

AN INDEPENDENT AGENCY OF THE COMMONWEALTH OF VIRGINIA

# PROVIDING EXCEPTIONAL SERVICE



Virginia  
Retirement  
System

**Virginia Retirement System**  
**Comprehensive Annual Financial Report**  
For the Year Ended June 30, 2018

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

(EXPRESSED IN THOUSANDS)

	2018	2017	% Change
<b>Activity for the Year:</b>			
Contributions	\$ 3,465,914	\$ 3,242,396	6.89%
Investment Income (Net of Investment Expenses)	\$ 5,353,019	\$ 8,014,834	-33.21%
Retirement Benefits	\$ 4,752,889	\$ 4,518,958	5.18%
Refunds	\$ 122,968	\$ 119,705	2.73%
Administrative and Other Expenses (Net of Miscellaneous Income)	\$ 54,386	\$ 57,620	-5.61%
Increase (Decrease) in Net Assets Held in Trust for Pension Benefits	\$ 3,888,690	\$ 6,560,947	
Retirement Benefits as a Percentage of Contributions	137.1%	139.4%	
Retirement Benefits as a Percentage of Contributions and Investment Income	53.9%	40.1%	
<b>Net Position Held in Trust for Benefits at Fiscal Year-End:</b>			
Virginia Retirement System (VRS)	\$ 74,084,142	\$ 70,342,933	5.32%
State Police Officers' Retirement System (SPORS)	\$ 836,702	\$ 796,073	5.10%
Virginia Law Officers' Retirement System (VaLORS)	\$ 1,423,980	\$ 1,345,887	5.80%
Judicial Retirement System (JRS)	\$ 544,158	\$ 515,399	5.58%
<b>Investment Performance:</b>			
One-Year Return on Investments	7.5%	12.1%	
Three-Year Return on Investments	7.1%	6.2%	
Five-Year Return on Investments	8.3%	9.1%	
<b>Participating Employers:</b>			
Counties/Cities/Towns	255	254	
Special Authorities	205	206	
School Boards*	145	145	
State Agencies	230	227	
Total Employers	835	832	0.4%
<b>Members/Retirees:</b>			
Active Members	343,005	341,200	0.5%
Retired Members	206,776	199,388	3.7%

\* 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, 2018

## 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

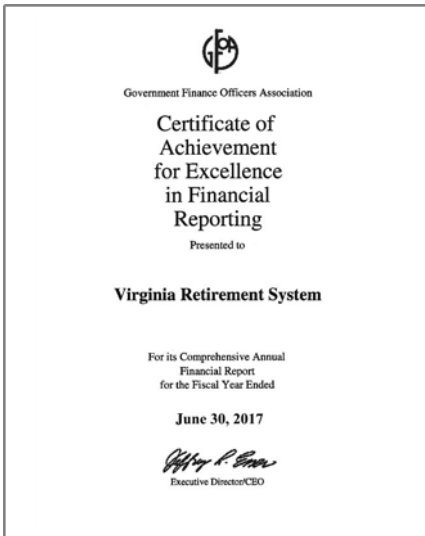
Confidentiality is exercising discretion and performing our ethical duty to protect the personal information of our members, retirees, beneficiaries and employers. We safeguard personal data and sensitive VRS information that is viewed, acquired or otherwise accessible during the course of VRS employment.

### 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.

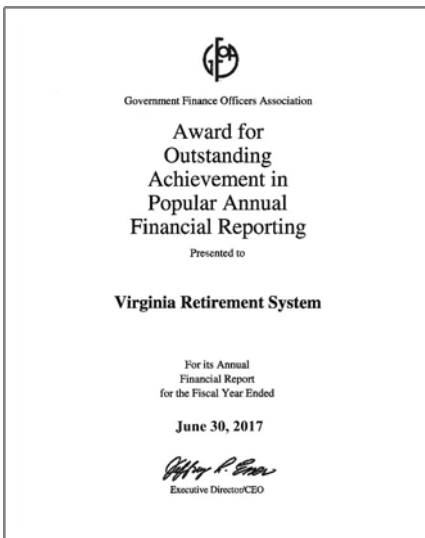


**Certificate of Achievement for Excellence in Financial Reporting, Comprehensive Annual Financial Report (CAFR)**

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, 2017. This was the 36th 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 2018 continues to conform to the Certificate of Achievement Program requirements and will be submitted to GFOA to determine its eligibility for another certificate.

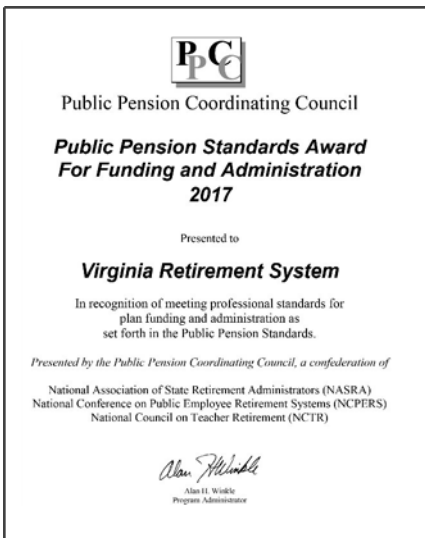


**Certificate of Achievement for Excellence in Financial Reporting, Popular Annual Financial Report (PAFR)**

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, 2017. This was the second 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 2018 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 2017 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 agency’s 14th 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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# VRS SERVES

with  
**a team  
dedicated  
to excellence**



At VRS, superior customer service means meeting people where they are in their careers to provide the right resources to help them plan for their future. Our vision to be the trusted leader in the delivery of benefits and services guides our actions, and serves as the foundation for our customer interactions. We value the diversity and inclusion of our workplace and those we serve, which is based on mutual respect and understanding. With teamwork as an agency core value, VRS employees work collaboratively to serve those who serve others.

## 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 14, 2018

### **The Honorable Ralph S. Northam, 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 2018. This year, VRS achieved a 7.5% net return on its investment portfolio, exceeding the 7.0% assumed rate of return, allowing the VRS managed portfolio to end the year with a historic year-end high of \$80.4 billion.

As of June 30, 2018, the private equity program returned 15.8%; the public equity program returned 9.7%; the real assets program returned 9.5%; the credit strategies program returned 5.2%; the strategic opportunities portfolio returned 7.0%; and the fixed income program returned -0.1%. The portfolio included \$31.4 billion in public equity, \$12.4 billion in credit strategies, \$12.1 billion in fixed income, \$10.6 billion in real assets, \$7.9 billion in private equity and \$1.9 billion in the strategic opportunities portfolio.

The VRS investment team's expertise provides substantial added value and fee savings for members, retirees and beneficiaries. Approximately 33% of the fund is managed in-house and 67% is managed externally under VRS supervision. By managing strategies in-house, VRS saves approximately \$45 million in external management fees each year. CEM Benchmarking, an independent firm specializing in pension fund benchmarking, continues to report that VRS is a low-cost, value-added system. In addition, nearly two-thirds of all benefits are derived from investment income, with the remaining third supplied by contributions.

Your approval of full funding of contribution rates for the statewide retirement plans and other post-employment benefit plans (OPEBs) has had a positive impact. Accelerated full funding of the Board-certified rates began in fiscal year 2017 for the state employee, state police officer, Virginia law enforcement officer and judicial plans. Your support provided additional funding to move to 100% of the Board-certified rates in 2018 for the teacher plan. This acceleration was two years ahead of the schedule enacted into law during the 2012 legislative session for the state plans, and one year ahead of schedule for the teacher plan. This action is estimated to reduce future contributions by \$232 million over the next 20 years.

Likewise, the commonwealth has addressed plan costs and liabilities by implementing plan design changes, including the introduction of the Hybrid

Retirement Plan in 2014. These initiatives have reduced the normal cost of the plans to employers and also introduced risk sharing with employees. As the hybrid plan becomes the dominant VRS plan, savings from these plan changes will be fully realized.

All of these actions 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 reduction in future benefit costs that will be realized as more participants enter the Hybrid Retirement Plan, now in its fifth year. These efforts, along with an improvement in the economy, have resulted in the aggregate funded status for all VRS retirement plans increasing to 76.8%, an improvement of nearly 11.5% over the last five years. For the most part, rates have stabilized for the state and teacher plans, keeping costs relatively level. In addition, OPEB funding now receives 100% of the actuarially determined contribution.

At the same time, VRS has worked with the plan record-keeper for the defined contribution plans, ICMA-RC, to introduce several new initiatives and communications aimed at increasing voluntary contributions by hybrid plan members. These initiatives are in addition to the plan's legislatively authorized auto-escalation feature that occurs every three years:

- A new webpage now appears for hybrid plan members as they log into their defined contributions accounts, presenting them with a choice to be proactive and save more for retirement.
- The online paycheck calculator helps members visualize the impact of voluntary contributions and other deductions on their paycheck, with guidance on taking their next steps to save more.
- SmartStep, a new savings feature, allows hybrid plan members to choose automatic annual increases in their voluntary contributions.
- Newly hired hybrid plan members can now preset their voluntary contributions during orientation, when they are most likely to take action.
- VRS promoted all hybrid savings tools widely through newsletters, statement messages and emails to members and their employers.

As of fiscal year-end, 57% of active hybrid plan members are making voluntary contributions. Among the population that is making voluntary contributions, 24% proactively elected to do so.

Just as we have moved forward in pension reform, VRS has continued its modernization journey with a focus on developing and testing systems that support the foundation of retirement and disbursement processing. This year, we finalized the designs for all retirement and disbursement processing and began extensive testing of core system functionality. Our work continues as we develop and deliver new features to reach our ultimate goal of providing a high level of account self-service for members and retirees.

VRS also added two important features to our secure online myVRS system: a financial wellness program for members and online plan election for members of the VRS-administered Optional Retirement Plan for Political Appointees (ORPPA) and Optional Retirement Plan for Higher Education (ORPHE). The online plan

election calculator received national recognition as an outstanding resource for users.

In addition, our employer website was redesigned during the year with a responsive design and intuitive approach to help employers easily find and use available resources, such as those related to implementation of Governmental Accounting Standards Board (GASB) Statements. Most VRS employers were required to implement provisions of GASB 75, related to OPEBs, as part of financial reporting for the fiscal year ending June 30, 2018.

VRS' executive team this year concentrated on improving the structure for selecting and reporting on Agency Performance Outcomes (APOs) and Agency Operating Standards, and delivered a new methodology for Enterprise Performance Management to the Board. The improved tracking and reporting structure is also foundational for the success of the agency's strategic plan and its Enterprise Risk Management program.

CEM Benchmarking also continues to report that compared to our peers, VRS delivers a high level of service at a relatively low cost. To illustrate, in fiscal year 2017, the most recent year for which data is available, VRS' cost per member was \$74 compared to the 2017 peer group median of \$98.

VRS focuses not only on quality service, but also delivers services efficiently. As evidence of VRS' commitment to service, VRS and its staff were recognized with five awards during the year. VRS' Optional Retirement Plan Online Election Project in myVRS received the Leadership Recognition Award in the Plan Design and Administration category from the National Association of Government Defined Contribution Administrators (NAGDCA).

The National Association of Investment Companies (NAIC) presented VRS with its Pacesetter Award, in recognition of VRS' deliberate and concerted efforts over a nine-year period to increase capital placed with high performing-diverse managers. This resulted in an increase in capital with diverse managers from less than \$100 million to greater than \$4 billion over that period.

For the 36th 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, 2017. VRS also received a Certificate of Achievement from GFOA for its second *Popular Annual Financial Report* (PAFR), a concise summary of our organization, services, financial results and investments, all of which were reported in more detail in the 2017 CAFR.

VRS also received a 2017 Public Pension Standards Award for Funding and Administration from the Public Pension Coordinating Council (PPCC). This is the 14th award VRS has received from PPCC.

One of VRS' greatest strengths is its people, who bring their own unique backgrounds and experiences to our workplace, strengthening our solutions and broadening our outlook. To deepen our understanding of one another and appreciation for diversity, VRS held several cultural appreciation events this past

year that collectively drew more than 600 staff participants for education and activities. Our New Employee Advisory Program fostered a welcoming, inclusive workplace by pairing new hires with veteran VRS employees as mentors.

Teamwork at VRS extends beyond agency projects. This past year individuals, and entire departments working together, gave back to the community by supporting the Combined Virginia Campaign, which benefits charitable organizations across Virginia; volunteering at food banks, schools and Habitat for Humanity; donating blood on-site through Virginia Blood Services; purchasing and assembling care packages for VCU cancer patients and their families; and gathering school supplies for the Bright Beginnings back-to-school backpack program.

In addition to our staff, dedicated to providing excellent service, we have more than 800 participating employers who help us carry out our work across Virginia 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 collaboration with us and their dedication to serving those who serve others.

In closing, on behalf of the Board of Trustees and the VRS staff, I thank you for your dedication, leadership and service to VRS members, retirees and beneficiaries. This year, VRS paid \$4.8 billion to retirees, 86% of whom live in the commonwealth. As we move forward, your continued efforts to fund 100% of actuarially determined contributions will ensure the health of the plan. Together, we will work to make certain that all those served by the Virginia Retirement System 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)



**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)



**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



**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



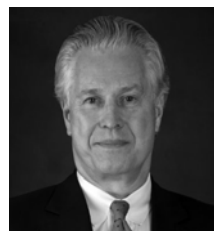
**W. Brett Hayes**  
Wells Fargo Advisors Financial Network  
Investment Professional  
Appointed by Joint Rules Committee  
*Term Expires: 2/28/2018*  
*Committee Assignments:* Defined Contribution Plans Advisory (Chairman), Investment Policy



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



**O'Kelly E. McWilliams III**  
Mintz Levin  
Employee Benefit Plans Professional  
Appointed by Governor  
*Term Expires: 2/28/2022*  
*Committee Assignments:* Benefits & Actuarial, 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



**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

# VRS Organization

## BOARD OF TRUSTEES



**Patricia S. Bishop**  
Director



**Ronald D. Schmitz**  
Chief Investment Officer



**Jennifer P. Schreck**  
Internal Audit Director

### INVESTMENT ADVISORY COMMITTEE

**Lawrence E. Kochard, Ph.D., Chairman**  
Chief Investment Officer, Makena Capital Management  
*Term Expires: 2/16/2019*  
*As Chairman: 5/31/2019*

**Hance West, Vice Chairman**  
Chief Investment Officer and Managing Director  
Investure  
*Term Expires: 12/31/2019*

**Deborah Allen Hewitt, Ph.D.**  
Clinical Professor, The College of William and Mary  
*Term Expires: 10/16/2020*

**Michael Beasley**  
Retired Chairman Emeritus, Strategic Investment Solutions Inc.  
*Term Expires: 6/20/2020*

**Théodore Economou**  
Chief Investment Officer, Multi-Asset  
Lombard Odier Asset Management, (Switzerland) SA  
*Term Expires: 9/13/2020*

**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: 3/31/2020*

**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*

**Allan M. Carmody**  
Director of Finance, Chesterfield County  
*Term Expires: 6/20/2020*

**Ravindra Deo**  
Executive Director, Federal Retirement Thrift Investment Board  
*Term Expires: 6/20/2020*

**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: 6/20/2020*

**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

**Michelle Christian**

Genworth Financial

LEGAL COUNSEL

**Office of the Attorney General**

Commonwealth of Virginia

LIFE INSURANCE CARRIER

**Joseph K.W. Chang**

Securian Financial

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: 1-888-827-3847 • TDD: 804-289-5919

December 18, 2018

### **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, 2018. 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 2018 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 2018 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).

### VRS Milestones (1908-1999)

- 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.
- 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.

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, 2018, 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 focuses on 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 67/68 guidance documents.

### VRS Milestones (2002-Present)

**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 as well as political appointees compare and contrast retirement plan options and make their plan election online.

myVRS adds a financial wellness program for members.

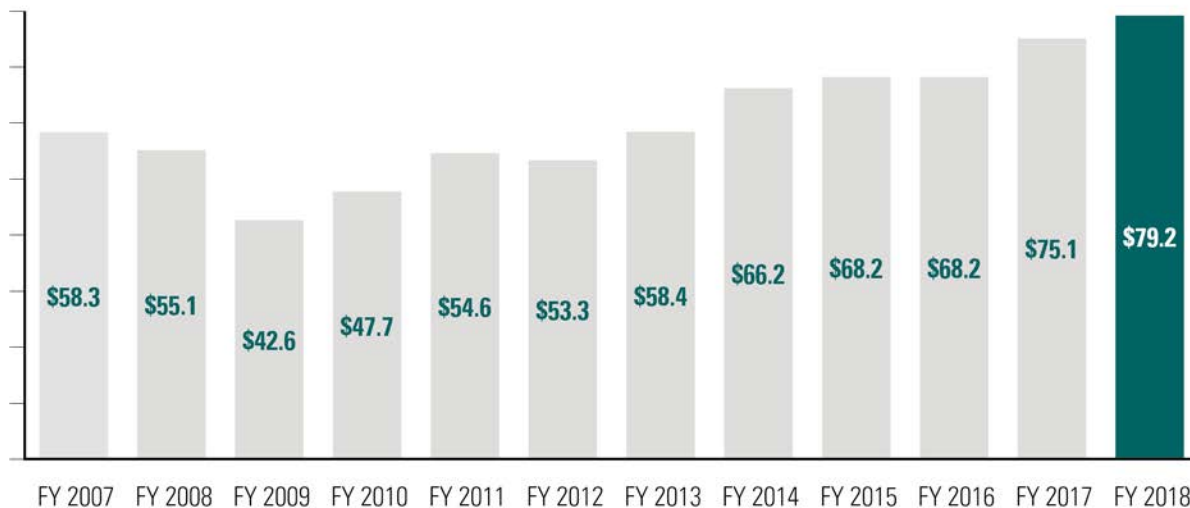
For other post-employment benefits (OPEB's), GASB Statement Number 74 focuses on financial reporting for state and local plan administrators and is also addressed in the Financial Section. GASB Statement Number 75 establishes new accounting and financial reporting requirements for state and local governments that provide their employers with OPEB benefits and prepare annual financial statements. To assist employers in meeting the GASB 75 standard, VRS developed additional OPEB-specific resources for employers and added those resources to the VRS website. Those online resources included GASB 75 audit opinions and disclosure guidance, contribution rates, valuation reports and GASB 74/75 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.

### 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, 2018, 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, 2018. The total pension liability was determined based on the actuarial valuation as of June 30, 2017, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2018.

Based on these calculations, the Plan Fiduciary Net Position as a percentage of the Total Pension Liability was 77.39% for the VRS State Plan, 74.81% for the VRS Teacher Plan and 90.24% 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 78.16%, 69.56% and 82.78%, 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, 2017, measurement date values of 75.33%, 72.92% and 89.27%, respectively. For SPORS, VaLORS and JRS, there was also an increase from their values of 76.00%, 67.22% and 79.34% 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, 2018. Further information on this valuation is included in the Financial Section and the Actuarial Section. Contributions for fiscal year 2018 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 2018. However, the Governor and General Assembly accelerated the funding rate for the state, teacher, SPORS, VaLORS and JRS plans to 100% of the Board-certified rates. 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, 2018. The total OPEB liability was determined based on the actuarial valuation as of June 30, 2017, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2018.

Based on these calculations, the plan fiduciary net position as a percentage of the total OPEB liability was 51.22% for the Group Life Insurance Fund, 9.51% for the state employee Health Insurance Credit, 8.08% for the teacher employee Health Insurance Credit, 57.39% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 11.06% for the state-

funded Health Insurance Credit for constitutional officers, 9.27% for the state-funded Health Insurance Credit for social services employees, and 10.41% 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 194.74% for the

**36 Years of Excellence in Financial Reporting.** The VRS *Comprehensive Annual Financial Report* for fiscal year 2017 marked the 36th year of recognition from the Government Finance Officers Association of the United States and Canada (GFOA) for excellence in financial reporting.

Disability Insurance Program and 0.60% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions were 46.05% and 51.22%, respectively.

This compares to the opening plan fiduciary net position as a percentage of the total OPEB liability at June 30, 2017, of 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 and 1.30% for the Line of Duty Act Program. The Virginia Local Disability Program plans for teachers and political subdivisions were 31.96% and 38.40%, respectively. Further information on this valuation is included in the Financial Section and the Actuarial Section.

Contributions for fiscal year 2018 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, 2018, the total value of the VRS managed investment portfolio was \$80.4 billion, an increase from the investment balance of \$76.6 billion at June 30, 2017. The increase was due to increased contribution and investment activity. The Fixed Income, Credit Strategies and Real Assets portfolio returns all exceeded their benchmarks this year.

The System's net position restricted for benefits at June 30, 2018, totaled \$79.2 billion, representing an increase from the net position of \$75.1 billion as of June 30, 2017.

Information regarding the investment professionals who provide services for the VRS Investment Pool for the pension and OPEB plans can be found on pages 144 and 145 in the Investment Section. The schedule of commissions and investment manager expenses is located on page 146 of that section.

Additional information on the System's investment policies and strategies as well as the portfolio's composition and investment return information is included in the Investment Section.

## Legislative Initiatives

During the 2018 session, the Virginia General Assembly enacted the following bills that affect the Virginia Retirement System and retirees covered under VRS.

### 2018 BILLS

**HOUSE BILL 846 and SENATE BILL 248: VRS ADMINISTRATION.** This bill makes clarifications to Title 51.1 of the *Code of Virginia* pertaining to Pensions, Benefits and, Retirement. The legislation clarifies:

- That medical boards may be composed of not only physicians but also “other health care professionals.”
  - Medical boards make determinations on disability retirement applications as well as Line of Duty Act benefits.
- That only “full-time” federal civilian service is eligible to be purchased as credit in VRS retirement plans.

- All other similar categories of service eligible for purchase already specify that such service must be full-time. The only part-time prior service eligible for purchase is with a VRS-participating employer.
- That the Board shall maintain and administer long-term care coverage or “similar benefit program” for any state employee working an average of at least 20 hours per week, and for any other person who has five or more years of creditable service with any retirement plan administered by VRS.
  - With the addition of “similar benefit,” the legislation adds flexibility to the VRS long-term care coverage program in light of the changing environment in the group long-term care market.

**HOUSE BILL 1599: DEFINITIONS OF LAW ENFORCEMENT OFFICER.** This bill adds members of the investigations unit designated by the State Inspector General to investigate allegations of criminal behavior affecting the operations of a state or non-state agency, and employees of the Department of Corrections or the Department of Juvenile Justice with internal investigations authority to the definition of law-enforcement officer. Such members and employees would not be eligible for Line of Duty Act benefits.

**BUDGET BILL:** The 2019-20 budget funds 100% of the VRS-certified employer and OPEB contribution rates.

**MEMBER AND RETIREE HIGHLIGHTS.** The total VRS membership increased from 687,818 members, retirees and beneficiaries in fiscal year 2017 to 706,045 in fiscal year 2018, representing an increase of 2.65%.

The following are highlights from the fiscal year:

- The number of active VRS members increased 0.53%, from 341,200 to 343,005.
- The number of retirees and beneficiaries increased 3.70% from 199,388 to 206,776.
- VRS paid \$4,752.9 million during fiscal year 2018, compared to \$4,519.0 million in retirement benefits in fiscal year 2017.
- The number of inactive and deferred members increased 6.14% from 147,230 to 156,264.
- A total of 79,396 members held accounts through the Commonwealth of Virginia Deferred Compensation Plan at the end of the fiscal year. Of these participants, 70,880 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 2018 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 7% for fiscal year 2018.	The averaged abandoned call rate was 6.05%.
<b>Service Retirements</b>	Service retirement applications are processed in an average of 30 days with a 95% accuracy rate.	Service retirement applications were processed in an average of 25 days with a 99.97% accuracy rate.
<b>Disability Retirements</b>	98% of disability retirement applications are processed within 30 days of approval by the VRS Medical Board.	99.77% of disability retirement applications were processed within 13 days of approval by the VRS Medical Board.
<b>Refunds</b>	98% of refunds of member contributions are processed within 5.0 days in fiscal year 2018.	98.14% of refunds were processed within 1.19 days in fiscal year 2018.
<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).	100% 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 99.96% 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 4,436 members and retirees, responded to 7,481 emails and conducted 310 retirement education and group counseling sessions, special presentations, videoconferences, webinars and benefit fairs, reaching 23,568 members around the state.
- The Hybrid Counseling Team held 80 sessions and webinars, attended by 712 Hybrid Retirement Plan members; the team responded to 717 myVRS online assistance and 212 hybrid-related emails during fiscal year 2018.
- Both teams participated in the 2018 ICMA-RC Realize Retirement tour at 15 locations, attended by 1,058 Virginia Defined Contribution Plan and Hybrid Retirement Plan participants throughout the state.
- In fiscal year 2018, 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 56 employer site visits and 55 roundtables, with 930 participants (representing 472 employers) in attendance.
- In addition, the Employer Representatives assisted two state agencies and one political subdivision joining VRS; two employers electing the Group Life Insurance Program; five employers electing the enhanced benefit for hazardous duty employees; one employer electing the enhanced retirement multiplier for hazardous duty employees; seven employers electing the health insurance credit; eight

employers electing to offer the Commonwealth of Virginia Deferred Compensation Plan; one employer electing to offer the Virginia Cash Match Plan; two employers electing to offer tax-deferred purchase of prior service; and one employer electing to offer the employer-sponsored hybrid 403(b) option.

- During fiscal year 2018, there were approximately 3.4 million total page views of the VRS website at [www.varetire.org](http://www.varetire.org), reflecting a 142.9% increase over the 1,337,966 total page views in fiscal year 2017. myVRS, the secure online system, led again as one of the top destinations.
- The average “open rate” for Employer Update was 26.5%, well above the government industry average.
- At the end of fiscal year 2018, Member News had 221,333 subscribers, with an “open rate” of 30.1%.

## Innovations

VRS continued its Modernization journey in fiscal year 2018 with a focus on developing and testing the foundation of retirement and disbursement processing in myVRS Navigator.

The Information Technology (IT) team finalized the designs for all retirement and disbursement processing functionality. At year-end, 90% of core system functionality for retirement processing and disbursements was in user testing.

As an important risk-mitigation strategy, the team executed mock productions to model the current disbursement process on the new system. The mock production runs began six months earlier than originally planned and with an expanded scope, resulting in a number of positive outcomes.

In addition, the IT team had two important releases within myVRS during the year:

**ORPPA and ORPHE Online Plan Election in myVRS:** Launched in December 2017, the secure online plan-election feature was designed for newly hired political appointees of Commonwealth of Virginia state agencies offering the defined contribution Optional Retirement Plan for Political Appointees (ORPPA) and faculty employees of institutions of higher education offering the defined contribution Optional Retirement Plan for Higher Education (ORPHE). The feature provides newly hired employees with online tools and resources, including a plan comparison calculator, to assist in making an informed decision about their retirement plan options.

**myVRS Financial Wellness:** Recognizing that many VRS members lack access to training in personal finance and retirement readiness, VRS saw an opportunity to integrate financial wellness content with the retirement planning tools within myVRS. The IT team partnered with the Customer Relations and Public Relations departments and third-party provider iGrad to release myVRS Financial Wellness in December 2017. The IT team worked closely with iGrad to ensure secure and seamless transfer of information between myVRS and the Enrich platform. When logged into myVRS, VRS members have access to personalized content, including mini-courses with action plans, budget worksheets and recommended content based on their interests and goals.

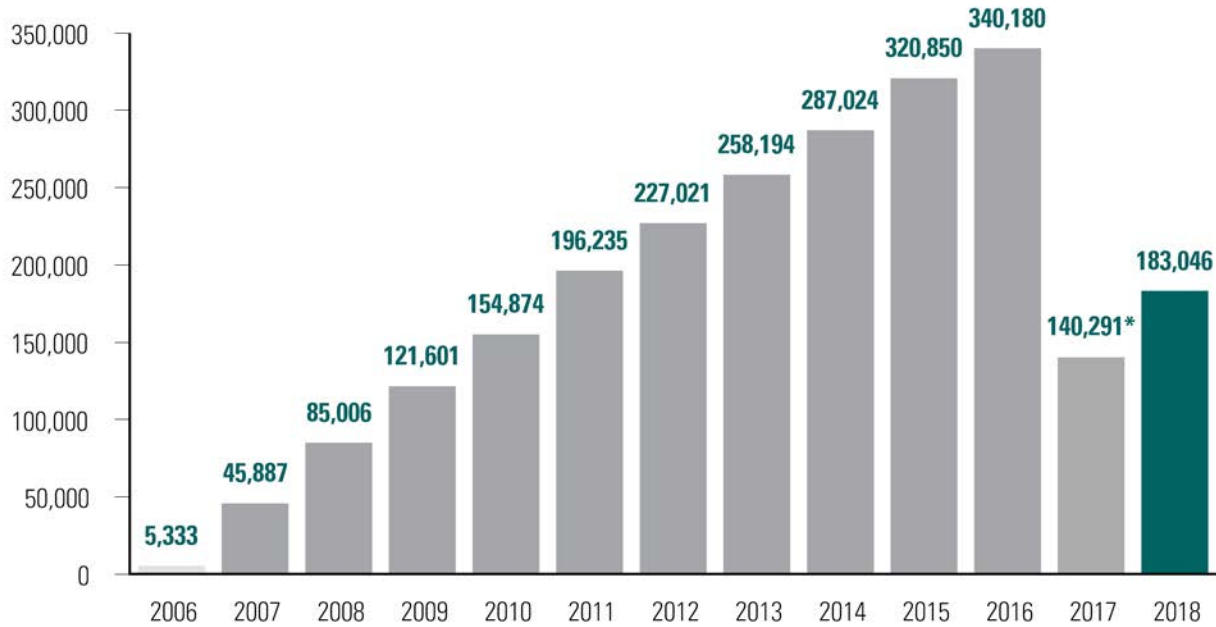
myVRS continues to attract users. During the fiscal year, the secure online myVRS system continued to serve as a valuable resource for members, retirees and employers:

- The total number of registered users as of June 30, 2018, was 183,046.
- Members put myVRS planning tools to good use during the fiscal year, creating 313,984 estimates through the myVRS Benefit Estimator and 50,499 retirement plans through the myVRS Retirement Planner.



- In fiscal year 2018, there were 24,390 retiree registrations. Retirees completed more than 5,482 income tax transactions through the myVRS retiree tax tool during the fiscal year.
- As of June 30, 2018, more than 3,629 participating employer contacts were authorized to access member information. During the fiscal year, employers created 57,952 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 its focus on providing efficient service and delivery of benefits while being a responsible steward of the funds in our care on behalf of our members, retirees and beneficiaries. These duties remain integral to our mission in an era when retirement plans are undergoing transformation.

Over the last several years, VRS has implemented a series of pension-reform initiatives. The Hybrid Retirement Plan introduced defined contribution accounts to accompany the defined benefit component provided by VRS. The hybrid plan also provides opportunities for its 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 appreciates the staunch commitment of the Governor and General Assembly to increase contributions to the plans at a more rapid pace than anticipated.

This multifaceted approach to pension reform has advanced the overall funded status of the plan, positioning VRS to serve its members for years to come. Progress has been achieved with the resourcefulness and tenacity of the VRS staff, the support of VRS' participating employers and business partners and the leadership and diligence of the Board of Trustees. We express our sincere thanks to each of these dedicated individuals and representatives.

Finally, we wish to thank Governor Ralph S. Northam and the members of the Virginia General Assembly for their continuing 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



# VRS MANAGES

with  
**the future  
in mind**



We are stewards for both the funds in our care and the people whom we serve. Prioritizing responsible financial management and prudent use of resources allows VRS to embrace continuous improvement, such as exploring technology solutions. And we respond to meet the varied needs of our employers, members, retirees and beneficiaries with education, counseling and communications to guide them in planning for tomorrow, today.

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Martha S. Mavredes, CPA  
Auditor of Public Accounts

# Commonwealth of Virginia

*Auditor of Public Accounts*

P.O. Box 1295  
Richmond, Virginia 23218

December 14, 2018

The Honorable Ralph S. Northam  
Governor of Virginia

The Honorable Thomas K. Norment, Jr.  
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, 2018, 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, 2018, 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, 2018, 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.

### *Other Matters*

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

We have previously audited the System's 2017 financial statements, and we expressed an unmodified audit opinion on the respective financial statements in our report dated December 15, 2017. In our opinion, the summarized comparative information presented herein as of and for the year ended June 30, 2017, 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, and Schedule of Employer Contributions for other post-employment benefit plans on pages 113 through 127 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 Investment Expenses, Administrative Expenses, and Professional and Consulting Services, 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 Investment Expenses, Administrative Expenses, and Professional and Consulting Services 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 14, 2018, 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



The Virginia Retirement System (the System) administers pension and other employee benefit plans for approximately 706,045 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.

## 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, 2018. 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 \$79.2 billion at June 30, 2018, representing an increase of \$4.1 billion, or 5.5%, from the net position as of June 30, 2017. The increase was due to higher contribution levels 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, 2018, was 7.5% compared to a return of 12.1% for the fiscal year ending June 30, 2017. The decrease was due primarily to the 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, 2017, data, rolled forward to June 30, 2018, the plan fiduciary net position as a percentage of the total pension liability was 77.39% for the VRS state plan, 74.81% for the VRS teacher plan, 90.24% for the aggregate total of the VRS political subdivision plans, 78.16% for SPORS, 69.56% for VaLORS and

82.78% for JRS. This compares to the June 30, 2016, data, rolled forward to June 30, 2017, when 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.

- 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, 2017, data, rolled forward to June 30, 2018, the plan fiduciary net position as a percentage of the total OPEB liability was 51.22% for the Group Life Insurance Fund, 9.51% for the state employee Health Insurance Credit, 8.08% for the teacher employee Health Insurance Credit, 57.39% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 11.06% for the state-funded Health Insurance Credit for constitutional officers, 9.27% for the state-funded Health Insurance Credit for social services employees, and 10.41% 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 194.74% for the Disability Insurance Program and 0.60% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions were 46.05% and 51.22%, respectively.
- This compares to the June 30, 2016, data, rolled forward to June 30, 2017, when 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 and 1.30% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions were 31.96% and 38.40%, respectively.

## Overview of the Financial Statements and Accompanying Information

The pension components of the fiscal year 2018 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 2018 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*, as modified by GASB Statement No. 85, *Omnibus 2017*.

**BASIC FINANCIAL STATEMENTS.** The System presents the Basic Financial Statements for the year ended June 30, 2018, 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)

	2018	Increase (Decrease)	2017	Increase (Decrease)	2016
<b>Assets:</b>					
Cash, Receivables and Capital Assets	\$ 2,026.2	\$ 72.5	\$ 1,953.7	\$ (314.7)	\$ 2,268.4
Investments	80,763.2	3,965.5	76,797.7	7,871.1	68,926.6
Security Lending Collateral	4,500.3	(296.6)	4,796.9	(226.1)	5,023.0
<b>Total Assets</b>	<b>87,289.7</b>	<b>3,741.4</b>	<b>83,548.3</b>	<b>7,330.3</b>	<b>76,218.0</b>
<b>Liabilities:</b>					
Accounts Payable	310.0	(42.4)	352.4	(499.1)	851.5
Investment Purchases Payable	3,294.0	(19.4)	3,313.4	1,217.9	2,095.5
Obligations Under Securities Lending	4,500.3	(296.6)	4,796.9	(226.1)	5,023.0
<b>Total Liabilities</b>	<b>\$ 8,104.3</b>	<b>\$ (358.4)</b>	<b>\$ 8,462.7</b>	<b>\$ 492.7</b>	<b>\$ 7,970.0</b>
<b>Total Net Position – Restricted for Benefits</b>	<b>\$ 79,185.4</b>	<b>\$ 4,099.8</b>	<b>\$ 75,085.6</b>	<b>\$ 6,837.6</b>	<b>\$ 68,248.0</b>

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

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2018	Increase (Decrease)	2017	Increase (Decrease)	2016
<b>Additions:</b>					
Member Contributions	\$ 1,088.5	\$ 25.8	\$ 1,062.7	\$ 66.9	\$ 995.8
Employer Contributions	2,849.7	225.2	2,624.5	(157.6)	2,782.1
Net Investment Income	5,510.4	(2,730.9)	8,241.3	7,071.5	1,169.8
Miscellaneous Revenue & Transfers	3.6	(0.1)	3.7	1.2	2.5
<b>Total Additions</b>	<b>9,452.2</b>	<b>(2,480)</b>	<b>11,932.2</b>	<b>6,982.0</b>	<b>4,950.2</b>
<b>Deductions:</b>					
Retirement Benefits	4,752.9	233.9	4,518.9	161.9	4,357.0
Refunds of Member Contributions	123.0	3.3	119.7	15.1	104.6
Insurance Premiums and Claims	200.3	16.2	184.1	10.3	173.8
Retiree Health Insurance Credit Reimbursements	163.9	5.0	159.0	5.1	153.9
Disability Insurance Benefits	39.8	0.9	38.9	(0.4)	39.3
Line of Duty Act Reimbursements	12.4	2.1	10.3	1.8	8.5
Administrative and Other Expenses	60.1	(3.6)	63.7	16.5	47.2
<b>Total Deductions</b>	<b>5,352.4</b>	<b>257.8</b>	<b>5,094.6</b>	<b>210.3</b>	<b>4,884.3</b>
<b>Net Increase (Decrease) in Net Position</b>	<b>4,099.8</b>	<b>(2,737.8)</b>	<b>6,837.6</b>	<b>6,771.7</b>	<b>65.9</b>
Net Position – Beginning of Year	75,085.6	6,837.6	68,248.0	65.9	68,182.1
<b>Net Position – End of Year</b>	<b>\$ 79,185.4</b>	<b>\$ 4,099.8</b>	<b>\$ 75,085.6</b>	<b>\$ 6,837.6</b>	<b>\$ 68,248.0</b>

## SYSTEM NET ASSETS

AT JUNE 30

(EXPRESSED IN BILLIONS)



## 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 343,005 active members were employed with 835 VRS-participating employers as of June 30, 2018. The number of retirees and other annuitants totaled approximately 206,776 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

	2018		2017		2016	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
State Employees (VRS)	77,337	22.6%	77,617	22.7%	77,651	22.7%
Teachers (VRS)	146,795	42.8%	146,090	42.9%	146,854	43.0%
Political Subdivision Employees (VRS)	107,827	31.4%	106,524	31.2%	105,654	30.9%
State Police Officers (SPORS)	1,887	0.6%	1,877	0.6%	1,947	0.6%
Virginia Law Officers (VaLORS)	8,742	2.5%	8,673	2.5%	9,147	2.7%
Judges (JRS)	417	0.1%	419	0.1%	418	0.1%
<b>Total Members</b>	<b>343,005</b>	<b>100.0%</b>	<b>341,200</b>	<b>100.0%</b>	<b>341,671</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

	2018		2017		2016	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
State Employees (VRS)	56,980	27.6%	55,427	27.7%	54,034	28.1%
Teachers (VRS)	89,667	43.4%	86,652	43.4%	83,738	43.5%
Political Subdivision Employees (VRS)	53,579	25.9%	51,147	25.7%	48,827	25.4%
State Police Officers (SPORS)	1,336	0.6%	1,300	0.7%	1,242	0.6%
Virginia Law Officers (VaLORS)	4,702	2.3%	4,355	2.2%	4,066	2.1%
Judges (JRS)	512	0.2%	507	0.3%	504	0.3%
<b>Total Retirees and Beneficiaries</b>	<b>206,776</b>	<b>100.0%</b>	<b>199,388</b>	<b>100.0%</b>	<b>192,411</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

	2018	2017	2016
Cities and Towns	162	161	161
Counties	93	93	93
School Boards*	145	145	145
Special Authorities	205	206	202
State Agencies	230	227	226
<b>Total Employers</b>	<b>835</b>	<b>832</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, 2018, amounted to \$8,820.0. This was a decrease of \$2,439.0 million when compared with the activity for fiscal year 2017. However, it was also greater than the contributions and investments earnings of \$4,513.7 million recorded in fiscal year 2016.

For fiscal year 2018, member contributions increased by \$21.4 million. The member contribution level increase reflects growth in the covered payroll.

For fiscal year 2018, employer contributions increased by \$202.1 million, due primarily to an increase in the teacher contribution rate from 14.66% to the full actuarially determined level of 16.32% and an increase in the covered payroll for

the state, teacher and political subdivision employer groups. The total of all contributions represented an increase of \$223.5 million from fiscal year 2017. Employer contributions for pensions are discussed further in Notes 2 and 12.

During fiscal year 2017, the System experienced an increase in total member contributions of \$48.8 million and a decrease in employer contributions of \$181.4 million. This decrease reflects the absence of the special contributions for the state employee groups received in 2016, a reduction in the actuarial rates being contributed for state employee and many political subdivision employer groups, offset by a slight increase in the covered payroll for most employer 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)

	2018	Increase (Decrease)	2017	Increase (Decrease)	2016
Member Contributions	\$ 938.1	\$ 21.4	\$ 916.7	\$ 48.8	\$ 867.9
Employer Contributions	2,527.8	202.1	2,325.7	(181.4)	2,507.1
Net Investment Income	5,353.0	(2,661.8)	8,014.8	6,877.9	1,136.9
Miscellaneous Revenue and Transfers	1.1	(0.7)	1.8	—	1.8
<b>Total Contributions, Investment Earnings and Miscellaneous Revenues</b>	<b>\$ 8,820.0</b>	<b>\$ (2,439.0)</b>	<b>\$ 11,259.0</b>	<b>\$ 6,745.3</b>	<b>\$ 4,513.7</b>

As shown in Figure 2.6, net investment income for fiscal year 2018 of \$5,353.0 million represented a decrease of \$2,661.8 million from fiscal year 2017. This compares with the net investment income increase of \$6,877.9 million in fiscal year 2017. Total pension trust fund investments were \$78,380.5 million at fair value at June 30, 2018. This was an increase of \$3,762.8 million from the fair value of \$74,617.7 million at June 30, 2017. The total pension trust fund investments also increased in fiscal year 2017 by \$7,552.2 million from their fair value of \$67,065.5 million at June 30, 2016. The total return on pension trust fund investments for the year ended June 30, 2018, was 7.5%. This represents an annualized return of 7.1% over the past three years and 8.3% 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 2018 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 2018 totaled \$4,931.4 million, an increase of \$233.4 million, or 5.0%, over the 2017 period.

Benefit payments were \$4,752.9 million in fiscal year 2018. This is an increase of \$234.0 million compared to an increase of \$161.9 million in fiscal year 2017. The increase in fiscal year 2018 was due to continued growth in the number of retirees and beneficiaries receiving benefits. The fiscal year 2018 benefit payments also reflect a 1.26% cost-of-living adjustment (COLA) effective July 1, 2017, for Plan 1 retirees and Plan 2 retirees.

Refunds of contributions to members who terminated employment during fiscal year 2018 amounted to \$123.0 million (11,781 refunds), compared with \$119.7 million refunded (12,460 refunds) during fiscal year 2017 and \$104.6 million refunded (12,288 refunds) during fiscal year 2016.

The change during fiscal year 2018 reflects a slight decrease in the volume of refunds but an increase in the average refund amount compared to fiscal year 2017.

Administrative and other expenses for fiscal year 2018 were \$55.5 million, compared with \$59.4 million for fiscal year 2017 and \$43.9 million for fiscal year 2016.

Administrative and other expenses decreased by \$3.9 million for fiscal year 2018. This compares to an increase in fiscal year 2017 of \$15.5 million. The slight decrease for fiscal year 2018 reflects a decrease in administrative expenses combined with a decrease in the other expenses categories. These include software development costs that were capitalized in fiscal year 2018, a decrease in furniture and equipment related to the renovations of the VRS office, and slight decreases in some of the other administrative expense categories. These decreases in administrative expenses were partially offset by increases in personal services costs, increases in data processing costs, additional depreciation of the capitalized software created as part of Modernization and pension reform. Other expenses decreased because of smaller 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.

## FIGURE 2.7: SUMMARY OF PENSION PLAN PRIMARY EXPENSES

FOR THE YEARS ENDED JUNE 30

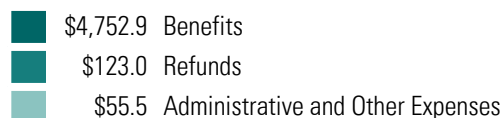
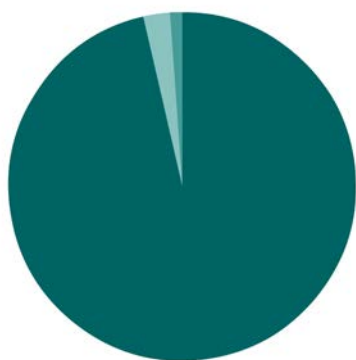
(EXPRESSED IN MILLIONS)

	2018	Increase (Decrease)	2017	Increase (Decrease)	2016
Benefits	\$ 4,752.9	\$ 234.0	\$ 4,518.9	\$ 161.9	\$ 4,357.0
Refunds	123.0	3.3	119.7	15.1	104.6
Administrative and Other Expenses	55.5	(3.9)	59.4	15.5	43.9
<b>Total Primary Expenses</b>	<b>\$ 4,931.4</b>	<b>\$ 233.4</b>	<b>\$ 4,698.0</b>	<b>\$ 192.5</b>	<b>\$ 4,505.5</b>

## PENSION PLAN ACTIVITY

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN MILLIONS)



## 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 2018, leading to a net increase of \$3,888.7 million in the retirement reserves held by the plans.

This follows an increase of \$6,561.0 million in the retirement reserves in fiscal year 2017. The increase for fiscal year 2018 reflects an increase in contributions, a decrease in investment income and 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, 2017, data, rolled forward to June 30, 2018, the plan fiduciary net position as a percentage of the total pension liability was 77.39% for the VRS state plan, 74.81% for the VRS teacher plan, 90.24% for the aggregate total of the VRS political subdivision plans, 78.16% for SPORS, 69.56% for VaLORS and 82.78% 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.



## FIGURE 2.8: SUMMARY OF PENSION PLAN RESERVE BALANCES

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2018	Increase (Decrease)	2017	Increase (Decrease)	2016
Member Reserves	\$ 13,940.4	\$ 488.2	\$ 13,452.2	\$ 483.0	\$ 12,969.2
Employer Reserves	62,948.6	3,400.5	59,548.1	6,078.0	53,470.1
<b>Total</b>	<b>\$ 76,889.0</b>	<b>\$ 3,888.7</b>	<b>\$ 73,000.3</b>	<b>\$ 6,561.0</b>	<b>\$ 66,439.3</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 2018, the amount of interest credited to member accounts was \$503.4 million, and the amount of member balances transferred to the Employer Reserve for retirements was \$910.3 million. For fiscal year 2017, the interest and retirement transfers were \$489.1 million and \$842.6 million, respectively.*

## 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 2018, the System remitted \$200.3 million to the insurer for claims and administrative costs. This is an increase from the \$184.1 million remitted for fiscal year 2017. Approximately 361,282 active members were covered under the Group Life Insurance Program at June 30, 2018.

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 \$1,594.8 million at June 30, 2018.

Investment income, including net securities lending income, was \$110.9 million during the fiscal year. For fiscal year 2017, this reserve had investment income of \$158.4 million and ended the year with a reserve balance of \$1,437.6 million, an increase from the balance of \$1,224.9 million at June 30, 2016.

For fiscal year 2018, the increase in the reserve balance was primarily the result of an increase in contributions, a decrease in investment income and an increase in the program's claims. Employer contributions for the Group Life Insurance Program are discussed further in Note 12.

Approximately 182,438 retirees were covered under the Group Life Insurance Program at June 30, 2018.

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 69,730 active members and 3,142 retirees were enrolled in the Optional Group Life Insurance Program at June 30, 2018. 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 2018, the System collected \$184.7 million in retiree health insurance credit contributions from participating employers and provided reimbursements to retirees of \$163.9 million. During fiscal year 2017, the System

collected \$168.3 million in retiree health insurance credit contributions from participating employers and provided reimbursements of \$159.0 million.

There was an increase in the contribution rates for the teacher employer group in fiscal year 2018 from 1.11% to the full actuarially determined rate of 1.23%. 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 \$235.4 million at June 30, 2018. Investment income, including net securities lending income, was \$13.6 million for the fiscal year. The reserve balances at June 30, 2017, and June 30, 2016, were \$201.3 million and \$173.2 million, respectively. Approximately 124,406 retirees were receiving the Health Insurance Credit at June 30, 2018. 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 2018, the System collected \$26.0 million in VSDP contributions from participating employers and paid disability premiums and benefits of \$37.7 million. This was the same as the \$37.7 million in benefits paid in fiscal year 2017.

Administrative and other expenses increased from fiscal year 2017. 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 \$463.0 million at June 30, 2018. Investment income, including net securities lending income, was \$32.1 million during the fiscal year. The reserve balances at June 30, 2017, and June 30, 2016, were \$442.3 million and \$407.8 million, respectively. At June 30, 2018, approximately 78,183 active members were participating in the program and approximately 2,710 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. Beginning July 1, 2017, the program was restructured and the responsibility for its operations were transferred from the Commonwealth of Virginia's Department of Accounts (DOA) to the System. The program provides death and health insurance benefits 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. The System is responsible for the review of all claims, determination of eligibility and case management. For participants in the program, the System is also responsible for identifying eligible individuals, having the VRS actuary prepare an actuarial valuation, collecting contributions, paying the Commonwealth of Virginia's Department of Human Resource Management health insurance premiums for covered eligible individuals and managing the assets of the program.

During fiscal year 2018, the System collected \$10.0 million in contributions and paid out \$12.4 million in benefits provided by this program. This is a decrease from the \$11.0 million in contributions received in fiscal year 2017 and an increase in benefit costs from the \$10.3 million for fiscal year 2017. This reflects the impact of the continuation of the stabilization of the program's participation and claims levels. The reserve balance at June 30, 2018, was \$1.9 million, a decrease from the reserve

balance of \$3.5 million at June 30, 2017. 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 2018, the System collected \$2.6 million in contributions and paid out \$2.1 million in benefits provided by this program. During fiscal year 2017, the System collected \$1.3 million in contributions and paid out \$1.2 million in benefits provided by the program. At June 30, 2018, approximately 17,281 active members were participating in the program and approximately 36 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, 2017, data, rolled forward to June 30, 2018, the plan fiduciary

net position as a percentage of the total OPEB liability was 51.22% for the Group Life Insurance Fund, 9.51% for the state employee Health Insurance Credit, 8.08% for the teacher employee Health Insurance Credit, 57.39% for the aggregate total of the political subdivision plans for Health Insurance Credit, 11.06% for the state-funded Health Insurance Credit for constitutional officers, 9.27% for the state-funded Health Insurance Credit for social services employees, and 10.41% 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 194.74% for the Disability Insurance Program and 0.60% for the Line of Duty Act Program. The Virginia Local Disability Program plans for teachers and political subdivisions were 46.05% and 51.22%, respectively. 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, 2018, was 7.5%, 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.

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

AS OF JUNE 30, 2018, WITH COMPARATIVE INFORMATION AS OF JUNE 30, 2017

	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)	\$ 104,256	\$ 1,555	\$ 2,645	\$ 1,004	\$ 109,460
Receivables:					
Contributions	273,664	1,770	3,988	1,335	280,757
Interest and Dividends	241,084	2,754	4,685	1,778	250,301
Receivables for Security Transactions	1,108,115	12,660	21,536	8,170	1,150,481
Other Investment Receivables	92,152	1,053	1,791	678	95,674
Other Receivables	846	19	2	—	867
<b>Total Receivables</b>	<b>1,715,861</b>	<b>18,256</b>	<b>32,002</b>	<b>11,961</b>	<b>1,778,080</b>
Investments: (Note 5)					
Bonds and Mortgage Securities	20,350,603	232,502	395,498	150,045	21,128,648
Stocks	22,854,140	261,104	444,153	168,504	23,727,901
Fixed-Income Commingled Funds	1,271,310	14,524	24,707	9,373	1,319,914
Index and Pooled Funds	9,816,555	112,153	190,777	72,378	10,191,863
Real Estate	8,638,084	98,688	167,875	63,689	8,968,336
Private Equity	12,074,932	137,953	234,667	89,030	12,536,582
Short-Term Investments	171,414	1,958	3,331	1,264	177,967
Hybrid Defined Contribution Investments	325,164	—	—	4,092	329,256
<b>Total Investments</b>	<b>75,502,202</b>	<b>858,882</b>	<b>1,461,008</b>	<b>558,375</b>	<b>78,380,467</b>
Collateral on Loaned Securities	4,206,137	48,055	81,744	31,012	4,366,948
Property, Plant, Furniture and Equipment (Note 6)	40,876	—	—	—	40,876
<b>Total Assets</b>	<b>81,569,332</b>	<b>926,748</b>	<b>1,577,399</b>	<b>602,352</b>	<b>84,675,831</b>
<b>Liabilities:</b>					
Retirement Benefits Payable	44,959	5,238	9,135	3,463	62,795
Refunds Payable	3,842	—	21	—	3,863
Accounts Payable and Accrued Expenses	28,416	253	430	163	29,262
Compensated Absences Payable	2,681	—	—	—	2,681
Insurance Premiums and Claims Payable	—	—	—	—	—
Payable for Security Transactions	3,078,732	35,174	59,833	22,700	3,196,439
Other Investment Payables	116,085	1,326	2,256	856	120,523
Other Payables	4,338	—	—	—	4,338
Obligations Under Security Lending Program	4,206,137	48,055	81,744	31,012	4,366,948
<b>Total Liabilities</b>	<b>7,485,190</b>	<b>90,046</b>	<b>153,419</b>	<b>58,194</b>	<b>7,786,849</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$ 74,084,142</b>	<b>\$ 836,702</b>	<b>\$ 1,423,980</b>	<b>\$ 544,158</b>	<b>\$76,888,982</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	2018	2017
\$ 3,034	\$ 432	\$ 843	\$ 3	\$ 2	\$ 4,314	\$ 113,774	\$ 53,897
21,153	15,808	1,480	—	285	38,726	319,483	286,525
5,373	765	1,493	6	4	7,641	257,942	233,179
24,694	3,516	6,863	28	20	35,121	1,185,602	1,322,398
2,054	293	571	2	2	2,922	98,596	12,985
—	2	9,109	—	9	9,120	9,987	9,414
<b>53,274</b>	<b>20,384</b>	<b>19,516</b>	<b>36</b>	<b>320</b>	<b>93,530</b>	<b>1,871,610</b>	<b>1,864,501</b>
453,514	64,573	126,040	523	364	645,014	21,773,662	21,960,682
509,306	72,517	141,545	587	409	724,364	24,452,265	24,329,065
28,331	4,034	7,874	33	23	40,295	1,360,209	1,151,868
218,762	31,148	60,798	252	176	311,136	10,502,999	9,630,071
192,500	27,409	53,499	222	155	273,785	9,242,121	8,279,144
269,090	38,314	74,785	310	216	382,715	12,919,297	11,114,649
3,820	544	1,062	4	3	5,433	183,400	149,844
—	—	—	—	—	—	329,256	182,368
<b>1,675,323</b>	<b>238,539</b>	<b>465,603</b>	<b>1,931</b>	<b>1,346</b>	<b>2,382,742</b>	<b>80,763,209</b>	<b>76,797,691</b>
93,735	13,346	26,051	108	75	133,315	4,500,263	4,796,902
—	—	—	—	—	—	40,876	35,360
<b>1,825,366</b>	<b>272,701</b>	<b>512,013</b>	<b>2,078</b>	<b>1,743</b>	<b>2,613,901</b>	<b>87,289,732</b>	<b>83,548,351</b>
—	—	—	—	—	—	62,795	66,281
—	345	—	—	—	345	4,208	3,883
493	13,501	3,214	1	—	17,209	46,471	46,927
—	—	—	—	—	—	2,681	2,516
65,168	—	—	—	—	65,168	65,168	69,205
68,610	9,769	19,068	78	55	97,580	3,294,019	3,313,401
2,587	368	719	2	2	3,678	124,201	159,630
—	—	—	—	148	148	4,486	3,988
93,735	13,346	26,051	108	75	133,315	4,500,263	4,796,902
<b>230,593</b>	<b>37,329</b>	<b>49,052</b>	<b>189</b>	<b>280</b>	<b>317,443</b>	<b>8,104,292</b>	<b>8,462,733</b>
<b>\$ 1,594,773</b>	<b>\$ 235,372</b>	<b>\$ 462,961</b>	<b>\$ 1,889</b>	<b>\$ 1,463</b>	<b>\$ 2,296,458</b>	<b>\$ 79,185,440</b>	<b>\$ 75,085,618</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, 2018, WITH COMPARATIVE INFORMATION FOR THE YEAR ENDED JUNE 30, 2017

	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	\$ 910,312	\$ 6,311	\$ 17,495	\$ 4,010	\$ 938,128
Employers	2,389,567	35,806	73,793	28,620	2,527,786
<b>Total Contributions</b>	<b>3,299,879</b>	<b>42,117</b>	<b>91,288</b>	<b>32,630</b>	<b>3,465,914</b>
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	1,258,802	14,217	24,054	9,165	1,306,238
Net Appreciation/(Depreciation) in Fair Value of Investments	4,297,272	48,419	81,817	31,414	4,458,922
Securities Lending Income	86,988	983	1,665	635	90,271
Total Investment Income Before Investment Expenses	5,643,062	63,619	107,536	41,214	5,855,431
<b>Investment Expenses:</b>					
Direct Investment Expenses	(428,285)	(4,839)	(8,173)	(3,118)	(444,415)
Securities Lending Management Fees and Borrower Rebates	(55,888)	(632)	(1,070)	(407)	(57,997)
Total Investment Expenses	(484,173)	(5,471)	(9,243)	(3,525)	(502,412)
<b>Net Investment Income</b>	<b>5,158,889</b>	<b>58,148</b>	<b>98,293</b>	<b>37,689</b>	<b>5,353,019</b>
Miscellaneous Revenue	1,076	—	—	—	1,076
Transfers In	—	—	—	—	—
<b>Total Additions</b>	<b>8,459,844</b>	<b>100,265</b>	<b>189,581</b>	<b>70,319</b>	<b>8,820,009</b>
<b>Deductions:</b>					
Retirement Benefits	4,548,751	58,197	104,776	41,165	4,752,889
Refunds of Member Contributions	116,473	867	5,604	24	122,968
Insurance Premiums and Claims	—	—	—	—	—
Retiree Health Insurance Reimbursements	—	—	—	—	—
Disability Insurance Premiums and Benefits	—	—	—	—	—
Line of Duty Benefits	—	—	—	—	—
Administrative Expenses	44,661	509	861	326	46,357
Other Expenses	8,750	63	247	45	9,105
Transfers Out	—	—	—	—	—
<b>Total Deductions</b>	<b>4,718,635</b>	<b>59,636</b>	<b>111,488</b>	<b>41,560</b>	<b>4,931,319</b>
Net Increase (Decrease)	3,741,209	40,629	78,093	28,759	3,888,690
Net Position – Restricted for Benefits – Beginning of Year	70,342,933	796,073	1,345,887	515,399	73,000,292
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 74,084,142</b>	<b>\$ 836,702</b>	<b>\$ 1,423,980</b>	<b>\$ 544,158</b>	<b>\$ 76,888,982</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	2018	2017
\$ 150,402	\$ —	\$ —	\$ —	\$ —	\$ 150,402	\$ 1,088,530	\$ 1,062,720
98,530	184,706	25,982	10,035	2,613	321,866	2,849,652	2,624,514
<b>248,932</b>	<b>184,706</b>	<b>25,982</b>	<b>10,035</b>	<b>2,613</b>	<b>472,268</b>	<b>3,938,182</b>	<b>3,687,234</b>
27,118	3,360	7,796	151	17	38,442	1,344,680	1,316,299
92,233	11,303	26,742	582	50	130,910	4,589,832	7,310,777
1,887	237	539	10	1	2,674	92,945	63,729
121,238	14,900	35,077	743	68	172,026	6,027,457	8,690,805
(9,107)	(1,102)	(2,658)	(59)	(3)	(12,929)	(457,344)	(424,258)
(1,214)	(152)	(346)	(6)	(1)	(1,719)	(59,716)	(25,281)
(10,321)	(1,254)	(3,004)	(65)	(4)	(14,648)	(517,060)	(449,539)
<b>110,917</b>	<b>13,646</b>	<b>32,073</b>	<b>678</b>	<b>64</b>	<b>157,378</b>	<b>5,510,397</b>	<b>8,241,266</b>
—	—	1,278	855	417	2,550	3,626	3,684
—	—	—	—	—	—	—	—
<b>359,849</b>	<b>198,352</b>	<b>59,333</b>	<b>11,568</b>	<b>3,094</b>	<b>632,196</b>	<b>9,452,205</b>	<b>11,932,184</b>
—	—	—	—	—	—	4,752,889	4,518,958
—	—	—	—	—	—	122,968	119,705
200,285	—	—	—	—	200,285	200,285	184,092
—	163,938	—	—	—	163,938	163,938	158,965
—	—	37,710	—	2,089	39,799	39,799	38,868
—	—	—	12,398	—	12,398	12,398	10,320
664	342	961	742	172	2,881	49,238	49,986
1,713	15	35	—	—	1,763	10,868	13,688
—	—	—	—	—	—	—	—
<b>202,662</b>	<b>164,295</b>	<b>38,706</b>	<b>13,140</b>	<b>2,261</b>	<b>421,064</b>	<b>5,352,383</b>	<b>5,094,582</b>
157,187	34,057	20,627	(1,572)	833	211,132	4,099,822	6,837,602
1,437,586	201,315	442,334	3,461	630	2,085,326	75,085,618	68,248,016
<b>\$ 1,594,773</b>	<b>\$ 235,372</b>	<b>\$ 462,961</b>	<b>\$ 1,889</b>	<b>\$ 1,463</b>	<b>\$ 2,296,458</b>	<b>\$ 79,185,440</b>	<b>\$ 75,085,618</b>

## VIRGINIA RETIREMENT SYSTEM COMBINING STATEMENT OF FIDUCIARY NET POSITION

AS OF JUNE 30, 2018

(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)	\$ 26,229	\$ 49,306	\$ 28,721	\$ —	\$ 104,256
Receivables:					
Contributions	45,723	165,448	55,813	6,680	273,664
Interest and Dividends	60,652	114,016	66,416	—	241,084
Receivables for Security Transactions	278,780	524,062	305,273	—	1,108,115
Other Investment Receivables	23,184	43,582	25,386	—	92,152
Other Receivables	212	400	233	1	846
<b>Total Receivables</b>	<b>408,551</b>	<b>847,508</b>	<b>453,121</b>	<b>6,681</b>	<b>1,715,861</b>
Investments: (Note 5)					
Bonds and Mortgage Securities	5,119,814	9,624,438	5,606,351	—	20,350,603
Stocks	5,749,655	10,808,439	6,296,046	—	22,854,140
Fixed-Income Commingled Funds	319,837	601,242	350,231	—	1,271,310
Index and Pooled Funds	2,469,653	4,642,557	2,704,345	—	9,816,555
Real Estate	2,173,173	4,085,221	2,379,690	—	8,638,084
Private Equity	3,037,817	5,710,614	3,326,501	—	12,074,932
Short-Term Investments	43,124	81,067	47,223	—	171,414
Hybrid Defined Contribution Investments	—	—	—	325,164	325,164
<b>Total Investments</b>	<b>18,913,073</b>	<b>35,553,578</b>	<b>20,710,387</b>	<b>325,164</b>	<b>75,502,202</b>
Collateral on Loaned Securities	1,058,182	1,989,214	1,158,741	—	4,206,137
Property, Plant, Furniture and Equipment (Note 6)	10,284	19,332	11,260	—	40,876
<b>Total Assets</b>	<b>20,416,319</b>	<b>38,458,938</b>	<b>22,362,230</b>	<b>331,845</b>	<b>81,569,332</b>
<b>Liabilities:</b>					
Retirement Benefits Payable	12,817	22,159	9,983	—	44,959
Refunds Payable	1,036	1,390	1,416	—	3,842
Accounts Payable and Accrued Expenses	7,149	13,439	7,828	—	28,416
Compensated Absences Payable	674	1,268	739	—	2,681
Insurance Premiums and Claims Payable	—	—	—	—	—
Payable for Security Transactions	774,549	1,456,029	848,154	—	3,078,732
Other Investment Payables	29,205	54,900	31,980	—	116,085
Other Payables	518	976	568	2,276	4,338
Obligations Under Security Lending Program	1,058,182	1,989,214	1,158,741	—	4,206,137
<b>Total Liabilities</b>	<b>1,884,130</b>	<b>3,539,375</b>	<b>2,059,409</b>	<b>2,276</b>	<b>7,485,190</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$ 18,532,189</b>	<b>\$ 34,919,563</b>	<b>\$ 20,302,821</b>	<b>\$ 329,569</b>	<b>\$ 74,084,142</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, 2018

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Hybrid Defined Contribution Plan	Total VRS Plans
<b>Additions:</b>					
Contributions:					
Members	\$ 201,920	\$ 391,490	\$ 241,340	\$ 75,562	\$ 910,312
Employers	548,158	1,292,988	490,285	58,136	2,389,567
<b>Total Contributions</b>	<b>750,078</b>	<b>1,684,478</b>	<b>731,625</b>	<b>133,698</b>	<b>3,299,879</b>
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	318,880	592,920	346,620	382	1,258,802
Net Appreciation/(Depreciation) in Fair Value of Investments	1,083,939	2,015,448	1,178,230	19,655	4,297,272
Securities Lending Income	22,042	40,986	23,960	—	86,988
Total Investment Income Before Investment Expenses	1,424,861	2,649,354	1,548,810	20,037	5,643,062
<b>Investment Expenses:</b>					
Direct Investment Expenses	(108,458)	(201,865)	(117,962)	—	(428,285)
Securities Lending Management Fees and Borrower Rebates	(14,162)	(26,332)	(15,394)	—	(55,888)
Total Investment Expenses	(122,620)	(228,197)	(133,356)	—	(484,173)
<b>Net Investment Income</b>	<b>1,302,241</b>	<b>2,421,157</b>	<b>1,415,454</b>	<b>20,037</b>	<b>5,158,889</b>
Miscellaneous Revenue	272	512	292	—	1,076
Transfers In*	29,652	—	—	—	29,652
<b>Total Additions</b>	<b>2,082,243</b>	<b>4,106,147</b>	<b>2,147,371</b>	<b>153,735</b>	<b>8,489,496</b>
<b>Deductions:</b>					
Retirement Benefits	1,296,803	2,241,927	1,010,021	—	4,548,751
Refunds of Member Contributions	30,236	40,578	41,325	4,334	116,473
Insurance Premiums and Claims	—	—	—	—	—
Retiree Health Insurance Reimbursements	—	—	—	—	—
Disability Insurance Premiums and Benefits	—	—	—	—	—
Line of Duty Benefits	—	—	—	—	—
Administrative Expenses	11,481	20,945	12,235	—	44,661
Other Expenses	1,422	2,679	1,564	3,085	8,750
Transfers Out*	—	—	29,652	—	29,652
<b>Total Deductions</b>	<b>1,339,942</b>	<b>2,306,129</b>	<b>1,094,797</b>	<b>7,419</b>	<b>4,748,287</b>
Net Increase (Decrease)	742,301	1,800,018	1,052,574	146,316	3,741,209
Net Position – Restricted for Benefits – Beginning of Year	17,789,888	33,119,545	19,250,247	183,253	70,342,933
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 18,532,189</b>	<b>\$ 34,919,563</b>	<b>\$ 20,302,821</b>	<b>\$ 329,569</b>	<b>\$ 74,084,142</b>

\* The State Employee and Political Subdivision figures include employer consolidations from Political Subdivision to State Employee.

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, 2018

(EXPRESSED IN THOUSANDS)

	Judicial Retirement Plan	Hybrid Defined Contribution Plan	Total JRS Plans
<b>Assets:</b>			
Cash (Note 5)	\$ 1,004	\$ —	\$ 1,004
Receivables:			
Contributions	1,278	57	1,335
Interest and Dividends	1,778	—	1,778
Receivables for Security Transactions	8,170	—	8,170
Other Investment Receivables	678	—	678
Other Receivables	—	—	—
<b>Total Receivables</b>	<b>11,904</b>	<b>57</b>	<b>11,961</b>
Investments: (Note 5)			
Bonds and Mortgage Securities	150,045	—	150,045
Stocks	168,504	—	168,504
Fixed-Income Commingled Funds	9,373	—	9,373
Index and Pooled Funds	72,378	—	72,378
Real Estate	63,689	—	63,689
Private Equity	89,030	—	89,030
Short-Term Investments	1,264	—	1,264
Hybrid Defined Contribution Investments	—	4,092	4,092
<b>Total Investments</b>	<b>554,283</b>	<b>4,092</b>	<b>558,375</b>
Collateral on Loaned Securities	31,012	—	31,012
Property, Plant, Furniture and Equipment (Note 6)	—	—	—
<b>Total Assets</b>	<b>598,203</b>	<b>4,149</b>	<b>602,352</b>
<b>Liabilities:</b>			
Retirement Benefits Payable	3,463	—	3,463
Refunds Payable	—	—	—
Accounts Payable and Accrued Expenses	163	—	163
Compensated Absences Payable	—	—	—
Insurance Premiums and Claims Payable	—	—	—
Payable for Security Transactions	22,700	—	22,700
Other Investment Payables	856	—	856
Other Payables	—	—	—
Obligations Under Security Lending Program	31,012	—	31,012
<b>Total Liabilities</b>	<b>58,194</b>	<b>—</b>	<b>58,194</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$ 540,009</b>	<b>\$ 4,149</b>	<b>\$ 544,158</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, 2018

(EXPRESSED IN THOUSANDS)

	Judicial Retirement System	Hybrid Defined Contribution Plan	Total JRS Plans
<b>Additions:</b>			
Contributions:			
Members	\$ 3,231	\$ 779	\$ 4,010
Employers	28,096	524	28,620
<b>Total Contributions</b>	<b>31,327</b>	<b>1,303</b>	<b>32,630</b>
<b>Investment Income:</b>			
Interest, Dividends and Other Investment Income	9,165	—	9,165
Net Appreciation/(Depreciation) in Fair Value of Investments	31,191	223	31,414
Securities Lending Income	635	—	635
Total Investment Income Before Investment Expenses	40,991	223	41,214
<b>Investment Expenses:</b>			
Direct Investment Expenses	(3,118)	—	(3,118)
Securities Lending Management Fees and Borrower Rebates	(407)	—	(407)
Total Investment Expenses	(3,525)	—	(3,525)
<b>Net Investment Income</b>	<b>37,466</b>	<b>223</b>	<b>37,689</b>
Miscellaneous Revenue	—	—	—
Transfers In	—	—	—
<b>Total Additions</b>	<b>68,793</b>	<b>1,526</b>	<b>70,319</b>
<b>Deductions:</b>			
Retirement Benefits	41,165	—	41,165
Refunds of Member Contributions	—	24	24
Insurance Premiums and Claims	—	—	—
Retiree Health Insurance Reimbursements	—	—	—
Disability Insurance Premiums and Benefits	—	—	—
Line of Duty Benefits	—	—	—
Administrative Expenses	326	—	326
Other Expenses	42	3	45
Transfers Out	—	—	—
<b>Total Deductions</b>	<b>41,533</b>	<b>27</b>	<b>41,560</b>
Net Increase (Decrease)	27,260	1,499	28,759
Net Position – Restricted for Benefits – Beginning of Year	512,749	2,650	515,399
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 540,009</b>	<b>\$ 4,149</b>	<b>\$ 544,158</b>

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

## RETIREE HEALTH INSURANCE CREDIT COMBINING STATEMENT OF FIDUCIARY NET POSITION

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Constitutional Officers	Social Services Employees	Registrars	Total HIC Plans
<b>Assets:</b>							
Cash (Note 5)	\$ 178	\$ 203	\$ 43	\$ 6	\$ 2	\$ —	\$ 432
Receivables:							
Contributions	5,302	10,189	182	23	112	—	15,808
Interest and Dividends	316	357	77	11	4	—	765
Receivables for Security Transactions	1,453	1,642	350	52	19	—	3,516
Other Investment Receivables	121	137	29	4	2	—	293
Other Receivables	1	1	—	—	—	—	2
<b>Total Receivables</b>	<b>7,193</b>	<b>12,326</b>	<b>638</b>	<b>90</b>	<b>137</b>	<b>—</b>	<b>20,384</b>
Investments: (Note 5)							
Bonds and Mortgage Securities	26,680	30,149	6,430	941	357	16	64,573
Stocks	29,962	33,857	7,222	1,057	400	19	72,517
Fixed-Income Commingled Funds	1,666	1,884	402	59	22	1	4,034
Index and Pooled Funds	12,869	14,543	3,102	454	172	8	31,148
Real Estate	11,325	12,797	2,729	399	152	7	27,409
Private Equity	15,830	17,889	3,815	558	212	10	38,314
Short-Term Investments	225	253	55	8	3	—	544
<b>Total Investments</b>	<b>98,557</b>	<b>111,372</b>	<b>23,755</b>	<b>3,476</b>	<b>1,318</b>	<b>61</b>	<b>238,539</b>
Collateral on Loaned Securities	5,514	6,231	1,329	195	74	3	13,346
Property, Plant, Furniture and Equipment (Note 6)	—	—	—	—	—	—	—
<b>Total Assets</b>	<b>111,442</b>	<b>130,132</b>	<b>25,765</b>	<b>3,767</b>	<b>1,531</b>	<b>64</b>	<b>272,701</b>
<b>Liabilities:</b>							
Retirement Benefits Payable	—	—	—	—	—	—	—
Refunds Payable	140	164	34	5	2	—	345
Accounts Payable and Accrued Expenses	5,692	7,364	222	142	80	1	13,501
Compensated Absences Payable	—	—	—	—	—	—	—
Insurance Premiums and Claims Payable	—	—	—	—	—	—	—
Payable for Security Transactions	4,036	4,562	973	142	54	2	9,769
Other Investment Payables	152	172	37	5	2	—	368
Other Payables	—	—	—	—	—	—	—
Obligations Under Security Lending Program	5,514	6,231	1,329	195	74	3	13,346
<b>Total Liabilities</b>	<b>15,534</b>	<b>18,493</b>	<b>2,595</b>	<b>489</b>	<b>212</b>	<b>6</b>	<b>37,329</b>
<b>Net Position –</b>							
<b>    Restricted for Benefits (Note 4)</b>	<b>\$ 95,908</b>	<b>\$ 111,639</b>	<b>\$ 23,170</b>	<b>\$ 3,278</b>	<b>\$ 1,319</b>	<b>\$ 58</b>	<b>\$ 235,372</b>

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

## RETIREE HEALTH INSURANCE CREDIT COMBINING STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Constitutional Officers	Social Services Employees	Registrars	Total HIC Plans
<b>Additions:</b>							
Contributions:							
Members	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
Employers	79,416	99,470	2,290	2,378	1,120	32	184,706
<b>Total Contributions</b>	<b>79,416</b>	<b>99,470</b>	<b>2,290</b>	<b>2,378</b>	<b>1,120</b>	<b>32</b>	<b>184,706</b>
<b>Investment Income:</b>							
Interest, Dividends and Other Investment Income	1,406	1,504	387	45	18	—	3,360
Net Appreciation/(Depreciation) in Fair Value of Investments	4,731	5,058	1,300	150	61	3	11,303
Securities Lending Income	99	107	27	3	1	—	237
Total Investment Income Before Investment Expenses	6,236	6,669	1,714	198	80	3	14,900
<b>Investment Expenses:</b>							
Direct Investment Expenses	(460)	(495)	(126)	(15)	(6)	—	(1,102)
Securities Lending Management Fees and Borrower Rebates	(64)	(67)	(18)	(2)	(1)	—	(152)
Total Investment Expenses	(524)	(562)	(144)	(17)	(7)	—	(1,254)
<b>Net Investment Income</b>	<b>5,712</b>	<b>6,107</b>	<b>1,570</b>	<b>181</b>	<b>73</b>	<b>3</b>	<b>13,646</b>
Miscellaneous Revenue	536	(451)	(111)	19	6	1	—
Transfers In	—	—	—	—	—	—	—
<b>Total Additions</b>	<b>85,664</b>	<b>105,126</b>	<b>3,749</b>	<b>2,578</b>	<b>1,199</b>	<b>36</b>	<b>198,352</b>
<b>Deductions:</b>							
Retirement Benefits	—	—	—	—	—	—	—
Refunds of Member Contributions	—	—	—	—	—	—	—
Insurance Premiums and Claims	—	—	—	—	—	—	—
Retiree Health Insurance Reimbursements	69,117	89,419	2,697	1,723	970	12	163,938
Disability Insurance Premiums and Benefits	—	—	—	—	—	—	—
Line of Duty Benefits	—	—	—	—	—	—	—
Administrative Expenses	149	151	37	4	1	—	342
Other Expenses	6	8	1	—	—	—	15
Transfers Out	—	—	—	—	—	—	—
<b>Total Deductions</b>	<b>69,272</b>	<b>89,578</b>	<b>2,735</b>	<b>1,727</b>	<b>971</b>	<b>12</b>	<b>164,295</b>
Net Increase (Decrease)	16,392	15,548	1,014	851	228	24	34,057
Net Position – Restricted for Benefits – Beginning of Year	79,516	96,091	22,156	2,427	1,091	34	201,315
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 95,908</b>	<b>\$ 111,639</b>	<b>\$ 23,170</b>	<b>\$ 3,278</b>	<b>\$ 1,319</b>	<b>\$ 58</b>	<b>\$ 235,372</b>

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

## VIRGINIA LOCAL DISABILITY PROGRAM COMBINING STATEMENT OF FIDUCIARY NET POSITION

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	Teacher Employee Plan	Political Subdivision Plan	Total VLDP Plans
<b>Assets:</b>			
Cash (Note 5)	\$ 1	\$ 1	\$ 2
Receivables:			
Contributions	150	135	285
Interest and Dividends	2	2	4
Receivables for Security Transactions	8	12	20
Other Investment Receivables	1	1	2
Other Receivables	4	5	9
<b>Total Receivables</b>	<b>165</b>	<b>155</b>	<b>320</b>
Investments: (Note 5)			
Bonds and Mortgage Securities	154	210	364
Stocks	172	237	409
Fixed-Income Commingled Funds	10	13	23
Index and Pooled Funds	75	101	176
Real Estate	66	89	155
Private Equity	92	124	216
Short-Term Investments	1	2	3
<b>Total Investments</b>	<b>570</b>	<b>776</b>	<b>1,346</b>
Collateral on Loaned Securities	32	43	75
Property, Plant, Furniture and Equipment (Note 6)	—	—	—
<b>Total Assets</b>	<b>768</b>	<b>975</b>	<b>1,743</b>
<b>Liabilities:</b>			
Retirement Benefits Payable	—	—	—
Refunds Payable	—	—	—
Accounts Payable and Accrued Expenses	—	—	—
Compensated Absences Payable	—	—	—
Insurance Premiums and Claims Payable	—	—	—
Payable for Security Transactions	23	32	55
Other Investment Payables	1	1	2
Other Payables	65	83	148
Obligations Under Security Lending Program	32	43	75
<b>Total Liabilities</b>	<b>121</b>	<b>159</b>	<b>280</b>
<b>Net Position – Restricted for Benefits (Note 4)</b>	<b>\$ 647</b>	<b>\$ 816</b>	<b>\$ 1,463</b>

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

## VIRGINIA LOCAL DISABILITY PROGRAM COMBINING STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	Teacher Employee Plan	Political Subdivision Plan	Total VLDP Plans
<b>Additions:</b>			
Contributions:			
Members	\$ —	\$ —	\$ —
Employers	1,155	1,458	2,613
<b>Total Contributions</b>	<b>1,155</b>	<b>1,458</b>	<b>2,613</b>
<b>Investment Income:</b>			
Interest, Dividends and Other Investment Income	8	9	17
Net Appreciation/(Depreciation) in Fair Value of Investments	22	28	50
Securities Lending Income	—	1	1
Total Investment Income Before Investment Expenses	30	38	68
<b>Investment Expenses:</b>			
Direct Investment Expenses	(1)	(2)	(3)
Securities Lending Management Fees and Borrower Rebates	—	(1)	(1)
Total Investment Expenses	(1)	(3)	(4)
<b>Net Investment Income</b>	<b>29</b>	<b>35</b>	<b>64</b>
Miscellaneous Revenue	184	233	417
Transfers In	—	—	—
<b>Total Additions</b>	<b>1,368</b>	<b>1,726</b>	<b>3,094</b>
<b>Deductions:</b>			
Retirement Benefits	—	—	—
Refunds of Member Contributions	—	—	—
Insurance Premiums and Claims	—	—	—
Retiree Health Insurance Reimbursements	—	—	—
Disability Insurance Premiums and Benefits	924	1,165	2,089
Line of Duty Benefits	—	—	—
Administrative Expenses	76	96	172
Other Expenses	—	—	—
Transfers Out	—	—	—
<b>Total Deductions</b>	<b>1,000</b>	<b>1,261</b>	<b>2,261</b>
Net Increase (Decrease)	368	465	833
Net Position – Restricted for Benefits – Beginning of Year	279	351	630
<b>Net Position – Restricted for Benefits – End of Year</b>	<b>\$ 647</b>	<b>\$ 816</b>	<b>\$ 1,463</b>

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

# Notes to Financial Statements

JUNE 30, 2018 AND 2017

## 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 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 is administered in accordance with Title 9.1, Chapter 4 of the *Code of Virginia* (1950), as amended. 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.

**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 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.

- 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 elected to implement it early and provide disclosure guidance to participating employers.

- GASB Statement No. 85, *Omnibus 2017*, amends a number of GASB statements, including GASB Statements No. 73, No. 74 and No. 75. 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 and (2) the classification of payments made by employers to satisfy employee (plan member) contribution requirements. This statement was effective for reporting periods beginning after June 15, 2017.

## 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 GASB Statement No. 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, 2018, 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 2018 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, 2018 and 2017, 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, 2018. 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, 2017, 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. Fulltime 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	2018 Total	2017 Total
Retirees and Beneficiaries Receiving Benefits	56,980	89,667	53,579	1,336	4,702	512	206,776	199,388
Terminated Employees Entitled to Benefits but not Receiving Them	11,654	26,601	13,028	129	762	—	52,174	49,932
<b>Total</b>	<b>68,634</b>	<b>116,268</b>	<b>66,607</b>	<b>1,465</b>	<b>5,464</b>	<b>512</b>	<b>258,950</b>	<b>249,320</b>
Active Members:								
Vested	53,743	104,688	69,039	1,591	5,001	332	234,394	236,290
Non-Vested	23,594	42,107	38,788	296	3,741	85	108,611	104,910
<b>Total</b>	<b>77,337</b>	<b>146,795</b>	<b>107,827</b>	<b>1,887</b>	<b>8,742</b>	<b>417</b>	<b>343,005</b>	<b>341,200</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 (CPI-U), 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.</p> <ul style="list-style-type: none"> <li>The defined benefit is based on a member's age, creditable service and average final compensation at retirement using a formula.</li> <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>Members covered under VaLORS, SPORS or VRS with enhanced hazardous duty benefits or the hazardous duty alternate option, and whose membership dates are on or after July 1, 2010, are in Plan 2 even if their membership dates are after December 31, 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> Members 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 members 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 members who are covered by enhanced benefits for hazardous duty employees</li> </ul> <p>Those members 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. 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.</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 member’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. (Cont.)</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></p> <p>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></p> <p>See definition under Plan 1.</p>	<p><b>Calculating the Benefit</b></p> <p><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></p> <p>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></p> <p>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></p> <p>Same as Plan 2. It is used in the retirement formula for the defined benefit component of the plan.</p>

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

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<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%.</p> <p>SPORS, sheriffs and regional jail superintendents: The retirement multiplier is 1.85%.</p> <p>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>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><b>Service Retirement Multiplier</b>  VRS Plan 2: Same as Plan 1 for service earned, purchased or granted prior to January 1, 2013.</p> <p>For non-hazardous duty members, the retirement multiplier is 1.65% for creditable service earned, purchased or granted on or after January 1, 2013.</p> <p>SPORS, sheriffs and regional jail superintendents: Same as Plan 1.</p> <p>VaLORS: The retirement multiplier is 2.00%.</p> <p>Political subdivision hazardous duty employees: Same as Plan 1.</p> <p>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%.</p> <p>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.</p> <p>SPORS, sheriffs and regional jail superintendents: Not applicable.</p> <p>VaLORS: Not applicable.</p> <p>Political subdivision hazardous duty employees: Not applicable.</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>  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>  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>  <i>Defined Benefit Component:</i>  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>  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 Unreduced Retirement Eligibility</b>  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.*  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.  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.  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><i>* Some political subdivision employers require employees to reach age 55 with at least 30 years of creditable service to be eligible for an unreduced retirement benefit.</i></p>	<p><b>Earliest Unreduced Retirement Eligibility</b>  VRS: Normal Social Security retirement age with at least five years (60 months) of creditable service or when their age and service equal 90.  SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1.  JRS: Age 65, with at least five years of weighted service credit, or age 60 with at least 30 years of weighted service credit.  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>  <i>Defined Benefit Component:</i>  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.  SPORS, VaLORS and political subdivision hazardous duty employees: Not applicable.  JRS: Same as Plan 2.  <i>Defined Contribution Component:</i>  Members are eligible to receive distributions upon leaving employment, subject to restrictions.</p>
<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.  SPORS, VaLORS and political subdivision hazardous duty employees: Age 50 with at least five years of creditable service.  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.  SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1.  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.  SPORS, VaLORS and political subdivision hazardous duty employees: Not applicable.  JRS: Same as Plan 1.  <i>Defined Contribution Component:</i>  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>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) from the date the monthly benefit begins, 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> </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) from the date the monthly benefit begins, 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>
<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>

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

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
<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. <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 years 2018 and 2017 were based on the actuary’s valuation as of June 30, 2015.

As shown in Figure 2.11, contributions to the pension plans for the fiscal years ended June 30, 2018 and 2017, totaled \$3,465,914,000 and \$3,242,396,000, respectively, in accordance with statutory requirements.

Employer contributions to the VRS cost-sharing pool for teachers in the fiscal year ended June 30, 2018, represented 16.32% of covered payrolls. This was the full actuarial cost and represented an increase from the 14.66% contributed in the fiscal year ended June 30, 2017. 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*	Employer Contributions*	Total
2018	VRS - State	\$ 224,973	\$ 564,813	\$ 789,786
	VRS - Teacher	424,183	1,319,472	1,743,655
	VRS - Political Subdivisions	261,156	505,282	766,438
	<b>Total VRS</b>	<b>910,312</b>	<b>2,389,567</b>	<b>3,299,879</b>
	SPORS	6,311	35,806	42,117
	ValORS	17,495	73,793	91,288
	JRS	4,010	28,620	32,630
	<b>Total</b>	<b>938,128</b>	<b>\$ 2,527,786</b>	<b>3,465,914</b>
2017	<b>Total</b>	<b>\$ 916,718</b>	<b>\$ 2,325,678</b>	<b>\$ 3,242,396</b>

\* For fiscal year 2018, member and employer contributions for the VRS plans include \$75,562,000 and \$58,136,000 respectively in Hybrid Defined Contribution Plan contributions. Member and employer contributions for the JRS plan includes \$779,000 and \$524,000 respectively in Hybrid Defined Contribution Plan contributions. This compares with fiscal year 2017 member contributions for the VRS plans and the JRS plan of \$56,228,000 and \$1,162,000, respectively, and fiscal year 2017 employer contributions of \$40,972,000 and \$427,000, 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, 2018. The total pension liability was determined based on an actuarial

valuation as of June 30, 2017, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2018.



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

AS OF JUNE 30, 2018

(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/	Covered Payroll (c)	Net Pension Liability/ (Asset) as a % of the Covered Employee Payroll (a-b)/(c)
<b>Virginia Retirement System:</b>						
State	\$23,945,821	\$18,532,189	\$ 5,413,632	77.39%	\$ 4,152,368	130.37%
Teacher	46,679,555	34,919,563	11,759,992	74.81%	8,086,986	145.42%
Political Subdivisions*	22,497,735	20,302,821	2,194,914	90.24%	4,932,344	44.50%
<b>Total Virginia Retirement System</b>	<b>93,123,111</b>	<b>73,754,573</b>	<b>19,368,538</b>		<b>17,171,698</b>	
State Police Officers' Retirement System	1,070,528	836,702	233,826	78.16%	124,003	188.56%
Virginia Law Officers' Retirement System	2,047,161	1,423,980	623,181	69.56%	345,531	180.35%
Judicial Retirement System	652,351	540,009	112,342	82.78%	68,245	164.62%
<b>Grand Total</b>	<b>\$96,893,151</b>	<b>\$76,555,264</b>	<b>\$20,337,887</b>		<b>\$17,709,477</b>	

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

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

	VRS					
	State	Teacher	Political Subdivisions	SPORS	ValORS	JRS
<b>Valuation Date</b>	June 30, 2017	June 30, 2017	June 30, 2017	June 30, 2017	June 30, 2017	June 30, 2017
<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 Subdivisions – Non-Hazardous Duty Employees	N/A	N/A	3.50% to 5.35%	N/A	N/A	N/A
Political Subdivisions – 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%
Hybrid	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.

## 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, 2018

(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	\$ 8,196,537	\$ 5,413,632	\$ 3,071,046
Teacher	17,963,676	11,759,992	6,625,048
Political Subdivisions	5,073,684	2,194,912	(228,193)
<b>Total Virginia Retirement System</b>	<b>\$ 31,233,897</b>	<b>\$ 19,368,536</b>	<b>\$ 9,467,901</b>
State Police Officers' Retirement System	359,387	233,826	127,959
Virginia Law Officers' Retirement System	884,351	623,181	407,001
Judicial Retirement System	171,387	112,342	61,007
<b>Grand Total</b>	<b>\$ 32,649,022</b>	<b>\$ 20,337,885</b>	<b>\$ 10,063,868</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 361,282 active members and 182,438 retirees were covered under the Basic Group Life Insurance Program at June 30, 2018.

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 69,730 active members and 3,142 retirees were covered under the Optional Group Life Insurance Program at June 30, 2018.

**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 124,406 retirees were covered under the Health Insurance Credit program at June 30, 2018.

**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 78,183 members were covered under VSDP at June 30, 2018, and approximately 2,710 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 17,281 members were covered under VLDP at June 30, 2018, and 36 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 12,970 members, retirees and their eligible family members were covered under the program at June 30, 2018.

**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 public safety officers. Beginning July 1, 2017, the System is responsible for the program and for managing the assets of the employers participating in 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: OTHER POST-EMPLOYMENT BENEFIT (OPEB) PLANS

AT JUNE 30, 2018

OPEB Plan	Number of Participating Employers			
	State	Teachers	Political Subdivisions	Total
Group Life Insurance	230	145	541*	916
Retiree Health Insurance Credit	230	145	130*	505
Disability Insurance Trust Fund	230	—	—	230
Virginia Local Disability Program	—	35	180*	215
Line of Duty Act Trust Fund	68	—	60	128

\* 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

	Eligible Employees	Coverage
<b>VRS Group Life Insurance Program: Basic Coverage</b>	<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 after employment ends 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 an \$8,000 minimum established in 2015. This minimum will be increased annually based on the VRS Plan 2 cost-of-living adjustment calculation. The member may end employment and defer retirement until a later date; however, the group life insurance will begin reducing based on the last month of employment.</p>
<b>Optional Group Life Insurance Program</b>	<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. 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>Employees who meet qualifications for retirement may continue a portion of their coverage upon leaving employment.</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 the last day of the month in which he or she leaves employment 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> <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>

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

**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

**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.\*\*

Eligible Employees	Coverage
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.

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

	<b>Eligible Employees</b>	<b>Coverage</b>
<b>Virginia Sickness and Disability Program (VSDP)</b>	<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> <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>

**Note:**

- 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.
- 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.
- 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.
- 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.

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

	<b>Eligible Employees</b>	<b>Coverage</b>
<b>Virginia Local Disability Program (VLDP)</b>	<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. 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> <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>

<b>Commonwealth of Virginia (COV) Voluntary Group Long-Term Care Insurance Program</b>	<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>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>
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*\* 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. 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.*



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

Line of Duty Act (LODA) Program	Eligible Employees	Coverage
	Paid employees and volunteers in hazardous duty positions in Virginia localities, including hazardous duty employees covered under VRS, SPORS and VaLORS.	<p>Coverage provides death and health insurance benefits. The LODA death benefit is a one-time payment made to the beneficiary or beneficiaries.</p> <p>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>	<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 an \$8,000 minimum established in 2015. 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, 2018. The total OPEB liability was determined based on an actuarial valuation as of June 30, 2017, using updated actuarial assumptions, applied to all periods

included in the measurement and rolled forward to the measurement date of June 30, 2018.

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, 2018

(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>\$ 3,113,508</b>	<b>\$ 1,594,773</b>	<b>\$ 1,518,735</b>	<b>51.22%</b>	<b>\$ 19,044,361</b>	<b>7.97%</b>
<b>Health Insurance Credit Fund:</b>						
State	1,008,184	95,908	912,276	9.51%	6,762,917	13.49%
Teacher	1,381,313	111,639	1,269,674	8.08%	8,087,389	15.70%
Political Subdivisions*	40,370	23,170	17,200	57.39%	1,022,007	1.68%
Constitutional Officers	29,629	3,278	26,351	11.06%	655,995	4.02%
Social Services Employees	14,222	1,319	12,903	9.27%	263,298	4.90%
Registrars	557	58	499	10.41%	11,512	4.33%
<b>Total Health Insurance Credit</b>	<b>2,474,275</b>	<b>235,372</b>	<b>2,238,903</b>		<b>16,803,118</b>	
<b>Disability Insurance Trust Fund</b>	<b>237,733</b>	<b>462,961</b>	<b>(225,228)</b>	<b>194.74%</b>	<b>3,972,637</b>	<b>-5.67%</b>
<b>Virginia Local Disability Program:</b>						
Teacher	1405	647	758	46.05%	372,869	0.20%
Political Subdivisions	1593	816	777	51.22%	242,807	0.32%
<b>Total Virginia Local Disability Program</b>	<b>2,998</b>	<b>1463</b>	<b>1,535</b>		<b>615,676</b>	
<b>Line of Duty Act Trust Fund</b>	<b>315,395</b>	<b>1,889</b>	<b>313,506</b>	<b>0.60%</b>	<b>**</b>	<b>N/A</b>
<b>Grand Total</b>	<b>\$ 6,143,909</b>	<b>\$ 2,296,458</b>	<b>\$ 3,847,451</b>		<b>\$ 40,435,792</b>	

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

\*\* 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.

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

	Group Life Insurance Fund	Retiree Health Insurance Credit Fund	Disability Insurance Trust Fund	Line of Duty Act Trust Fund	Virginia Local Disability Program
<b>Valuation Date</b>	June 30, 2017	June 30, 2017	June 30, 2017	June 30, 2017	June 30, 2017
<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	27.2 Years	26.1 Years	22.9 Years	30 Years	N/A
Teachers	27.2 Years	25.7 Years	N/A	N/A	18.6 Years
Political Subdivision Employees	27.2 Years	25.7 Years	N/A	30 Years	18.9 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	3.50% to 4.75%	3.50% to 4.75%	3.50% to 4.75%	N/A	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 4.75% 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 3.89%, which approximates the risk-free rate of return. This Single Equivalent Interest Rate (SEIR) is the applicable municipal bond index rate based on the Bond Buyer General Obligation 20-year Municipal Bond Index published monthly by the Board of Governors of the Federal Reserve System as of the measurement date of June 30, 2018.

#### SCHEDULE OF IMPACT OF CHANGES IN DISCOUNT RATE: LINE OF DUTY ACT (LODA) PLAN

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

System/Plan	1.00% Decrease (2.89%)	Current Discount Rate (3.89%)	1.00% Increase (4.89%)
Net LODA OPEB Liability	\$359,186	\$313,506	\$276,684

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

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

System/Plan	1.00% Decrease (6.75% decreasing to 4.00%)	Health Care Cost Trend Rates (7.75% decreasing to 5.00%)	1.00% Increase (8.75% decreasing to 6.00%)
Net LODA OPEB Liability	\$267,097	\$313,506	\$371,285

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

AS OF JUNE 30, 2018

(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>	\$1,984,793	\$ 1,518,735	\$1,140,332
<b>Health Insurance Credit Fund:</b>			
State	1,008,869	912,276	829,163
Teacher	1,418,120	1,269,674	1,143,421
Political Subdivisions	21,528	17,199	13,507
Constitutional Officers	29,514	26,351	23,660
Social Services Employees	14,288	12,903	11,714
Registrars	550	499	454
<b>Total Health Insurance Credit</b>	<b>2,492,869</b>	<b>2,238,902</b>	<b>2,021,919</b>
<b>Disability Insurance Trust Fund</b>	(217,112)	(225,228)	(232,173)
<b>Virginia Local Disability Program:</b>			
Teacher	934	758	607
Political Subdivisions	916	777	659
<b>Total Virginia Local Disability Program</b>	<b>1,850</b>	<b>1,535</b>	<b>1,266</b>
<b>Grand Total</b>	<b>\$4,262,400</b>	<b>\$ 3,533,944</b>	<b>\$2,931,344</b>

### 4. Reserve Accounts

The reserve account balances available for benefits at June 30, 2018 and 2017, 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).

## FIGURE 2.13: NET POSITION RESTRICTED FOR BENEFITS

AT JUNE 30

(EXPRESSED IN THOUSANDS)

	2018	2017
<b>Virginia Retirement System</b>		
Member Reserve	\$ 13,551,094	\$ 13,070,300
Employer Reserve	60,533,048	57,272,633
<b>Total VRS</b>	<b>74,084,142</b>	<b>70,342,933</b>
<b>State Police Officers' Retirement System</b>		
Member Reserve	103,710	99,643
Employer Reserve	732,992	696,430
<b>Total SPORS</b>	<b>836,702</b>	<b>796,073</b>
<b>Virginia Law Officers' Retirement System</b>		
Member Reserve	240,390	240,517
Employer Reserve	1,183,590	1,105,370
<b>Total VaLORS</b>	<b>1,423,980</b>	<b>1,345,887</b>
<b>Judicial Retirement System</b>		
Member Reserve	45,158	41,754
Employer Reserve	499,000	473,645
<b>Total JRS</b>	<b>544,158</b>	<b>515,399</b>
<b>Group Life Insurance Advance Premium Deposit Reserve</b>	<b>1,594,773</b>	<b>1,437,586</b>
<b>Retiree Health Insurance Credit Reserve</b>	<b>235,372</b>	<b>201,315</b>
<b>Disability Insurance Trust Fund (VSDP)</b>	<b>462,961</b>	<b>442,334</b>
<b>Line of Duty Act Trust Fund</b>	<b>1,889</b>	<b>3,461</b>
<b>Disability Insurance Trust Fund (VLDP)</b>	<b>1,463</b>	<b>630</b>
<b>Total Pension and Other Employee Benefit Reserves</b>	<b>\$ 79,185,440</b>	<b>\$ 75,085,618</b>

## 5. Deposits and Investment Risk Disclosures

### A. DEPOSITS

Deposits of the System maintained by the Treasurer of Virginia at June 30, 2018 and 2017, 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)

	2018 Carrying Amount	2017 Carrying Amount
Treasurer of Virginia	\$ 37,602	\$ 37,482
Master Custodian	76,172	16,415
<b>Total Deposits</b>	<b>\$ 113,774</b>	<b>\$ 53,897</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, 2018 and 2017, is presented in Figure 2.15.

**FIGURE 2.15: EQUITY INTERESTS**

AT JUNE 30

Fund	2018	2017
Virginia Retirement System	93.46%	93.59%
State Police Officers' Retirement System	1.07%	1.07%
Virginia Law Officers' Retirement System	1.82%	1.81%
Judicial Retirement System	0.69%	0.69%
Group Life Insurance Fund	2.08%	1.99%
Retiree Health Insurance Credit Fund	0.30%	0.27%
Disability Insurance Trust Fund (VSDP)	0.58%	0.58%
Line of Duty Act Trust Fund	—	—
Virginia Local Disability Program	—	—
<b>Total Equity Interests</b>	<b>100%</b>	<b>100%</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. Investments in the Hybrid Defined Contribution Plan of \$329,256,435 are also excluded from the fair value hierarchy and the disclosure of investments measured at the NAV because the System has limited administrative and investment responsibility for these assets. More information on the Hybrid Defined Contribution Plan may be found in the Investment Section.

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, 2018, and June 30, 2017.

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

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	6/30/2018	Fair Value Measurements Using		
		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	\$ 3,730,671	\$ 3,081,452	\$ 649,219	\$ —
Agencies	3,704,692	—	3,704,692	—
Municipal Securities	128,429	—	128,429	—
Supranational and Non-U.S. Government Bonds	2,096,385	—	2,096,385	—
Asset-Backed Securities	686,942	—	686,942	—
Collateralized Mortgage Obligations	228,178	—	228,178	—
Commercial Mortgages	335,022	—	335,022	—
Corporate and Other Bonds	6,995,552	—	6,995,552	—
Fixed-Income Commingled Funds	20,850	—	—	20,850
Mutual and Money Market Funds	165,340	165,340	—	—
Negotiable Certificates of Deposit	95,574	—	95,574	—
<b>Total Debt Securities</b>	<b>18,187,635</b>	<b>3,246,792</b>	<b>14,919,993</b>	<b>20,850</b>
Equity Securities:				
Common and Preferred Stocks	24,477,607	24,392,830	83,305	1,472
<b>Total Equity Securities</b>	<b>24,477,607</b>	<b>24,392,830</b>	<b>83,305</b>	<b>1,472</b>
Hedge Funds	1,181,494	—	—	1,181,494
Credit Strategies Funds	120,051	—	—	120,051
Private Equity Funds	789,990	—	—	789,990
Equity International Commingled Funds	288,434	—	—	288,434
Real Estate and Real Asset Funds	2,487,817	—	—	2,487,817
<b>Total Investments by Fair Value Level</b>	<b>47,533,028</b>	<b>27,639,622</b>	<b>15,003,298</b>	<b>4,890,108</b>
<b>Investments Measured at the Net Asset Value (NAV):</b>				
Hedge Funds	7,186,321			
Credit Strategies Funds	4,890,732			
Private Equity Funds	7,118,524			
Equity International Commingled Funds	1,701,323			
Fixed-Income Commingled Funds	1,339,359			
Real Estate and Real Asset Funds	6,754,304			
U.S. Equity Commingled Funds	145,427			
<b>Total Investments Measured at the NAV</b>	<b>29,135,990</b>			
<b>Total Investments Measured at Fair Value</b>	<b>\$76,669,018</b>			
<b>Investment Derivative Instruments:</b>				
Foreign Currency Forwards	\$ 24,384	\$ —	\$ 24,384	
Foreign Currency Options	(193)	—	(193)	
Swaptions	(4)	—	(4)	
Futures Contracts	(25,435)	(25,435)	—	
Credit Default Swaps	(876)	—	(876)	
Interest Rate Swaps	(1,518)	—	(1,518)	
Total Return Swaps	659	—	659	
<b>Total Investment Derivative Instruments</b>	<b>\$ (2,983)</b>	<b>\$ (25,435)</b>	<b>\$ 22,452</b>	



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

AS OF JUNE 30, 2017

(EXPRESSED IN THOUSANDS)

	Fair Value Measurements Using			
	6/30/2017	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 and 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	\$ (19,342)	\$ —	\$ (19,342)	
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>\$ (18,448)</b>	<b>\$ (2,206)</b>	<b>\$ (16,242)</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 include common and preferred equity securities, privately issued securities and other securities with limited trading volume and are valued using proprietary information or single source pricing.

Other investments in Level 3 include investments in hedge and commingled funds and private equity, credit strategies and real estate and real assets funds.

These investments have been assigned a Level 3, as they are valued using unobservable inputs. When observable inputs are not available for these investments, 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. The System also has investments in hedge and commingled funds and private equity, credit strategies and real estate and real assets funds that are not categorized under the fair value hierarchy and are shown at NAV. Investments at NAV are commonly calculated by subtracting the fair value of liabilities from the fair value of assets. These investments are discussed below in "Description of Investments 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 commodities, U.S. Treasury bonds and notes, non-U.S. government bonds, and U.S. and non-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**

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
<b>Hedge Funds:</b>				
Equity Long/Short Funds	\$ 3,963,193	\$ —	Monthly, quarterly, semi-annually, annually	30-90 days
Equity Long-Only Funds	684,696	49,200	Annually	90 days
Credit Funds	910,027	—	Annually	45-90 days
Multi-Strategy Funds	1,628,405	—	Monthly, semi-annually	30-90 days
<b>Total Hedge Funds</b>	<b>7,186,321</b>	<b>49,200</b>		
<b>Credit Strategies Funds:</b>				
Bank Loan and Direct Lending Funds	2,078,984	1,399,943		
Distressed Debt Funds	418,269	298,357		
Mezzanine Debt Funds	410,979	446,490		
Multi-Strategy Funds	720,251	1,360,522		
Opportunistic Funds	1,262,249	191,578		
<b>Total Credit Strategies Funds</b>	<b>4,890,732</b>	<b>3,696,890</b>		
<b>Private Equity Funds:</b>				
Buyout Funds	3,761,346	2,136,286		
Energy Funds	702,232	356,477		
Growth Funds	741,544	361,424		
International Buyout Funds	508,764	271,049		
Special Situations Funds	854,269	840,765		
Subordinated Debt Funds	52,410	55,783		
Turnaround Funds	428,041	210,111		
Venture Capital Funds	69,918	11,019		
<b>Total Private Equity Funds</b>	<b>7,118,524</b>	<b>4,242,914</b>		
<b>Equity International Commingled Funds</b>	<b>1,701,323</b>	<b>—</b>		
<b>Fixed-Income Mutual and Commingled Funds</b>	<b>1,339,359</b>	<b>—</b>		
<b>Real Estate and Real Asset Funds:</b>				
Infrastructure Funds	1,169,840	310,684		
Natural Resources Funds	595,604	100,070		
Private Investment Real Estate Funds	4,789,972	760,887		
Private Real Estate Investment Trusts	198,888	—		
<b>Total Real Estate and Real Asset Funds</b>	<b>6,754,304</b>	<b>1,171,641</b>		
<b>U.S. Equity Commingled Funds</b>	<b>145,427</b>	<b>—</b>		
<b>Total Investments Measured at the NAV</b>	<b>\$ 29,135,990</b>	<b>\$ 9,160,645</b>		

FIGURE 2.17: INVESTMENTS MEASURED AT THE NAV, cont.

AS OF 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	\$ 4,397,164	\$ —	Monthly, quarterly, semi-annually, annually	30-90 days
Equity Long-Only Funds	531,240	100,000	Quarterly	90 days
Credit Funds	847,548	—	Quarterly, annually	45-90 days
Multi-Strategy Funds	1,390,132	—	Monthly	30-90 days
Terminated Funds	26,631	—	n/a	n/a
<b>Total Hedge Funds</b>	<b>7,192,715</b>	<b>100,000</b>		
<b>Credit Strategies Funds:</b>				
Bank Loan and Direct Lending Funds	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>—</b>		
<b>Fixed-Income Mutual and Commingled Funds</b>	<b>1,115,182</b>	<b>—</b>		
<b>Real Estate and Real Asset Funds:</b>				
Infrastructure Funds	1,002,126	421,310		
Natural Resources Funds	452,604	108,144		
Private Investment Real Estate Funds	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>		

## 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 10 hedge funds at June 30, 2018, and 11 hedge funds at June 30, 2017, 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 57% 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, 2018.
- **Equity Long-Only Hedge Funds:** This type included an investment in one hedge fund at both June 30, 2018, and June 30, 2017, which invests in global long-only equity positions. This hedge fund is generally fully invested and only very occasionally may take short positions for hedging purposes. The fair value of the investment in this type has been determined using the NAV per share of the investments. Investments representing approximately 83% 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 remaining restriction period for these investments was less than 12 months at June 30, 2018.
- **Credit Hedge Funds:** This type included investments in two hedge funds at both June 30, 2018, and June 30, 2017, 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. Investments representing approximately 36% 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, 2018.
- **Multi-Strategy Hedge Funds:** This type included investments in five hedge funds at both June 30, 2018, and June 30, 2017, 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 42% 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, 2018.
- **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 10 institutional investment funds at June 30, 2018, which invest in international equities. These funds employ a variety of investment strategies in global developed and emerging 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 nine institutional investment funds that invest in U.S. and multi-national fixed income markets. 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, Private 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, 2018, 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, 2018:

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

AT JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

Investment Type	Weighted Average Effective Duration	Fair Value	Percent of Debt Securities
<b>Effective Duration:</b>			
Agencies	4.51	\$ 3,800,874	16.3%
Asset-Backed Securities	1.77	683,742	2.9%
Collateralized Mortgage Obligations	2.46	225,136	1.0%
Commercial Mortgages	4.27	333,072	1.4%
Commercial Paper	0.21	2,057,534	8.9%
Corporate Bonds and Notes	4.34	6,947,685	29.9%
Fixed-Income Commingled Funds	5.49	1,360,209	5.9%
Fixed-Income Derivatives	2.28	856	0.0%
Municipal Securities	6.81	128,429	0.6%
Mutual & Money Market Funds	5.87	165,340	0.7%
Negotiable Certificates of Deposit	0.22	1,079,512	4.6%
Supranational & Non-U.S. Government Bonds	5.47	2,112,151	9.1%
Time Deposits	0.01	106,000	0.5%
U.S. Government	6.06	3,941,422	17.0%
<b>No Effective Duration:</b>			
Mutual & Money Market Funds	N/A	113,974	0.5%
Corporate Bonds and Notes	N/A	98,279	0.4%
Commercial Paper	N/A	69,000	0.3%
Asset-Backed Securities	N/A	3,200	0.0%
Collateralized Mortgage Obligations	N/A	3,042	0.0%
Commercial Mortgages	N/A	1,950	0.0%
Fixed-Income Derivatives	N/A	1,808	0.0%
<b>Total Debt Securities</b>	<b>4.18</b>	<b>\$ 23,233,215</b>	<b>100.0%</b>

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, 2018, was reinvested in short-term cash equivalents that carry little interest rate risk as shown in Figure 2.19:

**FIGURE 2.19: SECURITIES LENDING COLLATERAL SUBJECT TO INTEREST RATE RISK**

AT JUNE 30

(EXPRESSED IN THOUSANDS)

Investment Type	Carrying Amount	Weighted Average Effective Duration
Corporate Bonds and Notes	\$ 3,008,071	0.07
Repurchase Agreements	66,394	0.01
Time Deposits	13,790	0.01
<b>Total*</b>	<b>\$ 3,088,255</b>	<b>0.05</b>

\* This figure does not include \$1,412,051 in equity repurchase agreements that are not subject to GASB 40 disclosure. The total of the investments in the securities lending collateral portfolio is \$4,500,306.

**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, 2018, the System's fixed-income assets that are not government-guaranteed represented 83% 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, 2018, are summarized in Figure 2.20.

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 2.21.



## FIGURE 2.20: CREDIT QUALITY AND EXPOSURE LEVELS OF NON-GOVERNMENT-GUARANTEED SECURITIES\*

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

Carrying Amount by Most Conservative Credit Rating – Moody's/S&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	\$ —	\$ 120,650	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 120,650
FHLMC	2,097	554,172	—	8,440	—	499	761,831	1,327,039
FNMA	—	1,140,211	—	—	—	4,260	1,216,931	2,361,402
Other Agencies	16,394	86,807	—	—	—	—	1,149	104,350
Short-Term Debt:								
Commercial Paper	—	—	109,752	—	2,015,185	—	1,597	2,126,534
Mutual and Money Market Funds	—	—	—	—	99,344	70,191	109,779	279,314
Negotiable Certificates of Deposit	—	57,798	30,000	—	144,511	—	847,203	1,079,512
Time Deposits	—	—	—	—	—	—	106,000	106,000
<b>Total U.S. Government and Short-Term Debt</b>	<b>18,491</b>	<b>1,959,638</b>	<b>139,752</b>	<b>8,440</b>	<b>2,259,040</b>	<b>74,950</b>	<b>3,044,490</b>	<b>7,504,801</b>
Long-Term Debt								
Asset-Backed Securities	350,883	22,988	90,677	16,929	—	180,587	24,878	686,942
Collateralized Mortgage Obligations	5,473	—	2,047	—	—	62,587	57,325	127,432
Commercial Mortgages	283,134	—	—	2,791	—	31,725	5,551	323,201
Corporate Bonds and Notes	61,466	193,315	1,325,659	2,306,590	—	1,549,400	1,609,534	7,045,964
Fixed-Income Commingled Funds	—	—	—	—	—	—	1,360,209	1,360,209
Fixed-Income Derivatives and Swaps	—	—	—	—	—	—	2,664	2,664
Municipal Securities	10,649	117,780	—	—	—	—	—	128,429
Supranational and Non-U.S. Government Bonds	136,419	71,992	232,777	525,182	—	1,082,499	63,282	2,112,151
<b>Total Long-Term Debt</b>	<b>848,024</b>	<b>406,075</b>	<b>1,651,160</b>	<b>2,851,492</b>	<b>—</b>	<b>2,906,798</b>	<b>3,123,443</b>	<b>11,786,992</b>
<b>Total</b>	<b>\$ 866,515</b>	<b>\$ 2,365,713</b>	<b>\$ 1,790,912</b>	<b>\$ 2,859,932</b>	<b>\$ 2,259,040</b>	<b>\$ 2,981,748</b>	<b>\$ 6,167,933</b>	<b>\$ 19,291,793</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.

## FIGURE 2.21: 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, AAA/Am/F**	Unrated	Totals
Corporate Bonds and Notes	\$ 927,639	\$ 1,713,448	\$ 366,984	\$ —	\$ 3,008,071
Repurchase Agreements	—	—	—	66,394	66,394
Time Deposits	—	—	13,790	—	13,790
<b>Total*</b>	<b>\$ 927,639</b>	<b>\$ 1,713,448</b>	<b>\$ 380,774</b>	<b>\$ 66,394</b>	<b>\$ 3,088,255</b>

\* This figure does not include \$1,412,051 in equity repurchase agreements that are not subject to GASB 40 disclosure. The total of the investments in the securities lending collateral portfolio is \$4,500,306.

- 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, 2018, 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, 2018, is highlighted in Figure 2.22.

## FIGURE 2.22: CURRENCY EXPOSURES BY ASSET CLASS

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

Currency	Cash and Short-term Investments	Equity	Fixed Income	Private Equity	Real Assets	International Funds	Forward Contracts	Total
U.S. Dollar	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 1,817,893	\$ —	\$ 1,817,893
Euro Currency Unit	62,068	2,099,833	25,370	721,896	279,686	—	(1,756,078)	1,432,775
Japanese Yen	(10,402)	2,082,082	—	—	2,302	236,099	(1,138,268)	1,171,813
Hong Kong Dollar	9,429	1,020,197	—	—	2,461	—	(194,132)	837,955
Pound Sterling	53,884	1,247,406	1,005	—	108,897	—	(600,072)	811,120
Canadian Dollar	(51,817)	885,255	—	—	47,455	—	(245,654)	635,239
Australian Dollar	10,003	561,177	—	—	5,529	—	45,442	622,151
South Korean Won	3,080	436,275	—	—	—	—	(3,532)	435,823
Swiss Franc	21,051	553,007	1,142	—	—	—	(266,376)	308,824
Indian Rupee	5,303	230,177	4,869	—	—	—	(6,875)	233,474
New Taiwan Dollar	409	223,841	—	—	—	—	(5,327)	218,923
South African Rand	1,543	163,400	67,655	—	197	—	(21,565)	211,230
Brazilian Real	1,262	154,253	85,021	—	2,901	—	(40,692)	202,745
Thai Baht	289	93,893	21,521	—	—	—	22,563	138,266
Turkish Lira	263	83,422	17,106	—	—	—	28,798	129,589
Indonesian Rupiah	1,321	42,780	63,973	—	—	—	1,160	109,234
Mexican Peso	1,292	37,280	29,049	—	1,827	—	39,772	109,220
New Zealand Dollar	220	19,909	—	—	1,328	—	87,155	108,612
Polish Zloty	617	28,744	50,817	—	1,390	—	13,760	95,328
Malaysian Ringgit	1,698	48,930	38,146	—	—	—	(6,418)	82,356
Russian Ruble (New)	68	18,239	46,762	—	—	—	13,948	79,017
Czech Koruna	182	1,736	1,158	—	—	—	55,509	58,585
Colombian Peso	952	3,147	39,140	—	—	—	8,583	51,822
Danish Krone	1,779	116,916	—	—	2,595	—	(70,595)	50,695
Hungarian Forint	628	9,750	38,060	—	—	—	(12,191)	36,247
Chilean Peso	565	16,061	9,560	—	—	—	6,205	32,391
Egyptian Pound	16,455	5,978	—	—	—	—	8,427	30,860
Peruvian Sol	44	103	31,886	—	—	—	(3,454)	28,579
Nigerian Naira	14,350	—	—	—	—	—	6,426	20,776
Israeli Shekel	115	36,825	25	—	1,838	—	(25,156)	13,647
Kazakhstan Tenge	—	—	7,217	—	—	—	2,578	9,795
Sri Lanka Rupee	—	—	5,987	—	—	—	—	5,987
UAE Dirham	113	5,996	—	—	—	—	(220)	5,889
Argentine Peso	2,373	—	5,424	—	—	—	(2,582)	5,215
Uruguayan Peso	—	—	3,968	—	—	—	—	3,968
Philippine Peso	148	8,256	—	—	—	—	(4,761)	3,643
Qatari Riyal	210	3,305	—	—	—	—	—	3,515
Dominican Republic Peso	—	—	3,032	—	—	—	—	3,032
Ghanaian Cedi	—	—	2,226	—	—	—	—	2,226
Moroccan Dirham	1	—	—	—	—	—	—	1
Romanian Leu	—	—	9,189	—	—	—	(9,682)	(493)
Saudi Arabian Riyal	—	—	—	—	—	—	(1,373)	(1,373)
Omani Rial	—	—	—	—	—	—	(1,384)	(1,384)
Chinese R Yuan HK	—	—	—	—	—	—	(14,282)	(14,282)
Chinese Yuan Renminbi	5	5,172	—	—	—	—	(46,367)	(41,190)
Singapore Dollar	2,111	176,908	—	—	—	—	(255,722)	(76,703)
Swedish Krona	921	202,068	—	—	1,432	—	(284,526)	(80,105)
Norwegian Krone	1,136	133,912	—	—	1,467	—	(222,619)	(86,104)
<b>Total</b>	<b>\$ 153,669</b>	<b>\$ 10,756,233</b>	<b>\$ 609,308</b>	<b>\$ 721,896</b>	<b>\$ 461,305</b>	<b>\$ 2,053,992</b>	<b>\$(4,899,577)</b>	<b>\$ 9,856,826</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 18 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, 2018 and 2017, was \$8,248,549,000 and \$8,069,337,000, respectively. The June 30, 2018 and 2017, balances were composed of U.S. government and agency securities of \$2,595,048,000 and \$2,541,872,000, respectively; corporate and other bonds of \$1,064,400,000 and \$1,554,588,000, respectively; common and preferred stocks of \$4,520,907,000 and \$3,827,747,000, respectively; and supranational and non-U.S. government bonds of \$68,194,000 and \$145,130,000, respectively.

The value of collateral (cash and non-cash) at June 30, 2018 and 2017, was \$8,773,115,000 and \$8,519,839,000, 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, 2018, the invested cash collateral had a cost of \$4,500,306,000 and was composed of time deposits of \$13,790,000, floating rate notes of \$3,008,070,000, and repurchase agreements of \$1,478,446,000.

**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, 2018 and 2017, included (1) receivables for deposits with brokers for securities sold short of \$731,714,000 and \$619,864,000, respectively; and (2) payables for securities sold short and not covered with fair values of \$663,743,000 and \$610,426,000, 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 2.27. 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 2.24. The System's investments in derivative instruments at June 30, 2018, are summarized in Figure 2.23.

**FIGURE 2.23: DERIVATIVE INSTRUMENTS SUMMARY**

(EXPRESSED IN THOUSANDS)

Investment	Net Appreciation/ (Depreciation) in Fair Value for the Fiscal Year Ended June 30, 2018		Fair Value June 30, 2018		
	Derivatives (by Type)	Amount	Classification	Amount	Notional (Dollars)
Commodity Futures Short	\$	66	Debt Securities	\$ 66	\$ (5,201)
Credit Default Swaps Bought		1,237	Debt Securities	1,347	26,129
Credit Default Swaps Written		(1,357)	Debt Securities	(2,223)	125,216
Fixed-Income Futures Long		2,143	Debt Securities	2,871	2,793,558
Fixed-Income Futures Short		(2,342)	Debt Securities	(3,036)	(572,771)
Foreign Currency Futures Short		(51)	Equity Securities	—	—
Foreign Currency Options Bought		(326)	Equity Securities	—	—
Foreign Currency Options Written		(140)	Equity Securities	(193)	(4,700)
FX Forwards		43,726	Investment Sales/Purchases	24,384	4,961,713
Index Futures Long		(23,231)	Equity Securities	(25,522)	1,147,192
Index Futures Short		186	Equity Securities	186	(37,282)
Pay Fixed-Interest Rate Swaps		2,169	Debt Securities	2,144	406,819
Receive Fixed-Interest Rate Swaps		(4,822)	Debt Securities	(3,662)	380,125
Swaptions Written		(4)	Equity Securities	(4)	(25,300)
Total Return Bond Index Swaps		(355)	Debt Securities	(355)	85,000
Total Return Equity Index Swaps		(1,435)	Equity Securities	1,014	331,323
<b>Total</b>	<b>\$</b>	<b>15,464</b>		<b>\$ (2,983)</b>	

**FIGURE 2.24: DERIVATIVE INSTRUMENTS SUBJECT TO INTEREST RATE RISK**

(EXPRESSED IN THOUSANDS)

Investment Type	Fair Value June 30, 2018	Investment Maturities (in years)			
		Under-1	1-5	6-10	Greater than 10
Credit Default Swaps Bought	\$ 1,347	\$ —	\$ 1,347	\$ —	\$ —
Credit Default Swaps Written	(2,223)	207	(2,430)	—	—
Pay Fixed Interest Rate Swaps	2,144	(41)	1,560	561	64
Receive Fixed Interest Rate Swaps	(3,662)	49	(1,080)	(1,897)	(734)
Total Return Bond Index Swaps	(355)	(355)	—	—	—
Total Return Equity Index Swaps	1,020	1,020	—	—	—
<b>Total</b>	<b>\$ (1,729)</b>	<b>\$ 880</b>	<b>\$ (603)</b>	<b>\$ (1,336)</b>	<b>\$ (670)</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, 2018, is shown in Figure 2.23.

**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, 2018, is shown in Figures 2.23 and 2.25.

## FIGURE 2.25: CURRENCY FORWARDS

AS OF JUNE 30

(EXPRESSED IN THOUSANDS)

Currency	Cost	Pending Foreign Exchange Purchases	Pending Foreign Exchange Sales	Fair Value 2018	Fair Value 2017
Argentine Peso	\$ (3,792)	\$ 12,891	\$ (14,471)	\$ (1,580)	\$ 17,266
Australian Dollar	58,570	496,520	(447,313)	49,207	(430,192)
Brazilian Real	(45,733)	32,189	(76,429)	(44,240)	11,075
British Pound Sterling	(615,634)	496,973	(1,110,214)	(613,241)	(668,106)
Canadian Dollar	(232,624)	382,439	(622,207)	(239,768)	(406,373)
Chilean Peso	6,594	24,875	(18,670)	6,205	10,231
Chinese Yuan Renminbi	(47,475)	22,641	(69,008)	(46,367)	(27,930)
Chinese Yuan Renminbi HK	(14,360)	—	(14,282)	(14,282)	—
Colombian Peso	9,585	23,464	(14,013)	9,451	16,850
Czech Koruna	54,635	54,518	(636)	53,882	77,499
Danish Krone	(71,444)	46,331	(117,549)	(71,218)	(76,162)
Egyptian Pound	8,507	16,392	(7,965)	8,427	(550)
Euro Currency Unit	(1,839,349)	411,921	(2,228,669)	(1,816,748)	(1,610,420)
Hong Kong Dollar	(181,404)	4,492	(185,938)	(181,446)	(176,325)
Hungarian Forint	(13,061)	8,047	(20,239)	(12,192)	(57,807)
Indian Rupee	(6,056)	2,085	(8,096)	(6,011)	114,256
Indonesian Rupiah	3,421	11,290	(7,775)	3,515	66,146
Israeli Shekel	(25,443)	11,372	(36,761)	(25,389)	(32,378)
Japanese Yen	(1,152,541)	234,795	(1,385,756)	(1,150,961)	(804,122)
Kazakhstan Tenge	2,618	2,578	—	2,578	—
Malaysian Ringgit	(795)	900	(1,687)	(787)	4,337
Mexican Peso	40,736	45,672	(4,712)	40,960	119,485
New Taiwan Dollar	(2,147)	6,611	(8,739)	(2,128)	(25,013)
New Zealand Dollar	89,077	142,932	(56,899)	86,033	(81,318)
Nigerian Naira	6,099	7,802	(1,375)	6,427	—
Norwegian Krone	(225,073)	182,923	(405,384)	(222,461)	(148,076)
Omani Rial	(1,357)	1,672	(3,056)	(1,384)	—
Peruvian Sol	(3,445)	1,049	(4,503)	(3,454)	(28,050)
Philippine Peso	(8,262)	189	(8,388)	(8,199)	(13,496)
Polish Zloty	7,838	20,517	(13,357)	7,160	75,044
Romanian Leu	(10,302)	12,183	(21,864)	(9,681)	(2,740)
Russian Ruble (New)	12,951	28,222	(15,334)	12,888	3,263
Saudi Arabia Riyal	(1,346)	3,216	(4,589)	(1,373)	—
Singapore Dollar	(258,171)	166,847	(420,195)	(253,348)	(106,695)
South African Rand	(21,011)	12,737	(34,104)	(21,367)	(16,904)
South Korean Won	(5,260)	—	(5,234)	(5,234)	(62,697)
Swedish Krona	(295,402)	177,401	(466,645)	(289,244)	(134,270)
Swiss Franc	(265,672)	59,115	(325,371)	(266,256)	(383,100)
Thai Baht	24,500	25,403	(1,813)	23,590	10,391
Turkish Lira	29,677	41,195	(11,122)	30,073	92,042
U.S. Dollar	4,992,352	8,205,463	(3,213,111)	4,992,352	4,655,497
<b>Total Forwards Subject to Foreign Currency Risk</b>				<b>\$ 24,389</b>	<b>\$ (19,342)</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, 2018, is shown in Figure 2.23.

**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 2018, 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, 2018, is shown in Figure 2.23, 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 2.26.



**FIGURE 2.26: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES**

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2018	Notional Amount
Interest Rate Swaps	Receive Fixed 1.81%, Pay Variable Israel 3-month TELBOR	\$ (68)	\$ 5,136
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.26%	16	26,909
Interest Rate Swaps	Receive Fixed 5.84%, Pay Variable 28-day MTIE	(106)	1,750
Interest Rate Swaps	Receive Variable 28-day MTIE, Pay Fixed 6.71%	96	900
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 9.50%	(69)	868
Interest Rate Swaps	Receive Fixed 6.080%, Pay Variable 28-day MTIE	(214)	1,928
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.50%	(8)	452
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 7.50%	(8)	2,714
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.25%	—	29
Interest Rate Swaps	Receive Fixed 1.50%, Pay Variable 3-month LIBOR	(842)	7,300
Interest Rate Swaps	Receive Fixed 1.75%, Pay Variable 3-month LIBOR	(625)	2,500
Interest Rate Swaps	Receive Fixed 8.28%, Pay Variable 28-day MTIE	1	1,262
Interest Rate Swaps	Receive Variable 28-day MTIE, Pay Fixed 7.15%	127	24,838
Interest Rate Swaps	Receive Fixed 8.31%, Pay Variable 28-day MTIE	14	3,373
Interest Rate Swaps	Receive Fixed 7.79%, Pay Variable 28-day MTIE	(8)	1,816
Interest Rate Swaps	Receive Fixed 8.32%, Pay Variable 28-day MTIE	44	3,215
Interest Rate Swaps	Receive Fixed 7.47%, Pay Variable 28-day MTIE	(1)	81
Interest Rate Swaps	Receive Fixed 10.30%, Pay Variable Brazil 1-day CDI	(54)	1,663
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.50%	—	10
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.75%	64	1,380
Interest Rate Swaps	Receive Fixed 9.76%, Pay Variable Brazil 1-day CDI	(108)	2,079
Interest Rate Swaps	Receive Fixed 9.3%, Pay Variable Brazil 1-day CDI	48	4,419
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.64%	73	4,211
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable 3-month LIBOR	(277)	10,230
Interest Rate Swaps	Receive Fixed 2.00%, Pay Variable 3-month LIBOR	90	8,800
Interest Rate Swaps	Receive Fixed 7.37%, Pay Variable 28-day MTIE	(121)	2,941
Interest Rate Swaps	Receive Fixed 7.32%, Pay Variable 28-day MTIE	(55)	1,231
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.98%	(61)	4,055
Interest Rate Swaps	Receive Variable 28-day MTIE, Pay Fixed 6.87%	141	5,815
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable Poland 6-month WIBOR	14	2,885
Interest Rate Swaps	Receive Fixed 7.75%, Pay Variable 3-month JIBAR	(182)	4,969
Interest Rate Swaps	Receive Fixed 10.33%, Pay Variable Brazil 1-day CDI	(201)	6,368
Interest Rate Swaps	Receive Fixed 10.46%, Pay Variable Brazil 1-day CDI	(46)	1,118
Interest Rate Swaps	Receive Fixed 2.00%, Pay Variable 3-month LIBOR	(191)	4,580
Interest Rate Swaps	Receive Fixed 2.50%, Pay Variable 3-month LIBOR	(168)	1,700
Interest Rate Swaps	Receive Fixed 7.83%, Pay Variable 28-day MTIE	(3)	1,531
Interest Rate Swaps	Receive Fixed 8.86%, Pay Variable Brazil 1-day CDI	(86)	12,564
Interest Rate Swaps	Receive Fixed 8.01%, Pay Variable 28-day MTIE	25	4,670
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 6.54%	1	3,457
Interest Rate Swaps	Receive Fixed 1.50%, Pay Variable Czech Krona 6-month PRIBOR	(26)	18,401
Interest Rate Swaps	Receive Fixed 2.00%, Pay Variable Czech Krona 6-month PRIBOR	18	3,994

FIGURE 2.26: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES, cont.

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2018	Notional Amount
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable Poland 6-month WIBOR	(218)	36,859
Interest Rate Swaps	Receive Fixed 3.25%, Pay Variable Poland 6-month WIBOR	77	2,698
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 7.65%	29	3,200
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 7.25%	—	15
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 8.14%	305	14,373
Interest Rate Swaps	Receive Fixed 2.50%, Pay Variable Poland 6-month WIBOR	1	6,223
Interest Rate Swaps	Receive Variable 6-month EURIBOR, Pay Fixed 1.5%	(11)	2,102
Interest Rate Swaps	Receive Fixed 3.00%, Pay Variable Poland 6-month WIBOR	1	187
Interest Rate Swaps	Receive Variable 6-month Hungary BUBOR, Pay Fixed 1.25%	430	9,818
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 7.06%	131	8,343
Interest Rate Swaps	Receive Fixed 7.88%, Pay Variable Brazil 1-day CDI	(446)	16,921
Interest Rate Swaps	Receive Fixed 9.97%, Pay Variable Brazil 1-day CDI	578	41,197
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.35%	(114)	49,280
Interest Rate Swaps	Receive Variable Czech Krona 6-month PRIBOR, Pay Fixed 2.0%	3	1,248
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 11.03%	(14)	1,248
Interest Rate Swaps	Receive Fixed 2.5%, Pay Variable Poland 6-month WIBOR	(29)	9,028
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable 6-month Hungary BUBOR	23	6,493
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 7.99%	(161)	31,437
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 8.69%	154	15,206
Interest Rate Swaps	Receive Fixed 7.64%, Pay Variable 28-day MTIIE	(90)	11,711
Interest Rate Swaps	Receive Fixed 8.70%, Pay Variable Brazil 1-day CDI	(54)	5,354
Interest Rate Swaps	Receive Fixed 7.53%, Pay Variable 28-day MTIIE	(45)	3,233
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.51%	(16)	2,917
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.09%	—	4,937
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.98%	—	4,870
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.27%	(70)	3,585
Interest Rate Swaps	Receive Fixed 9.48%, Pay Variable Brazil 1-day CDI	15	3,296
Interest Rate Swaps	Receive Fixed 9.5%, Pay Variable Brazil 1-day CDI	9	1,683
Interest Rate Swaps	Receive Fixed 9.10%, Pay Variable Brazil 1-day CDI	(32)	15,192
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 8.34%	229	13,195
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 8.34%	—	6,075
Interest Rate Swaps	Receive Fixed 9.32%, Pay Variable Brazil 1-day CDI	4	1,856
Interest Rate Swaps	Receive Fixed 9.35%, Pay Variable Brazil 1-day CDI	5	1,730
Interest Rate Swaps	Receive Fixed 9.34%, Pay Variable Brazil 1-day CDI	5	1,860
Interest Rate Swaps	Receive Fixed 9.20%, Pay Variable Brazil 1-day CDI	(3)	10,483
Interest Rate Swaps	Receive Fixed 2.78%, Pay Variable 6-month Thai Baht fixing rate	22	759
Interest Rate Swaps	Receive Fixed 12.23%, Pay Variable Brazil 1-day CDI	(35)	624
Interest Rate Swaps	Receive Fixed 2.10%, Pay Variable 6-month Thai Baht fixing rate	10	1,751
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 5.25%	(19)	560
Interest Rate Swaps	Receive Fixed 3.41%, Pay Variable 6-month Thai Baht fixing rate	6	151
Interest Rate Swaps	Receive Fixed 3.41%, Pay Variable 6-month Thai Baht fixing rate	6	151
Interest Rate Swaps	Receive Fixed 5.29%, Pay Variable 1-day Colombia IBR	13	1,372
Interest Rate Swaps	Receive Fixed 6.12%, Pay Variable 1-day Colombia IBR	15	810

FIGURE 2.26: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES, cont.

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2018	Notional Amount
Interest Rate Swaps	Receive Fixed 5.00%, Pay Variable 28-day MTIIE	(39)	972
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable 6-month Thai Baht fixing rate	6	344
Interest Rate Swaps	Receive Fixed 5.32%, Pay Variable 1-day Colombia IBR	2	204
Interest Rate Swaps	Receive Fixed 2.02%, Pay Variable 6-month Thai Baht fixing rate	5	573
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable 6-month Thai Baht fixing rate	7	459
Interest Rate Swaps	Receive Fixed 2.20%, Pay Variable 6-month Thai Baht fixing rate	4	353
Interest Rate Swaps	Receive Fixed 1.93%, Pay Variable 6-month Thai Baht fixing rate	6	1,176
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.26%	17	33,629
Interest Rate Swaps	Receive Fixed 1.81%, Pay Variable Israel 3-month TELBOR	(30)	2,322
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.65%	(3)	3,341
Interest Rate Swaps	Receive Fixed 4.95%, Pay Variable 1-day Colombia IBR	(2)	2,276
Interest Rate Swaps	Receive Fixed 4.81%, Pay Variable 1-day Colombia IBR	(149)	25,795
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.89%	92	20,769
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.25%	—	3,497
Interest Rate Swaps	Receive Fixed 3.54%, Pay Variable Chilean Peso 6-month CLICP	(29)	4,715
Interest Rate Swaps	Receive Variable Malaysian Ringgit 3-month KLIBOR, Pay Fixed 3.77%	9	3,169
Interest Rate Swaps	Receive Variable Malaysian Ringgit 3-month KLIBOR, Pay Fixed 3.74%	4	990
Interest Rate Swaps	Receive Variable Malaysian Ringgit 3-month KLIBOR, Pay Fixed 3.76%	6	1,733
Interest Rate Swaps	Receive Variable Chilean Peso 6-month CLICP, Pay Fixed 3.57%	2	229
Interest Rate Swaps	Receive Fixed 3.54%, Pay Variable Chilean Peso 6-month CLICP	(15)	1,524
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.22%	50	34,640
Interest Rate Swaps	Receive Fixed 1.72%, Pay Variable Israel 3-month TELBOR	(157)	7,075
Interest Rate Swaps	Receive Fixed 4.96%, Pay Variable 1-day Colombia IBR	(22)	20,770
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.64%	124	9,227
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.65%	147	14,148
Interest Rate Swaps	Receive Fixed 5.31%, Pay Variable 1-day Colombia IBR	(9)	1,020
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 12.7%	(567)	4,208
Interest Rate Swaps	Receive Fixed 6.2%, Pay Variable 1-day Colombia IBR	6	241
Interest Rate Swaps	Receive Fixed 2.505%, Pay Variable 6-month Thai Baht fixing rate	6	486
Interest Rate Swaps	Receive Fixed 2.04%, Pay Variable 6-month Thai Baht fixing rate	19	2,264
Interest Rate Swaps	Receive Fixed 2.20%, Pay Variable 6-month Thai Baht fixing rate	1	54
Interest Rate Swaps	Receive Fixed 2.55%, Pay Variable 6-month Thai Baht fixing rate	6	936
Interest Rate Swaps	Receive Fixed 1.99%, Pay Variable 6-month Thai Baht fixing rate	(1)	220
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.00%	501	12,220
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.25%	636	10,750
Interest Rate Swaps	Receive Variable 6-month EURIBOR, Pay Fixed 0.50%	(31)	3,386
Interest Rate Swaps	Receive Variable 6-month EURIBOR, Pay Fixed 1.25%	(86)	2,685
Interest Rate Swaps	Receive Fixed 0.5%, Pay Variable 6-month EURIBOR	13	2,218
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 5.25%	(5)	153
<b>Subtotal Interest Rate Swaps</b>		<b>\$ (1,518)</b>	<b>\$ 786,944</b>

FIGURE 2.26: DERIVATIVE INSTRUMENTS HIGHLY SENSITIVE TO INTEREST RATE CHANGES, cont.

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2018	Notional Amount
Total Return Bond Index Swaps	Receive Variable IBOXHY Index/ Pay Variable 3-month LIBOR	\$ (355)	\$ 35,000
Total Return Bond Index Swaps	Receive Variable Barclays Capital U.S. Aggregate Index/ Pay Variable 1-month LIBOR + 16 bps	—	50,000
Total Return Equity Index Swaps	Receive Variable Canadian Dollar 3-month Bankers' Acceptances rate/ Pay Variable BCMSIMCB Index	54	8,033
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR + 10 bps/ Pay Variable BNPBDCON Index	81	1,899
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR + 25 bps/ Pay Variable BNPBMACH Index	71	1,230
Total Return Equity Index Swaps	Receive Variable AMZX Index/ Pay Variable 3-month LIBOR + 49 bps	(15)	1,500
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR - 3 bps/ Pay Variable BNPMSLX Index	127	3,019
Total Return Equity Index Swaps	Receive Variable BNPBLDEF Index/ Pay Variable 3-month LIBOR + 35 bps	77	4,992
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR + 25 bps/ Pay Variable BNPBSCYC Index	163	4,989
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR + 14 bps/ Pay Variable M2USOBK Index	309	12,008
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR - 19 bps/ Pay Variable BNPBMHK1 Index	112	2,108
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR - 16 bps/ Pay Variable BNPBMSLX Index	(17)	1,659
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 34 bps	—	3
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 34 bps	(5)	200,080
Total Return Equity Index Swaps	Receive Variable MIMUJPNN Index/ Pay Variable 3-month LIBOR + 8 bps	—	17,000
Total Return Equity Index Swaps	Receive Variable MIMUUKGN Index/ Pay Variable 3-month LIBOR + 10 bps	—	12,160
Total Return Equity Index Swaps	Receive Variable MIMUUSAG Index/ Pay Variable 3-month LIBOR + 10 bps	(5)	34,691
Total Return Equity Index Swaps	Receive Variable NDUUEGF Index/ Pay Variable 3-month LIBOR + 6 bps	—	23,360
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR + 25 bps/ Pay Variable BCMSELE2 Index	10	743
Total Return Equity Index Swaps	Receive Variable 3-month LIBOR + 13 bps/ Pay Variable GSCBMSMS Index	52	1,849
<b>Subtotal Total Return Swaps</b>		<b>\$ 659</b>	<b>\$ 416,323</b>
<b>TOTAL</b>		<b>\$ (859)</b>	<b>\$ 1,203,267</b>

## FIGURE 2.27: DERIVATIVE INSTRUMENTS SUBJECT TO COUNTERPARTY CREDIT RISK

AT JUNE 30, 2018

Counterparty	Percentage of Net Exposure	Moody's Ratings	S & P Ratings	Fitch Ratings
UBS AG/Stamford CT	40.48%	—	AA-	—
Morgan Stanley Capital Services LLC	31.84%	—	A+	—
Goldman Sachs International	11.92%	A1	A+	A
BNP Paribas Securities Corp.	6.42%	—	A	—
JPMorgan Chase Bank NA	2.86%	Aa3	A+	AA
LCH Ltd.	2.46%	—	A+	—
HSBC Bank USA NA/New York, NY	1.49%	Aa2	AA-	AA-
Credit Suisse AG	0.71%	A1	A	A
BNP Paribas SA/London	0.64%	—	A	—
Goldman Sachs Bank USA/New York, NY	0.62%	A1	A+	A+
Citigroup Global Markets Ltd.	0.47%	A2	A+	A
Barclays Capital Inc.	0.09%	—	A	—
<b>Total</b>	<b>100%</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 2018 are summarized in Figure 2.28.

**FIGURE 2.28: ASSET ALLOCATION**

FOR THE YEAR ENDED JUNE 30, 2018

Asset Class (Strategy)	Target Allocation	Arithmetic Long-Term Expected Rate of Return	Weighted Average Long-Term Expected Rate of Return*
Public Equity	40%	4.54%	1.82%
Fixed Income	15%	0.69%	0.10%
Credit Strategies	15%	3.96%	0.59%
Real Assets	15%	5.76%	0.86%
Private Equity	15%	9.53%	1.43%
<b>Total</b>	<b>100%</b>		<b>4.80%</b>
		Inflation	2.50%
		<b>* Expected arithmetic nominal return</b>	<b>7.30%</b>

\* 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, 2018, and

the changes by category from the prior fiscal year-end are presented in Figure 2.29.

**FIGURE 2.29: PROPERTY, PLANT, FURNITURE, EQUIPMENT AND INTANGIBLE ASSETS**

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	Balance June 30, 2017	Increases	Decreases	Balance June 30, 2018
<b>Non-Depreciable Capital Assets:</b>				
Land	\$ 1,368	\$ —	\$ —	\$ 1,368
Construction in progress	15,374	10,940	139	26,175
<b>Total Non-Depreciable Capital Assets</b>	<b>16,742</b>	<b>10,940</b>	<b>139</b>	<b>27,543</b>
<b>Depreciable Capital and Intangible Assets:</b>				
Building	4,632	—	—	4,632
Furniture and Equipment	7,082	246	304	7,024
Intangible Assets	35,243	139	—	35,382
<b>Total Depreciable Capital Assets</b>	<b>46,957</b>	<b>385</b>	<b>304</b>	<b>47,038</b>
<b>Less Accumulated Depreciation:</b>				
Building	2,200	116	—	2,316
Furniture and Equipment	5,318	364	254	5,428
Intangible Assets	20,821	5,140	—	25,961
<b>Total Accumulated Depreciation</b>	<b>28,339</b>	<b>5,620</b>	<b>254</b>	<b>33,705</b>
<b>Total Depreciable Capital Assets – Net</b>	<b>18,618</b>	<b>(5,235)</b>	<b>50</b>	<b>13,333</b>
<b>Total Net Capital Assets</b>	<b>\$ 35,360</b>	<b>\$ 5,705</b>	<b>\$ 189</b>	<b>\$ 40,876</b>

Depreciation expense amounted to \$5,620,000 and \$5,395,000 in 2018 and 2017, 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, 2018, was \$2,738,000. The System's total future minimum rental payments as of June 30, 2018, are presented in Figure 2.30.

**FIGURE 2.30: OPERATING LEASES – FUTURE PAYMENTS**

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

Year	Amount
2019	\$ 1,337
2020	1,379
2021	1,423
2022	1,466
2023	1,510
2024	1,555
<b>Total Future Minimum Rental Payments</b>	<b>\$ 8,670</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 years ended June 30, 2018 and 2017.

There were approximately 56,980 state retirees, including System retirees, at June 30, 2018. Note 2.B provides information on the state's contribution toward funding the defined benefit plan for state employees for fiscal year 2018 and fiscal year 2017. The System's contribution requirement for its employees for fiscal year 2018 and fiscal year 2017 was \$3,782,000 and \$3,584,000, 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 years ended June 30, 2018 and 2017, was 1.31% of covered payroll. There were approximately 101,039 active state employees and 54,352 state retirees, including System employees and retirees, eligible for group life insurance coverage at June 30, 2018. The System's contribution requirement for its employees and retirees for fiscal year 2018 and fiscal year 2017 was \$388,000 and \$365,000, respectively.
- The state's contribution requirement for the Retiree Health Insurance Credit Program for the year ended June 30, 2018 and 2017, was 1.18% of covered payroll. There were approximately 46,959 state retirees, including System retirees, receiving the health insurance credit at June 30, 2018. The System's contribution requirement for its employees for fiscal year 2018 and fiscal year 2017 was \$350,000 and \$328,000, respectively.



- The state's contribution requirement for the Virginia Sickness and Disability Program (VSDP) for the years ended June 30, 2018, and June 30, 2017, was 0.66%. There were approximately 78,183 state employees, including System employees, enrolled in VSDP at June 30, 2018. The System's contribution requirement for its employees for fiscal year 2018 and fiscal year 2017 was \$191,000 and \$179,000, 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, 2018. 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 2018 and the three preceding fiscal years.

## 11. Commitments

The System extends investment commitments in the normal course of business. At June 30, 2018 and 2017, these commitments amounted to \$13,575,895,000 and \$11,622,731,000, respectively.

## 12. Statutory Contribution Adjustment

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.

For fiscal year 2018, the employer retirement contribution rate for state employees was 13.49% and the employer retirement contribution rate for teachers was 16.32%. The rates for both of these groups was 100% of the adjusted actuarially determined rate. 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 2018, 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 rate for Group Life Insurance was 1.31%, the rate for the Retiree Health Insurance Credit Program for state employees was 1.18% and the rate for the Retiree Health Insurance Credit Program for teachers was 1.23% to 1.11% of covered payroll. The rate for VSDP was 0.66%, and the rates for VLDP for teachers and political subdivision employers were 0.31% and 0.60% of covered payroll, respectively.

Contributions to the VRS-administered other post-employment programs, with the exception of the Group Life Insurance program, are fully paid by the employer. The Group Life Insurance Program has a total contribution rate which is allocated into an employee and an employer component using a 60/40 split. For fiscal year 2017 and fiscal year 2018, the split yields an employee contribution rate of 0.79% of covered payroll and an employer contribution rate of 0.52% of covered payroll. Employers may elect to pay all or part of the employee contribution; however, the employer must pay all of the employer contribution.

**REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY:  
VIRGINIA RETIREMENT SYSTEM – STATE**

(EXPRESSED IN THOUSANDS)

	<b>VRS State</b>				
	2018	2017	2016	2015	2014
<b>Total pension liability:</b>					
Service cost	\$ 375,965	\$ 370,235	\$ 369,779	\$ 375,149	\$ 369,120
Interest	1,606,772	1,562,819	1,533,764	1,482,951	1,436,064
Benefit changes	—	—	—	—	—
Difference between actual and expected experience	(327,289)	(85,975)	(245,642)	59,923	—
Assumption changes	—	76,965	—	—	—
Benefit payments	(1,296,803)	(1,234,388)	(1,195,198)	(1,136,102)	(1,081,866)
Refunds of contributions	(30,236)	(30,837)	(25,240)	(27,724)	(25,036)
Net change in total pension liability	328,409	658,819	437,463	754,197	698,282
<b>Total pension liability – beginning</b>	<b>23,617,412</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>\$ 23,945,821</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	\$ 548,158	\$ 535,424	\$ 722,617	\$ 480,657	\$ 343,259
Contributions – member	201,920	201,391	200,184	195,582	198,035
Net investment income	1,302,241	1,963,811	277,166	728,083	2,243,999
Benefit payments	(1,296,803)	(1,234,388)	(1,195,198)	(1,136,102)	(1,081,866)
Refunds of contributions	(30,236)	(30,837)	(25,240)	(27,724)	(25,036)
Administrative expense	(11,481)	(11,612)	(10,140)	(10,302)	(12,341)
Other	28,502	(1,743)	(122)	(154)	123
Net change in plan fiduciary net position	742,301	1,422,046	(30,733)	230,040	1,666,173
<b>Plan fiduciary net position – beginning</b>	<b>17,789,888</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>\$ 18,532,189</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>\$ 5,413,632</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)	77.39%	75.33%	71.29%	72.81%	74.28%
Covered payroll (c)	\$ 4,152,368	\$ 4,020,893	\$ 3,977,759	\$ 3,878,632	\$ 3,861,712
Net pension liability as a percentage of covered payroll ((a-b)/c)	130.37%	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:  
VIRGINIA RETIREMENT SYSTEM – TEACHER**

(EXPRESSED IN THOUSANDS)

	<b>VRS Teacher</b>				
	2018	2017	2016	2015	2014
<b>Total pension liability:</b>					
Service cost	\$ 885,510	\$ 830,475	\$ 828,856	\$ 828,901	\$ 831,501
Interest	3,099,338	3,016,207	2,931,065	2,834,138	2,722,788
Benefit changes	—	—	—	—	—
Difference between actual and expected experience	(440,308)	(642,745)	(391,881)	(212,089)	—
Assumption changes	—	218,559	—	—	—
Benefit payments	(2,241,927)	(2,147,781)	(2,081,069)	(1,980,353)	(1,874,636)
Refunds of contributions	(40,578)	(39,521)	(35,067)	(36,058)	(36,103)
Net change in total pension liability	1,262,035	1,235,194	1,251,904	1,434,539	1,643,550
<b>Total pension liability – beginning</b>	<b>45,417,520</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>\$ 46,679,555</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	\$ 1,292,988	\$ 1,137,976	\$ 1,062,338	\$ 1,267,250	\$ 853,634
Contributions – member	391,490	392,730	380,314	373,525	371,241
Net investment income	2,421,157	3,632,291	516,704	1,327,047	4,042,441
Benefit payments	(2,241,927)	(2,147,781)	(2,081,069)	(1,980,353)	(1,874,636)
Refunds of contributions	(40,578)	(39,521)	(35,067)	(36,058)	(36,103)
Administrative expense	(20,945)	(21,123)	(18,859)	(18,238)	(22,036)
Other	(2,167)	(3,238)	(222)	(284)	217
Net change in plan fiduciary net position	1,800,018	2,951,334	(175,861)	932,889	3,334,758
<b>Plan fiduciary net position – beginning</b>	<b>33,119,545</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>\$ 34,919,563</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>\$ 11,759,992</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)	74.81%	72.92%	68.28%	70.68%	70.88%
Covered payroll (c)	\$ 8,086,986	\$ 7,891,783	\$ 7,624,612	\$ 7,434,932	\$ 7,313,025
Net pension liability as a percentage of covered payroll ((a-b)/c)	145.42%	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:  
VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS**

(EXPRESSED IN THOUSANDS)

	<b>VRS Political Subdivisions</b>				
	2018	2017	2016	2015	2014
<b>Total pension liability:</b>					
Service cost	\$ 544,762	\$ 541,594	\$ 535,322	\$ 530,945	\$ 524,758
Interest	1,472,680	1,422,753	1,362,892	1,309,484	1,243,386
Benefit changes	10,811	36,652	2,053	1,135	—
Difference between actual and expected experience	(43,177)	(205,649)	(87,268)	(185,419)	—
Assumption changes	—	(64,510)	—	—	—
Benefit payments	(1,010,021)	(941,856)	(893,585)	(819,201)	(754,706)
Refunds of contributions	(41,324)	(42,068)	(37,380)	(36,898)	(36,876)
Net change in total pension liability	933,731	746,916	882,034	800,046	976,562
<b>Total pension liability – beginning</b>	<b>21,564,004</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>\$ 22,497,735</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	\$ 490,286	\$ 477,563	\$ 543,947	\$ 533,877	\$ 539,366
Contributions – member	241,339	238,636	231,934	227,060	225,555
Net investment income	1,415,454	2,113,973	300,995	761,164	2,272,284
Benefit payments	(1,010,021)	(941,856)	(893,585)	(819,201)	(754,706)
Refunds of contributions	(41,324)	(42,068)	(37,380)	(36,898)	(36,876)
Administrative expense	(12,236)	(12,220)	(10,696)	(10,358)	(12,153)
Other	(30,924)	(1,887)	(130)	(162)	120
Net change in plan fiduciary net position	1,052,574	1,832,141	135,085	655,482	2,233,590
<b>Plan fiduciary net position – beginning</b>	<b>19,250,247</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>\$ 20,302,821</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>\$ 2,194,914</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)	90.24%	89.27%	83.67%	86.70%	86.90%
Covered payroll (c)	\$ 4,932,344	\$ 4,765,842	\$ 4,628,806	\$ 4,513,335	\$ 4,434,764
Net pension liability as a percentage of covered payroll ((a-b)/c)	44.50%	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:  
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)**

(EXPRESSED IN THOUSANDS)

	<b>SPORS</b>				
	2018	2017	2016	2015	2014
<b>Total pension liability:</b>					
Service cost	\$ 18,187	\$ 18,880	\$ 18,700	\$ 18,847	\$ 18,341
Interest	71,251	74,042	72,618	70,350	67,978
Benefit changes	—	—	—	—	—
Difference between actual and expected experience	(7,248)	(5,327)	(14,711)	(2,890)	—
Assumption changes	—	(68,707)	—	—	—
Benefit payments	(58,197)	(57,814)	(53,515)	(53,338)	(50,467)
Refunds of contributions	(867)	(630)	(584)	(375)	(685)
Net change in total pension liability	23,126	(39,556)	22,508	32,594	35,167
<b>Total pension liability – beginning</b>	<b>1,047,402</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>\$ 1,070,528</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	\$ 35,806	\$ 31,888	\$ 33,655	\$ 28,427	\$ 42,683
Contributions – member	6,311	5,701	5,759	5,680	5,646
Net investment income	58,148	87,265	12,634	32,466	98,682
Benefit payments	(58,197)	(57,814)	(53,515)	(53,338)	(50,467)
Refunds of contributions	(867)	(630)	(584)	(375)	(685)
Administrative expense	(509)	(926)	(590)	(471)	(431)
Other	(63)	(99)	(23)	(27)	—
Net change in plan fiduciary net position	40,629	65,385	(2,664)	12,362	95,428
<b>Plan fiduciary net position – beginning</b>	<b>796,073</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>\$ 836,702</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>\$ 233,826</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)	78.16%	76.00%	67.22%	68.89%	69.87%
Covered payroll (c)	\$ 124,003	\$ 111,395	\$ 114,395	\$ 110,059	\$ 112,010
Net pension liability as a percentage of covered payroll ((a-b)/c)	188.56%	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:  
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)**

(EXPRESSED IN THOUSANDS)

	<b>VaLORS</b>				
	2018	2017	2016	2015	2014
<b>Total pension liability:</b>					
Service cost	\$ 45,179	\$ 47,189	\$ 45,608	\$ 47,531	\$ 46,504
Interest	136,289	135,453	129,756	124,579	119,040
Benefit changes	—	—	—	—	—
Difference between actual and expected experience	(26,111)	(1,457)	4,997	(4,849)	—
Assumption changes	—	(63,457)	—	—	—
Benefit payments	(104,776)	(96,224)	(92,270)	(84,990)	(78,412)
Refunds of contributions	(5,604)	(4,938)	(4,524)	(4,797)	(4,665)
Net change in total pension liability	44,977	16,566	83,567	77,474	82,467
<b>Total pension liability – beginning</b>	<b>2,002,184</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>\$ 2,047,161</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	\$ 73,793	\$ 73,816	\$ 79,392	\$ 62,084	\$ 67,483
Contributions – member	17,496	17,598	17,574	17,081	17,908
Net investment income	98,292	146,039	20,899	52,312	156,786
Benefit payments	(104,776)	(96,224)	(92,270)	(84,990)	(78,412)
Refunds of contributions	(5,604)	(4,938)	(4,524)	(4,797)	(4,665)
Administrative expense	(861)	(1,540)	(940)	(743)	(681)
Other	(247)	(310)	(38)	(44)	—
Net change in plan fiduciary net position	78,093	134,441	20,093	40,903	158,419
<b>Plan fiduciary net position – beginning</b>	<b>1,345,887</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>\$ 1,423,980</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>\$ 623,181</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)	69.56%	67.22%	61.01%	62.64%	63.05%
Covered payroll (c)	\$ 345,531	\$ 344,468	\$ 345,504	\$ 338,562	\$ 352,492
Net pension liability as a percentage of covered payroll ((a-b)/c)	180.35%	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:  
JUDICIAL RETIREMENT SYSTEM**

(EXPRESSED IN THOUSANDS)

	<b>JRS</b>				
	2018	2017	2016	2015	2014
<b>Total pension liability:</b>					
Service cost	\$ 19,228	\$ 22,144	\$ 21,978	\$ 23,254	\$ 24,024
Interest	43,799	42,081	42,820	41,759	40,013
Benefit changes	—	—	(15,552)	—	—
Difference between actual and expected experience	(15,786)	(14,774)	(18,681)	(9,107)	—
Assumption changes	—	16,114	—	—	—
Benefit payments	(41,165)	(40,895)	(41,341)	(40,205)	(37,984)
Refunds of contributions	—	—	—	—	—
Net change in total pension liability	6,076	24,670	(10,776)	15,701	26,053
<b>Total pension liability – beginning</b>	<b>646,275</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>\$ 652,351</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	\$ 28,096	\$ 27,612	\$ 41,502	\$ 31,503	\$ 27,727
Contributions – member	3,231	3,272	3,236	3,015	3,051
Net investment income	37,466	56,029	8,112	20,051	60,833
Benefit payments	(41,165)	(40,895)	(41,341)	(40,205)	(37,984)
Refunds of contributions	—	—	—	—	—
Administrative expense	(326)	(594)	(363)	(283)	(268)
Other	(42)	(64)	(15)	(17)	—
Net change in plan fiduciary net position	27,260	45,360	11,131	14,064	53,359
<b>Plan fiduciary net position – beginning</b>	<b>512,749</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>\$ 540,009</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>\$ 112,342</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)	82.78%	79.34%	75.19%	72.15%	71.71%
Covered payroll (c)	\$ 68,245	\$ 66,826	\$ 66,621	\$ 61,092	\$ 61,020
Net pension liability as a percentage of covered payroll ((a-b)/c)	164.62%	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					
2018	\$ 560,154	\$ 560,154	\$ —	\$ 4,152,368	13.49%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER					
2018	\$ 1,319,796	\$ 1,319,796	\$ —	\$ 8,086,986	16.32%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS					
2018	\$ 504,955	\$ 505,603	\$ (648)	\$ 4,932,344	10.25%
2017	487,067	487,702	(635)	4,765,842	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%

## 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>					
2018	\$ 35,391	\$ 35,391	\$ —	\$ 124,003	28.54%
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%
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>					
2018	\$ 72,734	\$ 72,734	\$ —	\$ 345,531	21.05%
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%
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>					
2018	\$ 28,642	\$ 28,642	\$ —	\$ 68,245	41.97%
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%

## REQUIRED SUPPLEMENTAL SCHEDULE OF INVESTMENT RETURNS

	VRS Pooled Asset Portfolio*				
	2018	2017	2016	2015	2014**
Annual money-weighted rate of return, net of investment expense	7.57%	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 OTHER POST-EMPLOYMENT BENEFIT (OPEB) LIABILITY AND RELATED RATIOS**

(EXPRESSED IN THOUSANDS)

	Group Life Insurance Fund		Disability Insurance Trust Fund		Virginia Local Disability Program	
	2018	2017	2018	2017	Teachers 2018	Teachers 2017
Change in the Net OPEB Liability						
<b>Total OPEB liability:</b>						
Service cost	\$ 84,355	\$ 81,479	\$ 27,527	\$ 27,884	\$ 668	\$ 389
Interest	198,960	201,770	15,503	15,810	57	29
Changes in benefit terms	—	—	—	—	—	—
Difference between actual and expected experience	88,052	(39,461)	(11,237)	—	(66)	—
Changes of assumptions	—	(91,738)	—	(17,511)	—	53
Benefit payments	(200,285)	(184,092)	(31,073)	(30,056)	(127)	(36)
Net change in total OPEB liability	171,082	(32,042)	720	(3,873)	532	435
<b>Total OPEB liability – beginning</b>	<b>2,942,426</b>	<b>2,974,468</b>	<b>237,013</b>	<b>240,886</b>	<b>873</b>	<b>438</b>
<b>Total OPEB liability – ending (a)</b>	<b>\$ 3,113,508</b>	<b>\$ 2,942,426</b>	<b>\$ 237,733</b>	<b>\$ 237,013</b>	<b>\$ 1,405</b>	<b>\$ 873</b>
<b>Plan fiduciary net position:</b>						
Contributions – employer	\$ 98,530	\$ 94,082	\$ 27,260	\$ 24,130	\$ 1,156	\$ 589
Contributions – member	150,402	146,002	—	—	—	—
Net investment income	110,917	158,430	32,073	48,206	29	—
Benefit payments	(200,285)	(184,092)	(31,073)	(30,056)	(127)	(36)
Third-party administrator charges	—	—	(6,637)	(7,001)	(794)	(484)
Administrative expense	(664)	(31)	(961)	(717)	(76)	(84)
Other	(1,713)	(1,731)	(35)	(54)	180	294
Net change in plan fiduciary net position	157,187	212,660	20,627	34,508	368	279
<b>Plan fiduciary net position – beginning</b>	<b>1,437,586</b>	<b>1,224,926</b>	<b>442,334</b>	<b>407,826</b>	<b>279</b>	<b>—</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 1,594,773</b>	<b>\$ 1,437,586</b>	<b>\$ 462,961</b>	<b>\$ 442,334</b>	<b>\$ 647</b>	<b>\$ 279</b>
<b>Net OPEB liability – ending (a-b)</b>	<b>\$ 1,518,735</b>	<b>\$ 1,504,840</b>	<b>\$ (225,228)</b>	<b>\$ (205,321)</b>	<b>\$ 758</b>	<b>\$ 594</b>
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	51.22%	48.86%	194.74 %	186.63 %	46.05%	31.96%
Covered employee payroll (c)	\$ 19,044,361	\$ 18,473,085	\$ 3,972,637	\$ 3,799,590	\$ 372,869	282,200
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	7.97%	8.15%	(5.67)%	(5.40)%	0.20%	0.21%

\* 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 OTHER POST-EMPLOYMENT BENEFIT (OPEB) LIABILITY AND RELATED RATIOS, cont.**

(EXPRESSED IN THOUSANDS)

	Virginia Local Disability Program					
	Political Subdivisions 2018	Political Subdivisions 2017	Total 2018	Total 2017	Line of Duty Trust Fund 2018	Line of Duty Trust Fund 2017
Change in the Net OPEB Liability						
<b>Total OPEB liability:</b>						
Service cost	\$ 876	\$ 664	\$ 1,544	\$ 1,053	\$ 15,197	\$ 17,648
Interest	58	25	115	54	9,258	8,305
Changes in benefit terms	—	—	—	—	—	—
Difference between actual and expected experience	(95)	—	(161)	—	51,048	—
Changes of assumptions	—	(110)	—	(57)	(13,962)	(30,500)
Benefit payments	(160)	(44)	(287)	(80)	(12,398)	(10,255)
Net change in total OPEB liability	679	535	1,211	970	49,143	(14,802)
<b>Total OPEB liability – beginning</b>	<b>914</b>	<b>379</b>	<b>1,787</b>	<b>817</b>	<b>266,252</b>	<b>281,054</b>
<b>Total OPEB liability – ending (a)</b>	<b>\$ 1,593</b>	<b>\$ 914</b>	<b>\$ 2,998</b>	<b>\$ 1,787</b>	<b>\$ 315,395</b>	<b>\$ 266,252</b>
<b>Plan fiduciary net position:</b>						
Contributions – employer	\$ 1,458	\$ 740	\$ 2,614	\$ 1,329	\$ 10,035	\$ 11,024
Contributions – member	—	—	—	—	—	—
Net investment income	36	—	65	—	678	683
Benefit payments	(160)	(44)	(287)	(80)	(12,398)	(10,255)
Third-party administrator charges	(1,000)	(609)	(1,794)	(1,093)	—	—
Administrative expense	(96)	(106)	(172)	(190)	(742)	(1,283)
Other	227	370	407	664	855	584
Net change in plan fiduciary net position	465	351	833	630	(1,572)	753
<b>Plan fiduciary net position – beginning</b>	<b>351</b>	<b>—</b>	<b>630</b>	<b>—</b>	<b>3,461</b>	<b>2,708</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 816</b>	<b>\$ 351</b>	<b>\$ 1,463</b>	<b>\$ 630</b>	<b>\$ 1,889</b>	<b>\$ 3,461</b>
<b>Net OPEB liability – ending (a-b)</b>	<b>\$ 777</b>	<b>\$ 563</b>	<b>\$ 1,535</b>	<b>\$ 1,157</b>	<b>\$ 313,506</b>	<b>\$ 262,791</b>
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	51.22%	38.40%	48.80%	35.25%	0.60%	1.30%
Covered employee payroll (c)	242,807	183,629	615,676	465,829	*	*
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	0.32%	0.31%	0.25%	0.25%	N/A	N/A

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 OTHER POST-EMPLOYMENT  
BENEFIT (OPEB) LIABILITY AND RELATED RATIOS, cont.

(EXPRESSED IN THOUSANDS)

	Health Insurance Credit						
	State	State	Teacher	Teacher	Political Subdivisions	Political Subdivisions	Constitutional Officers
Change in the Net OPEB Liability	2018	2017	2018	2017	2018	2017	2018
<b>Total OPEB liability:</b>							
Service cost	\$ 19,645	\$ 19,231	\$ 20,887	\$ 20,351	\$ 960	\$ 972	\$ 677
Interest	66,883	66,641	92,399	91,661	2,644	2,618	1,913
Changes in benefit terms	—	—	—	—	—	—	—
Difference between actual and expected experience	745	—	(7,255)	—	339	—	569
Changes of assumptions	—	(12,229)	—	(15,003)	—	(1,015)	—
Benefit payments	(69,117)	(71,256)	(89,420)	(83,510)	(2,697)	(1,676)	(1,723)
Net change in total OPEB liability	18,156	2,387	16,611	13,499	1,246	899	1,436
<b>Total OPEB liability – beginning</b>	<b>990,028</b>	<b>987,641</b>	<b>1,364,702</b>	<b>1,351,203</b>	<b>39,124</b>	<b>38,225</b>	<b>28,193</b>
<b>Total OPEB liability – ending (a)</b>	<b>\$ 1,008,184</b>	<b>\$ 990,028</b>	<b>\$ 1,381,313</b>	<b>\$ 1,364,702</b>	<b>\$ 40,370</b>	<b>\$ 39,124</b>	<b>\$ 29,629</b>
<b>Plan fiduciary net position:</b>							
Contributions – employer	\$ 79,416	\$ 75,058	\$ 99,469	\$ 87,613	\$ 2,291	\$ 2,164	\$ 2,378
Net investment income	5,706	7,706	6,097	8,818	1,570	2,273	183
Benefit payments	(69,117)	(71,256)	(89,420)	(83,510)	(2,697)	(1,676)	(1,723)
Administrative expense	(149)	(131)	(152)	(120)	(37)	(37)	(4)
Other	536	(546)	(446)	436	(113)	111	17
Net change in plan fiduciary net position	16,392	10,831	15,548	13,237	1,014	2,835	851
<b>Plan fiduciary net position – beginning</b>	<b>79,516</b>	<b>68,685</b>	<b>\$ 96,091</b>	<b>\$ 82,854</b>	<b>\$ 22,156</b>	<b>19,321</b>	<b>2,427</b>
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 95,908</b>	<b>\$ 79,516</b>	<b>\$ 111,639</b>	<b>\$ 96,091</b>	<b>\$ 23,170</b>	<b>\$ 22,156</b>	<b>\$ 3,278</b>
<b>Net OPEB liability – ending (a-b)</b>	<b>\$ 912,276</b>	<b>\$ 910,512</b>	<b>\$ 1,269,674</b>	<b>\$ 1,268,611</b>	<b>\$ 17,200</b>	<b>\$ 16,968</b>	<b>\$ 26,351</b>
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	9.51%	8.03%	8.08%	7.04%	57.39%	56.63%	11.06%
Covered employee payroll	\$ 6,764,917	\$ 6,489,069	\$ 8,087,389	\$ 7,892,011	\$ 1,022,007	\$ 966,611	\$ 655,995
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	13.49%	14.03%	15.70%	16.07%	1.68%	1.76%	4.02%

**REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET OTHER POST-EMPLOYMENT BENEFIT (OPEB) LIABILITY AND RELATED RATIOS, cont.**

(EXPRESSED IN THOUSANDS)

	Social Services Employees		Health Insurance Credit		Total		Total	
	Constitutional Officers	Social Services Employees	Social Services Employees	Registrars	Registrars	Total	Total	
Change in the Net OPEB Liability	2017	2018	2017	2018	2017	2018	2017	
<b>Total OPEB liability:</b>								
Service cost	\$ 671	\$ 257	\$ 263	\$ 12	\$ 12	\$ 42,438	\$ 41,500	
Interest	1,890	933	928	36	35	164,808	163,773	
Changes in benefit terms	—	—	—	—	—	—	—	
Difference between actual and expected	—	186	—	1	—	(5,415)	—	
Changes of assumptions	(578)	—	(162)	—	(10)	—	(28,997)	
Benefit payments	(1,568)	(970)	(928)	(12)	(27)	(163,949)	(158,965)	
Net change in total OPEB liability	415	406	101	37	10	37,882	17,311	
<b>Total OPEB liability – beginning</b>	<b>27,778</b>	<b>13,816</b>	<b>13,715</b>	<b>520</b>	<b>510</b>	<b>2,436,383</b>	<b>2,419,072</b>	
<b>Total OPEB liability – ending (a)</b>	<b>\$ 28,193</b>	<b>\$ 14,222</b>	<b>\$ 13,816</b>	<b>\$ 557</b>	<b>\$ 520</b>	<b>\$ 2,474,265</b>	<b>\$ 2,436,383</b>	
<b>Plan fiduciary net position:</b>								
Contributions – employer	\$ 2,320	\$ 1,120	\$ 1,069	\$ 32	\$ 47	\$ 184,706	\$ 168,271	
Net investment income	215	72	98	4	3	13,632	19,113	
Benefit payments	(1,568)	(970)	(928)	(12)	(27)	(163,939)	(158,965)	
Administrative expense	(4)	(1)	(2)	—	—	(343)	(294)	
Other	(15)	7	(7)	—	—	1	(21)	
Net change in plan fiduciary net position	948	228	230	24	23	34,057	28,104	
<b>Plan fiduciary net position – beginning</b>	<b>1,479</b>	<b>1,091</b>	<b>861</b>	<b>34</b>	<b>11</b>	<b>201,315</b>	<b>173,211</b>	
<b>Plan fiduciary net position – ending (b)</b>	<b>\$ 2,427</b>	<b>\$ 1,319</b>	<b>\$ 1,091</b>	<b>\$ 58</b>	<b>\$ 34</b>	<b>\$ 235,372</b>	<b>\$ 201,315</b>	
<b>Net OPEB liability – ending (a-b)</b>	<b>\$ 25,766</b>	<b>\$ 12,903</b>	<b>\$ 12,725</b>	<b>\$ 499</b>	<b>\$ 486</b>	<b>\$ 2,238,893</b>	<b>\$ 2,235,068</b>	
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	8.61%	9.27%	7.90%	10.41%	6.54%	9.51%	8.26%	
Covered employee payroll	\$ 633,397	\$ 263,298	\$ 251,084	\$ 11,512	\$ 11,047	\$ 16,805,118	\$ 16,243,219	
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	4.07%	4.90%	5.07%	4.33%	4.40%	13.32%	13.76%	

**REQUIRED SUPPLEMENTARY SCHEDULE OF EMPLOYER CONTRIBUTIONS:  
OTHER POST-EMPLOYMENT BENEFIT (OPEB) 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>					
2018	\$ 99,031	\$ 99,031	\$ —	\$ 19,044,361	0.52%
2017	96,060	96,060	—	18,473,085	0.52%
2016	95,383	86,385	8,998	17,996,821	0.48%
2015	92,864	84,103	8,761	17,521,463	0.48%
2014	91,580	82,940	8,640	17,279,273	0.48%
2013	88,985	80,590	8,395	16,789,539	0.48%
2012	71,957	47,293	24,664	16,353,785	0.29%
2011	70,312	44,744	25,568	15,980,013	0.28%
2010	58,744	32,532	26,212	16,317,768	0.20%
2009	59,277	44,458	14,819	16,465,749	0.27%
<b>DISABILITY INSURANCE TRUST FUND</b>					
2018	\$ 26,219	\$ 26,219	\$ —	\$ 3,972,637	0.66%
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%
<b>VIRGINIA LOCAL DISABILITY PROGRAM – TEACHER</b>					
2018	\$ 1,156	\$ 1,156	\$ —	\$ 372,869	0.31%
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>					
2018	\$ 1,457	\$ 1,457	\$ —	\$ 242,807	0.60%
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>					
2018	\$ 23,214	\$ 10,652	\$ 12,562	N/A	N/A
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 (OPEB) 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>					
2018	\$ 79,802	\$ 79,802	\$ —	\$ 6,762,917	1.18%
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%
<b>HEALTH INSURANCE CREDIT – TEACHER</b>					
2018	\$ 99,475	\$ 99,475	\$ —	\$ 8,087,389	1.23%
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%
<b>HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS</b>					
2018	\$ 2,208	\$ 2,208	\$ —	\$ 1,022,007	0.22%
2017	2,088	2,088	—	966,611	0.22%
2016	1,936	1,936	—	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%
<b>HEALTH INSURANCE CREDIT – CONSTITUTIONAL OFFICERS</b>					
2018	\$ 2,362	\$ 2,362	\$ —	\$ 655,995	0.36%
2017	2,280	2,280	—	633,397	0.36%
	1,950	1,830	120	609,359	0.30%
<b>HEALTH INSURANCE CREDIT – SOCIAL SERVICES EMPLOYEES</b>					
2018	\$ 1,106	\$ 1,106	\$ —	\$ 263,298	0.42%
2017	1,055	1,055	—	251,084	0.42%
	961	824	137	240,250	0.34%
<b>HEALTH INSURANCE CREDIT – REGISTRARS</b>					
2018	\$ 47	\$ 47	\$ —	\$ 11,512	0.41%
2017	45	45	—	11,047	0.41%
	36	30	6	9,987	0.30%



## REQUIRED SUPPLEMENTARY SCHEDULE OF EMPLOYER CONTRIBUTIONS: OTHER POST-EMPLOYMENT BENEFIT (OPEB) PLANS, cont.

\* 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 INVESTMENT EXPENSES

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2018	2017
<b>Management Fees:</b>		
Public Equity Managers	\$ 57,597	\$ 52,086
Fixed Income Managers	1,358	1,205
Credit Strategies Managers	57,368	57,135
Real Assets Managers	88,577	83,737
Alternative Investment Managers	104,497	94,367
Hedge Fund Managers	76,771	76,374
Strategic Opportunity Portfolio	17,003	15,386
Currency Managers	4,399	2,842
<b>Total External Management Fees</b>	<b>407,570</b>	<b>383,132</b>
<b>Performance Fees</b>	<b>4,906</b>	<b>2,485</b>
<b>Miscellaneous Fees and Expenses:</b>		
Custodial Fees	4,500	4,500
Legal Fees	1,064	676
Other Fees and Expenses	5,079	2,035
<b>Total Miscellaneous Fees and Expenses</b>	<b>10,643</b>	<b>7,211</b>
<b>In-House Investment Management</b>	<b>34,225</b>	<b>31,430</b>
<b>Total Investment Expenses</b>	<b>\$ 457,344</b>	<b>\$ 424,258</b>

## SCHEDULE OF ADMINISTRATIVE EXPENSES

TOTAL ACTUAL TO BUDGET

YEARS ENDED JUNE 30, 2018 AND 2017

(EXPRESSED IN THOUSANDS)

	Totals	
	2018	2017
<b>Personnel Services:</b>		
Salaries and Wages	\$ 38,781	\$ 36,751
Per Diem Services	318	337
Retirement Contributions	3,888	3,688
Social Security	2,294	2,185
Group Life and Medical Insurance	5,582	5,006
Compensated Absences	467	309
<b>Total Personnel Services</b>	<b>51,330</b>	<b>48,276</b>
<b>Professional Services:</b>		
Data Processing	22,468	19,073
Actuarial and Consulting Services	2,099	2,144
Legal Services	642	634
Medical Review Services	615	670
Management Services	405	644
Personnel Development Services	83	93
<b>Total Professional Services</b>	<b>26,312</b>	<b>23,258</b>
<b>Communication Services:</b>		
Media Services	18	32
Printing	623	763
Postal and Delivery Services	580	687
Telecommunications	718	742
<b>Total Communication Services</b>	<b>1,939</b>	<b>2,224</b>
<b>Rentals:</b>		
Business Equipment	—	—
Office Space	2,738	2,810
<b>Total Rentals</b>	<b>2,738</b>	<b>2,810</b>
<b>Other Services and Charges:</b>		
Skilled and Clerical Services	353	475
Depreciation	5,620	5,395
Dues and Memberships	133	126
Equipment	4,523	5,613
Insurance	106	41
Repairs and Maintenance	31	94
Supplies and Materials	418	243
Travel and Transportation	732	789
Miscellaneous	168	225
<b>Total Other Services and Charges</b>	<b>12,084</b>	<b>13,001</b>
<b>Total Administrative Expenses</b>	<b>\$ 94,403</b>	<b>\$ 89,569</b>

## SCHEDULE OF ADMINISTRATIVE EXPENSES, cont.

	Totals	
	2018	2017
Adjustment for Capitalization of Expenses	(10,940)	(8,153)
<b>Total Administrative Expenses (GAAP basis)</b>	<b>83,463</b>	<b>81,416</b>
Adjustments Necessary to Convert Administrative Expenses on the GAAP Basis to the Budgetary Basis at Year End (Net)	5,651	3,107
<b>Administrative Expenses (Budgetary Basis)</b>	<b>\$ 89,114</b>	<b>\$ 84,523</b>
<b>Administrative Expenses Appropriated</b>	<b>\$ 88,842</b>	<b>\$ 90,565</b>
<b>Distribution of Administrative Expenses:</b>		
Total Administrative Expenses	83,463	81,416
Less: In-house Investment Management	(34,225)	(31,430)
<b>Net Administrative Expenses</b>	<b>\$ 49,238</b>	<b>\$ 49,986</b>

## SCHEDULE OF PROFESSIONAL AND CONSULTING SERVICES

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

### Actuarial, Legal and Oversight Services

Aon Consulting Inc.	Actuarial Services and Benefits Consulting	\$ —
Cavanaugh MacDonald LLC	Actuarial Services and Benefits Consulting	1,039.2
Challa Law Offices	Legal Services	0.5
David L. Home PLLC	Legal Services	—
Ice Miller LLP	Legal Services	93.5
Joint Legislative Audit Review Commission	Oversight Responsibilities	115.7
Jeffrey Summers Law Office	Legal Services	—
Reed Smith	Legal Services	5.6
Troutman Sanders LLP	Legal Services	—

**Total Actuarial Legal and Oversight Services** **\$ 1,254.5**

### Consulting Services

Advantage 2000	Social Security Advocacy and Disability Tracking	115.6
Advent Software Inc.	Investment Record-Keeping System	44.6
Albourne America LLC	Investment Consultant Services	396.3
Assura, Inc.	VNAV Risk Assessment	40.7
BCA Research	Research & Advisory	97.5
Bertini O'Donnell & Hammer PC	Fact-Finding Hearing Officer for Disability Cases	—
CACI Federal Inc.	Test Planning & Execution IV & V Review Report	—
CEM Benchmarking Inc.	Benchmarking Analysis	75.0
FX Transparency LLC	Investment Advisory Services	20.0
Gallagher Benefit Services	Recruitment Consulting	7.2
Gartner Group Inc.	Research & Advisory	52.8
Genex	Job Analysis	1.5
Harrison & Turk PC	Fact-Finding Hearing Officer for Disability Cases	69.9
Hewitt Associates	Retirement Benefits Planning Tool	10.0
Inravr Enterprises	Fact-Finding Hearing Officer for Disability Cases	—
Katzen & Frye PC	Fact-Finding Hearing Officer for Disability Cases	252.6
Kroll	Investment Advisory Services	—
Life Status 360 LLC	Location Services	9.4

(cont.)

## SCHEDULE OF PROFESSIONAL AND CONSULTING SERVICES, cont.

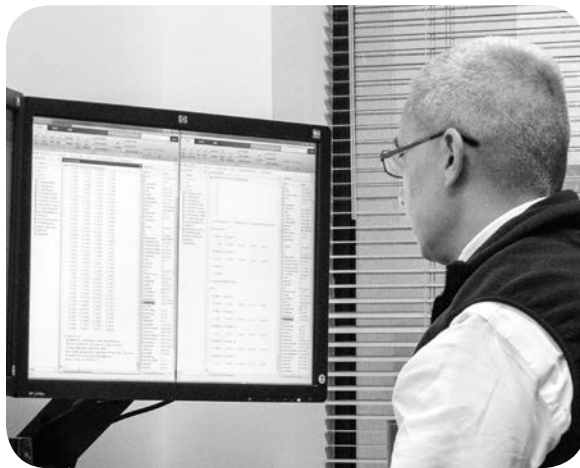
### Consulting Services

McGinley, Elsberg & Hutcheson PLC	Fact-Finding Hearing Officer for Disability Cases	18.1
McLagan Partners Inc.	Investment Compensation Study	10.5
Mercer Investment	Consulting Services for Hybrid Plan	—
Mercer Health & Benefit	Consulting Services for VSDP	—
Milliman Inc.	Long-Term Care Plan Consulting	—
Pension Consulting Alliance Inc.	Asset/Liability Study	—
Property & Portfolio Research Inc.	Investment Consulting Services	157.5
Roy McLeod	Outplacement Services	—
Sagitec Solutions LLC	VRS Modernization Project Solution Vendor	1,258.0
Servient Inc.	Consulting & Hardware	—
Strategic Economic Decisions Inc.	Location Services	20.0
Strategic Public Policy & Communications	Consultant for Assessment/Study for VRS Proposal	—
Torreycove Capital	Investment Consulting Services	50.0
Townsend Group	Investment Consulting Services	170.0
United Review Services Inc.	Medical Board Review and Examinations	616.0
Vedere Consulting LLC	Consulting Services	—
Waters & Company	Executive Recruitment	—
Wells Fargo Bank NA	Record-Keeping Services	71.1
Yardeni Research	Research & Advisory	15.0
<b>Total Consulting Services</b>		<b>\$ 3,579.3</b>
<b>Total Professional and Consulting Services</b>		<b>\$ 4,833.8</b>



# VRS INVESTS

with  
**a strategic  
focus  
on results**



VRS investment professionals are intently focused on minimizing risk while maximizing performance. Our highly qualified professionals oversee the entire portfolio, directly managing about one-third of assets in-house, which saves the fund millions in external management fees each year. Two-thirds of retirement benefits are funded through investment earnings. CEM Benchmarking, which evaluates pension funds around the world, recognizes VRS as a low-cost, value-added pension plan in comparison to its peers.

## 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

October 8, 2018

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

Fiscal year 2018 continued to bring positive global economic growth and corporate earnings have showed continued strength. As a result, equity markets responded favorably. Tax cuts have enhanced the reported earnings of U.S. domiciled companies. The U.S. Federal Reserve has begun the transition from monetary easing to monetary tightening. Ten-year Treasuries rose to about 3% in June. Inflation remains in check, although low unemployment rates should begin to boost wage pressures. Changing demographic trends and reasonable capacity utilization rates seem able to offset significant wage pressures at this point in the cycle.

### **PERFORMANCE OVERVIEW**

The VRS portfolio is positioned to provide diversification across a variety of asset classes. The Total Fund generated a return of 7.5% for the fiscal year. Returns by VRS primary asset classes from highest to lowest were as follows: Private Equity at 15.8%, Public Equity at 9.7%, Real Assets at 9.5%, Credit Strategies at 5.2% and Fixed Income at -0.1%. The Strategic Opportunities Portfolio (non-traditional, multi-asset class strategies) returned 7.0% for the fiscal year.

The Total Fund has tended to perform well versus its benchmark for the longer term. However, the return for the fiscal year fell just short of the benchmark. Some of this shortfall is attributable to the fact that the portfolio was positioned a bit defensively going into the fiscal year while the markets provided robust returns. My letter in the 2017 CAFR describes our rationale for defensive positioning. Some of this year's lag in performance relates to difficulties within individual asset classes, which I will discuss.

### Annualized Return for Periods Ended June 30, 2018:

	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years
VRS Total Fund	7.5%	7.1%	8.3%	6.1%	7.8%	6.5%	8.2%
Benchmark*	7.7%	6.8%	7.8%	5.8%	7.3%	6.0%	7.1%

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

*\* 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 in the Investment Section show the asset allocation of the fund at June 30, 2018, as well as performance for various periods ended on that date. Some comments on the asset class returns appear below.

While providing strong performance over time, the one-year return in the Public Equity portfolio fell short of its index by 1.2% for the fiscal year. Our long-term positioning led us to overweight low volatility and “value” stocks. These types of stocks were not in favor for much of the year. Although disappointing in the short run, we are heartened by the fact that the Public Equity portfolio has performed above the market benchmark over five- and 10-year periods.

As noted, the Federal Reserve recently began raising interest rates, causing an increase in the bond portfolio yield while simultaneously depressing its market value. As a result, the absolute return of the Fixed Income portfolio was basically flat. But the portfolio exceeded the benchmark return of -0.4%. The Fixed Income team continues to provide excellent value-added relative results on a consistent basis.

The Credit Strategies portfolio had an excellent year, generating a 5.2% return versus its benchmark of 3.7%. Within the more traditional publicly traded assets, convertible bonds generated the highest returns owing to their equity market sensitivity. Perhaps the biggest story within the program, however, is the return generated by the “alternative” components. These include privately negotiated transactions, operational enhancements and unique security structures. Such non-traditional strategies have been emphasized by the Credit Strategies team for several years now as we capitalize on our position as a large, long-term-oriented investor.

The Real Assets portfolio had a solid year generating a return of 9.5%, which was 2.1% above its benchmark. This strong result occurred in both traditional real estate (property markets) as well as in the less traditional areas including infrastructure (airports, seaports and pipelines) and income-oriented energy investments. Further, the team has delivered strong results over longer-term periods as well.



The Private Equity team had a strong year with a portfolio return of 15.8%. Unfortunately, this was below a strong index return of 16.6%. Since Private Equity investments are made as a substitute for public equities, a better perspective is to measure the return versus the Public Equity portfolio benchmark return of 10.9%. Additionally, Private Equity has been the Total Fund's highest absolute performance-generating asset over longer time periods.

The Strategic Opportunities Portfolio is a mix of diverse strategies whose purpose has changed over time. On the surface, the portfolio has underperformed. However, the portfolio has accomplished its mission as defined. Staff worked with the Investment Advisory Committee and the VRS Board of Trustees to segregate this portfolio into its component parts starting July 1, 2018.

The Board has adopted an efficient portfolio policy in a risk versus reward sense, with the target portfolio expected to generate returns similar to our peer states with risk levels lower than average (defined by annual volatility). VRS investment staff continues to generate good performance relative to the Board's benchmark portfolio and has added real dollars to the fund through its investment activity, compared to passive alternatives. Over the past 10 years, that excess performance has generated more than \$1.6 billion extra dollars for the plan.

## MARKET OUTLOOK

Financial conditions in advanced economies remain accommodative, though in the U.S., the Federal Reserve is beginning to tighten monetary policy. Growth is expected to remain above trend for the time being, but the outlook for 2019 and beyond is a bit cloudier. The U.S. market outlook is somewhat insulated from tightening liquidity and moderating growth in the near term as federal tax reforms have encouraged corporate repatriation of earnings. However, fiscal deficits and rising rates will increase the cost of debt burdens over the intermediate term.

Emerging economies have generally favorable economic conditions as well. But there are significant differences from country to country based on economic fundamentals and political uncertainty. Crosswinds include oil and commodity prices, trade tensions and rising U.S. interest rates that are expected to increase the strength of the dollar.

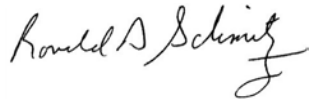
As we did last year, staff conducted a scenario analysis exercise that looked at symmetrical near-term shifts in projected inflation and economic growth. Given the historically high current asset valuations across all asset classes, last year's exercise had somewhat negatively skewed outcomes. That is, positive scenarios did not provide as strong an increase in returns as negative results caused price declines. This year, however, there is a stronger positive skew, given current fiscal conditions and growth outlook. That said, many of the scenarios do suggest returns below the 7% assumed long-term return.

Further, we studied a series of scenarios as defined by various external economists. Unlike the shifts in the first exercise in 2017, the outcomes this year were negatively skewed. Positive scenarios included increased productivity and an extension in the already long business cycle. Negative scenarios included a recession, a tariff-driven disruption to global trade, an economic crisis in China, a Eurozone breakup and inflation shocks.

Given these exercises, the portfolio is positioned neutrally as compared to the policy portfolio. We remain watchful for negative signs.

To conclude, I want to thank the Board of Trustees and the Investment Advisory Committee for their dedication and support over this past year. Many thanks also to my counterparts on the administrative side of VRS. Last, my appreciation goes out to the excellent team of investment professionals at VRS. Together, we will continue to build on the agency's great legacy.

Sincerely,

A handwritten signature in cursive script that reads "Ronald D. Schmitz". The signature is written in black ink and is positioned below the word "Sincerely,".

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.

## 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.

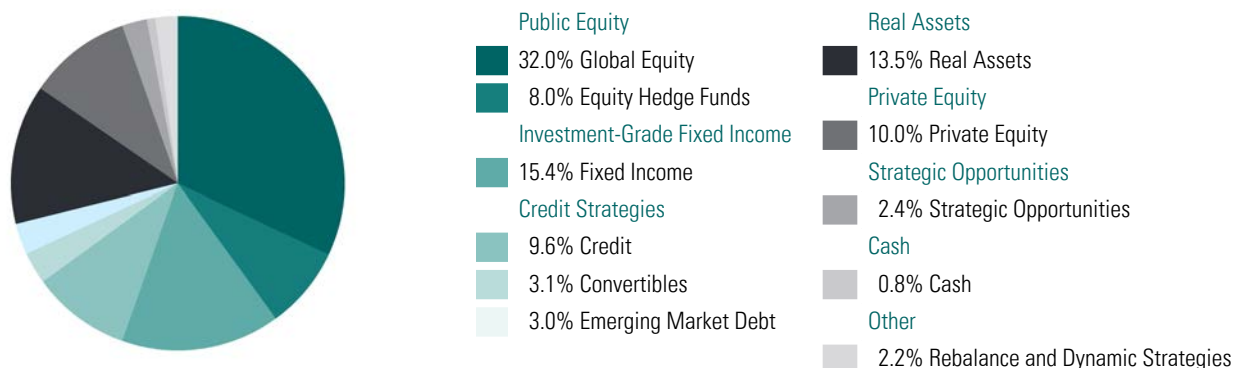
The Board delegates authority to the Chief Investment Officer to allocate the System's investments within the approved asset allocation policy and within the Board-approved active risk budget. The total fund active risk budget describes the degree of tolerance for yearly variation in the fund's performance 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, 2018, is shown in Figure 3.1:

### FIGURE 3.1: ASSET ALLOCATION MIX

AS OF JUNE 30, 2018



### FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY

ANNUALIZED DATA FOR THE PERIOD ENDING JUNE 30, 2018

	1 Year	3 Years	5 Years	10 Years
<b>1. Total Fund</b>				
VRS	7.5%	7.1%	8.3%	6.1%
VRS Custom Benchmark <sup>1</sup>	7.7%	6.8%	7.8%	5.8%
<b>2. Total Public Equity</b>				
VRS	9.7%	7.7%	9.9%	6.7%
Custom Benchmark <sup>2</sup>	10.9%	8.0%	9.6%	6.4%
<b>3. Total Investment-Grade Fixed Income</b>				
VRS	-0.1%	2.3%	2.8%	4.6%
Custom Benchmark <sup>3</sup>	-0.4%	1.7%	2.3%	3.8%
<b>4. Total Credit Strategies</b>				
VRS	5.2%	5.5%	5.9%	6.8%
Custom Benchmark <sup>4</sup>	3.7%	4.9%	5.3%	5.6%
<b>5. Total Real Assets</b>				
VRS	9.5%	10.6%	11.6%	6.7%
Custom Benchmark <sup>5</sup>	7.4%	8.7%	9.5%	6.2%
<b>6. Total Private Equity</b>				
VRS	15.8%	14.2%	14.7%	10.3%
Custom Benchmark <sup>6</sup>	16.6%	11.4%	12.9%	10.9%
<b>7. Total Strategic Opportunities</b>				
VRS	7.0%	4.2%	3.5%	n/a
Custom Benchmark <sup>7</sup>	8.8%	6.3%	4.7%	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, 2018, was \$31.4 billion, representing approximately 40% of the total fund. The program is dominated by traditional strategies valued at \$25.1 billion or 80.0%. The program also employs equity-oriented hedge fund strategies valued at \$6.3 billion or 20.0%. 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 Market currencies 50% hedged and 20% Credit Suisse Equity Long/Short Broad Index.

The Traditional Public Equity portfolio had 52% invested in domestic equity and 48% 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 53.3% of the MSCI U.S. Investible Market Index (IMI), 35.4% 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	11.77%	12.59%	North America	55.53%	56.53%
Consumer Staples	8.00%	7.68%	Europe/Middle East/Africa	21.09%	21.84%
Energy	6.10%	6.49%	Asia/Pacific	22.13%	20.46%
Financials	15.85%	16.92%	Latin and South America	1.25%	1.17%
Health Care	12.20%	11.07%		<b>100.00%</b>	<b>100.00%</b>
Industrials	10.76%	11.31%			
Information Technology	19.18%	18.83%			
Materials	5.14%	5.63%			
Real Estate	3.60%	4.02%			
Telecommunication Services	3.32%	2.53%			
Utilities	4.08%	2.93%			
	<b>100.00%</b>	<b>100.00%</b>			

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

The top 10 holdings in the Total Public Equity Program comprised 5.8% of the program at fiscal year-end. Three companies, Samsung Electronics,

Berkshire Hathaway and Exxon Mobil, were replaced by Verizon Communications, Royal Dutch Shell and Visa on this year's schedule.

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

AS OF JUNE 30, 2018

Company	Fair Value	Shares
Microsoft	\$ 314,387,416	3,188,190
Apple	245,624,680	1,326,912
Amazon.com	218,203,326	128,370
Johnson & Johnson	197,895,833	1,630,920
Facebook	155,352,622	799,468
Verizon Communications	151,958,990	3,020,453
Roche Holding	149,902,701	674,885
Alphabet	139,832,224	125,337
Royal Dutch Shell	121,644,787	3,369,846
Visa	120,085,925	906,651

\* Aggregated various share classes based on parent company. Refer to the "More Information" section for details on how to request additional information.

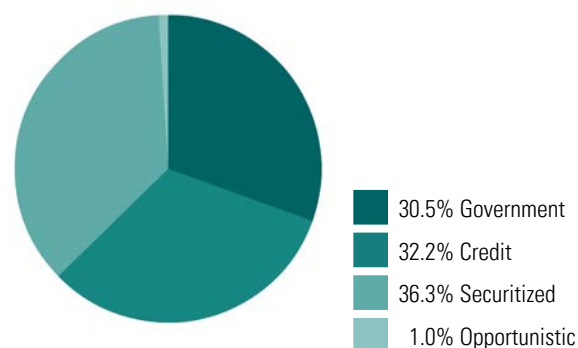
## FIXED INCOME

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, 2018, was \$12.1 billion, representing 15.4% 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 2018, the return of the program was -0.1% versus a return of -0.4% for the benchmark.

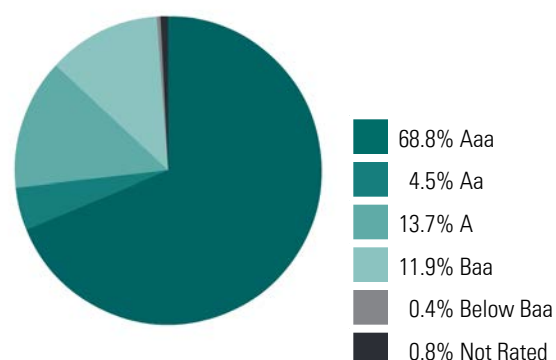
**FIGURE 3.5: FIXED INCOME PORTFOLIO BY SECTOR ALLOCATION**

AS OF JUNE 30, 2018



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

AS OF JUNE 30, 2018



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

AS OF JUNE 30, 2018

Security	Par Value	Fair Value
TREASURY NOTE	\$ 150,000,000	\$ 149,944,633
TREASURY NOTE	125,000,000	122,898,438
TREASURY NOTE	121,000,000	120,830,805
TREASURY NOTE	115,000,000	113,154,701
TREASURY BOND	111,300,000	108,178,650
TREASURY NOTE	106,000,000	102,073,854
TREASURY NOTE	100,000,000	99,452,127
TREASURY NOTE	100,000,000	98,243,432
FREDDIE MAC MBS	85,155,613	83,389,880
TREASURY NOTE	80,000,000	80,277,700

\* Refer to the "More Information" section for details on how to request additional information.

## SHORT-TERM INVESTMENTS AND TRANSITION ACTIVITY

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, as well as to synthetically replicate exposure to equity and/or fixed income.

## PRIVATE EQUITY

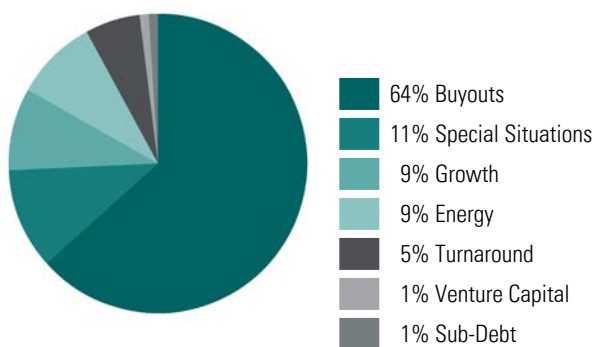
VRS invests in private equity to achieve returns greater than those available in the public equity markets. Specifically, the program seeks to outperform the Morgan Stanley Capital International All Country World Index (MSCI ACWI) by 2.5% per year. Program returns are calculated on both a time-weighted basis and a dollar-weighted or internal rate-of-return (IRR) basis. On a time-weighted basis, the program return for fiscal year 2018 was 15.8%. On a dollar-weighted or IRR basis, the private equity one-year return was 17.5% as of March 31, 2018.

As of June 30, 2018, the carrying value of the program was approximately \$7.9 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, 2018



## REAL ASSETS

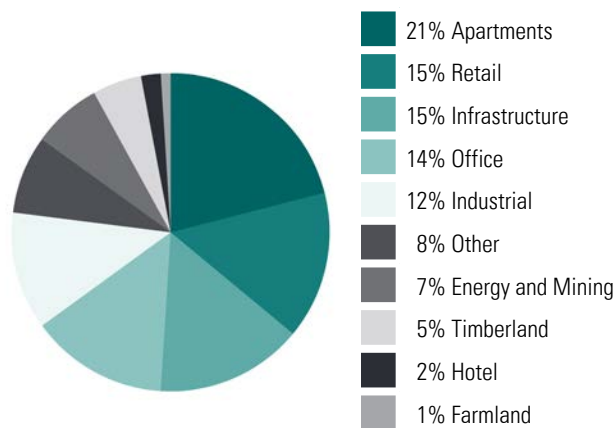
A portion of the VRS portfolio is invested in real assets to help diversify the Total Fund by providing exposure to asset classes and sectors that offer low historical correlations with the public markets and with the additional objectives of generating competitive risk-adjusted returns, significant operating cash flows and inflation linkages. The portfolio continued to grow in fiscal year 2018, producing a 9.5% return and outperforming the benchmark by 210 basis points. The private real estate portfolio delivered a 9.5% return while the real estate investment trusts (REITs) produced a total return of 7.3%. Investments in infrastructure, natural resources, timberland and farmland produced a 10.2% return for the fiscal year.

The percentage of the Total Fund represented by the real assets portfolio increased over the course of the year from 12.6% to 13.5%. In dollar terms, the real asset portfolio grew \$1.2 billion due primarily to asset income and appreciation, with contributions to new investments slightly outpacing distributions from existing investments by approximately \$295 million.

At fiscal year-end, the portfolio was composed of approximately 61.2% private real estate, 11.1% REITs, 14.8% infrastructure, 7.0% energy and mining, 4.6% timberland and 1.3% farmland. Portfolio leverage as a percentage of total real assets was 33.5% as of June 30, 2018.

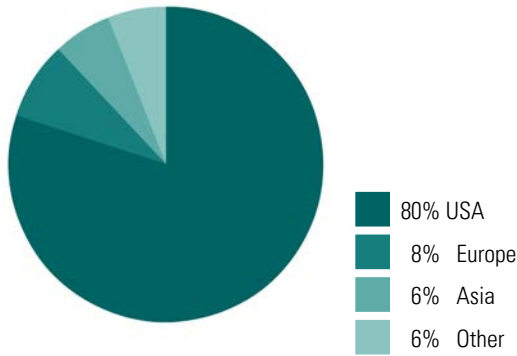
**FIGURE 3.9: REAL ASSETS BY SECTOR**

AS OF JUNE 30, 2018





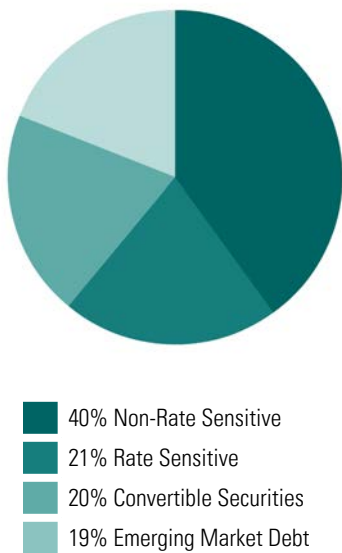
**FIGURE 3.10: REAL ASSETS BY GEOGRAPHIC REGION**  
AS OF JUNE 30, 2018



### CREDIT STRATEGIES

VRS allocates a portion of the portfolio to credit-related investments. The Credit Strategies program generates returns through income and capital appreciation. The objective of the program is to provide an attractive risk/return profile relative to the Custom Credit Strategies benchmark. For the fiscal year, the program returned 5.2%, while the program's custom benchmark returned 3.7%.

**FIGURE 3.11: CREDIT STRATEGIES PROGRAM**  
AS OF JUNE 30, 2018



### 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, 2018, was \$1.8 billion. For the fiscal year, it returned -3.0% 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, 2018, the portfolio had a market value of \$1.9 billion and was invested with two multi-asset class public investments managers and two multi-asset class private investments managers. During the fiscal year, it returned 7.0% against the program's custom benchmark, which returned 8.8%.

### 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, 2018, 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-Cap
Ariel	Global
Arrowstreet Capital	Global
Baillie Gifford	Global
GMO	Emerging
J.P. Morgan	U.S. Large-Cap
LSV Asset Management	Global, Non-U.S. Small-Cap, U.S. Small-Cap
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
Top 10 Equity Hedge Funds	Style Description
Cevian	Activist
Eminence	Long/Short
Farallon	Multi-Strat
Highline	Long/Short
Kylin	Long/Short
Lansdowne Partners	Long/Short
Maverick 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
Apax Partners	Buyout
Bain Capital	Buyout
First Reserve Corp.	Energy
Grosvenor	Customized Separate Account
Hellman and Friedman	Buyout
Littlejohn & Co.	Turnaround
Natural Gas Partners	Energy
Nordic Capital	Buyout
TA Associates	Growth
TPG Partners	Buyout

**CREDIT STRATEGIES – TOP 10 MANAGERS**

	Style Description
Advent Capital	Convertibles
Anchorage Capital	Hedge Fund, Opportunistic High-Yield
Beach Point Capital Management	Distressed, Leveraged Loans, Opportunistic
Oaktree Capital Management	Convertibles, Distressed, Mezzanine
Pacific Investment Management Co.	Emerging Market Debt, High-Yield
Payden & Rygel	Emerging Market Debt
Prudential	High-Yield, Investment-Grade, Mezzanine
Solus	Hedge Fund, Leveraged Loan
Tennenbaum Capital Partners	Direct Lending
Zazove Associates	Convertibles

**STRATEGIC OPPORTUNITIES PORTFOLIO**

	Style Description
AQR	Multi-Asset Class Public Investments
Bridgewater	Multi-Asset Class Public Investments
Carlyle	Multi-Asset Class Private Investments
KKR	Multi-Asset Class Private Investments

**CURRENCY**

	Style Description
First Quadrant	Developed

**REAL ASSETS – TOP 10 MANAGERS**

	Style Description
Blackstone Real Estate Partners	Core, Enhanced Core, Opportunistic Real Estate
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, 2018

Broker	Commission	Broker	Commission
National Financial Services Corp., New York	\$ 1,322,810.87	Deutsche Bank Securities Inc., New York	
Goldman Sachs & Co., New York	\$ 1,199,196.89	(NWSCUS33)	\$ 132,084.93
Credit Suisse, New York (CSUS)	\$ 1,145,514.94	Sanford C. Bernstein & Co., New York	\$ 122,841.75
Merrill Lynch International London Equities	\$ 525,429.04	UBS Warburg, London	\$ 114,631.58
Merrill Lynch Pierce Fenner Smith Inc., New York	\$ 323,670.15	Citigroup Global Market Ltd., London	\$ 113,925.72
Sanford C. Bernstein & Co. Inc., London	\$ 236,426.07	Citigroup Global Markets/Salomon, New York	\$ 112,073.68
Morgan Stanley & Co. Inc., New York	\$ 220,209.59	Other Brokers	\$ 2,446,354.84
Instinet Europe Limited, London	\$ 207,347.27	<b>Total FY 2018</b>	<b>\$ 8,388,716.29</b>
UBS Securities LLC, Stamford	\$ 166,198.97		

## SCHEDULE OF INVESTMENT EXPENSES

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	Assets Under Management	Management Fees and Expenses
<b>External Management:</b>		
Public Equity Managers	\$ 12,163,230	\$ 57,597
Fixed Income Managers	3,745,571	1,358
Credit Strategies Managers	11,243,816	57,368
Real Assets Managers	10,537,618	93,483
Alternative Investment Managers	8,052,849	104,497
Hedge Funds Managers	7,167,860	76,771
Strategic Opportunity Portfolio	1,911,520	17,003
Currency Managers*		4,399
Dynamic Strategy	881,366	—
<b>Internal Management:</b>	24,630,779	34,225
<b>Miscellaneous Fees and Expenses:</b>		
Custodial Fees	—	4,500
Legal Fees	—	1,064
Other Fees and Expenses	—	5,079
<b>Total</b>	<b>\$ 80,334,609</b>	<b>\$ 457,344</b>

\* The fees related to Active Currency Overlay Program is based on the managers' notional account values. The total notional value at June 30, 2018, was \$1.8 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, 2018 and 2017:

(EXPRESSED IN THOUSANDS)

	2018 Fair Value	Percent of Total Value	2017 Fair Value	Percent of Total Value
<b>Bonds and Mortgage Securities:</b>				
U.S. Government and Agencies	\$ 4,056,580	5.04%	\$ 3,840,770	5.01%
Mortgage Securities	4,361,474	5.42%	4,165,151	5.44%
Corporate and Other Bonds	13,355,608	16.60%	13,954,761	18.21%
<b>Total Bonds and Mortgage Securities</b>	<b>21,773,662</b>	<b>27.06%</b>	<b>21,960,682</b>	<b>28.66%</b>
<b>Common and Preferred Stocks</b>	<b>24,452,265</b>	<b>30.40%</b>	<b>24,329,065</b>	<b>31.75%</b>
<b>Index and Pooled Funds</b>				
Equity Index and Pooled Funds	10,502,999	13.06%	9,630,071	12.57%
Fixed-Income Commingled Funds	1,360,209	1.69%	1,151,868	1.50%
<b>Total Index and Pooled Funds</b>	<b>11,863,208</b>	<b>14.75%</b>	<b>10,781,939</b>	<b>14.07%</b>
<b>Real Assets</b>	<b>9,242,121</b>	<b>11.49%</b>	<b>8,279,144</b>	<b>10.81%</b>
<b>Private Equity</b>	<b>12,919,297</b>	<b>16.07%</b>	<b>11,114,649</b>	<b>14.51%</b>
<b>Short-Term Investments</b>				
Treasurer of Virginia – LGIP Investment Pool	99,344	0.12%	78,861	0.11%
Foreign Currencies	84,056	0.11%	70,983	0.09%
<b>Total Short-Term Investments</b>	<b>183,400</b>	<b>0.23%</b>	<b>149,844</b>	<b>0.20%</b>
<b>Total Investments</b>	<b>\$ 80,433,953</b>	<b>100.00%</b>	<b>\$ 76,615,323</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) Cash Match Plan account contains the hybrid plan member and employer mandatory contributions and the employer match on the voluntary member

contributions. The Hybrid 457 Deferred Compensation Plan account contains the hybrid plan member's voluntary 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, 2018

<b>Fund Name</b>	<b>Hybrid 401(a)</b>	<b>Hybrid 457</b>	<b>Total</b>
Retirement Portfolio	\$ 2,156,080	\$ 960,236	\$ 3,116,316
Target Date 2020 Portfolio	8,545,830	4,272,928	12,818,758
Target Date 2025 Portfolio	14,698,828	6,616,137	21,314,965
Target Date 2030 Portfolio	19,369,173	9,830,014	29,199,187
Target Date 2035 Portfolio	23,524,828	10,758,078	34,282,906
Target Date 2040 Portfolio	23,615,469	9,429,182	33,044,651
Target Date 2045 Portfolio	27,596,392	11,191,933	38,788,325
Target Date 2050 Portfolio	34,804,694	11,936,694	46,741,388
Target Date 2055 Portfolio	56,653,423	15,448,030	72,101,453
Target Date 2060 Portfolio	13,016,203	3,369,159	16,385,362
Money Market Fund	1,756,906	269,286	2,026,192
Stable Value Fund	401,860	601,817	1,003,677
Bond Fund	338,392	413,444	751,836
Inflation-Protected Bond Fund	88,926	121,259	210,185
High-Yield Bond Fund	298,001	586,366	884,367
Stock Fund	4,206,786	5,101,645	9,308,431
Small/Mid-Cap Stock Fund	1,732,285	2,061,557	3,793,842
International Stock Fund	1,007,925	1,230,961	2,238,886
Global Real Estate Fund	461,427	558,206	1,019,633
VRS Investment Portfolio – Interim Account	2,916	1,061	3,977
VRS Investment Portfolio	47,502	35,868	83,370
Self-Directed Brokerage	89,799	48,929	138,728
<b>Total Plan Assets</b>	<b>\$ 234,413,645</b>	<b>\$ 94,842,790</b>	<b>\$ 329,256,435</b>

## Description of Defined Contribution Plans Investment Options

Participants in 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 associated costs. 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 more than one account in the Plan pay only one annual fee of \$30.50. At June 30, 2018, the plans provided the following core investment options to 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: 51.3%   U.S. Large/Mid-Cap Stocks: 20.5%   International Stocks: 11.4%  
U.S. Inflation-Index Bonds: 8.8%   U.S. Small-Cap Stocks: 4.0%  
Commodities: 3.5%   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: 46.7%   U.S. Large/Mid-Cap Stocks: 23.2%   International Stocks: 14.1%  
U.S. Inflation-Index Bonds: 7.7%   U.S. Small-Cap Stocks: 3.9%  
Commodities: 3.4%   Developed Real Estate: 1.0%

---

**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: 35.9%   U.S. Large/Mid-Cap Stocks: 29.4%   International Stocks: 18.2%  
U.S. Inflation-Index Bonds: 5.8%   Developed Real Estate: 4.3%  
Commodities: 3.4%   U.S. Small-Cap Stocks: 3.1%

---

**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/Mid-Cap Stocks: 34.6%   U.S. Bonds: 26.7%   International Stocks: 21.7%  
Developed Real Estate: 7.2%   U.S. Inflation-Index Bonds: 4.1%  
Commodities: 3.4%   U.S. Small-Cap Stocks: 2.4%

---

**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/Mid-Cap Stocks: 39.5% International Stocks: 25.0% U.S. Bonds: 17.9%  
Developed Real Estate: 9.9% Commodities: 3.4%  
U.S. Inflation-Index Bonds: 2.6% U.S. Small-Cap Stocks: 1.9%

---

**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/Mid-Cap Stocks: 44.0% International Stocks: 27.9%  
Developed Real Estate: 12.3% U.S. Bonds: 9.9% Commodities: 3.4%  
U.S. Small-Cap Stocks: 1.3% U.S. Inflation-Index Bonds: 1.2%

---

**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-/Mid-Cap Stocks: 46.4% International Stocks: 30.4%  
Developed Real Estate: 14.5% U.S. Bonds: 3.7% Commodities: 3.6%  
U.S. Small-Cap Stocks: 1.2% U.S. Inflation-Index Bonds: 0.3%

---

**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/Mid-Cap Stocks: 47.3% International Stocks: 31.4% Developed Real Estate: 15.4%  
Commodities: 3.5% U.S. Bonds: 1.3% U.S. Small-Cap Stocks: 1.1%

---

**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/Mid-Cap Stocks: 47.4% International Stocks: 31.5% Developed Real Estate: 15.5%  
Commodities: 3.5% U.S. Bonds: 1.0% U.S. Small-Cap Stocks: 1.0%

---



**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/Mid-Cap Stocks: 47.4% International Stocks: 31.5% Developed Real Estate: 15.5%  
Commodities: 3.6% U.S. Small-Cap Stocks: 1.1% U.S. Bonds: 1.0%

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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: 48.3% Asset-Backed Commercial Paper: 14.0%  
Certificate of Deposit: 13.5% Time Deposits: 11.4% Commercial Paper: 8.1%  
Government Agency Debt: 2.2% Government Agency Repurchase Agreement: 1.6%  
Other: 0.5% Treasury Debt: 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 cash or cash equivalents, and liquidity to accommodate participant transactions.

Corporates: 26.9% Agency MBS: 21.2% Asset-Backed: 16.1% U.S. Treasury/Agency: 9.5%  
Cash/Equivalents: 8.8% CMBS: 7.0% Other U.S. Government: 5.6%  
Taxable Municipals: 3.7% Non-Agency MBS: 1.1%

**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: 37.2% Mortgages: 28.1% Industrials: 15.1% Financials: 7.9%  
Non-U.S. Credit: 4.3% Agencies: 2.4% CMBS: 1.9% Utilities: 1.8%  
Taxable Municipals: 0.6% Asset-Backed Securities: 0.5% Cash: 0.2% 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: 97.2% Cash: 2.8%

---

**High-Yield Bond Fund:** Seeks to achieve returns that exceed, over time, its benchmark, the ICE BofAML U.S. High-Yield BB-B 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: 25.4% Consumer Non-Cyclical: 17.3% Consumer Cyclical: 13.9%  
Energy: 10.7% Technology: 8.5% Other/Cash: 7.9% Capital Goods: 7.5% Basic Industry: 3.5%  
Finance: 2.3% Transportation: 1.8% Utilities: 0.7% Other Industrial: 0.6%

---

**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: 26.0% Health Care: 14.1% Financials: 13.9% Consumer Discretionary: 12.9%  
Industrials: 9.6% Consumer Staples: 6.9% Energy: 6.3%  
Utilities: 3.0% Real Estate: 2.9% Materials: 2.6% Telecommunications Services: 2.0%

---

**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.

Information Technology: 16.0% Financials: 15.9% Industrials: 15.1%  
Consumer Discretionary: 13.4% Health Care: 12.6% Real Estate: 9.7% Materials: 5.7%  
Energy: 4.9% Utilities: 3.5% Consumer Staples: 2.8% Telecommunication Services: 0.5%

---

**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: 20.4% Industrials: 12.7% Information Technology: 12.0% Consumer Discretionary: 11.8%  
Consumer Staples: 9.2% Materials: 8.5% Health Care: 8.0% Energy: 6.9%  
Real Estate: 4.1% Telecommunication Services: 3.4% Utilities: 3.0%

---

**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: 20.7% Office REITs: 12.1% Residential REITs: 10.7% Real Estate Operating Companies: 10.0%  
Diversified REITs: 9.5% Diversified Real Estate Activities: 8.5%  
Industrial REITs: 7.7% Specialized REITs: 7.3% Health Care REITs: 7.1%  
Hotel & Resort REITs: 4.3% Real Estate Development: 1.8% Health Care Facilities: 0.2%  
Hotels, Resorts & Cruise Lines: 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: 41.0% Fixed Income: 16.2% Credit Strategies: 16.1% Real Assets: 13.5%  
Private Equity: 10.0% Strategic Opportunities Portfolio: 2.4% Cash: 0.8%

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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.

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## Investment Option Performance Summary: Defined Contribution Plans

AS OF JUNE 30, 2018

(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>	<b>08/01/05</b>	<b>4.83%</b>	<b>4.49%</b>	<b>5.11%</b>	<b>5.21%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		4.77%	4.45%	5.08%	5.18%		
<b>Target Date 2020 Portfolio</b>	<b>08/01/05</b>	<b>5.61%</b>	<b>5.03%</b>	<b>5.92%</b>	<b>5.35%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		5.54%	4.97%	5.86%	5.31%		
<b>Target Date 2025 Portfolio</b>	<b>07/05/06</b>	<b>6.85%</b>	<b>5.82%</b>	<b>6.70%</b>	<b>5.73%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		6.77%	5.75%	6.63%	5.67%		
<b>Target Date 2030 Portfolio</b>	<b>08/01/05</b>	<b>7.96%</b>	<b>6.52%</b>	<b>7.40%</b>	<b>6.05%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		7.85%	6.41%	7.29%	5.97%		
<b>Target Date 2035 Portfolio</b>	<b>07/05/06</b>	<b>9.01%</b>	<b>7.19%</b>	<b>8.02%</b>	<b>6.34%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		8.89%	7.05%	7.91%	6.24%		
<b>Target Date 2040 Portfolio</b>	<b>08/01/05</b>	<b>9.94%</b>	<b>7.75%</b>	<b>8.58%</b>	<b>6.57%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		9.81%	7.59%	8.44%	6.45%		
<b>Target Date 2045 Portfolio</b>	<b>07/05/06</b>	<b>10.57%</b>	<b>8.12%</b>	<b>8.99%</b>	<b>6.72%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		10.41%	7.93%	8.83%	6.59%		
<b>Target Date 2050 Portfolio</b>	<b>09/30/07</b>	<b>10.76%</b>	<b>8.24%</b>	<b>9.21%</b>	<b>6.92%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		10.65%	8.06%	9.06%	6.81%		
<b>Target Date 2055 Portfolio</b>	<b>05/19/10</b>	<b>10.75%</b>	<b>8.23%</b>	<b>9.33%</b>	<b>10.29%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		10.65%	8.06%	9.18%	10.19%		
<b>Target Date 2060 Portfolio</b>	<b>11/17/14</b>	<b>10.71%</b>	<b>8.24%</b>	<b>N/A</b>	<b>7.37%</b>	<b>0.08%</b>	<b>\$0.80</b>
Custom Benchmark <sup>1</sup>		10.65%	8.06%	N/A	7.20%		

## 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>1.64%</b>	<b>0.88%</b>	<b>0.53%</b>	<b>0.47%</b>	<b>0.08%</b>	<b>\$0.80</b>	
Benchmark: Bloomberg Barclays 3-Month Treasury Bill Index Yield as of June 30, 2018, was 2.24%		1.37%	0.69%	0.44%	0.38%			
<b>Stable Value Fund</b>	<b>02/01/95</b>	<b>2.01%</b>	<b>1.78%</b>	<b>1.67%</b>	<b>2.29%</b>	<b>0.26%</b>	<b>\$2.60</b>	
Custom Benchmark <sup>2</sup> Yield as of June 30, 2018, was 2.16%		2.25%	1.74%	1.59%	1.53%			
<b>Bond Fund</b>	<b>11/01/99</b>	<b>-0.36%</b>	<b>1.77%</b>	<b>2.33%</b>	<b>3.79%</b>	<b>0.04%</b>	<b>\$0.40</b>	
Benchmark: Bloomberg Barclays U.S. Aggregate Bond Index		-0.40%	1.72%	2.27%	3.72%			
<b>Inflation-Protected Bond Fund</b>	<b>07/30/02</b>	<b>2.27%</b>	<b>2.06%</b>	<b>1.78%</b>	<b>3.11%</b>	<b>0.03%</b>	<b>\$0.30</b>	
Benchmark: Bloomberg Barclays U.S. Treasury Inflation-Protected Securities Index		2.11%	1.93%	1.68%	3.03%			
<b>High-Yield Bond Fund</b>	<b>05/31/04</b>	<b>3.01%</b>	<b>5.58%</b>	<b>5.59%</b>	<b>7.80%</b>	<b>0.40%</b>	<b>\$4.00</b>	
Benchmark: ICE BofAML U.S. High-Yield BB-B Constrained Index		1.85%	4.96%	5.33%	7.35%			
<b>Stock Fund</b>	<b>11/01/99</b>	<b>14.39%</b>	<b>11.94%</b>	<b>13.45%</b>	<b>10.22%</b>	<b>0.02%</b>	<b>\$0.20</b>	
Benchmark: S&P 500 Index		14.37%	11.93%	13.42%	10.17%			
<b>Small/Mid-Cap Stock Fund</b>	<b>11/01/99</b>	<b>16.31%</b>	<b>10.45%</b>	<b>12.41%</b>	<b>10.58%</b>	<b>0.04%</b>	<b>\$0.40</b>	
Benchmark: Russell 2500 Index <sup>3</sup>		16.24%	10.30%	12.29%	10.43%			
<b>International Stock Fund</b>	<b>11/01/99</b>	<b>8.03%</b>	<b>5.63%</b>	<b>6.80%</b>	<b>3.03%</b>	<b>0.09%</b>	<b>\$1.00</b>	
Benchmark: MSCI ACWI ex-U.S. IMI Index <sup>4</sup>		7.75%	5.33%	6.51%	2.74%			
<b>Global Real Estate Fund</b>	<b>10/01/02</b>	<b>6.05%</b>	<b>6.64%</b>	<b>6.74%</b>	<b>7.31%</b>	<b>0.11%</b>	<b>\$1.10</b>	
Benchmark: FTSE EPRA/NAREIT Developed Index <sup>5</sup>		5.64%	5.71%	5.97%	7.03%			
<b>VRS Investment Portfolio (VRSIP)</b>	<b>07/01/08</b>	<b>7.55%</b>	<b>7.10%</b>	<b>8.27%</b>	<b>6.11%</b>	<b>0.58%</b>	<b>\$5.80</b>	
VRS Custom Benchmark <sup>6</sup>		7.75%	6.85%	7.84%	5.81%			

- <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% two-year maturity + 50% three-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 three-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.



# VRS COMMUNICATES

with  
**timely  
and tailored  
information**



Preparing for retirement is a career-long process. By providing tailored communications and education, VRS helps members throughout their careers to get the facts and resources they need to make sound decisions, recognizing that members have unique learning styles. VRS delivers information about plans and benefits via print and electronic publications, group presentations and e-learning, websites and webinars, social media and face-to-face discussions. Whether members are early in their careers, a few years from retirement or already retired, VRS offers the right information at the right time.

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- Summary of OPEB Plan Changes



## Actuary's Certification Letter: Pension Plans



**Cavanaugh Macdonald**  
CONSULTING, LLC  
*The experience and dedication you deserve*

December 16, 2017

### **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, 2017.

- 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, 2017. 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, 2017, 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.

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Offices in Kennesaw, GA • Bellevue, NE



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 rates for fiscal years ending 2019 and 2020 based on the June 30, 2017, actuarial valuation and the employer contribution rates approved by the General Assembly for fiscal years ending 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 2017 & 2018		Informational Only Total Employer Rate for Retirement Plans	Fiscal Years 2019 & 2020		
	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
	2015 Valuation	2016 Valuation	2017 Valuation			
State	14.46%	13.49%	13.17%	12.94%	0.58%	13.52%
Teacher	16.32%	14.66%/16.32%	15.86%	15.24%	0.44%	15.68%
SPORS	28.99%	28.54%	27.78%	24.88%	N/A	24.88%
VaLORS	22.21%	21.05%	20.44%	21.61%	N/A	21.61%
Judicial	45.15%	41.97%	38.45%	33.21%	1.18%	34.39%
Political Subdivisions (average rates)	8.15%	N/A	7.70%	7.12%	0.48%	7.60%

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 26-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. The valuation reflects changes in the actuarial assumptions adopted by the Board of Trustees recommended in the experience study of VRS for the four-year period ending June 30, 2016. The table below summarizes the changes in actuarial assumptions. In addition to the assumption changes listed below, the method to determine the normal cost rate has changed. Beginning with this valuation, the payroll used to develop the rate will be reduced for those expected to leave during the year. The normal cost rate is also adjusted to reflect that the hybrid payroll as a percent of the total payroll will increase from the rate-setting valuation date to when employers make the contribution.

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



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 'Larry Langer'.

Larry Langer, ASA, EA, FCA, 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

	2008	2009	2010	2011-2012	2013	2014-2016	2017
Investment Rate of Return	7.5%	7.5%	7%	7%	7%	7%	7%
Inflation Assumption	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Cost of Living (COLA) Assumption							
Plan 1	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Plan 2	N/A	N/A	N/A	2.25%	2.25%	2.25%	2.25%
Hybrid	N/A	N/A	N/A	N/A	N/A	2.25%	2.25%
Actuarial Cost Method	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
Change in Decremental Assumptions	No	Yes	No	No	Yes	No	Yes
Value of Ancillary Benefits Included	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Value of Post-Retirement Adjustments to Date Included	Yes	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	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>								
2017	\$ 12,887,047	\$ 51,247,606	\$ 25,716,631	\$69,214,2	100.00%	100.00%	19.75%	
2016	12,518,183	48,717,939	25,882,870	65,203,7	100.00%	100.00%	15.33%	
2015	12,176,530	46,783,519	25,751,093	62,083,6	100.00%	100.00%	12.13%	
2014	11,819,771	44,469,489	25,794,124	57,144,5	100.00%	100.00%	3.32%	
2013	11,420,836	42,383,697	25,273,058	52,124,5	100.00%	96.00%	0.00%	
2012	9,479,988	39,996,442	28,382,426	51,211,9	100.00%	100.00%	6.11%	
2011	9,116,662	37,539,539	28,528,577	52,558,9	100.00%	100.00%	20.69%	
2010	9,246,421	35,117,915	28,436,065	52,728,5	100.00%	100.00%	29.41%	
2009	8,876,564	31,589,747	25,856,699	53,185,0	100.00%	100.00%	49.19%	
2008	8,389,773	29,225,652	24,939,054	52,548,3	100.00%	100.00%	59.88%	
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>								
2017	\$ 99,643	\$ 622,206	\$ 318,779	\$ 785,677	100.00%	100.00%	20.02%	
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%	
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>								
2017	\$ 240,517	\$ 1,219,673	\$ 517,591	\$1,328,17	100.00%	89.18%	0.00%	
2016	237,416	1,160,507	586,334	1,235,49	100.00%	86.00%	0.00%	
2015	232,824	1,088,742	585,155	1,155,76	100.00%	84.77%	0.00%	
2014	230,522	977,848	611,675	1,058,01	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%	
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>								
2017	\$ 39,104	\$ 407,862	\$ 184,556	\$ 505,834	100.00%	100.00%	31.90%	
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%	

\* 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			Valuation Assets	Portion of Accrued Liabilities		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members*		(1)	(2)	(3)
VRS – STATE							
2017	\$ 3,374,835	\$ 14,148,870	\$ 5,787,829	\$17,547,764	100.00%	100.00%	0.42%
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%
VRS – TEACHER							
2017	\$ 6,082,982	\$ 25,474,535	\$ 13,448,500	\$32,684,868	100.00%	100.00%	8.38%
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%
VRS – POLITICAL SUBDIVISIONS							
2017	\$ 3,429,230	\$ 11,624,201	\$ 6,480,302	\$18,981,614	100.00%	100.00%	60.62%
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%
VRS – TOTAL							
2017	\$ 12,887,047	\$ 51,247,606	\$ 25,716,631	\$69,214,246	100.00%	100.00%	19.75%
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%

\* 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

(EXPRESSED IN THOUSANDS)

Actuarial Valuation Date June 30	Actuarial Value of Assets (a)	Accrued Liability (AAL) - Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio Funded (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/(c)
VIRGINIA RETIREMENT SYSTEM (VRS) **						
2017*	\$ 69,214,246	\$ 89,851,284	\$ 20,637,038	77.0%	\$ 16,764,876	123.1%
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%
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)						
2017*	\$ 785,677	\$ 1,040,628	\$ 254,951	75.5%	\$ 110,265	231.2%
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%
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)						
2017*	\$ 1,328,178	\$ 1,977,781	\$ 649,603	67.2%	\$ 339,150	191.5%
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%
JUDICIAL RETIREMENT SYSTEM (JRS)						
2017*	\$ 505,834	\$ 631,522	\$ 125,688	80.1%	\$ 66,288	189.6%
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%

\* 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>						
2017*	\$ 17,547,764	\$ 23,311,534	\$ 5,763,770	75.3%	\$ 4,037,072	142.8%
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%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER</b>						
2017*	\$ 32,684,868	\$ 45,006,017	\$ 12,321,149	72.6%	\$ 7,919,450	155.6%
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%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS</b>						
2017*	\$ 18,981,614	\$ 21,533,733	\$ 2,552,119	88.1%	\$ 4,808,354	53.1%
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%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TOTAL</b>						
2017*	\$ 69,214,246	\$ 89,851,284	\$ 20,637,038	77.0%	\$ 16,764,876	123.1%
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%

\* 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)					
2017	\$ 332,538	\$ 16,764,879	\$ 50,415	2.0%	606
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2017	\$ 1,882	\$ 110,265	\$ 58,589	(1.1)%	1
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2017	\$ 8,718	\$ 339,150	\$ 38,902	0.4%	1
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
JUDICIAL RETIREMENT SYSTEM (JRS)					
2017	\$ 421	\$ 66,288	\$ 157,454	0.0%	1
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

**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					
2017	\$ 74,807	\$ 4,037,072	\$ 53,967	1.1%	1
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					
2017	\$ 150,416	\$ 7,919,450	\$ 52,650	2.3%	145
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					
2017	\$ 107,315	\$ 4,808,354	\$ 44,806	2.3%	460
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					
2017	\$ 332,538	\$ 16,764,876	\$ 50,415	2.0%	606
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

Valuation Date (June 30)	Retirees and Beneficiaries						Annualized Increase in Annual Allowances	Average Annual Allowance
	Added to Rolls		Removed From Rolls		Rolls at End of Year			
	Number	Allowances*	Number	Allowances	Number	Allowances		
VIRGINIA RETIREMENT SYSTEM (VRS)								
2017	12,067	\$ 309,556,000	5,432	\$ 101,892,000	194,103	\$ 4,241,621,000	5.1%	\$ 21,852
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)								
2017	97	\$ 4,994,000	31	\$ 1,178,000	1,346	\$ 55,248,000	7.4%	\$ 41,046
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)								
2017	354	\$ 9,403,000	65	\$ 3,496,000	4,413	\$ 95,607,000	6.6%	\$ 21,665
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
JUDICIAL RETIREMENT SYSTEM (JRS)								
2017	28	\$ 2,408,000	25	\$ 1,539,000	520	\$ 40,657,000	2.2%	\$ 78,187
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

\* 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

Valuation Date (June 30)	Retirees and Beneficiaries						Annualized % Increase in Annual Allowances	Average Annual Allowance
	Added to Rolls		Removed From Rolls		Rolls at End of Year			
	Number	Allowances*	Number	Allowances	Number	Allowances		
VRS – STATE								
2017	3,323	\$ 90,543,000	1,961	\$ 38,698,000	55,668	\$ 1,223,849,000	4.4%	\$ 21,985
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								
2017	4,850	\$ 132,452,000	1,922	\$ 43,246,000	86,997	\$ 2,090,205,000	4.5%	\$ 24,026
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								
2017	3,894	\$ 86,561,000	1,549	\$ 19,948,000	51,438	\$ 927,567,000	7.7%	\$ 18,033
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								
2017	12,067	\$ 309,556,000	5,432	\$ 101,892,000	194,103	\$ 4,241,621,000	5.1%	\$ 21,852
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, 2017

(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, 2016	\$ 21,915,256	\$ 337,324	\$ 748,767	\$ 131,477	\$ 23,132,824
2. Normal Cost for Previous Year	1,628,321	17,645	44,102	20,695	1,710,763
3. Actual Contributions During the Year	(2,931,897)	(36,564)	(89,564)	(30,226)	(3,088,251)
4. Interest at Previous Year's Rate of 7.00%					
a. On UAAL	1,534,069	(1,058)	52,414	9,203	1,594,628
b. On Normal Cost	113,982	1,235	3,087	1,449	119,753
c. On contributions	(102,616)	(1,280)	(3,135)		(107,031)
<b>d. Total</b>	<b>1,545,435</b>	<b>(1,103)</b>	<b>52,366</b>	<b>10,652</b>	<b>1,607,350</b>
5. Expected UAAL as of June 30, 2017 (A1+A2+A3+A4)	22,157,115	341,973	755,671	131,540	23,386,299
6. Actual UAAL as of June 30, 2017	20,637,038	254,951	649,603	125,688	21,667,280
<b>7. Total Gain/(Loss) (A5-A6)</b>	<b>1,520,077</b>	<b>87,022</b>	<b>106,068</b>	<b>5,852</b>	<b>1,719,019</b>
<b>B. Calculation of Asset Gain/(Loss)</b>					
1. Actuarial Value of Assets (AVA) as of June 30, 2016	65,203,736	744,656	1,235,490	476,321	67,660,203
2. Contributions During the Year	2,931,897	36,564	89,564	30,226	3,088,251
3. Benefit Payments During the Year	(4,436,451)	(58,444)	(101,162)	(40,895)	(4,636,952)
4. Interest at Previous Year's Rate of 7.00%					
a. On AVA at Beginning of Year	4,564,261	52,126	86,484	33,342	4,736,213
b. On Contributions	102,616	1,280	3,135	1,058	108,089
c. On Benefit Payments	(155,276)	(2,046)	(3,541)	(1,431)	(162,294)
<b>d. Total</b>	<b>4,511,601</b>	<b>51,360</b>	<b>86,078</b>	<b>32,969</b>	<b>4,682,008</b>
5. Expected AVA as of June 30, 2017 (B1+B2+B3+B4)	68,210,783	774,136	1,309,970	498,621	70,793,510
6. Actual AVA as of June 30, 2017	69,214,246	785,677	1,328,178	505,834	71,833,935
<b>7. Total Gain/(Loss) on Assets (B6-B5)</b>	<b>1,003,463</b>	<b>11,541</b>	<b>18,208</b>	<b>7,213</b>	<b>1,040,425</b>
<b>C. Calculation of Liability Gain/(Loss)</b>					
1. Gain/(Loss) Due to Changes in Actuarial Assumptions	(107,233)	63,377	59,591	(19,589)	(3,854)
2. Gain/(Loss) Due to Plan Amendments	(10,104)	—	—	—	(10,104)
3. Gain/(Loss) Due to Change in Asset Method	—	—	—	—	—
<b>4. Liability Experience Gain/(Loss) (A7-B7-C1-C2-C3)</b>	<b>\$ 633,951</b>	<b>\$ 12,104</b>	<b>\$ 28,269</b>	<b>\$ 18,228</b>	<b>\$ 692,552</b>

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

FOR THE YEAR ENDED JUNE 30, 2017

(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, 2016	\$ 6,205,467	\$ 12,813,352	\$ 2,896,437	\$ 21,915,256
2. Normal Cost for Previous Year	346,014	776,145	506,162	1,628,321
3. Actual Contributions During the Year	(723,460)	(1,506,345)	(702,092)	(2,931,897)
4. Interest at Previous Year's Rate of 7.00%				
a. On UAAL	434,383	896,935	202,751	1,534,069
b. On Normal Cost	24,221	54,330	35,431	113,982
c. On Contributions	(25,321)	(52,722)	(24,573)	(102,616)
<b>d. Total</b>	<b>433,283</b>	<b>898,543</b>	<b>213,609</b>	<b>1,545,435</b>
5. Expected UAAL as of June 30, 2017 (A1+A2+A3+A4)	6,261,304	12,981,695	2,914,116	22,157,115
6. Actual UAAL as of June 30, 2017	5,763,770	12,321,149	2,552,119	20,637,038
<b>7. Total Gain/(Loss) (A5-A6)</b>	<b>497,534</b>	<b>660,546</b>	<b>361,997</b>	<b>1,520,077</b>
<b>B. Calculation of Asset Gain/(Loss)</b>				
1. Actuarial Value of Assets (AVA) as of June 30, 2016	16,672,776	30,768,277	17,762,683	65,203,736
2. Contributions During the Year	723,460	1,506,345	702,092	2,931,897
3. Benefit Payments During the Year	(1,265,225)	(2,187,302)	(983,924)	(4,436,451)
4. Interest at Previous Year's Rate of 7.00%				
a. On AVA at Beginning of Year	1,167,094	2,153,779	1,243,388	4,564,261
b. On Contributions	25,321	52,722	24,573	102,616
c. On Benefit Payments	(44,283)	(76,556)	(34,437)	(155,276)
<b>d. Total</b>	<b>1,148,132</b>	<b>2,129,945</b>	<b>1,233,524</b>	<b>4,511,601</b>
5. Expected AVA as of June 30, 2017 (B1+B2+B3+B4)	17,279,143	32,217,265	18,714,375	68,210,783
6. Actual AVA as of June 30, 2017	17,547,764	32,684,868	18,981,614	69,214,246
<b>7. Total Gain/(Loss) on Assets (B6-B5)</b>	<b>268,621</b>	<b>467,603</b>	<b>267,239</b>	<b>1,003,463</b>
<b>C. Calculation of Liability Gain/(Loss)</b>				
1. Gain/(Loss) Due to Changes in Actuarial Assumptions	(62,301)	(104,288)	59,356	(107,233)
2. Gain/(Loss) Due to Plan Amendments	—	—	(10,104)	(10,104)
3. Gain/(Loss) Due to Change in Asset Method	—	—	—	—
<b>4. Liability Experience Gain/(Loss)     (A7-B7-C1-C2-C3)</b>	<b>\$ 291,214</b>	<b>\$ 297,231</b>	<b>\$ 45,506</b>	<b>\$ 633,951</b>

## Actuarial Assumptions and Methods

On April 26, 2017, 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, 2012, through June 30, 2016, and were used for the June 30, 2017, valuation.

### ACTUARIAL ASSUMPTIONS AND METHODS: PENSION PLANS

FOR THE JUNE 30, 2017, 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 members receiving benefits or vested as of January 1, 2013, and by 2.25% for all other members.

#### Mortality Rates

**Pre-Retirement:** RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at age 81 and Older Projected With Scale BB to 2020:

- State – Males set back 1 year, 85% of rates and females set back 1 year
- State Police – Males 90% of rates, females set forward 1 year
- VaLORS – Males 90% of rates, females set forward 1 year
- Judicial – Males set back 1 year, 85% of rates, females set back 1 year
- Political subdivisions, non-hazardous duty – Males 95% of rates, females 105% of rates
- Political subdivisions, hazardous duty – Males 90% of rates, females set forward 1 year

**Post-Retirement:** RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at age 50 and Older Projected With Scale BB

- State – Males set forward 1 year, females set back 1 year with 1.5% increase compounded from age 70 to 85
- Teachers – Males 1% increase compounded from age 70 to 90, females set back 3 years with 1.5% increase compounded from age 65 to 70 and 2% increase compounded from age 75 to 90
- State Police – Males set forward 1 year with 1% increase compounded from ages 70 to 90, females set forward 3 years
- VaLORS – Males set forward 1 year with 1% increase compounded from ages 70 to 90, females set forward 3 years
- Judicial – Males set forward 1 year, females set back 1 year with 1.5% compounding increase from age 70 to 85
- Political subdivisions, non-hazardous duty – Males set forward 3 years, females 1% increase compounded from ages 70 to 90
- Political subdivisions, hazardous duty – Males set forward 1 year, females 1% increase compounded from ages 70 to 90, females set forward 3 years

**Post-Disablement:** RP-2014 Disabled Mortality Rates Projected With Scale BB to 2020:

- State – Males 115% of rates, females 130% of rates
- Teachers – Males and females 115% of rates
- State Police – Males set forward 2 years, unisex using 100% males
- VaLORS – Males set forward 2 years, unisex using 100% males
- Judicial – Males 115% of rates, females 130% of rates
- Political subdivisions, non-hazardous duty – Males set forward 2 years, 110% of rates, females 125% of rates
- Political subdivisions, hazardous duty – Males set forward 2 years, unisex using 100% males



### FIGURE 4.3: RETIREMENT RATES – PENSION PLANS

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

#### State Employees

Plan 1 – Male  
Years of Service

Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	3.3%	3.3%	12.5%	12.5%
55	4.50%	4.50%	4.50%	3.50%	5.00%	9.00%
59	4.50%	4.00%	4.00%	4.00%	10.00%	9.00%
60	4.50%	5.00%	5.00%	5.00%	11.50%	9.00%
61	15.00%	7.50%	7.50%	7.50%	16.50%	15.00%
62	15.00%	10.00%	10.00%	10.00%	20.00%	20.00%
64	15.00%	13.50%	13.50%	13.50%	20.00%	17.50%
65	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
67	27.50%	22.00%	22.00%	22.00%	22.00%	22.00%
70	20.00%	22.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Plan 1 – Female  
Years of Service

Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	3.00%	3.00%	7.50%	7.50%
55	5.00%	5.00%	5.00%	4.00%	10.00%	9.00%
59	5.00%	5.00%	5.00%	5.00%	10.00%	9.00%
60	5.00%	5.00%	5.00%	5.00%	12.00%	12.50%
61	7.50%	8.00%	8.00%	8.00%	16.50%	17.50%
62	10.00%	12.00%	12.00%	12.00%	22.50%	25.00%
64	17.50%	15.00%	15.00%	15.00%	22.50%	17.50%
65	27.50%	27.50%	27.50%	27.50%	27.50%	30.00%
67	30.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	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.

**State Employees**

Plan 2 and Hybrid – Male  
Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%
55	0.00%	0.00%	0.00%	5.00%	9.00%	9.00%	9.00%
59	0.00%	10.00%	9.00%	9.00%	9.00%	9.00%	9.00%
60	11.50%	11.50%	9.00%	9.00%	9.00%	9.00%	9.00%
61	16.50%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
62	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
64	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
65	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
67	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
70	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*Rate is 11.50% when age plus service equals 90.*

Plan 2 and Hybrid – Female  
Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.50%
55	0.00%	0.00%	0.00%	10.00%	9.00%	9.00%	9.00%
59	0.00%	10.00%	9.00%	9.00%	9.00%	9.00%	9.00%
60	12.00%	12.00%	12.50%	12.50%	12.50%	12.50%	12.50%
61	16.50%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
62	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
64	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
65	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
67	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*Rate is 12.00% 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.

**Teachers**

Plan 1 – Male  
Years of Service

Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	2.00%	2.00%	17.50%	17.50%
55	7.00%	7.00%	7.00%	4.50%	22.50%	15.00%
59	10.00%	6.00%	6.00%	6.00%	22.50%	15.00%
60	10.00%	7.00%	7.00%	7.00%	22.50%	15.00%
61	11.00%	8.50%	8.50%	8.50%	30.00%	25.00%
62	17.00%	15.00%	15.00%	15.00%	35.00%	35.00%
64	18.00%	15.00%	15.00%	15.00%	35.00%	25.00%
65	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
67	30.00%	35.00%	35.00%	35.00%	35.00%	35.00%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Plan 1 – Female  
Years of Service

Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	2.40%	2.40%	15.00%	15.00%
55	6.00%	6.00%	6.00%	5.00%	22.50%	16.00%
59	8.00%	6.00%	6.00%	6.00%	22.50%	20.00%
60	9.00%	8.00%	8.00%	8.00%	22.50%	20.00%
61	15.00%	10.00%	10.00%	10.00%	30.00%	25.00%
62	15.00%	15.00%	15.00%	15.00%	35.00%	30.00%
64	25.00%	15.00%	15.00%	15.00%	35.00%	30.00%
65	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%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	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 – Male  
Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.50%
55	0.00%	0.00%	0.00%	22.50%	15.00%	15.00%	15.00%
59	0.00%	22.50%	15.00%	15.00%	15.00%	15.00%	15.00%
60	22.50%	22.50%	15.00%	15.00%	15.00%	15.00%	15.00%
61	30.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
62	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
64	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
65	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
67	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*Rate is 22.50% when age plus service equals 90.*

Plan 2 and Hybrid – Female  
Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.00%
55	0.00%	0.00%	0.00%	22.50%	16.00%	16.00%	16.00%
59	0.00%	22.50%	20.00%	20.00%	20.00%	20.00%	20.00%
60	22.50%	22.50%	20.00%	20.00%	20.00%	20.00%	20.00%
61	30.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
62	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
65	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

*Rate is 22.50% 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.

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers Plan 1**

Age	Male Years of Service					Female Years of Service				
	5	10	11-29	30	≥31	5	10	11-29	30	≥31
50	0.00%	2.75%	2.75%	10.00%	10.00%	0.00%	3.50%	3.50%	16.00%	16.00%
55	6.00%	6.00%	5.00%	10.00%	10.00%	4.50%	4.50%	5.00%	22.00%	16.00%
59	10.00%	4.50%	4.50%	10.00%	14.00%	10.50%	6.00%	6.00%	20.00%	16.00%
60	10.00%	6.00%	6.00%	10.00%	14.00%	10.50%	7.50%	7.50%	14.00%	16.00%
61	10.00%	10.00%	10.00%	10.00%	14.00%	10.50%	10.00%	10.00%	14.00%	16.00%
62	10.00%	14.00%	14.00%	25.00%	30.00%	10.50%	14.00%	14.00%	34.50%	27.50%
64	10.00%	15.00%	15.00%	25.00%	25.00%	10.50%	17.00%	17.00%	10.00%	18.00%
65	25.00%	25.00%	25.00%	25.00%	37.00%	25.00%	25.00%	25.00%	25.00%	27.50%
67	15.00%	25.00%	25.00%	25.00%	25.00%	15.00%	27.50%	27.50%	27.50%	27.50%
70	27.50%	25.00%	25.00%	25.00%	25.00%	15.00%	27.50%	27.50%	27.50%	27.50%
≥75	100.00%	100.00%	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 – Ten Largest Employers Plan 2 and Hybrid**

Age	Male Years of Service								
	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	10.00%	10.00%	10.00%
59	0.00%	0.00%	0.00%	10.00%	14.00%	14.00%	14.00%	14.00%	14.00%
60	10.00%	10.00%	10.00%	10.00%	14.00%	14.00%	14.00%	14.00%	14.00%
61	10.00%	10.00%	10.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
62	10.00%	14.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	10.00%	15.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
65	25.00%	25.00%	37.50%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%
67	15.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	27.50%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	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.

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers Plan 2 and Hybrid, cont.**

Age	Female Years of Service								
	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	22.00%	16.00%	16.00%	16.00%
59	0.00%	0.00%	0.00%	20.00%	16.00%	16.00%	16.00%	16.00%	16.00%
60	10.50%	10.50%	14.00%	14.00%	16.00%	16.00%	16.00%	16.00%	16.00%
61	10.50%	10.00%	14.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%
62	10.50%	14.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
64	10.50%	17.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%
65	25.00%	25.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
67	15.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
70	15.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
≥75	100.00%	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 Plan 1**

Age	Male Years of Service					Female Years of Service				
	5	10	11-29	30	≥31	5	10	11-29	30	≥31
50	0.00%	5.00%	5.00%	10.00%	10.00%	0.00%	5.50%	5.50%	6.00%	6.00%
55	5.50%	5.50%	5.00%	14.00%	10.00%	7.00%	7.00%	5.50%	12.00%	10.00%
59	10.00%	5.50%	5.50%	12.00%	10.00%	6.00%	5.50%	5.50%	15.00%	10.00%
60	10.00%	6.00%	6.00%	12.00%	10.00%	8.50%	7.50%	7.50%	15.00%	10.00%
61	15.00%	10.00%	10.00%	25.00%	22.00%	8.50%	7.50%	7.50%	20.00%	17.50%
62	13.00%	17.00%	17.00%	35.00%	30.00%	19.00%	17.00%	17.00%	20.00%	25.00%
64	20.00%	15.00%	15.00%	27.00%	25.00%	11.00%	15.00%	15.00%	25.00%	15.00%
65	27.00%	27.00%	27.00%	27.00%	30.00%	28.00%	28.00%	28.00%	28.00%	35.00%
67	27.00%	25.00%	25.00%	25.00%	25.00%	17.50%	22.00%	22.00%	22.00%	22.00%
70	27.00%	25.00%	25.00%	25.00%	25.00%	30.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	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.

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers Plan 2 and Hybrid**

Male									
Years of Service									
Age	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	14.00%	10.00%	10.00%	10.00%
59	0.00%	0.00%	0.00%	12.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	10.00%	10.00%	12.00%	12.00%	10.00%	10.00%	10.00%	10.00%	10.00%
61	15.00%	10.00%	25.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
62	13.00%	17.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	20.00%	15.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
65	27.00%	27.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
67	27.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	27.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Female									
Years of Service									
Age	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	12.00%	10.00%	10.00%	10.00%
59	0.00%	0.00%	0.00%	15.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	8.50%	8.50%	15.00%	15.00%	10.00%	10.00%	10.00%	10.00%	10.00%
61	8.50%	7.50%	20.00%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
62	19.00%	17.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
64	11.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
65	28.00%	28.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
67	17.50%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
70	30.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	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.

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

Age	Male Years of Service				Female Years of Service			
	5	6-24	25	≥26	5	6-24	25	≥26
50	7.00%	7.00%	26.00%	26.00%	5.00%	5.00%	32.00%	32.00%
55	7.00%	6.00%	15.00%	20.50%	5.00%	7.50%	25.00%	21.00%
59	7.00%	12.50%	32.00%	27.50%	5.00%	14.00%	25.00%	40.00%
60	21.00%	21.00%	21.00%	27.50%	20.00%	20.00%	20.00%	40.00%
61	37.50%	27.50%	27.50%	27.50%	20.00%	20.00%	20.00%	20.00%
62	50.00%	32.00%	32.00%	32.00%	20.00%	35.00%	35.00%	35.00%
63	50.00%	32.00%	32.00%	32.00%	20.00%	30.00%	30.00%	30.00%
64	50.00%	40.00%	40.00%	40.00%	20.00%	30.00%	30.00%	30.00%
≥65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

Age	Male Years of Service				Female Years of Service			
	5	6-24	25	≥26	5	6-24	25	≥26
50	9.00%	9.00%	27.50%	27.50%	9.25%	9.25%	50.00%	50.00%
55	9.00%	7.50%	20.00%	18.00%	12.50%	9.00%	20.00%	18.00%
59	9.00%	12.00%	20.00%	24.00%	12.50%	9.00%	20.00%	24.00%
60	15.00%	15.00%	15.00%	27.50%	20.00%	20.00%	20.00%	27.50%
61	15.00%	27.50%	27.50%	27.50%	20.00%	27.50%	27.50%	27.50%
62	15.00%	27.50%	27.50%	27.50%	20.00%	27.50%	27.50%	27.50%
63	25.00%	30.00%	30.00%	30.00%	20.00%	30.00%	30.00%	30.00%
64	20.00%	30.00%	30.00%	30.00%	20.00%	30.00%	30.00%	30.00%
≥65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**State Police Officers – All Plans**

Age	Years of Service	
	5-24	≥25
50	10.00%	10.00%
55	6.00%	10.00%
59	10.00%	10.00%
60	10.00%	10.00%
≥65	100.00%	100.00%



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

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

**Virginia Law Officers – All Plans**

Years of Service – Male				
Age	5	6-24	25	≥26
50	11.00%	11.00%	35.00%	35.00%
55	10.00%	8.00%	18.00%	25.00%
59	10.00%	12.00%	18.00%	20.00%
60	18.00%	18.00%	18.00%	20.00%
≥65	100.00%	100.00%	100.00%	100.00%

Years of Service – Female				
Age	5	6-24	25	≥26
50	10.00%	10.00%	37.50%	37.50%
55	10.00%	8.00%	25.00%	27.50%
59	10.00%	13.00%	30.00%	22.50%
60	20.00%	20.00%	20.00%	22.50%
≥65	100.00%	100.00%	100.00%	100.00%

**Judges – All Plans**

Age	Rate
60	15.00%
65	15.00%
70	50.00%
≥73	100.00%

**FIGURE 4.4: DISABILITY RATES – PENSION PLANS**

As shown below for selected ages.

**State Employees**

25% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0390%	0.0330%
30	0.0910%	0.2110%
40	0.2120%	0.3540%
50	0.4970%	0.6290%
60	0.6900%	0.7350%

**Teachers**

5% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0005%	0.0003%
30	0.0064%	0.0081%
40	0.0325%	0.0481%
50	0.1444%	0.1609%
60	0.3395%	0.3321%

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

20% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0050%	0.0010%
30	0.0070%	0.0230%
40	0.1390%	0.1340%
50	0.3840%	0.3300%
60	0.8080%	0.5300%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

15% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0050%	0.0010%
30	0.0220%	0.0010%
40	0.1300%	0.0580%
50	0.4290%	0.2740%
60	0.6560%	0.6400%

**FIGURE 4.4: DISABILITY RATES – PENSION PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

70% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0190%	0.0120%
30	0.0520%	0.5580%
40	0.2670%	0.7940%
50	0.5000%	1.0900%
60	1.0550%	1.7880%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

45% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0010%	0.0050%
30	0.0580%	0.1570%
40	0.2180%	0.2010%
50	0.4160%	0.4130%
60	0.5750%	1.6050%

**State Police Officers**

85% of disability cases are assumed to be service-related.

Age	Rate
≤44	0.1940%
50	0.4810%
55	0.7700%
60	0.8970%
70	1.3680%

**Virginia Law Officers**

35% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.1430%	0.5430%
30	0.5840%	0.6590%
40	0.7930%	1.0010%
50	1.1650%	1.8210%
60	1.7820%	2.9010%
70	1.9200%	5.4990%

**Judges**

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

**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 – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	22.297%	22.297%	22.056%	20.171%	16.921%	13.670%	10.954%	9.132%	8.251%	7.732%	7.214%
35	15.120%	14.553%	13.631%	12.195%	10.694%	9.577%	8.902%	8.387%	7.574%	5.878%	4.183%
45	14.223%	11.470%	9.617%	8.321%	7.345%	6.888%	6.600%	6.412%	5.934%	4.282%	2.630%
55	13.242%	10.032%	8.050%	7.094%	6.491%	6.348%	5.950%	5.391%	4.470%	3.550%	2.630%
65	13.038%	9.477%	7.859%	7.094%	6.491%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	26.747%	26.747%	25.594%	23.170%	20.061%	16.601%	13.663%	11.705%	11.136%	11.136%	11.136%
35	19.257%	17.078%	15.532%	14.101%	12.758%	11.658%	10.633%	9.380%	8.241%	7.177%	6.019%
45	17.029%	13.335%	11.247%	9.984%	8.920%	8.275%	7.531%	6.872%	6.277%	5.214%	3.025%
55	16.695%	11.694%	9.149%	8.236%	7.660%	7.039%	6.175%	5.711%	5.138%	5.088%	3.025%
65	16.695%	11.656%	9.060%	8.236%	7.660%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**Teachers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	18.729%	14.293%	12.175%	11.084%	9.453%	8.071%	7.568%	6.716%	5.060%	4.286%	4.286%
35	16.964%	13.888%	12.459%	10.907%	9.347%	7.931%	6.709%	5.881%	5.210%	4.361%	3.314%
45	16.964%	13.888%	11.573%	10.116%	7.864%	6.940%	6.230%	5.733%	5.243%	4.239%	2.407%
55	16.964%	13.888%	11.217%	10.116%	7.038%	5.844%	5.813%	5.733%	5.234%	4.238%	2.407%
65	16.964%	13.888%	11.217%	10.116%	7.038%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**Teachers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	18.037%	12.332%	10.860%	10.637%	9.381%	7.728%	6.567%	6.507%	5.448%	4.933%	4.933%
35	16.500%	14.138%	12.602%	11.307%	10.178%	9.519%	8.653%	7.385%	6.386%	5.292%	3.931%
45	15.055%	12.047%	9.933%	8.544%	7.686%	7.181%	6.623%	5.912%	5.390%	4.417%	2.287%
55	14.909%	11.617%	9.449%	8.038%	7.093%	6.249%	5.450%	5.326%	4.771%	4.357%	2.287%
65	14.909%	11.617%	9.449%	8.038%	7.093%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

FIGURE 4.5: TERMINATION RATES – PENSION PLANS, cont.

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

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	23.300%	20.505%	18.626%	17.319%	16.251%	14.426%	11.711%	9.285%	8.232%	6.883%	6.883%
35	19.131%	16.822%	15.078%	13.689%	12.397%	11.188%	10.157%	9.215%	8.232%	6.883%	5.224%
45	16.933%	14.546%	12.562%	10.920%	9.444%	8.921%	8.524%	8.181%	7.546%	6.301%	3.941%
55	15.609%	12.538%	10.330%	8.976%	8.448%	7.339%	6.690%	5.864%	4.833%	4.320%	3.941%
65	15.343%	9.244%	6.477%	6.477%	6.477%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	22.847%	20.860%	19.802%	19.425%	19.257%	18.886%	17.958%	15.784%	13.041%	13.041%	13.041%
35	21.392%	18.767%	17.208%	16.238%	15.439%	14.424%	13.001%	11.315%	9.792%	8.502%	7.338%
45	19.067%	15.747%	13.540%	12.135%	11.040%	10.262%	9.177%	8.099%	7.250%	6.008%	3.671%
55	17.295%	12.753%	9.920%	8.541%	8.214%	7.159%	6.952%	6.590%	5.564%	5.536%	3.671%
65	17.275%	11.784%	8.108%	6.923%	6.923%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	25.057%	23.024%	20.925%	18.373%	15.688%	13.361%	11.957%	10.835%	9.992%	9.992%	9.992%
35	20.650%	18.223%	16.214%	14.313%	12.751%	11.426%	10.347%	9.571%	8.813%	7.795%	6.549%
45	18.397%	14.896%	12.718%	11.399%	10.572%	9.878%	9.085%	8.205%	7.363%	6.227%	4.626%
55	16.068%	12.967%	12.001%	10.500%	10.447%	9.747%	8.930%	8.111%	6.486%	6.227%	4.626%
65	15.356%	12.875%	12.001%	10.500%	10.447%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	27.370%	25.711%	23.395%	20.379%	17.488%	15.451%	13.809%	12.034%	10.656%	10.642%	10.642%
35	22.330%	20.208%	18.736%	17.235%	15.849%	14.347%	12.837%	11.557%	10.447%	9.116%	7.607%
45	19.506%	16.555%	14.581%	13.206%	12.281%	11.551%	10.655%	9.714%	8.999%	7.643%	5.323%
55	16.934%	14.490%	12.400%	10.933%	10.007%	9.284%	9.284%	9.284%	8.445%	7.560%	5.323%
65	15.628%	14.008%	12.292%	10.875%	10.007%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

FIGURE 4.5: TERMINATION RATES – PENSION PLANS, cont.

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		
Terminations Per 100 Members		
Years of Service	Males	Females
0	10.000%	15.000%
1	8.500%	9.000%
2	8.000%	9.000%
3	7.500%	9.000%
4	5.500%	9.000%
5	5.000%	9.000%
6	4.750%	9.000%
7	4.500%	6.000%
8	4.000%	3.500%
9	3.000%	2.000%
≥10	1.800%	2.000%

FIGURE 4.5: TERMINATION RATES – PENSION PLANS, cont.

Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits –  
All Other Employers – All Plans

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	16.006%	14.519%	13.807%	13.247%	12.169%	10.519%	8.845%	7.768%	6.899%	6.899%	6.899%
35	15.310%	12.574%	10.924%	9.896%	9.156%	8.897%	8.437%	7.640%	6.609%	5.433%	4.189%
45	15.275%	11.790%	9.478%	8.223%	7.802%	7.022%	6.634%	6.269%	5.626%	4.561%	3.022%
55	14.065%	10.547%	8.414%	7.694%	7.694%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	11.088%	8.665%	7.763%	7.694%	7.694%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	18.762%	15.474%	13.049%	11.598%	11.001%	10.648%	10.224%	8.766%	6.591%	5.831%	5.831%
35	20.886%	16.395%	13.402%	11.544%	10.335%	9.327%	8.334%	7.404%	6.591%	5.831%	5.043%
45	18.253%	14.688%	12.276%	10.843%	9.904%	8.818%	7.992%	7.253%	6.587%	5.314%	3.443%
55	11.234%	10.212%	9.680%	9.680%	9.599%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	1.269%	3.040%	3.040%	3.040%	3.040%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

State Police Officers – All Plans

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION	
Service	Rate
0	9.750%
1	4.750%
2	4.750%
3	4.750%
4	4.750%
5	4.750%
6	4.750%
7	3.000%
8	3.000%
9	3.000%
≥10	1.750%

**FIGURE 4.5: TERMINATION RATES – PENSION PLANS, cont.**

**Virginia Law Officers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION									
Years of Service – Males									
Age	0	1	2	3	4	5	6	7	8
25	30.264%	26.915%	23.838%	20.793%	17.797%	14.758%	12.544%	11.510%	11.510%
35	25.749%	21.974%	18.823%	16.020%	13.400%	11.603%	10.242%	9.350%	8.615%
45	22.182%	17.034%	13.792%	12.032%	11.173%	9.580%	8.484%	7.391%	6.240%
55	21.689%	14.708%	10.525%	9.930%	9.930%	0.000%	0.000%	0.000%	0.000%
65	21.689%	14.673%	9.796%	9.787%	9.787%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION									
Years of Service – Females									
Age	0	1	2	3	4	5	6	7	8
25	33.633%	30.645%	27.155%	23.161%	19.212%	15.381%	13.567%	10.072%	9.919%
35	32.025%	25.204%	20.727%	17.948%	15.980%	14.868%	13.534%	10.072%	9.909%
45	30.589%	21.487%	15.693%	12.720%	11.803%	10.976%	10.134%	9.113%	7.804%
55	28.000%	17.544%	10.155%	6.516%	6.490%	0.000%	0.000%	0.000%	0.000%
65	23.879%	12.934%	3.574%	0.004%	0.182%	0.000%	0.000%	0.000%	0.000%

**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%
11-19	0.15%	3.65%
20 or more	0.00%	3.50%



**FIGURE 4.6: SALARY INCREASE RATES – PENSION PLANS, cont.**

**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%
11-19	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%
11-19	0.15%	3.65%
20 or more	0.00%	3.50%

**FIGURE 4.6: SALARY INCREASE RATES – PENSION PLANS, cont.**

**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%
11-19	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%
11-19	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%
11-19	0.50%	4.00%
20 or more	0.00%	3.50%

**FIGURE 4.6: SALARY INCREASE RATES – PENSION PLANS, cont.**

**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%
11-19	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 (ORP); 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 Retirement 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 on or after July 1, 2010, and maintain an account balance. If a member of VaLORS or SPORS, or VRS with enhanced hazardous duty benefits or the hazardous duty alternate option, 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% 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%, 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

PLAN 1	PLAN 2 & HYBRID PLAN	BENEFIT CALCULATIONS
<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**

<b>PLAN 1</b>	<b>PLAN 2 &amp; HYBRID PLAN</b>	<b>BENEFIT CALCULATIONS</b>
JRS: Age 65 with at least five years of weighted service credit or age 60 with at least 30 years of weighted service credit	Same as Plan 1.	<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>

**EARLIEST REDUCED RETIREMENT ELIGIBILITY**

<b>PLAN 1</b>	<b>PLAN 2 &amp; HYBRID PLAN</b>	<b>BENEFIT CALCULATIONS</b>
VRS: Age 55 with at least five years of service credit or age 50 with at least 10 years of service credit.	Age 60 with at least five years of service credit.	<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>
SPORS, VaLORS and political subdivision hazardous duty covered employees: Age 50 with at least five years of service credit.	Same as Plan 1.	
JRS: Age 55 with at least five years of weighted service credit.	Same as Plan 1.	

## 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. Basic Benefit With the Partial Lump-Sum Option Payment (PLOP) or Survivor Option With the PLOP.** This option is available with the Basic Benefit and the Survivor Option. Members who are in active service for one or more years beyond the date they become eligible for an unreduced retirement benefit may elect the Basic Benefit with the PLOP or Survivor Option with the PLOP 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.

**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 an annual increase in your retirement benefit that allows it to keep pace with inflation. If a member retires with an unreduced benefit or with a reduced benefit with at least 20 years of service credit, the COLA will go into effect on July 1 after one full calendar year from the retirement date.

If a member retires with a reduced benefit with fewer than 20 years of service credit, the COLA will go into effect on July 1 after one full calendar year from the date the member would have become eligible for an unreduced benefit. Exceptions to the COLA effective dates are listed in Figure 2.10 in the Financial Section.

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 vested and his or her spouse, natural or legally adopted minor child or parent is not one of the member's named beneficiaries, or is not the beneficiary based on order of precedence, that beneficiary will be eligible for a lump-sum payment only. 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 lump-sum payment 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%. (continued)

**2012 VALUATION (continued):**

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.

**2017 VALUATION:** No actuarially material changes are made to the plan provisions. There is one change of note: On April 26, 2017, the Board adopts the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2016 experience study.

**2018 VALUATION:** No actuarially material changes are made to the plan provisions.

## Actuary's Certification Letter: Other Post-Employment Benefit (OPEB) Plans



**Cavanaugh Macdonald**  
CONSULTING, LLC  
*The experience and dedication you deserve*

January 30, 2018

### **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, 2017:

- 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 – Social Service 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, 2017. 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.

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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, 2017. 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.

Contribution rates for Virginia Retirement System (VRS) employers are established every two years. The actuarially calculated employer contribution rates based on the June 30, 2017, results presented in this report are for fiscal years ending in 2019 and 2020. The actuarially calculated employer contribution rates based on the June 30, 2016, valuation presented in this report 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, 2016, actuarial valuation, the employer contribution rates approved by the General Assembly for fiscal years ending 2019 and 2020, and the employer contribution rates based on the June 30, 2016, actuarial valuation.

OPEB Plan	Fiscal Years 2019 & 2020		2016 Valuation (Informational Only)
	Board Approved	General Assembly Approved	
GLI*	1.31%	1.31%	1.31%
HIC – State Employees	1.17%	1.17%	1.15%
HIC – Teachers	1.20%	1.20%	1.25%
HIC – Participating Political Subdivisions**	0.32%	0.32%	0.32%
HIC – Constitutional Officers	0.38%	0.38%	0.37%
HIC – Social Service Employees	0.43%	0.43%	0.42%
HIC – Registrars	0.39%	0.39%	0.40%
VSDP	0.62%	0.62%	0.63%
VLDP – Teachers	0.41%	0.41%	0.32%
VLDP – Political Subdivisions	0.72%	0.72%	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 actuarial 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). The discount rate used to value a plan should be based on the likely return of the assets used to pay benefits. As of June 30, 2017, 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. 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.

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

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Alisa Bennett'.

Alisa Bennett, FSA, EA, FCA, MAAA  
Principal and Consulting Actuary

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

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

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

Bradley R. Wild, ASA, FCA, MAAA  
Actuary

## Actuary's Certification Letter: OPEB Plans – Line of Duty Act (LODA) Fund



**Cavanaugh Macdonald**  
CONSULTING, LLC  
*The experience and dedication you deserve*

February 28, 2018

### **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 of the Virginia Retirement System (VRS) Line of Duty Act Fund (Plan) prepared as of June 30, 2017.

Cavanaugh Macdonald Consulting LLC (CMC) has relied on the plan provisions and eligibility provisions of the Commonwealth of Virginia's Line of Duty Program (LODA Program) provided by §9.1-400 et seq. of the *Code of Virginia* (Code), including changes resulting from the passage of House Bill 1345 (HB 1345) from the 2016 legislative session, Item 269 of the 2016 Appropriations Act (the Act) and House Bill 2243 (HB 2243) from the 2017 legislative session. Additionally, CMC has received active participant data from the Virginia Retirement System (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. Health care benefits were assumed to be uniform amongst Plan beneficiaries to reflect the changes brought about by the passage of HB 1345 (2016) and HB 2243 (2017). The legislation revised the Line of Duty Act by transferring overall administration of eligibility determinations to VRS and administration of health insurance benefits to the Department of Human Resource Management (DHRM) and creates statewide health insurance plans for all LODA beneficiaries, with separate plans based on Medicare eligibility. The legislation became effective July 1, 2017, and is included in this valuation. Here the assumed health care costs were based upon the estimates provided by the DHRM actuaries which used adjusted

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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.

Based upon the June 30, 2017, valuation results, the Board-approved rate for fiscal years 2019 and 2020 is \$705.77. Contribution rates for participating employer groups are established every two years. The contribution rates assume Plan participation of 11,217.30 state employee Full-Time Equivalent employee contributions (FTEs) and 7,516.50 political subdivision employee FTEs, for a total of 18,733.80 FTEs. The contribution rate of \$705.77 represents, in total, the estimated cost of providing benefits payable in fiscal years 2019 and 2020, including administrative expenses.

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.

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. The actuarially determined employer contribution rates 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. Therefore, the 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.

The valuation reflects changes in the actuarial assumptions and methods used in the prior study, including revisions to the assumed per capita health care costs; and updates to the assumed rates of health care inflation.

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

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

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: potential variance in the number and/or type of covered lives, Plan experience differing from that anticipated by the economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in Plan provisions or applicable law.



Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

The 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 'Alisa Bennett'.

Alisa Bennett, FSA, EA, FCA, MAAA  
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Actuary

The 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 April 26, 2017, 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, 2012, through June 30, 2016, and were used for the June 30, 2017, valuation.

### SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS: OTHER POST-EMPLOYMENT BENEFIT (OPEB) PLANS

FOR THE JUNE 30, 2017, ACTUARIAL VARIATION

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%	7%	7%	4.75%	7%
Salary Scale Inflation Factor	2.5%	2.5%	2.5%	2.5%	2.5%
Actuarial Cost Method	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
Effective Amortization Period – State	27.2 Years	26.1 Years	22.9 Years	30 Years	N/A
Effective Amortization Period – Teacher	27.2 Years	25.7 Years	N/A	N/A	18.6 Years
Effective Amortization Period – Political Subdivisions	27.2 Years	25.7 Years	N/A	30 Years	18.9 Years
Amortization Method	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
Payroll Growth Rate	3%	3%	3%	3%	3%
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)	
GROUP LIFE INSURANCE								
2017	N/A	\$ 1,786,401	\$ 1,238,317	\$ 1,410,087	N/A	78.93%	0.00%	
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%	
RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES**								
2017	N/A	\$ 638,266	\$ 352,458	\$ 79,451	N/A	12.45%	0.00%	
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%	
RETIREE HEALTH INSURANCE CREDIT – TEACHERS								
2017	N/A	\$ 832,771	\$ 525,150	\$ 96,987	N/A	11.65%	0.00%	
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%	
RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS								
2017	N/A	\$ 25,791	\$ 17,444	\$ 3,552	N/A	13.77%	0.00%	
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)

RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS										
2017	N/A	\$	21,326	\$	17,974	\$	22,167	N/A	100.00%	4.68%
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%
VIRGINIA SICKNESS AND DISABILITY PROGRAM – LONG-TERM DISABILITY (LTD) BENEFITS										
2017****	N/A	\$	160,283	\$	66,229	\$	437,372	N/A	100.00%	418.38%
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%
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS										
2017****	N/A	\$	103	\$	709	\$	324	N/A	100.00%	31.17%
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%
VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS										
2017****	N/A	\$	361	\$	464	\$	413	N/A	100.00%	11.21%
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%
LINE OF DUTY ACT PROGRAM										
2017	N/A	\$	233,193	\$	37,186	\$	3,461	N/A	1.48%	0.00%
2016	N/A		192,578		32,105		2,708	N/A	1.41%	0.00%
2015	N/A		169,288		76,520		728	N/A	0.43%	0.00%
2014	N/A		152,120		73,696		—	N/A	0.00%	0.00%
2013	N/A		139,835		64,249		—	N/A	0.00%	0.00%
2012	N/A		131,501		94,673		—	N/A	0.00%	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 University of Virginia (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				
2017	\$ 365,149	\$ 19,222,759	\$ 52,644	4.21%
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	0.35%
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*				
2017	\$ 108,027	\$ 6,480,712	\$ 59,992	2.37%
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				
2017	\$ 150,416	\$ 8,303,502	\$ 55,204	7.30%
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

**SCHEDULE OF ACTIVE MEMBER VALUATION DATA: OPEB PLANS, cont.**

RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS							
2017	\$	18,532	\$	893,334	\$	48,205	1.30%
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
RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS							
2017	\$	22,478	\$	987,951	\$	43,952	1.80%
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							
2017	\$	73,620	\$	3,767,055	\$	51,169	1.13%
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							
2017	\$	7,239	\$	305,446	\$	42,195	9.31%
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							
2017	\$	6,331	\$	206,895	\$	32,680	3.42%
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 UVA.

\*\* Data for prior fiscal years is unavailable.

**SCHEDULE OF RETIREE AND BENEFICIARY VALUATION DATA: OPEB PLANS**

GROUP LIFE INSURANCE								
Valuation Date (June 30)	Retirees					Insurance Amount	Annualized % Increase in Life Insurance Amount	Average Life Insurance Amount
	Added to Rolls		Removed from Rolls		Total			
	Number	Amount	Number	Amount				
2017	11,212	\$ 1,281,014,000	4,936	\$ 2,445,277,000	179,410	\$ 7,068,589,000	(14.14)%	\$ 39,399
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 Credit	Average Annual Insurance Credit
	Added to Rolls		Removed from Rolls		Total			
	Number	Amount	Number	Amount				
2017	3,364	\$ 4,928,000	1,734	\$ 2,671,000	46,288	\$ 68,756,000	3.39%	\$ 1,485
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 Credit	Average Annual Insurance Credit
	Added to Rolls		Removed from Rolls		Total			
	Number	Amount	Number	Amount				
2017	3,412	\$ 4,565,000	1,470	\$ 1,984,000	64,355	\$ 88,654,000	3.00%	\$ 1,378
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

\* State employees include 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.

**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 Credit	Average Annual Insurance Credit	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2017	440	\$ 217,000	133	\$ 63,000	5,508	\$ 2,798,000	5.82 %	\$ 508	
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 Credit	Average Annual Insurance Credit	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2017	394	\$ 188,000	166	\$ 80,000	4,830	\$ 2,383,000	4.75 %	\$ 493	
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	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2017	366	\$ 6,428,000	441	\$ 6,696,000	2,721	\$ 30,631,000	(0.87)%	\$ 11,257	
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	

VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS									
Valuation Date (June 30)	Retirees					Current Total Annual LTD Payments	Annualized % Increase in LTD Payments	Average Annual LTD	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2017	—	\$ —	1	11,000	—	\$ —	N/A	N/A	
2016	1	11,000	—	—	1	11,000	N/A	11,000	
2015	—	—	—	—	—	—	N/A	N/A	
2014***	—	—	—	—	—	—	N/A	N/A	

VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS									
Valuation Date (June 30)	Retirees					Current Total Annual LTD Payments	Annualized % Increase in LTD Payments	Average Annual LTD	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2017	5	\$ 69,000	—	—	5	\$ 69,000	N/A	\$ 13,800	
2016	—	—	—	—	—	—	N/A	N/A	
2015	—	—	—	—	—	—	N/A	N/A	
2014***	—	—	—	—	—	—	N/A	N/A	

## FIGURE 4.7: RETIREMENT RATES – OPEB PLANS

Sample retirement rates for eligible members 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 – Male						
Years of Service						
Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	3.30%	3.30%	12.50%	12.50%
55	4.50%	4.50%	4.50%	3.50%	5.00%	9.00%
59	4.50%	4.00%	4.00%	4.00%	10.00%	9.00%
60	4.50%	5.00%	5.00%	5.00%	11.50%	9.00%
61	15.00%	7.50%	7.50%	7.50%	16.50%	15.00%
62	15.00%	10.00%	10.00%	10.00%	20.00%	20.00%
64	15.00%	13.50%	13.50%	13.50%	20.00%	17.50%
65	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
67	27.50%	22.00%	22.00%	22.00%	22.00%	22.00%
70	20.00%	22.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Plan 1 – Female						
Years of Service						
Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	3.00%	3.00%	7.50%	7.50%
55	5.00%	5.00%	5.00%	4.00%	10.00%	9.00%
59	5.00%	5.00%	5.00%	5.00%	10.00%	9.00%
60	5.00%	5.00%	5.00%	5.00%	12.00%	12.50%
61	7.50%	8.00%	8.00%	8.00%	16.50%	17.50%
62	10.00%	12.00%	12.00%	12.00%	22.50%	25.00%
64	17.50%	15.00%	15.00%	15.00%	22.50%	17.50%
65	27.50%	27.50%	27.50%	27.50%	27.50%	30.00%
67	30.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.

State Employees

Plan 2 and Hybrid – Male

Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%
55	0.00%	0.00%	0.00%	5.00%	9.00%	9.00%	9.00%
59	0.00%	10.00%	9.00%	9.00%	9.00%	9.00%	9.00%
60	11.50%	11.50%	9.00%	9.00%	9.00%	9.00%	9.00%
61	16.50%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
62	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
64	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
65	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
67	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
70	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 11.50% when age plus service equals 90.

Plan 2 and Hybrid – Female

Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.50%
55	0.00%	0.00%	0.00%	10.00%	9.00%	9.00%	9.00%
59	0.00%	10.00%	9.00%	9.00%	9.00%	9.00%	9.00%
60	12.00%	12.00%	12.50%	12.50%	12.50%	12.50%	12.50%
61	16.50%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
62	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
64	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
65	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
67	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 12.00% when age plus service equals 90.

FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.

Teachers

Plan 1 – Male						
Years of Service						
Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	2.00%	2.00%	17.50%	17.50%
55	7.00%	7.00%	7.00%	4.50%	22.50%	15.00%
59	10.00%	6.00%	6.00%	6.00%	22.50%	15.00%
60	10.00%	7.00%	7.00%	7.00%	22.50%	15.00%
61	11.00%	8.50%	8.50%	8.50%	30.00%	25.00%
62	17.00%	15.00%	15.00%	15.00%	35.00%	35.00%
64	18.00%	15.00%	15.00%	15.00%	35.00%	25.00%
65	30.00%	30.00%	30.00%	30.00%	30.00%	35.00%
67	30.00%	35.00%	35.00%	35.00%	35.00%	35.00%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Plan 1 – Female						
Years of Service						
Age	5	6-9	10	11-29	30	≥31
50	0.00%	0.00%	2.40%	2.40%	15.00%	15.00%
55	6.00%	6.00%	6.00%	5.00%	22.50%	16.00%
59	8.00%	6.00%	6.00%	6.00%	22.50%	20.00%
60	9.00%	8.00%	8.00%	8.00%	22.50%	20.00%
61	15.00%	10.00%	10.00%	10.00%	30.00%	25.00%
62	15.00%	15.00%	15.00%	15.00%	35.00%	30.00%
64	25.00%	15.00%	15.00%	15.00%	35.00%	30.00%
65	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%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.

Teachers

Plan 2 and Hybrid – Male

Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.50%
55	0.00%	0.00%	0.00%	22.50%	15.00%	15.00%	15.00%
59	0.00%	22.50%	15.00%	15.00%	15.00%	15.00%	15.00%
60	22.50%	22.50%	15.00%	15.00%	15.00%	15.00%	15.00%
61	30.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
62	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
64	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
65	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
67	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 22.50% when age plus service equals 90.

Plan 2 and Hybrid – Female

Years of Service

Age	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.00%
55	0.00%	0.00%	0.00%	22.50%	16.00%	16.00%	16.00%
59	0.00%	22.50%	20.00%	20.00%	20.00%	20.00%	20.00%
60	22.50%	22.50%	20.00%	20.00%	20.00%	20.00%	20.00%
61	30.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
62	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
65	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
67	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
70	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Rate is 22.50% when age plus service equals 90.



FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.

Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – Plan 1

Age	Male Years of Service					Female Years of Service				
	5	10	11-29	30	≥31	5	10	11-29	30	≥31
50	0.00%	2.80%	2.80%	10.00%	10.00%	0.00%	3.50%	3.50%	16.00%	16.00%
55	6.00%	6.00%	5.00%	10.00%	10.00%	4.50%	4.50%	5.00%	22.00%	16.00%
59	10.00%	4.50%	4.50%	10.00%	14.00%	10.50%	6.00%	6.00%	20.00%	16.00%
60	10.00%	6.00%	6.00%	10.00%	14.00%	10.50%	7.50%	7.50%	14.00%	16.00%
61	10.00%	10.00%	10.00%	10.00%	14.00%	10.50%	10.00%	10.00%	14.00%	16.00%
62	10.00%	14.00%	14.00%	25.00%	30.00%	10.50%	14.00%	14.00%	34.50%	27.50%
64	10.00%	15.00%	15.00%	25.00%	25.00%	10.50%	17.00%	17.00%	10.00%	18.00%
65	25.00%	25.00%	25.00%	25.00%	37.00%	25.00%	25.00%	25.00%	25.00%	27.50%
67	15.00%	25.00%	25.00%	25.00%	25.00%	15.00%	27.50%	27.50%	27.50%	27.50%
70	27.50%	25.00%	25.00%	25.00%	25.00%	15.00%	27.50%	27.50%	27.50%	27.50%
≥75	100.00%	100.00%	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 – Ten Largest Employers – Plan 2 and Hybrid

Age	Male Years of Service								
	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	10.00%	10.00%	10.00%
59	0.00%	0.00%	0.00%	10.00%	14.00%	14.00%	14.00%	14.00%	14.00%
60	10.00%	10.00%	10.00%	10.00%	14.00%	14.00%	14.00%	14.00%	14.00%
61	10.00%	10.00%	10.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
62	10.00%	14.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	10.00%	15.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
65	25.00%	25.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%
67	15.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	27.50%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	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 – Ten Largest Employers – Plan 2 and Hybrid, cont.

Age	Female Years of Service								
	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	22.00%	16.00%	16.00%	16.00%
59	0.00%	0.00%	0.00%	20.00%	16.00%	16.00%	16.00%	16.00%	16.00%
60	10.50%	10.50%	14.00%	14.00%	16.00%	16.00%	16.00%	16.00%	16.00%
61	10.50%	10.00%	14.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%
62	10.50%	14.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
64	10.50%	17.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%
65	25.00%	25.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
67	15.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
70	15.00%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%	27.50%
≥75	100.00%	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 – Plan 1

Age	Male Years of Service					Female Years of Service				
	5	10	11-29	30	≥31	5	10	11-29	30	≥31
50	0.00%	5.00%	5.00%	10.00%	10.00%	0.00%	5.50%	5.50%	6.00%	6.00%
55	5.50%	5.50%	5.00%	14.00%	10.00%	7.00%	7.00%	5.50%	12.00%	10.00%
59	10.00%	5.50%	5.50%	12.00%	10.00%	6.00%	5.50%	5.50%	15.00%	10.00%
60	10.00%	6.00%	6.00%	12.00%	10.00%	8.50%	7.50%	7.50%	15.00%	10.00%
61	15.00%	10.00%	10.00%	25.00%	22.00%	8.50%	7.50%	7.50%	20.00%	17.50%
62	13.00%	17.00%	17.00%	35.00%	30.00%	19.00%	17.00%	17.00%	20.00%	25.00%
64	20.00%	15.00%	15.00%	27.00%	25.00%	11.00%	15.00%	15.00%	25.00%	15.00%
65	27.00%	27.00%	27.00%	27.00%	30.00%	28.00%	28.00%	28.00%	28.00%	35.00%
67	27.00%	25.00%	25.00%	25.00%	25.00%	17.50%	22.00%	22.00%	22.00%	22.00%
70	27.00%	25.00%	25.00%	25.00%	25.00%	30.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	100.00%	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 – Plan 2 and Hybrid

Male									
Years of Service									
Age	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	14.00%	10.00%	10.00%	10.00%
59	0.00%	0.00%	0.00%	12.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	10.00%	10.00%	12.00%	12.00%	10.00%	10.00%	10.00%	10.00%	10.00%
61	15.00%	10.00%	25.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
62	13.00%	17.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
64	20.00%	15.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
65	27.00%	27.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
67	27.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
70	27.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
≥75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Female									
Years of Service									
Age	5	6-25	30	31	33	35	37	39	≥40
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.00%
55	0.00%	0.00%	0.00%	0.00%	0.00%	12.00%	10.00%	10.00%	10.00%
59	0.00%	0.00%	0.00%	15.00%	10.00%	10.00%	10.00%	10.00%	10.00%
60	8.50%	8.50%	15.00%	15.00%	10.00%	10.00%	10.00%	10.00%	10.00%
61	8.50%	7.50%	20.00%	17.50%	17.50%	17.50%	17.50%	17.50%	17.50%
62	19.00%	17.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
64	11.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
65	28.00%	28.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
67	17.50%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
70	30.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%
≥75	100.00%	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 Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

Age	Male Years of Service				Female Years of Service			
	5	6-24	25	≥26	5	6-24	25	≥26
50	7.00%	7.00%	26.00%	26.00%	5.00%	5.00%	32.00%	32.00%
55	7.00%	6.00%	15.00%	20.50%	5.00%	7.50%	25.00%	21.00%
59	7.00%	12.50%	32.00%	27.50%	5.00%	14.00%	25.00%	40.00%
60	21.00%	21.00%	21.00%	27.50%	20.00%	20.00%	20.00%	40.00%
61	37.50%	27.50%	27.50%	27.50%	20.00%	20.00%	20.00%	20.00%
62	50.00%	32.00%	32.00%	32.00%	20.00%	35.00%	35.00%	35.00%
63	50.00%	32.00%	32.00%	32.00%	20.00%	30.00%	30.00%	30.00%
64	50.00%	40.00%	40.00%	40.00%	20.00%	30.00%	30.00%	30.00%
≥65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

Age	Male Years of Service				Female Years of Service			
	5	6-24	25	≥26	5	6-24	25	≥26
50	9.00%	9.00%	27.50%	27.50%	9.30%	9.30%	50.00%	50.00%
55	9.00%	7.50%	20.00%	18.00%	12.50%	9.00%	20.00%	18.00%
59	9.00%	12.00%	20.00%	24.00%	12.50%	9.00%	20.00%	24.00%
60	15.00%	15.00%	15.00%	27.50%	20.00%	20.00%	20.00%	27.50%
61	15.00%	27.50%	27.50%	27.50%	20.00%	27.50%	27.50%	27.50%
62	15.00%	27.50%	27.50%	27.50%	20.00%	27.50%	27.50%	27.50%
63	25.00%	30.00%	30.00%	30.00%	20.00%	30.00%	30.00%	30.00%
64	20.00%	30.00%	30.00%	30.00%	20.00%	30.00%	30.00%	30.00%
≥65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**State Police Officers – All Plans**

Age	Years of Service	
	5-24	≥25
50	10.00%	10.00%
55	6.00%	10.00%
59	10.00%	10.00%
60	10.00%	10.00%
≥65	100.00%	100.00%

**FIGURE 4.7: RETIREMENT RATES – OPEB PLANS, cont.**

**Virginia Law Officers – All Plans**

Age	Years of Service – Male			
	5	6-24	25	≥26
50	11.00%	11.00%	35.00%	35.00%
55	10.00%	8.00%	18.00%	25.00%
59	10.00%	12.00%	18.00%	20.00%
60	18.00%	18.00%	18.00%	20.00%
≥65	100.00%	100.00%	100.00%	100.00%

Age	Years of Service – Female			
	5	6-24	25	≥26
50	10.00%	10.00%	37.50%	37.50%
55	10.00%	8.00%	25.00%	27.50%
59	10.00%	13.00%	30.00%	22.50%
60	20.00%	20.00%	20.00%	22.50%
≥65	100.00%	100.00%	100.00%	100.00%

**Judges – All Plans**

Age	Rate
60	15.00%
65	15.00%
70	50.00%
≥73	100.00%

**FIGURE 4.8: DISABILITY RATES – OPEB PLANS**

As shown below for selected ages.

**State Employees**

25% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0390%	0.0330%
30	0.0910%	0.2110%
40	0.2120%	0.3540%
50	0.4970%	0.6290%
60	0.6900%	0.7350%

**FIGURE 4.8: DISABILITY RATES – OPEB PLANS, cont.**

**Teachers**

5% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0005%	0.0003%
30	0.0064%	0.0081%
40	0.0325%	0.0481%
50	0.1444%	0.1609%
60	0.3395%	0.3321%

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

25% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0050%	0.0010%
30	0.0070%	0.0230%
40	0.1390%	0.1340%
50	0.3840%	0.3300%
60	0.8080%	0.5300%

**Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

25% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0050%	0.0010%
30	0.0220%	0.0010%
40	0.1300%	0.0580%
50	0.4290%	0.2740%
60	0.6560%	0.6400%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers**

50% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0190%	0.0120%
30	0.0520%	0.5580%
40	0.2670%	0.7940%
50	0.5000%	1.0900%
60	1.0550%	1.7880%

**FIGURE 4.8: DISABILITY RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers**

50% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.0010%	0.0050%
30	0.0580%	0.1570%
40	0.2180%	0.2010%
50	0.4160%	0.4130%
60	0.5750%	1.6050%

**State Police Officers**

60% of disability cases are assumed to be service-related.

Age	Rate
≤44	0.1940%
50	0.4810%
55	0.7700%
60	0.8970%
70	1.3680%

**Virginia Law Officers**

50% of disability cases are assumed to be service-related.

Age	Male	Female
20	0.1430%	0.5430%
30	0.5840%	0.6590%
40	0.7930%	1.0010%
50	1.1650%	1.8210%
60	1.7820%	2.9010%
70	1.9200%	5.4990%

**Judges**

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

**FIGURE 4.9: TERMINATION RATES – OPEB 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 – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	22.297%	22.297%	22.056%	20.171%	16.921%	13.670%	10.954%	9.132%	8.251%	7.732%	7.214%
35	15.120%	14.553%	13.631%	12.195%	10.694%	9.577%	8.902%	8.387%	7.574%	5.878%	4.183%
45	14.223%	11.470%	9.617%	8.321%	7.345%	6.888%	6.600%	6.412%	5.934%	4.282%	2.630%
55	13.242%	10.032%	8.050%	7.094%	6.491%	6.348%	5.950%	5.391%	4.470%	3.550%	2.630%
65	13.038%	9.477%	7.859%	7.094%	6.491%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Years of Service Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	26.747%	26.747%	25.594%	23.170%	20.061%	16.601%	13.663%	11.705%	11.136%	11.136%	11.136%
35	19.257%	17.078%	15.532%	14.101%	12.758%	11.658%	10.633%	9.380%	8.241%	7.177%	6.019%
45	17.029%	13.335%	11.247%	9.984%	8.920%	8.275%	7.531%	6.872%	6.277%	5.214%	3.025%
55	16.695%	11.694%	9.149%	8.236%	7.660%	7.039%	6.175%	5.711%	5.138%	5.088%	3.025%
65	16.695%	11.656%	9.060%	8.236%	7.660%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**Teachers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	18.729%	14.293%	12.175%	11.084%	9.453%	8.071%	7.568%	6.716%	5.060%	4.286%	4.286%
35	16.964%	13.888%	12.459%	10.907%	9.347%	7.931%	6.709%	5.881%	5.210%	4.361%	3.314%
45	16.964%	13.888%	11.573%	10.116%	7.864%	6.940%	6.230%	5.733%	5.243%	4.239%	2.407%
55	16.964%	13.888%	11.217%	10.116%	7.038%	5.844%	5.813%	5.733%	5.234%	4.238%	2.407%
65	16.964%	13.888%	11.217%	10.116%	7.038%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	18.037%	12.332%	10.860%	10.637%	9.381%	7.728%	6.567%	6.507%	5.448%	4.933%	4.933%
35	16.500%	14.138%	12.602%	11.307%	10.178%	9.519%	8.653%	7.385%	6.386%	5.292%	3.931%
45	15.055%	12.047%	9.933%	8.544%	7.686%	7.181%	6.623%	5.912%	5.390%	4.417%	2.287%
55	14.909%	11.617%	9.449%	8.038%	7.093%	6.249%	5.450%	5.326%	4.771%	4.357%	2.287%
65	14.909%	11.617%	9.449%	8.038%	7.093%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%



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											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	23.300%	20.505%	18.626%	17.319%	16.251%	14.426%	11.711%	9.285%	8.232%	6.883%	6.883%
35	19.131%	16.822%	15.078%	13.689%	12.397%	11.188%	10.157%	9.215%	8.232%	6.883%	5.224%
45	16.933%	14.546%	12.562%	10.920%	9.444%	8.921%	8.524%	8.181%	7.546%	6.301%	3.941%
55	15.609%	12.538%	10.330%	8.976%	8.448%	7.339%	6.690%	5.864%	4.833%	4.320%	3.941%
65	15.343%	9.244%	6.477%	6.477%	6.477%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	22.847%	20.860%	19.802%	19.425%	19.257%	18.886%	17.958%	15.784%	13.041%	13.041%	13.041%
35	21.392%	18.767%	17.208%	16.238%	15.439%	14.424%	13.001%	11.315%	9.792%	8.502%	7.338%
45	19.067%	15.747%	13.540%	12.135%	11.040%	10.262%	9.177%	8.099%	7.250%	6.008%	3.671%
55	17.295%	12.753%	9.920%	8.541%	8.214%	7.159%	6.952%	6.590%	5.564%	5.536%	3.671%
65	17.275%	11.784%	8.108%	6.923%	6.923%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Political Subdivision Employees Not Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	25.057%	23.024%	20.925%	18.373%	15.688%	13.361%	11.957%	10.835%	9.992%	9.992%	9.992%
35	20.650%	18.223%	16.214%	14.313%	12.751%	11.426%	10.347%	9.571%	8.813%	7.795%	6.549%
45	18.397%	14.896%	12.718%	11.399%	10.572%	9.878%	9.085%	8.205%	7.363%	6.227%	4.626%
55	16.068%	12.967%	12.001%	10.500%	10.447%	9.747%	8.930%	8.111%	6.486%	6.227%	4.626%
65	15.356%	12.875%	12.001%	10.500%	10.447%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	27.370%	25.711%	23.395%	20.379%	17.488%	15.451%	13.809%	12.034%	10.656%	10.642%	10.642%
35	22.330%	20.208%	18.736%	17.235%	15.849%	14.347%	12.837%	11.557%	10.447%	9.116%	7.607%
45	19.506%	16.555%	14.581%	13.206%	12.281%	11.551%	10.655%	9.714%	8.999%	7.643%	5.323%
55	16.934%	14.490%	12.400%	10.933%	10.007%	9.284%	9.284%	9.284%	8.445%	7.560%	5.323%
65	15.628%	14.008%	12.292%	10.875%	10.007%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**FIGURE 4.9: TERMINATION RATES – OPEB PLANS, cont.**

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – Ten Largest Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Terminations Per 100 Members

Years of Service	Males	Females
0	10.000%	15.000%
1	8.500%	9.000%
2	8.000%	9.000%
3	7.500%	9.000%
4	5.500%	9.000%
5	5.000%	9.000%
6	4.750%	9.000%
7	4.500%	6.000%
8	4.000%	3.500%
9	3.000%	2.000%
10 or more	1.800%	2.000%

**Political Subdivision Employees Receiving Enhanced Hazardous Duty Benefits – All Other Employers – All Plans**

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Years of Service – Males

Age	0	1	2	3	4	5	6	7	8	9	≥10
25	16.006%	14.519%	13.807%	13.247%	12.169%	10.519%	8.845%	7.768%	6.899%	6.899%	6.899%
35	15.310%	12.574%	10.924%	9.896%	9.156%	8.897%	8.437%	7.640%	6.609%	5.433%	4.189%
45	15.275%	11.790%	9.478%	8.223%	7.802%	7.022%	6.634%	6.269%	5.626%	4.561%	3.022%
55	14.065%	10.547%	8.414%	7.694%	7.694%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	11.088%	8.665%	7.763%	7.694%	7.694%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION

Years of Service – Females

Age	0	1	2	3	4	5	6	7	8	9	≥10
25	18.762%	15.474%	13.049%	11.598%	11.001%	10.648%	10.224%	8.766%	6.591%	5.831%	5.831%
35	20.886%	16.395%	13.402%	11.544%	10.335%	9.327%	8.334%	7.404%	6.591%	5.831%	5.043%
45	18.253%	14.688%	12.276%	10.843%	9.904%	8.818%	7.992%	7.253%	6.587%	5.314%	3.443%
55	11.234%	10.212%	9.680%	9.680%	9.599%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	1.269%	3.040%	3.040%	3.040%	3.040%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

FIGURE 4.9: TERMINATION RATES – OPEB PLANS, cont.

State Police Officers – All Plans

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION	
Service	Rate
0	9.750%
1	4.750%
2	4.750%
3	4.750%
4	4.750%
5	4.750%
6	4.750%
7	3.000%
8	3.000%
9	3.000%
≥10	1.750%

Virginia Law Officers – All Plans

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Males											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	30.264%	26.915%	23.838%	20.793%	17.797%	14.758%	12.544%	11.510%	11.510%	11.510%	11.510%
35	25.749%	21.974%	18.823%	16.020%	13.400%	11.603%	10.242%	9.350%	8.615%	7.590%	6.050%
45	22.182%	17.034%	13.792%	12.032%	11.173%	9.580%	8.484%	7.391%	6.240%	5.163%	4.275%
55	21.689%	14.708%	10.525%	9.930%	9.930%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	21.689%	14.673%	9.796%	9.787%	9.787%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

SEPARATIONS FROM ACTIVE SERVICE DUE TO TERMINATION											
Years of Service – Females											
Age	0	1	2	3	4	5	6	7	8	9	≥10
25	33.633%	30.645%	27.155%	23.161%	19.212%	15.381%	13.567%	10.072%	9.919%	9.919%	9.919%
35	32.025%	25.204%	20.727%	17.948%	15.980%	14.868%	13.534%	10.072%	9.909%	8.073%	6.058%
45	30.589%	21.487%	15.693%	12.720%	11.803%	10.976%	10.134%	9.113%	7.804%	6.036%	3.687%
55	28.000%	17.544%	10.155%	6.516%	6.490%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	23.879%	12.934%	3.574%	0.004%	0.182%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Judges

There are no assumed rates of withdrawal prior to service retirement (for causes other than death 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 because 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%
11-19	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%
11-19	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%
11-19	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%
11-19	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%
11-19	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%
11-19	0.50%	4.00%
20 or more	0.00%	3.50%

**FIGURE 4.10: SALARY INCREASE RATES – OPEB PLANS, cont.**

**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%
11-19	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 on the age at which they started the program (either their age in 2002 or age at hire, if later).

**Current Selected Policy Porting Rate Assumptions by Policy Issue Age and Policy Duration**

Issue Age	Policy Duration (in years)					
	0	10	20	30	40	50+
30	0.1000	0.1234	0.2185	0.4537	0.7574	1.0000
40	0.1000	0.1608	0.3423	0.5526	0.9230	1.0000
50	0.1027	0.2244	0.4116	0.6790	1.0000	1.0000
60	0.1162	0.2667	0.4986	0.8407	1.0000	1.0000
70	0.1485	0.3308	0.6099	0.9985	1.0000	1.0000
80	0.1875	0.4043	0.7524	1.0000	1.0000	1.0000
90	0.2012	0.4601	0.9347	1.0000	1.0000	1.0000
100	0.2171	0.5261	1.0000	1.0000	1.0000	1.0000
110	0.2354	0.6042	1.0000	1.0000	1.0000	1.0000

## ADDITIONAL INFORMATION ABOUT ACTUARIAL ASSUMPTIONS AND METHODS: OTHER POST-EMPLOYMENT BENEFIT (OPEB) PLANS

### Mortality Rates:

**Pre-Retirement:** RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020

- State – Males set back 1 year, 85% of rates, and females set back 1 year
- State Police – Males 90% of rates, females set forward 1 year
- VaLORS – Males 90% of rates, females set forward 1 year
- Judicial – Males set back 1 year, 85% of rates, females set back 1 year
- Political subdivisions, non-hazardous duty – Males 95% of rates, females 105% of rates
- Political subdivisions, hazardous duty – Males 90% of rates, females set forward 1 year

**Post-Retirement:** RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020

- State – Males set back 1 year, females set back 1 year, 1.5% compounding increase from ages 70 to 85
- Teachers – Males 1% increase compounded from 70 to 90, females set back 3 years, 1.5% increase compounded from ages 65 to 70, and 2.0% increase compounded from ages 75 to 90
- State Police – Males set forward 1 year, 1% increase compounded from ages 70 to 90, females set forward 3 years
- VaLORS – Males set forward 1 year with 1% increase compounded from ages 70 to 90, females set forward 3 years
- Judicial – Males set forward 1 year, females set back 1 year with 1.5% compounding increase from age 70 to 85
- Political subdivisions, non-hazardous duty – Males set forward 3 years, 1% increase compounded from ages 70 to 90
- Political subdivisions, hazardous duty – Males set forward 1 year, 1% increase compounded from ages 70 to 90, females set forward 3 years

**Post-Disablement:** RP-2014 Disabled Mortality Rates Projected BB to 2020

- State – Males 115% of rates, females 130% of rates
- Teachers – Males and females 115% of rates
- State Police – Males set forward 2 years, unisex using 100% male
- VaLORS – Males set forward 2 years, unisex using 100% male
- Judicial – Males 115% of rates, females 130% of rates
- Political subdivisions, non-hazardous duty – Males set forward 2 years, 110% of rates, females 125% of rates
- Political subdivisions, hazardous duty – Males set forward 2 years, unisex using 100% males

**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 Securian Financial 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, Securian Financial 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 an \$8,000 minimum established in 2015. The minimum will be increased annually based on the VRS Plan 2 cost-of-living adjustment

calculation. A member may end employment and defer retirement until a later date; however, the group life insurance will begin reducing based on the last month of employment.

**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 calendar year from the month 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 health care 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 health care 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). 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 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.

**2017 VALUATION:** No actuarially material changes are made to the plan provisions. There is one change of note: On April 26, 2017, the Board adopts the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2016 experience study.

**2018 VALUATION:** No actuarially material changes are made to the plan provisions.

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# VRS INNOVATES

with  
**integrated  
and creative  
solutions**



VRS has invested resources to update and integrate systems to deliver retirement benefits online. The enhanced myVRS portal offers new features like the goal-based Retirement Planner and refreshed Benefit Estimator, in addition to new self-service features. Advancements continue with near-term plans to accept retirement applications and beneficiary changes online. Meanwhile, as web technology adapts to accommodate access by a variety of devices, VRS has launched a new employer website with responsive design and streamlined navigation and introduced an app for easy access to defined contribution plan information.

## 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 VRS-participating 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)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	2,097	1,862	1,549	1,821	2,600	2,697	3,250	3,375	3,244	3,466
Benefits and Administrative Expenses and Transfers	(2,857)	(3,157)	(3,397)	(3,518)	(3,791)	(4,029)	(4,263)	(4,505)	(4,698)	(4,931)
<b>Net Funding</b>	<b>(760)</b>	<b>(1,295)</b>	<b>(1,848)</b>	<b>(1,697)</b>	<b>(1,191)</b>	<b>(1,332)</b>	<b>(1,013)</b>	<b>(1,130)</b>	<b>(1,454)</b>	<b>(1,465)</b>
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	762	775	1,031	1,052	911	984	912	907	905	895
Net Appreciation (Depreciation) in Fair Value	(12,254)	5,459	7,681	(415)	5,168	7,891	2,010	231	7,110	4,459
<b>Net Investment Income</b>	<b>(11,492)</b>	<b>6,234</b>	<b>8,712</b>	<b>637</b>	<b>6,079</b>	<b>8,875</b>	<b>2,922</b>	<b>1,138</b>	<b>8,015</b>	<b>5,354</b>
<b>Net Increase (Decrease)</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>3,889</b>
<b>Fiduciary Net Position Restricted – End of Year</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>	<b>\$ 76,889</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 (VRS) – STATE**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	417	360	253	309	520	542	684	939	766	790
Benefits and Administrative Expenses and Transfers	(825)	(931)	(968)	(992)	(1,054)	(1,119)	(1,175)	(1,232)	(1,280)	(1,343)
Net Funding	(408)	(571)	(715)	(683)	(534)	(577)	(491)	(293)	(514)	(553)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	212	212	275	263	235	249	227	221	222	219
Net Appreciation (Depreciation) in Fair Value	(3,405)	1,490	2,048	(104)	1,333	1,996	501	56	1,747	1,090
Net Investment Income	(3,193)	1,702	2,323	159	1,568	2,245	728	277	1,969	1,309
<b>Net Increase (Decrease)</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>756</b>
<b>Fiduciary Net Position Restricted – End of Year</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>	<b>\$ 18,650</b>

**VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	986	821	623	816	1,204	1,225	1,651	1,464	1,574	1,743
Benefits and Administrative Expenses and Transfers	(1,386)	(1,509)	(1,651)	(1,697)	(1,834)	(1,933)	(2,036)	(2,136)	(2,215)	(2,308)
Net Funding	(400)	(688)	(1,028)	(881)	(630)	(708)	(385)	(672)	(641)	(565)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	356	361	477	481	415	448	414	414	412	406
Net Appreciation (Depreciation) in Fair Value	(5,731)	2,543	3,554	(190)	2,359	3,594	913	105	3,228	2,024
Net Investment Income	(5,375)	2,904	4,031	291	2,774	4,042	1,327	519	3,640	2,430
<b>Net Increase (Decrease)</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>1,865</b>
<b>Fiduciary Net Position Restricted – End of Year</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>	<b>\$ 35,059</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 (VRS) – POLITICAL SUBDIVISIONS**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	576	584	606	615	747	766	767	790	741	767
Benefits and Administrative Expenses and Transfers	(524)	(584)	(635)	(679)	(741)	(803)	(866)	(943)	(999)	(1,068)
Net Funding	52	—	(29)	(64)	6	(37)	(99)	(153)	(258)	(301)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	168	175	243	272	228	251	237	241	239	238
Net Appreciation (Depreciation) in Fair Value	(2,697)	1,234	1,809	(107)	1,294	2,020	524	60	1,879	1,183
Net Investment Income	(2,529)	1,409	2,052	165	1,522	2,271	761	301	2,118	1,421
<b>Net Increase (Decrease)</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>1,120</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 20,375</b>

**TOTAL VIRGINIA RETIREMENT SYSTEM (VRS) PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	1,979	1,765	1,482	1,740	2,471	2,533	3,102	3,193	3,081	3,300
Benefits and Administrative Expenses and Transfers	(2,735)	(3,024)	(3,254)	(3,368)	(3,629)	(3,855)	(4,077)	(4,311)	(4,494)	(4,719)
Net Funding	(756)	(1,259)	(1,772)	(1,628)	(1,158)	(1,322)	(975)	(1,118)	(1,413)	(1,419)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	736	748	995	1,016	878	948	878	876	873	863
Net Appreciation (Depreciation) in Fair Value	(11,833)	5,267	7,411	(401)	4,986	7,610	1,938	221	6,854	4,297
Net Investment Income	(11,097)	6,015	8,406	615	5,864	8,558	2,816	1,097	7,727	5,160
<b>Net Increase (Decrease)</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>3,741</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 74,084</b>

Note: VRS and JRS plans include Hybrid Retirement Plan data.

**FIGURE 5.3: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – VIRGINIA RETIREMENT SYSTEM, cont.**

FOR THE YEARS ENDED JUNE 30

**STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS) PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	25	21	13	16	31	48	34	39	38	42
Benefits and Administrative Expenses and Transfers	(41)	(43)	(47)	(47)	(49)	(51)	(54)	(55)	(59)	(59)
Net Funding	(16)	(22)	(34)	(31)	(18)	(3)	(20)	(16)	(21)	(17)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	9	9	12	12	11	11	10	11	9	10
Net Appreciation (Depreciation) in Fair Value	(145)	63	87	(5)	57	88	22	3	77	48
Net Investment Income	(136)	72	99	7	68	99	32	14	86	58
<b>Net Increase (Decrease)</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>41</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 837</b>

**VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS) PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	69	56	35	42	68	85	79	97	91	91
Benefits and Administrative Expenses and Transfers	(50)	(58)	(64)	(69)	(76)	(84)	(90)	(98)	(103)	(111)
Net Funding	19	(2)	(29)	(27)	(8)	1	(11)	(1)	(12)	(20)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	12	12	18	18	16	18	16	16	17	17
Net Appreciation (Depreciation) in Fair Value	(193)	91	130	(7)	89	139	36	5	130	81
Net Investment Income	(181)	103	148	11	105	157	52	21	147	98
<b>Net Increase (Decrease)</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>78</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 1,424</b>

**FIGURE 5.3: ANALYSIS OF CHANGES AND GROWTH IN FIDUCIARY NET POSITION – VIRGINIA RETIREMENT SYSTEM, cont.**

FOR THE YEARS ENDED JUNE 30

**JUDICIAL RETIREMENT SYSTEM (JRS) PENSION TRUST FUND**

(EXPRESSED IN MILLIONS)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	24	20	20	22	30	31	35	45	32	33
Benefits and Administrative Expenses and Transfers	(29)	(31)	(32)	(34)	(37)	(39)	(40)	(42)	(41)	(41)
Net Funding	(5)	(11)	(12)	(12)	(7)	(8)	(5)	3	(9)	(8)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	5	5	7	7	6	7	6	6	6	6
Net Appreciation (Depreciation) in Fair Value	(83)	37	51	(2)	36	54	14	2	50	31
Net Investment Income	(78)	42	58	5	42	61	20	8	56	37
<b>Net Increase (Decrease)</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>29</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 544</b>

Note: VRS and JRS plans include Hybrid Retirement Plan data.

## SCHEDULE OF RETIREMENT CONTRIBUTIONS BY SYSTEM AND PLAN

FISCAL YEARS 2009-2018

(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				
2018	\$ 789,786	\$ 1,743,655	\$ 766,438	\$ 3,299.879	\$42,117	\$91,288	\$32,630	\$ 3,465.914
2017	766,084	1,573,429	741,407	3,080.92	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	2,532.47	48,329	85,391	30,778	2,696.968
2013	519,319	1,204,021	746,040	2,469.38	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

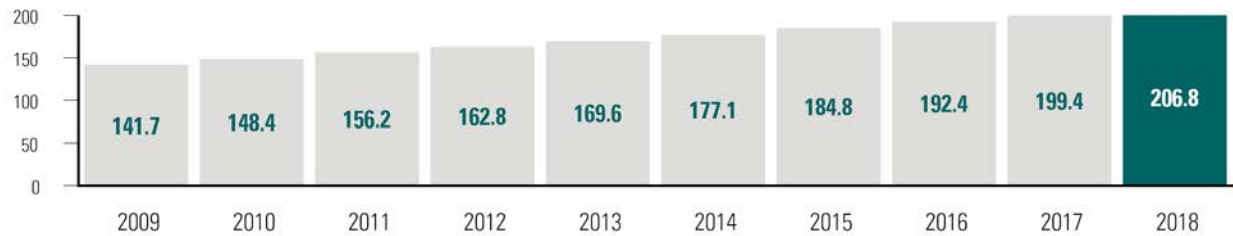
\* The General Assembly suspended employer contributions for all state employees, SPORS, VaLORS and JRS for April, May and the first half of June 2010 and for teachers for the entire fourth quarter of fiscal year 2010.

\*\* 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

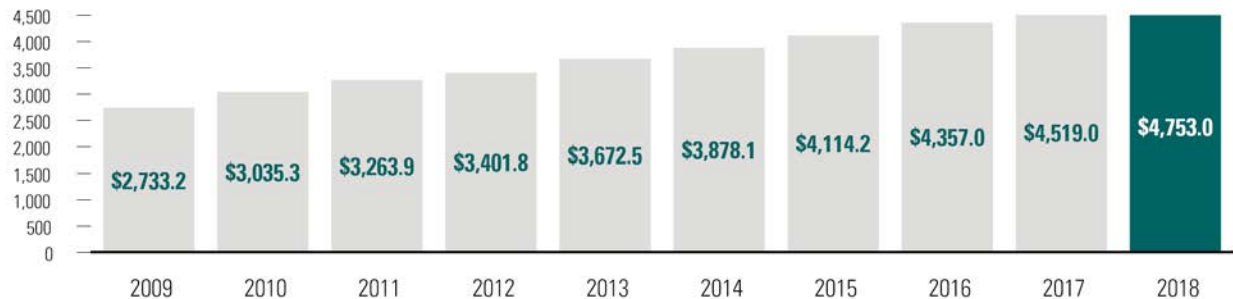
(EXPRESSED IN THOUSANDS)



## FIGURE 5.5: RETIREMENT BENEFITS PAID

FISCAL YEARS ENDED JUNE 30, 2009-2018

(EXPRESSED IN MILLIONS)



## SCHEDULE OF PENSION TRUST FUND ADDITIONS BY SOURCE

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Member Contributions	Employer Contributions		Investment Income (Loss)	Other	Total
		For Members	Employer Share			
<b>VIRGINIA RETIREMENT SYSTEM (VRS)</b>						
2018	\$ 910,312	\$ —	\$ 2,389,567	\$ 5,158,889	\$ 1,076	\$ 8,459,844
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)
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>						
2018	\$ 6,311	\$ —	\$ 35,806	\$ 58,148	\$ —	\$ 100,265
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)
<b>VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)</b>						
2018	\$ 17,495	\$ —	\$ 73,793	\$ 98,293	\$ —	\$ 189,581
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)
<b>JUDICIAL RETIREMENT SYSTEM (JRS)</b>						
2018	\$ 4,010	\$ —	\$ 28,620	\$ 37,689	\$ —	\$ 70,319
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)

\* 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 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Retirement Benefits	Refunds	Administrative Expenses	Other	Total
VIRGINIA RETIREMENT SYSTEM (VRS)					
2018	\$ 4,548,751	\$ 116,473	\$ 44,661	\$ 8,750	\$ 4,718,635
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2018	\$ 58,197	\$ 867	\$ 509	\$ 63	\$ 59,636
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2018	\$ 104,776	\$ 5,604	\$ 861	\$ 247	\$ 111,488
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
JUDICIAL RETIREMENT SYSTEM (JRS)					
2018	\$ 41,165	\$ 24	\$ 326	\$ 45	\$ 41,560
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



## SCHEDULE OF RETIREMENT BENEFITS BY SYSTEM AND PLAN

FISCAL YEARS 2009-2018

(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 Subdivisions	Sub-Total				
2018	\$ 1,296,803	\$ 2,241,927	\$ 1,010,021	\$ 4,548,751	\$58,197	\$104,776	\$41,165	\$ 4,752,889
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

## SCHEDULE OF RETIREMENT BENEFITS BY TYPE

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
STATE				
2018	\$ 1,212,167	\$ 68,343	\$ 16,295	\$ 1,296,805
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
TEACHER				
2018	\$ 2,122,961	\$ 109,420	\$ 9,546	\$ 2,241,927
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

## SCHEDULE OF RETIREMENT BENEFITS BY TYPE, cont.

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
POLITICAL SUBDIVISIONS				
2018	\$ 861,564	\$ 139,170	\$ 9,285	\$ 1,010,019
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
TOTAL VIRGINIA RETIREMENT SYSTEM (VRS)				
2018	4,196,692	316,933	35,126	\$ 4,548,751
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)				
2018	\$ 50,901	\$ 6,644	\$ 652	\$ 58,197
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

## SCHEDULE OF RETIREMENT BENEFITS BY TYPE, cont.

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)				
2018	\$ 99,748	\$ 4,227	\$ 801	\$ 104,776
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
JUDICIAL RETIREMENT SYSTEM (JRS)				
2018	\$ 39,725	\$ 229	\$ 1,211	\$ 41,165
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

## SCHEDULE OF REFUNDS BY TYPE

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
STATE (VRS)			
2018	\$ 23,982	\$ 8,122	\$ 32,104
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

**SCHEDULE OF REFUNDS BY TYPE, cont.**

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
<b>TEACHER (VRS)</b>			
2018	\$ 35,027	\$ 6,521	\$ 41,548
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
<b>POLITICAL SUBDIVISIONS (VRS)</b>			
2018	\$ 37,396	\$ 5,425	\$ 42,821
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
<b>TOTAL VIRGINIA RETIREMENT SYSTEM (VRS)</b>			
2018	96,405	20,068	\$ 116,473
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
<b>STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)</b>			
2018	\$ 573	\$ 294	\$ 867
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

## SCHEDULE OF REFUNDS BY TYPE, cont.

FISCAL YEARS 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)			
2018	\$ 4,899	\$ 705	\$ 5,604
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
JUDICIAL RETIREMENT SYSTEM (JRS)			
2018	\$ 24	\$ —	\$ 24
2017	—	—	—
2016	—	—	—
2015	—	—	—
2014	—	—	—
2013	—	—	—
2012	—	—	—
2011	5	—	5
2010	—	—	—
2009	40	—	40

## SCHEDULE OF RETIREES AND BENEFICIARIES BY TYPE OF RETIREMENT

AS OF JUNE 30, 2018

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	14,045	12,052	2	0	1	474	586	25	2	903
201-400	22,052	18,096	127	8	0	1,668	570	83	6	1,494
401-600	19,508	15,421	292	35	2	2,201	386	205	20	946
601-800	16,675	13,013	358	87	2	1,992	262	330	20	611
801-1,000	15,246	11,783	477	218	5	1,703	185	375	25	475
1,001-1,200	13,831	10,699	437	400	3	1,415	158	319	18	382
1,201-1,400	11,842	9,065	399	514	13	1,133	117	284	13	304
1,401-1,600	11,150	8,640	333	683	17	874	91	236	12	264
1,601-1,800	10,649	8,184	259	969	18	715	67	202	4	231
1,801-2,000	11,035	8,422	189	1,378	25	585	85	189	3	159
Over 2,000	60,743	50,710	376	6,294	84	1,797	315	746	13	408
<b>Totals</b>	<b>206,776</b>	<b>166,085</b>	<b>3,249</b>	<b>10,586</b>	<b>170</b>	<b>14,557</b>	<b>2,822</b>	<b>2,994</b>	<b>136</b>	<b>6,177</b>

## SCHEDULE OF RETIREES AND BENEFICIARIES BY TYPE OF RETIREMENT AND PLAN

AS OF JUNE 30, 2018

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	56,980	45,134	1,729	3,292	169	3,072	1,199	853	22	1,510
VRS – Teacher	89,667	73,570	1,337	5,746	1	4,857	710	198	6	3,242
VRS – Political Subdivisions	53,579	41,430	183	1,547	—	6,400	774	1,736	84	1,425
SPORS	1,336	1,106	—	—	—	40	16	153	21	—
ValORS	4,702	4,366	—	1	—	181	97	54	3	—
JRS	512	479	—	—	—	7	26	—	—	—
<b>All Plans</b>	<b>206,776</b>	<b>166,085</b>	<b>3,249</b>	<b>10,586</b>	<b>170</b>	<b>14,557</b>	<b>2,822</b>	<b>2,994</b>	<b>136</b>	<b>6,177</b>

## SCHEDULE OF RETIREES AND BENEFICIARIES BY PAYOUT OPTION SELECTED

AS OF JUNE 30, 2018

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	11,505	13	489	82	431	2	47	—	—	1	530	—	517	180	233	15
201-400	17,875	7	574	115	433	5	661	14	0	34	489	—	1,058	235	496	56
401-600	15,119	8	442	150	460	6	1,035	31	—	79	406	—	988	199	533	52
601-800	12,476	5	346	168	487	7	933	28	—	90	358	—	948	207	566	56
801-1,000	11,085	1	284	215	561	10	683	15	1	57	389	—	1,000	214	642	89
1,001-1,200	9,629	—	269	209	491	11	523	13	2	49	246	—	1,070	259	908	152
1,201-1,400	8,061	—	226	205	330	15	350	8	1	28	173	—	1,016	219	1,034	176
1,401-1,600	7,416	—	214	202	201	24	205	1	—	25	132	—	947	190	1,352	241
1,601-1,800	6,928	—	177	198	124	22	147	2	—	13	79	—	922	203	1,538	296
1,801-2,000	6,950	—	158	198	93	21	105	2	—	7	75	—	892	191	1,963	380
Over 2,000	32,723	—	585	621	147	139	159	8	—	20	123	—	6,869	1,164	15,614	2,571
<b>Totals</b>	<b>139,767</b>	<b>34</b>	<b>3,764</b>	<b>2,363</b>	<b>3,758</b>	<b>262</b>	<b>4,848</b>	<b>122</b>	<b>4</b>	<b>403</b>	<b>3,000</b>	<b>0</b>	<b>16,227</b>	<b>3,261</b>	<b>24,879</b>	<b>4,084</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

H: Minimum Guaranteed Disability Variable Survivor Option

I: Disability 100% Survivor Option

J: Special Disability Survivor Option

K: Leveling Benefit

L: Leveling Benefit/Rollover

M: Survivor Option

N: Advance Pension Option

O: Basic Benefit with Partial Lump-Sum Option Payment (PLOP)

P: Survivor Option with PLOP

## SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2009, TO JUNE 30, 2018

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2018	State	Average Monthly Benefit	\$ 430.51	\$ 743.61	\$ 1,115.65	\$ 1,492.54	\$ 2,155.74	\$ 3,201.83
		Number of Active Retirees	329	382	437	329	413	1,226
		Average AFC	\$ 46,191	\$ 51,341	\$ 51,470	\$ 56,655	\$ 59,536	\$ 70,115
	Teacher	Average Monthly Benefit	\$ 397.48	\$ 702.13	\$ 1,164.24	\$ 1,605.86	\$ 2,411.89	\$ 3,225.68
		Number of Active Retirees	478	647	802	653	782	1,424
		Average Benefit	\$ 39,946	\$ 47,785	\$ 55,420	\$ 58,933	\$ 65,809	\$ 73,067
	Political Subdivisions	Average Monthly Benefit	\$ 348.90	\$ 619.09	\$ 889.04	\$ 1,452.77	\$ 2,234.06	\$ 2,986.58
		Number of Active Retirees	471	644	583	523	595	877
		Average Benefit	\$ 35,320	\$ 40,381	\$ 42,941	\$ 53,511	\$ 61,134	\$ 68,504
	Total VRS	Average Monthly Benefit	\$ 388.08	\$ 679.64	\$ 1,064.53	\$ 1,527.89	\$ 2,293.68	\$ 3,157.94
		Number of Active Retirees	1,278	1,673	1,822	1,505	1,790	3,527
		Weighted Average AFC	\$ 39,849	\$ 45,747	\$ 50,480	\$ 56,551	\$ 62,808	\$ 70,906
	SPORS	Average Monthly Benefit	\$ —	\$ 467.23	\$ —	\$ 1,344.71	\$ 2,929.29	\$ 4,355.99
		Number of Active Retirees	—	2	—	4	16	22
		Average Benefit	\$ —	\$ 54,484	\$ —	\$ 60,252	\$ 75,772	\$ 92,743
	VaLORS	Average Monthly Benefit	\$ 457.08	\$ 706.48	\$ 1,001.35	\$ 1,231.97	\$ 1,846.10	\$ 2,624.09
		Number of Active Retirees	22	51	63	131	81	41
		Average Benefit	\$ 37,163	\$ 37,664	\$ 40,782	\$ 44,121	\$ 51,789	\$ 59,481
	JRS	Average Monthly Benefit	\$ —	\$ 2,287.69	\$ —	\$ —	\$ 2,020.72	\$ 7,766.95
		Number of Active Retirees	—	1	—	—	3	14
		Average Benefit	\$ —	\$ 148,351	\$ —	\$ —	\$ 149,709	\$ 158,830
All Plans	Average Monthly Benefit	\$ 389.25	\$ 681.11	\$ 1,062.42	\$ 1,503.79	\$ 2,279.44	\$ 3,177.07	
	Number of Active Retirees	1,300	1,727	1,885	1,640	1,890	3,604	
	Weighted Average AFC	\$ 39,803	\$ 45,578	\$ 50,155	\$ 55,567	\$ 62,583	\$ 71,251	
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	

## SCHEDULE OF AVERAGE BENEFIT PAYMENTS, cont.

FOR RETIREMENTS EFFECTIVE JULY 1, 2009, TO JUNE 30, 2018

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
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	\$ 70,336
	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	
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	\$ 1,078.6	\$ 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



## SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2009, TO JUNE 30, 2018

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
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	
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
		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	\$ 30.00	\$ 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

\* 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, 2018

	Basic Benefit	Survivor Option	Basic Benefit With PLOP	Survivor Option With PLOP	Advance Payment Option	Total
VRS	70.77%	10.78%	11.74%	1.85%	4.86%	100.00%
SPORS	50.07%	27.43%	13.98%	8.00%	0.52%	100.00%
VaLORS	62.60%	14.68%	15.97%	3.30%	3.45%	100.00%
JRS	43.66%	31.19%	11.50%	11.31%	2.34%	100.00%
<b>All Plans</b>	<b>70.38%</b>	<b>11.03%</b>	<b>11.85%</b>	<b>1.95%</b>	<b>4.79%</b>	<b>100.00%</b>

FISCAL YEAR 2018 RETIREES

	Basic Benefit	Survivor Option	Basic Benefit With PLOP	Survivor Option With PLOP	Advance Payment Option	Total
VRS	68.76%	11.37%	16.18%	2.29%	1.40%	100.00%
SPORS	49.07%	20.75%	20.75%	9.43%	0.00%	100.00%
VaLORS	68.68%	9.27%	17.54%	1.50%	3.01%	100.00%
JRS	42.85%	42.86%	14.29%	0.00%	0.00%	100.00%
<b>All Plans</b>	<b>68.63%</b>	<b>11.39%</b>	<b>16.24%</b>	<b>2.30%</b>	<b>1.44%</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.

**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.

**Basic Benefit With Partial Lump-Sum Option Payment (PLOP) and Survivor Option With PLOP.** This option is available with the Basic Benefit or Survivor Option. 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.

**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, 2018

	1-10 Years	11-20 Years	21-30 Years	Over 30 Years	Total
VRS	11.32%	24.79%	29.25%	34.64%	100.00%
SPORS	2.51%	3.83%	23.90%	69.76%	100.00%
VaLORS	7.50%	21.88%	52.71%	17.91%	100.00%
JRS	0.65%	2.93%	7.64%	88.78%	100.00%
<b>All Plans</b>	<b>11.15%</b>	<b>24.52%</b>	<b>29.67%</b>	<b>34.66%</b>	<b>100.00%</b>

**FIGURE 5.7: DISTRIBUTION OF RETIREES BY YEARS OF SERVICE, cont.**

FISCAL YEAR 2018 RETIREES

	1-10 Years	11-20 Years	21-30 Years	Over 30 Years	Total
VRS	11.02%	30.14%	28.42%	30.42%	100.00%
SPORS	0.00%	4.55%	45.45%	50.00%	100.00%
VaLORS	5.66%	29.31%	54.49%	10.54%	100.00%
JRS	0.00%	5.56%	16.67%	77.77%	100.00%
<b>All Plans</b>	<b>10.79%</b>	<b>29.99%</b>	<b>29.30%</b>	<b>29.92%</b>	<b>100.00%</b>

**FIGURE 5.8: DISTRIBUTION OF RETIREES BY AGE AT RETIREMENT**

ALL RETIREES AT JUNE 30, 2018

	Under 55	55-59	60-65	Over Age 65	Total
VRS	15.56%	24.74%	46.08%	13.62%	100.00%
SPORS	48.04%	32.72%	16.54%	2.70%	100.00%
VaLORS	42.53%	25.06%	27.45%	4.96%	100.00%
JRS	1.36%	11.41%	41.03%	46.20%	100.00%
<b>All Plans</b>	<b>16.19%</b>	<b>24.76%</b>	<b>45.57%</b>	<b>13.48%</b>	<b>100.00%</b>

FISCAL YEAR 2018 RETIREES

	Under 55	55-59	60-65	Over Age 65	Total
VRS	10.00%	16.34%	48.89%	24.77%	100.00%
SPORS	47.73%	27.27%	22.73%	2.27%	100.00%
VaLORS	40.06%	22.19%	32.65%	5.10%	100.00%
JRS	5.56%	5.56%	27.78%	61.10%	100.00%
<b>All Plans</b>	<b>11.10%</b>	<b>16.55%</b>	<b>48.24%</b>	<b>24.11%</b>	<b>100.00%</b>

**FIGURE 5.9: DISTRIBUTION OF RETIREES BY AVERAGE FINAL COMPENSATION**

ALL RETIREES AT JUNE 30, 2018

	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	5.69%	16.53%	16.72%	15.79%	14.34%	19.06%	11.87%	100.00%
SPORS	3.49%	4.96%	6.92%	12.25%	16.05%	29.55%	26.78%	100.00%
VaLORS	0.00%	0.06%	8.75%	47.16%	28.59%	13.26%	2.18%	100.00%
JRS	3.13%	1.63%	0.95%	3.80%	5.03%	9.38%	76.08%	100.00%
<b>All Plans</b>	<b>5.57%</b>	<b>16.14%</b>	<b>16.48%</b>	<b>16.30%</b>	<b>14.58%</b>	<b>18.98%</b>	<b>11.95%</b>	<b>100.00%</b>

FISCAL YEAR 2018 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	0.33%	6.00%	10.75%	12.65%	15.67%	29.00%	25.60%	100.00%
SPORS	0.00%	0.00%	0.00%	0.00%	0.00%	27.27%	72.73%	100.00%
VaLORS	0.00%	0.00%	1.28%	35.71%	42.09%	17.60%	3.32%	100.00%
JRS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
<b>All Plans</b>	<b>0.31%</b>	<b>5.78%</b>	<b>10.39%</b>	<b>13.33%</b>	<b>16.45%</b>	<b>28.58%</b>	<b>25.16%</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 Funded (MVA/ AAL)	Covered Payroll (c)	Net Pension Liability as a Percentage of Covered Payroll (b-a)/(c)
VIRGINIA RETIREMENT SYSTEM (VRS) **						
2017	\$ 70,159,680	\$ 89,851,284	\$ 19,691,604	78.1%	\$16,764,876	117.5%
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%
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)						
2017	\$ 796,073	\$ 1,040,628	\$ 244,555	76.5%	\$ 110,265	221.8%
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%
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)						
2017	\$ 1,345,887	\$ 1,977,781	\$ 631,894	68.1%	\$ 339,150	186.3%
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%
JUDICIAL RETIREMENT SYSTEM (JRS)						
2017	\$ 512,749	\$ 631,522	\$ 118,773	81.2%	\$ 66,288	179.2%
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%

\* 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)	Covered Payroll (c)	Net Pension Liability as a Percentage of Covered Payroll (b-a)/(c)
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – STATE</b>						
2017	\$ 17,789,888	\$ 23,311,534	\$ 5,521,646	76.3%	\$ 4,037,072	136.8%
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%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER</b>						
2017	\$ 33,119,545	\$ 45,006,017	\$ 11,886,472	73.6%	\$ 7,919,450	150.1%
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%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS</b>						
2017	\$ 19,250,247	\$ 21,533,733	\$ 2,283,486	89.4%	\$ 4,808,354	47.5%
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%
<b>VIRGINIA RETIREMENT SYSTEM (VRS) – TOTAL</b>						
2017	\$ 70,159,680	\$ 89,851,284	\$ 19,691,604	78.1%	\$ 16,764,876	117.5%
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%

\* 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)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position Restricted – Beginning 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>
<b>Funding:</b>										
Member and Employer Contributions and Other Additions	135,063	94,860	45,048	47,285	201,688	205,586	208,463	214,257	240,084	248,932
Benefits and Administrative Expenses	(153,083)	(139,344)	(146,550)	(141,026)	(150,700)	(160,909)	(177,336)	(175,393)	(185,854)	(202,662)
Net Funding	(18,020)	(44,484)	(101,502)	(93,741)	50,988	44,677	31,127	38,864	54,230	46,270
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	13,582	14,128	17,924	16,301	13,669	16,981	16,341	17,040	17,945	18,684
Net Appreciation (Depreciation) in Fair Value	(218,896)	99,602	133,585	(9,006)	76,497	129,884	35,834	6,405	140,485	92,233
Net Investment Income	(205,314)	113,730	151,509	7,295	90,166	146,865	52,175	23,445	158,430	110,917
<b>Net Increase (Decrease)</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>157,187</b>
<b>Fiduciary Net Position Restricted – End of Year</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>	<b>\$1,594,773</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 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions						Total
	State	Teacher	Political Subdivisions	Sub-Total	Investment Income (Loss)	Other	
2018	\$ 75,997	\$ 106,329	\$ 66,606	\$ 248,932	\$ 110,917	\$ —	\$ 359,849
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)

\* 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 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Group Life Claims			Administrative Expenses	Other	Total
	Active	Retired	Sub-Total			
2018	\$ 64,822	\$ 135,463	\$ 200,285	\$ 664	\$ 1,713	\$ 202,662
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

**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)

	2009	2010*	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Employer Contributions and Other Additions	146,333	100,613	50,052	51,356	145,031	146,742	144,834	151,916	168,271	184,706
Reimbursements and Administrative Expenses	(115,878)	(120,872)	(126,963)	(131,435)	(137,906)	(143,088)	(148,459)	(154,320)	(159,280)	(164,295)
Net Funding	30,455	(20,259)	(76,911)	(80,079)	7,125	3,654	(3,625)	(2,404)	8,991	20,411
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	3,314	4,127	4,849	2,997	1,856	2,226	2,140	2,098	2,168	2,343
Net Appreciation (Depreciation) in Fair Value	(53,409)	29,096	36,137	(4,717)	10,257	17,696	4,631	323	16,945	11,303
Net Investment Income	(50,095)	33,223	40,986	(1,720)	12,113	19,922	6,771	2,421	19,113	13,646
<b>Net Increase (Decrease)</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>34,057</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$235,372</b>

**VIRGINIA RETIREMENT SYSTEM – STATE**

	2009	2010*	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Employer Contributions and Other Additions	64,979	43,208	5,425	5,859	60,848	59,438	63,907	66,410	74,520	79,952
Reimbursements and Administrative Expenses	(51,565)	(55,117)	(57,013)	(58,224)	(60,911)	(61,249)	(64,551)	(66,157)	(71,395)	(69,272)
Net Funding	13,414	(11,909)	(51,588)	(52,365)	(63)	(1,811)	(644)	253	3,125	10,680
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	2,031	2,373	2,735	1,977	866	941	910	864	875	981
Net Appreciation (Depreciation) in Fair Value	(32,719)	16,738	20,388	(3,099)	4,787	6,192	1,966	134	6,831	4,731
Net Investment Income	(30,688)	19,111	23,123	(1,122)	5,653	7,133	2,876	998	7,706	5,712
<b>Net Increase (Decrease)</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>16,392</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 95,908</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)

	VIRGINIA RETIREMENT SYSTEM – TEACHER									
	2009	2010*	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>Funding:</b>										
Employer Contributions and Other Additions	77,205	53,114	41,410	42,245	80,489	80,720	78,875	80,831	88,059	99,019
Reimbursements and Administrative Expenses	(61,446)	(62,799)	(66,779)	(69,777)	(73,147)	(75,033)	(79,670)	(83,510)	(83,640)	(89,578)
Net Funding	15,759	(9,685)	(25,369)	(27,532)	7,342	5,687	(795)	(2,679)	4,419	9,441
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	1,166	1,598	1,849	1,033	728	1,012	970	995	1,000	1,049
Net Appreciation (Depreciation) in Fair Value	(18,810)	11,260	13,771	(1,638)	4,016	6,454	2,103	152	7,818	5,058
Net Investment Income	(17,644)	12,858	15,620	(605)	4,744	7,466	3,073	1,147	8,818	6,107
<b>Net Increase (Decrease)</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>15,548</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>\$ 111,639</b>

	VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS									
	2009	2010*	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Employer Contributions and Other Additions	2,872	3,014	1,940	1,975	1,945	1,876	1,933	1,991	2,278	2,179
Reimbursements and Administrative Expenses	(1,331)	(1,382)	(1,489)	(1,626)	(1,802)	(1,817)	(2,015)	(2,278)	(1,717)	(2,735)
Net Funding	1,541	1,632	451	349	143	59	(82)	(287)	561	(556)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	117	156	265	(13)	262	273	260	239	258	270
Net Appreciation (Depreciation) in Fair Value	(1,879)	1,098	1,978	20	1,454	2,134	562	37	2,016	1,300
Net Investment Income	(1,762)	1,254	2,243	7	1,716	2,407	822	276	2,274	1,570
<b>Net Increase (Decrease)</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>1,014</b>
<b>Fiduciary Net Position</b>										
<b>Restricted – End of Year</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>	<b>\$ 23,170</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>										
	2009	2010**	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>Funding:</b>										
Employer Contributions and Other Additions	805	805	805	805	805	2,833	113	1,830	2,305	2,397
Reimbursements and Administrative Expenses	(986)	(996)	(1,052)	(1,119)	(1,312)	(3,245)	(1,370)	(1,471)	(1,572)	(1,727)
Net Funding	(181)	(191)	(247)	(314)	(507)	(412)	(1,257)	359	733	670
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	—	24	31
Net Appreciation (Depreciation) in Fair Value	(1)	—	—	—	—	1,959	—	—	191	150
Net Investment Income	(1)	—	—	—	—	1,959	—	—	215	181
<b>Net Increase (Decrease)</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>851</b>
<b>Fiduciary Net Position Restricted – End of Year</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>\$ 3,278</b>

<b>VIRGINIA RETIREMENT SYSTEM – SOCIAL SERVICES</b>										
	2009	2010*	2011	2012	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position</b>										
<b>Restricted – Beginning 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>
<b>Funding:</b>										
Employer Contributions and Other Additions	472	472	472	472	862	1,818	5	824	1,062	1,126
Reimbursements and Administrative Expenses	(541)	(567)	(617)	(670)	(713)	(1,683)	(828)	(878)	(929)	(971)
Net Funding	(69)	(95)	(145)	(198)	149	135	(823)	(54)	133	155
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	—	11	12
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	—	920	—	—	86	61
Net Investment Income	—	—	—	—	—	920	—	—	97	73
<b>Net Increase (Decrease)</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>228</b>
<b>Fiduciary Net Position Restricted – End of Year</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>	<b>\$ 1,319</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)

VIRGINIA RETIREMENT SYSTEM – REGISTRARS											
	2009	2010*	2011	2012	2013	2014	2015	2016	2017	2018	
<b>Fiduciary Net Position</b>											
<b>Restricted – Beginning of Year</b>	\$	(11) \$	(20) \$	(31) \$	(44) \$	(63) \$	(2) \$	31 \$	7 \$	11 \$	34
<b>Funding:</b>											
Employer Contributions and Other Additions	—	—	—	—	82	57	1	30	47	33	
Reimbursements and Administrative Expenses	(9)	(11)	(13)	(19)	(21)	(61)	(25)	(26)	(27)	(12)	
Net Funding	(9)	(11)	(13)	(19)	61	(4)	(24)	4	20	21	
<b>Investment Income:</b>											
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	—	—	—	
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	—	37	—	—	3	3	
Net Investment Income	—	—	—	—	—	37	—	—	3	3	
<b>Net Increase (Decrease)</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>24</b>	
<b>Fiduciary Net Position Restricted – End of Year</b>	<b>\$</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>	<b>58</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 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions					Investment Income (Loss)	Other	Total
	State	Teacher	Political Subdivisions	State-Funded HIC	Sub-Total			
2018	\$ 79,400	\$ 99,469	\$ 2,291	\$ 3,546	\$ 184,706	\$ 13,646	\$ —	\$ 198,352
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

\* 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 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Retiree Health Insurance Reimbursements					Administrative Expenses	Other	Total
	State	Teacher	Political Subdivisions	State- Funded HIC	Sub-Total			
2018	\$ 69,099	\$ 89,420	\$ 2,697	\$ 2,722	\$ 163,938	\$ 257	\$ 15	\$ 164,210
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

\* 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)

	2009	2010*	2011*	2012*	2013	2014	2015	2016	2017	2018
<b>Fiduciary Net Position Restricted – Beginning 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>
<b>Funding:</b>										
Employer Contributions and Other Additions	71,337	31,021	6	78	17,267	17,693	24,026	25,156	24,768	25,982
Disability Insurance Benefits and Administrative Expenses	(28,800)	(28,415)	(29,001)	(28,955)	(30,668)	(34,290)	(37,942)	(38,782)	(38,466)	(38,706)
Net Funding	42,537	2,606	(28,995)	(28,877)	(13,401)	(16,597)	(13,916)	(13,626)	(13,698)	(12,724)
<b>Investment Income:</b>										
Interest, Dividends and Other Investment Income	4,339	5,358	7,317	7,048	5,919	6,264	5,705	5,576	5,458	6,609
Net Appreciation (Depreciation) in Fair Value	(69,916)	37,768	54,536	(3,270)	33,631	50,309	12,632	1,358	42,748	26,742
Net Investment Income	(65,577)	43,126	61,853	3,778	39,550	56,573	18,337	6,934	48,206	33,351
<b>Net Increase (Decrease)</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>20,627</b>
<b>Fiduciary Net Position Restricted – End of Year</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>	<b>\$462,961</b>

\* The disability insurance contribution rate for fiscal year 2011, 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 2009-2018

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions	Investment Income	Transfers and Other Additions*	Total
LONG-TERM DISABILITY PROGRAM				
2018	\$ 25,195	\$ 26,653	\$ —	\$ 51,848
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
LONG-TERM CARE PROGRAM				
2018	\$ 2,065	\$ 5,420	\$ —	\$ 7,485
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
TOTAL DISABILITY INSURANCE TRUST FUND				
2018	\$ 27,260	\$ 32,073	\$ —	\$ 59,333
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

\* 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 included 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 2009-2018

(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
<b>LONG-TERM DISABILITY PROGRAM</b>						
2018	\$ 29,421	\$ —	\$ 6,637	\$ 799	\$ 29	\$ 36,886
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
<b>LONG-TERM CARE PROGRAM</b>						
2018	\$ —	\$ 1,652	\$ —	\$ 162	\$ 6	\$ 1,820
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
<b>TOTAL DISABILITY INSURANCE TRUST FUND</b>						
2018	\$ 29,421	\$ 1,652	\$ 6,637	\$ 961	\$ 35	\$ 38,706
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

\* 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	2018
<b>Net Position Restricted – Beginning of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 728</b>	<b>\$ 2,708</b>	<b>\$ 3,461</b>
Employer Contributions and Other Additions	10,678	11,554	6,869	7,229	9,121	10,881	11,608	10,890
Disability Insurance Benefits and Administrative Expenses	(10,678)	(11,559)	(7,814)	(8,668)	(8,572)	(9,026)	(11,538)	(13,140)
Net Funding	—	(5)	(945)	(1,439)	549	1,855	70	(2,250)
<b>Investment Income:</b>								
Interest, Dividends and Other Investment Income	—	1	144	157	64	62	77	96
Net Appreciation (Depreciation) in Fair Value	—	4	801	1,282	115	63	606	582
Net Investment Income	—	5	945	1,439	179	125	683	678
<b>Net Increase (Decrease)</b>	<b>—</b>	<b>9</b>	<b>—</b>	<b>—</b>	<b>728</b>	<b>1,980</b>	<b>753</b>	<b>(1,572)</b>
<b>Net Position Restricted – End of Year</b>	<b>\$ —</b>	<b>\$ 9</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 728</b>	<b>\$ 2,708</b>	<b>\$ 3,461</b>	<b>\$ 1,889</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	2018
<b>Net Position Restricted – Beginning of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 630</b>
Employer Contributions and Other Additions	429	875	1,351	1,993	3,030
Disability Insurance Benefits and Administrative Expenses	(429)	(873)	(1,351)	(1,363)	(2,261)
Net Funding	—	2	—	630	769
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	—	—	—	—	14
Net Appreciation (Depreciation) in Fair Value	—	(2)	—	—	50
Net Investment Income	—	(2)	—	—	64
<b>Net Increase (Decrease)</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>630</b>	<b>833</b>
<b>Net Position Restricted – End of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 630</b>	<b>\$ 1,463</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	2018
<b>Net Position Restricted – Beginning of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 279</b>
Employer Contributions and Other Additions	182	370	567	883	1,339
Disability Insurance Benefits and Administrative Expenses	(182)	(369)	(567)	(604)	(1,000)
Net Funding	—	1	—	279	339
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	—	—	—	—	7
Net Appreciation (Depreciation) in Fair Value	—	(1)	—	—	22
Net Investment Income	—	(1)	—	—	29
<b>Net Increase (Decrease)</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 279</b>	<b>\$ 368</b>
<b>Net Position Restricted – End of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 279</b>	<b>\$ 647</b>

**VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS**

	2014*	2015	2016	2017	2018
<b>Net Position Restricted – Beginning of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 351</b>
Employer Contributions and Other Additions	247	505	784	1,110	1,691
Disability Insurance Benefits and Administrative Expenses	(247)	(504)	(784)	(759)	(1,261)
Net Funding	—	1	—	351	430
<b>Investment Income:</b>					
Interest, Dividends and Other Investment Income	—	—	—	—	7
Net Appreciation (Depreciation) in Fair Value	—	(1)	—	—	28
Net Investment Income	—	(1)	—	—	35
<b>Net Increase (Decrease)</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 351</b>	<b>\$ 465</b>
<b>Net Position Restricted – End of Year</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ 351</b>	<b>\$ 816</b>

\* 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*
2018	182,438	124,406	2,710	696
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
2018	5,255	\$ 24,865	June 2018	124,406	\$ 108
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 2018	2,707	\$ 1,899	\$ 982
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	Avg. Annual Health Insurance Benefit
2018	3	—	2018	696	\$ 17,381
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 for 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, 2018:

### 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*

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#### COUNTIES: 93

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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: C	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: C	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	

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CITIES AND TOWNS: 162

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City of Alexandria: A	Town of Appomattox: A	Town of Gordonsville: B	Town of Pound: A
City of Bedford: B	Town of Ashland: B	Town of Gretna: B	Town of Pulaski: B
City of Bristol: B	Town of Berryville: B	Town of Grottoes: B	Town of Purcellville: B
City of Buena Vista: B	Town of Big Stone Gap: A	Town of Grundy: B	Town of Quantico: B
City of Chesapeake: B	Town of Blacksburg: B	Town of Halifax: B	Town of Remington: B
City of Colonial Heights: B	Town of Blackstone: B	Town of Hamilton: C	Town of Rich Creek: B
City of Covington: C	Town of Bluefield: B	Town of Haymarket: B	Town of Richlands: A
City of Danville: A	Town of Bowling Green: B	Town of Haysi: A	Town of Rocky Mount: B
City of Emporia: B	Town of Boyce: B	Town of Herndon: B	Town of Round Hill: B
City of Fairfax: A	Town of Boydton: B	Town of Hillsville: B	Town of Rural Retreat: A
City of Falls Church: B	Town of Boykins: A	Town of Hurt: B	Town of Saltville: A
City of Franklin: B	Town of Bridgewater: B	Town of Independence: A	Town of Scottsville: B
City of Fredericksburg: B	Town of Broadway: B	Town of Iron Gate: B	Town of Shenandoah: C
City of Galax: B	Town of Brodnax: A	Town of Jarratt: A	Town of Smithfield: B
City of Hampton: B	Town of Brookneal: B	Town of Jonesville: B	Town of South Boston: B
City of Harrisonburg: B	Town of Burkeville: B	Town of Kenbridge: C	Town of South Hill: A
City of Hopewell: B	Town of Cape Charles: B	Town of Kilmarnock: C	Town of St. Paul: B
City of Lexington: B	Town of Chase City: B	Town of La Crosse: A	Town of Stanley: C
City of Lynchburg: B	Town of Chatham: B	Town of Lawrenceville: C	Town of Stephens City: B
City of Manassas Park: B	Town of Chilhowie: B	Town of Lebanon: B	Town of Strasburg: C
City of Manassas: C	Town of Chincoteague: B	Town of Leesburg: B	Town of Stuart: B
City of Martinsville: B	Town of Christiansburg: A	Town of Louisa: B	Town of Tappahannock: A
City of Newport News: B	Town of Clarksville: B	Town of Lovettsville: B	Town of Tazewell: A
City of Norfolk: B	Town of Clifton Forge: B	Town of Luray: B	Town of Timberville: B
City of Norton: B	Town of Coeburn: B	Town of Madison: B	Town of Troutville: A
City of Petersburg: B	Town of Colonial Beach: B	Town of Marion: B	Town of Urbanna: B
City of Poquoson: C	Town of Courtland: B	Town of McKenney: B	Town of Victoria: B
City of Portsmouth: B	Town of Craigsville: B	Town of Middleburg: B	Town of Vienna: B
City of Radford: C	Town of Crewe: B	Town of Middletown: D	Town of Vinton: B
City of Richmond: B	Town of Culpeper: B	Town of Mineral: A	Town of Wakefield: A
City of Roanoke: B	Town of Dayton: B	Town of Montross: B	Town of Warrenton: B
City of Salem: B	Town of Dillwyn: A	Town of Mount Jackson: B	Town of Warsaw: B
City of Staunton: B	Town of Dublin: B	Town of Narrows: A	Town of Waverly: A
City of Suffolk: B	Town of Dumfries: C	Town of New Market: B	Town of Weber City: B
City of Virginia Beach: B	Town of Edinburg: A	Town of Onancock: B	Town of West Point: B
City of Waynesboro: B	Town of Elkton: B	Town of Onley: B	Town of Windsor: B
City of Williamsburg: B	Town of Exmore: A	Town of Orange: B	Town of Wise: B
City of Winchester: C	Town of Floyd: B	Town of Parksley: B	Town of Woodstock: C
Town of Abingdon: B	Town of Front Royal: B	Town of Pearisburg: C	Town of Wytheville: B
Town of Altavista: B	Town of Gate City: A	Town of Pembroke: B	
Town of Amherst: B	Town of Glasgow: B	Town of Pennington Gap: A	

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AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS: 205

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Accomack-Northampton Planning District Commission: B	Crater Youth Care Commission: B
Albemarle County Service Authority: B	Culpeper Soil & Water Conservation District: B
Albemarle-Charlottesville Regional Jail: B	Cumberland Mountain Community Services Board: B
Alexandria Redevelopment & Housing Authority: B	Cumberland Plateau Regional Housing Authority: B
Alexandria Renew Enterprises: A	Daniel Boone Soil & Water Conservation District: C
Alleghany Highlands Community Services Board: B	Danville-Pittsylvania Community Services Board: B
Alleghany Highlands Regional Library, Inc.: B	Danville Redevelopment & Housing Authority: B
Amherst County Service Authority: C	Dinwiddie County Water Authority: B
Anchor Commission: B	District 19 Community Services Board: C
Appalachian Juvenile Commission: C	Eastern Shore Community Services Board: B
Appomattox Regional Library: B	Eastern Shore Public Library: B
Appomattox River Water Authority: B	Eastern Shore Soil & Water Conservation District: B
Augusta County Service Authority: B	Economic Development Authority of Henrico County: B
Bedford Public Library: B	Evergreen Soil & Water Conservation District: B
Bedford Regional Water Authority: B	Fauquier County Water & Sanitation Authority: B
Big Sandy Soil & Water Conservation District: A	Ferrum Water & Sewage Authority: A
Big Stone Gap Redevelopment & Housing Authority: A	Franklin Redevelopment & Housing Authority: B
Big Walker Soil & Water Conservation District: A	Frederick County Sanitation Authority: C
Blacksburg-Christiansburg-VPI Water Authority: B	Giles County Public Service Authority: B
Blacksburg-VPI Sanitation Authority: B	Goochland-Powhatan Community Services Board: B
Blue Ridge Behavioral Healthcare: B	Greensville County Water & Sewer Authority: C
Blue Ridge Juvenile Detention Center: B	Greensville-Emporia Department of Social Services: C
Blue Ridge Regional Jail Authority: B	Halifax Service Authority: B
Bristol Redevelopment & Housing Authority: B	Hampton-Newport News Community Services Board: A
Bristol Virginia Utilities Authority: B	Hampton Redevelopment & Housing Authority: B
Brunswick Industrial Development Authority: B	Hampton Roads Planning District Commission: B
Campbell County Utilities & Service Authority: B	Hampton Roads Regional Jail Authority: B
Capital Region Airport Commission: C	Hampton Roads Sanitation District: C
Castlewood Water & Sewage Authority: B	Hampton Roads Transit: B
Central Rappahannock Regional Library: B	Hampton Roads Transportation Accountability Commission: C
Central Shenandoah Justice Training Academy: B	Handley Regional Library: B
Central Virginia Regional Jail: B	Harrisonburg-Rockingham Community Services Board: C
Central Virginia Waste Management Authority: C	Harrisonburg-Rockingham Regional Sewer Authority: B
Charlottesville-Albemarle Airport Authority: B	Henricopolis Soil & Water Conservation District: B
Charlottesville Redevelopment & Housing Authority: B	Henry County Public Service Authority: C
Chesapeake Bay Bridge & Tunnel District: B	Holston River Soil & Water Conservation District: A
Chesapeake Redevelopment & Housing Authority: B	Hopewell Redevelopment & Housing Authority: A
Chesterfield County Health Center Commission: B	Horizon Behavioral Health: B
Clinch Valley Soil & Water Conservation District: B	Institute for Advanced Learning and Research: A
Coburn-Norton-Wise Regional Water Treatment Authority: B	James City Service Authority: C
Colonial Behavioral Health: C	John Marshall Soil & Water Conservation District: B
Colonial Soil & Water Conservation District: B	Lee County Public Service Authority: B
Commonwealth Regional Council: A	Lee County Redevelopment & Housing Authority: B
Crater Criminal Justice Training Academy: B	Lenowisco Planning District Commission: B

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AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS, cont.

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Lonesome Pine Regional Library: B	Portsmouth Redevelopment & Housing Authority: B
Lonesome Pine Soil & Water Conservation District: B	Potomac and Rappahannock Transportation Commission: B
Loudoun County Sanitation Authority: B	Potomac River Fisheries Commission: B
Massanutten Regional Library: B	Prince William County Service Authority: C
Maury Service Authority: B	Prince William Soil & Water Conservation District: B
Meherrin Regional Library: C	Rappahannock Area Community Services Board: C
Meherrin River Regional Jail Authority: C	Rappahannock Area Youth Services & Group Home Commission: B
Middle Peninsula-Northern Neck Community Services Board: B	Rappahannock-Rapidan Community Services Board: B
Middle Peninsula Planning District Commission: B	Rappahannock-Rapidan Regional Planning District Commission: B
Middle Peninsula Regional Security Center: B	Rappahannock Regional Jail: B
Middle River Regional Jail Authority: B	Region Ten Community Services Board: B
Monacan Soil & Water Conservation District: C	Richmond Metropolitan Transportation Authority: B
Montgomery Regional Solid Waste Authority: B	Richmond Redevelopment & Housing Authority: B
Mount Rogers Community Services Board: B	Richmond Regional Planning District Commission: A
Nelson County Service Authority: B	Rivanna Solid Waste Authority: B
New River Resource Authority: C	Rivanna Water & Sewer Authority: B
New River Soil & Water Conservation District: B	Riverside Regional Jail: B
New River Valley Community Services Board: A	Roanoke Higher Education Authority: C
New River Valley Emergency Communications Regional Authority: B	Roanoke Redevelopment & Housing Authority: A
New River Valley Juvenile Detention Home Commission: B	Roanoke River Service Authority: B
New River Valley Regional Commission: A	Robert E. Lee Soil & Water Conservation District: A
New River Valley Regional Jail: B	Rockbridge Area Community Services Board: B
Norfolk Airport Authority: B	Rockbridge Area Social Services Department: B
Norfolk Redevelopment & Housing Authority: B	Rockbridge County Public Service Authority: B
Northern Neck Planning District Commission: B	Rockbridge Regional Library: A
Northern Neck Regional Jail: B	RSW Regional Jail Authority: B
Northern Shenandoah Valley Regional Commission: B	Russell County Public Service Authority: C
Northern Virginia Health Care Center Commission: A	Scott County Public Service Authority: B
Northern Virginia Juvenile Detention Home: B	Scott County Redevelopment & Housing Authority: B
Northern Virginia Transportation Authority: C	Scott County Soil & Water Conservation District: B
Northwestern Community Services Board: B	Shenandoah Valley Juvenile Center: C
Opportunity Inc. of Hampton Roads: B	Shenandoah Valley Regional Airport Commission: B
Pamunkey Regional Jail: B	Skyline Soil & Water Conservation District: A
Pamunkey Regional Library: C	South Central Wastewater Authority: B
Peaks of Otter Soil & Water Conservation District: B	Southeastern Virginia Public Service Authority: B
Peninsula Airport Commission: B	Southside Community Services Board: C
Pepper's Ferry Regional Wastewater Authority: C	Southside Planning District Commission: B
Peter Francisco Soil & Water Conservation District: A	Southside Regional Jail: C
Petersburg Redevelopment & Housing Authority: C	Southside Regional Juvenile Group Home Commission: B
Piedmont Community Services Board: B	Southside Regional Library Board: B
Piedmont Regional Jail: B	Southwest Regional Recreation Authority: B
Piedmont Regional Juvenile Detention Center: B	Southwest Virginia Regional Jail: B
Pittsylvania County Service Authority: B	Staunton Redevelopment & Housing Authority: B
Planning District One Behavioral Health Services Board: C	Suffolk Redevelopment & Housing Authority: B

**AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS, cont.**

Sussex Service Authority: B	Virginia Resources Authority: B
Tazewell Soil & Water Conservation District: B	Virginia's Region 2000 Local Government Council: B
Thomas Jefferson Planning District Commission: B	Washington County Service Authority: B
Thomas Jefferson Soil & Water Conservation District: B	Washington Metropolitan Area Transportation Commission: A
Tidewater Soil & Water Conservation District: A	Waynesboro Redevelopment & Housing Authority: B
Tidewater Youth Services Commission: C	Western Tidewater Community Services Board: D
Tri-County/City Soil & Water Conservation District: B	Western Tidewater Regional Jail: B
Upper Occoquan Sewage Authority: B	Western Virginia Regional Jail Authority: C
Valley Community Services Board: B	Western Virginia Water Authority: B
Virginia Biotechnology Research Park Authority: C	Wise County Public Service Authority: B
Virginia Coalfield Economic Development Authority: C	Wise County Redevelopment & Housing Authority: C
Virginia Highlands Airport Authority: B	Woodway Water Authority: B
Virginia Peninsula Regional Jail: B	Wythe-Grayson Regional Library: B
Virginia Peninsulas Public Service Authority: B	Wytheville Redevelopment & Housing Authority: B

**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	Pulaski County Schools: E
Albemarle County Schools: E	Dickenson County Schools: E	Lancaster County Schools: E	Rappahannock County Schools: F
Alleghany County Schools: E	Dinwiddie County Schools: E	Lee County Schools: F	Richmond County Schools: E
Amelia County Schools: E	Essex County Schools: E	Loudoun County Schools: F	Roanoke County Schools: E
Amherst County Schools: E	Fairfax County Schools: E	Louisa County Schools: F	Rockbridge County Schools: E
Appomattox County Schools: E	Fauquier County Schools: E	Lunenburg County Schools: E	Rockingham County Schools: F
Arlington County Schools: E	Floyd County Schools: E	Madison County Schools: E	Russell County Schools: F
Augusta County Schools: E	Fluvanna County Schools: E	Mathews County Schools: E	Scott County Schools: E
Bath County Schools: F	Franklin County Schools: F	Mecklenburg County Schools: E	Shenandoah County Schools: E
Bedford County Schools: E	Frederick County Schools: E	Middlesex County Schools: E	Smyth County Schools: E
Bland County Schools: E	Giles County Schools: E	Montgomery County Schools: E	Southampton County Schools: E
Botetourt County Schools: F	Gloucester County Schools: F	Nelson County Schools: E	Spotsylvania County Schools: E
Brunswick County Schools: F	Goochland County Schools: E	New Kent County Schools: E	Stafford County Schools: F
Buchanan County Schools: E	Grayson County Schools: E	Northampton County Schools: E	Surry County Schools: E
Buckingham County Schools: E	Greene County Schools: E	Northumberland County Schools: E	Sussex County Schools: E
Campbell County Schools: F	Greensville County Schools: E	Nottoway County Schools: E	Tazewell County Schools: E
Caroline County Schools: E	Halifax County Schools: F	Orange County Schools: E	Warren County Schools: E
Carroll County Schools: F	Hanover County Schools: E	Page County Schools: E	Washington County Schools: F
Charles City County Schools: E	Henrico County Schools: E	Patrick County Schools: E	Westmoreland County Schools: E
Charlotte County Schools: E	Henry County Schools: E	Pittsylvania County Schools: F	Wise County Schools: F
Chesterfield County Schools: E	Highland County Schools: E	Powhatan County Schools: E	Wythe County Schools: F
Clarke County Schools: E	Isle of Wight County Schools: E	Prince Edward County Schools: E	York County Schools: E
Craig County Schools: E	King & Queen County Schools: E	Prince George County Schools: E	
Culpeper County Schools: F	King George County Schools: E	Prince William County Schools: F	

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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: Northern Neck Regional Special Education Program: E	The Pruden Center for Industry and Technology: E
Appomattox Regional Governor’s School: E	Jackson River Vocational Technical Center: F	Northern Neck Regional Vocational Center: 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	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: 230**

*Covered by retirement, group life insurance, retiree health insurance credit and sickness and disability*

**TOTAL VRS-PARTICIPATING EMPLOYERS: 835**

**FIGURE 5.16: VRS EMPLOYER RANKING**  
**CURRENT YEAR**

AS OF JUNE 30, 2018

Employer	Active Employees	Percentage of Total
1. Fairfax County Schools – Professional Employees	21,811	6.36%
2. Loudoun County Schools – Professional Employees	9,361	2.73%
3. Prince William County Schools – Professional Employees	8,790	2.56%
4. Virginia Beach City Schools – Professional Employees	8,106	2.36%
5. Chesterfield County Schools – Professional Employees	6,457	1.88%
6. City of Virginia Beach – General Government	6,019	1.75%
7. Henrico County Schools – Professional Employees	5,344	1.56%
8. University of Virginia – Academic Division	5,264	1.53%
9. Henrico County – General Government	5,066	1.48%
10. Virginia Polytechnic Institute and State University – Academic	4,788	1.40%
11. All other	261,999	76.39%
<b>Total</b>	<b>343,005</b>	<b>100.00%</b>

**HISTORICAL COMPARISON**

AS OF JUNE 30, 2008

Employer	Active Employees	Percentage of Total
1. Fairfax County Schools – Professional Employees	19,438	5.62%
2. Virginia Beach City Schools – Professional Employees	8,436	2.44%
3. Prince William County Schools – Professional Employees	7,511	2.17%
4. Loudoun County Schools – Professional Employees	6,555	1.90%
5. Chesterfield County Schools – Professional Employees	6,265	1.81%
6. City of Virginia Beach – General Government	6,001	1.74%
7. University of Virginia – Academic Division	5,524	1.60%
8. Norfolk City Schools – Professional Employees	5,243	1.52%
9. Virginia Polytechnic Institute and State University – Academic	4,913	1.42%
10. Henrico County – General Government	4,872	1.41%
11. All other	270,979	78.37%
<b>Total</b>	<b>345,737</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 for salaried state employees hired before January 1, 2008, and for 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, 2018, 2017, and 2016.

Contributions to the Deferred Compensation Plan during fiscal year 2018 and fiscal year 2017 were \$140,758,585 and \$134,004,333, respectively.

Contributions to the Cash Match Plan during fiscal year 2018 and fiscal year 2017 were \$15,814,125 and \$15,697,347, respectively.

As shown in Figures 5.18 and 5.19, there were approximately 79,396 employees in the Deferred Compensation Plan and 70,880 employees in the Cash Match Plan as of June 30, 2018.

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 80 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

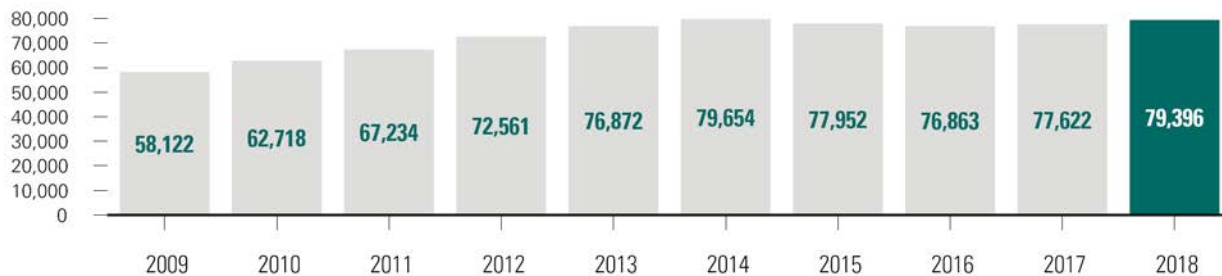
	Deferred Compensation Plan – 457(b)			Cash Match Plan – 401(a)		
	2018	2017	2016	2018	2017	2016
Plan Assets on July 1	\$ 2,434,472,689	\$ 2,184,755,502	\$ 2,114,351,524	\$ 418,697,759	\$ 379,078,068	\$ 369,825,796
Contributions	140,758,585	134,004,333	139,303,721	15,814,125	15,697,347	16,454,181
Distributions	(134,736,315)	(132,536,740)	(110,806,127)	(22,630,405)	(23,664,326)	(22,149,632)
Plan Transfers*	47,159,971	11,252,987	9,129,981	9,932,909	8,850,618	8,591,671
Third-Party Administrative Fees**	(2,293,173)	(2,292,692)	(2,322,347)	(70,186)	(67,058)	(65,041)
Period Earnings	215,197,925	239,289,299	35,098,750	34,873,341	38,803,110	6,421,093
<b>Plan Assets on June 30</b>	<b>\$ 2,700,559,681</b>	<b>\$ 2,434,472,689</b>	<b>\$ 2,184,755,502</b>	<b>\$ 456,617,543</b>	<b>\$ 418,697,759</b>	<b>\$ 379,078,068</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 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 \$705,921 and \$646,640 in fiscal year 2018 and fiscal year 2017, respectively. For the Cash Match Plan, they were \$344,977 and \$414,243 in fiscal year 2018 and fiscal year 2017, respectively. These costs are funded by the employers participating in the plans.

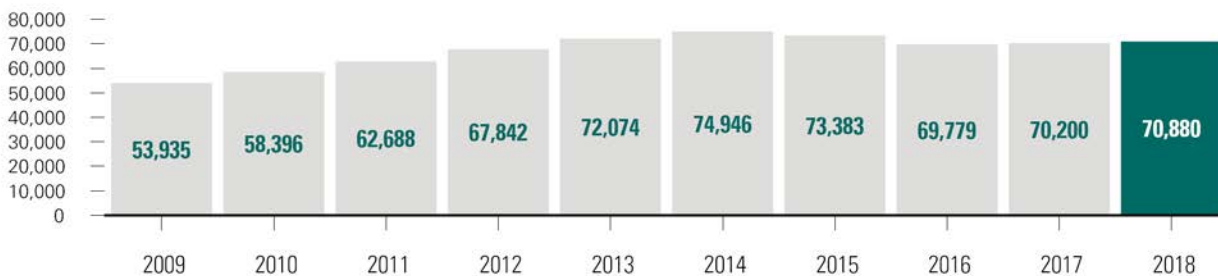
## FIGURE 5.18: 457(b) ACTIVE AND INACTIVE PLAN PARTICIPANTS

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, 2018

(EXPRESSED IN THOUSANDS)

Fund Name	Deferred Compensation Plan – 457(b)	Cash Match Plan – 401(a)
Retirement Portfolio	4,621	3,414
Target Date 2020 Portfolio	5,412	4,525
Target Date 2025 Portfolio	6,800	5,716
Target Date 2030 Portfolio	6,782	5,738
Target Date 2035 Portfolio	6,851	5,834
Target Date 2040 Portfolio	6,320	5,434
Target Date 2045 Portfolio	7,032	6,052
Target Date 2050 Portfolio	7,199	6,308
Target Date 2055 Portfolio	5,375	4,754
Target Date 2060 Portfolio	1,548	1,373
Money Market Fund	4,211	3,072
Stable Value Fund	17,241	16,642
Bond Fund	8,701	6,328
Inflation-Protected Bond Fund	3,604	2,341
High-Yield Bond Fund	4,206	2,579
Stock Fund	23,102	18,854
Small/Mid-Cap Stock Fund	12,743	9,545
International Stock Fund	11,400	8,394
Global Real Estate Fund	7,905	5,834
VRS Investment Portfolio	1,541	928
Self-Directed Brokerage	496	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)		
	2018	2017	2016	2018	2017	2016
Retirement Portfolio	\$ 135,724,324	\$ 136,923,374	\$ 134,124,866	\$ 22,971,035	\$ 23,077,644	\$ 22,105,079
Target Date 2015 Portfolio	—	—	—	—	—	—
Target Date 2020 Portfolio	139,041,358	128,169,224	110,385,748	21,036,785	19,070,807	16,779,592
Target Date 2025 Portfolio	125,171,097	102,240,948	84,285,982	19,437,366	16,988,439	14,473,693
Target Date 2030 Portfolio	91,168,880	72,100,189	56,407,009	17,736,619	14,567,392	12,086,563
Target Date 2035 Portfolio	73,276,299	58,868,973	46,218,327	16,576,793	13,821,879	11,309,360
Target Date 2040 Portfolio	56,290,750	43,107,808	34,233,349	15,170,392	12,872,472	8,571,036
Target Date 2045 Portfolio	37,638,565	30,327,098	22,910,724	11,564,019	9,530,850	7,485,866
Target Date 2050 Portfolio	26,628,342	20,467,326	15,188,388	9,049,164	7,366,990	5,712,752
Target Date 2055 Portfolio	16,349,669	12,700,919	9,280,237	4,862,559	3,745,756	2,749,779
Target Date 2060 Portfolio	2,528,246	1,725,904	971,667	647,091	347,498	149,332
Money Market Fund	48,209,841	45,172,232	43,385,395	6,561,359	5,813,042	6,376,164
Stable Value Fund	401,846,607	392,843,573	392,258,749	95,743,802	96,033,260	95,579,966
Bond Fund	108,752,967	106,512,214	110,341,141	13,506,497	13,421,044	13,922,248
Inflation-Protected Bond Fund	32,288,234	31,794,113	31,708,715	3,260,090	3,155,104	3,270,111
High-Yield Bond Fund	31,318,366	29,550,219	24,046,718	3,765,406	3,556,159	2,999,957
Stock Fund	799,484,027	712,477,931	621,481,903	123,776,849	111,054,172	95,970,209
Small/Mid-Cap Stock Fund	268,354,513	230,756,132	196,652,719	35,332,087	30,984,324	26,692,300
International Stock Fund	147,777,818	130,285,820	101,749,572	16,730,996	15,253,669	12,477,092
Emerging Markets Stock Fund	—	—	9,028,308	—	—	602,796
Global Real Estate Fund	83,913,575	84,411,045	86,537,812	12,749,519	12,670,590	13,057,981
VRS Investment Portfolio – Interim Account	853,066	437,310	1,546,921	27,156	117,265	141,332
VRS Investment Portfolio	29,377,287	26,810,905	22,965,612	4,879,534	4,363,367	5,827,047
Self-Directed Brokerage	44,565,850	36,789,432	29,045,640	1,232,425	886,036	737,813
<b>Total Accumulation Plan</b>	<b>\$ 2,700,559,681</b>	<b>\$ 2,434,472,689</b>	<b>\$ 2,184,755,502</b>	<b>\$ 456,617,543</b>	<b>\$ 418,697,759</b>	<b>\$ 379,078,068</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.





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