> = 65	100.00%	100.00%

**State Police Officers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	10.00%	15.00%
55	10.00%	15.00%
59	12.00%	20.00%
60	25.00%	40.00%
> = 64	100.00%	100.00%

**FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.**

**Virginia Law Officers – All Plans**

Age	Reduced Retirement	Unreduced Retirement
50	9.20%	25.00%
55	9.50%	25.00%
59	12.00%	40.00%
60	20.00%	40.00%
> = 65	100.00%	100.00%

**Judges – All Plans**

Age	Service Credit Weighting = 1.5* Years of Service			Service Credit Weighting = 2.0* Years of Service		
	2-19	20	> = 21	2-14	15	> = 16
60	0.00%	50.00%	50.00%	0.00%	50.00%	50.00%
65	50.00%	50.00%	15.00%	50.00%	50.00%	15.00%
69	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
70	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
> = 73	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Age	Service Credit Weighting = 2.5* Years of Service			Service Credit Weighting = 3.5* Years of Service		
	2-11	12	> = 13	1-8	9	> = 10
60	0.00%	50.00%	50.00%	0.00%	50.00%	50.00%
65	50.00%	50.00%	15.00%	50.00%	50.00%	15.00%
69	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
70	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
> = 73	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

\* Plan 1 members appointed or elected to an original term before July 1, 2010:

- 3.5, if appointed or elected to an original term before January 1, 1995
- 2.5, if appointed or elected to an original term on or after January 1, 1995, but before July 1, 2010

Plan 1 and Plan 2 members appointed or elected to an original term between July 1, 2010, and December 31, 2013, and Hybrid Retirement Plan members appointed or elected to an original term on or after January 1, 2014:

- 1.5, if appointed or elected to an original term and less than 45 years old
- 2.0, if appointed or elected to an original term and at least 45 years old but less than 55 years old
- 2.5, if appointed or elected to an original term and at least 55 years old

For judges who retire from the judicial system or from another VRS-covered position, the portion of the retirement benefit relating to judicial system service cannot exceed 78% of average final compensation.

**FIGURE 4.8: DISABILITY RATES – OPEB PLANS**

As shown below for selected ages.

**State Employees**

14% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0900%	0.0100%
30	0.1800%	0.1500%
40	0.1800%	0.2900%
50	0.4500%	0.5500%
60	0.7200%	1.0000%

**Teachers**

Age	Male	Female
20	0.0000%	0.0000%
30	0.0100%	0.0100%
40	0.0210%	0.0360%
50	0.1330%	0.0900%
60	0.3080%	0.2400%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Age	Male	Female
20	0.0000%	0.0000%
30	0.0600%	0.0450%
40	0.1800%	0.0450%
50	0.2400%	0.1800%
60	0.7200%	0.4500%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Age	Male	Female
20	0.0180%	0.0060%
30	0.0600%	0.0240%
40	0.1440%	0.1260%
50	0.3120%	0.4500%
60	0.8160%	0.5520%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

60% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0000%	0.0000%
30	0.0500%	0.0500%
40	0.1800%	0.2400%
50	0.4000%	0.5300%
60	0.6500%	0.8100%

**FIGURE 4.8: DISABILITY RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

60% of disability cases are assumed to be service-related.

Age	Rate
20	0.0000%
30	0.0300%
40	0.1130%
50	0.3830%
60	0.6380%

**State Police Officers**

60% of disability cases are assumed to be service-related.

Age	Rate
20	0.0000%
30	0.0280%
40	0.2100%
50	0.6750%
60	0.0000%

**Virginia Law Officers**

50% of disability cases are assumed to be service-related.

Age	Rate
20	0.1500%
30	0.6000%
40	0.8000%
50	1.2000%
60	1.0000%

**Judges**

5% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0000%	0.0000%
30	0.0070%	0.0070%
40	0.1420%	0.0900%
50	0.4800%	0.3970%
60	0.0000%	0.0000%



**FIGURE 4.9: TERMINATION RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION							
Age	Years of Service – Males			Years of Service – Females			
	0-2	3-9	10+	0-2	3-9	10+	
25	21.80%	13.70%	0.00%	23.30%	16.70%	0.00%	
35	17.20%	9.70%	5.80%	18.60%	10.60%	5.10%	
45	14.30%	7.10%	2.90%	14.80%	7.70%	2.80%	
55	10.90%	5.30%	0.70%	11.90%	6.30%	0.00%	
65	13.60%	8.20%	0.00%	12.60%	8.20%	0.00%	

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION							
Age	Years of Service – Males			Years of Service – Females			
	0-2	3-9	10+	0-2	3-9	10+	
25	23.50%	14.00%	0.00%	25.50%	16.50%	0.00%	
35	18.50%	10.50%	5.50%	19.00%	11.50%	6.00%	
45	15.50%	8.00%	3.00%	15.00%	8.00%	3.50%	
55	12.00%	6.50%	1.00%	12.50%	6.50%	0.00%	
65	12.00%	8.00%	0.00%	13.00%	9.00%	0.00%	

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION							
Age	Years of Service – Males			Years of Service – Females			
	0-2	3-9	10+	0-2	3-9	10+	
25	7.80%	6.80%	0.00%	7.80%	6.80%	0.00%	
35	8.00%	4.40%	2.40%	8.00%	4.40%	2.40%	
45	9.20%	4.60%	1.50%	9.20%	4.60%	1.50%	
55	8.30%	6.30%	0.00%	8.30%	6.30%	0.00%	
60	8.70%	6.50%	0.00%	8.70%	6.50%	0.00%	

**FIGURE 4.9: TERMINATION RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits –  
All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION						
Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	13.00%	8.50%	0.00%	13.00%	10.00%	0.00%
35	11.00%	7.00%	3.80%	14.00%	8.00%	4.50%
45	13.00%	6.00%	2.40%	12.00%	6.00%	3.50%
55	15.00%	8.00%	0.50%	12.00%	5.00%	0.50%
60	11.00%	10.00%	0.50%	12.00%	5.00%	0.50%

**State Police Officers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION								
Age	Years of Service – Males				Years of Service – Females			
	0-2	3-4	5-9	10+	2	5	9	10+
25	7.50%	5.50%	5.50%	3.00%	10.80%	10.50%	5.40%	4.40%
35	7.50%	4.80%	4.80%	2.40%	12.10%	7.40%	6.00%	6.10%
45	10.00%	4.50%	4.50%	1.40%	10.80%	8.20%	6.40%	5.90%
55	10.00%	6.70%	0.00%	0.00%	7.40%	12.60%	6.70%	4.10%
65	10.00%	7.50%	0.00%	0.00%	1.50%	20.50%	6.90%	0.60%

**Virginia Law Officers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION						
Age	Years of Service – Males			Years of Service – Females		
	0-2	3-9	10+	0-2	3-9	10+
25	20.00%	15.00%	5.00%	20.00%	15.00%	7.50%
35	20.00%	12.50%	5.00%	20.00%	12.50%	6.00%
45	15.00%	10.50%	4.00%	17.50%	8.00%	4.00%
55	12.00%	6.50%	4.00%	10.00%	12.00%	4.00%
65	15.00%	7.00%	4.00%	10.00%	10.00%	4.00%

**Judges**

There are no assumed rates of withdrawal prior to service retirement for causes other than death, disability or retirement.

**FIGURE 4.10: SALARY INCREASE RATES – OPEB PLANS**

The sample salary increase rates are shown below. These factors are not applicable to the Line of Duty Act program since neither the benefit nor the cost are salary-based.

**State Employees**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown. It is assumed state employees who are covered under the Virginia Sickness and Disability Program (VSDP) receive a 3.50% annual increase in pay while disabled. This adjusted pay is used to determine deferred retirement benefits payable from the System.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.85%	5.35%
3	1.25%	4.75%
6	0.95%	4.45%
9	0.50%	4.00%
11	0.15%	3.65%
15	0.15%	3.65%
19	0.15%	3.65%
20 or more	0.00%	3.50%

**Teachers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	2.45%	5.95%
3	2.35%	5.85%
6	1.95%	5.45%
9	1.85%	5.35%
11	1.35%	4.85%
15	1.15%	4.65%
19	0.95%	4.45%
20 or more	0.00%	3.50%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.85%	5.35%
3	1.25%	4.75%
6	0.95%	4.45%
9	0.50%	4.00%
11	0.15%	3.65%
15	0.15%	3.65%
19	0.15%	3.65%
20 or more	0.00%	3.50%

**FIGURE 4.10: SALARY INCREASE RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.85%	5.35%
3	1.25%	4.75%
6	0.95%	4.45%
9	0.50%	4.00%
11	0.15%	3.65%
15	0.15%	3.65%
19	0.15%	3.65%
20 or more	0.00%	3.50%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**FIGURE 4.10: SALARY INCREASE RATES – OPEB PLANS, cont.**

**State Police Officers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown. It is assumed state police officers who are covered under the Virginia Sickness and Disability Program (VSDP) receive a 3.50% annual increase in pay while disabled. This adjusted pay is used to determine deferred retirement benefits payable from the System.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**Virginia Law Officers**

Inflation of 2.50% plus a productivity component of 1.00% and a step-rate/promotional component as shown. It is assumed Virginia law officers who are covered under the Virginia Sickness and Disability Program (VSDP) receive a 3.50% annual increase in pay while disabled. This adjusted pay is used to determine deferred retirement benefits payable from the System.

Years of Service	Annual Step-Rate/Promotional Rates of Increase	Total Annual Rate of Increase
1	1.25%	4.75%
3	1.25%	4.75%
6	0.90%	4.40%
9	0.90%	4.40%
11	0.50%	4.00%
15	0.50%	4.00%
19	0.50%	4.00%
20 or more	0.00%	3.50%

**Judges**

Salary increase rates are 4.50%.

## FIGURE 4.11: PORTING RATES – LONG-TERM CARE

Porting rates represent the probability that an individual will choose to port the coverage upon employment termination. Porting rates are assumed to increase with longevity because the contributions for terminated employees are based upon the age at which they started the program (either 2002 or age at hire, if later).

### Current Selected Policy Porting Rate Assumptions by Policy Issue Age and Policy Duration

Issue Age	Policy Duration (years)				
	0	10	20	30	40
30	0.1000	0.1234	0.2185	0.4537	0.7574
40	0.1000	0.1608	0.3423	0.5526	0.9230
50	0.1027	0.2244	0.4116	0.6790	1.0000
60	0.1162	0.2667	0.4986	0.8407	1.0000
70	0.1485	0.3308	0.6099	0.9985	1.0000
80	0.1875	0.4043	0.7524	1.0000	1.0000
90	0.2012	0.4601	0.9347	1.0000	1.0000
100	0.2171	0.5261	1.0000	1.0000	1.0000
110	0.2354	0.6042	1.0000	1.0000	1.0000

#### ADDITIONAL INFORMATION ABOUT ACTUARIAL ASSUMPTIONS AND METHODS:

#### OTHER POST-EMPLOYMENT BENEFIT (OPEB) PLANS

#### MORTALITY RATES:

- **Pre-Retirement: RP-2000 Employee Mortality Table Projected with Scale AA to 2020:**
  - State – Males set forward 2 years and females set back 3 years
  - Teachers – Males set back 3 years and females set back 5 years
  - State Police – Males set forward 5 years and females set back 3 years
  - VaLORS – Males set forward 5 years and females set back 3 years
  - Judicial – Males set forward 2 years and females set back 3 years
  - Political subdivisions, Non-LEOS – Males set forward 4 years and females set back 2 years
  - Political subdivisions, LEOS – Males set back 2 years and females set back 2 years
- **Post-Retirement: RP-2000 Combined Mortality Table Projected with Scale AA to 2020:**
  - State – Females set back 1 year
  - Teachers – Males set back 2 years and females set back 3 years
  - State Police – Females set back 1 year
  - VaLORS – Females set back 1 year
  - Judicial – Females set back 1 year
  - Political subdivisions, Non-LEOS – Males set forward 1 year
  - Political subdivisions, LEOS – Males set forward 1 year
- **Post-Disablement: RP-2000 Disability Life Mortality Table:**
  - State – Males set back 3 years and no provision for future mortality improvement
  - Teachers – Males set back 1 year and no provision for future mortality Improvement
  - State Police – Males set back 3 years and no provision for future mortality improvement
  - VaLORS – Males set back 3 years and no provision for future mortality improvement

- Judicial – Males set back 3 years and no provision for future mortality improvement
- Political subdivisions, Non-LEOS – Males set back 3 years and no provision for future mortality improvement
- Political subdivisions, LEOS – Males set back 3 years and no provision for future mortality improvement

**Provision for Expense.** The assumed investment return represents the anticipated net rate of return after payment of all administrative expenses.

**Asset Valuation Method.** For the Group Life Insurance Program, the state and teacher employer groups for the Retiree Health Insurance Credit Program, VSDP and VLDP, the method of valuing assets is intended to recognize a “smoothed” market value of assets. Under this method, the difference between actual return on market value from investment experience and the expected return on market value is recognized over a five-year period. The resulting actuarial value of assets cannot be less than 80% or more than 120% of the market value of assets. For the Line of Duty Act Program and the political subdivision employer groups in the Retiree Health Insurance Credit Program or employees who are eligible for the state-funded benefit for constitutional officers and their employees, general registrars and their employees and local social services employees, the actuarial value of assets is equal to the market value of assets.

**Actuarial Cost Method.** For the Group Life Insurance, Retiree Health Insurance Credit Programs, VSDP, VLDP and the Line of Duty Act Program, the normal contribution is determined using the entry age normal method. Under this method, a calculation is made for the cost of benefits to

determine the uniform and constant percentage rate of the employer contribution which, if applied to the compensation of the average new member during the entire period of the member’s anticipated covered service, would meet the cost of all benefits payable on the member’s behalf. The unfunded accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions from the present value of the expected benefits to be paid. The accrued liability contribution amortizes the balance of the unfunded accrued actuarial liability (UAAL) over a period of years from the valuation date.

**Actuarial Gains and Losses.** Actuarial gains and losses are reflected in the unfunded actuarial accrued liability and are amortized as part of that balance.

**Payroll Growth Rates.** The payroll growth rate is assumed to be 3.00% based on a zero population growth assumption.

**Funding Period.** For all programs, the amortization of the legacy UAAL began at 30 years on June 30, 2013, and this amortization period is to decrease by one year on each subsequent valuation date until the legacy UAAL is fully amortized (amortization period is 0 years). With each subsequent valuation, a new amortization base will be used to amortize that portion of the UAAL not covered by the current balances of the previously established amortization bases. Here, each valuation’s newly allocated share of the UAAL will be amortized over a closed 20-year period. In the event this funding policy produces an effective amortization period of greater than 30 years, a 30-year amortization period for the aggregate UAAL is used in accordance with GASB 43 and 45.

## Summary of Other Post-Employment Benefit Plan Provisions

### Group Life Insurance Program

#### ADMINISTRATION

The plan is administered by the Board of Trustees of the Virginia Retirement System (the System). Contributions received are held in trust. Payments are made to the Minnesota Life Insurance Company as reimbursement for the payment of life insurance proceeds to the beneficiaries.

An addition to the contribution requirement for the active member benefit provides for the retiree death benefit. The active portion of the contribution is used to purchase group term life insurance from an insurance company; the retired member portion is held in a trust until required for benefit payments.

When a covered retiree dies, the Minnesota Life Insurance Company pays the insurance claim and then collects a premium equal to the cost of the claim.

The retired member contribution is determined actuarially. The Board sets administrative policy and determines the allocation of the assets held for investment.

#### ELIGIBILITY

The following employees are covered under the Group Life Insurance Program upon employment:

- Full-time permanent, salaried employees of the Commonwealth of Virginia, including state employees, faculty members of the state's public colleges and universities, state police officers (SPORS), Virginia law officers (VaLORS) and judicial employees (JRS).
- Full-time permanent, salaried teachers and other administrative employees of local public school divisions.

- Full-time permanent, salaried sheriffs, deputy sheriffs and other eligible non-hazardous duty and hazardous duty employees of political subdivisions that have elected to participate in the Group Life Insurance Program.
- Employees of five localities that do not participate in VRS for retirement: City of Richmond, City of Portsmouth, City of Roanoke, City of Norfolk and Roanoke City School Board.
- Certain members who were employed at the time of initial coverage under the Group Life Insurance Program had the option to decline coverage.

#### ACTIVE MEMBER BENEFIT

Active members are covered for the following benefits:

- Natural death benefit equal to the member's compensation rounded to the next highest thousand and then doubled
- Accidental death benefit, which is double the natural death benefit
- Accidental dismemberment benefit, safety belt benefit, repatriation benefit, felonious assault benefit and an accelerated death benefit option

Covered employees may elect additional coverage for themselves as well as a spouse or dependent children through the Optional Group Life Insurance Program. Optional group life benefits are not included in the valuations of the OPEB plans.

#### RETIREE BENEFIT

**1. Service Retirement.** A death benefit equal to the active member's natural death benefit and the accelerated death benefit option continue for retirees and for deferred members who have met the eligibility requirements for retirement upon leaving employment. Coverage begins to reduce by 25% on the January 1 following one calendar year after the member's employment ends and by 25%

each January 1 thereafter, until it reaches 25% of its original value. If a member has at least 30 years of creditable service, that coverage cannot reduce below \$8,000. The minimum will be increased annually based on the VRS Plan 2 cost-of-living adjustment calculation.

**2. Disability Retirement.** The benefits available to disability retirees are the same as those for service retirees, except that the first 25% annual reduction begins on the January 1 following the first full year from the date the retiree reaches normal retirement age.

## Retiree Health Insurance Credit Program

### ADMINISTRATION

The plan is administered by the System’s Board of Trustees. Contributions received are held in trust. The Board sets administrative policy and determines the allocation of the assets held for investment.

### ELIGIBILITY

The health insurance credit is a tax-free reimbursement in an amount set by the General Assembly for each year of service credit against the portion of qualified health insurance premiums retirees pay for single coverage. The credit cannot exceed the amount of the premium and ends upon the retiree’s death.

If a member has worked for more than one employer under VRS, SPORS, VaLORS or JRS, for the purpose of this valuation, the most current (or last) employer assumes the full liability for that employee.

## CREDIT AMOUNTS

The dollar amounts vary depending on the employee type, as shown in the following table:

### Health Insurance Credit Dollar Amounts at Retirement

ELIGIBLE EMPLOYEES	AMOUNT PER YEAR OF SERVICE	MAXIMUM CREDIT PER MONTH
State employees	\$ 4.00	No Cap
Teachers and other administrative school employees	\$ 4.00	No Cap
General registrars and their employees, constitutional officers and their employees and local social service employees	\$ 1.50	\$45.00
General registrars and their employees, constitutional officers and their employees and local social service employees, if the political subdivision elects the \$1.00 enhancement	\$ 2.50	\$75.00
Other political subdivision employees as elected by the employer	\$ 1.50	\$45.00

## Virginia Sickness and Disability Program (VSDP)

### ADMINISTRATION

The plan is administered by the System's Board of Trustees. Contributions received are held in trust. The Board sets administrative policy and determines the allocation of the assets held for investment.

### ELIGIBILITY

The following state employees are covered automatically under the Virginia Sickness and Disability Program (VSDP) upon employment:

- Full-time permanent, salaried employees of the Commonwealth of Virginia (VRS) and part-time permanent, salaried state employees who work at least 20 hours a week;
- Public college and university faculty members who elect to participate in VRS instead of an optional retirement plan. These faculty members can elect VSDP or a disability plan offered by their institution;
- Full-time permanent, salaried state police officers (SPORS); and
- Full-time permanent, salaried Virginia law officers other than state police (VaLORS).

State employees hired before January 1, 1999, had the option to elect VSDP or retain their eligibility to be considered for disability retirement.

### SHORT-TERM AND LONG-TERM DISABILITY BENEFITS

VSDP coverage provides short-term and long-term disability benefits for non-work-related and work-related illnesses and injuries. Eligible members who become disabled receive short-term disability benefits for up to 125 workdays, following a seven-calendar day waiting period from the first day of disability.

Members who are still disabled after 125 workdays are evaluated for long-term disability. Members hired or rehired on or after July 1, 2009, must satisfy eligibility periods for non-work-related disability coverage and certain income-replacement levels.

The long-term disability benefit provides income replacement equal to 60% of the member's pre-disability income. While members are on long-term disability, they are not considered employees of the Commonwealth of Virginia. Members who can work at least 20 hours a week but cannot perform their full duties may be eligible for long-term disability benefits while working. They must have returned to work with modified duties while on short-term disability.

The long-term disability benefit is adjusted by any salary, wages, workers' compensation benefits or other disability payments the member receives for the same condition. If a member's condition becomes catastrophic, income replacement will increase to 80% of pre-disability income for as long as the condition is considered catastrophic. A disability is determined to be catastrophic if a member is unable to perform at least two of a specified list of activities of daily living without assistance.

Long-term disability benefits end if the member can perform the full duties of his or her pre-disability position without any restrictions during the first 24 months of disability; can perform the regular duties of any job for which the member is reasonably qualified after 24 months of disability and earning 80% or more of his or her pre-disability income; takes a refund of his or her member contributions and interest; does not cooperate or comply with the requirements of VSDP; or begins receiving a VRS service retirement benefit. Benefits also end in the event of the member's death.

## VSDP LONG-TERM CARE PLAN

VSDP plan members are eligible for no-cost long-term care coverage under the VSDP Long-Term Care Plan. The plan provides a two-year maximum coverage period with a maximum \$96-per-day daily benefit for nursing home care and other covered services. The benefit of many of the other services is less than the nursing home benefit, which means those needing these services will take longer to reach their lifetime maximum amount, resulting in longer coverage duration.

Benefits begin after 90 days from the date the member is certified by a licensed healthcare professional as eligible for benefits. The benefit schedule includes the possibility of an increase for inflation every five years in the amount of 5.00% compounded annually since the last inflation increase. Since such increases are not pre-funded, they are accompanied by a corresponding increase in contributions. Upon retirement or termination from employment, VSDP plan members may elect to continue their long-term care coverage by paying the premiums.

## Virginia Local Disability Program (VLDP)

### ADMINISTRATION

The plan is administered by the System's Board of Trustees. Contributions received are held in trust. The Board sets administrative policy and determines the allocation of the assets held for investment.

### ELIGIBILITY

The following state employees are covered automatically under the Virginia Local Disability Program (VLDP) upon employment:

- Full-time permanent, salaried Hybrid Retirement Plan employees of participating local public school divisions (teachers); and
- Full-time permanent, salaried Hybrid Retirement Plan employees of participating political subdivisions.

## SHORT-TERM AND LONG-TERM DISABILITY BENEFITS

VLDP coverage provides short-term and long-term disability benefits for non-work-related and work-related illnesses and injuries. Eligible members who become disabled receive short-term disability benefits for up to 125 workdays, following a seven-calendar-day waiting period from the first day of disability. Members who are still disabled after 125 workdays are evaluated for long-term disability.

The long-term disability benefit provides income replacement equal to 60% of the member's pre-disability income. While members are on long-term disability, they are not considered employees. Members who can work at least 20 hours a week but cannot perform their full duties may be eligible for long-term disability benefits while working. They must have returned to work with modified duties while on short-term disability.

The long-term disability benefit is adjusted by any salary, wages, workers' compensation benefits or other disability payments the member receives for the same condition. If a member's condition becomes catastrophic, income replacement will increase to 80% of pre-disability income for as long as the condition is considered catastrophic. A disability is determined to be catastrophic if a member is unable to perform at least two of a specified list of activities of daily living without assistance.

Long-term disability benefits end if the member can perform the full duties of his or her pre-disability position without any restrictions during the first 24 months of disability; can perform the regular duties of any job for which the member is reasonably qualified after 24 months of disability and earning 80% or more of his or her pre-disability income; takes a refund of his or her member contributions and interest; does not cooperate or comply with the requirements of VLDP; or begins receiving a VRS service retirement benefit. Benefits also end in the event of the member's death.

## VLDP LONG-TERM CARE PLAN

VLDP plan members are eligible for no-cost long-term care coverage under the VSDP Long-Term Care Plan. The plan provides a two-year maximum coverage period with a maximum \$96-per-day daily benefit for nursing home care and other covered services. The benefit of many of the other services is less than the nursing home benefit, which means those needing these services will take longer to reach their lifetime maximum amount, resulting in longer coverage duration.

Benefits begin after 90 days from the date the member is certified by a licensed healthcare professional as eligible for benefits. The benefit schedule includes the possibility of an increase for inflation every five years in the amount of 5.00% compounded annually since the last inflation increase. Since such increases are not pre-funded, they are accompanied by a corresponding increase in contributions. Upon retirement or termination from employment, VLDP plan members may elect to continue their long-term care coverage by paying the premiums.

## Line of Duty Act Program

### ADMINISTRATION

The plan is administered by the System's Board of Trustees. Contributions received are held in trust. The Board sets administrative policy and determines the allocation of the assets held for investment.

### ELIGIBILITY

Members of SPORS and VaLORS as well as members of VRS who are eligible for enhanced hazardous duty coverage are covered under the Line of Duty Act. Paid employees and volunteers in hazardous duty positions in all VRS-participating and non-VRS participating localities also are covered under the act.

### BENEFITS

Coverage provides death and disability benefits, administered by VRS, and health insurance benefits, which are administered by the Virginia Department of Human Resource Management (DHRM), effective July 1, 2017. Prior to July 1, 2017, benefits were administered by the Virginia Department of Accounts (DOA). The System is responsible for managing the assets of the Line of Duty Act Fund.

## Summary of OPEB Plan Changes

The following changes have occurred to the OPEB plan provisions.

**2009 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

1. On April 16, 2009, the Board adopts the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2008 actuarial experience study.
2. For the June 30, 2009, valuation, the Board suspends application of the 80% to 120% market value-of-assets corridor on the actuarial value of assets for the Group Life Insurance Program and the Retiree Health Insurance Credit Program.

**2010 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

1. For the June 30, 2010, valuation, the application of the 80% to 120% market value-of-assets corridor on the actuarial value of assets is reinstated.
2. The Board reduces the investment rate-of-return assumption for the Group Life Insurance Program, the Retiree Health Insurance Credit Program and the Virginia Sickness and Disability Program (VSDP) from 7.50% to 7.00%.

**2011 VALUATION:** No actuarially material changes are made to the plan provisions.

**2012 VALUATION:** The changes resulting from recent legislation are listed below:

1. Under House Bill 791, effective July 1, 2012, the life insurance amount reduction start date for disabled retirees was changed to January 1 following the first full year from the date the retiree reaches normal retirement age.
2. In 2012 House Bill 1130/Senate Bill 498 was enacted and was effective on January 1, 2013, requiring that active non-vested members of Plan 1 have to satisfy the Rule of 90 (sum of age and service is at least 90) or reach their Social Security normal retirement age to be eligible for unreduced

retirement. These same members must attain age 60 with five years of service to be eligible for early retirement. This provision applies to the state and teacher plans and to members of political subdivision plans who are not covered by hazardous duty benefits. In addition, state employees on long-term disability are assumed to receive cost-of-living adjustments to their long-term disability benefits in an amount of 2.25% per year, compounded annually.

3. Benefit offset adjustments for VSDP were adjusted to reflect actual VRS experience.

**2013 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

1. On June 20, 2013, the Board adopts the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2012 experience study.
2. Changes noted in the 2012 valuation information, with effective dates in fiscal year 2013 were implemented.

**2014 VALUATION:** No actuarially material changes are made to the plan provisions. The 2014 valuation includes Hybrid Retirement Plan members for the first time. The hybrid plan covers eligible employees hired on or after January 1, 2014, in the state, teacher and judicial plans or Plan 1 or Plan 2 members who elected during a one-time opt-in period, to be covered under the hybrid plan. The hybrid plan does not apply to members in the SPORS and VaLORS plans. The hybrid plan consists of defined benefit plan and defined contribution plan components.

**2015 VALUATION:** No actuarially material changes are made to the plan provisions. There are two changes of note:

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

**2016 VALUATION:** No actuarially material changes are made to the plan provisions.

At VRS, we value

# INCLUSIVITY

*inclusivity*

Inclusivity is embracing a diversity of thinking that helps us reach solutions that achieve excellence and meet the needs of our customers. We encourage an open work environment and an ethical culture in which colleagues are treated with respect and are free to raise issues or concerns without fear of retaliation.

## Statistical Section

### Pension Trust Funds:

- Schedule of Retirement Contributions by System and Plan
- Schedule of Pension Trust Fund Additions by Source
- Schedule of Pension Trust Fund Deductions by Type
- Schedule of Retirement Benefits by System and Plan
- Schedule of Retirement Benefits by Type
- Schedule of Refunds by Type
- Schedule of Retirees and Beneficiaries by Type of Retirement
- Schedule of Retirees and Beneficiaries by Type of Retirement and Plan
- Schedule of Retirees and Beneficiaries by Payout Option Selected
- Schedule of Average Benefit Payments
- Schedule of Funding (Market Value Basis): All Pension Plans
- Schedule of Funding (Market Value Basis): VRS Pension Plans

### Other Employee Benefit Trust Funds:

- Schedule of Group Life Insurance Additions by Source
- Schedule of Group Life Insurance Deductions by Type
- Schedule of Retiree Health Insurance Credit Additions by Source
- Schedule of Retiree Health Insurance Credit Deductions by Type
- Schedule of Disability Insurance Trust Fund Additions by Source
- Schedule of Disability Insurance Trust Fund Deductions by Type
- Schedule of Retired Members and Beneficiaries by Plan
- Schedule of Average Benefit Payments by Plan

### VRS-Participating Employers

- Commonwealth of Virginia 457 Deferred Compensation and Cash Match Plans

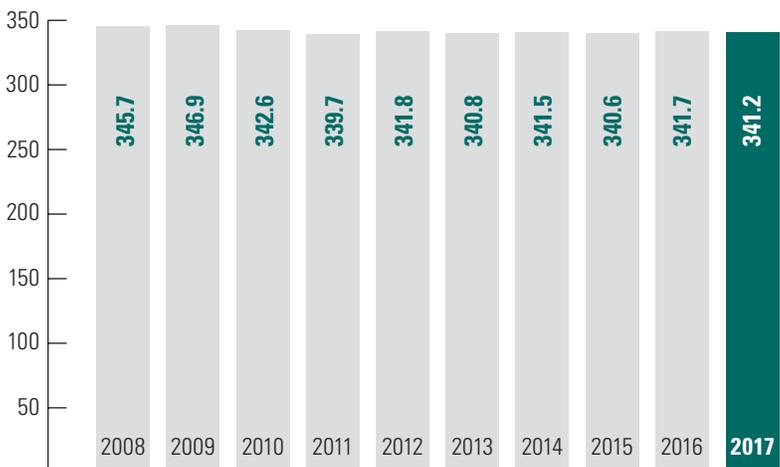
The Statistical Section presents detailed historical information regarding the pension and other employee benefit plans administered by the System. This information includes a 10-year analysis of changes in plan net position, plan enrollment, contributions, plan additions and deductions, benefits and refunds. In addition, this section provides information regarding retirees and an analysis of funding, enrollment and investment activity related to the Commonwealth of Virginia 457 Deferred Compensation Plan and the Virginia Cash Match Plan. The Statistical Section also lists the employers as of the end of the fiscal year.

## Pension Trust Funds

**FIGURE 5.1: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – ALL PENSION TRUST FUNDS**  
FOR THE YEARS ENDED JUNE 30 (EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$56,890</b>	<b>\$53,600</b>	<b>\$41,348</b>	<b>\$46,287</b>	<b>\$53,151</b>	<b>\$52,091</b>	<b>\$56,979</b>	<b>\$64,522</b>	<b>\$66,431</b>	<b>\$66,439</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	2,148	2,097	1,862	1,549	1,821	2,600	2,697	3,250	3,375	3,244
Benefits and Administrative Expenses and Transfers	(2,665)	(2,857)	(3,157)	(3,397)	(3,518)	(3,791)	(4,029)	(4,263)	(4,505)	(4,698)
Net Funding	(517)	(760)	(1,295)	(1,848)	(1,697)	(1,191)	(1,332)	(1,013)	(1,130)	(1,454)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	983	762	775	1,031	1,052	911	984	912	907	905
Net Appreciation (Depreciation) in Fair Value	(3,756)	(12,254)	5,459	7,681	(415)	5,168	7,891	2,010	231	7,110
Net Investment Income	(2,773)	(11,492)	6,234	8,712	637	6,079	8,875	2,922	1,138	8,015
<b>Net Increase (Decrease)</b>	<b>(3,290)</b>	<b>(12,252)</b>	<b>4,939</b>	<b>6,864</b>	<b>(1,060)</b>	<b>4,888</b>	<b>7,543</b>	<b>1,909</b>	<b>8</b>	<b>6,561</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$53,600</b>	<b>\$41,348</b>	<b>\$46,287</b>	<b>\$53,151</b>	<b>\$52,091</b>	<b>\$56,979</b>	<b>\$64,522</b>	<b>\$66,431</b>	<b>\$66,439</b>	<b>\$73,000</b>

**FIGURE 5.2: NUMBER OF ACTIVE MEMBERS**  
AT JUNE 30 (EXPRESSED IN THOUSANDS)



**FIGURE 5.3: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – VIRGINIA RETIREMENT SYSTEM**

FOR THE YEARS ENDED JUNE 30

**VIRGINIA RETIREMENT SYSTEM – STATE**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$16,034</b>	<b>\$14,902</b>	<b>\$11,301</b>	<b>\$12,432</b>	<b>\$14,040</b>	<b>\$13,516</b>	<b>\$14,550</b>	<b>\$16,218</b>	<b>\$16,455</b>	<b>\$16,439</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	410	417	360	253	309	520	542	684	939	766
Benefits and Administrative Expenses and Transfers	(770)	(825)	(931)	(968)	(992)	(1,054)	(1,119)	(1,175)	(1,232)	(1,280)
Net Funding	(360)	(408)	(571)	(715)	(683)	(534)	(577)	(491)	(293)	(514)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	273	212	212	275	263	235	249	227	221	222
Net Appreciation (Depreciation) in Fair Value	(1,045)	(3,405)	1,490	2,048	(104)	1,333	1,996	501	56	1,747
Net Investment Income	(772)	(3,193)	1,702	2,323	159	1,568	2,245	728	277	1,969
<b>Net Increase (Decrease)</b>	<b>(1,132)</b>	<b>(3,601)</b>	<b>1,131</b>	<b>1,608</b>	<b>(524)</b>	<b>1,034</b>	<b>1,668</b>	<b>237</b>	<b>(16)</b>	<b>1,455</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$14,902</b>	<b>\$11,301</b>	<b>\$12,432</b>	<b>\$14,040</b>	<b>\$13,516</b>	<b>\$14,550</b>	<b>\$16,218</b>	<b>\$16,455</b>	<b>\$16,439</b>	<b>\$17,894</b>

**VIRGINIA RETIREMENT SYSTEM – TEACHER**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$26,616</b>	<b>\$25,074</b>	<b>\$19,299</b>	<b>\$21,515</b>	<b>\$24,518</b>	<b>\$23,928</b>	<b>\$26,072</b>	<b>\$29,406</b>	<b>\$30,348</b>	<b>\$30,195</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	1,055	986	821	623	816	1,204	1,225	1,651	1,464	1,574
Benefits and Administrative Expenses and Transfers	(1,294)	(1,386)	(1,509)	(1,651)	(1,697)	(1,834)	(1,933)	(2,036)	(2,136)	(2,215)
Net Funding	(239)	(400)	(688)	(1,028)	(881)	(630)	(708)	(385)	(672)	(641)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	462	356	361	477	481	415	448	414	414	412
Net Appreciation (Depreciation) in Fair Value	(1,765)	(5,731)	2,543	3,554	(190)	2,359	3,594	913	105	3,228
Net Investment Income	(1,303)	(5,375)	2,904	4,031	291	2,774	4,042	1,327	519	3,640
<b>Net Increase (Decrease)</b>	<b>(1,542)</b>	<b>(5,775)</b>	<b>2,216</b>	<b>3,003</b>	<b>(590)</b>	<b>2,144</b>	<b>3,334</b>	<b>942</b>	<b>(153)</b>	<b>2,999</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$25,074</b>	<b>\$19,299</b>	<b>\$21,515</b>	<b>\$24,518</b>	<b>\$23,928</b>	<b>\$26,072</b>	<b>\$29,406</b>	<b>\$30,348</b>	<b>\$30,195</b>	<b>\$33,194</b>

**FIGURE 5.3: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – VIRGINIA RETIREMENT SYSTEM, cont.**

FOR THE YEARS ENDED JUNE 30

**VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$12,298</b>	<b>\$11,767</b>	<b>\$9,290</b>	<b>\$10,699</b>	<b>\$12,722</b>	<b>\$12,823</b>	<b>\$14,351</b>	<b>\$16,585</b>	<b>\$17,247</b>	<b>\$17,395</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	557	576	584	606	615	747	766	767	790	741
Benefits and Administrative Expenses and Transfers	(486)	(524)	(584)	(635)	(679)	(741)	(803)	(866)	(943)	(999)
Net Funding	71	52	–	(29)	(64)	6	(37)	(99)	(153)	(258)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	213	168	175	243	272	228	251	237	241	239
Net Appreciation (Depreciation) in Fair Value	(815)	(2,697)	1,234	1,809	(107)	1,294	2,020	524	60	1,879
Net Investment Income	(602)	(2,529)	1,409	2,052	165	1,522	2,271	761	301	2,118
<b>Net Increase (Decrease)</b>	<b>(531)</b>	<b>(2,477)</b>	<b>1,409</b>	<b>2,023</b>	<b>101</b>	<b>1,528</b>	<b>2,234</b>	<b>662</b>	<b>148</b>	<b>1,860</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$11,767</b>	<b>\$9,290</b>	<b>\$10,699</b>	<b>\$12,722</b>	<b>\$12,823</b>	<b>\$14,351</b>	<b>\$16,585</b>	<b>\$17,247</b>	<b>\$17,395</b>	<b>\$19,255</b>

**TOTAL VIRGINIA RETIREMENT SYSTEM PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$54,948</b>	<b>\$51,743</b>	<b>\$39,890</b>	<b>\$44,646</b>	<b>\$51,280</b>	<b>\$50,267</b>	<b>\$54,973</b>	<b>\$62,209</b>	<b>\$64,050</b>	<b>\$64,029</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	2,022	1,979	1,765	1,482	1,740	2,471	2,533	3,102	3,193	3,081
Benefits and Administrative Expenses and Transfers	(2,550)	(2,735)	(3,024)	(3,254)	(3,368)	(3,629)	(3,855)	(4,077)	(4,311)	(4,494)
Net Funding	(528)	(756)	(1,259)	(1,772)	(1,628)	(1,158)	(1,322)	(975)	(1,118)	(1,413)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	948	736	748	995	1,016	878	948	878	876	873
Net Appreciation (Depreciation) in Fair Value	(3,625)	(11,833)	5,267	7,411	(401)	4,986	7,610	1,938	221	6,854
Net Investment Income	(2,677)	(11,097)	6,015	8,406	615	5,864	8,558	2,816	1,097	7,727
<b>Net Increase (Decrease)</b>	<b>(3,205)</b>	<b>(11,853)</b>	<b>4,756</b>	<b>6,634</b>	<b>(1,013)</b>	<b>4,706</b>	<b>7,236</b>	<b>1,841</b>	<b>(21)</b>	<b>6,314</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$51,743</b>	<b>\$39,890</b>	<b>\$44,646</b>	<b>\$51,280</b>	<b>\$50,267</b>	<b>\$54,973</b>	<b>\$62,209</b>	<b>\$64,050</b>	<b>\$64,029</b>	<b>\$70,343</b>

Note: VRS and JRS plans include Hybrid Retirement Plan data.

**FIGURE 5.3: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION BY PENSION TRUST FUND, cont.**  
FOR THE YEARS ENDED JUNE 30

**STATE POLICE OFFICERS' RETIREMENT SYSTEM PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$ 684</b>	<b>\$ 636</b>	<b>\$ 484</b>	<b>\$ 534</b>	<b>\$ 599</b>	<b>\$ 575</b>	<b>\$ 625</b>	<b>\$ 721</b>	<b>\$ 733</b>	<b>\$ 731</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	26	25	21	13	16	31	48	34	39	38
Benefits and Administrative Expenses and Transfers	(41)	(41)	(43)	(47)	(47)	(49)	(51)	(54)	(55)	(59)
Net Funding	(15)	(16)	(22)	(34)	(31)	(18)	(3)	(20)	(16)	(21)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	12	9	9	12	12	11	11	10	11	9
Net Appreciation (Depreciation) in Fair Value	(45)	(145)	63	87	(5)	57	88	22	3	77
Net Investment Income	(33)	(136)	72	99	7	68	99	32	14	86
<b>Net Increase (Decrease)</b>	<b>(48)</b>	<b>(152)</b>	<b>50</b>	<b>65</b>	<b>(24)</b>	<b>50</b>	<b>96</b>	<b>12</b>	<b>(2)</b>	<b>65</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$ 636</b>	<b>\$ 484</b>	<b>\$ 534</b>	<b>\$ 599</b>	<b>\$ 575</b>	<b>\$ 625</b>	<b>\$ 721</b>	<b>\$ 733</b>	<b>\$ 731</b>	<b>\$ 796</b>

**VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$ 868</b>	<b>\$ 853</b>	<b>\$ 691</b>	<b>\$ 792</b>	<b>\$ 911</b>	<b>\$ 895</b>	<b>\$ 992</b>	<b>\$ 1,150</b>	<b>\$ 1,191</b>	<b>\$ 1,211</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	74	69	56	35	42	68	85	79	97	91
Benefits and Administrative Expenses and Transfers	(45)	(50)	(58)	(64)	(69)	(76)	(84)	(90)	(98)	(103)
Net Funding	29	19	(2)	(29)	(27)	(8)	1	(11)	(1)	(12)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	16	12	12	18	18	16	18	16	16	17
Net Appreciation (Depreciation) in Fair Value	(60)	(193)	91	130	(7)	89	139	36	5	130
Net Investment Income	(44)	(181)	103	148	11	105	157	52	21	147
<b>Net Increase (Decrease)</b>	<b>(15)</b>	<b>(162)</b>	<b>101</b>	<b>119</b>	<b>(16)</b>	<b>97</b>	<b>158</b>	<b>41</b>	<b>20</b>	<b>135</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$ 853</b>	<b>\$ 691</b>	<b>\$ 792</b>	<b>\$ 911</b>	<b>\$ 895</b>	<b>\$ 992</b>	<b>\$ 1,150</b>	<b>\$ 1,191</b>	<b>\$ 1,211</b>	<b>\$ 1,346</b>

**FIGURE 5.3: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION BY PENSION TRUST FUND, cont.**  
FOR THE YEARS ENDED JUNE 30

**JUDICIAL RETIREMENT SYSTEM PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$ 390</b>	<b>\$ 367</b>	<b>\$ 284</b>	<b>\$ 315</b>	<b>\$ 361</b>	<b>\$ 354</b>	<b>\$ 389</b>	<b>\$ 442</b>	<b>\$ 457</b>	<b>\$ 468</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	25	24	20	20	22	30	31	35	45	32
Benefits and Administrative Expenses and Transfers	(29)	(29)	(31)	(32)	(34)	(37)	(39)	(40)	(42)	(41)
Net Funding	(4)	(5)	(11)	(12)	(12)	(7)	(8)	(5)	3	(9)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	7	5	5	7	7	6	7	6	6	6
Net Appreciation (Depreciation) in Fair Value	(26)	(83)	37	51	(2)	36	54	14	2	50
Net Investment Income	(19)	(78)	42	58	5	42	61	20	8	56
<b>Net Increase (Decrease)</b>	<b>(23)</b>	<b>(83)</b>	<b>31</b>	<b>46</b>	<b>(7)</b>	<b>35</b>	<b>53</b>	<b>15</b>	<b>11</b>	<b>47</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$ 367</b>	<b>\$ 284</b>	<b>\$ 315</b>	<b>\$ 361</b>	<b>\$ 354</b>	<b>\$ 389</b>	<b>\$ 442</b>	<b>\$ 457</b>	<b>\$ 468</b>	<b>\$ 515</b>

Note: VRS and JRS plans include Hybrid Retirement Plan data.

## SCHEDULE OF RETIREMENT CONTRIBUTIONS BY SYSTEM AND PLAN

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Virginia Retirement System				State Police Officers' Retirement System	Virginia Law Officers' Retirement System	Judicial Retirement System	Total
	State	Teacher	Political	Sub-Total				
2017	\$ 766,084	\$ 1,573,429	\$ 741,407	\$ 3,080,920	\$ 37,589	\$ 91,414	\$ 32,473	\$ 3,242,396
2016	939,045	1,464,148	790,072	3,193,265	39,414	96,966	45,412	3,375,057
2015	683,602	1,650,697	767,310	3,101,609	34,107	79,165	34,734	3,249,615
2014	541,816	1,225,175	765,479	2,532,470	48,329	85,391	30,778	2,696,968
2013	519,319	1,204,021	746,040	2,469,380	31,553	67,654	30,000	2,598,587
2012**	307,843	814,681	613,572	1,736,096	16,611	42,202	21,875	1,816,784
2011**	252,110	622,904	605,908	1,480,922	12,343	34,423	20,338	1,548,026
2010*	359,827	820,193	583,864	1,763,884	20,747	56,347	20,206	1,861,184
2009	416,921	986,116	575,951	1,978,988	25,280	69,071	24,064	2,097,403
2008	409,685	1,055,498	557,230	2,022,413	26,218	74,039	25,498	2,148,168

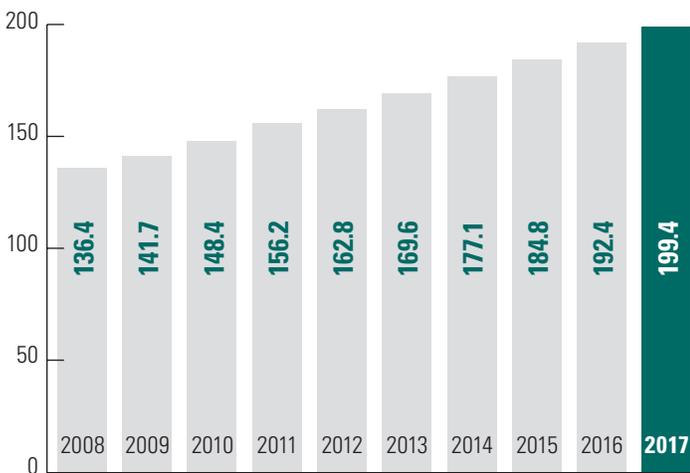
\* The General Assembly suspended employer contributions for all state employees, SPORS, VaLORS and JRS for April, May and the first half of June 2010 and for teachers for the entire fourth quarter of fiscal year 2010.

\*\* The General Assembly funded contribution rates for all state employee groups and teachers significantly below those certified by the Board of Trustees for fiscal year 2011. For fiscal year 2012, the funding for all state employee groups remained at low levels for the first three quarters of the year.

**FIGURE 5.4: NUMBER OF RETIREES AND BENEFICIARIES**

AT JUNE 30

(EXPRESSED IN THOUSANDS)



**FIGURE 5.5: RETIREMENT BENEFITS PAID**

FISCAL YEARS ENDED JUNE 30, 2008 – 2017

(EXPRESSED IN MILLIONS)



## SCHEDULE OF PENSION TRUST FUND ADDITIONS BY SOURCE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Member Contributions	Employer Contributions		Investment Income (Loss)	Other	Total
		For Members	Employer Share			
VIRGINIA RETIREMENT SYSTEM (VRS)						
2017	\$ 888,870	\$ 115	\$ 2,191,935	\$ 7,725,350	\$ 1,798	\$ 10,808,068
2016	817,652	23,463	2,352,150	1,095,229	1,789	4,290,283
2015	758,355	51,006	2,292,248	2,815,780	1,723	5,919,112
2014**	702,089	93,468	1,736,913	8,558,759	460	11,091,689
2013**	572,543	207,695	1,689,142	5,864,628	1,547	8,335,555
2012*	208,243	557,522	970,331	614,613	3,782	2,354,491
2011	26,529	712,560	741,833	8,405,834	1,290	9,888,046
2010	26,225	736,413	1,001,246	6,014,601	1,083	7,779,568
2009	20,254	743,762	1,214,972	(11,106,018)	8,668	(9,118,362)
2008	24,843	716,797	,280,773	(2,677,358)	290	(654,655)
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)						
2017	\$ 5,701	\$ —	\$ 31,888	\$ 87,265	\$ —	\$ 124,854
2016	5,759	—	33,655	12,635	—	52,049
2015	5,680	—	28,427	32,466	—	66,573
2014	5,646	—	42,683	98,682	—	147,011
2013	5,361	—	26,192	67,067	—	98,620
2012*	5,167	1	11,443	6,853	—	23,464
2011	121	4,742	7,480	99,209	—	111,552
2010	47	4,945	15,755	72,609	—	93,356
2009	57	5,034	20,189	(135,929)	87	(110,562)
2008	149	5,061	21,008	(33,367)	20	(7,129)
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)						
2017	\$ 17,598	\$ —	\$ 73,816	\$ 146,039	\$ —	\$ 237,453
2016	17,574	—	79,392	20,897	—	117,863
2015	17,081	—	62,084	52,312	—	131,477
2014	17,908	—	67,483	156,786	—	242,177
2013	17,256	—	50,398	105,084	27	172,765
2012*	17,510	48	24,644	11,195	110	53,507
2011	941	16,102	17,380	147,982	130	182,535
2010	196	17,208	38,943	103,488	104	159,939
2009	212	17,871	50,988	(181,112)	519	(111,522)
2008	291	17,723	56,025	(44,270)	274	30,043
JUDICIAL RETIREMENT SYSTEM (JRS)						
2017	\$ 2,225	\$ 2,209	\$ 28,039	\$ 56,180	\$ —	\$ 88,653
2016	1,154	2,349	41,909	8,137	—	53,549
2015	643	2,531	31,560	20,049	—	54,783
2014	327	2,724	27,727	60,833	—	91,611
2013	179	2,795	27,026	41,557	—	71,557
2012	47	2,921	18,907	4,576	—	26,451
2011	32	3,003	17,303	58,587	—	78,925
2010	30	3,108	17,068	42,430	—	62,636
2009	20	3,043	21,001	(77,947)	50	(53,833)
2008	21	2,945	22,532	(19,305)	—	6,193

\* Member contributions and employer contributions for members reflect the shift to member-paid retirement contributions for state employees, except judges, effective July 1, 2011.

\*\* Member contributions and employer contributions for members reflect the shift to member-paid retirement contributions for teachers and political subdivision employees effective July 1, 2012.

## SCHEDULE OF PENSION TRUST FUND DEDUCTIONS BY TYPE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Retirement Benefits	Refunds	Administrative Expenses	Other	Total
VIRGINIA RETIREMENT SYSTEM (VRS)					
2017	\$ 4,324,025	\$ 114,137	\$ 44,955	\$ 10,927	\$ 4,494,044
2016	4,169,852	99,444	39,695	2,263	4,311,254
2015	3,935,656	100,993	38,898	2,323	4,077,870
2014	3,711,208	98,049	39,785	6,745	3,855,787
2013	3,516,219	77,588	31,154	4,579	3,629,540
2012	3,257,359	84,577	25,475	694	3,368,105
2011	3,125,772	96,209	25,082	6,464	3,253,527
2010	2,907,204	88,671	23,720	3,911	3,023,506
2009	2,617,313	86,688	30,692	668	2,735,361
2008	2,427,543	97,574	24,677	298	2,550,092
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2017	\$ 57,814	\$ 630	\$ 926	\$ 99	\$ 59,469
2016	53,515	584	591	23	54,713
2015	53,338	375	471	27	54,211
2014	50,467	685	353	78	51,583
2013	47,884	364	227	51	48,526
2012	46,113	319	243	7	46,682
2011	46,259	279	222	68	46,828
2010	42,714	496	257	46	43,513
2009	40,919	469	340	–	41,728
2008	39,382	730	299	–	40,411
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2017	\$ 96,224	\$ 4,938	\$ 1,540	\$ 310	\$ 103,012
2016	92,270	4,524	938	38	97,770
2015	84,990	4,797	743	44	90,574
2014	78,412	4,665	557	124	83,758
2013	71,638	3,586	344	82	75,650
2012	64,849	4,027	366	15	69,257
2011	59,749	4,051	395	103	64,298
2010	53,758	3,919	373	66	58,116
2009	45,890	4,151	471	–	50,512
2008	40,805	4,586	378	–	45,769
JUDICIAL RETIREMENT SYSTEM (JRS)					
2017	\$ 40,895	\$ –	\$ 594	\$ 67	\$ 41,556
2016	41,341	–	363	15	41,719
2015	40,205	–	283	17	40,505
2014	37,984	–	221	47	38,252
2013	36,800	–	141	31	36,972
2012	33,454	–	143	5	33,602
2011	32,115	5	158	40	32,318
2010	31,598	–	151	27	31,776
2009	29,101	40	198	–	29,339
2008	28,538	45	168	–	28,751

## SCHEDULE OF RETIREMENT BENEFITS BY SYSTEM AND PLAN

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Virginia Retirement System				State Police Officers' Retirement System	Virginia Law Officers' Retirement System	Judicial Retirement System	Total
	State	Teacher	Political	Sub-Total				
2017	\$ 1,234,388	\$ 2,147,781	\$ 941,856	\$ 4,324,025	\$ 57,814	\$ 96,224	\$ 40,895	\$ 4,518,958
2016	1,195,198	2,081,069	893,585	4,169,852	53,515	92,270	41,341	4,356,978
2015	1,136,102	1,980,353	819,201	3,935,656	53,338	84,990	40,205	4,114,189
2014	1,081,866	1,874,636	754,706	3,711,208	50,467	78,412	37,984	3,878,071
2013	1,024,464	1,788,548	703,207	3,516,219	47,884	71,638	36,800	3,672,541
2012	961,209	1,654,377	641,773	3,257,359	46,113	64,849	33,454	3,401,775
2011	931,893	1,599,208	594,671	3,125,772	46,259	59,749	32,115	3,263,895
2010	898,226	1,462,638	546,340	2,907,204	42,714	53,758	31,598	3,035,274
2009	790,472	1,338,776	488,065	2,617,313	40,919	45,890	29,101	2,733,223
2008	736,053	1,245,201	446,289	2,427,543	39,382	40,805	28,538	2,536,268

## SCHEDULE OF RETIREMENT BENEFITS BY TYPE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
STATE				
2017	\$ 1,146,792	\$ 72,148	\$ 15,448	\$ 1,234,388
2016	1,105,788	74,127	15,283	1,195,198
2015	1,048,497	73,490	14,115	1,136,102
2014	994,111	74,245	13,510	1,081,866
2013	937,148	74,353	12,963	1,024,464
2012	874,606	74,558	12,045	961,209
2011	845,009	75,395	11,489	931,893
2010	810,248	77,223	10,755	898,226
2009	702,730	77,940	9,802	790,472
2008	653,088	74,354	8,611	736,053
TEACHER				
2017	\$ 2,030,384	\$ 108,142	\$ 9,255	\$ 2,147,781
2016	1,965,675	106,580	8,814	2,081,069
2015	1,867,670	104,305	8,378	1,980,353
2014	1,764,792	101,720	8,124	1,874,636
2013	1,682,021	98,767	7,760	1,788,548
2012	1,551,557	95,498	7,322	1,654,377
2011	1,498,877	93,450	6,881	1,599,208
2010	1,364,367	91,882	6,389	1,462,638
2009	1,245,300	87,777	5,699	1,338,776
2008	1,155,318	84,775	5,108	1,245,201

**SCHEDULE OF RETIREMENT BENEFITS BY TYPE, cont.**

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
POLITICAL SUBDIVISIONS				
2017	\$ 797,794	\$ 135,025	\$ 9,037	\$ 941,856
2016	752,038	132,240	9,307	893,585
2015	685,530	125,992	7,679	819,201
2014	625,221	122,362	7,123	754,706
2013	578,105	118,023	7,079	703,207
2012	521,682	113,610	6,481	641,773
2011	477,944	110,750	5,977	594,671
2010	432,678	108,080	5,582	546,340
2009	380,546	102,357	5,162	488,065
2008	344,982	96,742	4,565	446,289
TOTAL VIRGINIA RETIREMENT SYSTEM (VRS)				
2017	\$ 3,974,970	\$ 315,315	\$ 33,740	\$ 4,324,025
2016	3,823,501	312,947	33,404	4,169,852
2015	3,601,697	303,787	30,172	3,935,656
2014	3,384,124	298,327	28,757	3,711,208
2013	3,197,274	291,143	27,802	3,516,219
2012	2,947,845	283,666	25,848	3,257,359
2011	2,821,830	279,595	24,347	3,125,772
2010	2,607,293	277,185	22,726	2,907,204
2009	2,328,576	268,074	20,663	2,617,313
2008	2,153,388	255,871	18,284	2,427,543
STATE POLICE OFFICERS' RETIREMENT SYSTEMS (SPORS)				
2017	\$ 50,708	\$ 6,523	\$ 583	\$ 57,814
2016	46,429	6,447	639	53,515
2015	46,426	6,392	520	53,338
2014	43,693	6,270	504	50,467
2013	41,254	6,128	502	47,884
2012	39,626	6,011	476	46,113
2011	39,828	5,983	448	46,259
2010	36,779	5,532	403	42,714
2009	35,155	5,391	373	40,919
2008	34,011	5,049	322	39,382

## SCHEDULE OF RETIREMENT BENEFITS BY TYPE, cont.

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)				
2017	\$ 91,364	\$ 4,141	\$ 719	\$ 96,224
2016	87,538	4,013	719	92,270
2015	80,663	3,728	599	84,990
2014	74,291	3,549	572	78,412
2013	67,715	3,380	543	71,638
2012	61,128	3,246	475	64,849
2011	56,409	2,910	430	59,749
2010	50,704	2,660	394	53,758
2009	43,008	2,507	375	45,890
2008	38,428	2,096	281	40,805
JUDICIAL RETIREMENT SYSTEM (JRS)				
2017	\$ 39,406	\$ 335	\$ 1,154	\$ 40,895
2016	39,806	387	1,148	41,341
2015	38,632	401	1,172	40,205
2014	36,396	402	1,186	37,984
2013	35,289	394	1,117	36,800
2012	31,963	413	1,078	33,454
2011	30,635	463	1,017	32,115
2010	30,124	425	1,049	31,598
2009	27,614	410	1,077	29,101
2008	27,154	411	973	28,538

## SCHEDULE OF REFUNDS BY TYPE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
STATE			
2017	\$ 23,917	\$ 7,543	\$ 31,460
2016	19,341	6,617	25,958
2015	20,893	6,956	27,849
2014	19,673	5,374	25,047
2013	14,980	5,114	20,094
2012	17,664	5,199	22,863
2011	20,832	5,485	26,317
2010	18,822	5,370	24,192
2009	19,826	6,046	25,872
2008	20,966	5,138	26,104

**SCHEDULE OF REFUNDS BY TYPE, cont.**

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
<b>TEACHER</b>			
2017	\$ 34,848	\$ 5,201	\$ 40,049
2016	30,458	4,997	35,455
2015	30,355	5,744	36,099
2014	30,955	5,156	36,111
2013	23,406	4,746	28,152
2012	26,823	3,645	30,468
2011	32,560	4,021	36,581
2010	28,926	4,353	33,279
2009	27,561	3,985	31,546
2008	32,599	4,438	37,037
<b>POLITICAL SUBDIVISIONS</b>			
2017	\$ 38,277	\$ 4,351	\$ 42,628
2016	33,483	4,548	38,031
2015	31,718	5,327	37,045
2014	32,498	4,393	36,891
2013	24,908	4,434	29,342
2012	27,205	4,041	31,246
2011	29,647	3,664	33,311
2010	27,755	3,445	31,200
2009	25,683	3,587	29,270
2008	30,202	4,231	34,433
<b>TOTAL VIRGINIA RETIREMENT SYSTEM (VRS)</b>			
2017	\$ 97,042	\$ 17,095	\$ 114,137
2016	83,282	16,162	99,444
2015	82,966	18,027	100,993
2014	83,126	14,923	98,049
2013	63,294	14,294	77,588
2012	71,692	12,885	84,577
2011	83,039	13,170	96,209
2010	75,503	13,168	88,671
2009	73,070	13,618	86,688
2008	83,767	13,807	97,574
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEMS (SPORS)</b>			
2017	\$ 601	\$ 29	\$ 630
2016	405	179	584
2015	325	50	375
2014	685	–	685
2013	243	121	364
2012	303	16	319
2011	273	6	279
2010	496	–	496
2009	440	29	469
2008	730	–	730

**SCHEDULE OF REFUNDS BY TYPE, cont.**

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>			
2017	\$ 4,694	\$ 244	\$ 4,938
2016	3,688	836	4,524
2015	4,465	332	4,797
2014	4,340	325	4,665
2013	3,157	429	3,586
2012	3,673	354	4,027
2011	3,904	147	4,051
2010	3,601	318	3,919
2009	3,948	203	4,151
2008	4,190	396	4,586
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>			
2017	\$ —	\$ —	\$ —
2016	—	—	—
2015	—	—	—
2014	—	—	—
2013	—	—	—
2012	—	—	—
2011	5	—	5
2010	—	—	—
2009	40	—	40
2008	45	—	45

**SCHEDULE OF RETIREES AND BENEFICIARIES BY TYPE OF RETIREMENT**

AS OF JUNE 30, 2017

Minimum Guaranteed Benefit Amount	Number of Retirees	Type of Retirement								
		Service Retirement	Early Retirement Window	50/30 Service Retirement	1991 Early Faculty Ret. Window	Regular Disability	Survivor Death-in-Service	Line-of-Duty (LOD) Disability	Survivor LOD Death-in-Service	50/10 Service Retirement
\$ 1-200	14,141	12,157	2	—	1	492	582	24	2	881
201-400	21,755	17,785	130	6	—	1,742	544	87	6	1,455
401-600	19,126	15,038	304	35	2	2,240	370	207	20	910
601-800	16,323	12,613	376	80	1	2,054	244	340	17	598
801-1,000	14,772	11,303	499	204	5	1,705	171	390	27	468
1,001-1,200	13,383	10,274	463	387	5	1,400	144	321	18	371
1,201-1,400	11,444	8,690	423	497	16	1,125	107	285	13	288
1,401-1,600	10,771	8,269	361	677	19	856	86	230	12	261
1,601-1,800	10,258	7,805	275	965	22	708	63	198	3	219
1,801-2,000	10,650	8,056	205	1,370	28	569	79	184	1	158
Over 2,000	56,765	47,022	393	6,161	89	1,724	287	691	14	384
<b>Totals</b>	<b>199,388</b>	<b>159,012</b>	<b>3,431</b>	<b>10,382</b>	<b>188</b>	<b>14,615</b>	<b>2,677</b>	<b>2,957</b>	<b>133</b>	<b>5,993</b>

## SCHEDULE OF RETIREES AND BENEFICIARIES BY TYPE OF RETIREMENT AND PLAN

AS OF JUNE 30, 2017

Plan	Number of Retirees	Type of Retirement								
		Service Retirement	Early Retirement Window	50/30 Service Retirement	1991 Early Faculty Ret. Window	Regular Disability	Survivor Death-in-Service	Line-of-Duty (LOD) Disability	Survivor LOD Death-in-Service	50/10 Service Retirement
VRS – State	55,427	43,431	1,830	3,246	187	3,214	1,136	878	24	1,481
VRS – Teacher	86,652	70,730	1,402	5,669	1	4,825	681	194	6	3,144
VRS – Political Subdivisions	51,147	39,269	199	1,466	–	6,351	733	1,679	82	1,368
SPORS	1,300	1,076	–	–	–	39	15	152	18	–
ValORS	4,355	4,030	–	1	–	179	88	54	3	–
JRS	507	476	–	–	–	7	24	–	–	–
<b>All Plans</b>	<b>199,388</b>	<b>159,012</b>	<b>3,431</b>	<b>10,382</b>	<b>188</b>	<b>14,615</b>	<b>2,677</b>	<b>2,957</b>	<b>133</b>	<b>5,993</b>

## SCHEDULE OF RETIREES AND BENEFICIARIES BY PAYOUT OPTION SELECTED

AS OF JUNE 30, 2017

Minimum Guaranteed Benefit Amount	Payout Option Selected															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
\$ 1-200	11,594	16	488	87	476	2	49	–	–	1	556	–	484	162	211	15
201-400	17,571	9	557	130	475	4	695	15	2	34	527	–	1,027	213	446	50
401-600	4,773	9	445	168	503	7	1,052	32	–	74	424	–	922	188	488	41
601-800	12,150	5	338	197	531	7	957	29	–	89	373	–	902	191	505	49
801-1,000	10,656	1	285	236	600	11	677	17	1	57	403	–	943	199	604	82
1,001-1,200	9,277	–	271	229	520	12	514	16	2	47	252	–	1,012	232	855	144
1,201-1,400	7,774	–	229	224	351	17	339	9	1	29	179	–	945	202	983	162
1,401-1,600	7,113	–	221	214	224	24	205	1	–	25	139	–	886	191	1,286	242
1,601-1,800	6,693	–	181	209	135	24	143	3	–	11	83	–	873	195	1,420	288
1,801-2,000	6,713	–	158	215	99	24	99	2	–	6	79	–	850	180	1,863	362
Over 2,000	30,454	–	577	652	160	147	150	8	–	21	129	–	6,422	1,152	14,462	2,431
<b>Totals</b>	<b>134,768</b>	<b>40</b>	<b>3,750</b>	<b>2,561</b>	<b>4,074</b>	<b>279</b>	<b>4,880</b>	<b>132</b>	<b>6</b>	<b>394</b>	<b>3,144</b>	<b>–</b>	<b>15,266</b>	<b>3,105</b>	<b>23,123</b>	<b>3,866</b>

A: Basic Benefit

B: Increased Basic Benefit

C: 100% Survivor Option

D: Variable Survivor Option

E: Social Security Leveling Benefit

F: Special Survivor Option

G: Minimum Guaranteed Disability Basic Benefit

H: Minimum Guaranteed Disability Variable

I: Survivor Option

J: Disability 100% Survivor Option

K: Special Disability Survivor Option

L: Leveling Benefit

L: Leveling Benefit/Rollover

M: Survivor Option

N: Advance Pension Option

O: Partial Lump-Sum Option Payment (PLOP)

with Basic Benefit

P: PLOP with Survivor Option

## SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2008, TO JUNE 30, 2017

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2017	State	Average Monthly Benefit	\$ 413.21	\$ 743.04	\$ 1,034.43	\$ 1,550.80	\$ 2,059.13	\$ 3,066.54
		Number of Active Retirees	320	374	414	338	374	1,200
		Average AFC	\$ 45,412	\$ 49,487	\$ 48,208	\$ 58,190	\$ 56,901	\$ 65,405
	Teacher	Average Monthly Benefit	\$ 386.27	\$ 693.17	\$ 1,093.01	\$ 1,571.09	\$ 2,414.56	\$ 3,132.83
		Number of Active Retirees	444	644	772	656	756	1,369
		Average Benefit	\$ 39,773	\$ 45,512	\$ 52,398	\$ 58,570	\$ 65,087	\$ 70,892
	Political Subdivisions	Average Monthly Benefit	\$ 350.60	\$ 553.85	\$ 886.92	\$ 1,351.87	\$ 2,211.27	\$ 2,813.82
		Number of Active Retirees	493	590	562	482	591	813
		Average Benefit	\$ 33,216	\$ 35,209	\$ 41,290	\$ 48,136	\$ 59,764	\$ 65,487
	Total VRS	Average Monthly Benefit	\$ 379.14	\$ 653.66	\$ 1,012.88	\$ 1,494.85	\$ 2,267.51	\$ 3,032.62
		Number of Active Retirees	1,257	1,608	1,748	1,476	1,721	3,382
		Weighted Average AFC	\$ 38,637	\$ 42,656	\$ 47,834	\$ 55,076	\$ 61,480	\$ 67,646
	SPORS	Average Monthly Benefit	\$ 599.64	\$ 639.34	\$ —	\$ 1,826.61	\$ 2,960.46	\$ 3,905.67
		Number of Active Retirees	1	4	—	3	23	47
		Average Benefit	\$ 55,565	\$ 46,014	\$ —	\$ 58,898	\$ 74,016	\$ 85,256
	VaLORS	Average Monthly Benefit	\$ 444.50	\$ 653.93	\$ 1,032.94	\$ 1,318.83	\$ 1,788.27	\$ 2,564.74
		Number of Active Retirees	17	44	45	107	82	38
		Average Benefit	\$ 35,913	\$ 36,428	\$ 41,026	\$ 43,808	\$ 47,182	\$ 58,498
	JRS	Average Monthly Benefit	\$ —	\$ 511.79	\$ —	\$ 2,608.35	\$ 4,863.62	\$ 8,352.50
		Number of Active Retirees	—	2	—	2	2	14
		Average Benefit	\$ —	\$ 142,367	\$ —	\$ 147,295	\$ 156,110	\$ 153,865
All Plans	Average Monthly Benefit	\$ 380.18	\$ 653.46	\$ 1,013.37	\$ 1,485.01	\$ 2,257.56	\$ 3,060.69	
	Number of Active Retirees	1,275	1,658	1,793	1,588	1,828	3,481	
	Weighted Average AFC	\$ 38,614	\$ 42,619	\$ 47,663	\$ 54,440	\$ 61,100	\$ 68,130	
FY 2016*	State	Average Monthly Benefit	\$ 401.55	\$ 768.31	\$ 1,038.35	\$ 1,539.86	\$ 1,907.73	\$ 3,004.64
		Number of Active Retirees	315	318	357	307	411	1,307
		Average AFC	\$ 43,993	\$ 49,585	\$ 49,392	\$ 55,174	\$ 54,986	\$ 64,126
	Teacher	Average Monthly Benefit	\$ 432.49	\$ 746.26	\$ 1,115.50	\$ 1,606.80	\$ 2,436.89	\$ 3,078.52
		Number of Active Retirees	484	681	699	671	797	1,468
		Average AFC	\$ 42,306	\$ 49,610	\$ 54,438	\$ 58,555	\$ 65,786	\$ 70,386
	Political Subdivisions	Average Monthly Benefit	\$ 320.69	\$ 562.57	\$ 895.21	\$ 1,252.95	\$ 2,082.39	\$ 2,946.00
		Number of Active Retirees	545	569	556	473	647	895
		Average AFC	\$ 31,052	\$ 38,544	\$ 41,480	\$ 45,989	\$ 58,617	\$ 68,431
	Total VRS	Average Monthly Benefit	\$ 379.90	\$ 684.08	\$ 1,022.44	\$ 1,477.29	\$ 2,196.01	\$ 3,019.89
		Number of Active Retirees	1,344	1,568	1,612	1,451	1,855	3,670
		Weighted Average AFC	\$ 38,138	\$ 45,589	\$ 48,851	\$ 53,743	\$ 60,893	\$ 67,660
	SPORS	Average Monthly Benefit	—	\$ 139.46	\$ 864.59	\$ 1,538.59	\$ 2,960.02	\$ 4,092.02
		Number of Active Retirees	—	2	2	5	11	18
		Average AFC	—	\$ 24,869	\$ 53,438	\$ 62,731	\$ 75,082	\$ 92,720
	VaLORS	Average Monthly Benefit	\$ 372.46	\$ 619.25	\$ 946.46	\$ 1,203.56	\$ 1,596.89	\$ 2,458.85
		Number of Active Retirees	29	26	48	90	79	51
		Average AFC	\$ 39,019	\$ 37,606	\$ 39,308	\$ 43,542	\$ 45,962	\$ 55,791
	JRS	Average Monthly Benefit	—	—	—	\$ 4,396.22	\$ 5,647.58	\$ 8,048.62
		Number of Active Retirees	—	—	—	1	1	17
		Average AFC	—	—	—	\$ 146,295	\$ 146,294	\$ 154,562
All Plans	Average Monthly Benefit	\$ 379.74	\$ 682.34	\$ 1,020.04	\$ 1,463.44	\$ 2,177.77	\$ 3,040.16	
	Number of Active Retirees	1,373	1,596	1,662	1,547	1,946	3,756	
	Weighted Average AFC	\$ 38,156	\$ 45,433	\$ 48,581	\$ 53,239	\$ 60,411	\$ 68,012	

## SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2008, TO JUNE 30, 2017

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2015	State	Average Monthly Benefit	\$392.12	\$694.37	\$1,030.11	\$1,446.53	\$1,930.58	\$3,016.49
		Number of Active Retirees	329	327	369	301	388	1,170
	Teacher	Average Monthly Benefit	\$381.68	\$714.22	\$1,066.14	\$1,541.72	\$2,476.42	\$3,096.71
		Number of Active Retirees	559	669	696	704	732	1,453
	Political Subdivisions	Average Monthly Benefit	\$330.59	\$513.35	\$843.10	\$1,254.45	\$2,059.40	\$2,708.39
		Number of Active Retirees	592	620	478	458	572	846
	Total VRS	Average Monthly Benefit	\$363.56	\$633.14	\$988.43	\$1,432.21	\$2,210.28	\$2,974.96
		Number of Active Retirees	1,480	1,616	1,543	1,463	1,692	3,469
	SPORS	Average Monthly Benefit	\$1,078.60	\$969.65	–	\$2,506.63	\$2,539.27	\$3,697.36
		Number of Active Retirees	1	1	–	2	16	34
	VaLORS	Average Monthly Benefit	\$455.80	\$585.05	\$946.20	\$1,161.28	\$1,715.68	\$2,141.37
		Number of Active Retirees	23	50	52	95	93	56
	JRS	Average Monthly Benefit	–	–	–	–	\$5,408.75	\$7,674.09
		Number of Active Retirees	–	–	–	–	1	31
All Plans	Average Monthly Benefit	\$365.45	\$631.90	\$987.05	\$1,417.08	\$2,189.44	\$3,009.36	
	Number of Active Retirees	1,504	1,667	1,595	1,560	1,802	3,590	
FY 2014	State	Average Monthly Benefit	\$374.40	\$674.96	\$1,035.41	\$1,308.58	\$1,913.24	\$2,766.37
		Number of Active Retirees	341	363	299	315	333	1,185
	Teacher	Average Monthly Benefit	\$408.27	\$701.52	\$1,083.91	\$1,559.04	\$2,383.18	\$3,055.18
		Number of Active Retirees	604	651	611	690	804	1,463
	Political Subdivisions	Average Monthly Benefit	\$308.87	\$542.75	\$855.38	\$1,248.49	\$2,007.63	\$2,668.41
		Number of Active Retirees	569	563	456	448	524	676
	Total VRS	Average Monthly Benefit	\$363.28	\$638.73	\$997.01	\$1,408.99	\$2,170.49	\$2,873.56
		Number of Active Retirees	1,514	1,577	1,366	1,453	1,661	3,324
	SPORS	Average Monthly Benefit	–	–	\$615.19	\$1,631.99	\$2,809.19	\$3,597.68
		Number of Active Retirees	–	–	1	2	10	28
	VaLORS	Average Monthly Benefit	\$383.32	\$695.40	\$899.70	\$1,133.65	\$1,700.98	\$2,537.26
		Number of Active Retirees	25	29	45	75	72	36
	JRS	Average Monthly Benefit	–	–	–	–	\$5,051.59	\$7,400.90
		Number of Active Retirees	–	–	–	–	3	22
All Plans	Average Monthly Benefit	\$363.61	\$639.75	\$993.63	\$1,395.78	\$2,159.73	\$2,905.16	
	Number of Active Retirees	1,539	1,606	1,412	1,530	1,746	3,410	

## SCHEDULE OF AVERAGE BENEFIT PAYMENTS, cont.

FOR RETIREMENTS EFFECTIVE JULY 1, 2008, TO JUNE 30, 2017

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2013**	State	Average Monthly Benefit	\$373.47	\$636.41	\$1,035.61	\$1,362.08	\$1,881.63	\$2,813.81
		Number of Active Retirees	291	299	261	283	340	1,086
	Teacher	Average Monthly Benefit	\$429.20	\$689.55	\$1,128.94	\$1,537.48	\$2,304.17	\$2,915.42
		Number of Active Retirees	531	574	536	636	747	1,672
	Political Subdivisions	Average Monthly Benefit	\$295.20	\$525.24	\$803.27	\$1,220.49	\$1,920.03	\$2,666.07
		Number of Active Retirees	562	512	396	394	496	753
	Total VRS	Average Monthly Benefit	\$363.12	\$617.34	\$1,000.42	\$1,404.56	\$2,093.05	\$2,830.51
		Number of Active Retirees	1,384	1,385	1,193	1,313	1,583	3,511
	SPORS	Average Monthly Benefit	—	—	—	\$2,263.68	\$2,752.85	\$3,282.00
		Number of Active Retirees	—	—	—	3	10	17
	ValORS	Average Monthly Benefit	\$332.59	\$632.67	\$883.09	\$1,223.64	\$1,709.19	\$2,246.63
		Number of Active Retirees	29	30	39	67	70	49
	JRS	Average Monthly Benefit	—	—	\$3,645.63	\$4,738.37	—	\$7,490.90
		Number of Active Retirees	—	—	3	1	—	28
	All Plans	Average Monthly Benefit	\$362.24	\$617.66	\$1,003.13	\$1,400.06	\$2,080.06	\$2,860.90
		Number of Active Retirees	1,413	1,415	1,235	1,384	1,663	3,605
FY 2012	All Plans	Average Monthly Benefit	\$349.17	\$628.04	\$950.15	\$1,360.69	\$2,149.70	\$2,843.02
		Number of Active Retirees	1,331	1,309	1,176	1,273	1,453	3,367
FY 2011	All Plans	Average Monthly Benefit	\$346.15	\$590.10	\$923.89	\$1,364.97	\$2,058.50	\$2,791.19
		Number of Active Retirees	1,218	1,196	1,164	1,383	1,637	4,318
FY 2010	All Plans	Average Monthly Benefit	\$319.83	\$585.59	\$895.47	\$1,309.38	\$1,977.48	\$2,750.03
		Number of Active Retirees	1,106	954	980	1,251	1,543	4,303
FY 2009	All Plans	Average Monthly Benefit	\$344.16	\$578.17	\$880.56	\$1,269.17	\$2,024.64	\$2,669.86
		Number of Active Retirees	986	859	916	1,090	1,377	3,063
FY 2008	All Plans	Average Monthly Benefit	\$327.19	\$575.47	\$861.72	\$1,234.89	\$2,024.96	\$2,610.24
		Number of Active Retirees	994	857	995	1,091	1,615	3,271

\* Average Final Compensation (AFC) information was not available prior to fiscal year 2016.

\*\* Fiscal year 2013 is the first year for which information is available to support this detailed presentation by plan.

**FIGURE 5.6: DISTRIBUTION OF RETIREES BY PAYOUT OPTION SELECTED**

ALL RETIREES AT JUNE 30, 2017

	Basic Benefit	Survivor Option	PLOP with Basic Benefit	PLOP with Survivor Option	Advance Payment Option	Total
VRS	70.91%	10.79%	11.30%	1.81%	5.19%	100.00%
SPORS	49.46%	28.46%	13.69%	7.85%	0.54%	100.00%
ValORS	61.98%	15.12%	15.91%	3.47%	3.52%	100.00%
JRS	43.09%	31.42%	11.46%	11.66%	2.37%	100.00%
<b>All Plans</b>	<b>70.51%</b>	<b>11.05%</b>	<b>11.41%</b>	<b>1.91%</b>	<b>5.12%</b>	<b>100.00%</b>

FISCAL YEAR 2017 RETIREES

	Basic Benefit	Survivor Option	PLOP with Basic Benefit	PLOP with Survivor Option	Advance Payment Option	Total
VRS	68.76%	11.30%	16.23%	2.19%	1.52%	100.00%
SPORS	43.53%	21.18%	20.00%	15.29%	0.00%	100.00%
ValORS	68.33%	11.14%	16.42%	1.76%	2.35%	100.00%
JRS	42.31%	38.46%	15.38%	3.85%	0.00%	100.00%
<b>All Plans</b>	<b>68.52%</b>	<b>11.42%</b>	<b>16.26%</b>	<b>2.27%</b>	<b>1.53%</b>	<b>100.00%</b>

**Benefit Payout Options**

**Basic Benefit.** The Basic Benefit is based on the unreduced (normal) retirement benefit calculation. It does not provide for a continuation of a benefit to a survivor. Upon the member’s death, any remaining member contributions and accrued interest are paid in a lump sum to the member’s beneficiary.

**Partial Lump-Sum Option Payment (PLOP).** Members who are in active service for one or more years beyond their eligibility for an unreduced retirement benefit are eligible to elect a partial lump-sum payment of their member contributions and accrued interest equal to one, two or three times their annual retirement benefit, depending on how long they work beyond their unreduced retirement eligibility. The monthly benefit is actuarially reduced accordingly. This option is available with the Basic Benefit or Survivor Option.

**Survivor Option.** Members may choose a whole percentage of their benefit, between 10% and 100%, to continue as a lifetime benefit to a survivor upon their death. The member’s benefit is actuarially reduced accordingly.

**Advance Pension Option.** With this option, members elect to receive a temporary higher benefit that begins at retirement and continues until an age chosen by the member, between age 62 up to the normal retirement age under Social Security. At that point, the monthly benefit is permanently reduced on an actuarially equivalent basis.

**FIGURE 5.7: DISTRIBUTION OF RETIREES BY YEARS OF SERVICE**

ALL RETIREES AT JUNE 30, 2017

	1–10 Years	11–20 Years	21–30 Years	Over 30 Years	Total
VRS	11.36%	24.52%	29.35%	34.77%	100.00%
SPORS	2.44%	3.74%	23.06%	70.76%	100.00%
ValORS	7.70%	21.17%	52.58%	18.55%	100.00%
JRS	0.67%	2.83%	7.32%	89.18%	100.00%
<b>All Plans</b>	<b>11.20%</b>	<b>24.25%</b>	<b>29.74%</b>	<b>34.81%</b>	<b>100.00%</b>

**FIGURE 5.7: DISTRIBUTION OF RETIREES BY YEARS OF SERVICE, cont.**

FISCAL YEAR 2017 RETIREES

	1–10 Years	11–20 Years	21–30 Years	Over 30 Years	Total
VRS	11.23%	29.99%	28.57%	30.21%	100.00%
SPORS	1.28%	5.13%	33.33%	60.26%	100.00%
VaLORS	8.98%	22.91%	52.32%	15.79%	100.00%
JRS	0.00%	10.00%	20.00%	70.00%	100.00%
<b>All Plans</b>	<b>11.08%</b>	<b>29.59%</b>	<b>29.24%</b>	<b>30.09%</b>	<b>100.00%</b>

**FIGURE 5.8: DISTRIBUTION OF RETIREES BY AGE AT RETIREMENT**

ALL RETIREES AT JUNE 30, 2017

	Under 55	55 – 59	60 – 65	Over Age 65	Total
VRS	15.80%	25.11%	45.99%	13.10%	100.00%
SPORS	47.79%	32.97%	16.46%	2.78%	100.00%
VaLORS	42.68%	25.18%	27.18%	4.96%	100.00%
JRS	1.26%	11.58%	41.28%	45.88%	100.00%
<b>All Plans</b>	<b>16.41%</b>	<b>25.13%</b>	<b>45.48%</b>	<b>12.98%</b>	<b>100.00%</b>

FISCAL YEAR 2017 RETIREES

	Under 55	55 – 59	60 – 65	Over Age 65	Total
VRS	10.49%	17.79%	47.40%	24.32%	100.00%
SPORS	45.57%	31.65%	15.19%	7.59%	100.00%
VaLORS	42.22%	21.56%	28.14%	8.08%	100.00%
JRS	0.00%	5.00%	35.00%	60.00%	100.00%
<b>All Plans</b>	<b>11.61%</b>	<b>17.96%</b>	<b>46.63%</b>	<b>23.80%</b>	<b>100.00%</b>

**FIGURE 5.9: DISTRIBUTION OF RETIREES BY AVERAGE FINAL COMPENSATION**

ALL RETIREES AT JUNE 30, 2017

	Up to \$10,000	\$10,001 – 20,000	\$20,001 – 30,000	\$30,001 – 40,000	\$40,001 – 50,000	\$50,001 – 70,000	Over \$70,000	Total
VRS	5.52%	15.83%	15.84%	14.84%	13.28%	17.34%	17.35%	100.00%
SPORS	3.61%	5.06%	7.09%	12.66%	16.52%	29.49%	25.57%	100.00%
VaLORS	0.00%	0.06%	9.31%	48.07%	27.57%	12.89%	2.10%	100.00%
JRS	3.21%	1.67%	0.98%	3.91%	5.16%	9.76%	75.31%	100.00%
<b>All Plans</b>	<b>5.41%</b>	<b>15.49%</b>	<b>15.65%</b>	<b>15.33%</b>	<b>13.51%</b>	<b>17.32%</b>	<b>17.29%</b>	<b>100.00%</b>

FISCAL YEAR 2017 RETIREES

	Up to \$10,000	\$10,001 – 20,000	\$20,001 – 30,000	\$30,001 – 40,000	\$40,001 – 50,000	\$50,001 – 70,000	Over \$70,000	Total
VRS	0.36%	6.39%	10.78%	13.98%	16.05%	28.82%	23.62%	100.00%
SPORS	0.00%	0.00%	0.00%	1.27%	1.27%	27.85%	69.61%	100.00%
VaLORS	0.00%	0.00%	0.60%	44.91%	35.03%	14.67%	4.79%	100.00%
JRS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
<b>All Plans</b>	<b>0.34%</b>	<b>6.16%</b>	<b>10.40%</b>	<b>14.76%</b>	<b>16.47%</b>	<b>28.35%</b>	<b>23.52%</b>	<b>100.00%</b>

**SCHEDULE OF FUNDING (MARKET VALUE OF ASSETS BASIS): ALL PENSION PLANS**

(EXPRESSED IN THOUSANDS)

Actuarial Valuation Date June 30	Market Value of Assets (MVA)(a)	Actuarial Accrued Liability (AAL) – Entry Age (b)	Net Pension Liability (AAL-MVA) (b-a)	Funded Ratio (MVA/AAL) (a/b)	Covered Payroll (c)	Net Pension Liability as a Percentage of Covered Payroll (b-a)/(c)
<b>VIRGINIA RETIREMENT SYSTEM (VRS)**</b>						
2016	\$ 63,954,159	\$ 87,118,992	\$ 23,164,833	73.4%	\$ 16,325,998	141.9%
2015	64,025,668	84,711,142	20,685,474	75.6%	15,901,380	130.1%
2014	62,207,257	82,083,384	19,876,127	75.8%	15,671,359	126.8%
2013*	54,972,736	79,077,591	24,104,855	69.5%	15,269,079	157.9%
2012	50,266,721	77,858,856	27,592,135	64.6%	14,880,275	185.4%
2011	51,280,335	75,184,760	23,904,425	68.2%	14,708,859	162.5%
2010	44,645,816	72,800,401	28,154,585	61.3%	14,757,790	190.8%
2009*	39,889,754	66,323,011	26,433,257	60.1%	14,947,644	176.8%
2008	51,743,476	62,554,479	10,811,003	82.7%	14,558,592	74.3%
2007	54,948,223	58,116,473	3,168,250	94.5%	13,834,022	22.9%
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>						
2016	\$ 730,688	\$ 1,081,980	\$ 351,292	67.5%	\$ 114,877	305.8%
2015	733,352	1,050,701	317,349	69.7%	110,543	285.5%
2014	720,990	1,029,155	308,165	70.1%	112,303	274.0%
2013*	625,562	996,690	371,128	62.7%	109,006	341.0%
2012	575,468	1,013,278	437,810	56.8%	104,189	420.6%
2011	598,686	985,704	387,018	60.8%	99,669	388.3%
2010	533,962	948,892	414,930	56.3%	97,601	425.3%
2009*	484,119	879,180	395,061	55.1%	100,974	391.4%
2008	636,408	844,195	207,787	75.5%	102,466	202.9%
2007	684,000	806,000	122,000	84.9%	101,000	121.3%
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>						
2016	\$ 1,211,446	\$ 1,984,257	\$ 772,811	61.1%	\$ 352,677	219.1%
2015	1,191,353	1,906,721	715,368	62.5%	330,397	217.2%
2014	1,150,450	1,820,045	669,595	63.2%	352,709	190.0%
2013*	992,031	1,742,110	750,079	56.9%	342,154	219.0%
2012	894,916	1,753,014	858,098	51.1%	344,616	248.9%
2011	910,666	1,683,191	772,525	54.1%	356,240	216.8%
2010	792,429	1,579,321	786,892	50.2%	346,040	227.5%
2009*	690,606	1,411,844	721,238	48.9%	359,070	200.7%
2008	852,640	1,281,477	428,837	66.7%	368,255	116.2%
2007	868,000	1,166,000	298,000	74.4%	341,000	87.3%
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>						
2016	\$ 467,389	\$ 607,798	\$ 140,409	76.9%	\$ 65,524	214.3%
2015	456,258	600,388	144,130	76.0%	61,881	230.3%
2014	442,194	608,169	165,975	72.7%	59,373	279.4%
2013*	388,835	590,626	201,791	65.8%	57,110	353.5%
2012	354,250	582,456	228,206	60.8%	56,958	400.9%
2011	361,401	569,494	208,093	63.5%	58,919	353.7%
2010	314,794	559,920	245,126	56.4%	61,021	401.2%
2009*	283,934	521,463	237,529	54.4%	62,709	377.6%
2008	367,107	494,768	127,661	74.1%	60,486	211.3%
2007	390,000	442,000	52,000	88.2%	58,000	91.1%

\* Revised economic and demographic assumptions due to experience study.

\*\* The breakdown of VRS data into state, teacher and political subdivisions is also presented in the Statistical Section.

**SCHEDULE OF FUNDING (MARKET VALUE BASIS): VRS PENSION PLANS**

(EXPRESSED IN THOUSANDS)

Actuarial Valuation Date June 30	Market Value of Assets (MVA)(a)	Actuarial Accrued Liability (AAL) – Entry Age (b)	Net Pension Liability (AAL-MVA) (b-a)	Funded Ratio (MVA/AAL) (a/b)	Covered Payroll (c)	Net Pension Liability as a Percentage of Covered Payroll (b-a)/(c)
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – STATE</b>						
2016	\$ 16,367,842	\$ 22,878,243	\$ 6,510,401	71.5%	\$ 4,002,477	162.7%
2015	16,398,575	22,291,558	5,892,983	73.6%	3,872,724	152.2%
2014	16,168,535	21,822,936	5,654,401	74.1%	3,854,779	146.7%
2013*	14,502,362	21,068,651	6,566,289	68.8%	3,716,548	176.7%
2012	13,469,215	20,944,258	7,475,043	64.3%	3,713,119	201.3%
2011	13,992,901	20,407,958	6,415,057	68.6%	3,686,259	174.0%
2010	12,384,638	19,539,453	7,154,815	63.4%	3,514,396	203.6%
2009*	11,253,767	17,925,879	6,672,112	62.8%	3,619,478	184.3%
2008	14,856,159	17,096,942	2,240,783	86.9%	3,640,692	61.5%
2007	15,987,528	16,279,781	292,253	98.2%	3,467,388	8.4%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER</b>						
2016	\$ 30,168,211	\$ 43,581,629	\$ 13,413,418	69.2%	\$ 7,666,824	175.0%
2015	30,344,072	42,564,178	12,220,106	71.3%	7,488,507	163.2%
2014	29,411,183	41,297,669	11,886,486	71.2%	7,362,793	161.4%
2013*	26,076,425	39,852,334	13,775,909	65.4%	7,211,543	191.0%
2012	23,930,149	39,090,408	15,160,259	61.2%	7,004,577	216.4%
2011	24,520,362	37,771,732	13,251,370	64.9%	6,922,130	191.4%
2010	21,517,178	37,088,576	15,571,398	58.0%	7,119,889	218.7%
2009*	19,302,368	33,860,514	14,558,146	57.0%	7,160,842	203.3%
2008	25,076,413	31,958,321	6,881,908	78.5%	6,896,432	99.8%
2007	26,618,235	29,669,838	3,051,603	89.7%	6,604,643	46.2%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS</b>						
2016	\$ 17,418,106	\$ 20,659,120	\$ 3,241,014	84.3%	\$ 4,656,697	69.6%
2015	17,283,021	19,855,406	2,572,385	87.0%	4,540,149	56.7%
2014	16,627,539	18,962,779	2,335,240	87.7%	4,453,787	52.4%
2013*	14,393,949	18,156,606	3,762,657	79.3%	4,340,988	86.7%
2012	12,867,357	17,824,190	4,956,833	72.2%	4,162,579	119.1%
2011	12,767,072	17,005,070	4,237,998	75.1%	4,100,470	103.4%
2010	10,744,000	16,172,372	5,428,372	66.4%	4,123,505	131.6%
2009*	9,333,619	14,536,618	5,202,999	64.2%	4,167,324	124.9%
2008	11,810,904	13,499,216	1,688,312	87.5%	4,021,468	42.0%
2007	12,342,460	12,166,854	(175,606)	101.4%	3,761,991	(4.7%)
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TOTAL</b>						
2016	\$ 63,954,159	\$ 87,118,992	\$ 23,164,833	73.4%	\$ 16,325,998	141.9%
2015	64,025,668	84,711,142	20,685,474	75.6%	15,901,380	130.1%
2014	62,207,257	82,083,384	19,876,127	75.8%	15,671,359	126.8%
2013*	54,972,736	79,077,591	24,104,855	69.5%	15,269,079	157.9%
2012	50,266,721	77,858,856	27,592,135	64.6%	14,880,275	185.4%
2011	51,280,335	75,184,760	23,904,425	68.2%	14,708,859	162.5%
2010	44,645,816	72,800,401	28,154,585	61.3%	14,757,790	190.8%
2009*	39,889,754	66,323,011	26,433,257	60.1%	14,947,644	176.8%
2008	51,743,476	62,554,479	10,811,003	82.7%	14,558,592	74.3%
2007	54,948,223	58,116,473	3,168,250	94.5%	13,834,022	22.9%

\* Revised economic and demographic assumptions due to experience study.

## Other Employee Benefit Trust Funds

**FIGURE 5.10: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – GROUP LIFE INSURANCE FUND**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2008	2009	2010*	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$962,328</b>	<b>\$937,146</b>	<b>\$713,812</b>	<b>\$783,058</b>	<b>\$833,065</b>	<b>\$746,619</b>	<b>\$887,773</b>	<b>\$1,079,315</b>	<b>\$1,162,617</b>	<b>\$1,224,926</b>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	158,823	135,063	94,860	45,048	47,285	201,688	205,586	208,463	214,257	240,084
Benefits and Administrative Expenses	(133,407)	(153,083)	(139,344)	(146,550)	(141,026)	(150,700)	(160,909)	(177,336)	(175,393)	(185,854)
Net Funding	25,416	(18,020)	(44,484)	(101,502)	(93,741)	50,988	44,677	31,127	38,864	54,230
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	17,908	13,582	14,128	17,924	16,301	13,669	16,981	16,341	17,040	17,945
Net Appreciation (Depreciation) in Fair Value	(68,506)	(218,896)	99,602	133,585	(9,006)	76,497	129,884	35,834	6,405	140,485
Net Investment Income	(50,598)	(205,314)	113,730	151,509	7,295	90,166	146,865	52,175	23,445	158,430
<b>Net Increase (Decrease)</b>	<b>(25,182)</b>	<b>(223,334)</b>	<b>69,246</b>	<b>50,007</b>	<b>(86,446)</b>	<b>141,154</b>	<b>191,542</b>	<b>83,302</b>	<b>62,309</b>	<b>212,660</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$937,146</b>	<b>\$713,812</b>	<b>\$783,058</b>	<b>\$833,065</b>	<b>\$746,619</b>	<b>\$887,773</b>	<b>\$1,079,315</b>	<b>\$1,162,617</b>	<b>\$1,224,926</b>	<b>\$1,437,586</b>

\* The group life contribution rates for the last quarter of fiscal year 2010 were zero as a result of a statutory premium holiday. Amounts shown in premium holiday years are adjustments and contributions for new employers.

## SCHEDULE OF GROUP LIFE INSURANCE ADDITIONS BY SOURCE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions				Investment Income (Loss)	Other	Total
	State	Teacher	Political Subdivisions	Sub-Total			
2017	\$ 71,666	\$ 103,751	\$ 64,667	\$ 240,084	\$ 158,430	\$ –	\$ 398,514
2016	65,980	91,121	57,156	214,257	23,445	–	237,702
2015	63,927	88,871	55,665	208,463	52,175	–	260,638
2014	64,151	86,807	54,628	205,586	146,865	–	352,451
2013	61,541	85,725	53,449	200,715	90,166	973	291,854
2012	14,243	20,183	12,108	46,534	7,295	751	54,580
2011	13,348	19,427	11,920	44,695	151,509	353	196,557
2010*	28,685	40,502	25,673	94,860	113,730	–	208,590
2009	40,369	58,855	35,839	135,063	(205,314)	–	(70,251)
2008	52,503	60,405	45,915	158,823	(50,598)	–	108,225

\* The group life insurance contribution rates for the last quarter of fiscal year 2010 were zero as a result of a statutory premium holiday. Amounts shown in premium holiday years are adjustments and contributions for new employers.

## SCHEDULE OF GROUP LIFE INSURANCE DEDUCTIONS BY TYPE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Group Life Claims			Administrative Expenses	Other	Total
	Active	Retired	Sub-Total			
2017	\$ 56,889	\$ 127,203	\$ 184,092	\$ 31	\$ 1,731	\$ 185,854
2016	60,427	113,416	173,843	81	1,469	175,393
2015	55,429	120,331	175,760	183	1,393	177,336
2014	53,478	105,880	159,358	275	1,276	160,909
2013	47,875	101,612	149,487	65	1,148	150,700
2012	54,605	85,338	139,943	77	1,006	141,026
2011	51,236	93,791	145,027	484	1,039	146,550
2010	46,263	91,570	137,833	663	848	139,344
2009	64,119	87,550	151,669	700	714	153,083
2008	55,814	76,279	132,093	686	628	133,407

**FIGURE 5.11: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION –  
RETIREE HEALTH INSURANCE CREDIT FUND**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$224,606</b>	<b>\$251,634</b>	<b>\$231,994</b>	<b>\$244,958</b>	<b>\$209,033</b>	<b>\$127,234</b>	<b>\$146,472</b>	<b>\$170,048</b>	<b>\$173,194</b>	<b>\$173,211</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	148,908	146,333	100,613	50,052	51,356	145,031	146,742	144,834	151,916	168,271
Reimbursements and Administrative Expenses	(109,426)	(115,878)	(120,872)	(126,963)	(131,435)	(137,906)	(143,088)	(148,459)	(154,320)	(159,280)
Net Funding	39,482	30,455	(20,259)	(76,911)	(80,079)	7,125	3,654	(3,625)	(2,404)	8,991
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	4,407	3,314	4,127	4,849	2,997	1,856	2,226	2,140	2,098	2,167
Net Appreciation (Depreciation) in Fair Value	(16,861)	(53,409)	29,096	36,137	(4,717)	10,257	17,696	4,631	323	16,945
Net Investment Income	(12,454)	(50,095)	33,223	40,986	(1,720)	12,113	19,922	6,771	2,421	19,113
<b>Net Increase (Decrease)</b>	<b>27,028</b>	<b>(19,640)</b>	<b>12,964</b>	<b>(35,925)</b>	<b>(81,799)</b>	<b>19,238</b>	<b>23,576</b>	<b>3,146</b>	<b>17</b>	<b>28,104</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$251,634</b>	<b>\$231,994</b>	<b>\$244,958</b>	<b>\$209,033</b>	<b>\$127,234</b>	<b>\$146,472</b>	<b>\$170,048</b>	<b>\$173,194</b>	<b>\$173,211</b>	<b>\$201,315</b>

**VIRGINIA RETIREMENT SYSTEM – STATE**

	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$137,945</b>	<b>\$146,314</b>	<b>\$129,040</b>	<b>\$136,242</b>	<b>\$107,777</b>	<b>\$54,290</b>	<b>\$59,880</b>	<b>\$65,202</b>	<b>\$67,434</b>	<b>\$68,685</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	64,419	64,979	43,208	5,425	5,859	60,848	59,438	63,907	66,410	74,520
Reimbursements and Administrative Expenses	(48,276)	(51,565)	(55,117)	(57,013)	(58,224)	(60,911)	(61,249)	(64,551)	(66,157)	(71,395)
Net Funding	16,143	13,414	(11,909)	(51,588)	(52,365)	(63)	(1,811)	(644)	253	3,125
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	2,755	2,031	2,373	2,735	1,977	866	941	910	864	875
Net Appreciation (Depreciation) in Fair Value	(10,529)	(32,719)	16,738	20,388	(3,099)	4,787	6,192	1,966	134	6,831
Net Investment Income	(7,774)	(30,688)	19,111	23,123	(1,122)	5,653	7,133	2,876	998	7,706
<b>Net Increase (Decrease)</b>	<b>8,369</b>	<b>(17,274)</b>	<b>7,202</b>	<b>(28,465)</b>	<b>(53,487)</b>	<b>5,590</b>	<b>5,322</b>	<b>2,232</b>	<b>1,251</b>	<b>10,831</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$146,314</b>	<b>\$129,040</b>	<b>\$136,242</b>	<b>\$107,777</b>	<b>\$54,290</b>	<b>\$59,880</b>	<b>\$65,202</b>	<b>\$67,434</b>	<b>\$68,685</b>	<b>\$79,516</b>

**FIGURE 5.11: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – RETIREE HEALTH INSURANCE CREDIT FUND, cont.**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	<b>VIRGINIA RETIREMENT SYSTEM – TEACHER</b>									
	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$77,107</b>	<b>\$93,467</b>	<b>\$91,582</b>	<b>\$94,755</b>	<b>\$85,006</b>	<b>\$56,869</b>	<b>\$68,955</b>	<b>\$82,108</b>	<b>\$84,386</b>	<b>\$82,854</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	79,518	77,205	53,114	41,410	42,245	80,489	80,720	78,875	80,831	88,059
Reimbursements and Administrative Expenses	(58,896)	(61,446)	(62,799)	(66,779)	(69,777)	(73,147)	(75,033)	(79,670)	(83,510)	(83,640)
Net Funding	20,622	15,759	(9,685)	(25,369)	(27,532)	7,342	5,687	(795)	(2,679)	4,419
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	1,504	1,166	1,598	1,849	1,033	728	1,012	970	995	1,000
Net Appreciation (Depreciation) in Fair Value	(5,766)	(18,810)	11,260	13,771	(1,638)	4,016	6,454	2,103	152	7,818
Net Investment Income	(4,262)	(17,644)	12,858	15,620	(605)	4,744	7,466	3,073	1,147	8,818
<b>Net Increase (Decrease)</b>	<b>16,360</b>	<b>(1,885)</b>	<b>3,173</b>	<b>(9,749)</b>	<b>(28,137)</b>	<b>12,086</b>	<b>13,153</b>	<b>2,278</b>	<b>(1,532)</b>	<b>13,237</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$93,467</b>	<b>\$91,582</b>	<b>\$94,755</b>	<b>\$85,006</b>	<b>\$56,869</b>	<b>\$68,955</b>	<b>\$82,108</b>	<b>\$84,386</b>	<b>\$82,854</b>	<b>\$96,091</b>

	<b>VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS</b>									
	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$6,288</b>	<b>\$8,552</b>	<b>\$8,331</b>	<b>\$11,217</b>	<b>\$13,911</b>	<b>\$14,267</b>	<b>\$16,126</b>	<b>\$18,592</b>	<b>\$19,332</b>	<b>\$19,321</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	3,694	2,872	3,014	1,940	1,975	1,945	1,876	1,933	1,991	2,278
Reimbursements and Administrative Expenses	(1,012)	(1,331)	(1,382)	(1,489)	(1,626)	(1,802)	(1,817)	(2,015)	(2,278)	(1,717)
Net Funding	2,682	1,541	1,632	451	349	143	59	(82)	(287)	561
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	148	117	156	265	(13)	262	273	260	239	258
Net Appreciation (Depreciation) in Fair Value	(566)	(1,879)	1,098	1,978	20	1,454	2,134	562	37	2,016
Net Investment Income	(418)	(1,762)	1,254	2,243	7	1,716	2,407	822	276	2,274
<b>Net Increase (Decrease)</b>	<b>2,264</b>	<b>(221)</b>	<b>2,886</b>	<b>2,694</b>	<b>356</b>	<b>1,859</b>	<b>2,466</b>	<b>740</b>	<b>(11)</b>	<b>2,835</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$8,552</b>	<b>\$8,331</b>	<b>\$11,217</b>	<b>\$13,911</b>	<b>\$14,267</b>	<b>\$16,126</b>	<b>\$18,592</b>	<b>\$19,332</b>	<b>\$19,321</b>	<b>\$22,156</b>

FIGURE 5.11: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION –  
RETIREE HEALTH INSURANCE CREDIT FUND, cont.

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

<b>VIRGINIA RETIREMENT SYSTEM – CONSTITUTIONAL OFFICERS</b>										
	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$2,248</b>	<b>\$2,271</b>	<b>\$2,089</b>	<b>\$1,898</b>	<b>\$1,651</b>	<b>\$1,337</b>	<b>\$830</b>	<b>\$2,377</b>	<b>\$1,120</b>	<b>\$1,479</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	805	805	805	805	805	805	2,833	113	1,830	2,305
Reimbursements and Administrative Expenses	(782)	(986)	(996)	(1,052)	(1,119)	(1,312)	(3,245)	(1,370)	(1,471)	(1,572)
Net Funding	23	(181)	(191)	(247)	(314)	(507)	(412)	(1,258)	359	733
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	–	–	–	–	–	–	–	–	–	24
Net Appreciation (Depreciation) in Fair Value	–	(1)	–	–	–	–	1,959	–	–	191
Net Investment Income	–	(1)	–	–	–	–	1,959	–	–	215
<b>Net Increase (Decrease)</b>	<b>23</b>	<b>(182)</b>	<b>(191)</b>	<b>(247)</b>	<b>(314)</b>	<b>(507)</b>	<b>1,547</b>	<b>(1,257)</b>	<b>359</b>	<b>948</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$2,271</b>	<b>\$2,089</b>	<b>\$1,898</b>	<b>\$1,651</b>	<b>\$1,337</b>	<b>\$830</b>	<b>\$2,377</b>	<b>\$1,120</b>	<b>\$1,479</b>	<b>\$2,427</b>

<b>VIRGINIA RETIREMENT SYSTEM – SOCIAL SERVICES</b>										
	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$1,022</b>	<b>\$1,041</b>	<b>\$972</b>	<b>\$877</b>	<b>\$732</b>	<b>\$534</b>	<b>\$683</b>	<b>\$1,738</b>	<b>\$915</b>	<b>\$861</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	472	472	472	472	472	862	1,818	5	824	1,062
Reimbursements and Administrative Expenses	(453)	(541)	(567)	(617)	(670)	(713)	(1,683)	(828)	(878)	(929)
Net Funding	19	(69)	(95)	(145)	(198)	149	135	(823)	(54)	133
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	–	–	–	–	–	–	–	–	–	11
Net Appreciation (Depreciation) in Fair Value	–	–	–	–	–	–	920	–	–	86
Net Investment Income	–	–	–	–	–	–	920	–	–	97
<b>Net Increase (Decrease)</b>	<b>19</b>	<b>(69)</b>	<b>(95)</b>	<b>(145)</b>	<b>(198)</b>	<b>149</b>	<b>1,055</b>	<b>(823)</b>	<b>(54)</b>	<b>230</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$1,041</b>	<b>\$972</b>	<b>\$877</b>	<b>\$732</b>	<b>\$534</b>	<b>\$683</b>	<b>\$1,738</b>	<b>\$915</b>	<b>\$861</b>	<b>\$1,091</b>

**FIGURE 5.11: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – RETIREE HEALTH INSURANCE CREDIT FUND, cont.**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

<b>VIRGINIA RETIREMENT SYSTEM – REGISTRARS</b>										
	2008*	2009	2010**	2011	2012	2013	2014	2015	2016	2017
<b>Net Fiduciary Position Restricted – Beginning of Year</b>	<b>\$(4)</b>	<b>\$(11)</b>	<b>\$(20)</b>	<b>\$(31)</b>	<b>\$(44)</b>	<b>\$(63)</b>	<b>\$(2)</b>	<b>\$31</b>	<b>\$7</b>	<b>\$11</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	–	–	–	–	–	82	57	1	30	47
Reimbursements and Administrative Expenses	(7)	(9)	(11)	(13)	(19)	(21)	(61)	(25)	(26)	(27)
Net Funding	(7)	(9)	(11)	(13)	(19)	61	(4)	(23)	4	20
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	–	–	–	–	–	–	–	–	–	–
Net Appreciation (Depreciation) in Fair Value	–	–	–	–	–	–	37	–	–	3
Net Investment Income	–	–	–	–	–	–	37	–	–	3
<b>Net Increase (Decrease)</b>	<b>(7)</b>	<b>(9)</b>	<b>(11)</b>	<b>(13)</b>	<b>(19)</b>	<b>61</b>	<b>33</b>	<b>(24)</b>	<b>4</b>	<b>23</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$(11)</b>	<b>\$(20)</b>	<b>\$(31)</b>	<b>\$(44)</b>	<b>\$(63)</b>	<b>\$(2)</b>	<b>\$31</b>	<b>\$7</b>	<b>\$11</b>	<b>\$34</b>

\* The health insurance credit for teachers increased to \$4 per month for each year of service with no cap on the benefit. The balance in the Enhanced Retiree Health Insurance Credit Program for teachers was refunded to employers.

\*\* The health insurance credit contribution rate for the last quarter of fiscal year 2010 was zero as a result of a statutory contribution holiday.

**SCHEDULE OF RETIREE HEALTH INSURANCE CREDIT ADDITIONS BY SOURCE**

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions					Investment Income (Loss)	Other	Total
	State	Teacher	Political Subdivisions	State-Funded HIC	Sub-Total			
2017	\$ 74,520	\$ 88,059	\$ 2,278	\$ 3,414	\$ 168,271	\$ 19,113	\$ –	\$ 187,384
2016	66,411	80,831	1,990	2,684	151,916	2,421	–	154,337
2015	63,908	78,874	1,933	119	144,834	6,771	–	151,605
2014	59,438	80,720	1,876	4,708	146,742	19,922	–	166,664
2013	60,848	80,489	1,945	1,749	145,031	12,113	–	157,144
2012	5,859	42,245	1,975	1,277	51,356	(1,720)	–	49,636
2011	5,425	41,410	1,940	1,277	50,052	40,986	–	91,038
2010*	43,208	53,114	3,014	1,277	100,613	33,223	–	133,836
2009	64,979	77,205	2,872	1,277	146,333	(50,095)	–	96,238
2008	64,419	79,518	3,694	1,277	148,908	(12,454)	–	136,454

\* The health insurance credit contribution rate for the last quarter of fiscal year 2010 was zero as a result of a statutory contribution holiday.

## SCHEDULE OF RETIREE HEALTH INSURANCE CREDIT DEDUCTIONS BY TYPE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Retiree Health Insurance Reimbursements					Administrative		Total
	State	Teacher	Political Subdivisions	State-Funded HIC	Sub-Total	Expenses	Other	
2017	\$ 71,255	\$ 83,510	\$ 1,677	\$ 2,523	\$ 158,965	\$ 294	\$ 21	\$ 159,280
2016	65,984	83,329	2,226	2,375	153,914	401	5	154,320
2015	64,354	79,457	1,956	2,222	147,989	465	5	148,459
2014	59,433	76,389	1,799	4,989	142,610	463	15	143,088
2013	60,749	72,997	1,746	2,046	137,538	358	10	137,906
2012	58,074	69,638	1,582	1,808	131,102	333	–	131,435
2011	56,751	66,608	1,459	1,682	126,500	463	–	126,963
2010	54,763	62,573	1,359	1,574	120,269	603	–	120,872
2009	51,206	61,229	1,307	1,536	115,278	600	–	115,878
2008*	48,006	58,748	993	1,242	108,989	437	–	109,426

\* The health insurance credit reimbursement for teachers was increased to \$4 per month per year of service with no cap on the benefit.

## FIGURE 5.12: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – DISABILITY INSURANCE TRUST FUND

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2008	2009	2010*	2011*	2012*	2013	2014	2015	2016	2017
<b>Net Fiduciary Position</b>										
<b>Restricted – Beginning of Year</b>	<b>\$263,586</b>	<b>\$313,521</b>	<b>\$290,481</b>	<b>\$336,213</b>	<b>\$369,071</b>	<b>\$343,972</b>	<b>\$370,121</b>	<b>\$410,097</b>	<b>\$414,518</b>	<b>\$407,826</b>
<b>Funding:</b>										
Employer Contributions and Other Additions	99,430	71,337	31,021	6	78	17,267	17,693	24,026	25,156	24,768
Disability Insurance Benefits and Administrative Expenses	(32,697)	(28,800)	(28,415)	(29,001)	(28,955)	(30,668)	(34,290)	(37,942)	(38,782)	(38,466)
Net Funding	66,733	42,537	2,606	(28,995)	(28,877)	(13,401)	(16,597)	(13,916)	(13,626)	(13,698)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	5,946	4,339	5,358	7,317	7,048	5,919	6,264	5,705	5,576	5,458
Net Appreciation (Depreciation) in Fair Value	(22,744)	(69,916)	37,768	54,536	(3,270)	33,631	50,309	12,632	1,358	42,748
Net Investment Income	(16,798)	(65,577)	43,126	61,853	3,778	39,550	56,573	18,337	6,934	48,206
<b>Net Increase (Decrease)</b>	<b>49,935</b>	<b>(23,040)</b>	<b>45,732</b>	<b>32,858</b>	<b>(25,099)</b>	<b>26,149</b>	<b>39,976</b>	<b>4,421</b>	<b>(6,692)</b>	<b>34,508</b>
<b>Net Fiduciary Position Restricted – End of Year</b>	<b>\$313,521</b>	<b>\$290,481</b>	<b>\$336,213</b>	<b>\$369,071</b>	<b>\$343,972</b>	<b>\$370,121</b>	<b>\$410,097</b>	<b>\$414,518</b>	<b>\$407,826</b>	<b>\$442,334</b>

\* The disability insurance contribution rate for fiscal year 2011 and fiscal year 2012 and the last quarter of fiscal year 2010 was zero as a result of a statutory contribution holiday.

## SCHEDULE OF DISABILITY INSURANCE TRUST FUND ADDITIONS BY SOURCE

FISCAL YEARS 2008 – 2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions	Investment Income	Transfers and Other Additions*	Total
LONG-TERM DISABILITY PROGRAM				
2017	\$ 23,399	\$ 40,339	\$ –	\$ 63,738
2016	20,134	5,911	–	26,045
2015	19,458	15,884	–	35,342
2014	14,393	49,603	–	63,996
2013	14,061	35,090	–	49,151
2012	67	3,378	–	3,445
2011	5	55,686	–	55,691
2010	24,196	39,586	7,029	70,811
2009	61,371	(59,852)	–	1,519
2008	66,606	(15,332)	–	51,274
LONG-TERM CARE PROGRAM				
2017	\$ 1,369	\$ 7,867	\$ –	\$ 9,236
2016	5,022	1,023	–	6,045
2015	4,557	2,454	10	7,021
2014	2,998	6,970	302	10,270
2013	2,929	4,460	277	7,666
2012	11	400	–	411
2011	1	6,167	–	6,168
2010	6,825	3,540	–	10,365
2009	9,966	(5,725)	–	4,241
2008	11,754	(1,466)	21,070	31,358
TOTAL DISABILITY INSURANCE TRUST FUND				
2017	\$ 24,768	\$ 48,206	\$ –	\$ 72,974
2016	25,156	6,934	–	32,090
2015	24,015	18,338	10	42,363
2014	17,391	56,573	302	74,266
2013	16,990	39,550	277	56,817
2012	78	3,778	–	3,856
2011	6	61,853	–	61,859
2010	31,021	43,126	7,029	81,176
2009	71,337	(65,577)	–	5,760
2008	78,360	(16,798)	21,070	82,632

\* Transfers and Other Additions in fiscal year 2008 was a transfer of assets from a fully insured plan. Transfers and Other Additions in fiscal year 2010 includes a transfer of \$7,029,000 between long-term care and long-term disability.

## SCHEDULE OF DISABILITY INSURANCE TRUST FUND DEDUCTIONS BY TYPE

FISCAL YEARS 2008–2017

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Long-Term Disability Benefits	Long-Term Care and Costs	TPA Administrative Services	VRS Administrative Expenses	Transfers and Other Expenses*	Total
LONG-TERM DISABILITY PROGRAM						
2017	\$ 29,792	\$ —	\$ 7,001	\$ 600	\$ 45	\$ 37,438
2016	30,358	—	7,102	660	10	38,130
2015	28,504	—	7,953	729	13	37,199
2014	24,920	—	7,830	486	39	33,275
2013	23,015	—	6,320	449	26	29,810
2012	20,924	—	6,974	425	32	28,355
2011	20,050	—	7,512	585	148	28,295
2010	19,771	—	7,191	747	25	27,734
2009	19,076	—	8,285	716	—	28,077
2008	19,675	—	8,438	583	—	28,696
LONG-TERM CARE PROGRAM						
2017	\$ —	\$ 902	\$ —	\$ 117	\$ 9	\$ 1,028
2016	—	536	—	114	2	652
2015	—	628	—	113	2	743
2014	—	931	—	69	15	1,015
2013	—	798	—	57	3	858
2012	—	546	—	50	4	600
2011	—	624	—	65	17	706
2010	—	612	—	67	7,031	7,710
2009	—	655	—	68	—	723
2008	—	3,098	—	903	—	4,001
TOTAL DISABILITY INSURANCE TRUST FUND						
2017	\$ 29,792	\$ 902	\$ 7,001	\$ 717	\$ 54	\$ 38,466
2016	30,358	536	7,102	774	12	38,782
2015	28,504	628	7,953	842	15	37,942
2014	24,920	931	7,830	555	54	34,290
2013	23,015	798	6,320	506	29	30,668
2012	20,924	546	6,974	475	36	28,955
2011	20,050	624	7,512	650	165	29,001
2010	19,771	612	7,191	814	7,056	35,444
2009	19,076	655	8,285	784	—	28,800
2008	19,675	3,098	8,438	1,486	—	32,697

\* Transfers and Other Expenses in fiscal year 2010 included a transfer of \$7,029,000 between long-term care and long-term disability.

**FIGURE 5.13: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – LINE OF DUTY ACT**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2011*	2012	2013	2014	2015	2016	2017
<b>Net Position Restricted – Beginning of Year</b>	<b>\$ –</b>	<b>\$ 728</b>	<b>\$ 2,708</b>				
Employer Contributions and Other Additions	10,678	11,554	6,869	7,229	9,121	10,881	11,608
Disability Insurance Benefits and Administrative Expenses	(10,678)	(11,559)	(7,814)	(8,668)	(8,572)	(9,026)	(11,538)
Net Funding	–	(5)	(945)	(1,439)	549	1,855	70
<b>Investment Income:</b>							
Interest, Dividends and Other Investment Income	–	1	144	157	64	62	77
Net Appreciation (Depreciation) in Fair Value	–	4	801	1,282	115	63	606
Net Investment Income	–	5	945	1,439	179	125	683
<b>Net Increase (Decrease)</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>728</b>	<b>1,980</b>	<b>753</b>
<b>Net Position Restricted – End of Year</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ 728</b>	<b>\$ 2,708</b>	<b>\$ 3,461</b>

\* Fiscal year 2011 was the first year for which this data was available.

**FIGURE 5.14: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – VIRGINIA LOCAL DISABILITY PROGRAM**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2014*	2015	2016	2017
<b>Net Position Restricted – Beginning of Year</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ –</b>
Employer Contributions and Other Additions	429	875	1,351	1,993
Disability Insurance Benefits and Administrative Expenses	(429)	(873)	(1,351)	(1,363)
Net Funding	–	2	–	630
<b>Investment Income:</b>				
Interest, Dividends and Other Investment Income	–	–	–	–
Net Appreciation (Depreciation) in Fair Value	–	(1)	–	–
Net Investment Income	–	(2)	–	–
<b>Net Increase (Decrease)</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ 630</b>
<b>Net Position Restricted – End of Year</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ –</b>	<b>\$ 630</b>

\* Fiscal year 2014 was the first year for which this data was available.

**FIGURE 5.14: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – VIRGINIA LOCAL DISABILITY PROGRAM, cont.**

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

**VIRGINIA RETIREMENT SYSTEM – TEACHER**

	2014*	2015	2016	2017
<b>Net Position Restricted – Beginning of Year</b>	\$ –	\$ –	\$ –	\$ –
Employer Contributions and Other Additions	182	370	567	883
Disability Insurance Benefits and Administrative Expenses	(182)	(369)	(567)	(604)
Net Funding	–	1	–	279
<b>Investment Income:</b>				
Interest, Dividends and Other Investment Income	–	–	–	–
Net Appreciation (Depreciation) in Fair Value	–	(1)	–	–
Net Investment Income	–	(1)	–	–
<b>Net Increase (Decrease)</b>	\$ –	\$ –	\$ –	\$ 279
<b>Net Position Restricted – End of Year</b>	\$ –	\$ –	\$ –	\$ 279

**VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS**

	2014*	2015	2016	2017
<b>Net Position Restricted – Beginning of Year</b>	\$ –	\$ –	\$ –	\$ –
Employer Contributions and Other Additions	247	505	784	1,110
Disability Insurance Benefits and Administrative Expenses	(247)	(504)	(784)	(759)
Net Funding	–	1	–	351
<b>Investment Income:</b>				
Interest, Dividends and Other Investment Income	–	–	–	–
Net Appreciation (Depreciation) in Fair Value	–	(1)	–	–
Net Investment Income	–	(1)	–	–
<b>Net Increase (Decrease)</b>	\$ –	\$ –	\$ –	\$ 351
<b>Net Position Restricted – End of Year</b>	\$ –	\$ –	\$ –	\$ 351

\* Fiscal year 2014 was the first year for which this data was available.

**FIGURE 5.15: OTHER POST-EMPLOYMENT BENEFIT PLAN STATISTICS**

**SCHEDULE OF RETIRED MEMBERS AND BENEFICIARIES BY PLAN**

At June 30	Group Life Insurance	Retiree Health Insurance Credit	Disability Insurance	Line of Duty*
2017	176,107	120,304	2,785	654
2016	169,786	116,408	2,844	621
2015	163,482	112,053	2,860	525
2014	156,549	108,076	2,764	551
2013	149,926	103,952	2,757	536
2012	143,657	99,836	2,722	788
2011	137,784	96,671	2,698	801
2010	130,915	92,126	2,592	N/A
2009**	124,646	87,538	2,483	N/A

\* This was a new program in fiscal year 2011. The reduction in cases resulted from employers that opted out of the Line of Duty program and are self-administering their line of duty cases and funding their benefits.

\*\* Fiscal year 2009 was the first year for which this data was available.

FIGURE 5.15: OTHER POST-EMPLOYMENT BENEFIT PLAN STATISTICS, cont.

SCHEDULE OF AVERAGE BENEFIT PAYMENTS BY PLAN

Group Life Insurance			Retiree Health Insurance Credit		
Year Ended June 30	Number of Claims Paid	Average Claim Amount	Payment Period	Number of Recipients	Average Monthly Credit Amount
2017	4,846	\$ 24,634	June 2017	120,304	\$ 108
2016	4,660	23,735	June 2016	116,408	\$ 108
2015	4,520	24,754	June 2015	112,053	\$ 108
2014	4,259	23,489	June 2014	108,076	\$ 108
2013	4,206	21,816	June 2013	103,952	\$ 107
2012	4,013	21,737	June 2012	99,834	\$ 107
2011	3,999	21,896	June 2011	96,671	\$ 107
2010	3,852	22,118	June 2010	92,125	\$ 106
2009*	3,650	21,301	June 2009*	87,537	\$ 105

\* Fiscal year 2009 was the first year for which this data was available.

\* Fiscal year 2009 was the first year for which this data was available.

Disability Insurance

Payment Period	Number of Claims Paid	Average Gross Monthly Benefit	Average Net Monthly Benefit*
June 2017	2,783	\$ 1,851	\$ 969
June 2016	2,836	\$ 1,797	\$ 892
June 2015	2,829	\$ 1,820	\$ 885
June 2014	2,814	\$ 1,852	\$ 843
June 2013	2,707	\$ 1,852	\$ 814
June 2012	2,683	\$ 1,828	\$ 762
June 2011	2,650	\$ 1,770	\$ 759
June 2010	2,564	\$ 1,738	\$ 779
June 2009**	2,428	\$ 1,714	\$ 797

\* The net monthly benefit reflects adjustments for Social Security, workers' compensation and other offsets.

\*\* Fiscal year 2009 was the first year for which this data was available.

Line of Duty\*

Line of Duty Death Benefits**			Health Insurance Benefits		
Year Ended June 30	LOD Death	Presumptive LOD Death	Year Ended June 30	Number of Active Claims	Average Annual Health Insurance Benefit
2017	3	3	2017	654	\$ 15,107
2016	1	2	2016	621	\$ 13,503
2015	—	3	2015	525	\$ 15,198
2014	3	2	2014	573	\$ 12,725
2013	2	3	2013	552	\$ 10,807
2012	4	4	2012	781	\$ 12,298
2011***	6	11	2011	801	\$ 11,138

\* The Line of Duty Program was funded by a trust fund beginning in fiscal year 2011. In that year and fiscal year 2012, employers had the option to opt-out and self-fund the benefits provided by the program. Data for fiscal year 2011 and fiscal year 2012 are not representative of the program's expected activity going forward.

\*\* The Line of Duty Program provides a \$100,000 death benefit of an eligible individual whose death was as a direct or proximate result of the performance of duty. The program also provides a \$25,000 death benefit for certain individuals whose death arose out of their employment or was within five years of the date of retirement.

\*\*\* Fiscal year 2011 was the first year for which this data was available.

## VRS-Participating Employers

More than 800 employers participate in the Virginia Retirement System (VRS) on behalf of their employees. Employers include state agencies, public colleges and universities, school divisions and political subdivisions.

The following employers were participating in VRS as of June 30, 2017:

### PARTICIPATING POLITICAL SUBDIVISIONS: 460

*A: retirement only B: retirement and group life insurance C: retirement, group life insurance and retiree health insurance credit  
D: retirement and retiree health insurance credit*

#### COUNTIES: 93

Accomack County: C	Dickenson County: A	Lancaster County: B	Rappahannock County: C
Albemarle County: B	Dinwiddie County: B	Lee County: B	Richmond County: B
Alleghany County: B	Essex County: C	Loudoun County: B	Roanoke County: C
Amelia County: C	Fauquier County: B	Louisa County: C	Rockbridge County: B
Amherst County: C	Floyd County: B	Lunenburg County: B	Rockingham County: B
Appomattox County: B	Fluvanna County: C	Madison County: C	Russell County: C
Augusta County: B	Franklin County: B	Mathews County: C	Scott County: B
Bath County: B	Frederick County: B	Mecklenburg County: B	Shenandoah County: C
Bedford County: B	Giles County: B	Middlesex County: B	Smyth County: B
Bland County: C	Gloucester County: C	Montgomery County: B	Southampton County: C
Botetourt County: B	Goochland County: B	Nelson County: B	Spotsylvania County: B
Brunswick County: B	Grayson County: B	New Kent County: C	Stafford County: C
Buchanan County: B	Greene County: C	Northampton County: B	Surry County: B
Buckingham County: B	Greensville County: C	Northumberland County: C	Sussex County: B
Campbell County: B	Halifax County: C	Nottoway County: B	Tazewell County: C
Caroline County: B	Hanover County: C	Orange County: B	Warren County: B
Carroll County: B	Henrico County: B	Page County: B	Washington County: C
Charles City County: B	Henry County: C	Patrick County: B	Westmoreland County: C
Charlotte County: B	Highland County: B	Pittsylvania County: C	Wise County: C
Chesterfield County: B	Isle of Wight County: C	Powhatan County: C	Wythe County: C
Clarke County: B	James City County: C	Prince Edward County: B	York County: C
Craig County: C	King & Queen County: B	Prince George County: B	
Culpeper County: B	King George County: B	Prince William County: C	
Cumberland County: B	King William County: B	Pulaski County: C	

#### CITIES AND TOWNS: 161

City of Alexandria: A	City of Hampton: B	City of Radford: C	Town of Ashland: B
City of Bedford: B	City of Harrisonburg: B	City of Richmond: B	Town of Berryville: B
City of Bristol: B	City of Hopewell: B	City of Roanoke: B	Town of Big Stone Gap: A
City of Buena Vista: B	City of Lexington: B	City of Salem: B	Town of Blacksburg: B
City of Chesapeake: B	City of Lynchburg: B	City of Staunton: B	Town of Blackstone: B
City of Colonial Heights: B	City of Manassas: C	City of Suffolk: B	Town of Bluefield: B
City of Covington: C	City of Manassas Park: B	City of Virginia Beach: B	Town of Bowling Green: B
City of Danville: A	City of Martinsville: B	City of Waynesboro: B	Town of Boyce: B
City of Emporia: B	City of Newport News: B	City of Williamsburg: B	Town of Boydton: B
City of Fairfax: A	City of Norfolk: B	City of Winchester: C	Town of Boykins: A
City of Falls Church: B	City of Norton: B	Town of Abingdon: B	Town of Bridgewater: B
City of Franklin: B	City of Petersburg: B	Town of Altavista: B	Town of Broadway: B
City of Fredericksburg: B	City of Poquoson: C	Town of Amherst: B	Town of Brodnax: A
City of Galax: B	City of Portsmouth: B	Town of Appomattox: A	Town of Brookneal: B

CITIES AND TOWNS, cont.

Town of Burkeville: B	Town of Gretna: B	Town of Middletown: D	Town of South Boston: B
Town of Cape Charles: B	Town of Grottoes: B	Town of Mineral: A	Town of South Hill: A
Town of Chase City: B	Town of Grundy: B	Town of Montross: B	Town of St. Paul: B
Town of Chatham: B	Town of Halifax: B	Town of Mount Jackson: B	Town of Stanley: C
Town of Chilhowie: B	Town of Hamilton: C	Town of Narrows: A	Town of Stephens City: B
Town of Chincoteague: B	Town of Haymarket: B	Town of New Market: B	Town of Strasburg: C
Town of Christiansburg: A	Town of Haysi: A	Town of Onancock: B	Town of Stuart: B
Town of Clarksville: B	Town of Herndon: B	Town of Onley: B	Town of Tappahannock: A
Town of Clifton Forge: B	Town of Hillsville: B	Town of Orange: B	Town of Tazewell: A
Town of Coeburn: B	Town of Hurt: B	Town of Parksley: B	Town of Timberville: B
Town of Colonial Beach: B	Town of Independence: A	Town of Pearisburg: C	Town of Urbanna: B
Town of Courtland: B	Town of Iron Gate: B	Town of Pembroke: B	Town of Victoria: B
Town of Craigsville: B	Town of Jarratt: A	Town of Pennington Gap: A	Town of Vienna: B
Town of Crewe: B	Town of Jonesville: B	Town of Pound: A	Town of Vinton: B
Town of Culpeper: B	Town of Kenbridge: C	Town of Pulaski: B	Town of Wakefield: A
Town of Dayton: B	Town of Kilmarnock: C	Town of Purcellville: B	Town of Warrenton: B
Town of Dillwyn: A	Town of La Crosse: A	Town of Quantico: B	Town of Warsaw: B
Town of Dublin: B	Town of Lawrenceville: C	Town of Remington: B	Town of Waverly: A
Town of Dumfries: C	Town of Lebanon: B	Town of Rich Creek: A	Town of Weber City: B
Town of Edinburg: A	Town of Leesburg: B	Town of Richlands: A	Town of West Point: B
Town of Elkton: B	Town of Louisa: B	Town of Rocky Mount: B	Town of Windsor: B
Town of Exmore: A	Town of Lovettsville: B	Town of Round Hill: B	Town of Wise: B
Town of Floyd: B	Town of Luray: B	Town of Rural Retreat: A	Town of Woodstock: C
Town of Front Royal: B	Town of Madison: B	Town of Saltville: A	Town of Wytheville: B
Town of Gate City: A	Town of Marion: B	Town of Scottsville: B	
Town of Glasgow: B	Town of McKenney: B	Town of Shenandoah: C	
Town of Gordonsville: B	Town of Middleburg: B	Town of Smithfield: B	

AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS: 206

Accomack-Northampton Planning District Commission: B	Bedford Public Library: B	Campbell County Utilities & Service Authority: B	Clinch Valley Soil & Water Conservation District: B
Albemarle County Service Authority: B	Bedford Regional Water Authority: B	Capital Region Airport Commission: C	Coeburn-Norton-Wise Regional Water Treatment Authority: B
Albemarle-Charlottesville Regional Jail: B	Big Sandy Soil & Water Conservation District: A	Castlewood Water & Sewage Authority: B	Colonial Behavioral Health: C
Alexandria Redevelopment & Housing Authority: B	Big Stone Gap Redevelopment & Housing Authority: A	Central Rappahannock Regional Library: B	Colonial Soil & Water Conservation District: B
Alexandria Renew Enterprises: A	Big Walker Soil & Water Conservation District: A	Central Shenandoah Justice Training Academy: B	Commonwealth Regional Council: A
Alleghany Highlands Community Services Board: B	Blacksburg-Christiansburg-VPI Water Authority: B	Central Virginia Community Services Board: B	Crater Criminal Justice Training Academy: B
Alleghany Highlands Regional Library, Inc.: B	Blacksburg-VPI Sanitation Authority: B	Central Virginia Regional Jail: B	Crater Youth Care Commission: B
Amherst County Service Authority: C	Blue Ridge Behavioral Healthcare: B	Central Virginia Waste Management Authority: C	Culpeper Soil & Water Conservation District: B
Anchor Commission: B	Blue Ridge Juvenile Detention Center: B	Charlottesville-Albemarle Airport Authority: B	Cumberland Mountain Community Services Board: B
Appalachian Juvenile Commission: C	Blue Ridge Regional Jail Authority: B	Charlottesville Redevelopment & Housing Authority: B	Cumberland Plateau Regional Housing Authority: B
Appomattox Regional Library: B	Bristol Redevelopment & Housing Authority: B	Chesapeake Bay Bridge & Tunnel District: B	Daniel Boone Soil & Water Conservation District: B
Appomattox River Water Authority: B	Bristol Virginia Utilities Authority: B	Chesapeake Redevelopment & Housing Authority: B	Danville-Pittsylvania Community Services Board: B
Augusta County Service Authority: B	Brunswick Industrial Development Authority: B	Chesterfield County Health Center Commission: B	Danville Redevelopment & Housing Authority: B

AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS, cont.

Dinwiddie County Water Authority: B	Hopewell Redevelopment & Housing Authority: A	Northern Neck Planning District Commission: B	Region Ten Community Services Board: B
District 19 Community Services Board: C	Institute for Advanced Learning and Research: A	Northern Neck Regional Jail: B	Richmond Metropolitan Authority: B
Eastern Shore Community Services Board: B	James City Service Authority: C	Northern Shenandoah Valley Regional Commission: B	Richmond Redevelopment & Housing Authority: B
Eastern Shore Public Library: B	John Marshall Soil & Water Conservation District: B	Northern Virginia Health Care Center Commission: A	Richmond Regional Planning District Commission: A
Eastern Shore Soil & Water Conservation District: B	Lee County Public Service Authority: B	Northern Virginia Juvenile Detention Home: B	Rivanna Solid Waste Authority: B
Economic Development Authority of Henrico County: B	Lee County Redevelopment & Housing Authority: B	Northern Virginia Transportation Authority: C	Rivanna Water & Sewer Authority: B
Evergreen Soil & Water Conservation District: B	Lenowisco Planning District Commission: B	Northwestern Community Services Board: B	Riverside Regional Jail: B
Fauquier County Water & Sanitation Authority: B	Lonesome Pine Regional Library: B	Opportunity Inc. of Hampton Roads: B	Roanoke Higher Education Authority: C
Ferrum Water & Sewage Authority: A	Lonesome Pine Soil & Water Conservation District: B	Pamunkey Regional Jail: B	Roanoke Redevelopment & Housing Authority: A
Franklin Redevelopment & Housing Authority: B	Loudoun County Sanitation Authority: B	Pamunkey Regional Library: C	Roanoke River Service Authority: B
Frederick County Sanitation Authority: C	Massanutten Regional Library: B	Peaks of Otter Soil & Water Conservation District: B	Robert E. Lee Soil & Water Conservation District: A
Giles County Public Service Authority: B	Maury Service Authority: B	Peninsula Airport Commission: B	Rockbridge Area Community Services Board: B
Goochland-Powhatan Community Services Board: B	Meherrin Regional Library: C	Pepper's Ferry Regional Wastewater Authority: C	Rockbridge Area Social Services Department: B
Greensville County Water & Sewer Authority: C	Meherrin River Regional Jail Authority: C	Peter Francisco Soil & Water Conservation District: A	Rockbridge County Public Service Authority: B
Greensville-Emporia Department of Social Services: C	Middle Peninsula-Northern Neck Community Services Board: B	Petersburg Redevelopment & Housing Authority: C	Rockbridge Regional Library: A
Halifax Service Authority: B	Middle Peninsula Planning District Commission: B	Peumansend Creek Regional Jail: B	RSW Regional Jail Authority: B
Hampton-Newport News Community Services Board: A	Middle Peninsula Regional Security Center: B	Piedmont Community Services Board: B	Russell County Public Service Authority: C
Hampton Redevelopment & Housing Authority: B	Middle River Regional Jail Authority: B	Piedmont Regional Jail: B	Scott County Public Service Authority: B
Hampton Roads Planning District Commission: B	Monacan Soil & Water Conservation District: C	Piedmont Regional Juvenile Detention Center: B	Scott County Redevelopment & Housing Authority: B
Hampton Roads Regional Jail Authority: B	Montgomery Regional Solid Waste Authority: B	Pittsylvania County Service Authority: B	Scott County Soil & Water Conservation District: B
Hampton Roads Sanitation District: C	Mount Rogers Community Services Board: B	Planning District One Behavioral Health Services Board: C	Shenandoah Valley Juvenile Center: C
Hampton Roads Transit: B	Nelson County Service Authority: B	Portsmouth Redevelopment & Housing Authority: B	Shenandoah Valley Regional Airport Commission: B
Hampton Roads Transportation Accountability Commission: C	New River Resource Authority: C	Potomac and Rappahannock Transportation Commission: B	Skyline Soil & Water Conservation District: A
Handley Regional Library: B	New River Soil & Water Conservation District: B	Potomac River Fisheries Commission: B	South Central Wastewater Authority: B
Harrisonburg-Rockingham Community Services Board: C	New River Valley Community Services Board: A	Prince William County Service Authority: C	Southeastern Virginia Public Service Authority: B
Harrisonburg-Rockingham Regional Sewer Authority: B	New River Valley Emergency Communications Regional Authority: B	Prince William Soil & Water Conservation District: B	Southside Community Services Board: C
Henricopolis Soil & Water Conservation District: B	New River Valley Juvenile Detention Home Commission: B	Rappahannock Area Community Services Board: C	Southside Planning District Commission: B
Henry County Public Service Authority: C	New River Valley Planning District Commission: A	Rappahannock Juvenile Center: C	Southside Regional Jail: C
Holston River Soil & Water Conservation District: A	New River Valley Regional Jail: B	Rappahannock-Rapidan Community Services Board: B	Southside Regional Juvenile Group Home Commission: B
	Norfolk Airport Authority: B	Rappahannock-Rapidan Regional Planning District Commission: B	Southside Regional Library Board: B
	Norfolk Redevelopment & Housing Authority: B	Rappahannock Regional Jail: B	

AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS, cont.

Southwest Regional Recreation Authority: B	Thomas Jefferson Soil & Water Conservation District: B	Virginia Highlands Airport Authority: B	Western Tidewater Regional Jail: B
Southwest Virginia Regional Jail: B	Tidewater Soil & Water Conservation District: A	Virginia Peninsula Regional Jail: B	Western Virginia Regional Jail Authority: C
Spotsylvania-Stafford-Fredericksburg Group Home Commission: B	Tidewater Youth Services Commission: C	Virginia Peninsulas Public Service Authority: B	Western Virginia Water Authority: B
Staunton Redevelopment & Housing Authority: B	Tri-County/City Soil & Water Conservation District: B	Virginia Resources Authority: B	Wise County Public Service Authority: B
Suffolk Redevelopment & Housing Authority: B	Upper Occoquan Sewage Authority: B	Virginia's Region 2000 Local Government Council: B	Wise County Redevelopment & Housing Authority: C
Sussex Service Authority: B	Valley Community Services Board: B	Washington County Service Authority: B	Woodway Water Authority: B
Tazewell Soil & Water Conservation District: B	Virginia Biotechnology Research Park Authority: C	Washington Metropolitan Area Transportation Commission: A	Wythe-Grayson Regional Library: B
Thomas Jefferson Planning District Commission: B	Virginia Coalfield Economic Development Authority: C	Waynesboro Redevelopment & Housing Authority: B	Wytheville Redevelopment & Housing Authority: B
		Western Tidewater Community Services Board: D	

**SCHOOLS: 145\***

*E: professional employees covered by retirement, group life insurance and the retiree health insurance credit and non-professional employees (as applicable) covered by retirement and group life insurance*

*F: professional and non-professional employees covered by retirement, group life insurance and the retiree health insurance credit*

COUNTY SCHOOLS: 94

Accomack County Schools: E	Cumberland County Schools: E	King William County Schools: E	Prince William County Schools: F
Albemarle County Schools: E	Dickenson County Schools: E	Lancaster County Schools: E	Pulaski County Schools: E
Alleghany County Schools: E	Dinwiddie County Schools: E	Lee County Schools: F	Rappahannock County Schools: F
Amelia County Schools: E	Essex County Schools: E	Loudoun County Schools: F	Richmond County Schools: E
Amherst County Schools: E	Fairfax County Schools: E	Louisa County Schools: F	Roanoke County Schools: E
Appomattox County Schools: E	Fauquier County Schools: E	Lunenburg County Schools: E	Rockbridge County Schools: E
Arlington County Schools: E	Floyd County Schools: E	Madison County Schools: E	Rockingham County Schools: F
Augusta County Schools: E	Fluvanna County Schools: E	Mathews County Schools: E	Russell County Schools: F
Bath County Schools: F	Franklin County Schools: F	Mecklenburg County Schools: E	Scott County Schools: E
Bedford County Schools: E	Frederick County Schools: E	Middlesex County Schools: E	Shenandoah County Schools: E
Bland County Schools: E	Giles County Schools: E	Montgomery County Schools: E	Smyth County Schools: E
Botetourt County Schools: F	Gloucester County Schools: F	Nelson County Schools: E	Southampton County Schools: E
Brunswick County Schools: F	Goochland County Schools: E	New Kent County Schools: E	Spotsylvania County Schools: E
Buchanan County Schools: E	Grayson County Schools: E	Northampton County Schools: E	Stafford County Schools: F
Buckingham County Schools: E	Greene County Schools: E	Northumberland County Schools: E	Surry County Schools: E
Campbell County Schools: F	Greensville County Schools: E	Nottoway County Schools: E	Sussex County Schools: E
Caroline County Schools: E	Halifax County Schools: F	Orange County Schools: E	Tazewell County Schools: E
Carroll County Schools: F	Hanover County Schools: E	Page County Schools: E	Warren County Schools: E
Charles City County Schools: E	Henrico County Schools: E	Patrick County Schools: E	Washington County Schools: F
Charlotte County Schools: E	Henry County Schools: E	Pittsylvania County Schools: F	Westmoreland County Schools: E
Chesterfield County Schools: E	Highland County Schools: E	Powhatan County Schools: E	Wise County Schools: F
Clarke County Schools: E	Isle of Wight County Schools: E	Prince Edward County Schools: E	Wythe County Schools: F
Craig County Schools: E	King & Queen County Schools: E	Prince George County Schools: E	York County Schools: E
Culpeper County Schools: F	King George County Schools: E		

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CITY AND TOWN SCHOOLS: 39

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Alexandria City Schools: E	Falls Church Public Schools: E	Manassas Park City Schools: F	Roanoke City Schools: F
Bristol City Schools: E	Franklin City Schools: F	Martinsville City Schools: E	Salem City Schools: F
Buena Vista City Schools: E	Fredericksburg City Schools: E	Newport News Public Schools: F	Staunton City Schools: F
Charlottesville Public Schools: E	Galax City Schools: E	Norfolk Public Schools: E	Suffolk City Schools: E
Chesapeake Public Schools: E	Hampton City Schools: E	Norton City Schools: E	Virginia Beach City Schools: E
Colonial Beach Schools: E	Harrisonburg City Schools: E	Petersburg City Schools: E	Waynesboro City Schools: E
Colonial Heights City Schools: E	Hopewell City Schools: E	Poquoson City Schools: F	West Point Schools: E
Covington City Schools: F	Lexington City Schools: E	Portsmouth City Schools: E	Williamsburg-James City County Schools: F
Danville City Schools: E	Lynchburg Public Schools: E	Radford City Schools: E	Winchester Public Schools: F
Fairfax City Schools: E	Manassas City Schools: F	Richmond City Public Schools: E	

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OTHER SCHOOLS: 12

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Amelia-Nottoway Technical Center: E	Charlottesville-Albemarle Vocational Technical Center: E	New Horizons Technical Center: E	The Pruden Center for Industry and Technology: E
Appomattox Regional Governor's School: E	Jackson River Vocational Technical Center: F	Northern Neck Regional Special Education Program: E	Valley Vocational Technical Center: E
Bridging Communities Regional Career Center & Technical Center: E	Maggie Walker Governor's School for Government and International Studies: E	Northern Neck Regional Vocational Center: E	
		Rowanty Vocational Technical Center: E	

*\* Of the 145 school boards, 133 also provide coverage for non-professional employees and are treated as political subdivisions.*

**AGENCIES OF THE COMMONWEALTH OF VIRGINIA, INCLUDING PUBLIC  
COLLEGES AND UNIVERSITIES: 227**

*Covered by retirement, group life insurance, retiree health insurance credit and sickness and disability*

**TOTAL VRS-PARTICIPATING EMPLOYERS: 832**

**FIGURE 5.16: VRS EMPLOYER RANKING  
CURRENT YEAR**

AS OF JUNE 30, 2017

Employer	Active Employees	Percentage of Total
1 Fairfax County Schools – Professional Employees	21,756	6.38%
2 Loudoun County Schools – Professional Employees	8,886	2.60%
3 Prince William County Schools - Professional Employees	8,571	2.51%
4 Virginia Beach City Schools – Professional Employees	8,011	2.35%
5 Chesterfield County Schools – Professional Employees	6,297	1.85%
6 City of Virginia Beach – General Government	5,929	1.74%
7 Henrico County Schools – Professional Employees	5,276	1.55%
8 University of Virginia – Academic Division	5,204	1.53%
9 Henrico County – General Government	5,078	1.49%
10 Virginia Polytechnic Institute and State University – Academic	4,823	1.41%
11 All other	261,369	76.59%
<b>Total</b>	<b>341,200</b>	<b>100.00%</b>

**HISTORICAL COMPARISON**

AS OF JUNE 30, 2007

Employer	Active Employees	Percentage of Total
1 Fairfax County Schools – Professional Employees	19,297	5.69%
2 Virginia Beach City Schools – Professional Employees	8,496	2.50%
3 Prince William County Schools – Professional Employees	7,309	2.15%
4 Loudoun County Schools – Professional Employees	6,053	1.78%
5 Chesterfield County Schools – Professional Employees	5,983	1.76%
6 City of Virginia Beach – General Government	5,887	1.74%
7 University of Virginia – Academic Division	5,340	1.57%
8 Norfolk City Schools – Professional Employees	5,133	1.51%
9 Virginia Polytechnic Institute and State University – Academic	4,792	1.41%
10 Henrico County – General Government	4,711	1.39%
11 All other	266,214	78.50%
<b>Total</b>	<b>339,215</b>	<b>100.00%</b>

**Commonwealth of Virginia 457 Deferred Compensation and Cash Match Plans  
Program With Oversight by VRS**

**PLAN OVERVIEW**

The Commonwealth of Virginia 457 Deferred Compensation Plan is qualified under Section 457(b) of the Internal Revenue Code and regulated by Title 51.1, Chapter 6, of the *Code of Virginia*.

The 457 Deferred Compensation Plan provides eligible members a way to save for retirement through deferrals of compensation each pay period. The Cash Match Plan is qualified under Section 401(a) of the Internal Revenue Code and is regulated by Title 51.1, Chapter 6, of the *Code of*

Virginia. Employees participating in the Deferred Compensation Plan are eligible to receive an employer-provided contribution to the Cash Match Plan if they are state employees or employees whose employers have elected the Cash Match Plan.

## ELIGIBILITY

New and re-hired salaried state employees in Plan 1 and Plan 2 are automatically enrolled in the Deferred Compensation Plan upon employment with two opportunities to opt out of the plan. The Deferred Compensation Plan is voluntary to salaried state employees hired before January 1, 2008, and to eligible political subdivision employees whose employers have elected to participate in the plan.

Wage employees of employers that offer the plans may participate in the Deferred Compensation Plan but not the Cash Match Plan. Figure 5.17 presents details of each plan's activity for the years ended June 30, 2017, 2016, 2015 and 2014.

Contributions to the Deferred Compensation Plan during fiscal year 2017 and fiscal year 2016 were \$134,004,333 and \$139,303,721, respectively.

Contributions to the Cash Match Plan during fiscal year 2017 and fiscal year 2016 were \$15,697,347 and \$16,454,181, respectively.

As shown in Figures 5.18 and 5.19, there were approximately 77,622 employees in the Deferred Compensation Plan and 70,200 employees in the Cash Match Plan as of June 30, 2017.

Current state legislation establishing the Commonwealth of Virginia 457 Deferred Compensation Plan allows participants to use plan funds to purchase eligible prior service credit in their defined benefit plan. Approximately 215 plan participants used the trustee-to-trustee transfer provision to buy VRS service credit.

The Virginia Retirement System (the System) has oversight but no investment responsibility for the Deferred Compensation and Cash Match Plans. These plans' assets, therefore, are not included in the System's Basic Financial Statements.

## FIGURE 5.17: STATEMENT OF CHANGES IN PLAN ACCUMULATION ASSETS

FOR THE YEARS ENDED JUNE 30

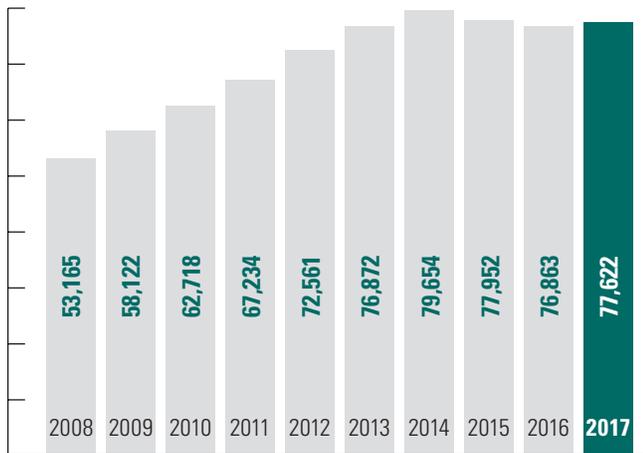
	Deferred Compensation Plan – 457(b)			Cash Match Plan – 401(a)		
	2017	2016	2015	2017	2016	2015
Plan Assets						
on July 1	\$ 2,184,755,502	\$ 2,114,351,524	\$ 2,026,875,362	\$ 379,078,068	\$ 369,825,796	\$ 353,287,941
Contributions	134,004,333	139,303,721	129,961,846	15,697,347	16,454,181	17,164,370
Distributions	(132,536,740)	(110,806,127)	(110,690,633)	(23,664,326)	(22,149,632)	(21,481,259)
Plan						
Transfers*	11,252,987	9,129,981	8,627,066	8,850,618	8,591,671	10,355,268
Third-Party						
Administrative						
Fees**	(2,292,692)	(2,322,347)	(2,382,686)	(67,058)	(65,041)	(64,692)
Period						
Earnings	239,289,299	35,098,750	61,960,569	38,803,110	6,421,093	10,564,168
<b>Plan Assets</b>						
<b>on June 30</b>	<b>\$ 2,434,472,689</b>	<b>\$ 2,184,755,502</b>	<b>\$ 2,114,351,524</b>	<b>\$ 418,697,759</b>	<b>\$ 379,078,068</b>	<b>\$ 369,825,796</b>

\* For the Deferred Compensation Plan, this represents plan transfers from other eligible Section 457(b) plans into the Commonwealth's Plan. For the Cash Match Plan, this represents transfers from other qualified plans, including Partial Lump-Sum Option Payments (PLOPs) for the VRS pension plans.

\*\* The current third-party administrator, ICMA-RC, is compensated based on an annual record-keeping and communication fee of \$30.50 per participant deducted on a monthly basis (approximately \$2.54 per month). Participants with multiple accounts only pay one annual fee of \$30.50. In addition, administrative costs were incurred by VRS for each of the plans. For the Deferred Compensation Plan, they were \$646,640 and \$696,956 in fiscal years 2017 and 2016, respectively. For the Cash Match Plan, they were \$414,243 and \$481,423 in fiscal years 2017 and 2016, respectively. These costs are funded by the employers participating in the plans.

**FIGURE 5.18: 457(b) ACTIVE AND INACTIVE PLAN PARTICIPANTS**

AT JUNE 30



**FIGURE 5.19: 401(a) ACTIVE AND INACTIVE PLAN PARTICIPANTS**

AT JUNE 30



**FIGURE 5.20: TOTAL PARTICIPANT ACCOUNTS IN EACH FUND OPTION**

AT JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

Fund Name	Deferred Compensation Plan – 457(b)	Cash Match Plan – 401(a)
Retirement Portfolio	4,855	3,702
Target Date 2020 Portfolio	5,525	4,658
Target Date 2025 Portfolio	6,565	5,560
Target Date 2030 Portfolio	6,509	5,553
Target Date 2035 Portfolio	6,556	5,602
Target Date 2040 Portfolio	6,047	5,282
Target Date 2045 Portfolio	6,705	5,806
Target Date 2050 Portfolio	6,810	5,975
Target Date 2055 Portfolio	4,985	4,408
Target Date 2060 Portfolio	851	777
Money Market Fund	4,238	3,153
Stable Value Fund	17,831	17,468
Bond Fund	9,067	6,667
Inflation-Protected Bond Fund	3,710	2,496
High-Yield Bond Fund	4,178	2,633
Stock Fund	23,309	19,347
Small/Mid-Cap Stock Fund	12,744	9,726
International Stock Fund	11,362	8,547
Global Real Estate Fund	8,256	6,108
VRS Investment Portfolio	1,612	987
Self-Directed Brokerage	470	60

*The number of participant accounts exceeds the number of participants as a participant may invest in more than one fund.*

## FIGURE 5.21: ACCUMULATION PLAN ASSETS BY FUND

FOR THE YEARS ENDED JUNE 30

Fund Name	Deferred Compensation Plan – 457(b)			Cash Match Plan – 401(a)		
	2017	2016	2015	2017	2016	2015
Retirement Portfolio	\$ 136,923,374	\$ 134,124,866	\$ 137,414,862	\$ 23,077,644	\$ 22,105,079	\$ 21,261,655
Target Date 2020 Portfolio	128,169,224	110,385,748	100,288,852	19,070,807	16,779,592	15,906,309
Target Date 2025 Portfolio	102,240,948	84,285,982	73,076,359	16,988,439	14,473,693	13,339,434
Target Date 2030 Portfolio	72,100,189	56,407,009	50,022,756	14,567,392	12,086,563	11,237,640
Target Date 2035 Portfolio	58,868,973	46,218,327	40,851,071	13,821,879	11,309,360	10,351,825
Target Date 2040 Portfolio	43,107,808	34,233,349	29,310,334	12,872,472	8,571,036	7,930,036
Target Date 2045 Portfolio	30,327,098	22,910,724	19,593,200	9,530,850	7,485,866	6,768,548
Target Date 2050 Portfolio	20,467,326	15,188,388	13,060,692	7,366,990	5,712,752	5,073,018
Target Date 2055 Portfolio	12,700,919	9,280,237	7,526,914	3,745,756	2,749,779	2,310,816
Target Date 2060 Portfolio	1,725,904	971,667	630,963	347,498	149,332	66,441
Money Market Fund	45,172,232	43,385,395	37,444,368	5,813,042	6,376,164	6,353,361
Stable Value Fund	392,843,573	392,258,749	371,650,613	96,033,260	95,579,966	92,982,094
Bond Fund	106,512,214	110,341,141	100,878,897	13,421,044	13,922,248	13,268,210
Inflation-Protected Bond Fund	31,794,113	31,708,715	31,669,110	3,155,104	3,270,111	3,373,663
High-Yield Bond Fund	29,550,219	24,046,718	25,336,688	3,556,159	2,999,957	3,294,132
Stock Fund	712,477,931	621,481,903	615,546,031	111,054,172	95,970,209	94,382,476
Small/Mid-Cap Stock Fund	230,756,132	196,652,719	206,470,600	30,984,324	26,692,300	28,449,295
International Stock Fund	130,285,820	101,749,572	114,882,413	15,253,669	12,477,092	14,060,551
Emerging Markets Stock Fund	–	9,028,308	8,885,917	–	602,796	631,430
Global Real Estate Fund	84,411,045	86,537,812	80,985,503	12,670,590	13,057,981	12,301,215
VRS Investment Portfolio – Interim Account	437,310	1,546,921	1,164,566	117,265	141,332	69,825
VRS Investment Portfolio	26,810,905	22,965,612	19,707,298	4,363,367	5,827,047	5,605,016
Self-Directed Brokerage	36,789,432	29,045,640	27,953,519	886,036	737,813	808,805
<b>Total Accumulation Plan Assets</b>	<b>\$ 2,434,472,689</b>	<b>\$ 2,184,755,502</b>	<b>\$ 2,114,351,524</b>	<b>\$ 418,697,759</b>	<b>\$ 379,078,068</b>	<b>\$ 369,825,796</b>

Detailed information on each of these funds, including the investment objective, distribution of assets, investment performance and annual operating expense for each fund, is presented in the Investment Section of this report.



