



TRANSFORMING



TOMORROW



Comprehensive Annual Financial Report

FOR THE FISCAL YEAR ENDED
JUNE 30, 2019

AN INDEPENDENT AGENCY OF THE COMMONWEALTH OF VIRGINIA

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

(EXPRESSED IN THOUSANDS)

	2019	2018	% Change
Activity for the Year:			
Contributions	\$ 3,511,343	\$ 3,465,914	1.31%
Investment Income (Net of Investment Expenses)	\$ 5,082,690	\$ 5,353,019	-5.05%
Retirement Benefits	\$ 4,990,124	\$ 4,752,889	4.99%
Refunds	\$ 117,907	\$ 122,968	-4.12%
Administrative and Other Expenses (Net of Miscellaneous Income)	\$ 59,709	\$ 54,386	9.79%
Increase (Decrease) in Net Position Held in Trust for Pension Benefits	\$ 3,428,592	\$ 3,888,690	
Retirement Benefits as a Percentage of Contributions	142.1%	137.1%	
Retirement Benefits as a Percentage of Contributions and Investment Income	58.1%	53.9%	
Net Position Held in Trust for Benefits at Fiscal Year-End:			
Virginia Retirement System (VRS)	\$ 77,392,855	\$ 74,084,142	4.47%
State Police Officers' Retirement System (SPORS)	\$ 865,273	\$ 836,702	3.41%
Virginia Law Officers' Retirement System (VaLORS)	\$ 1,495,990	\$ 1,423,980	5.06%
Judicial Retirement System (JRS)	\$ 563,456	\$ 544,158	3.55%
Investment Performance*:			
One-Year Return on Investments	6.7%	7.5%	
Three-Year Return on Investments	8.8%	7.1%	
Five-Year Return on Investments	6.5%	8.3%	
Participating Employers:			
Counties/Cities/Towns	252	255	
Special Authorities	207	205	
School Boards**	144	145	
State Agencies	230	230	
Total Employers	833	835	-0.2%
Members/Retirees:			
Active Members	346,273	343,005	1.0%
Retired Members	214,545	206,776	3.8%

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

** Of the 144 school boards, 132 also provide coverage for non-professional employees.



Virginia
Retirement
System

Virginia Retirement System

Comprehensive Annual Financial Report

For the Year Ended June 30, 2019

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

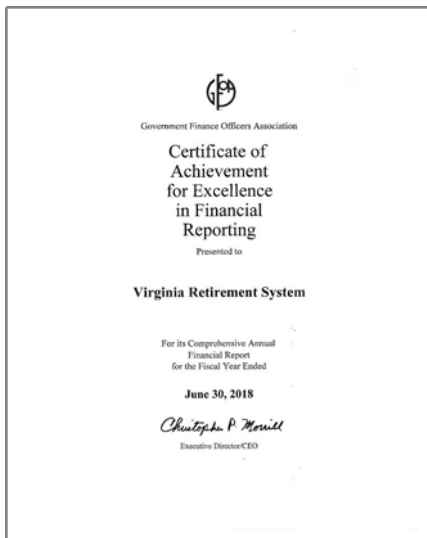
Confidentiality is exercising discretion and performing our ethical duty to protect the personal information of our members, retirees, beneficiaries and employers. We safeguard personal data and sensitive VRS information that is viewed, acquired or otherwise accessible during the course of VRS employment.

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.

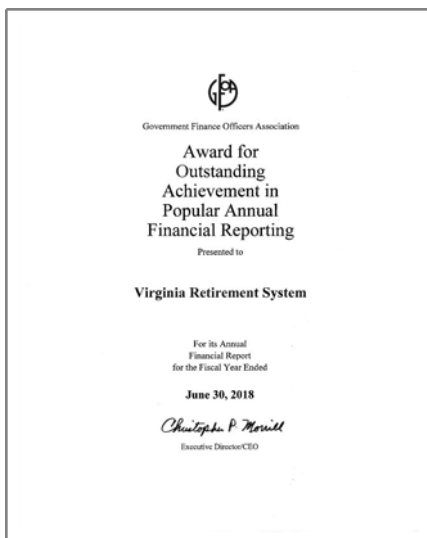


Certificate of Achievement for Excellence in Financial Reporting, Comprehensive Annual Financial Report (CAFR)

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, 2018. This was the 37th 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 2019 continues to conform to the Certificate of Achievement Program requirements and will be submitted to GFOA to determine its eligibility for another certificate.

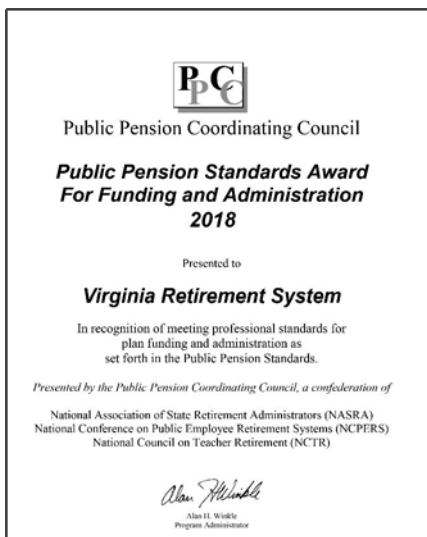


Award for Outstanding Achievement in Financial Reporting, Popular Annual Financial Report (PAFR)

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Award for Outstanding Achievement in Financial Reporting to the Virginia Retirement System for its *Popular Annual Financial Report* (PAFR) for the fiscal year ended June 30, 2018. This was the third 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 2019 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 2018 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 15th 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).

Divider images: Courtesy of Rita Crockett/Virginia Institute of Marine Science; Virginia Department of Mines, Minerals and Energy; D. Allen Covey/Virginia Department of Transportation; Massanutten Technical Center eSOC, Daniel Lin/Daily News-Record; Mark Blanks/Virginia Tech.

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Introductory Section¹

TRANSFORMING FOR TOMORROW



Introductory Section1

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: 888-827-3847 • TDD: 804-289-5919

December 13, 2019

**The Honorable Ralph S. Northam, Governor of Virginia, and Members
of the General Assembly:**

INVESTMENT UPDATE

I am pleased to present the Virginia Retirement System (VRS) *Comprehensive Annual Financial Report* for fiscal year 2019. This year, VRS achieved a 6.7% net return on its investment portfolio, allowing the VRS managed portfolio to end the year with a historic year-end high of \$84.4 billion.

During fiscal year 2019, the major asset classes performed as follows:

- Public equity program returned 3.9%
- Private equity program returned 14.0%
- Real assets program returned 7.8%
- Credit strategies program returned 6.8%
- Fixed income program returned 8.3%
- Private investment partnerships returned 6.7%
- Multi-asset public strategies returned 2.2%

The portfolio included approximately \$32.1 billion in public equity, \$11.9 billion in credit strategies, \$13.1 billion in fixed income, \$11.1 billion in real assets, \$9.5 billion in private equity, \$1.1 billion in private investment partnerships and \$2.2 billion in multi-asset public strategies portfolios, as of June 30, 2019.

Public pension plans like VRS must adopt a long-term investment management strategy. The Board has adopted an efficient and defensive portfolio policy that balances risks with rewards. Looking at the larger picture, we are exceeding expectations with an 8.4% return, net of fees, over the last 25 years. The decisions our investment professionals make today must support public employees for the next 40 years and beyond.

VRS' investment professionals have provided an average annual added value of \$225 million net of all fees and incentive payments per year above the VRS Board policy benchmark, resulting in about \$2.3 billion in additional dollars to the fund over the past 10 years. Investment income funds approximately two-thirds of all benefits, with the remaining third derived from contributions. About one-third of

plan assets are managed in-house, which saves approximately \$52 million in external management fees annually.

PENSION REFORM

Virginia has been a leader in pension reform since 2014, which also included the introduction of the Hybrid Retirement Plan. The hybrid plan introduced risk sharing among employers and members, reducing future costs for state and local employers while providing members with flexibility on saving for their retirement. In addition, your steadfast commitment to fund contribution rates for the statewide retirement plans and other post-employment benefit plans (OPEBs) has had a positive impact on the fund.

DEFINED CONTRIBUTION PLANS UPDATE

The Defined Contribution Plans (DCP) team continued its work with ICMA-RC, the plan record keeper for the eight defined contribution plans administered by VRS, to educate members and employers on the importance of voluntary contributions to the Hybrid Retirement Plan, as well as saving for retirement in VRS supplemental plans. Three engagement tools for hybrid members produced favorable results during the year:

- Hybrid plan members who are not making the full 4% voluntary contribution to their Hybrid 457 plan account are presented with a special screen when they log into their defined contribution account that offers a choice to be proactive and save more for retirement. As of fiscal year-end, 96% of participants who viewed the active choice screen increased their voluntary contributions.
- More than 1,300 members used SmartStep to set automatic annual increases in their voluntary contributions, with an average election of 1.14%.
- The voluntary contributions feature known as “Go Hybrid!” allowed newly hired hybrid plan members to preset their voluntary contributions upon employment, which is especially helpful during new-hire orientations.

As of fiscal year-end, 48% of active hybrid plan members are making voluntary contributions. Among the population who are making voluntary contributions, 27% proactively elected to do so and 52% are making a contribution greater than the 0.5% minimum. Of the members who are making a voluntary contribution greater than the minimum, 82% are contributing the maximum allowable amount.

With an eye toward helping members prepare for the future, we will keep our focus on member engagement, creating communications and tools to empower them to take action early in their careers. Through programs like myVRS Financial Wellness, we’re taking a more holistic approach to retirement education, meeting members where they are in life and providing practical ideas for saving.

The DCP team worked closely with the Investments team this year to make substantive improvements to the Optional Retirement Plan for Higher Education (ORPHE), realigning the provider choices and updating the investment lineup. ORPHE participants will have a choice of two providers: TIAA and DCP (record-kept by ICMA-RC). To prepare for the transition in providers, VRS launched an ORPHE 2020 campaign, which included development of an ORPHE 2020 web page, employer and faculty outreach, a recorded webinar for higher education faculty and the launch of a multifaceted communications campaign to support fall open enrollment and the transition in providers.

ADVANCEMENTS IN TECHNOLOGY AND SECURITY

VRS has continued its Modernization journey, and we're well on our way to revolutionizing the retirement process for our members. We successfully transitioned retirement processing and disbursements to a cloud-based environment and decommissioned our legacy mainframe, transferring more than 400 million records. We successfully disbursed more than 200,000 payments to retirees and beneficiaries under the new system in May. The VRS team worked diligently to meet our service objectives.

Our work continues as we develop and deliver new features to reach our ultimate goal of providing exceptional service through multiple channels for our members and retirees. One of the ways we're reaching this goal is leveraging technology to improve the member and retiree customer experience.

In addition, information security has remained a top priority. This spring, VRS implemented a cloud-based, disaster-response solution to protect our most critical business processes in the event of a multi-site, multi-state disaster. Our security team continues to evaluate and enhance our efforts on cybersecurity, including authentication and access management.

TEAMWORK AND DEDICATION

VRS remains focused on diversity and inclusion activities for all staff, providing valuable workplace training and ensuring employees have the resources they need to be healthy, productive and engaged at work. VRS held several cultural appreciation events and offered professional development, wellness and safety programs.

Teamwork at VRS extends beyond supporting agency projects and initiatives. Staff frequently use their teamwork skills to make a difference outside of the work environment by volunteering in the community and providing support to charitable organizations.

BENCHMARKING AND AWARDS

VRS focuses not only on quality service but also delivering services efficiently. CEM Benchmarking reports that, compared to our peers, VRS delivers a high level of service at a relatively low cost. Our cost per member was \$78 compared

to the peer group median of \$97 in fiscal year 2018, the most recent year for which data is available.

Investing in our workforce and developing partner relationships results in a tangible return. As evidence of VRS' commitment to excellence, VRS and its staff were recognized with the following national and local awards during the year:

- Eddy Award (first place in the public pension plans category) for the myVRS Financial Wellness program, presented by *Pensions & Investments* magazine to recognize communication campaigns nationally that motivate and educate plan participants.
- Finalist, 2019 Plan Sponsor of the Year in the public defined contribution category, presented by *PLANSPONSOR* magazine to recognize retirement plan sponsors that show a commitment to their participants' financial health and retirement success.
- Communicator Award of Distinction for initiatives to promote voluntary contributions to the Hybrid Retirement Plan, presented by the Academy of Interactive & Visual Arts (AIVA), which spotlights creative excellence in marketing and communication.
- Two Leadership Recognition Awards presented by the National Association of Government Defined Contribution Administrators (NAGDCA):
 - Technology & Social Media, for initiatives to promote Hybrid Retirement Plan voluntary contributions, including GoHybrid, Enhanced Active Choice Splash Screen, SmartStep and the Paycheck Calculator.
 - Plan Design and Administration, for the Optional Retirement Plan (ORP) online plan election feature added to myVRS.
- Two Virginia Public Relations Awards, presented by the Public Relations Society of America-Richmond Chapter:
 - Commonwealth Award of Excellence for the myVRS Financial Wellness program, for the communications strategy to promote the program and drive engagement.
 - Capital Award of Merit for the VRS employer website redesign, for the overall design features and demonstrated usage analytics.
- For the 37th 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, 2018. VRS also received a Award for Outstanding

Achievement in Financial Reporting from GFOA for its third 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 2018 CAFR.

- VRS received a 2018 Public Pension Standards Award for Funding and Administration from the Public Pension Coordinating Council (PPCC). This is the 15th award VRS has received from PPCC.

SERVING THOSE WHO SERVE OTHERS

VRS focuses on serving those who serve others in their communities across the commonwealth. These public servants are the dedicated teachers in your hometown and the first responders who protect our communities. They are the state and local workers who provide a variety of services to Virginians, like ensuring we have clean water to drink, maintaining roads, providing health services and licensing local businesses, to name a few.

On behalf of the Board of Trustees and the VRS staff, please accept our appreciation for your service, dedication and leadership. Together, our efforts will ensure that all those served by the Virginia Retirement System can rely on 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.
Department of Social Services (Retired)
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: 2/28/2023
Committee Assignments: Defined Contribution Plans Advisory (Chairman), Investment Policy



William H. Leighty
Virginia Commonwealth University
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: 2/28/2024
Committee Assignments: Administration & Personnel, Investment Policy



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

* Terms continue until successor appointed.

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: 2/16/2021

As Chairman: 5/31/2021

Hance West, *Vice Chairman*

Chief Investment Officer and Managing Director,
Investure

Term Expires: 12/31/2019

Deborah Allen Hewitt, Ph.D.

Retired Clinical Professor, The College of William and Mary

Term Expires: 10/16/2020

Michael Beasley

Retired Chairman Emeritus, Strategic Investment Solutions Inc.

Term Expires: 6/20/2021

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: 2/19/2021

W. Bryan Lewis

Vice President and Chief Investment Officer,
United States Steel Corporation

Term Expires: 3/31/2020

Rod Smyth

Chief Investment Strategist, RiverFront Investment Group

Term Expires: 6/20/2021

DEFINED CONTRIBUTION PLANS ADVISORY COMMITTEE

W. Brett Hayes, *Chairman*

Member, VRS Board of Trustees

Wells Fargo Advisors Financial Network

Term Expires: 2/28/2023

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: 6/20/2021

Rick Larson

Assistant Vice President for Human Resources, Training and Performance,
James Madison University

Term Expires: 6/20/2021

Margaret M. Maslak

Benefits Analyst, MeadWestvaco

Term Expires: 6/20/2020

David A. Winter

Owner, Winter HR Consulting LLC

Term Expires: 6/20/2021

Executive Administrative Team

Patricia S. Bishop

Director

L. Farley Beaton Jr.

Chief Technology and Security Officer

Jeanne L. Chenault

Director of Public Relations

Michael P. Cooper

Chief Operating Officer and Acting Director of Human Resources

Barry C. Faison

Chief Financial Officer

Robert L. Irving

Director of Customer Services

LaShaunda B. King

Executive Assistant

Jennifer P. Schreck

Internal Audit Director

Cynthia D. Wilkinson

Director of Policy, Planning and Compliance

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, Public Assets

Kenneth C. Howell, CFA

Managing Director, Private Assets

Ross M. Kasarda, CFA

Director, Risk Management

Kristina P. Koutrakos, CAIA

Director, Portfolio Strategy

Matthew L. Lacy, CFA

Director, Internal Equity Management

Chung S. Ma, CFA

Managing Director, Portfolio Intelligence Team

Curtis M. Mattson, CPA

Chief Administrative Officer

Stephen R. McClelland, CFA, CAIA

Director, Credit Strategies

Walker J. Noland, CFA

Director, Real Assets

Steven P. Peterson, Ph.D.

Director, Research

Daniel B. Whitlock, CFA, CAIA

Director, Global Equity

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: 888-827-3847 • TDD: 804-289-5919

December 16, 2019

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, 2019. 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 2019 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 854 of the 2019 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.

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 of the *Code of Virginia*.

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.

VRS Milestones (1908-Present)

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.

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 passed 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, became the retirement plan for new members (with the exception of hazardous duty members) hired on or after January 1, 2014.

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

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

2017 Self-service purchase of prior service, enhanced security and features for retirees added to myVRS, along with tools to help college and university faculty members and political appointees compare retirement plan options and make their plan election online. Financial wellness program for members added to myVRS.

2019 VRS took a major step forward in member-record management, moving from a legacy mainframe to a web-based environment and adding new retirement application processing, retirement payments and disbursement, retiree health insurance maintenance and post-retirement maintenance.

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 2019 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 promulgated by the Governmental Accounting Standards Board (GASB).

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, 2019, 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 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.

For other post-employment benefits (OPEBs), 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 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, 2019, 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, 2019. The total pension

liability was determined based on the actuarial valuation as of June 30, 2018, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2019.

Based on these calculations, the Plan Fiduciary Net Position as a percentage of the Total Pension Liability was 75.13% for the VRS State Plan, 73.51% for the VRS Teacher Plan and 87.82% 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 73.52%, 68.31% and 82.16%, respectively. The calculations for the June 30, 2019, measurement date reflect a reduction in the assumption for the actuarial rate of return. At their meeting in October 2019, the VRS Board of Trustees approved a reduction in the rate from 7.00% to 6.75%.

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, 2018, measurement date values of 77.39%, 74.81% and 90.24%, respectively. For SPORS, VaLORS and JRS, there was also an increase from their values of 78.16%, 69.56% and 82.78% at June 30, 2018. The decline in the Plan Fiduciary Net Position as a percentage of the Total Pension Liability is primarily attributable to the reduction in the assumption for the actuarial rate of return. The funding would likely have improved without the change in assumption. Further information on this valuation is included in the Financial Section and the Actuarial Section. Contributions for fiscal year 2019 were based on the June 30, 2017, 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 2019. 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, 2019. The total OPEB liability was determined based on the actuarial valuation as of June 30, 2018, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2019.

Based on these calculations, the plan fiduciary net position as a percentage of the total OPEB liability was 52.00% for the Group Life Insurance Fund, 10.56% for the state employee Health Insurance Credit, 8.97% for the teacher employee Health Insurance Credit, 57.33% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 14.28% for the state-

funded Health Insurance Credit for constitutional officers, 15.43% for the state-funded Health Insurance Credit for social services employees, and 14.75% 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 167.18% for the Disability Insurance Program and 0.79% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions were 74.12% and 49.19%, respectively.

37 Years of Excellence in Financial Reporting. The VRS *Comprehensive Annual Financial Report* for fiscal year 2018 marked the 37th year of recognition from the Government Finance Officers Association of the United States and Canada (GFOA) for excellence in financial reporting.

This compares to the opening plan fiduciary net position as a percentage of the total OPEB liability at June 30, 2018, of 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, 57.41% 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 0.6% for the Line of Duty Act Program. The Virginia Local Disability Program plans for teachers and political subdivisions were 46.18% and 51.39%, respectively. Further information on this valuation is included in the Financial Section and the Actuarial Section.

Contributions for fiscal year 2019 were based on the June 30, 2017, actuarial valuation. The rates certified by the VRS Board of Trustees for the OPEB plans were fully funded by the Governor and General Assembly, except for the Line of Duty Act Program for which rates are not applicable. Contribution rates for each of these OPEB plans are discussed in further detail in the Financial Section.

Investments

At June 30, 2019, the total value of the VRS managed investment portfolio was \$84.4 billion, an increase from the investment balance of \$80.4 billion at June 30, 2018. The increase was due to increased contribution and investment activity. The Fixed Income, Real Assets, Private Equity and Private Investment Partnerships portfolio returns all exceeded their benchmarks this year.

The System's net position restricted for benefits at June 30, 2019, totaled \$82.8 billion, representing an increase from the net position of \$79.2 billion as of June 30, 2018.

Information regarding the investment professionals who provide services for the VRS Investment Pool for the pension and OPEB plans can be found on pages 156 and 157 in the Investment Section. The schedule of commissions and investment manager expenses is located on page 158 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 2019 session, the Virginia General Assembly enacted the following bills that affect the Virginia Retirement System and retirees covered under VRS.

2019 BILLS

SENATE BILL 1227: K-12 CRITICAL SHORTAGE. This bill extends to July 2025 the sunset date for the K-12 critical shortage program. Under the provisions of the program, a retiree may be eligible to teach or serve as a principal or assistant principal in a critical shortage position. If the retiree qualifies, he or she will continue to receive VRS retirement benefits.

BUDGET BILL: EMPLOYER CONTRIBUTION RATES.

- Funds 100% of the VRS board-certified retirement contribution rates for teachers, state employees, the State Police Officers' Retirement System (SPORS), the Virginia Law Officers' Retirement System (VaLORS) and the Judicial Retirement System (JRS).
- Funds 100% of the VRS board-certified other post-employment benefits (OPEB) contribution rates for the health insurance credit for state employees and teachers, group life insurance for state employees, the employer share of the teachers' group life insurance program and the Virginia Sickness and Disability Program (VSDP).

APPROPRIATION ACT, ITEM 474, 0.1.a and 0.1.b: MODIFICATION OF EXISTING ORPHE SURCHARGE. Requires higher education institutions that have their own ORPHE plan to pay a surcharge for non-teaching positions converted to ORPHE-eligible positions in order to help ensure that all employers contribute more equitably to the legacy unfunded liability of the state employee plan.

Membership

MEMBER AND RETIREE HIGHLIGHTS. The total VRS membership increased from 706,045 members, retirees and beneficiaries in fiscal year 2018 to 723,011 in fiscal year 2019, representing an increase of 2.40%.

The following are highlights from the fiscal year:

- The number of active VRS members increased 0.95%, from 343,005 to 346,273.
- The number of retirees and beneficiaries increased 3.76% from 206,776 to 214,545.
- VRS paid \$4,990.1 million in retirement benefits during fiscal year 2019, compared to \$4,752.9 million in retirement benefits in fiscal year 2018.
- The number of inactive and deferred members increased 3.79% from 156,264 to 162,193.
- A total of 80,187 members held accounts through the Commonwealth of Virginia Deferred Compensation Plan at the end of the fiscal year. Of these participants, 71,088 received a cash match through the Virginia Cash Match Plan.

(Continued)

AIMING FOR EXCELLENCE. VRS personnel continued to meet or exceed target goals for operational measures, as the following highlights show:

OPERATIONAL MEASURES	TARGET	FY 2019 RESULT
Timeliness of Monthly Account Reconciliations	90.00% or more of monthly financial control reconciliations completed by the last business day of the following month.	100.00% of monthly financial control reconciliations completed by the last business day of the following month.
Customer Counseling Center Abandoned Call Rate	The average abandoned call rate is no greater than 7.00%.	The average abandoned call rate is 5.99%.
Timeliness of Response to Messages Received by the Customer Counseling Center	The average response time is 2.00 business days.	The average response time is 0.40 business days.
Timeliness of Monthly Retirement Disbursements	100.00% of monthly retirement disbursements processed no later than the first business day of the month.	100.00% of monthly retirement disbursements processed no later than the first business day of the month.
Timeliness of Service Retirements Processed	95.00% of service retirements processed so that retiring members receive retirement benefits on the first retirement payment date for which they are eligible.	97.64% of service retirements processed so that retiring members receive retirement benefits on the first retirement payment date for which they are eligible.
Accuracy of Disability Retirements Processed	99.00% of disability retirements processed for which the corresponding benefit payment correctly reflects the member's service record.	100.00% of disability retirements processed for which the corresponding benefit payment correctly reflects the member's service record.
Timeliness of Employer Contribution Confirmations	97.00% of employer contribution confirmation snapshots are completed by the end of the month in which they are due.	99.80% of employer contribution confirmation snapshots are completed by the end of the month in which they are due.
Workflow Imaging	99.50% of documents VRS receives are imaged within one business day of receipt.	100.00% of documents VRS receives are imaged within one business day of receipt.
IT System Availability	Critical business systems are available 99.50% of the time during periods of planned availability.	Critical business systems are available 99.94% of the time during periods of planned availability.

Education & Counseling

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

- The VRS Customer Contact Center answered 183,118 calls and provided 6,641 email responses in fiscal year 2019.
- The Member Counseling Team conducted 327 retirement education and group counseling sessions, special presentations, videoconferences, webinars and benefit fairs, reaching 31,986 members around the state. The team also held 4,954 in-person counseling sessions for members and retirees.
- The Hybrid Counseling Team held 80 sessions and webinars, attended by 787 Hybrid Retirement Plan members. Hybrid Retirement Plan member counselors participating in 22 benefit fairs with 1,848 attendees. In addition, ICMA-RC held 327 Hybrid Overview Meetings with 4,386 attendees, typically at the request of an individual employer, during fiscal year 2019.
- Both teams participated in the 2019 ICMA-RC Realize Retirement tour at eight locations, attended by 357 Virginia Defined Contribution Plan participants throughout the state.
- The Education and Training Team provided 29 instructor-led training sessions for employers with 500 attendees; 22 e-courses for employers, with 468 completions; and 13 employer webinars with 956 attendees during fiscal year 2019.
- In fiscal year 2019, 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 58 employer site visits and 59 roundtables, with 999 participants (representing 566 employers) in attendance.
- In addition, the Employer Representatives assisted six political subdivisions joining VRS; seven employers electing the Group Life Insurance Program; two employers electing to provide unreduced retirement age eligibility at the age of 50 with 30 years of service credit; seven employers electing the enhanced benefit for hazardous duty employees; six employers electing the enhanced retirement multiplier for hazardous duty employees; five employers electing the health insurance credit; seven employers electing to offer the Commonwealth of Virginia 457 Deferred Compensation Plan; five 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 2019, the VRS website (varetire.org) received more than 3.2 million total page views. myVRS, the secure online member account portal, led again as one of the top destinations.
- The average “open rate” for *Employer Update* was 25.0%, well above the government industry average.
- At the end of fiscal year 2019, *Member News* had 234,342 subscribers, with an “open rate” of 26.7%.

Innovations

VRS has been engaged in a multi-year technology transformation to provide a streamlined and holistic online experience for VRS members and retirees.

Every year has marked a new milestone built upon foundations completed in previous phases, starting with increased online functionality for employers and moving on to expanded and enhanced services for members and retirees. Each step has been guided by a business model that organizes VRS processes around member life events and enhances online access to services and information.

In spring 2019, VRS made a significant step forward in member-record management, moving from a legacy mainframe to a web-based environment. The agency planned this complex transition carefully, building in a long period of testing and mock production. As a result, the first disbursement to retirees and beneficiaries under the new system was a success, with an overall smooth transition.

The data conversion process transferring more than 400 million records and successfully disbursed \$417 million in payments to more than 200,000 retirees and beneficiaries for the month of May. In addition to functions already in place, such as refunds and purchase of prior service, new functionality for the transition included new retirement application processing, retirement payments and disbursement, retiree health insurance maintenance and post-retirement maintenance, which includes benefit adjustments, tax withholding and direct deposit changes as well as cost-of-living adjustment (COLA) increases.

In addition to internal system updates, VRS took another step toward our goal of online retirement for members. VRS participating employers now certify retirement applications online, eliminating another paper process. The next step will be to allow members to retire online using their secure myVRS accounts. We will then add features that will include the ability to update beneficiaries online and an on-demand statement of benefits.

Information security remains a top priority, and VRS takes a proactive approach to security with a variety of tools and processes. During fiscal year 2019, VRS added a cloud-based solution to protect critical business processes; additional fraud identification and response capabilities; a cloud-based system information and event management solution; and enhanced security around the registration process for the myVRS application.

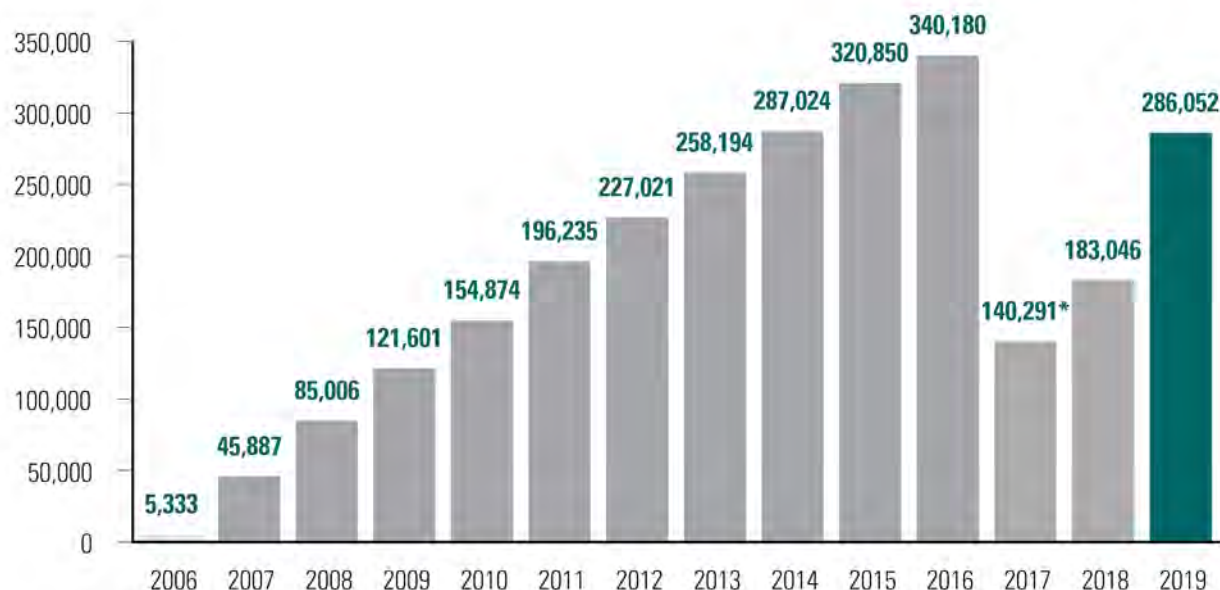
The secure online myVRS system continues to attract users. During the fiscal year, myVRS continued to serve as a valuable resource for members, retirees and employers:

- The cumulative number of registered users as of June 30, 2019, was 286,052.
- In fiscal year 2019, there were 56,046 member and retiree registrations.
- Members are taking greater advantage of the myVRS Retirement Planner and Benefit Estimator to plan their futures and adjust their savings goals, creating 4,641 retirement plans and 395,000 benefit estimates in fiscal year 2019.

We were honored to receive national and state awards for our communications campaign promoting the myVRS Financial Wellness program, now in its second year. As part of VRS' holistic approach to retirement planning, the program aims to help all members make informed and educated decisions on everyday financial matters while saving for the future. Since the launch, there have been 9,703 cumulative registrations, with 32,609 page views through the public website during fiscal year 2019.

We continue to work with our partner iGrad to provide a personalized customer experience, consistent with industry best practices for engaging users. VRS members now have access to a dozen financial wellness mini-courses, and iGrad tracks their progress through pre-course and post-course assessments. The average knowledge gain scores for mini-courses include 118% for “Understanding Your Credit Report and Scores”; 86% for “Buying a Home and Understanding Mortgages”; and 79% for “Banking Beyond Credit and Savings.”

myVRS MEMBER USERS



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

(Continued)

Acknowledgments

In all of its work, VRS focuses on efficient service and delivery of benefits and responsible stewardship of the funds in our care for our members, retirees and beneficiaries. These duties remain integral to our mission and unchanging priorities in a rapidly changing world.

Pension reform initiatives implemented over recent years have advanced the funded status of the plan, positioning VRS to serve its members for years to come. The Hybrid Retirement Plan introduced defined contribution accounts to accompany the defined benefit component provided by VRS. The hybrid plan also encourages members to be actively engaged in retirement planning, with a selection of investment paths and portfolios and a number of options for increasing voluntary contributions to retirement savings. VRS has also become a nationally recognized leader in providing financial wellness education, so that members can be informed as well as involved in planning for their futures.

At the same time, VRS appreciates the commitment of the Governor and General Assembly to increase contributions to the plans at a more rapid pace than anticipated. Progress has been achieved with the efforts and persistence 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.

In closing, we wish to thank Governor Ralph S. Northam and the members of the Virginia General Assembly for their continued commitment to the financial security of the members, retirees and beneficiaries of the Virginia Retirement System.

Respectfully submitted,



Patricia S. Bishop
Director



Barry C. Faison
Chief Financial Officer

Financial Section 2

TRANSFORMING FOR TOMORROW



Financial Section 2

Independent Auditor's Report

Management's Discussion and Analysis

Basic Financial Statements:

VRS Statement of Fiduciary Net Position: Defined Benefit Pension Trust Funds
and Other Employee Benefit Trust Funds

VRS Statement of Changes in Fiduciary Net Position: Defined Benefit Pension
Trust Funds and Other Employee Benefit Trust Funds

VRS Combining Statement of Fiduciary Net Position

VRS Combining Statement of Changes in Fiduciary Net Position

JRS Combining Statement of Fiduciary Net Position

JRS Combining Statement of Changes in Fiduciary Net Position

Retiree Health Insurance Credit Statement of Fiduciary Net Position

Retiree Health Insurance Credit Combining Statement of Changes in Fiduciary Net Position

VLDP Statement of Fiduciary Net Position

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Required Supplementary Schedule of Employer Contributions: Pension Plans

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Schedule of Administrative Expenses

Schedule of Professional and Consulting Services

Schedule of Investment Expenses



Martha S. Mavredes, CPA
Auditor of Public Accounts

Commonwealth of Virginia

Auditor of Public Accounts

P.O. Box 1295
Richmond, Virginia 23218

December 13, 2019

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, 2019, 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, 2019, and the changes in fiduciary net position for the year 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, 2019, 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 2018 financial statements, and we expressed an unmodified audit opinion on the respective financial statements in our report dated December 14, 2018. In our opinion, the summarized comparative information presented herein as of and for the year ended June 30, 2018, 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 33 through 43 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 116 through 140 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 Financial and Statistical Highlights for all pension trust funds and 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 Investment Expenses, Administrative Expenses, and Professional and Consulting Services are fairly stated, in all material respects, in relation to the basic financial statements taken as a whole.

The Financial and Statistical Highlights for all pension trust funds and 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 13, 2019, 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.

Martha S. Mavredes

AUDITOR OF PUBLIC ACCOUNTS

The Virginia Retirement System (the System) administers pension and other employee benefit plans for approximately 723,011 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, 2019. 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 \$82.8 billion at June 30, 2019, representing an increase of \$3.7 billion, or 4.6%, from the net position as of June 30, 2018. 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 time-weighted rate of return on investments during the fiscal year ended June 30, 2019, was 6.7% compared to a return of 7.5% for the fiscal year ending June 30, 2018. 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, 2018, data rolled forward to June 30, 2019, the plan fiduciary net position as a percentage of the total pension liability was 75.13% for the VRS state plan, 73.51% for the VRS teacher plan, 87.82% for the aggregate total of the VRS political subdivision plans, 73.52% for SPORS, 68.31% for VaLORS and 82.16% for JRS. This compares to the June 30, 2017, data rolled forward to June 30, 2018,

when 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.

- 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, 2018, data rolled forward to June 30, 2019, the plan fiduciary net position as a percentage of the total OPEB liability was 52.00% for the Group Life Insurance Fund, 10.56% for the state employee Health Insurance Credit, 8.97% for the teacher employee Health Insurance Credit, 57.33% for the aggregate total of the VRS political subdivision plans for Health Insurance Credit, 14.28% for the state-funded Health Insurance Credit for constitutional officers, 15.43% for the state-funded Health Insurance Credit for social services employees, and 14.75% 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 167.18% for the Disability Insurance Program and 0.79% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions were 74.12% and 49.19%, respectively.
- This compares to the June 30, 2017, data rolled forward to June 30, 2018, when 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, 57.41% 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 0.6% for the Line of Duty Act plan. The Virginia Local Disability Program plans for teachers and political subdivisions were 46.18% and 51.39%, respectively.

Overview of the Financial Statements and Accompanying Information

The pension components of the fiscal year 2019 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 2019 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, 2019, with comparative information from the previous fiscal year. In addition, a set of pension combining statements is now added to show the amounts attributable to the state, teacher and local plans included in the VRS totals. There is also a set of OPEB combining statements for the Health Insurance Credit and Virginia Local Disability Program to show the specific amounts attributed to the plans included in the 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)

	2019	Increase (Decrease)	2018	Increase (Decrease)	2017
Assets:					
Cash, Receivables and Capital Assets	\$ 1,882.4	\$ (143.9)	\$ 2,026.2	\$ 72.6	\$ 1,953.7
Investments	84,957.5	4,194.3	80,763.2	3,965.5	76,797.7
Security Lending Collateral	4,667.8	167.5	4,500.3	(296.6)	4,796.9
Total Assets	91,507.7	4,217.9	87,289.7	3,741.5	83,548.3
Liabilities:					
Accounts Payable	815.7	505.7	310.0	(42.4)	352.4
Investment Purchases Payable	3,179.6	(114.4)	3,294.0	(19.4)	3,313.4
Obligations Under Securities Lending	4,667.8	167.5	4,500.3	(296.6)	4,796.9
Total Liabilities	8,663.1	558.8	8,104.3	(358.4)	8,462.7
Total Net Position – Restricted for Benefits	\$ 82,844.6	\$ 3,659.1	\$ 79,185.4	\$ 4,099.9	\$ 75,085.6

FIGURE 2.2: SUMMARY OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2019	Increase (Decrease)	2018	Increase (Decrease)	2017
Additions:					
Member Contributions	\$ 1,136.8	\$ 48.3	\$ 1,088.5	\$ 25.8	\$ 1,062.7
Employer Contributions	2,862.4	12.7	2,849.7	225.2	2,624.5
Net Investment Income	5,242.5	(267.9)	5,510.4	(2,730.9)	8,241.3
Miscellaneous Revenue & Transfers	4.1	0.5	3.6	(0.1)	3.7
Total Additions	9,245.8	(206.4)	9,452.2	(2,480.0)	11,932.2
Deductions:					
Retirement Benefits	4,990.1	237.2	4,752.9	234	4,518.9
Refunds of Member Contributions	117.9	(5.1)	123.0	3.3	119.7
Insurance Premiums and Claims	199.9	(0.4)	200.3	16.2	184.1
Retiree Health Insurance Credit Reimbursements	168.7	4.8	163.9	4.9	159
Disability Insurance Benefits	32.9	(6.9)	39.8	0.9	38.9
Line of Duty Act Reimbursements	12.9	0.5	12.4	2.1	10.3
Administrative and Other Expenses	64.2	4.1	60.1	(3.6)	63.7
Total Deductions	5,586.6	234.2	5,352.4	257.8	5,094.6
Net Increase (Decrease) in Net Position	3,659.2	(440.6)	4,099.8	(2,737.8)	6,837.6
Net Position – Beginning of Year	79,185.4	4,099.8	75,085.6	6,837.6	68,248
Net Position – End of Year	\$ 82,844.6	\$ 3,659.2	\$ 79,185.4	\$ 4,099.8	\$ 75,085.6

SYSTEM NET POSITION

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 346,273 active members were employed with 833 VRS-participating employers as of June 30, 2019. The number of retirees and other annuitants totaled approximately 214,545 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

	2019		2018		2017	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
State Employees (VRS)	77,010	22.2%	77,337	22.6%	77,617	22.7%
Teachers (VRS)	147,622	42.6%	146,795	42.8%	146,090	42.9%
Political Subdivision Employees (VRS)	110,538	31.9%	107,827	31.4%	106,524	31.2%
State Police Officers (SPORS)	1,912	0.6%	1,887	0.6%	1,877	0.6%
Virginia Law Officers (VaLORS)	8,734	2.5%	8,742	2.5%	8,673	2.5%
Judges (JRS)	457	0.1%	417	0.1%	419	0.1%
Total Members	346,273	100.0%	343,005	100.0%	341,200	100.0%

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

	2019		2018		2017	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
State Employees (VRS)	58,797	27.5%	56,980	27.6%	55,427	27.7%
Teachers (VRS)	92,723	43.2%	89,667	43.4%	86,652	43.4%
Political Subdivision Employees (VRS)	56,094	26.1%	53,579	25.9%	51,147	25.7%
State Police Officers (SPORS)	1,410	0.7%	1,336	0.6%	1,300	0.7%
Virginia Law Officers (VaLORS)	4,991	2.3%	4,702	2.3%	4,355	2.2%
Judges (JRS)	530	0.2%	512	0.2%	507	0.3%
Total Retirees and Beneficiaries	214,545	100.0%	206,776	100.0%	199,388	100.0%

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

FIGURE 2.5: DISTRIBUTION OF EMPLOYERS

AT JUNE 30

	2019	2018	2017
Cities and Towns	159	162	161
Counties	93	93	93
School Boards*	144	145	145
Special Authorities	207	205	206
State Agencies	230	230	227
Total Employers	833	835	832

* Of the 144 school boards, 132 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, 2019, amounted to \$8,596.3 million. This was a decrease of \$223.7 million when compared with the activity for fiscal year 2018. It was also lower than the contributions and investments earnings of \$11,259.0 million recorded in fiscal year 2017.

For fiscal year 2019, member contributions increased by \$43.5 million. The member contribution level increase reflects growth in the covered payroll.

For fiscal year 2019, employer contributions increased by \$1.9 million, due primarily to growth in the covered payroll. The total of all contributions

represented an increase of \$45.4 million from fiscal year 2018. Employer contributions for pensions are discussed further in Notes 2 and 12.

During fiscal year 2018, the System experienced an increase in total member contributions of \$21.4 million and an increase in employer contributions of \$202.1 million. This increase is 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.

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)

	2019	Increase (Decrease)	2018	Increase (Decrease)	2017
Member Contributions	\$ 981.6	\$ 43.5	\$ 938.1	\$ 21.4	\$ 916.7
Employer Contributions	2,529.7	1.9	2,527.8	202.1	2,325.7
Net Investment Income	5,082.7	(270.3)	5,353	(2,661.8)	8,014.8
Miscellaneous Revenue and Transfers	2.3	1.2	1.1	(0.7)	1.8
Total Contributions, Investment Earnings and Miscellaneous Revenues	\$ 8,596.3	\$ (223.7)	\$ 8,820.0	\$ (2,439.0)	\$ 11,259.0

As shown in Figure 2.6, net investment income for fiscal year 2019 of \$5,082.7 million represented a decrease of \$270.3 million from fiscal year 2018. This compares with the net investment income decrease of \$2,661.8 million in fiscal year 2018. Total pension trust fund investments were \$82,331.8 million at fair value at June 30, 2019. This was an increase of \$3,951.3 million from the fair value of \$78,380.5 million at June 30, 2018. The total pension trust fund investments also increased in fiscal year 2018 by \$3,762.8 million from their fair value of \$74,617.7 million at June 30, 2017. The total return on pension trust fund investments for the year ended June 30, 2019, was 6.7%. This represents an annualized return of 8.8% over the past three years and 6.5% 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 2019 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 2019 totaled \$5,167.7 million, an increase of \$236.3 million, or 5%, over the 2018 period.

Benefit payments were \$4,990.1 million in fiscal year 2019. This is an increase of \$237.2 million compared to an increase of \$234.0 million in fiscal year 2018. The increase in fiscal year 2019 was due to continued growth in the number of retirees and beneficiaries receiving benefits. The fiscal year 2019 benefit payments also reflect a cost-of-living adjustment (COLA) of 2.13% for Plan 1 retirees and 2.07 % for Plan 2 and hybrid plan retirees effective July 1, 2018.

Refunds of contributions to members who terminated employment during fiscal year 2019 amounted to \$117.9 million (10,986 refunds), compared with \$123.0 million refunded (11,781 refunds) during fiscal year 2018 and \$119.7 million refunded (12,460 refunds) during fiscal year 2017.

The change during fiscal year 2019 reflects a slight decrease in the volume of refunds but an increase in the average refund amount compared to fiscal year 2018.

Administrative and other expenses for fiscal year 2019 were \$59.7 million, compared with \$55.5 million for fiscal year 2018 and \$59.4 million for fiscal year 2017.

Administrative and other expenses increased by \$4.2 million for fiscal year 2019. This compares to a decrease in fiscal year 2018 of \$3.9 million. The increase for fiscal year 2019 reflects an increase in administrative expenses combined with a slight increase in the other expenses categories. The increase in administrative expenses primarily related to increases in data processing costs, additional depreciation of the capitalized software created as part of Modernization and pension reform, and increased office space expense due to the lease of additional building space. Other expenses increased 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

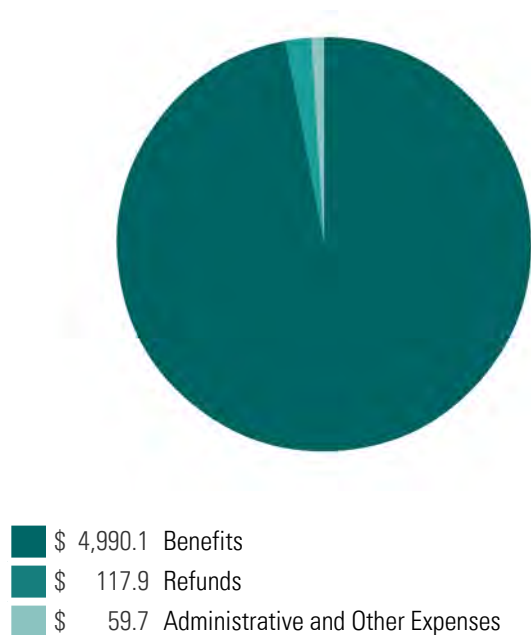
(EXPRESSED IN MILLIONS)

	2019	Increase (Decrease)	2018	Increase (Decrease)	2017
Benefits	\$ 4,990.1	\$ 237.2	\$ 4,752.9	\$ 234.0	\$ 4,518.9
Refunds	117.9	(5.1)	123	3.3	119.7
Administrative and Other Expenses	59.7	4.2	55.5	(3.9)	59.4
Total Primary Expenses	\$ 5,167.7	\$ 236.3	\$ 4,931.4	\$ 233.4	\$ 4,698

PENSION PLAN ACTIVITY

FOR THE YEAR ENDED JUNE 30, 2019

(EXPRESSED IN MILLIONS)



This follows an increase of \$3,888.7 million in the retirement reserves in fiscal year 2018. The increase for fiscal year 2019 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, 2018, data rolled forward to June 30, 2019, the plan fiduciary net position as a percentage of the total pension liability was 75.13% for the VRS state plan, 73.51% for the VRS teacher plan, 87.82% for the aggregate total of the VRS political subdivision plans, 73.52% for SPORS, 68.31% for VaLORS and 82.16% 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.

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 2019, leading to a net increase of \$3,428.6 million in the retirement reserves held by the plans.

FIGURE 2.8: SUMMARY OF PENSION PLAN RESERVE BALANCES

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN MILLIONS)

	2019	Increase (Decrease)	2018	Increase (Decrease)	2017
Member Reserves	\$ 14,533.6	\$ 593.2	\$ 13,940.4	\$ 488.2	\$ 13,452.2
Employer Reserves	65,784.0	2,835.4	62,948.6	3,400.5	59,548.1
Total	\$ 80,317.6	\$ 3,428.6	\$ 76,889	\$ 3,888.7	\$ 73,000.3

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 2019, the amount of interest credited to member accounts was \$515.8 million, and the amount of member balances transferred to the Employer Reserve for retirements was \$883.7 million. For fiscal year 2018, the interest and retirement transfers were \$503.4 million and \$910.3 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 2019, the System remitted \$199.9 million to the insurer for claims and administrative costs. This is a decrease from the \$200.3 million remitted for fiscal year 2018. Approximately 369,831 active members were covered under the Group Life Insurance Program at June 30, 2019.

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 \$1,763.0 million at June 30, 2019.

Investment income, including net securities lending income, was \$113.4 million during the fiscal year. For fiscal year 2018, this reserve had investment income of \$110.9 million and ended the year with a reserve balance of \$1,594.8 million, an increase from the balance of \$1,437.6 million at June 30, 2017.

For fiscal year 2019, 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 188,370 retirees were covered under the Group Life Insurance Program at June 30, 2019.

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 70,903 active members and 3,234 retirees were enrolled in the Optional Group Life Insurance Program at June 30, 2019. 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 2019, the System collected \$187.7 million in retiree health insurance credit contributions from participating employers and provided reimbursements to retirees of \$168.7 million. During fiscal year 2018, the System

collected \$184.7 million in retiree health insurance credit contributions from participating employers and provided reimbursements of \$163.9 million.

There was a decrease in the contribution rates for the teacher employer group in fiscal year 2019 from 1.23% to the full actuarially determined rate of 1.20%. 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 \$269.3 million at June 30, 2019. Investment income, including net securities lending income, was \$15.4 million for the fiscal year. The reserve balances at June 30, 2018, and June 30, 2017, were \$235.4 million and \$201.3 million, respectively. Approximately 127,802 retirees were receiving the Health Insurance Credit at June 30, 2019. 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 2019, the System collected \$25.3 million in VSDP contributions from participating employers and paid disability premiums and benefits of \$30.8 million. This is a decrease from the \$37.7 million in benefits paid in fiscal year 2018.

Administrative and other expenses increased from fiscal year 2018. 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 \$488.2 million at June 30, 2019.

Investment income, including net securities lending income, was \$30.5 million during the fiscal year.

The reserve balances at June 30, 2018, and June 30, 2017, were \$463.0 million and \$442.3 million, respectively. At June 30, 2019, approximately 79,269 active members were participating in the program and approximately 2,579 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 2019, the System collected \$13.4 million in contributions and paid out \$12.9 million in benefits provided by this program. This is an increase from the \$10.0 million in contributions received in fiscal year 2018 and an increase in benefit costs from the \$12.4 million for fiscal year 2018. This reflects the impact of the continuation of the stabilization of the program's participation and claims levels. The reserve balance at June 30, 2019, was \$2.8 million, an increase from the reserve

balance of \$1.9 million at June 30, 2018. 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 2019, the System collected \$4.2 million in contributions and paid out \$2.1 million in benefits provided by this program. During fiscal year 2018, the System collected \$2.6 million in contributions and paid out \$2.1 million in benefits provided by the program. At June 30, 2019, approximately 21,115 active members were participating in the program and approximately 35 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, 2018, data rolled forward to June 30, 2019, the plan fiduciary

net position as a percentage of the total OPEB liability was 52.00% for the Group Life Insurance Fund, 10.56% for the state employee Health Insurance Credit, 8.97% for the teacher employee Health Insurance Credit, 57.33% for the aggregate total of the political subdivision plans for Health Insurance Credit, 14.28% for the state-funded Health Insurance Credit for constitutional officers, 15.43% for the state-funded Health Insurance Credit for social services employees, and 14.75% 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 167.18% for the Disability Insurance Program and 0.79% for the Line of Duty Act Program. The Virginia Local Disability Program plans for teachers and political subdivisions were 74.12% and 49.19%, 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, 2019, was 6.7%, 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, 2019, WITH COMPARATIVE INFORMATION AS OF JUNE 30, 2018

	Pension Trust Funds				
	Virginia Retirement System	State Police Officers' Retirement System	Virginia Law Officers' Retirement System	Judicial Retirement System	Total Pension Trust Funds
Assets:					
Cash (Note 5)	\$ 110,149	\$ 1,632	\$ 2,821	\$ 1,052	\$ 115,654
Receivables:					
Contributions	268,080	1,568	4,195	1,153	274,996
Interest and Dividends	258,249	2,914	5,034	1,878	268,075
Receivables for Security Transactions	929,353	10,484	18,117	6,758	964,712
Other Investment Receivables	92,306	1,041	1,799	671	95,817
Other Receivables	22,327	—	—	—	22,327
Total Receivables	1,570,315	16,007	29,145	10,460	1,625,927
Investments: (Note 5)					
Bonds and Mortgage Securities	20,438,379	230,572	398,419	148,630	21,216,000
Stocks	23,076,188	260,330	449,840	167,812	23,954,170
Fixed-Income Commingled Funds	1,252,995	14,135	24,425	9,112	1,300,667
Index and Pooled Funds	10,332,158	116,560	201,412	75,136	10,725,266
Real Estate	9,219,279	104,006	179,718	67,043	9,570,046
Private Equity	14,078,918	158,829	274,450	102,384	14,614,581
Short-Term Investments	414,770	4,679	8,085	3,016	430,550
Hybrid Defined Contribution Investments	514,672	—	—	5,845	520,517
Total Investments	79,327,359	889,111	1,536,349	578,978	82,331,797
Collateral on Loaned Securities	4,356,925	49,152	84,932	31,684	4,522,693
Property, Plant, Furniture and Equipment (Note 6)	43,739	—	—	—	43,739
Total Assets	85,408,487	955,902	1,653,247	622,174	88,639,810
Liabilities:					
Retirement Benefits Payable	405,280	4,977	9,253	3,506	423,016
Refunds Payable	4,308	—	—	—	4,308
Accounts Payable and Accrued Expenses	28,823	252	436	163	29,674
Compensated Absences Payable	2,759	—	—	—	2,759
Insurance Premiums and Claims Payable	—	—	—	—	—
Payable for Security Transactions	2,967,785	33,481	57,853	21,582	3,080,701
Other Investment Payables	245,303	2,767	4,783	1,783	254,636
Other Payables	4,449	—	—	—	4,449
Obligations Under Security Lending Program	4,356,925	49,152	84,932	31,684	4,522,693
Total Liabilities	8,015,632	90,629	157,257	58,718	8,322,236
Net Position – Restricted for Benefits (Note 4)	\$ 77,392,855	\$ 865,273	\$ 1,495,990	\$ 563,456	\$ 80,317,574

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	2019	2018
\$ 3,405	\$ 502	\$ 903	\$ 5	\$ 6	\$ 4,821	\$ 120,475	\$ 113,774
21,915	16,537	1,388	—	481	40,321	315,317	319,483
6,077	895	1,612	9	11	8,604	276,679	257,942
21,867	3,222	5,800	34	40	30,963	995,675	1,185,602
2,172	320	576	3	5	3,076	98,893	98,596
—	23	9,174	49	9	9,255	31,582	9,987
52,031	20,997	18,550	95	546	92,219	1,718,146	1,871,610
480,907	70,854	127,549	741	880	680,931	21,896,931	21,773,662
542,974	79,998	144,012	836	993	768,813	24,722,983	24,452,265
29,482	4,344	7,821	45	54	41,746	1,342,413	1,360,209
243,112	35,818	64,481	374	445	344,230	11,069,496	10,502,999
216,927	31,960	57,535	334	397	307,153	9,877,199	9,242,121
331,271	48,807	87,863	510	606	469,057	15,083,638	12,919,297
9,759	1,438	2,588	15	18	13,818	444,368	183,400
—	—	—	—	—	—	520,517	329,256
1,854,432	273,219	491,849	2,855	3,393	2,625,748	84,957,545	80,763,209
102,516	15,104	27,190	158	188	145,156	4,667,849	4,500,263
—	—	—	—	—	—	43,739	40,876
2,012,384	309,822	538,492	3,113	4,133	2,867,944	91,507,754	87,289,732
—	—	—	—	—	—	423,016	62,795
—	159	—	—	—	159	4,467	4,208
527	14,075	3,009	1	1	17,613	47,287	46,471
—	—	—	—	—	—	2,759	2,681
70,766	—	—	—	—	70,766	70,766	65,168
69,831	10,288	18,521	107	128	98,875	3,179,576	3,294,019
5,772	850	1,531	8	10	8,171	262,807	124,201
—	—	—	—	183	183	4,632	4,486
102,516	15,104	27,190	158	188	145,156	4,667,849	4,500,263
249,412	40,476	50,251	274	510	340,923	8,663,159	8,104,292
\$ 1,762,972	\$ 269,346	\$ 488,241	\$ 2,839	\$ 3,623	\$ 2,527,021	\$ 82,844,595	\$ 79,185,440

**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, 2019, WITH COMPARATIVE INFORMATION FOR THE YEAR ENDED JUNE 30, 2018

	Pension Trust Funds				
	Virginia Retirement System	State Police Officers' Retirement System	Virginia Law Officers' Retirement System	Judicial Retirement System	Total Pension Trust Funds
Additions:					
Contributions:					
Members	\$ 953,343	\$ 6,379	\$ 17,871	\$ 4,031	\$ 981,624
Employers	2,399,465	31,437	75,327	23,490	2,529,719
Total Contributions	3,352,808	37,816	93,198	27,521	3,511,343
Investment Income:					
Interest, Dividends and Other Investment Income	1,359,483	15,330	26,193	9,898	1,410,904
Net Appreciation/(Depreciation) in Fair Value of Investments	3,966,439	44,279	75,925	28,931	4,115,574
Securities Lending Income	122,664	1,381	2,366	892	127,303
Total Investment Income Before Investment Expenses	5,448,586	60,990	104,484	39,721	5,653,781
Investment Expenses:					
Direct Investment Expenses	(454,647)	(5,121)	(8,768)	(3,306)	(471,842)
Securities Lending Management Fees and Borrower Rebates	(95,632)	(1,077)	(1,844)	(696)	(99,249)
Total Investment Expenses	(550,279)	(6,198)	(10,612)	(4,002)	(571,091)
Net Investment Income	4,898,307	54,792	93,872	35,719	5,082,690
Miscellaneous Revenue	2,299	—	—	—	2,299
Transfers In	—	—	—	—	—
Total Additions	8,253,414	92,608	187,070	63,240	8,596,332
Deductions:					
Retirement Benefits	4,774,664	62,683	109,193	43,584	4,990,124
Refunds of Member Contributions	112,169	805	4,933	—	117,907
Insurance Premiums and Claims	—	—	—	—	—
Retiree Health Insurance Reimbursements	—	—	—	—	—
Disability Insurance Premiums and Benefits	—	—	—	—	—
Line of Duty Benefits	—	—	—	—	—
Administrative Expenses	48,586	488	831	315	50,220
Other Expenses	9,282	61	103	43	9,489
Transfers Out	—	—	—	—	—
Total Deductions	4,944,701	64,037	115,060	43,942	5,167,740
Net Increase (Decrease)	3,308,713	28,571	72,010	19,298	3,428,592
Net Position – Restricted for Benefits – Beginning of Year	74,084,142	836,702	1,423,980	544,158	76,888,982
Net Position – Restricted for Benefits – End of Year	\$ 77,392,855	\$ 865,273	\$ 1,495,990	\$ 563,456	\$ 80,317,574

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	2019	2018
\$ 155,153	\$ —	\$ —	\$ —	\$ —	\$ 155,153	\$ 1,136,777	\$ 1,088,530
102,175	187,652	25,263	13,377	4,192	332,659	2,862,378	2,849,652
257,328	187,652	25,263	13,377	4,192	487,812	3,999,155	3,938,182
30,846	4,073	8,427	167	38	43,551	1,454,455	1,344,680
92,371	12,609	24,721	166	150	130,017	4,245,591	4,589,832
2,800	371	761	15	4	3,951	131,254	92,945
126,017	17,053	33,909	348	192	177,519	5,831,300	6,027,457
(10,393)	(1,369)	(2,821)	(60)	(14)	(14,657)	(486,499)	(457,344)
(2,184)	(290)	(594)	(11)	(2)	(3,081)	(102,330)	(59,716)
(12,577)	(1,659)	(3,415)	(71)	(16)	(17,738)	(588,829)	(517,060)
113,440	15,394	30,494	277	176	159,781	5,242,471	5,510,397
—	—	1,150	658	—	1,808	4,107	3,626
—	—	—	—	—	—	—	—
370,768	203,046	56,907	14,312	4,368	649,401	9,245,733	9,452,205
—	—	—	—	—	—	4,990,124	4,752,889
—	—	—	—	—	—	117,907	122,968
199,879	—	—	—	—	199,879	199,879	200,285
—	168,725	—	—	—	168,725	168,725	163,938
—	—	30,807	—	2,124	32,931	32,931	39,799
—	—	—	12,854	—	12,854	12,854	12,398
709	328	787	508	84	2,416	52,636	49,238
1,981	19	33	—	—	2,033	11,522	10,868
—	—	—	—	—	—	—	—
202,569	169,072	31,627	13,362	2,208	418,838	5,586,578	5,352,383
168,199	33,974	25,280	950	2,160	230,563	3,659,155	4,099,822
1,594,773	235,372	462,961	1,889	1,463	2,296,458	79,185,440	75,085,618
\$ 1,762,972	\$ 269,346	\$ 488,241	\$ 2,839	\$ 3,623	\$ 2,527,021	\$ 82,844,595	\$ 79,185,440

VIRGINIA RETIREMENT SYSTEM COMBINING STATEMENT OF FIDUCIARY NET POSITION

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Hybrid Defined Contribution Plan	Total VRS Plans
Assets:					
Cash (Note 5)	\$ 27,406	\$ 52,287	\$ 30,456	\$ —	\$ 110,149
Receivables:					
Contributions	43,153	160,104	56,380	8,443	268,080
Interest and Dividends	64,254	122,590	71,405	—	258,249
Receivables for Security Transactions	231,230	441,161	256,962	—	929,353
Other Investment Receivables	22,966	43,817	25,523	—	92,306
Other Receivables	5,544	10,608	6,174	1	22,327
Total Receivables	367,147	778,280	416,444	8,444	1,570,315
Investments: (Note 5)					
Bonds and Mortgage Securities	5,085,215	9,702,036	5,651,128	—	20,438,379
Stocks	5,741,521	10,954,196	6,380,471	—	23,076,188
Fixed-Income Commingled Funds	311,754	594,793	346,448	—	1,252,995
Index and Pooled Funds	2,570,715	4,904,644	2,856,799	—	10,332,158
Real Estate	2,293,823	4,376,363	2,549,093	—	9,219,279
Private Equity	3,502,936	6,683,219	3,892,763	—	14,078,918
Short-Term Investments	103,198	196,890	114,682	—	414,770
Hybrid Defined Contribution Investments	—	—	—	514,672	514,672
Total Investments	19,609,162	37,412,141	21,791,384	514,672	79,327,359
Collateral on Loaned Securities	1,084,034	2,068,219	1,204,672	—	4,356,925
Property, Plant, Furniture and Equipment (Note 6)	10,883	20,763	12,093	—	43,739
Total Assets	21,098,632	40,331,690	23,455,049	523,116	85,408,487
Liabilities:					
Retirement Benefits Payable	115,509	197,862	91,909	—	405,280
Refunds Payable	1,116	1,523	1,669	—	4,308
Accounts Payable and Accrued Expenses	7,172	13,682	7,969	—	28,823
Compensated Absences Payable	686	1,310	763	—	2,759
Insurance Premiums and Claims Payable	—	—	—	—	—
Payable for Security Transactions	738,407	1,408,798	820,580	—	2,967,785
Other Investment Payables	61,033	116,445	67,825	—	245,303
Other Payables	565	1,082	630	2,172	4,449
Obligations Under Security Lending Program	1,084,034	2,068,219	1,204,672	—	4,356,925
Total Liabilities	2,008,522	3,808,921	2,196,017	2,172	8,015,632
Net Position – Restricted for Benefits (Note 4)	\$ 19,090,110	\$ 36,522,769	\$ 21,259,032	\$ 520,944	\$ 77,392,855

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, 2019

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Hybrid Defined Contribution Plan	Total VRS Plans
Additions:					
Contributions:					
Members	\$ 201,481	\$ 403,258	\$ 248,421	\$ 100,183	\$ 953,343
Employers	545,584	1,280,964	499,293	73,624	2,399,465
Total Contributions	747,065	1,684,222	747,714	173,807	3,352,808
Investment Income:					
Interest, Dividends and Other Investment Income	338,340	645,307	375,774	62	1,359,483
Net Appreciation/(Depreciation) in Fair Value of Investments	979,790	1,868,723	1,088,192	29,734	3,966,439
Securities Lending Income	30,529	58,228	33,907	—	122,664
Total Investment Income Before Investment Expenses	1,348,659	2,572,258	1,497,873	29,796	5,448,586
Investment Expenses:					
Direct Investment Expenses	(113,136)	(215,832)	(125,679)	—	(454,647)
Securities Lending Management Fees and Borrower Rebates	(23,801)	(45,396)	(26,435)	—	(95,632)
Total Investment Expenses	(136,937)	(261,228)	(152,114)	—	(550,279)
Net Investment Income	1,211,722	2,311,030	1,345,759	29,796	4,898,307
Miscellaneous Revenue	571	1,092	636	—	2,299
Transfers In	—	—	—	—	—
Total Additions	1,959,358	3,996,344	2,094,109	203,603	8,253,414
Deductions:					
Retirement Benefits	1,360,833	2,331,038	1,082,793	—	4,774,664
Refunds of Member Contributions	26,897	36,715	40,249	8,308	112,169
Insurance Premiums and Claims	—	—	—	—	—
Retiree Health Insurance Reimbursements	—	—	—	—	—
Disability Insurance Premiums and Benefits	—	—	—	—	—
Line of Duty Benefits	—	—	—	—	—
Administrative Expenses	12,374	22,843	13,369	—	48,586
Other Expenses	1,333	2,540	1,489	3,920	9,282
Transfers Out	—	—	—	—	—
Total Deductions	1,401,437	2,393,136	1,137,900	12,228	4,944,701
Net Increase (Decrease)	557,921	1,603,208	956,209	191,375	3,308,713
Net Position – Restricted for Benefits – Beginning of Year	18,532,189	34,919,561	20,302,823	329,569	74,084,142
Net Position – Restricted for Benefits – End of Year	\$ 19,090,110	\$ 36,522,769	\$ 21,259,032	\$ 520,944	\$ 77,392,855

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, 2019

(EXPRESSED IN THOUSANDS)

	Judicial Retirement Plan	Hybrid Defined Contribution Plan	Total JRS Plans
Assets:			
Cash (Note 5)	\$ 1,052	\$ —	\$ 1,052
Receivables:			
Contributions	1,083	70	1,153
Interest and Dividends	1,878	—	1,878
Receivables for Security Transactions	6,758	—	6,758
Other Investment Receivables	671	—	671
Other Receivables	—	—	—
Total Receivables	10,390	70	10,460
Investments: (Note 5)			
Bonds and Mortgage Securities	148,630	—	148,630
Stocks	167,812	—	167,812
Fixed-Income Commingled Funds	9,112	—	9,112
Index and Pooled Funds	75,136	—	75,136
Real Estate	67,043	—	67,043
Private Equity	102,384	—	102,384
Short-Term Investments	3,016	—	3,016
Hybrid Defined Contribution Investments	—	5,845	5,845
Total Investments	573,133	5,845	578,978
Collateral on Loaned Securities	31,684	—	31,684
Property, Plant, Furniture and Equipment (Note 6)	—	—	—
Total Assets	616,259	5,915	622,174
Liabilities:			
Retirement Benefits Payable	3,506	—	3,506
Refunds Payable	—	—	—
Accounts Payable and Accrued Expenses	163	—	163
Compensated Absences Payable	—	—	—
Insurance Premiums and Claims Payable	—	—	—
Payable for Security Transactions	21,582	—	21,582
Other Investment Payables	1,783	—	1,783
Other Payables	—	—	—
Obligations Under Security Lending Program	31,684	—	31,684
Total Liabilities	58,718	—	58,718
Net Position – Restricted for Benefits (Note 4)	\$ 557,541	\$ 5,915	\$ 563,456

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, 2019

(EXPRESSED IN THOUSANDS)

	Judicial Retirement System	Hybrid Defined Contribution Plan	Total JRS Plans
Additions:			
Contributions:			
Members	\$ 3,208	\$ 823	\$ 4,031
Employers	22,890	600	23,490
Total Contributions	26,098	1,423	27,521
Investment Income:			
Interest, Dividends and Other Investment Income	9,898	—	9,898
Net Appreciation/(Depreciation) in Fair Value of Investments	28,584	347	28,931
Securities Lending Income	892	—	892
Total Investment Income Before Investment Expenses	39,374	347	39,721
Investment Expenses:			
Direct Investment Expenses	(3,306)	—	(3,306)
Securities Lending Management Fees and Borrower Rebates	(696)	—	(696)
Total Investment Expenses	(4,002)	—	(4,002)
Net Investment Income	35,372	347	35,719
Miscellaneous Revenue	—	—	—
Transfers In	—	—	—
Total Additions	61,470	1,770	63,240
Deductions:			
Retirement Benefits	43,584	—	43,584
Refunds of Member Contributions	—	—	—
Insurance Premiums and Claims	—	—	—
Retiree Health Insurance Reimbursements	—	—	—
Disability Insurance Premiums and Benefits	—	—	—
Line of Duty Benefits	—	—	—
Administrative Expenses	315	—	315
Other Expenses	39	4	43
Transfers Out	—	—	—
Total Deductions	43,938	4	43,942
Net Increase (Decrease)	17,532	1,766	19,298
Net Position – Restricted for Benefits – Beginning of Year	540,009	4,149	544,158
Net Position – Restricted for Benefits – End of Year	\$ 557,541	\$ 5,915	\$ 563,456

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, 2019

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Constitutional Officers	Social Services Employees	Registrars	Total HIC Plans
Assets:							
Cash (Note 5)	\$ 207	\$ 238	\$ 46	\$ 8	\$ 3	\$ —	\$ 502
Receivables:							
Contributions	5,292	10,109	192	220	712	12	16,537
Interest and Dividends	368	424	82	15	6	—	895
Receivables for Security Transactions	1,326	1,527	296	53	19	1	3,222
Other Investment Receivables	133	152	29	4	2	—	320
Other Receivables	10	11	2	—	—	—	23
Total Receivables	7,129	12,223	601	292	739	13	20,997
Investments: (Note 5)							
Bonds and Mortgage Securities	29,152	33,572	6,502	1,171	437	20	70,854
Stocks	32,914	37,905	7,341	1,322	492	24	79,998
Fixed-Income Commingled Funds	1,786	2,058	399	73	27	1	4,344
Index and Pooled Funds	14,736	16,971	3,287	593	221	10	35,818
Real Estate	13,150	15,143	2,933	528	197	9	31,960
Private Equity	20,081	23,126	4,478	807	301	14	48,807
Short-Term Investments	592	681	132	24	9	—	1,438
Total Investments	112,411	129,456	25,072	4,518	1,684	78	273,219
Collateral on Loaned Securities	6,214	7,157	1,386	250	93	4	15,104
Property, Plant, Furniture and Equipment (Note 6)	—	—	—	—	—	—	—
Total Assets	125,961	149,074	27,105	5,068	2,519	95	309,822
Liabilities:							
Retirement Benefits Payable	—	—	—	—	—	—	—
Refunds Payable	64	77	14	3	1	—	159
Accounts Payable and Accrued Expenses	6,078	7,546	214	152	84	1	14,075
Compensated Absences Payable	—	—	—	—	—	—	—
Insurance Premiums and Claims Payable	—	—	—	—	—	—	—
Payable for Security Transactions	4,232	4,875	945	170	63	3	10,288
Other Investment Payables	350	403	78	14	5	—	850
Other Payables	—	—	—	—	—	—	—
Obligations Under Security Lending Program	6,214	7,157	1,386	250	93	4	15,104
Total Liabilities	16,938	20,058	2,637	589	246	8	40,476
Net Position –							
Restricted for Benefits (Note 4)	\$ 109,023	\$ 129,016	\$ 24,468	\$ 4,479	\$ 2,273	\$ 87	\$ 269,346

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, 2019

(EXPRESSED IN THOUSANDS)

	State Employee Plan	Teacher Employee Plan	Political Subdivision Plans	Constitutional Officers	Social Services Employees	Registrars	Total HIC Plans
Additions:							
Contributions:							
Members	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
Employers	79,926	100,643	2,406	2,794	1,847	36	187,652
Total Contributions	79,926	100,643	2,406	2,794	1,847	36	187,652
Investment Income:							
Interest, Dividends and Other Investment Income	1,637	1,945	394	64	32	1	4,073
Net Appreciation/(Depreciation) in Fair Value of Investments	5,068	6,020	1,220	197	100	4	12,609
Securities Lending Income	149	177	36	6	3	—	371
Total Investment Income Before Investment Expenses	6,854	8,142	1,650	267	135	5	17,053
Investment Expenses:							
Direct Investment Expenses	(548)	(654)	(132)	(23)	(12)	—	(1,369)
Securities Lending Management Fees and Borrower Rebates	(117)	(138)	(28)	(6)	(1)	—	(290)
Total Investment Expenses	(665)	(792)	(160)	(29)	(13)	—	(1,659)
Net Investment Income	6,189	7,350	1,490	238	122	5	15,394
Miscellaneous Revenue	—	—	—	—	—	—	—
Transfers In	—	—	—	—	—	—	—
Total Additions	86,115	107,993	3,896	3,032	1,969	41	203,046
Deductions:							
Retirement Benefits	—	—	—	—	—	—	—
Refunds of Member Contributions	—	—	—	—	—	—	—
Insurance Premiums and Claims	—	—	—	—	—	—	—
Retiree Health Insurance Reimbursements	72,857	90,455	2,564	1,825	1,012	12	168,725
Disability Insurance Premiums and Benefits	—	—	—	—	—	—	—
Line of Duty Benefits	—	—	—	—	—	—	—
Administrative Expenses	135	152	32	6	3	—	328
Other Expenses	8	9	2	—	—	—	19
Transfers Out	—	—	—	—	—	—	—
Total Deductions	73,000	90,616	2,598	1,831	1,015	12	169,072
Net Increase (Decrease)	13,115	17,377	1,298	1,201	954	29	33,974
Net Position – Restricted for Benefits – Beginning of Year	95,908	111,639	23,170	3,278	1,319	58	235,372
Net Position – Restricted for Benefits – End of Year	\$ 109,023	\$ 129,016	\$ 24,468	\$ 4,479	\$ 2,273	\$ 87	\$ 269,346

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, 2019

(EXPRESSED IN THOUSANDS)

	Teacher Employee Plan	Political Subdivision Plan	Total VLDP Plans
Assets:			
Cash (Note 5)	\$ 3	\$ 3	\$ 6
Receivables:			
Contributions	260	221	481
Interest and Dividends	5	6	11
Receivables for Security Transactions	18	22	40
Other Investment Receivables	2	3	5
Other Receivables	4	5	9
Total Receivables	289	257	546
Investments: (Note 5)			
Bonds and Mortgage Securities	393	487	880
Stocks	442	551	993
Fixed-Income Commingled Funds	24	30	54
Index and Pooled Funds	199	246	445
Real Estate	177	220	397
Private Equity	271	335	606
Short-Term Investments	8	10	18
Total Investments	1,514	1,879	3,393
Collateral on Loaned Securities	84	104	188
Property, Plant, Furniture and Equipment (Note 6)	—	—	—
Total Assets	1,890	2,243	4,133
Liabilities:			
Retirement Benefits Payable	—	—	—
Refunds Payable	—	—	—
Accounts Payable and Accrued Expenses	—	1	1
Compensated Absences Payable	—	—	—
Insurance Premiums and Claims Payable	—	—	—
Payable for Security Transactions	57	71	128
Other Investment Payables	4	6	10
Other Payables	84	99	183
Obligations Under Security Lending Program	84	104	188
Total Liabilities	229	281	510
Net Position – Restricted for Benefits (Note 4)	\$ 1,661	\$ 1,962	\$ 3,623

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, 2019

(EXPRESSED IN THOUSANDS)

	Teacher Employee Plan	Political Subdivision Plan	Total VLDP Plans
Additions:			
Contributions:			
Members	\$ —	\$ —	\$ —
Employers	1,966	2,226	4,192
Total Contributions	1,966	2,226	4,192
Investment Income:			
Interest, Dividends and Other Investment Income	18	20	38
Net Appreciation/(Depreciation) in Fair Value of Investments	70	80	150
Securities Lending Income	2	2	4
Total Investment Income Before Investment Expenses	90	102	192
Investment Expenses:			
Direct Investment Expenses	(7)	(7)	(14)
Securities Lending Management Fees and Borrower Rebates	—	(2)	(2)
Total Investment Expenses	(7)	(9)	(16)
Net Investment Income	83	93	176
Miscellaneous Revenue	—	—	—
Transfers In	—	—	—
Total Additions	2,049	2,319	4,368
Deductions:			
Retirement Benefits	—	—	—
Refunds of Member Contributions	—	—	—
Insurance Premiums and Claims	—	—	—
Retiree Health Insurance Reimbursements	—	—	—
Disability Insurance Premiums and Benefits	167	188	355
Line of Duty Benefits	—	—	—
Administrative Expenses	39	45	84
Third-party administrator charges	829	940	1,769
Other Expenses	—	—	—
Transfers Out	—	—	—
Total Deductions	1,035	1,173	2,208
Net Increase (Decrease)	1,014	1,146	2,160
Net Position – Restricted for Benefits – Beginning of Year	647	816	1,463
Net Position – Restricted for Benefits – End of Year	\$ 1,661	\$ 1,962	\$ 3,623

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

Notes to Financial Statements

JUNE 30, 2019 AND 2018

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 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 became effective for fiscal years beginning after June 15, 2017, 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 OPEB plans. The information reported by the employers will be their share of the information reported by VRS 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*, amended 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 addressed 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 may be 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. For investments in limited partnerships the System's share of the partnership's earnings or losses for the period are included in investment income.

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, 2019, the annual money-weighted rate of return for the Pooled Assets portfolio, net of investment expenses, was 6.63%. 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 2019 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, 2019 and 2018, 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 from investment income and employer contributions. 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, 2019. 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, 2018, from which the summarized information was derived.

2. Pension Plans

A. PLAN DESCRIPTIONS

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

The System is comprised of the following pension trust funds:

- The Virginia Retirement System (VRS), established March 1, 1952, as the Virginia Supplemental Retirement System, was renamed VRS in 1990 in response to the Federal Tax Reform Act of 1986. VRS includes a single-employer plan for state employees, a multiple-employer cost-sharing plan for teachers and an

agent multiple-employer plan for employees of participating political subdivisions.

- State Police Officers' Retirement System (SPORS), established July 1, 1950, is a single-employer plan for state police officers.
- Virginia Law Officers' Retirement System (VaLORS), established October 1, 1999, is a single-employer plan for non-local government Virginia law officers other than state police.
- Judicial Retirement System (JRS), established July 1, 1970, is a single-employer plan for judges of a court of record or a district court of the state and other eligible judicial employees.

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

All full-time, salaried permanent (professional) employees of state agencies, public school divisions and employees of participating employers are automatically covered by a pension plan upon employment. Members qualify for retirement when they become vested and meet the age and service requirements for their plan, as shown in the following table. The System administers three different benefit structures for government employees: Plan 1, Plan 2 and the Hybrid Retirement Plan. Each of these is called a plan in statute and each has different provisions with a specific eligibility and benefit structure. These different benefit structures are set out in Figure 2.10.

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	2019 Total	2018 Total
Retirees and Beneficiaries Receiving Benefits	58,797	92,723	56,094	1,410	4,991	530	214,545	206,776
Terminated Employees Entitled to Benefits but not Receiving Them	11,707	26,732	13,317	143	771	7	52,677	52,174
Total	70,504	119,455	69,411	1,553	5,762	537	267,222	258,950
Active Members:								
Vested	52,123	106,173	68,733	1,579	4,806	348	233,762	234,394
Non-Vested	24,887	41,449	41,805	333	3,928	109	112,511	108,611
Total	77,010	147,622	110,538	1,912	8,734	457	346,273	343,005

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
About Plan 1 Plan 1 is a defined benefit plan. The retirement benefit is based on a member's age, service credit and average final compensation at retirement using a formula.	About Plan 2 Plan 2 is a defined benefit plan. The retirement benefit is based on a member's age, service credit and average final compensation at retirement using a formula.	About the Hybrid Retirement Plan The Hybrid Retirement Plan combines the features of a defined benefit plan and a defined contribution plan. • The defined benefit is based on a member's age, service credit and average final compensation at retirement using a formula. • 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. • 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.
Eligible Members 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. Hybrid Opt-In Election 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. If eligible deferred members returned to work during the election window, they were also eligible to opt into the Hybrid Retirement Plan. 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.	Eligible Members 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. 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. Hybrid Opt-In Election 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. If eligible deferred members returned to work during the election window, they were also eligible to opt into the Hybrid Retirement Plan. 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.	Eligible Members Members are in the Hybrid Retirement Plan if their membership date is on or after January 1, 2014. This includes: • State employees* • School division employees • Political subdivision employees* • 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. • 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. * Non-Eligible Members Some members are not eligible to participate in the Hybrid Retirement Plan. They include: • Members of the State Police Officers' Retirement System (SPORS) • Members of the Virginia Law Officers' Retirement System (VaLORS) • Political subdivision members who are covered by enhanced benefits for hazardous duty employees 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.

FIGURE 2.10 : RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
Retirement Contributions 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.	Retirement Contributions State employees contribute 5% of their compensation each month to their member contribution account through a pre-tax salary reduction.	Retirement Contributions 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.
Service Credit Service credit includes active service. Members earn service credit for each month they are employed in a covered position. It also may include credit for prior service the member has purchased or additional service credit the member was granted. A member's total service credit 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.	Service Credit Same as Plan 1.	Service Credit <i>Defined Benefit Component:</i> Under the defined benefit component of the plan, service credit includes active service. Members earn service credit for each month they are employed in a covered position. It also may include credit for prior service the member has purchased or additional service credit the member was granted. A member's total service credit 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. <i>Defined Contribution Component:</i> Under the defined contribution component, service credit is used to determine vesting for the employer contribution portion of the plan.
Vesting 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 service credit. 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.	Vesting Same as Plan 1.	Vesting <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 service credit. Plan 1 or Plan 2 members with at least five years (60 months) of service credit who opted into the Hybrid Retirement Plan remain vested in the defined benefit component. (Cont.)

FIGURE 2.10 : RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
		<i>Vesting, cont.</i> <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. • After two years, a member is 50% vested and may withdraw 50% of employer contributions. • After three years, a member is 75% vested and may withdraw 75% of employer contributions. • After four or more years, a member is 100% vested and may withdraw 100% of employer contributions. Distribution is not required by law until age 70½.
Calculating the Benefit 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. 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.	Calculating the Benefit See definition under Plan 1.	Calculating the Benefit <i>Defined Benefit Component:</i> See definition under Plan 1. <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.
Average Final Compensation A member's average final compensation is the average of the 36 consecutive months of highest creditable compensation as a covered employee.	Average Final Compensation A member's average final compensation is the average of the 60 consecutive months of highest creditable compensation as a covered employee.	Average Final Compensation Same as Plan 2. It is used in the retirement formula for the defined benefit component of the plan.

FIGURE 2.10 : RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
Service Retirement Multiplier VRS Plan 1: The retirement multiplier is a factor used in the formula to determine a final retirement benefit. The retirement multiplier for non-hazardous duty members is 1.70%. SPORS, sheriffs and regional jail superintendents: The retirement multiplier is 1.85%. VaLORS: The retirement multiplier is 1.70% or 2.00%. - 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. - Members hired on or after July 1, 2001, have a 2.00% multiplier and no supplement. 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. JRS Plan 1: If appointed or elected to an original term prior to January 1, 2013, the retirement multiplier is 1.70%. 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.	Service Retirement Multiplier VRS Plan 2: Same as Plan 1 for service earned, purchased or granted prior to January 1, 2013. For non-hazardous duty members, the retirement multiplier is 1.65% for service credit earned, purchased or granted on or after January 1, 2013. SPORS, sheriffs and regional jail superintendents: Same as Plan 1. VaLORS: The retirement multiplier is 2.00%. Political subdivision hazardous duty employees: Same as Plan 1. JRS Plan 2: Same as Plan 1.	Service Retirement Multiplier <i>Defined Benefit Component:</i> VRS: The retirement multiplier for the defined benefit component is 1.00%. For members who opted into the Hybrid Retirement Plan from Plan 1 or Plan 2, the applicable multipliers for those plans will be used to calculate the retirement benefit for service credited in those plans. SPORS, sheriffs and regional jail superintendents: Not applicable. VaLORS: Not applicable. Political subdivision hazardous duty employees: Not applicable. 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. <i>Defined Contribution Component:</i> Not applicable.
Normal Retirement Age VRS: Age 65. SPORS, VaLORS and political subdivision hazardous duty employees: Age 60. JRS: Age 65; mandatory retirement age is 73.	Normal Retirement Age VRS: Normal Social Security retirement age. SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1. JRS: Same as Plan 1.	Normal Retirement Age <i>Defined Benefit Component:</i> VRS: Same as Plan 2. 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.

FIGURE 2.10 : RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
Earliest Unreduced Retirement Eligibility VRS: Age 65 with at least five years (60 months) of service credit or at age 50 with at least 30 years of service credit.* SPORS, VaLORS and political subdivision hazardous duty employees: Age 60 with at least five years of service credit or age 50 with at least 25 years of service credit. 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: • 3.5 for JRS members appointed or elected to an original term before January 1, 1995. • 2.5 for JRS members appointed or elected to an original term on or after January 1, 1995, but before July 1, 2010. For members appointed or elected to an original term between July 1, 2010, and December 31, 2013, the weighting factors are: • 1.5 if appointed or elected to an original term before age 45. • 2.0 if appointed or elected to an original term between ages 45 and 54. • 2.5 if appointed or elected to an original term at age 55 or older. <i>* Some political subdivision employers require employees to reach age 55 with at least 30 years of service credit to be eligible for an unreduced retirement benefit.</i>	Earliest Unreduced Retirement Eligibility VRS: Normal Social Security retirement age with at least five years (60 months) of service credit 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: • 1.5 for JRS members appointed or elected to an original term before age 45. • 2.0 for JRS members appointed or elected to an original term between ages 45 and 54. • 2.5 for JRS members appointed or elected to an original term at age 55 or older.	Earliest Unreduced Retirement Eligibility <i>Defined Benefit Component:</i> VRS: Normal Social Security retirement age and have at least five years (60 months) of service credit 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.
Earliest Reduced Retirement Eligibility VRS: Age 55 with at least five years (60 months) of service credit or age 50 with at least 10 years of service credit. SPORS, VaLORS and political subdivision hazardous duty employees: Age 50 with at least five years of service credit. JRS: Age 55, with at least five years of service credit.	Earliest Reduced Retirement Eligibility VRS: Age 60 with at least five years (60 months) of service credit. SPORS, VaLORS and political subdivision hazardous duty employees: Same as Plan 1. JRS: Same as Plan 1.	Earliest Reduced Retirement Eligibility <i>Defined Benefit Component:</i> VRS: Age 60 with at least five years (60 months) of service credit. 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.

FIGURE 2.10 : RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
Cost-of-Living Adjustment (COLA) in Retirement 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%. <i>Eligibility:</i> For members who retire 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. For members who retire with a reduced benefit and who have fewer than 20 years of service credit, the COLA will go into effect on July 1 after one calendar year following the unreduced retirement eligibility date. <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: • The member is within five years of qualifying for an unreduced retirement benefit as of January 1, 2013. • The member retires directly from short-term or long-term disability under the Virginia Local Disability Program (VLDP) or employer opt-out plan. • 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.	Cost-of-Living Adjustment (COLA) in Retirement 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%. <i>Eligibility:</i> Same as Plan 1. <i>Exceptions to COLA Effective Dates:</i> Same as Plan 1.	Cost-of-Living Adjustment (COLA) in Retirement <i>Defined Benefit Component:</i> Same as Plan 2. <i>Defined Contribution Component:</i> Not applicable. <i>Eligibility:</i> Same as Plan 1. <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: • The member is within five years of qualifying for an unreduced retirement benefit as of January 1, 2013. • The member retires directly from short-term or long-term disability under the Virginia Local Disability Program (VLDP) or employer opt-out plan. • 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. • The member dies in service and the member's survivor or beneficiary is eligible for a monthly death-in-service benefit.
Disability Coverage 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. Most state employees are covered under the Virginia Sickness and Disability Program (VSDP) and are not eligible for disability retirement. VSDP members are subject to a one-year waiting period before becoming eligible for non-work-related disability benefits.	Disability Coverage 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. Most state employees are covered under the Virginia Sickness and Disability Program (VSDP) and are not eligible for disability retirement. VSDP members are subject to a one-year waiting period before becoming eligible for non-work-related disability benefits.	Disability Coverage 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. 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. 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.

FIGURE 2.10 : RETIREMENT PLAN PROVISIONS, cont.

PLAN 1	PLAN 2	HYBRID RETIREMENT PLAN
Purchase of Prior Service 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 service credit in their plan. Prior service credit 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.	Purchase of Prior Service Same as Plan 1.	Purchase of Prior Service <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.

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 2019 and 2018 were based on the actuary's valuation as of June 30, 2017 and June 30, 2015, respectively.

As shown in Figure 2.11, contributions to the pension plans for the fiscal years ended June 30, 2019 and 2018, totaled \$3,511,343,000 and \$3,465,914,000, respectively, in accordance with statutory requirements.

Employer contributions to the VRS cost-sharing pool for teachers in the fiscal year ended June 30, 2019, represented 15.68% of covered payrolls. This was the full actuarial cost and represented a decrease from the 16.32% contributed in the fiscal year ended June 30, 2018. Employer contributions for state employees represented 13.52% of covered payrolls. Each political subdivision's contributions ranged from zero (0.00%) to 40.89% of covered payrolls. State employer contributions to SPORS, VaLORS and JRS represented 24.88%, 21.61% and 34.39%, 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, 2017, 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
2019	VRS - State	\$ 201,481	\$ 545,584	\$ 747,065
	VRS - Teacher	403,258	1,280,964	1,684,222
	VRS - Political Subdivisions	248,421	499,293	747,714
	Hybrid Defined Contribution Plan	100,183	73,624	173,807
	Total VRS	953,343	2,399,465	3,352,808
	JRS	3,208	22,890	26,098
	Hybrid Defined Contribution Plan	823	600	1,423
	Total JRS	4,031	23,490	27,521
	SPORS	6,379	31,437	37,816
	ValORS	17,871	75,327	93,198
	Total	\$ 981,624	\$ 2,529,719	\$ 3,511,343
2018	Total	\$ 938,128	\$ 2,527,786	\$ 3,465,914

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, 2019. The total pension liability was determined based on an actuarial valuation as of June 30, 2018, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the

measurement date of June 30, 2019. The updated actuarial assumptions include a change in the assumption for the long-term investment rate of return from 7.00% to 6.75% and this change is reflected in the development of the June 30, 2019, total pension liability.

SCHEDULE OF EMPLOYERS' NET PENSION LIABILITY BY SYSTEM AND PLAN

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Employers' Net Pension Liability/ (Asset) (a-b)	Plan Fiduciary Net Position as a % of the Total Pension Liability (b/a)	Covered Payroll (c)	Net Pension Liability/ (Asset) as a % of the Covered Employee Payroll (a-b)/(c)
Virginia Retirement System:						
State	\$25,409,842	\$19,090,110	\$ 6,319,732	75.13%	\$ 4,197,484	150.56%
Teacher	49,683,336	36,522,769	13,160,567	73.51%	8,387,503	156.91%
Political Subdivisions*	24,206,763	21,259,032	2,947,731	87.82%	5,118,622	57.59%
Total Virginia Retirement System	99,299,941	76,871,911	22,428,030		17,703,609	
State Police Officers' Retirement System	1,176,937	865,273	311,664	73.52%	126,483	246.41%
Virginia Law Officers' Retirement System	2,190,025	1,495,990	694,035	68.31%	349,998	198.30%
Judicial Retirement System	678,593	557,541	121,052	82.16%	68,330	177.16%
Grand Total	\$103,345,49	\$79,790,715	\$23,554,781		\$18,248,420	

* 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
Valuation Date	June 30, 2018	June 30, 2018	June 30, 2018	June 30, 2018	June 30, 2018	June 30, 2018
Actuarial Cost Method	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
Actuarial Assumptions:						
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 6.75%. This is not the discount rate used in the initial actuarial valuation, however, it was incorporated in the roll-forward calculations as set out in note 2C, above. 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 6.75%, as well as what the employers' net pension liability would be if it were calculated using a discount rate that is 1.00% lower (5.75%) or 1.00% higher (7.75%) than the current rate.

SCHEDULE OF IMPACT OF CHANGES IN DISCOUNT RATE – PENSION PLANS

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

System/Plan	Net Pension Liability		
	1.00% Decrease (5.75%)	Current Discount Rate (6.75%)	1.00% Increase (7.75%)
Virginia Retirement System			
State	\$ 9,283,632	\$ 6,319,732	\$ 3,828,162
Teacher	19,812,371	13,160,567	7,660,756
Political Subdivisions	6,063,120	2,947,731	462,729
Total Virginia Retirement System	\$ 35,159,123	\$ 22,428,030	\$ 11,951,647
State Police Officers' Retirement System	453,612	311,664	192,309
Virginia Law Officers' Retirement System	974,668	694,035	462,184
Judicial Retirement System	182,616	121,052	67,541
Grand Total	\$ 36,770,019	\$ 23,554,781	\$ 12,673,681

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 handles the administration of the Line of Duty Act Fund.

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 369,831 active members and 188,370 retirees were covered under the Basic Group Life Insurance Program at June 30, 2019.

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 70,903 active members and 3,234 retirees were covered under the Optional Group Life Insurance Program at June 30, 2019.

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 127,802 retirees were covered under the Health Insurance Credit program at June 30, 2019.

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 79,269 members were covered under VSDP at June 30, 2019, and approximately 2,579 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 21,115 members were covered under VLDP at June 30, 2019, and 35 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 12,812 members, retirees and their eligible family members were covered under the program at June 30, 2019.

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 was 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, 2019

OPEB Plan	Number of Participating Employers			
	State	Teachers	Political Subdivisions	Total
Group Life Insurance	230	144	547*	921
Retiree Health Insurance Credit	230	144	137*	511
Disability Insurance Trust Fund	230	—	—	230
Virginia Local Disability Program	—	35	192*	227
Line of Duty Act Trust Fund	69	—	59	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
VRS Group Life Insurance Program: Basic Coverage	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: City of Richmond, City of Portsmouth, City of Roanoke, City of Norfolk and Roanoke City School Board. 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.	• Natural death benefit equal to the employee'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 accelerated death benefit option. • Continuation of death benefit and accelerated death benefit option for employees who retire or who have met the age and service requirements for retirement upon separation from employment. 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. If a member has at least 30 years of service credit, coverage cannot reduce below \$8,279. 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.
Optional Group Life Insurance Program	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. 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. Coverage continues for dependent unmarried children who are disabled. Employees who meet qualifications for retirement may continue a portion of their coverage upon leaving employment.	The program provides natural death and accidental death or dismemberment coverage: • Employees select one, two, three or four times their compensation, not to exceed \$750,000. • 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. • 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. • 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. • 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.

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.
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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.

Virginia Sickness and Disability Program (VSDP)	Eligible Employees	Coverage
	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. Eligible employees are enrolled automatically upon employment. They include: • 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). • 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.	• Sick, family and personal leave. • 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%. • 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. • Income replacement adjustment to 80% for catastrophic conditions. • VSDP Long-Term Care Plan, a self-funded program that assists with the cost of covered long-term care services.
Notes: • 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.

	Eligible Employees	Coverage
Virginia Local Disability Program (VLDP)	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: • Teacher or other professional employee of a local public school division. • General employee of a VRS-participating political subdivision such as a city, county, town, authority or commission. • Local law enforcement officer, firefighter or emergency medical technician if the employer does not provide enhanced hazardous duty benefits.	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. • Eligibility for work-related short-term disability coverage begins upon employment. • 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. • Once the eligibility period is satisfied, employees are eligible for higher income-replacement levels. • 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. • 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. • 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. • VLDP Long-Term Care Plan, a self-funded program that assists with the cost of covered long-term care services.
Commonwealth of Virginia (COV) Voluntary Group Long-Term Care Insurance Program	The following members between the ages of 18 and 79 were eligible to apply through December 31, 2016*: • State employees and public college and university faculty members. • Employees of school divisions and political subdivisions whose employers have elected to participate in the program. • Vested deferred members and retirees (their employers are not required to have elected the program). • Select family members of eligible members. <i>* Genworth Life Insurance Company stopped accepting new enrollees in the Commonwealth of Virginia (COV) Voluntary Group Long-Term Care Insurance program in December 2016. 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, and Genworth confirmed it will honor the terms of all current policies received through December 31, 2016. VRS subsequently engaged in negotiations with Genworth to develop a replacement voluntary group long-term care product offering that will begin accepting new enrollees in late 2019.</i>	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.

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

	Eligible Employees	Coverage
Line of Duty Act (LODA) Program	Paid employees and volunteers in hazardous duty positions in Virginia localities, including hazardous duty employees covered under VRS, SPORS and VaLORS.	Coverage provides death and health insurance benefits. The LODA death benefit is a one-time payment made to the beneficiary or beneficiaries. Amounts vary as follows: • \$100,000 when a death occurs as the direct or proximate result of performing duty as of January 1, 2006, or after • \$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 • 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 The System is responsible for managing the assets of the Line of Duty Act Fund.
Cost-of-Living Adjustments (COLA) for OPEB Plans	• VRS Group Life Insurance Program, Basic Coverage: If a member has at least 30 years of service credit, 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. • Optional Group Life Insurance: The actuary reviews the maximum coverage levels every five years for possible increases. • Virginia Sickness and Disability Program (VSDP): ○ 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. ○ 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. ○ 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.	

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, 2019. The total OPEB liability was determined based on an actuarial valuation as of June 30, 2018, using updated actuarial assumptions, applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2019. The updated actuarial assumptions include a change in

the assumption for the long-term investment rate of return from 7.00% to 6.75% and this change is reflected in the development of the June 30, 2019, total OPEB liability.

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, 2019

(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)
Group Life Insurance Fund	\$ 3,390,238	\$ 1,762,972	\$ 1,627,266	52.00%	\$ 19,633,771	8.29%
Health Insurance Credit Fund:						
State	1,032,094	109,023	923,071	10.56%	6,844,807	13.49%
Teacher	1,438,114	129,016	1,309,098	8.97%	8,387,684	15.61%
Political Subdivisions*	42,677	24,468	18,209	57.33%	1,081,702	1.68%
Constitutional Officers	31,356	4,479	26,877	14.28%	682,376	3.94%
Social Services Employees	14,730	2,273	12,457	15.43%	279,503	4.46%
Registrars	590	87	503	14.75%	11,770	4.27%
Total Health Insurance Credit	2,559,561	269,346	2,290,215		17,287,842	
Disability Insurance Trust Fund	292,046	488,241	(196,195)	167.18%	4,077,627	-4.81%
Virginia Local Disability Program:						
Teacher	2241	1661	580	74.12%	479,535	0.12%
Political Subdivisions	3989	1962	2027	49.19%	309,020	0.66%
Total Virginia Local Disability Program	6,230	3623	2,607		788,555	
Line of Duty Act Trust Fund	361,626	2,839	358,787	0.79%	**	N/A
Grand Total	\$ 6,609,701	\$ 2,527,021	\$ 4,082,680		\$ 41,787,795	

* 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
Valuation Date	June 30, 2018	June 30, 2018	June 30, 2018	June 30, 2018	June 30, 2018
Actuarial Cost Method	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal	Entry Age Normal
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:					
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
Asset Valuation Method					
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
Actuarial Assumptions					
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	7.25% to 4.75%	N/A
Medical Trend Assumptions (Age 65 and Older)	N/A	N/A	N/A	5.50% to 4.75%	N/A
Year of Ultimate Trend Rate					
Post-65	N/A	N/A	N/A	2023	N/A
Pre-65	N/A	N/A	N/A	2028	N/A

* 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 6.75% 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. This is not the discount rate used in the initial actuarial valuation, however, it was incorporated in the roll-forward calculations as set out in note 3B, above. 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 6.75%, as well as what the employers' net pension liability would be if it were calculated using a discount rate that is 1.00% lower (5.75%) or 1.00% higher (7.75%) 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 3.50%, 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, 2019.

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

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

System/Plan	1.00% Decrease (2.50%)	Current Discount Rate (3.50%)	1.00% Increase (4.50%)
Net LODA OPEB Liability	\$416,220	\$358,787	\$313,363

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

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

System/Plan	1.00% Decrease (6.75% decreasing to 3.75%)	Health Care Cost Trend Rates (7.75% decreasing to 4.75%)	1.00% Increase (8.75% decreasing to 5.75%)
Net LODA OPEB Liability	\$303,352	\$358,787	\$428,698

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

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

System/Plan	Net OPEB Liability		
	1.00% Decrease (5.75%)	Current Discount Rate (6.75%)	1.00% Increase (7.75%)
Group Life Insurance Fund	\$2,137,778	\$ 1,627,266	\$1,213,257
Health Insurance Credit Fund:			
State	1,023,067	923,071	837,133
Teacher	1,465,102	1,309,098	1,176,571
Political Subdivisions	23,385	18,209	14,740
Constitutional Officers	30,245	26,877	24,017
Social Services Employees	13,898	12,457	11,223
Registrars	556	503	457
Total Health Insurance Credit	2,556,253	2,290,215	2,064,141
Disability Insurance Trust Fund	(178,143)	(196,195)	(212,189)
Virginia Local Disability Program:			
Teacher	853	580	344
Political Subdivisions	2332	2027	1,762
Total Virginia Local Disability Program	3,185	2,607	2,106
Grand Total	\$4,519,073	\$ 3,723,893	\$3,067,315

4. Reserve Accounts

The reserve account balances available for benefits at June 30, 2019 and 2018, 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% calculated on the balance as of the previous June 30. 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)

	2019	2018
Virginia Retirement System		
Member Reserve	\$ 14,134,849	\$ 13,551,094
Employer Reserve	63,258,006	60,533,048
Total VRS	77,392,855	74,084,142
State Police Officers' Retirement System		
Member Reserve	105,943	103,710
Employer Reserve	759,330	732,992
Total SPORS	865,273	836,702
Virginia Law Officers' Retirement System		
Member Reserve	244,233	240,390
Employer Reserve	1,251,757	1,183,590
Total VaLORS	1,495,990	1,423,980
Judicial Retirement System		
Member Reserve	48,575	45,158
Employer Reserve	514,881	499,000
Total JRS	563,456	544,158
Group Life Insurance Advance Premium Deposit Reserve	1,762,972	1,594,773
Retiree Health Insurance Credit Reserve	269,346	235,372
Disability Insurance Trust Fund (VSDP)	488,241	462,961
Line of Duty Act Trust Fund	2,839	1,889
Disability Insurance Trust Fund (VLDP)	3,623	1,463
Total Pension and Other Employee Benefit Reserves	\$ 82,844,595	\$ 79,185,440

5. Deposits and Investment Risk Disclosures

A. DEPOSITS

Deposits of the System maintained by the Treasurer of Virginia at June 30, 2019 and 2018, 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)

	2019 Carrying Amount	2018 Carrying Amount
Treasurer of Virginia	\$ 45,732	\$ 37,602
Master Custodian	74,743	76,172
Total Deposits	\$ 120,475	\$ 113,774

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, 2019 and 2018, is presented in Figure 2.15.

FIGURE 2.15: EQUITY INTERESTS

AT JUNE 30

Fund	2019	2018
Virginia Retirement System	93.338%	93.464%
State Police Officers' Retirement System	1.053%	1.068%
Virginia Law Officers' Retirement System	1.820%	1.816%
Judicial Retirement System	0.679%	0.689%
Group Life Insurance Fund	2.196%	2.083%
Retiree Health Insurance Credit Fund	0.324%	0.297%
Disability Insurance Trust Fund (VSDP)	0.583%	0.579%
Line of Duty Act Trust Fund	0.003%	0.002%
Virginia Local Disability Program	0.004%	0.002%
Total Equity Interests	100.000%	100.000%

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 equivalents and certain other short-term, highly liquid investments that are measured at amortized cost as described in F. Investments 1. Investment Valuation are also not classified in the fair value hierarchy. Investments in the Hybrid Defined Contribution Plan of \$520,518,935 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, 2019, and June 30, 2018.

FIGURE 2.16: INVESTMENTS AND DERIVATIVE INSTRUMENTS MEASURED AT FAIR VALUE

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

		Fair Value Measurements Using			
	6/30/2019	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
Investments by Fair Value Level:					
Debt Securities:					
U.S. Government Securities	\$ 4,102,838	\$ 3,359,846	\$ 742,992	\$ —	
Agencies	3,540,542	—	3,540,542	—	
Municipal Securities	138,049	—	138,049	—	
Supranational and Non-U.S. Government Bonds	2,136,551	—	2,136,551	—	
Asset-Backed Securities	924,392	—	924,392	—	
Collateralized Mortgage Obligations	415,354	—	415,354	—	
Commercial Mortgages	441,271	—	441,271	—	
Corporate and Other Bonds	7,505,553	—	7,505,553	—	
Fixed-Income Commingled Funds	20,323	—	—	20,323	
Mutual and Money Market Funds	168,196	168,196	—	—	
Negotiable Certificates of Deposit	107,746	—	107,746	—	
Total Debt Securities	19,500,815	3,528,042	15,952,450	20,323	
Equity Securities:					
Common and Preferred Stocks	24,697,438	24,588,461	107,770	1,207	
Total Equity Securities	24,697,438	24,588,461	107,770	1,207	
Hedge Funds	26,229	—	—	26,229	
Credit Strategies Funds	84	—	—	84	
Private Equity Funds	4,059	—	—	4,059	
Real Estate and Real Asset Funds	823,559	—	—	823,559	
Total Investments by Fair Value Level	\$45,052,184	\$ 28,116,503	\$ 16,060,220	\$ 875,461	
Investments Measured at the Net Asset Value (NAV):					
Hedge Funds	8,835,794				
Credit Strategies Funds	5,558,089				
Private Equity Funds	9,521,407				
Equity International Commingled Funds	2,080,203				
Fixed-Income Commingled Funds	1,322,090				
Real Estate and Real Asset Funds	9,053,640				
U.S. Equity Commingled Funds	127,270				
Total Investments Measured at the NAV	36,498,493				
Total Investments Measured at Fair Value	\$81,550,677				
Investment Derivative Instruments:					
Foreign currency forwards	\$ 6,242	\$ —	\$ 6,242		
Foreign currency options	(59)	—	(59)		
Foreign currency swaps	3,099	—	3,099		
Swaptions	(3)	—	(3)		
Futures contracts	26,197	26,197	—		
Credit default swaps	1,600	—	1,600		
Interest rate swaps	4,049	—	4,049		
Total return swaps	7,649	—	7,649		
Total Investment Derivative Instruments	\$ 48,774	\$ 26,197	\$ 22,577		

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

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

		Fair Value Measurements Using			
	6/30/2018	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
Investments by Fair Value Level:					
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	—	
Total Debt Securities	18,187,635	3,246,792	14,919,993	20,850	
Equity Securities:					
Common and Preferred Stocks	24,477,607	24,392,830	83,305	1,472	
Total Equity Securities	24,477,607	24,392,830	83,305	1,472	
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	
Total Investments by Fair Value Level	\$ 47,533,028	\$ 27,639,622	\$ 15,003,298	\$ 4,890,108	
Investments Measured at the Net Asset Value (NAV):					
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				
Total Investments Measured at the NAV	29,135,990				
Total Investments Measured at Fair Value	\$ 76,669,018				
Investment Derivative Instruments:					
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		
Total Investment Derivative Instruments	\$ (2,983)	\$ (25,435)	\$ 22,452		

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, the income approach and/or

the cost 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 cost approach is often based on the amount that would currently be required to replace an asset with one of comparable utility. In particular, the System has an investment in a real estate multi-family housing development company that is employing the cost approach by using the cumulative cost of construction in progress as a proxy for fair value.

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 net asset value (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, eurodollars, 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, 2019

(EXPRESSED IN THOUSANDS)

	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Hedge Funds:				
Equity Long/Short Funds	\$ 4,495,242	\$ —	Monthly, quarterly, semi-annually, annually	45-90 days
Equity Long-Only Funds	1,774,781	—	Daily, quarterly, annually	14-90 days
Credit Funds	765,672	—	Quarterly, annually	45-90 days
Multi-Strategy Funds	1,800,099	—	Monthly, quarterly, semi-annually	30-90 days
Total Hedge Funds	8,835,794	—		
Credit Strategies Funds:				
Bank Loan and Direct Lending Funds	1,846,954	1,397,660		
Distressed Debt Funds	695,018	636,531		
Mezzanine Debt Funds	429,050	465,024		
Multi-Strategy Funds	1,085,684	1,595,625		
Opportunistic Funds	1,501,383	232,487		
Total Credit Strategies Funds	5,558,089	4,327,327		
Private Equity Funds:				
Buyout Funds	5,023,821	2,590,662		
Energy Funds	701,245	255,246		
Growth Funds	1,055,431	751,653		
International Buyout Funds	1,200,400	810,058		
Special Situations Funds	935,717	862,472		
Subordinated Debt Funds	76,655	265,319		
Turnaround Funds	469,383	193,567		
Venture Capital Funds	58,755	15,754		
Total Private Equity Funds	9,521,407	5,744,731		
Equity International Commingled Funds	2,080,203	—		
Fixed-Income Commingled Funds	1,322,090	—		
Real Estate and Real Asset Funds:				
Infrastructure Funds	1,750,510	590,367		
Natural Resources Funds	1,328,116	551,870		
Private Investment Real Estate Funds	5,761,136	822,172		
Private Real Estate Investment Trusts	213,878	—		
Total Real Estate and Real Asset Funds	9,053,640	1,964,409		
U.S. Equity Commingled Funds	127,270	—		
Total Investments Measured at the NAV	\$ 36,498,493	\$ 12,036,467		

FIGURE 2.17: INVESTMENTS MEASURED AT THE NAV, cont.

AS OF JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	Fair Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Hedge Funds:				
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
Total Hedge Funds	7,186,321	49,200		
Credit Strategies Funds:				
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		
Total Credit Strategies Funds	4,890,732	3,696,890		
Private Equity Funds:				
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		
Total Private Equity Funds	7,118,524	4,242,914		
Equity International Commingled Funds	1,701,323	—		
Fixed-Income Commingled Funds	1,339,359	—		
Real Estate and Real Asset Funds:				
Infrastructure Funds	1,169,840	310,684		
Natural Resources Funds	595,604	100,070		
Private Investment Real Estate Funds	4,789,972	760,887		
Real Estate Investment Trusts	198,888	—		
Total Real Estate and Real Asset Funds	6,754,304	1,171,641		
U.S. Equity Commingled Funds	145,427	—		
Total Investments Measured at the NAV	\$ 29,135,990	\$ 9,160,645		

Description of Investments Measured at the NAV

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

HEDGE FUNDS:

- **Equity Long/Short Hedge Funds:** This type included investments in 11 hedge funds at June 30, 2019, and 10 hedge funds at June 30, 2018, 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 66% 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, 2019.
- **Equity Long-Only Hedge Funds:** This type included an investment in four hedge funds at June 30, 2019, and one hedge fund at June 30, 2018, which invest in global long-only equity positions. These hedge funds are 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 67% 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 48 months after acquisition. The remaining restriction period for these investments was less than 12 months at June 30, 2019.
- **Credit Hedge Funds:** This type included investments in two hedge funds at both June 30, 2019, and June 30, 2018, 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 12% 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 next 12 months. The restriction period for redemptions in regard to 88% of investments in this type was less than 12 months at June 30, 2019.
- **Multi-Strategy Hedge Funds:** This type included investments in six hedge funds at June 30, 2019, and five hedge funds at June 30, 2018, 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 33% 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 12 months at June 30, 2019.
- **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 ten institutional investment funds at June 30, 2019, 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 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.
- **U.S. Equity Commingled Funds:** This type includes investments in five institutional investment funds at June 30, 2019, which invest in domestic equities. These funds employ a variety of investment strategies in small-, mid-, and large-cap U.S. stocks. 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.
- **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 income as well as 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, 2019, 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, 2019:

FIGURE 2.18: DEBT SECURITIES SUBJECT TO INTEREST RATE RISK

AT JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

Investment Type	Weighted Average Effective Duration	Fair Value	Percent of Debt Securities
Effective Duration:			
Agencies	1.97	\$ 3,494,047	14.8%
Asset-Backed Securities	1.80	907,154	3.8%
Collateralized Mortgage Obligations	2.15	415,354	1.8%
Commercial Mortgages	3.92	439,299	1.9%
Commercial Paper	0.13	1,898,695	8.1%
Corporate Bonds and Notes	4.81	7,418,397	31.4%
Fixed-Income Commingled Funds	5.09	1,342,398	5.7%
Fixed-Income Derivatives	21.84	12,637	0.1%
Municipal Securities	6.20	138,049	0.6%
Mutual & Money Market Funds	4.54	168,196	0.7%
Negotiable Certificates of Deposit	0.22	375,196	1.6%
Supranational & Non-U.S. Government Bonds	6.54	2,144,283	9.1%
Time Deposits	0.01	116,000	0.5%
U.S. Government	5.96	4,181,473	17.7%
No Effective Duration:			
Mutual & Money Market Funds	N/A	352,216	1.5%
Corporate Bonds and Notes	N/A	96,090	0.4%
Agencies	N/A	46,495	0.2%
Asset-Backed Securities	N/A	17,238	0.1%
Fixed-Income Derivatives	N/A	4,412	0.0%
Commercial Mortgages	N/A	1,972	0.0%
Supranational & Non-U.S. Government Bonds	N/A	1,550	0.0%
Fixed-income Commingled Funds	N/A	15	0.0%
Total Debt Securities	4.12	\$ 23,571,166	100.0%

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, 2019, was reinvested in cash equivalents and short-term investments 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, 2019

(EXPRESSED IN THOUSANDS)

Investment Type	Carrying Amount	Weighted Average Effective Duration
Commercial Paper	\$ 92,070	0.085
Corporate Bonds and Notes	3,114,332	0.065
Negotiable Certificates of Deposit	60,380	0.198
Repurchase Agreements	1,401,054	0.003
Total	\$ 4,667,836	0.049

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, 2019, the System's fixed-income assets that are not government-guaranteed represented 82% 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, 2019, 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, 2019

(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/F1**	Less than Investment Grade	Unrated	Totals
U.S. Government Agencies:								
FHLB	\$ —	\$ 116,856	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 116,856
FHLMC	6,748	667,831	4,335	—	—	502	—	679,416
FNMA	1,197	1,042,213	—	7,962	—	—	1,694,588	2,745,960
Other Agencies	35,101	69,101	—	—	—	—	—	104,202
Short-Term Debt:								
Commercial Paper	—	—	15,000	—	1,866,860	—	16,835	1,898,695
Mutual and Money Market Funds	—	—	8,247	—	331,823	61,147	119,195	520,412
Negotiable Certificates of Deposit	—	25,019	65,250	—	30,000	—	254,927	375,196
Time Deposits	—	—	—	—	—	—	116,000	116,000
Total U.S. Government and Short-Term Debt	43,046	1,921,020	92,832	7,962	2,228,683	61,649	2,201,545	6,556,737
Long-Term Debt								
Asset-Backed Securities	350,094	182,387	121,783	73,697	—	172,545	23,886	924,392
Collateralized Mortgage Obligations	160,853	—	2,592	3,912	—	41,957	102,351	311,665
Commercial Mortgages	323,589	41,973	—	6,988	—	43,906	22,612	439,068
Corporate Bonds and Notes	38,705	378,559	1,798,167	2,427,612	—	1,394,262	1,477,182	7,514,487
Fixed-Income Commingled Funds	—	—	—	—	—	—	1,342,413	1,342,413
Fixed-Income Derivatives	—	—	—	—	—	—	17,049	17,049
Municipal Securities	10,761	117,725	9,563	—	—	—	—	138,049
Supranational and Non-U.S. Government Bonds	167,679	59,534	207,715	510,542	—	1,110,723	89,640	2,145,833
Total Long-Term Debt	1,051,681	780,178	2,139,820	3,022,751	—	2,763,393	3,075,133	12,832,956
Total	\$1,094,727	\$ 2,701,198	\$ 2,232,652	\$ 3,030,713	\$ 2,228,683	\$ 2,825,042	\$ 5,276,678	\$ 19,389,693

* 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

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

Investment Type	Carrying Amount by Most Conservative Credit Rating – Moody's/S&P/Fitch				Totals
	Aa/AA	A	P/A-1, AAAm/F1**	Unrated	
Commercial Paper	\$ —	\$ —	\$ 92,070	\$ —	\$ 92,070
Corporate Bonds and Notes	962,864	1,906,750	244,718	—	3,114,332
Negotiable Certificates of Deposits	—	—	60,380	—	60,380
Repurchase Agreements	—	—	—	178,153	178,153
Total*	\$ 962,864	\$ 1,906,750	\$ 397,168	\$ 178,153	\$ 3,444,935

* This figure does not include \$1,222,901 in equity repurchase agreements that are not subject to GASB 40 disclosure. The total of the investments in the securities lending collateral portfolio is \$4,667,836.

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

- **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, 2019, 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, 2019, is highlighted in Figure 2.22.

FIGURE 2.22: CURRENCY EXPOSURES BY ASSET CLASS

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

Currency	Cash and Short-term Investments	Equity	Fixed Income	Private Equity	Real Assets	International Funds	Forward Contracts	Total
U.S. Dollar	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 1,923,144	\$ —	\$ 1,923,144
Euro Currency Unit	132,496	2,133,693	52,877	771,932	340,555	—	(1,535,035)	1,896,518
Japanese Yen	18,704	1,884,573	(29)	—	2,619	246,997	(772,978)	1,379,886
Hong Kong Dollar	8,746	1,058,015	—	—	3,712	—	(144,382)	926,091
Pound Sterling	5,535	1,154,114	1,084	—	90,586	—	(736,940)	514,379
South Korean Won	3,596	404,648	—	—	808	—	(17,780)	391,272
Swiss Franc	27,178	596,807	—	—	754	—	(264,511)	360,228
New Zealand Dollar	238	17,749	—	—	1,279	—	333,422	352,688
Canadian Dollar	22,513	808,123	—	—	24,126	—	(518,788)	335,974
Brazilian Real	2,925	169,228	81,253	—	5,457	—	5,037	263,900
Australian Dollar	7,809	592,176	—	—	5,229	—	(348,580)	256,634
Indian Rupee	1,096	223,835	5,093	—	—	—	10,676	240,700
South African Rand	1,940	138,199	67,646	—	524	—	(19,921)	188,388
New Taiwan Dollar	2,226	180,385	—	—	—	—	(4,240)	178,371
Thailand Baht	2,204	98,200	24,831	—	—	—	8,948	134,183
Swedish Krona	2,226	217,102	—	—	1,781	—	(107,413)	113,696
Indonesian Rupiah	2,337	50,418	75,442	—	—	—	(17,418)	110,779
Mexican Peso	1,009	47,995	26,089	—	1,017	—	29,887	105,997
Turkish Lira	607	75,051	17,219	—	267	—	3,976	97,120
Polish Zloty	685	29,607	40,996	—	1,326	—	16,101	88,715
Russian Ruble (New)	562	21,052	62,891	—	—	—	(11,059)	73,446
Malaysian Ringgit	1,438	36,014	29,081	—	—	—	6,291	72,824
Danish Krone	2,436	118,473	—	—	875	—	(63,282)	58,502
Colombian Peso	542	2,889	29,838	—	—	—	18,618	51,887
Peruvian Sol	176	—	55,302	—	—	—	(7,030)	48,448
Czech Koruna	899	1,939	1,180	—	—	—	35,543	39,561
Hungarian Forint	360	11,379	29,103	—	—	—	(4,359)	36,483
Chinese Yuan Renminbi	547	72,490	—	—	—	—	(46,327)	26,710
Israeli Shekel	42	43,125	701	—	2,620	—	(21,688)	24,800
Chilean Peso	505	19,764	7,070	—	—	—	(5,330)	22,009
Nigerian Naira	12,598	—	—	—	—	—	9,082	21,680
Egyptian Pound	5,189	6,029	—	—	—	—	8,727	19,945
Philippines Peso	229	8,575	1,327	—	—	—	3,440	13,571
Dominican Republic Peso	—	—	11,983	—	—	—	—	11,983
UAE Dirham	(159)	9,591	—	—	—	—	1,697	11,129
Argentine Peso	537	—	6,552	—	—	—	719	7,808
Kazakhstan Tenge	—	—	6,370	—	—	—	331	6,701
Qatari Riyal	390	4,537	—	—	—	—	—	4,927
Uruguayan Peso	—	—	3,534	—	—	—	—	3,534
Ukrainian Hryvnia	748	—	—	—	—	—	1,180	1,928
Romanian Leu	108	—	5,006	—	—	—	(4,437)	677
Sri Lanka Rupee	—	—	599	—	—	—	—	599
Chinese R Yuan HK	—	—	—	—	—	—	189	189
Moroccan Dirham	1	—	—	—	—	—	—	1
Saudi Arabian Riyal	—	—	(83)	—	—	—	—	(83)
Omani Rial	—	—	—	—	—	—	(5,080)	(5,080)
Singapore Dollar	2,834	199,276	—	—	—	—	(332,684)	(130,574)
Norwegian Krone	2,761	102,505	—	—	362	—	(308,403)	(202,775)
Total	\$ 276,813	\$ 10,537,556	\$ 642,955	\$ 771,932	\$ 483,897	\$ 2,170,141	\$(4,803,801)	\$ 10,079,493

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, 2019 and 2018, was \$8,574,945,000 and \$8,248,549,000, respectively. The June 30, 2019 and 2018, balances were composed of U.S. government and agency securities of \$2,710,732,000 and \$2,595,048,000, respectively; corporate and other bonds of \$1,177,523,000 and \$1,064,400,000, respectively; common and preferred stocks of \$4,573,701,000 and \$4,520,907,000, respectively; and supranational and non-U.S. government bonds of \$112,989,000 and \$68,194,000, respectively.

The value of collateral (cash and non-cash) at June 30, 2019 and 2018, was \$9,044,872,000 and \$8,773,115,000, 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, 2019, the invested cash collateral had a cost of \$4,667,836,000 and was composed of negotiable certificates of deposit of \$60,380,000, floating rate notes of \$3,114,332,000, commercial paper of \$92,070,000 and repurchase agreements of \$1,401,054,000.

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, 2019 and 2018, included (1) receivables for deposits with brokers for securities sold short of \$620,745,000 and \$731,714,000, respectively; and (2) payables for securities sold short and not covered with fair values of \$624,614,000 and \$663,743,000, 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, 2019, 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, 2019		Fair Value June 30, 2019	
Derivatives (by Type)	Amount	Classification	Amount	Notional (Dollars)
Commodity Futures Long	\$ 208	Equity Securities	\$ 208	\$ 2,403
Commodity Futures Short	(66)	Equity Securities	—	—
Credit Default Swaps Bought	56	Debt Securities	1,403	35,447
Credit Default Swaps Written	2,420	Debt Securities	197	45,200
Fixed-Income Futures Long	27,735	Debt Securities	30,607	1,804,401
Fixed-Income Futures Short	(18,921)	Debt Securities	(21,957)	(1,500,781)
Foreign Currency Futures Short	(348)	Debt Securities	(348)	(33,596)
Foreign Currency Options Written	134	Equity Securities	(59)	(5,600)
FX Forwards	(18,142)	Investment Sales/Purchases	6,242	4,554,076
Index Futures Long	44,032	Equity Securities	18,510	935,970
Index Futures Short	(1,009)	Equity Securities	(823)	(58,572)
Pay Fixed Foreign Currency Swaps	—	Debt Securities	—	1,455
Receive Fixed Foreign Currency Swaps	3,099	Debt Securities	3,099	3,099
Pay Fixed-Interest Rate Swaps	(10,540)	Debt Securities	(8,396)	577,373
Receive Fixed-Interest Rate Swaps	16,108	Debt Securities	12,445	513,273
Swaptions Written	2	Equity Securities	(3)	(21,400)
Total Return Bond Index Swaps	1,304	Equity Securities	949	80,522
Total Return Equity Index Swaps	5,686	Equity Securities	6,700	111,857
Total	\$ 51,758		\$ 48,774	

FIGURE 2.24: DERIVATIVE INSTRUMENTS SUBJECT TO INTEREST RATE RISK

(EXPRESSED IN THOUSANDS)

Investment Type	Fair Value June 30, 2019	Investment Maturities (in years)			
		Under-1	1-5	6-10	Greater than 10
Credit Default Swaps Bought	\$ 1,403	\$ —	\$ 1,403	\$ —	\$ —
Credit Default Swaps Written	197	(4)	201	—	—
Receive Fixed Foreign Currency Swaps	3,099	—	3,099	—	—
Pay Fixed Interest Rate Swaps	(8,396)	(603)	(3,673)	(4,120)	—
Receive Fixed Interest Rate Swaps	12,445	(271)	8,306	4,351	59
Total	\$ 8,748	\$ (878)	\$ 9,336	\$ 231	\$ 59

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, commodities and equity index futures at June 30, 2019, 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, 2019, 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 2019	Fair Value 2018
Argentine Peso	\$ 337	\$ 42,093	\$ (41,374)	\$ 719	\$ (1,580)
Australian Dollar	(323,869)	174,732	(497,553)	(322,821)	49,207
Brazilian Real	4,652	27,501	(22,418)	5,083	(44,240)
British Pound Sterling	(748,028)	189,325	(935,320)	(745,995)	(613,241)
Canadian Dollar	(475,215)	291,808	(767,996)	(476,188)	(239,768)
Chilean Peso	(5,242)	20,129	(25,459)	(5,330)	6,205
Chinese Yuan Renminbi	(45,785)	5,844	(52,053)	(46,209)	(46,367)
Chinese Yuan Renminbi HK	1,232	35,177	(34,988)	189	(14,282)
Colombian Peso	18,058	25,688	(7,070)	18,618	9,451
Czech Koruna	34,377	45,647	(10,104)	35,543	53,882
Danish Krone	(60,522)	11,789	(72,397)	(60,608)	(71,218)
Egyptian Pound	7,963	16,807	(8,080)	8,727	8,427
Euro Currency Unit	(1,493,896)	546,622	(2,046,534)	(1,499,912)	(1,816,748)
Hong Kong Dollar	(170,681)	15,229	(185,717)	(170,488)	(181,446)
Hungarian Forint	(4,985)	9,491	(14,489)	(4,998)	(12,192)
Indian Rupee	10,595	11,970	(1,294)	10,676	(6,011)
Indonesian Rupiah	(17,096)	11,436	(28,517)	(17,081)	3,515
Israeli Shekel	(21,630)	7,693	(29,381)	(21,688)	(25,389)
Japanese Yen	(668,515)	395,550	(1,059,969)	(664,419)	(1,150,961)
Kazakhstan Tenge	269	4,658	(4,327)	331	2,578
Malaysian Ringgit	6,314	14,630	(8,338)	6,292	(787)
Mexican Peso	29,159	52,873	(23,680)	29,193	40,960
New Taiwan Dollar	(4,165)	6,354	(10,594)	(4,240)	(2,128)
New Zealand Dollar	326,332	420,384	(86,962)	333,422	86,033
Nigerian Naira	8,768	11,467	(2,385)	9,082	6,427
Norwegian Krone	(295,788)	74,063	(373,707)	(299,644)	(222,461)
Omani Rial	(5,062)	—	(5,080)	(5,080)	(1,384)
Peruvian Sol	(7,021)	29,602	(36,632)	(7,030)	(3,454)
Philippine Peso	3,390	7,657	(4,216)	3,441	(8,199)
Polish Zloty	15,936	25,206	(9,105)	16,101	7,160
Romanian Leu	(4,388)	5,154	(9,591)	(4,437)	(9,681)
Russian Ruble (New)	(10,663)	11,793	(22,852)	(11,059)	12,888
Saudi Arabia Riyal	1	1,373	(1,373)	—	(1,373)
Singapore Dollar	(318,065)	29,061	(349,629)	(320,568)	(253,348)
South African Rand	(20,044)	20,844	(41,127)	(20,283)	(21,367)
South Korean Won	(17,579)	6,619	(24,399)	(17,780)	(5,234)
Swedish Krona	(88,869)	196,733	(283,915)	(87,182)	(289,244)
Swiss Franc	(256,704)	79,773	(335,051)	(255,278)	(266,256)
Thai Baht	8,519	20,052	(11,104)	8,948	23,590
Turkish Lira	4,578	10,923	(6,205)	4,718	30,073
Ukrainian Hryvnia	1,035	5,798	(4,618)	1,180	—
U.S. Dollar	4,582,297	7,371,710	(2,789,413)	4,582,297	4,992,352
Total Forwards Subject to Foreign Currency Risk				\$ 6,242	\$ 24,389

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, 2019, 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 2019, the System had activity in credit default, foreign currency, 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, 2019, 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, 2019	Notional Amount
Foreign Currency Swaps	Receive Fixed Turkish Lira 20.79%, Pay Variable 3-month LIBOR USD	\$ 403	\$ 403
Foreign Currency Swaps	Receive Fixed Turkish Lira 22.38%, Pay Variable 3-month LIBOR USD	2,696	2,696
Foreign Currency Swaps	Receive Variable 3-month LIBOR USD, Pay Fixed Turkish Lira 23.67%	—	1,455
Subtotal Foreign Currency Swaps		\$ 3,099	\$ 4,554

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Interest Rate Swaps	Receive Fixed 1.81%, Pay Variable Israel 3-month TELBOR	\$ 220	\$ 5,271
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.26%	2	27,618
Interest Rate Swaps	Receive Fixed 1.05%, Pay Variable Israel 3-month TELBOR	81	5,271
Interest Rate Swaps	Receive Fixed 7.407%, Pay Variable 28-day MTIIE	14	1,827
Interest Rate Swaps	Receive Fixed 8.58%, Pay Variable 28-day MTIIE	34	2,866
Interest Rate Swaps	Receive Fixed 8.83%, Pay Variable 28-day MTIIE	75	4,996
Interest Rate Swaps	Receive Fixed 8.67%, Pay Variable 28-day MTIIE	32	2,477
Interest Rate Swaps	Receive Fixed 7.97%, Pay Variable 28-day MTIIE	33	5,742
Interest Rate Swaps	Receive Fixed 7.51%, Pay Variable 28-day MTIIE	27	7,696
Interest Rate Swaps	Receive Variable Chilean Peso 1-day CLICP, Pay Fixed 3.95%	(54)	898
Interest Rate Swaps	Receive Variable Chilean Peso 1-day CLICP, Pay Fixed 3.95%	(54)	898
Interest Rate Swaps	Receive Fixed 5.17%, Pay Variable 1-day Colombia IBR	19	692
Interest Rate Swaps	Receive Fixed 5.83%, Pay Variable 1-day Colombia IBR	54	1,165
Interest Rate Swaps	Receive Fixed 7.42%, Pay Variable Brazil 1-day CDI	122	6,001
Interest Rate Swaps	Receive Fixed 7.71%, Pay Variable Brazil 1-day CDI	21	776
Interest Rate Swaps	Receive Fixed 7.265%, Pay Variable Brazil 1-day CDI	—	879
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 6.25%	(42)	42,425
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 6.93%	—	14,507
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 7.05%	(7)	444
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 8.635%	(526)	8,923
Interest Rate Swaps	Receive Fixed 6.26%, Pay Variable Brazil 1-day CDI	—	2,192
Interest Rate Swaps	Receive Fixed 6.93%, Pay Variable Brazil 1-day CDI	7	470
Interest Rate Swaps	Receive Fixed 7.42%, Pay Variable Brazil 1-day CDI	161	6,601
Interest Rate Swaps	Receive Fixed 7.48%, Pay Variable Brazil 1-day CDI	69	3,575
Interest Rate Swaps	Receive Fixed 7.80%, Pay Variable Brazil 1-day CDI	109	4,357
Interest Rate Swaps	Receive Fixed 8.64%, Pay Variable Brazil 1-day CDI	141	2,374
Interest Rate Swaps	Receive Fixed 1.50%, Pay Variable Czech Krona 6-month PRIBOR	(123)	18,350
Interest Rate Swaps	Receive Fixed 2.00%, Pay Variable Czech Krona 6-month PRIBOR	(136)	3,983
Interest Rate Swaps	Receive Fixed 1.78%, Pay Variable Czech Krona 6-month PRIBOR	8	2,014
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable Czech Krona 6-month PRIBOR	185	34,485
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable 6-month Hungary BUBOR	322	6,457
Interest Rate Swaps	Receive Fixed 2.00%, Pay Variable 6-month Hungary BUBOR	141	3,503
Interest Rate Swaps	Receive Fixed 1.20%, Pay Variable 6-month Hungary BUBOR	155	13,086
Interest Rate Swaps	Receive Fixed 8.32%, Pay Variable 28-day MTIIE	142	2,655

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

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Interest Rate Swaps	Receive Fixed 6.71%, Pay Variable 28-day MTIIE	(147)	2,275
Interest Rate Swaps	Receive Fixed 8.28%, Pay Variable 28-day MTIIE	59	1,291
Interest Rate Swaps	Receive Fixed 8.31%, Pay Variable 28-day MTIIE	140	2,858
Interest Rate Swaps	Receive Fixed 8.01%, Pay Variable 28-day MTIIE	157	4,778
Interest Rate Swaps	Receive Fixed 8.34%, Pay Variable 28-day MTIIE	46	1,166
Interest Rate Swaps	Receive Fixed 8.81%, Pay Variable 28-day MTIIE	817	14,090
Interest Rate Swaps	Receive Fixed 8.80%, Pay Variable 28-day MTIIE	334	5,731
Interest Rate Swaps	Receive Fixed 8.97%, Pay Variable 28-day MTIIE	363	5,606
Interest Rate Swaps	Receive Fixed 8.61%, Pay Variable 28-day MTIIE	217	2,863
Interest Rate Swaps	Receive Fixed 8.00%, Pay Variable 28-day MTIIE	429	12,690
Interest Rate Swaps	Receive Fixed 7.99%, Pay Variable 28-day MTIIE	53	1,598
Interest Rate Swaps	Receive Fixed 8.24%, Pay Variable 28-day MTIIE	103	2,082
Interest Rate Swaps	Receive Fixed 8.54%, Pay Variable 28-day MTIIE	103	1,400
Interest Rate Swaps	Receive Fixed 8.38%, Pay Variable 28-day MTIIE	24	8,151
Interest Rate Swaps	Receive Fixed 7.68%, Pay Variable 28-day MTIIE	13	1,624
Interest Rate Swaps	Receive Fixed 7.89%, Pay Variable 28-day MTIIE	5	2,103
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable Poland 6-month WIBOR	(165)	37,005
Interest Rate Swaps	Receive Fixed 3.25%, Pay Variable Poland 6-month WIBOR	108	1,126
Interest Rate Swaps	Receive Fixed 3.00%, Pay Variable Poland 6-month WIBOR	14	188
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable Poland 6-month WIBOR	112	6,194
Interest Rate Swaps	Receive Fixed 2.25%, Pay Variable Poland 6-month WIBOR	44	2,387
Interest Rate Swaps	Receive Fixed 2.00%, Pay Variable Poland 6-month WIBOR	98	14,695
Interest Rate Swaps	Receive Fixed 1.50%, Pay Variable 3-month LIBOR	(192)	6,700
Interest Rate Swaps	Receive Fixed 1.75%, Pay Variable 3-month LIBOR	(259)	2,500
Interest Rate Swaps	Receive Fixed 2.50%, Pay Variable 3-month LIBOR	17	290
Interest Rate Swaps	Receive Fixed 3.00%, Pay Variable 3-month LIBOR	124	1,350
Interest Rate Swaps	Receive Fixed 3.00%, Pay Variable 3-month LIBOR	278	4,710
Interest Rate Swaps	Receive Fixed 7.75%, Pay Variable 3-month JIBAR	60	4,829
Interest Rate Swaps	Receive Fixed 7.25%, Pay Variable 3-month JIBAR	11	915
Interest Rate Swaps	Receive Fixed 8.75%, Pay Variable 3-month JIBAR	298	3,936
Interest Rate Swaps	Receive Variable Czech Krona 6-month PRIBOR, Pay Fixed 2.00%	(28)	1,244
Interest Rate Swaps	Receive Variable 6-month Hungary BUBOR, Pay Fixed 1.25%	(84)	9,765
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 9.05%	(1,205)	11,384
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 9.21%	(138)	1,171
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 9.08%	(383)	3,529
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 9.09%	(231)	2,113
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 8.55%	(150)	2,092
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 8.54%	(122)	1,718
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 8.43%	(123)	1,952
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 8.49%	(22)	1,905
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 7.73%	(286)	19,202
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 7.75%	(125)	8,016
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 7.9%	(71)	2,800
Interest Rate Swaps	Receive Variable 28-day MTIIE, Pay Fixed 8.26%	(14)	8,151

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

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Interest Rate Swaps	Receive Variable Poland 6-month WIBOR, Pay Fixed 1.94%	(13)	3,003
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 2.75%	(256)	5,930
Interest Rate Swaps	Receive Variable 3-month LIBOR, Pay Fixed 3.00%	(461)	49,960
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 9.50%	(101)	844
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.50%	(28)	440
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.25%	(1)	28
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 7.75%	(87)	2,908
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 7.52%	(36)	1,752
Interest Rate Swaps	Receive Variable 3-month JIBAR, Pay Fixed 8.00%	(36)	1,610
Interest Rate Swaps	Receive Fixed 12.25%, Pay Variable Brazil 1-day CDI	312	1,696
Interest Rate Swaps	Receive Fixed 9.76%, Pay Variable Brazil 1-day CDI	203	2,087
Interest Rate Swaps	Receive Fixed 10.30%, Pay Variable Brazil 1-day CDI	190	1,670
Interest Rate Swaps	Receive Fixed 9.98%, Pay Variable Brazil 1-day CDI	223	4,253
Interest Rate Swaps	Receive Fixed 10.33%, Pay Variable Brazil 1-day CDI	1,309	11,402
Interest Rate Swaps	Receive Fixed 9.60%, Pay Variable Brazil 1-day CDI	453	4,696
Interest Rate Swaps	Receive Fixed 11.35%, Pay Variable Brazil 1-day CDI	122	783
Interest Rate Swaps	Receive Fixed 8.79%, Pay Variable Brazil 1-day CDI	481	12,785
Interest Rate Swaps	Receive Fixed 10.30%, Pay Variable Brazil 1-day CDI	32	261
Interest Rate Swaps	Receive Fixed 6.80%, Pay Variable Brazil 1-day CDI	(1)	5,323
Interest Rate Swaps	Receive Fixed 7.83%, Pay Variable Brazil 1-day CDI	332	12,994
Interest Rate Swaps	Receive Fixed 7.19%, Pay Variable Brazil 1-day CDI	28	1,383
Interest Rate Swaps	Receive Fixed 7.22%, Pay Variable Brazil 1-day CDI	25	1,435
Interest Rate Swaps	Receive Fixed 7.18%, Pay Variable Brazil 1-day CDI	14	809
Interest Rate Swaps	Receive Fixed 7.21%, Pay Variable Brazil 1-day CDI	132	7,514
Interest Rate Swaps	Receive Fixed 7.22%, Pay Variable Brazil 1-day CDI	41	2,322
Interest Rate Swaps	Receive Fixed 8.48%, Pay Variable Brazil 1-day CDI	170	3,157
Interest Rate Swaps	Receive Fixed 8.68%, Pay Variable Brazil 1-day CDI	351	5,792
Interest Rate Swaps	Receive Fixed 6.92%, Pay Variable Brazil 1-day CDI	80	5,792
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.64%	(71)	4,227
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.46%	(601)	4,723
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 7.06%	(40)	8,375
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 9.97%	(37)	720
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 11.03%	(140)	1,252
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.42%	(848)	8,689
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 10.09%	(323)	2,844
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 8.70%	(221)	3,575
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 6.98%	(103)	6,993
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 6.86%	(278)	21,265
Interest Rate Swaps	Receive Variable Brazil 1-day CDI, Pay Fixed 6.4075%	29	119,656
Interest Rate Swaps	Receive Fixed 12.23%, Pay Variable Brazil 1-day CDI	(49)	626
Interest Rate Swaps	Receive Fixed 7.53%, Pay Variable 28-day MTIE	25	3,308
Interest Rate Swaps	Receive Fixed 8.71%, Pay Variable 28-day MTIE	14	1,084
Interest Rate Swaps	Receive Fixed 8.71%, Pay Variable 28-day MTIE	23	1,806
Interest Rate Swaps	Receive Variable 28-day MTIE, Pay Fixed 5.25%	(4)	573

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

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Interest Rate Swaps	Receive Fixed 3.41%, Pay Variable 6-month Thai Baht fixing rate	5	163
Interest Rate Swaps	Receive Fixed 3.41%, Pay Variable 6-month Thai Baht fixing rate	5	163
Interest Rate Swaps	Receive Fixed 5.29%, Pay Variable 1-day Colombia IBR	3	1,257
Interest Rate Swaps	Receive Fixed 6.12%, Pay Variable 1-day Colombia IBR	53	742
Interest Rate Swaps	Receive Fixed 5.00%, Pay Variable 28-day MTIE	(10)	994
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable 6-month Thai Baht fixing rate	17	372
Interest Rate Swaps	Receive Fixed 5.32%, Pay Variable 1-day Colombia IBR	2	187
Interest Rate Swaps	Receive Fixed 2.02%, Pay Variable 6-month Thai Baht fixing rate	3	620
Interest Rate Swaps	Receive Fixed 2.58%, Pay Variable 6-month Thai Baht fixing rate	25	496
Interest Rate Swaps	Receive Fixed 1.93%, Pay Variable 6-month Thai Baht fixing rate	8	1,271
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.26%	1	34,515
Interest Rate Swaps	Receive Fixed 1.81%, Pay Variable Israel 3-month TELBOR	100	2,383
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.65%	(12)	3,060
Interest Rate Swaps	Receive Fixed 4.95%, Pay Variable 1-day Colombia IBR	31	2,085
Interest Rate Swaps	Receive Fixed 4.81%, Pay Variable 1-day Colombia IBR	292	22,509
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.89%	(282)	19,021
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.59%	(20)	6,028
Interest Rate Swaps	Receive Fixed 5.83%, Pay Variable 1-day Colombia IBR	4	98
Interest Rate Swaps	Receive Fixed 1.92%, Pay Variable 6-month Thai Baht fixing rate	8	740
Interest Rate Swaps	Receive Fixed 5.88%, Pay Variable 1-day Colombia IBR	47	945
Interest Rate Swaps	Receive Fixed 7.97%, Pay Variable 28-day MTIE	6	1,139
Interest Rate Swaps	Receive Fixed 3.54%, Pay Variable Chilean Peso 6-month CLICP	124	3,913
Interest Rate Swaps	Receive Variable Malaysian Ringgit 3-month KLIBOR, Pay Fixed 3.77%	(33)	3,097
Interest Rate Swaps	Receive Variable Malaysian Ringgit 3-month KLIBOR, Pay Fixed 3.74%	(10)	968
Interest Rate Swaps	Receive Variable Malaysian Ringgit 3-month KLIBOR, Pay Fixed 3.76%	(18)	1,694
Interest Rate Swaps	Receive Variable Chilean Peso 6-month CLICP, Pay Fixed 3.57%	(8)	220
Interest Rate Swaps	Receive Fixed 3.54%, Pay Variable Chilean Peso 6-month CLICP	50	1,462
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.22%	9	35,553
Interest Rate Swaps	Receive Fixed 1.72%, Pay Variable Israel 3-month TELBOR	217	6,421
Interest Rate Swaps	Receive Fixed 4.96%, Pay Variable 1-day Colombia IBR	288	19,021
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.64%	(85)	8,450
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.65%	(131)	12,957
Interest Rate Swaps	Receive Fixed 6.57%, Pay Variable 1-day Colombia IBR	216	1,965
Interest Rate Swaps	Receive Fixed 4.28%, Pay Variable Chilean Peso 6-month CLICP	112	1,321
Interest Rate Swaps	Receive Fixed 5.31%, Pay Variable 1-day Colombia IBR	105	2,908
Interest Rate Swaps	Receive Fixed 2.10%, Pay Variable 6-month Thai Baht fixing rate	57	4,187
Interest Rate Swaps	Receive Fixed 4.04%, Pay Variable Chilean Peso 6-month CLICP	210	3,210
Interest Rate Swaps	Receive Fixed 0.97%, Pay Variable Israel 3-month TELBOR	62	5,524
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.45%	(11)	6,897
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.49%	(299)	9,355
Interest Rate Swaps	Receive Fixed 5.83%, Pay Variable 1-day Colombia IBR	462	9,978

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

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Interest Rate Swaps	Receive Fixed 1.94%, Pay Variable 6-month Thai Baht fixing rate	12	1,043
Interest Rate Swaps	Receive Fixed 2.18%, Pay Variable 6-month Thai Baht fixing rate	1	46
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.95%	(50)	5,215
Interest Rate Swaps	Receive Variable Israel 3-month TELBOR, Pay Fixed 0.96%	(52)	5,159
Interest Rate Swaps	Receive Fixed 3.33%, Pay Variable Malaysian Ringgit 3-month KLIBOR	(1)	653
Interest Rate Swaps	Receive Variable 1-day Colombia IBR, Pay Fixed 4.88%	(62)	4,303
Interest Rate Swaps	Receive Fixed 3.27%, Pay Variable Chilean Peso 6-month CLICP	(2)	1,053
Interest Rate Swaps	Receive Fixed 6.2%, Pay Variable 1-day Colombia IBR	16	221
Interest Rate Swaps	Receive Fixed 2.505%, Pay Variable 6-month Thai Baht fixing rate	23	525
Interest Rate Swaps	Receive Fixed 2.04%, Pay Variable 6-month Thai Baht fixing rate	14	2,446
Interest Rate Swaps	Receive Fixed 2.55%, Pay Variable 6-month Thai Baht fixing rate	55	1,011
Interest Rate Swaps	Receive Fixed 1.99%, Pay Variable 6-month Thai Baht fixing rate	86	6,564
Interest Rate Swaps	Receive Fixed 1.18%, Pay Variable Israel 3-month TELBOR	33	1,542
Interest Rate Swaps	Receive Variable 6-month Thai Baht fixing rate, Pay Fixed 2.1%	(15)	760
Interest Rate Swaps	Receive Fixed 2.20%, Pay Variable 6-month Thai Baht fixing rate	10	346
Interest Rate Swaps	Receive Fixed 1.93%, Pay Variable 6-month Thai Baht fixing rate	1	108
Interest Rate Swaps	Receive Fixed 1.84%, Pay Variable 6-month Thai Baht fixing rate	3	920
Interest Rate Swaps	Receive Fixed 1.96%, Pay Variable 6-month Thai Baht fixing rate	6	854
Subtotal Interest Rate Swaps		\$ 4,049	\$ 1,090,650

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Total Return Bond Index Swaps	Receive Variable IBOXHY Index/ Pay Variable 3-month LIBOR	\$ 418	\$ 30,522
Total Return Bond Index Swaps	Receive Variable Barclays Capital US Aggregate Index/ Pay Variable 1-month LIBOR + 15 bps	531	50,000
Total Return Equity Index Swaps	Receive Variable BCMSIMHC Index/ Pay Variable 3-month LIBOR + 16 bps	122	2,385
Total Return Equity Index Swaps	Receive Variable BCMSIMHC Index/ Pay Variable 3-month LIBOR + 16 bps	181	4,114
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 31.7 bps	3,178	155
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 31.7 bps	805	39
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 31.7 bps	1,140	56
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 31.7 bps	596	29
Total Return Equity Index Swaps	Receive Variable MSCI ACWI IMI Index/ Pay Variable 3-month LIBOR + 31.7 bps	370	18

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

(EXPRESSED IN THOUSANDS)

Investment Type	Reference Rate	Fair Value June 30, 2019	Notional Amount
Total Return Equity Index Swaps	Receive Variable MIMUJPNN Index/ Pay Variable 3-month LIBOR + 8 bps	6	13,757
Total Return Equity Index Swaps	Receive Variable MIMUUKGN Index/ Pay Variable 3-month LIBOR + 10 bps	9	9,910
Total Return Equity Index Swaps	Receive Variable MIMUUSAG Index/ Pay Variable 3-month LIBOR + 10 bps	299	8,866
Total Return Equity Index Swaps	Receive Variable NDUEEGF Index/ Pay Variable 3-month LIBOR + 6 bps	(7)	19,997
Total Return Equity Index Swaps	Receive Variable MIMUUSAG Index/ Pay Variable 3-month LIBOR + 23 bps	—	8,866
Total Return Equity Index Swaps	Receive Variable NDUEEGF Index/ Pay Variable 3-month LIBOR + 17 bps	—	19,997
Total Return Equity Index Swaps	Receive Variable MIMUUKGN Index/ Pay Variable 3-month LIBOR + 20 bps	—	9,910
Total Return Equity Index Swaps	Receive Variable MIMUJPNN Index/ Pay Variable 3-month LIBOR - 15 bps	—	13,757
Subtotal Total Return Swaps		\$ 7,648	\$ 192,378
TOTAL		\$ 14,796	\$ 1,287,582

FIGURE 2.27: DERIVATIVE INSTRUMENTS SUBJECT TO COUNTERPARTY CREDIT RISK

AT JUNE 30, 2019

Counterparty	Percentage of Net Exposure	Moody's Ratings	S & P Ratings	Fitch Ratings
Goldman Sachs International	39.17%	A1	A+	A
Goldman Sachs Bank USA/New York NY	17.67%	A1	A+	A+
Barclays Bank PLC	12.79%	A2	A	A+
Deutsche Bank AG/London	10.27%	—	BBB+	BBB
Morgan Stanley Capital Services LLC	8.68%	A1	A+	—
Chicago Mercantile Exchange Inc.	5.49%	—	—	—
HSBC Bank USA NA/New York NY	3.67%	Aa2	AA-	AA-
Morgan Stanley & Co. International PLC	1.31%	A1	A+	—
HSBC Securities Inc.	0.67%	—	AA-	—
Barclays Capital, Inc.	0.11%	—	A	—
Citigroup Global Markets Ltd.	0.10%	A1	A+	A
Citibank NA	0.07%	Aa3	A+	A+
Total	100.00%			

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 long-term 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 October 10, 2019. Best estimates of arithmetic real

rates of return for each major asset class included in the System's long-term target asset allocation are summarized in Figure 2.28. As set out in the note for the figure, the long-term expected rate of return with this strategic asset allocation is approximately 6.75% at the 40th percentile. This provided the basis for the 6.75% long-term rate of return actuarial assumption used in the calculation of the Pension and OPEB liabilities with the Measurement Date of June 30, 2019. See the Investments Section for more detailed asset allocation and performance information.

FIGURE 2.28: ASSET ALLOCATION

FOR THE YEAR ENDED JUNE 30, 2019

Asset Class (Strategy)	Long-term Target Asset Allocation	Arithmetic Long-Term Expected Rate of Return	Weighted Average Long-Term Expected Rate of Return*
Public Equity	34%	5.61%	1.91%
Fixed Income	15%	0.88%	0.13%
Credit Strategies	14%	5.13%	0.72%
Real Assets	14%	5.27%	0.74%
Private Equity	14%	8.77%	1.23%
MAPS – Multi-Asset Public Strategies	6%	3.52%	0.21%
PIP – Private Investment Partnership	3%	6.29%	0.19%
Total	100%		5.13%
		Inflation	2.50%
		* Expected arithmetic nominal return	7.63%

* The above allocation provides a one-year expected return of 7.63%. 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 7.11%, including expected inflation of 2.50%. The VRS Board elected a long-term rate of return of 6.75% which is roughly at the 40th percentile of expected long-term results of the VRS fund asset allocation.

6. Capital Assets

The System's non-depreciable and depreciable capital assets for the year ended June 30, 2019, 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, 2019

(EXPRESSED IN THOUSANDS)

	Balance June 30, 2018	Increases	Decreases	Balance June 30, 2019
Non-Depreciable Capital Assets:				
Land	\$ 1,368	\$ —	\$ —	\$ 1,368
Construction in progress	26,175	9,193	34,233	1,135
Total Non-Depreciable Capital Assets	27,543	9,193	34,233	2,503
Depreciable Capital and Intangible Assets:				
Building	4,632	—	—	4,632
Furniture and Equipment	7,024	108	—	7,132
Intangible Assets	35,382	34,234	—	69,616
Total Depreciable Capital Assets	47,038	34,342	—	81,380
Less Accumulated Depreciation:				
Building	2,316	116	—	2,432
Furniture and Equipment	5,428	356	—	5,784
Intangible Assets	25,961	5,967	—	31,928
Total Accumulated Depreciation	33,705	6,439	—	40,144
Total Depreciable Capital Assets – Net	13,333	27,903	—	41,236
Total Net Capital Assets	\$ 40,876	\$ 37,096	\$ 34,233	\$ 43,739

Depreciation expense amounted to \$6,439,000 and \$5,620,000 in 2019 and 2018, 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, 2019, was \$3,356,000. The System's total future minimum rental payments as of June 30, 2019, are presented in Figure 2.30.

FIGURE 2.30: OPERATING LEASES – FUTURE PAYMENTS

AS OF JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

Year	Amount
2020	\$ 1,577
2021	1,625
2022	1,674
2023	1,723
2024	1,772
Total Future Minimum Rental Payments	\$ 8,371

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 13.52% for the fiscal year ended June 30, 2019, and 13.49% for the fiscal year ended June 30, 2018.

There were approximately 58,797 state retirees, including System retirees, at June 30, 2019. Note 2.B provides information on the state's contribution

toward funding the defined benefit plan for state employees for fiscal year 2019 and fiscal year 2018. The System's contribution requirement for its employees for fiscal year 2019 and fiscal year 2018 was \$3,872,000 and \$3,786,000, 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, 2019 and 2018, was 1.31% of covered payroll. There were approximately 101,443 active state employees and 55,924 state retirees, including System employees and retirees, eligible for group life insurance coverage at June 30, 2019. The System's contribution requirement for its employees and retirees for fiscal year 2019 and fiscal year 2018 was \$399,000 and \$388,000, respectively.
- The state's contribution requirement for the Retiree Health Insurance Credit Program for the years ended June 30, 2019 and 2018, was 1.17% and 1.18% of covered payroll, respectively. There were approximately 45,808 state retirees, including System retirees, receiving the health insurance credit at June 30, 2019. The System's contribution requirement for its employees for fiscal year 2019 and fiscal year 2018 was \$356,000 and \$350,000, respectively.
- The state's contribution requirement for the Virginia Sickness and Disability Program (VSDP) for the years ended June 30, 2019, and June 30, 2018, was 0.62% and 0.66%, respectively. There were approximately 79,269 state employees, including System employees, enrolled in VSDP at June 30, 2019. The System's contribution requirement for its employees for fiscal year 2019 and fiscal year 2018 was \$186,000 and \$191,000, 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, 2019. 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 2019 and the three preceding fiscal years.

11. Commitments

The System extends investment commitments in the normal course of business. At June 30, 2019 and 2018, these commitments amounted to \$15,292,063,000 and \$13,575,895,000, respectively.

12. Statutory Contribution Adjustment

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 were 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 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 1.23%. 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 2019, the employer retirement contribution rate for state employees was 13.52% and the employer retirement contribution rate for teachers was 15.68%. The rates for both of these groups were 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 24.88%, 21.61% and 34.39%, 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 2019, other post-employment benefit plan contributions due or required also were based on the June 30, 2017, 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 1.17% and the rate for the Retiree Health Insurance Credit Program for teachers was 1.20% of covered payroll. The rate for VSDP was 0.62%, and the rates for VLDP for teachers and political subdivision employers were 0.41% and 0.72% 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 2018 and fiscal year 2019, 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**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	VRS State		
	2019	2018	2017
Total pension liability:			
Service cost	\$ 379,359	\$ 375,965	\$ 370,235
Interest	1,627,637	1,606,772	1,562,819
Benefit changes	—	—	—
Difference between actual and expected experience	181,189	(327,289)	(85,975)
Assumption changes	663,566	—	76,965
Benefit payments	(1,360,833)	(1,296,803)	(1,234,388)
Refunds of contributions	(26,897)	(30,236)	(30,837)
Net change in total pension liability	1,464,021	328,409	658,819
Total pension liability – beginning	23,945,821	23,617,412	22,958,593
Total pension liability – ending (a)	\$ 25,409,842	\$ 23,945,821	\$ 23,617,412
Plan fiduciary net position:			
Contributions – employer	\$ 545,584	\$ 548,158	\$ 535,424
Contributions – member	201,481	201,920	201,391
Net investment income	1,211,722	1,302,241	1,963,811
Benefit payments	(1,360,833)	(1,296,803)	(1,234,388)
Refunds of contributions	(26,897)	(30,236)	(30,837)
Administrative expense	(12,374)	(11,481)	(11,612)
Other	(762)	28,502	(1,743)
Net change in plan fiduciary net position	557,921	742,301	1,422,046
Plan fiduciary net position – beginning	18,532,189	17,789,888	16,367,842
Plan fiduciary net position – ending (b)	\$ 19,090,110	\$ 18,532,189	\$ 17,789,888
Net pension liability – ending (a-b)	\$ 6,319,732	\$ 5,413,632	\$ 5,827,524
Plan fiduciary net position as a percentage of the total pension liability (b/a)	75.13%	77.39%	75.33%
Covered payroll (c)	\$ 4,197,484	\$ 4,152,368	\$ 4,020,893
Net pension liability as a percentage of covered payroll ((a-b)/c)	150.56%	130.37%	144.93%

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 – STATE**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

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

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

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	VRS Teacher		
	2019	2018	2017
Total pension liability:			
Service cost	\$ 889,003	\$ 885,510	\$ 830,475
Interest	3,184,697	3,099,338	3,016,207
Benefit changes	—	—	—
Difference between actual and expected experience	(174,815)	(440,308)	(642,745)
Assumption changes	1,472,649	—	218,559
Benefit payments	(2,331,038)	(2,241,927)	(2,147,781)
Refunds of contributions	(36,715)	(40,578)	(39,521)
Net change in total pension liability	3,003,781	1,262,035	1,235,194
Total pension liability – beginning	46,679,555	45,417,520	44,182,326
Total pension liability – ending (a)	\$ 49,683,336	\$ 46,679,555	\$ 45,417,520
Plan fiduciary net position:			
Contributions – employer	\$ 1,280,964	\$ 1,292,988	\$ 1,137,976
Contributions – member	403,258	391,490	392,730
Net investment income	2,311,028	2,421,157	3,632,291
Benefit payments	(2,331,038)	(2,241,927)	(2,147,781)
Refunds of contributions	(36,715)	(40,578)	(39,521)
Administrative expense	(22,843)	(20,945)	(21,123)
Other	(1,448)	(2,167)	(3,238)
Net change in plan fiduciary net position	1,603,206	1,800,018	2,951,334
Plan fiduciary net position – beginning	34,919,563	33,119,545	30,168,211
Plan fiduciary net position – ending (b)	\$ 36,522,769	\$ 34,919,563	\$ 33,119,545
Net pension liability – ending (a-b)	\$ 13,160,567	\$ 11,759,992	\$ 12,297,975
Plan fiduciary net position as a percentage of the total pension liability (b/a)	73.51%	74.81%	72.92%
Covered payroll (c)	\$ 8,387,503	\$ 8,086,986	\$ 7,891,783
Net pension liability as a percentage of covered payroll ((a-b)/c)	156.91%	145.42%	155.83%

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**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

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

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

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	VRS Political Subdivisions		
	2019	2018	2017
Total pension liability:			
Service cost	\$ 556,149	\$ 544,762	\$ 541,594
Interest	1,535,532	1,472,680	1,422,753
Benefit changes	3,948	10,811	36,652
Difference between actual and expected experience	45,032	(43,177)	(205,649)
Assumption changes	691,407	—	(64,510)
Benefit payments	(1,082,791)	(1,010,021)	(941,856)
Refunds of contributions	(40,249)	(41,324)	(42,068)
Net change in total pension liability	1,709,028	933,731	746,916
Total pension liability – beginning	22,497,735	21,564,004	20,817,088
Total pension liability – ending (a)	\$ 24,206,763	\$ 22,497,735	\$ 21,564,004
Plan fiduciary net position:			
Contributions – employer	\$ 499,293	\$ 490,286	\$ 477,563
Contributions – member	248,421	241,339	238,636
Net investment income	1,345,759	1,415,454	2,113,973
Benefit payments	(1,082,791)	(1,010,021)	(941,856)
Refunds of contributions	(40,249)	(41,324)	(42,068)
Administrative expense	(13,369)	(12,236)	(12,220)
Other	(853)	(30,924)	(1,887)
Net change in plan fiduciary net position	956,211	1,052,574	1,832,141
Plan fiduciary net position – beginning	20,302,821	19,250,247	17,418,106
Plan fiduciary net position – ending (b)	\$ 21,259,032	\$ 20,302,821	\$ 19,250,247
Net pension liability – ending (a-b)	\$ 2,947,731	\$ 2,194,914	\$ 2,313,757
Plan fiduciary net position as a percentage of the total pension liability (b/a)	87.82%	90.24%	89.27%
Covered payroll (c)	\$ 5,118,622	\$ 4,932,344	\$ 4,765,842
Net pension liability as a percentage of covered payroll ((a-b)/c)	57.59%	44.50%	48.55%

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**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

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

**REQUIRED SUPPLEMENTARY SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY:
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	SPORS					
	2019	2018	2017	2016	2015	2014
Total pension liability:						
Service cost	\$ 20,079	\$ 18,187	\$ 18,880	\$ 18,700	\$ 18,847	\$ 18,341
Interest	72,715	71,251	74,042	72,618	70,350	67,978
Benefit changes	—	—	—	—	—	—
Difference between actual and expected experience	45,330	(7,248)	(5,327)	(14,711)	(2,890)	—
Assumption changes	31,773	—	(68,707)	—	—	—
Benefit payments	(62,683)	(58,197)	(57,814)	(53,515)	(53,338)	(50,467)
Refunds of contributions	(805)	(867)	(630)	(584)	(375)	(685)
Net change in total pension liability	106,409	23,126	(39,556)	22,508	32,594	35,167
Total pension liability – beginning	1,070,528	1,047,402	1,086,958	1,064,450	1,031,856	996,689
Total pension liability – ending (a)	\$1,176,937	\$1,070,528	\$1,047,402	\$1,086,958	\$1,064,450	\$1,031,856
Plan fiduciary net position:						
Contributions – employer	\$ 31,437	\$ 35,806	\$ 31,888	\$ 33,655	\$ 28,427	\$ 42,683
Contributions – member	6,379	6,311	5,701	5,759	5,680	5,646
Net investment income	54,792	58,148	87,265	12,634	32,466	98,682
Benefit payments	(62,683)	(58,197)	(57,814)	(53,515)	(53,338)	(50,467)
Refunds of contributions	(805)	(867)	(630)	(584)	(375)	(685)
Administrative expense	(488)	(509)	(926)	(590)	(471)	(431)
Other	(61)	(63)	(99)	(23)	(27)	—
Net change in plan fiduciary net position	28,571	40,629	65,385	(2,664)	12,362	95,428
Plan fiduciary net position – beginning	836,702	796,073	730,688	733,352	720,990	625,562
Plan fiduciary net position – ending (b)	\$ 865,273	\$ 836,702	\$ 796,073	\$ 730,688	\$ 733,352	\$ 720,990
Net pension liability – ending (a-b)	\$ 311,664	\$ 233,826	\$ 251,329	\$ 356,270	\$ 331,098	\$ 310,866
Plan fiduciary net position as a percentage of the total pension liability (b/a)	73.52%	78.16%	76.00%	67.22%	68.89%	69.87%
Covered payroll (c)	\$ 126,483	\$ 124,003	\$ 111,395	\$ 114,395	\$ 110,059	\$ 112,010
Net pension liability as a percentage of covered payroll ((a-b)/c)	246.41%	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)**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	VaLORS					
	2019	2018	2017	2016	2015	2014
Total pension liability:						
Service cost	\$ 44,526	\$ 45,179	\$ 47,189	\$ 45,608	\$ 47,531	\$ 46,504
Interest	139,307	136,289	135,453	129,756	124,579	119,040
Benefit changes	—	—	—	—	—	—
Difference between actual and expected experience	11,067	(26,111)	(1,457)	4,997	(4,849)	—
Assumption changes	62,090	—	(63,457)	—	—	—
Benefit payments	(109,193)	(104,776)	(96,224)	(92,270)	(84,990)	(78,412)
Refunds of contributions	(4,933)	(5,604)	(4,938)	(4,524)	(4,797)	(4,665)
Net change in total pension liability	142,864	44,977	16,566	83,567	77,474	82,467
Total pension liability – beginning	2,047,161	2,002,184	1,985,618	1,902,051	1,824,577	1,742,110
Total pension liability – ending (a)	\$2,190,025	\$2,047,161	\$2,002,184	\$1,985,618	\$1,902,051	\$1,824,577
Plan fiduciary net position:						
Contributions – employer	\$ 75,327	\$ 73,793	\$ 73,816	\$ 79,392	\$ 62,084	\$ 67,483
Contributions – member	17,871	17,496	17,598	17,574	17,081	17,908
Net investment income	93,872	98,292	146,039	20,899	52,312	156,786
Benefit payments	(109,193)	(104,776)	(96,224)	(92,270)	(84,990)	(78,412)
Refunds of contributions	(4,933)	(5,604)	(4,938)	(4,524)	(4,797)	(4,665)
Administrative expense	(831)	(861)	(1,540)	(940)	(743)	(681)
Other	(103)	(247)	(310)	(38)	(44)	—
Net change in plan fiduciary net position	72,010	78,093	134,441	20,093	40,903	158,419
Plan fiduciary net position – beginning	1,423,980	1,345,887	1,211,446	1,191,353	1,150,450	992,031
Plan fiduciary net position – ending (b)	\$1,495,990	\$1,423,980	\$1,345,887	\$1,211,446	\$1,191,353	\$1,150,450
Net pension liability – ending (a-b)	\$ 694,035	\$ 623,181	\$ 656,297	\$ 774,172	\$ 710,698	\$ 674,127
Plan fiduciary net position as a percentage of the total pension liability (b/a)	68.31%	69.56%	67.22%	61.01%	62.64%	63.05%
Covered payroll (c)	\$ 349,998	\$ 345,531	\$ 344,468	\$ 345,504	\$ 338,562	\$ 352,492
Net pension liability as a percentage of covered payroll ((a-b)/c)	198.30%	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**

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	JRS					
	2019	2018	2017	2016	2015	2014
Total pension liability:						
Service cost	\$ 18,767	\$ 19,228	\$ 22,144	\$ 21,978	\$ 23,254	\$ 24,024
Interest	44,139	43,799	42,081	42,820	41,759	40,013
Benefit changes	—	—	—	(15,552)	—	—
Difference between actual and expected experience	(7,157)	(15,786)	(14,774)	(18,681)	(9,107)	—
Assumption changes	14,077	—	16,114	—	—	—
Benefit payments	(43,584)	(41,165)	(40,895)	(41,341)	(40,205)	(37,984)
Refunds of contributions	—	—	—	—	—	—
Net change in total pension liability	26,242	6,076	24,670	(10,776)	15,701	26,053
Total pension liability – beginning	652,351	646,275	621,605	632,381	616,680	590,627
Total pension liability – ending (a)	\$ 678,593	\$ 652,351	\$ 646,275	\$ 621,605	\$ 632,381	\$ 616,680
Plan fiduciary net position:						
Contributions – employer	\$ 22,890	\$ 28,096	\$ 27,612	\$ 41,502	\$ 31,503	\$ 27,727
Contributions – member	3,208	3,231	3,272	3,236	3,015	3,051
Net investment income	35,372	37,466	56,029	8,112	20,051	60,833
Benefit payments	(43,584)	(41,165)	(40,895)	(41,341)	(40,205)	(37,984)
Refunds of contributions	—	—	—	—	—	—
Administrative expense	(315)	(326)	(594)	(363)	(283)	(268)
Other	(39)	(42)	(64)	(15)	(17)	—
Net change in plan fiduciary net position	17,532	27,260	45,360	11,131	14,064	53,359
Plan fiduciary net position – beginning	540,009	512,749	467,389	456,258	442,194	388,835
Plan fiduciary net position – ending (b)	\$ 557,541	\$ 540,009	\$ 512,749	\$ 467,389	\$ 456,258	\$ 442,194
Net pension liability – ending (a-b)	\$ 121,052	\$ 112,342	\$ 133,526	\$ 154,216	\$ 176,123	\$ 174,486
Plan fiduciary net position as a percentage of the total pension liability (b/a)	82.16%	82.78%	79.34%	75.19%	72.15%	71.71%
Covered payroll (c)	\$ 68,330	\$ 68,245	\$ 66,826	\$ 66,621	\$ 61,092	\$ 61,020
Net pension liability as a percentage of covered payroll ((a-b)/c)	177.16%	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

FOR THE PLAN YEARS ENDED JUNE 30

(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					
2019	\$ 567,450	\$ 567,450	\$ —	\$ 4,197,484	13.52%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER					
2019	\$ 1,315,160	\$ 1,315,160	\$ —	\$ 8,387,503	15.68%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS					
2019	\$ 515,904	\$ 518,513	\$ (2,609)	\$ 5,118,622	10.13%
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%

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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2019	\$ 31,469	\$ 31,469	\$ —	\$ 126,483	24.88%
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%
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2019	\$ 75,635	\$ 75,635	\$ —	\$ 349,998	21.61%
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%
JUDICIAL RETIREMENT SYSTEM (JRS)					
2019	\$ 23,498	\$ 23,498	\$ —	\$ 68,330	34.39%
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%

REQUIRED SUPPLEMENTARY SCHEDULE OF INVESTMENT RETURNS

FOR THE PLAN YEARS ENDED JUNE 30

	VRS Pooled Asset Portfolio*					
	2019	2018	2017	2016	2015	2014**
Annual money-weighted rate of return, net of investment expense	6.63%	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.

** This schedule should present 10 years of data; however, the information prior to 2014 is unavailable.

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

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	Group Life Insurance Fund 2019	Group Life Insurance Fund 2018	Group Life Insurance Fund 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 86,912	\$ 84,355	\$ 81,479
Interest	210,950	198,960	201,770
Changes in benefit terms	—	—	—
Difference between actual and expected experience	56,736	88,052	(39,461)
Changes of assumptions	122,011	—	(91,738)
Benefit payments	(199,879)	(200,285)	(184,092)
Net change in total OPEB liability	276,730	171,082	(32,042)
Total OPEB liability – beginning	3,113,508	2,942,426	2,974,468
Total OPEB liability – ending (a)	\$ 3,390,238	\$ 3,113,508	\$ 2,942,426
Plan fiduciary net position:			
Contributions – employer	\$ 102,175	\$ 98,530	\$ 94,082
Contributions – member	155,153	150,402	146,002
Net investment income	113,440	110,917	158,430
Benefit payments	(199,879)	(200,285)	(184,092)
Administrative expense	(709)	(664)	(31)
Other	(1,981)	(1,713)	(1,731)
Net change in plan fiduciary net position	168,199	157,187	212,660
Plan fiduciary net position – beginning	1,594,773	1,437,586	1,224,926
Plan fiduciary net position – ending (b)	\$ 1,762,972	\$ 1,594,773	\$ 1,437,586
Net OPEB liability – ending (a-b)	\$ 1,627,266	\$ 1,518,735	\$ 1,504,840
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	52.00%	51.22%	48.86%
Covered employee payroll (c)	\$ 19,633,771	\$ 19,044,361	\$ 18,473,085
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	8.29%	7.97%	8.15%

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.

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	Disability Insurance Trust Fund 2019	Disability Insurance Trust Fund 2018	Disability Insurance Trust Fund 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 29,232	\$ 27,527	\$ 27,884
Interest	15,788	15,503	15,810
Changes in benefit terms	—	—	—
Difference between actual and expected experience	29,489	(11,237)	—
Changes of assumptions	4,180	—	(17,511)
Benefit payments	(24,376)	(31,073)	(30,056)
Net change in total OPEB liability	54,313	720	(3,873)
Total OPEB liability – beginning	237,733	237,013	240,886
Total OPEB liability – ending (a)	\$ 292,046	\$ 237,733	\$ 237,013
Plan fiduciary net position:			
Contributions – employer	\$ 25,263	\$ 27,260	\$ 24,130
Contributions – member	—	—	—
Net investment income	30,494	32,073	48,206
Benefit payments	(24,376)	(31,073)	(30,056)
Third-party administrator charges	(6,431)	(6,637)	(7,001)
Administrative expense	(787)	(961)	(717)
Other	1,117	(35)	(54)
Net change in plan fiduciary net position	25,280	20,627	34,508
Plan fiduciary net position – beginning	462,961	442,334	407,826
Plan fiduciary net position – ending (b)	\$ 488,241	\$ 462,961	\$ 442,334
Net OPEB liability – ending (a-b)	\$ (196,195)	\$ (225,228)	\$ (205,321)
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	167.18%	194.74%	186.63%
Covered employee payroll (c)	\$ 4,077,627	\$ 3,972,637	\$ 3,799,590
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	(4.81)%	(5.67)%	(5.40)%

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.

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	Virginia Local Disability Program		
	Teachers 2019	Teachers 2018	Teachers 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 871	\$ 668	\$ 389
Interest	92	57	29
Changes in benefit terms	—	—	—
Difference between actual and expected experience	(19)	(66)	—
Changes of assumptions	63	—	53
Benefit payments	(167)	(131)	(36)
Net change in total OPEB liability	840	528	435
Total OPEB liability – beginning	1,401	873	438
Total OPEB liability – ending (a)	\$ 2,241	\$ 1,401	\$ 873
Plan fiduciary net position:			
Contributions – employer	\$ 1,966	\$ 1,160	\$ 589
Contributions – member	—	—	—
Net investment income	83	29	0
Benefit payments	(167)	(131)	(36)
Third-party administrator charges	(829)	(794)	(484)
Administrative expense	(39)	(76)	(84)
Other	0	180	294
Net change in plan fiduciary net position	1,014	368	279
Plan fiduciary net position – beginning	647	279	0
Plan fiduciary net position – ending (b)	\$ 1,661	\$ 647	\$ 279
Net OPEB liability – ending (a-b)	\$ 580	\$ 754	\$ 594
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	74.12%	46.18%	31.96%
Covered employee payroll (c)	\$ 479,535	\$ 372,869	282,200
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	0.12%	0.20%	0.21%

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 2019	Political Subdivisions 2018	Political Subdivisions 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 1,191	\$ 876	\$ 664
Interest	105	58	25
Changes in benefit terms	—	—	—
Difference between actual and expected experience	1,224	(95)	—
Changes of assumptions	69	—	(110)
Benefit payments	(188)	(165)	(44)
Net change in total OPEB liability	2,401	674	535
Total OPEB liability – beginning	1,588	914	379
Total OPEB liability – ending (a)	\$ 3,989	\$ 1,588	\$ 914
Plan fiduciary net position:			
Contributions – employer	\$ 2,226	\$ 1,463	\$ 740
Contributions – member	—	—	—
Net investment income	93	36	—
Benefit payments	(188)	(165)	(44)
Third-party administrator charges	(940)	(1,000)	(609)
Administrative expense	(45)	(96)	(106)
Other	0	227	370
Net change in plan fiduciary net position	1,146	465	351
Plan fiduciary net position – beginning	816	351	—
Plan fiduciary net position – ending (b)	\$ 1,962	\$ 816	\$ 351
Net OPEB liability – ending (a-b)	\$ 2,027	\$ 772	\$ 563
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	49.19%	51.39%	38.40%
Covered employee payroll (c)	309,020	242,807	183,629
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	0.66%	0.32%	0.31%

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)

	Line of Duty Trust Fund 2019	Line of Duty Trust Fund 2018	Line of Duty Trust Fund 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 13,292	\$ 15,197	\$ 17,648
Interest	12,019	9,258	8,305
Changes in benefit terms	—	—	—
Difference between actual and expected experience	14,833	51,048	—
Changes of assumptions	18,941	(13,962)	(30,500)
Benefit payments	(12,854)	(12,398)	(10,255)
Net change in total OPEB liability	46,231	49,143	(14,802)
Total OPEB liability – beginning	315,395	266,252	281,054
Total OPEB liability – ending (a)	\$ 361,626	\$ 315,395	\$ 266,252
Plan fiduciary net position:			
Contributions – employer	\$ 13,377	\$ 10,035	\$ 11,024
Contributions – member	—	—	—
Net investment income	277	678	683
Benefit payments	(12,854)	(12,398)	(10,255)
Administrative expense	(508)	(742)	(1,283)
Other	658	855	584
Net change in plan fiduciary net position	950	(1,572)	753
Plan fiduciary net position – beginning	1,889	3,461	2,708
Plan fiduciary net position – ending (b)	\$ 2,839	\$ 1,889	\$ 3,461
Net OPEB liability – ending (a-b)	\$ 358,787	\$ 313,506	\$ 262,791
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	0.79%	0.60%	1.30%
Covered employee payroll (c)	*	*	*
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	N/A	N/A	N/A

* Contributions to the Line of Duty Trust Fund are based on the number of participants in the program using a per-capita-based contribution versus a payroll-based contribution. Note: This schedule should present 10 years of data; however, the information prior to 2017 is unavailable.

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

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	Health Insurance Credit		
	State 2019	State 2018	State 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 19,446	\$ 19,645	\$ 19,231
Interest	68,023	66,883	66,641
Changes in benefit terms	—	—	—
Difference between actual and expected experience	(13,402)	745	—
Changes of assumptions	22,700	—	(12,229)
Benefit payments	(72,857)	(69,117)	(71,256)
Net change in total OPEB liability	23,910	18,156	2,387
Total OPEB liability – beginning	1,008,184	990,028	987,641
Total OPEB liability – ending (a)	\$ 1,032,094	\$ 1,008,184	\$ 990,028
Plan fiduciary net position:			
Contributions – employer	\$ 79,926	\$ 79,416	\$ 75,058
Net investment income	6,189	5,706	7,706
Benefit payments	(72,857)	(69,117)	(71,256)
Administrative expense	(135)	(149)	(131)
Other	(8)	536	(546)
Net change in plan fiduciary net position	13,115	16,392	10,831
Plan fiduciary net position –beginning	95,908	79,516	68,685
Plan fiduciary net position – ending (b)	\$ 109,023	\$ 95,908	\$ 79,516
Net OPEB liability – ending (a-b)	\$ 923,071	\$ 912,276	\$ 910,512
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	10.56%	9.51%	8.03%
Covered employee payroll (c)	\$ 6,844,807	\$ 6,764,917	\$ 6,489,069
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	13.49%	13.49%	14.03%

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

FOR THE PLAN YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	Health Insurance Credit		
	Teacher 2019	Teacher 2018	Teacher 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 20,979	\$ 20,887	\$ 20,351
Interest	93,526	92,399	91,661
Changes in benefit terms	—	—	—
Difference between actual and expected experience	(2,397)	(7,255)	—
Changes of assumptions	35,148	—	(15,003)
Benefit payments	(90,455)	(89,420)	(83,510)
Net change in total OPEB liability	56,801	16,611	13,499
Total OPEB liability – beginning	1,381,313	1,364,702	1,351,203
Total OPEB liability – ending (a)	\$ 1,438,114	\$ 1,381,313	\$ 1,364,702
Plan fiduciary net position:			
Contributions – employer	100,643	99,469	87,613
Net investment income	7,350	6,097	8,818
Benefit payments	(90,455)	(89,420)	(83,510)
Administrative expense	(152)	(152)	(120)
Other	(9)	(446)	436
Net change in plan fiduciary net position	17,377	15,548	13,237
Plan fiduciary net position – beginning	\$ 111,639	\$ 96,091	\$ 82,854
Plan fiduciary net position – ending (b)	\$ 129,016	\$ 111,639	\$ 96,091
Net OPEB liability – ending (a-b)	\$ 1,309,098	\$ 1,269,674	\$ 1,268,611
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	8.97%	8.08%	7.04%
Covered employee payroll (c)	\$ 8,387,684	\$ 8,087,389	\$ 7,892,011
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	15.61%	15.70%	16.07%

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

(EXPRESSED IN THOUSANDS)

	Health Insurance Credit		
	Political Subdivisions	Political Subdivisions	Political Subdivisions
	2019	2018	2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 997	\$ 960	\$ 972
Interest	2,721	2,644	2,618
Changes in benefit terms	—	—	—
Difference between actual and expected experience	964	339	—
Changes of assumptions	199	—	(1,015)
Benefit payments	(2,564)	(2,707)	(1,676)
Net change in total OPEB liability	2,317	1,236	899
Total OPEB liability – beginning	40,360	39,124	38,225
Total OPEB liability – ending (a)	\$ 42,677	\$ 40,360	\$ 39,124
Plan fiduciary net position:			
Contributions – employer	\$ 2,406	\$ 2,291	\$ 2,164
Net investment income	1,490	1,570	2,273
Benefit payments	(2,564)	(2,707)	(1,676)
Administrative expense	(32)	(37)	(37)
Other	(2)	(103)	111
Net change in plan fiduciary net position	1,298	1,014	2,835
Plan fiduciary net position – beginning	23,170	22,156	19,321
Plan fiduciary net position – ending (b)	\$ 24,468	\$ 23,170	\$ 22,156
Net OPEB liability – ending (a-b)	\$ 18,209	\$ 17,190	\$ 16,968
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	57.33%	57.41%	56.63%
Covered employee payroll (c)	\$ 1,081,702	\$ 1,022,007	\$ 966,611
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	1.68%	1.68%	1.76%

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

(EXPRESSED IN THOUSANDS)

	Health Insurance Credit		
	Constitutional Officers 2019	Constitutional Officers 2018	Constitutional Officers 2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 687	\$ 677	\$ 671
Interest	2,010	1,913	1,890
Changes in benefit terms	—	—	—
Difference between actual and expected experience	98	569	—
Changes of assumptions	757	0	(578)
Benefit payments	(1,825)	(1,723)	(1,568)
Net change in total OPEB liability	1,727	1,436	415
Total OPEB liability – beginning	29,629	28,193	27,778
Total OPEB liability – ending (a)	\$ 31,356	\$ 29,629	\$ 28,193
Plan fiduciary net position:			
Contributions – employer	\$ 2,794	\$ 2,378	\$ 2,320
Net investment income	238	183	215
Benefit payments	(1,825)	(1,723)	(1,568)
Administrative expense	(6)	(4)	(4)
Other	0	17	(15)
Net change in plan fiduciary net position	1,201	851	948
Plan fiduciary net position – beginning	3,278	2,427	1,479
Plan fiduciary net position – ending (b)	\$ 4,479	\$ 3,278	\$ 2,427
Net OPEB liability – ending (a-b)	\$ 26,877	\$ 26,351	\$ 25,766
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	14.28%	11.06%	8.61%
Covered employee payroll (c)	\$ 682,376	\$ 655,995	\$ 633,397
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	3.94%	4.02%	4.07%

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

(EXPRESSED IN THOUSANDS)

	Health Insurance Credit		
	Social Services Employees	Social Services Employees	Social Services Employees
	2019	2018	2017
Change in the Net OPEB Liability			
Total OPEB liability:			
Service cost	\$ 260	\$ 257	\$ 263
Interest	960	933	928
Changes in benefit terms	—	—	—
Difference between actual and expected experience	(27)	186	—
Changes of assumptions	327	—	(162)
Benefit payments	(1,012)	(970)	(928)
Net change in total OPEB liability	508	406	101
Total OPEB liability – beginning	14,222	13,816	13,715
Total OPEB liability – ending (a)	\$ 14,730	\$ 14,222	\$ 13,816
Plan fiduciary net position:			
Contributions – employer	\$ 1,847	\$ 1,120	\$ 1,069
Net investment income	122	72	98
Benefit payments	(1,012)	(970)	(928)
Administrative expense	(3)	(1)	(2)
Other	0	7	(7)
Net change in plan fiduciary net position	954	228	230
Plan fiduciary net position – beginning	1,319	1,091	861
Plan fiduciary net position – ending (b)	\$ 2,273	\$ 1,319	\$ 1,091
Net OPEB liability – ending (a-b)	\$ 12,457	\$ 12,903	\$ 12,725
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	15.43%	9.27%	7.90%
Covered employee payroll (c)	\$ 279,503	\$ 263,298	\$ 251,084
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	4.46%	4.9%	5.07%

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

(EXPRESSED IN THOUSANDS)

Change in the Net OPEB Liability	Health Insurance Credit		
	Registrars 2019	Registrars 2018	Registrars 2017
Total OPEB liability:			
Service cost	\$ 16	\$ 12	\$ 12
Interest	39	36	35
Changes in benefit terms	—	—	—
Difference between actual and expected experience	(22)	1	—
Changes of assumptions	12	—	(10)
Benefit payments	(12)	(12)	(27)
Net change in total OPEB liability	33	37	10
Total OPEB liability – beginning	557	520	510
Total OPEB liability – ending (a)	\$ 590	\$ 557	\$ 520
Plan fiduciary net position:			
Contributions – employer	\$ 36	\$ 32	\$ 47
Net investment income	5	4	3
Benefit payments	(12)	(12)	(27)
Administrative expense	0	0	0
Other	0	0	0
Net change in plan fiduciary net position	29	24	23
Plan fiduciary net position – beginning	58	34	11
Plan fiduciary net position – ending (b)	\$ 87	\$ 58	\$ 34
Net OPEB liability – ending (a-b)	\$ 503	\$ 499	\$ 486
Plan fiduciary net position as a percentage of the total OPEB liability (b/a)	14.75%	10.41%	6.54%
Covered employee payroll (c)	\$ 11,770	\$ 11,512	\$ 11,047
Net OPEB liability as a percentage of covered employee payroll ((a-b)/c)	4.27%	4.33%	4.40%

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

FOR THE PLAN YEARS ENDED JUNE 30

(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
GROUP LIFE INSURANCE FUND					
2019	\$ 102,096	\$ 102,096	\$ —	\$ 19,633,771	0.52%
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%
DISABILITY INSURANCE TRUST FUND					
2019	\$ 25,281	\$ 25,281	\$ —	\$ 4,077,627	0.62%
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%
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHER					
2019	\$ 1,966	\$ 1,966	\$ —	\$ 479,535	0.41%
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%
VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS					
2019	\$ 2,225	\$ 2,225	\$ —	\$ 309,020	0.72%
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%
LINE OF DUTY TRUST FUND****					
2019	\$ 24,176	\$ 13,421	\$ 10,755	N/A	N/A
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
HEALTH INSURANCE CREDIT – STATE					
2019	\$ 80,084	\$ 80,084	\$ —	\$ 6,844,807	1.17%
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%
HEALTH INSURANCE CREDIT – TEACHER					
2019	\$ 100,652	\$ 100,652	\$ —	\$ 8,387,684	1.20%
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%
HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS					
2019	\$ 2,353	\$ 2,353	\$ —	\$ 1,081,702	0.22%
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%
HEALTH INSURANCE CREDIT – CONSTITUTIONAL OFFICERS					
2019	\$ 2,593	\$ 2,593	\$ —	\$ 682,376	0.38%
2018	2,362	2,362	—	655,995	0.36%
2017	2,280	2,280	—	633,397	0.36%
2016***	1,950	1,830	120	609,359	0.30%
HEALTH INSURANCE CREDIT – SOCIAL SERVICES EMPLOYEES					
2019	\$ 1,202	\$ 1,202	\$ —	\$ 279,503	0.43%
2018	1,106	1,106	—	263,298	0.42%
2017	1,055	1,055	—	251,084	0.42%
2016***	961	824	137	240,250	0.34%
HEALTH INSURANCE CREDIT – REGISTRARS					
2019	\$ 46	\$ 46	\$ —	\$ 11,770	0.39%
2018	47	47	—	11,512	0.41%
2017	45	45	—	11,047	0.41%
2016***	36	30	6	9,987	0.30%

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
HEALTH INSURANCE CREDIT – REGISTRARS					
2019	\$ 46	\$ 46	\$ —	\$ 11,770	0.39%
2018	47	47	—	11,512	0.41%
2017	45	45	—	11,047	0.41%
2016***	36	30	6	9,987	0.30%

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

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

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

**** 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.

SCHEDULE OF INVESTMENT EXPENSES

FOR THE YEARS ENDED JUNE 30

(EXPRESSED IN THOUSANDS)

	2019	2018
Management Fees:		
Public Equity Managers	\$ 48,864	\$ 57,597
Fixed Income Managers	1,241	1,358
Credit Strategies Managers	58,953	57,368
Real Assets Managers	97,071	88,577
Alternative Investment Managers	127,552	104,497
Hedge Fund Managers	75,183	76,771
Dynamic Strategies Managers	4,329	—
Strategic Opportunity Portfolio	—	17,003
Risk Based Investments Managers	15,492	—
Currency Managers	2,700	4,399
Total External Management Fees	431,385	407,570
Performance Fees	3,709	4,906
Miscellaneous Fees and Expenses:		
Custodial Fees	4,500	4,500
Legal Fees	614	1,064
Other Fees and Expenses	9,169	5,079
Total Miscellaneous Fees and Expenses	14,283	10,643
In-House Investment Management	37,122	34,225
Total Investment Expenses	\$ 486,499	\$ 457,344

SCHEDULE OF ADMINISTRATIVE EXPENSES: ACTUAL TO BUDGET

YEARS ENDED JUNE 30, 2019 AND 2018

(EXPRESSED IN THOUSANDS)

	Totals	
	2019	2018
Personnel Services:		
Salaries and Wages	\$ 38,629	\$ 38,781
Per Diem Services	314	318
Retirement Contributions	3,979	3,888
Social Security	2,340	2,294
Group Life and Medical Insurance	5,879	5,582
Compensated Absences	299	467
Total Personnel Services	51,440	51,330
Professional Services:		
Data Processing	25,097	22,468
Actuarial and Consulting Services	2,773	2,099
Legal Services	525	642
Medical Review Services	557	615
Management Services	165	405
Personnel Development Services	162	83
Total Professional Services	29,279	26,312
Communication Services:		
Media Services	363	18
Printing	212	623
Postal and Delivery Services	677	580
Telecommunications	665	718
Total Communication Services	1,917	1,939
Rentals:		
Business Equipment	—	—
Office Space	3,356	2,738
Total Rentals	3,356	2,738
Other Services and Charges:		
Skilled and Clerical Services	224	353
Depreciation	6,438	5,620
Dues and Memberships	192	133
Equipment	4,638	4,523
Insurance	173	106
Repairs and Maintenance	—	31
Supplies and Materials	256	418
Travel and Transportation	820	732
Miscellaneous	219	168
Total Other Services and Charges	12,960	12,084
Total Administrative Expenses	\$ 98,952	\$ 94,403
Adjustment for Capitalization of Expenses	(9,194)	(10,940)
Total Administrative Expenses (GAAP basis)	89,758	83,463
Adjustments Necessary to Convert Administrative Expenses on the GAAP Basis to the Budgetary Basis at Year End (Net)	3,221	5,651
Administrative Expenses (Budgetary Basis)	\$ 92,979	\$ 89,114
Administrative Expenses Appropriated	\$ 95,844	\$ 88,842
Distribution of Administrative Expenses:		
Total Administrative Expenses	89,758	83,463
Less: In-house Investment Management	(37,122)	(34,225)
Net Administrative Expenses	\$ 52,636	\$ 49,238

SCHEDULE OF PROFESSIONAL AND CONSULTING SERVICES

FOR THE YEAR ENDED JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

Actuarial, Legal and Oversight Services			
Aon Consulting Inc.	Actuarial Services and Benefits Consulting	\$	15.2
Auditor of Public Accounts	Financial Reporting Auditor		255.4
Attorney General	Legal Services		32.5
Cavanaugh MacDonald Consulting LLC	Actuarial Services and Benefits Consulting		1,066.1
Ice Miller LLP	Legal Services		66.7
Joint Legislative Audit Review Commission	Oversight Responsibilities		263.9
Reed Smith	Legal Services		5.2
Total Actuarial, Legal and Oversight Services		\$	1,705.0
Consulting Services			
Advantage 2000	Social Security Advocacy and Disability Tracking	\$	112.4
Albourne America, LLC	Investment Consultant Services		409.9
Bishops Services	Due Diligence Services		33.4
CEM Benchmarking Inc.	Benchmarking Analysis		75.0
Evolve Architecture	Space Planning		1.6
Farnsworth & Taylor	Hearing Officer for Disability Cases		7.5
FX Transparency LLC	Investment Advisory Services		22.5
Gallagher Benefit Services	Recruitment Consulting		3.4
Gartner Group Inc.	Research & Advisory		154.6
Genex	Job Analysis		1.8
Harrison & Turk, PC	Fact-Finding Hearing Officer for Disability Cases		40.8
Hartsoe Morgan PLLC	Hearing Officer for Disability Cases		2.3
Hewitt Associates	Retirement Benefits Planning Tool		10.0
John Frye	Fact-Finding Hearing Officer for Disability Cases		18.5
Life Status 360 LLC	Location Services		14.9
McGinley, Elsberg & Hutcheson, PLC	Fact-Finding Hearing Officer for Disability Cases		11.3
McLagan Partners, Inc.	Investment Compensation Study		135.8
Michael Katzen	Fact-Finding Hearing Officer for Disability Cases		165.7
MMRO	Medical Board Review and Examinations		103.6
Planet Depos	Fact-Finding Hearing Officer for Disability Cases		1.7
Sagitec Solutions, LLC	VRS Modernization Project Solution Vendor		403.9
Torreycove Capital	Investment Consulting Services		50.0
United Review Services, Inc.	Medical Board Review and Examinations		237.9
Veteran Reporters	Court Reporting Services		31.9
Total Consulting Services		\$	2,050.4
Total Professional and Consulting Services		\$	3,755.4

Investment Section 3

TRANSFORMING FOR TOMORROW



Investment Section 3

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Chief Investment Officer's Letter



Ronald D. Schmitz, Chief Investment Officer

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October 18, 2019

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

Fiscal year 2019 has been both a “glass half-empty” and a “glass half-full” kind of year. On the negative side, we had the weakest manufacturing data in Europe since the sovereign debt crisis in 2008; a flat and sometimes negative yield curve in the U.S., which may be a precursor to a recession; and tariffs at the highest level in a half-century. On the positive side, we saw the strongest January rally in equities since 1987; historically low interest rates (in some cases negative); the longest U.S. expansion in history; and the lowest jobless claims since 1969. In fact, the last time unemployment was this low, Richard Nixon was in the White House, Neil Armstrong was on the moon and The Who was at Woodstock.

Against this backdrop, the global economy appears to be in a holding pattern of sub-trend growth while exhibiting late-cycle behavior. Trade and monetary policy dominated the economic narrative in 2019. With trade in particular, some growth metrics such as U.S. consumer data are robust, while other sectors, such as those that depend on trade and exports, are doing decidedly less well. On the other hand, markets seem to be pricing in the central banks’ continued tilt toward accommodation, even as much of the global economy has moved to negative rate territory.

PERFORMANCE OVERVIEW

As shown in the table below, the Total Fund has tended to perform well versus its benchmark for the longer term, generally exceeding the benchmark by about half a percent. However, the excess return over the last three and five years has been more modest and the return for the current fiscal year fell just short of the benchmark, in part due to central bank intervention in the markets, which created difficulties in equities and credit markets.

Annualized Return for Periods Ended June 30, 2019:

	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years
VRS Total Fund	6.7%	8.8%	6.5%	9.4%	7.1%	6.2%	8.4%
Benchmark*	6.8%	8.7%	6.3%	8.9%	6.6%	5.6%	7.9%

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.*

The VRS portfolio is positioned to provide diversification across five primary asset classes. Three of the five (Private Equity, Fixed Income and Real Assets) outperformed their benchmarks for the fiscal year and two (Public Equity and Credit Strategies) did not. The Total Fund generated 6.7%, slightly below the 7% assumed long-term return. Returns by VRS primary asset classes from highest to lowest were as follows: Private Equity at 14.0%, Investment-Grade Fixed Income at 8.3%, Real Assets at 7.8%, Credit Strategies at 6.8% and Public Equity at 3.9%.

VRS also invests in several multi-asset class portfolios in an attempt to accomplish various portfolio objectives. The Private Investment Partnerships (PIP) portfolio comprises strategic relationships with two large private market general partners across the real estate, energy and credit opportunity sets. The Multi-Asset Public Strategies (MAPS) portfolios attempt to seek value-added returns through active decisions around asset class and industry exposures, as well as through a risk mitigation strategy that attempts to offset volatile equity market return patterns.

ASSET CLASS COMMENTARY

Figures 3.1 and 3.2, which follow this letter, show the asset allocation of the fund at June 30, 2019, as well as performance by asset class for various periods ended on that date. Comments about each portfolio's structure and holdings follow those graphics.

We continue to struggle in certain asset classes:

- Equity is still being plagued by the portfolio's tilt to the value, a factor based largely on price in the portfolio. More precisely, it isn't so much the degree to which we have value exposure above the underlying index, it's the degree of the abnormal relationship of value to growth factor returns. Revenue and earnings growth, even at expensive prices, have won the day in recent quarters. Value has been a good long-term play in equity portfolios over long periods of time and has always bounced back strongly after periods of dislocation such as we see now. We remain confident that our patience will pay off.
- Credit is under pressure in the short run: The biggest single driver of strong credit returns this calendar year has been falling interest rates, which have driven up prices of fixed coupon, or rate-sensitive, securities. The Credit Strategies program is overweight floating-rate debt, private debt and distressed debt. These positions are not as sensitive to falling interest rates, and that has caused the program to lag its benchmark in the near term. We remain confident that being exposed to higher yielding private debt, more senior in the capital structure, will serve us well across both interest rate and credit cycles in the longer term.

Also, a few comments regarding near-term performance in the multi-asset portfolios:

- Private Investment Partnerships (PIP) are doing exactly as expected. We are just exiting the startup period when costs are high relative to returns. We expect to see the

returns begin to significantly exceed costs and approach the levels of return that we see in the private market assets.

- The Multi-Asset Portfolio Strategies (MAPS) portfolio has two components. Risk-Based Investments (RBI) is more of an absolute return portfolio and is struggling with the strong performance of a benchmark that is more equity-oriented than the portfolio. Dynamic Strategies attempts to add value by moving assets opportunistically across geographies and asset classes. The portfolio is a bit behind the benchmark as it had a defensive posture during the January rally in the equity markets.
- Fixed Income, Real Assets and Private Equity all have solid near-term and long-term numbers. Private Equity posted strong three- and five-year results versus its benchmark and had good absolute numbers for the 10-year period. Our portfolio did lag its benchmark for the 10 years ended June 30, 2019, because of a mismatch between the benchmark and the portfolio. There is no public index for private equity assets, so we use a stock market benchmark. Although there is a general correlation between the two, they are not always in sync. In short, this lag in the 10-year return versus the benchmark is not a sign of poor performance. In fact, Private Equity delivered returns that were 4% per year higher than Public Equities. That is exactly what we aim to achieve.

ASSET ALLOCATION

The Board has adopted an efficient portfolio policy in a risk/reward sense, with the target portfolio expected to generate returns similar to our peer states and risk levels lower than average, defined by annual volatility. The Board of Trustees reviews the Fund's long-term expected returns annually and performs a more in-depth asset/liability analysis every three years. As of this writing, that study is nearing its conclusion. Although we do not expect to see major changes to the long-term policy portfolio, there will be some adjustments made to strategies and benchmarks for some asset classes and slightly different target weights for some asset classes as well.

MARKET OUTLOOK

Corporate activity is slowing for several reasons: diminishing effects of the corporate tax cuts from 2017; a general global slowdown, particularly in China; and growing uncertainty around trade tensions.

The “tariff war” is causing companies to slow their pace of cross-border investment, which is down 15% per a recent report from Bridgewater Associates. Further, a report from UBS states that imports affected by tariffs are down 40%. These are not statistics that bode well for the economy.

On the other hand, many economic statistics remain strong. Household income is rising and unemployment remains low. Recession risk is higher than a year ago. It is also possible that we will experience a slowdown in the rate of growth in the economy, without a reversal of economic output, and that growth will accelerate again next year.

For example, a positive sign is that we do *not* see inventory buildup or loan repayment stress.

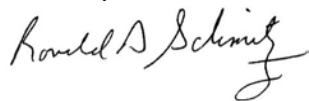
Given these circumstances, we have a guarded macro-economic outlook. The portfolio is positioned neutrally as compared to the policy portfolio. We remain watchful, however, for the negative signs mentioned above.

Despite our neutral stance in broad asset allocation terms, we do have several tilts within asset classes that can favorably affect results. For instance, we have a slight overweight to emerging markets in our equity portfolio; an underweight to treasuries in the fixed income portfolio; an underweight to rate-sensitive securities in the credit portfolio; an underweight to retail and office properties in the real assets portfolio; and an overweight to technology, healthcare and energy in the private equity portfolio.

A LAST WORD

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 colleagues in VRS administration. Finally, my appreciation goes out to our superb team of investment professionals. Together, we will continue to build on the great legacy that exists at VRS.

Sincerely,

A handwritten signature in black ink, reading "Ronald D. Schmitz". The signature is fluid and cursive, with the first name "Ronald" and last name "Schmitz" clearly legible.

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, 2019, is shown in Figure 3.1:

FIGURE 3.1: ASSET ALLOCATION MIX

AS OF JUNE 30, 2019

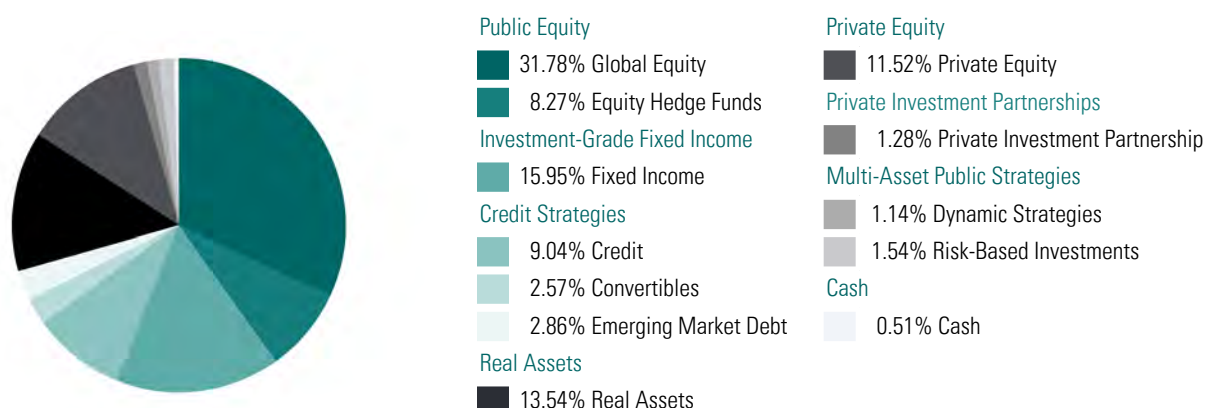


FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY

ANNUALIZED DATA FOR THE PERIOD ENDING JUNE 30, 2019

	1 Year	3 Years	5 Years	10 Years
1. Total Fund				
VRS	6.7%	8.8%	6.5%	9.4%
VRS Custom Benchmark ¹	6.8%	8.7%	6.3%	8.9%
2. Total Public Equity				
VRS	3.9%	10.3%	6.5%	10.7%
Custom Benchmark ²	4.8%	11.0%	6.5%	10.2%
3. Total Investment-Grade Fixed Income				
VRS	8.3%	2.8%	3.4%	4.9%
Custom Benchmark ³	7.9%	2.3%	2.9%	3.9%
4. Total Credit Strategies				
VRS	6.8%	7.4%	4.8%	8.3%
Custom Benchmark ⁴	7.7%	6.8%	4.7%	7.2%
5. Total Real Assets				
VRS	7.8%	9.4%	10.3%	11.2%
Custom Benchmark ⁵	6.9%	7.3%	8.5%	9.3%
6. Total Private Equity				
VRS	14.0%	16.8%	13.0%	14.5%
Custom Benchmark ⁶	8.3%	14.8%	10.7%	16.8%
7. Total Private Investment Partnerships				
VRS	6.7%	8.2%	N/A	N/A
Custom Benchmark ⁷	6.6%	8.2%	N/A	N/A
8. Total Multi-Asset Public Strategies				
VRS	2.2%	N/A	N/A	N/A
Custom Benchmark ⁸	6.0%	N/A	N/A	N/A

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

FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY, cont.

- ¹ The VRS Custom Benchmark is a blend of the Asset Class Benchmarks at policy weights.
- ² 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%).
- ³ Effective July 2014, the Investment-Grade Fixed Income Custom Benchmark consists of the Bloomberg Capital U.S. Aggregate Index.
- ⁴ 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.
- ⁵ 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.
- ⁶ 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.
- ⁷ The Private Investment Partnerships Benchmark is the weighted average of the custom VRS Private Equity Benchmark (MSCI 50% hedged customized for the VRS dividend withholding tax rates lagged by three months plus 250 basis points) (40%), the NCREIF Private Real Estate Benchmark (ODCE Index (net) lagged by three months) (30%), the Other Real Assets Custom Benchmark (the CPI-U Index plus 400 basis points per annum lagged by three months) (10%), the Credit Strategies Rate Sensitive Benchmark (the Bank of America Merrill Lynch High Yield BB-B Constrained Index) (10%), and the Credit Strategies Non-Rate Sensitive Benchmark (the S&P Performing Loan Index) (10%).
- ⁸ Effective July 2018, the Multi-Asset Public Strategies Custom Benchmark is the market value weighted average of the benchmarks of the mandates (Dynamic Strategies and Risk-Based Investments) within the program

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Portfolio Highlights

PUBLIC EQUITY

The market value of the Total Public Equity Program as of June 30, 2019, was \$32.1 billion, representing approximately 39% of the total fund. The program is dominated by traditional strategies valued at \$25.3 billion or 78.8%. The program also employs equity-oriented hedge fund strategies valued at \$6.8 billion or 21.2%. 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, and 41% was managed internally.

At fiscal year-end, the ACWI IMI benchmark was comprised of 54.8% of the MSCI U.S. Investible Market Index (IMI), 33.6% of the MSCI World excluding U.S. IMI (50% hedged) and 11.6% 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	Regions	VRS	MSCI ACWI
Communication Services	7.95%	8.09%	North America	55.49%	57.99%
Consumer Discretionary	10.14%	10.97%	Europe/Middle East/Africa	22.15%	20.87%
Consumer Staples	7.95%	7.82%	Asia/Pacific	21.05%	19.75%
Energy	4.73%	5.63%	Latin and South America	1.31%	1.39%
Financials	16.26%	16.46%	Total	100.00%	100.00%
Health Care	13.26%	11.35%			
Industrials	10.61%	11.31%			
Information Technology	16.16%	15.65%			
Materials	4.60%	5.28%			
Real Estate	3.90%	4.19%			
Utilities	4.44%	3.25%			
Total	100.00%	100.00%			

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

The top 10 holdings in the Total Public Equity Program comprised 6.6% of the program at fiscal

year-end. One company, Royal Dutch Shell, was replaced by MasterCard on this year's schedule.

FIGURE 3.4: PUBLIC EQUITY – TOP 10 EXPOSURES*

AS OF JUNE 30, 2019

Company	Fair Value	Shares
Microsoft	\$ 361,762,865	2,700,529
Johnson & Johnson	253,837,382	1,822,497
Apple	231,874,561	1,171,557
Alphabet	222,802,793	1,282,103
Amazon.com	216,843,359	114,512
Roche Holding	197,870,352	702,435
Visa	177,022,562	1,020,009
MasterCard	161,487,629	610,470
Verizon Communications	156,215,929	2,734,394
Facebook	125,284,985	649,145

* 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, 2019, was \$13.1 billion, representing 15.9% 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 2019, the return of the program was 8.3% versus a return of 7.9% for the benchmark.

FIGURE 3.5: FIXED INCOME PORTFOLIO BY SECTOR ALLOCATION

AS OF JUNE 30, 2019

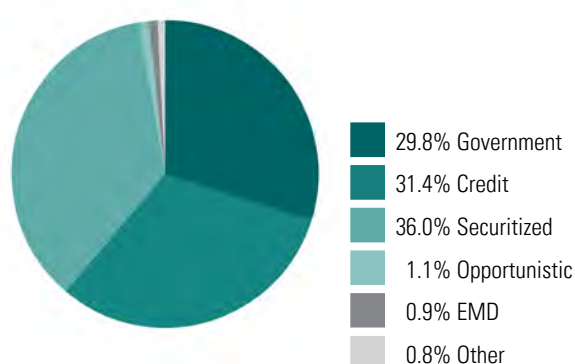


FIGURE 3.6: FIXED INCOME PORTFOLIO BY CREDIT QUALITY BREAKDOWN

AS OF JUNE 30, 2019

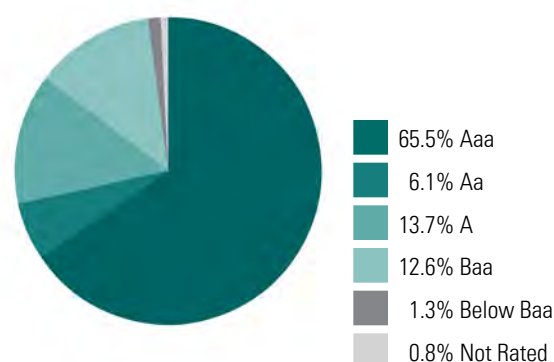


FIGURE 3.7: FIXED INCOME – TOP 10 HOLDINGS BY MARKET VALUE*

AS OF JUNE 30, 2019

Security	Par Value	Fair Value
TREASURY NOTE	\$ 200,000,000	\$ 206,303,449
TREASURY BOND	111,300,000	117,911,171
TREASURY NOTE	113,000,000	110,767,401
TREASURY NOTE	106,000,000	109,515,885
TREASURY NOTE	100,000,000	103,037,503
TREASURY NOTE	95,000,000	97,941,158
TREASURY NOTE	90,000,000	92,644,630
TREASURY NOTE	85,000,000	87,460,252
FREDDIE MAC MBS	76,701,934	78,478,511
TREASURY NOTE	75,000,000	77,264,340

* 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

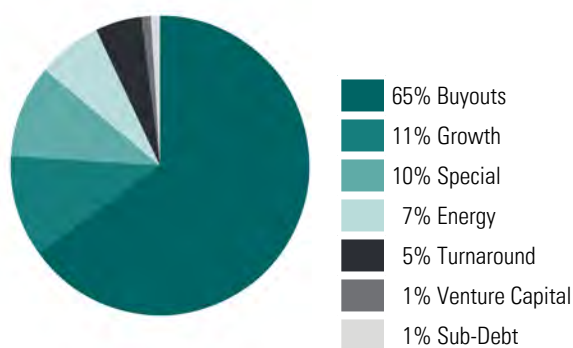
VRS invests in private equity to achieve returns greater than those available in the public equity markets. Specifically, the program seeks to outperform the Morgan Stanley Capital International All Country World Index (MSCI ACWI) by 2.5% per year. Program returns are calculated on both a time-weighted basis and a dollar-weighted or internal rate-of-return (IRR) basis. On a time-weighted basis, the program return for fiscal year 2019 was 14.0%. On a dollar-weighted or IRR basis, the private equity one-year return was 13.7% as of March 31, 2019.

As of June 30, 2019, the carrying value of the program was approximately \$9.5 billion. Most of the program is invested in limited partnerships.

Sectors in which the program invests include leveraged buyouts, venture capital, growth, sub-debt, turnaround, energy and special situations. The Private Equity Program's market value by subclass was as follows:

FIGURE 3.8: PRIVATE EQUITY PROGRAM

AS OF JUNE 30, 2019



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 2019, producing a 7.8% return and outperforming the benchmark by 90 basis points. The private real estate portfolio delivered an 8.0% return while the real estate investment trusts (REITs) produced a total return of 8.5%. Investments in infrastructure, natural resources, timberland and farmland produced a 7.1% return for the fiscal year.

The percentage of the Total Fund represented by the real assets portfolio fluctuated over the course of the year but ended flat at 13.5%. In dollar terms, the real asset portfolio grew \$531 million due primarily to asset income and appreciation, with distributions from existing investments outpacing contributions to new investments by approximately \$287 million.

At fiscal year-end, the portfolio was composed of approximately 59.2% private real estate, 10.8% REITs, 16.2% infrastructure, 7.3% energy and mining, 4.3% timberland and 2.2% farmland. Portfolio leverage as a percentage of total real assets was 29.8% as of June 30, 2019.

FIGURE 3.9: REAL ASSETS BY SECTOR

AS OF JUNE 30, 2019

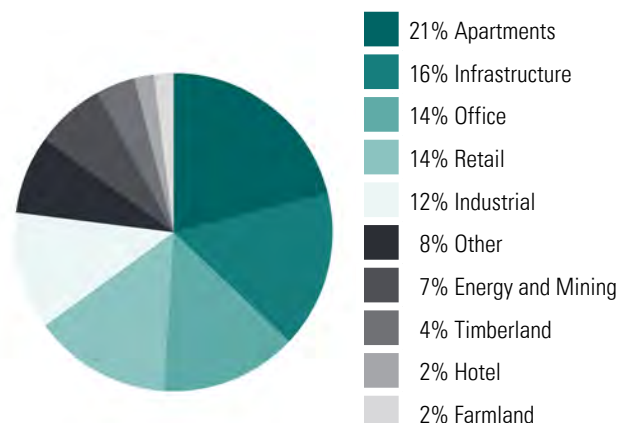
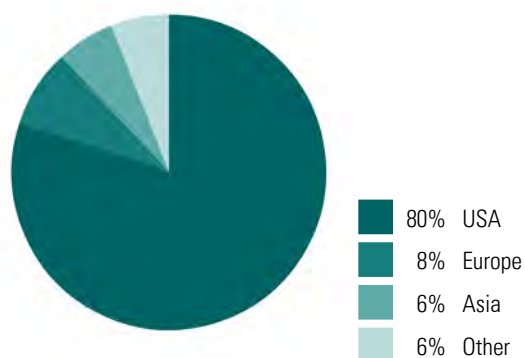


FIGURE 3.10: REAL ASSETS BY GEOGRAPHIC REGION

AS OF JUNE 30, 2019

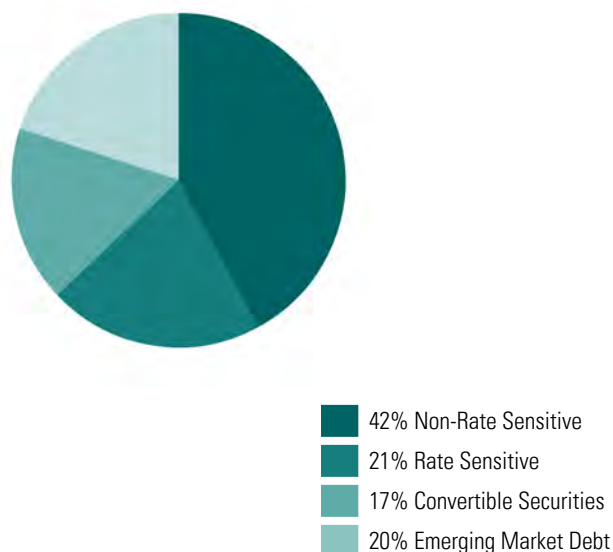


CREDIT STRATEGIES

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 6.8%, while the program's custom benchmark returned 7.7%.

FIGURE 3.11: CREDIT STRATEGIES PROGRAM

AS OF JUNE 30, 2019



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, 2019, was \$1.8 billion. For the fiscal year, it returned -0.07% versus a zero benchmark.

MULTI-ASSET PUBLIC STRATEGIES

The Board of Trustees approved the Multi-Asset Public Strategies (MAPS) program on July 1, 2018, to manage strategies that add value and mitigate risk beyond the structure allowed by individual asset class program mandates. The program is separated into two portfolios with differing objectives. The Risk-Based Investment portfolio invests in strategies that offer meaningful diversification to the exposures of the overall Plan. The Dynamic Strategies portfolio seeks to add value across asset classes through the incorporation of macro perspectives. As of June 30, 2019, the total program had a market value of \$2.2 billion and was invested with six multi-asset class public investments managers and one internally managed fixed income strategy. During the fiscal year, it returned 2.2% against the program's custom benchmark, which returned 6.0%.

PRIVATE INVESTMENT PARTNERSHIPS

Beginning July 1, 2018, the VRS Board approved a strategic allocation to Private Investment Partnerships (PIP). These investments had previously been part of the Strategic Opportunities Portfolio. The objective of the program is to provide an attractive risk/return profile relative to the Private Investment Partnerships benchmark.

Managers in this program invest broadly across the private and less liquid components of the credit, private equity, real asset and real estate investment

spaces. During the fiscal year the program returned 6.7% while the program's custom benchmark returned 6.6%.

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 varetire.org/legal/foia.asp.

VRS Money Managers

The diversified investment structure as of June 30, 2019, 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
Jackson Square	U.S. Small-Cap
LSV Asset Management	Global, Non-U.S. Small-Cap, U.S. Small-Cap
Nordea	Emerging, Global
Select	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
Arisaig	Concentrated Long-Only
Cevian	Activist
Eminence	Long/Short
Farallon	Multi-Strat
Lansdowne Partners	Long/Short
Maverick Capital	Long/Short
Nitorum	Long/Short
Select	Long/Short
Theleme	Long/Short
ValueAct Capital	Activist

FIXED INCOME

Internal Portfolios	Style Description
VRS Credit	High-Quality Corporates
VRS Securitized	Mortgage and Other Asset-Backed Securities
VRS Government	U.S. and Other Government-Related Debt
VRS Emerging Market Debt	EM Sovereign and Quasi-Sovereign Debt
VRS Fixed-Income Opportunistic	Various Fixed-Income Related Assets

PRIVATE EQUITY – TOP 10 MANAGERS	Style Description
Apax Partners	Buyout
Bain Capital	Buyout
CVC Capital	Buyout
Grosvenor	Customized Separate Account
Hellman and Friedman	Buyout
Littlejohn & Co.	Turnaround
Natural Gas Partners	Energy
Stone Point Capital	Buyout
TA Associates	Growth
TPG Partners	Buyout
CREDIT STRATEGIES – TOP 10 MANAGERS	Style Description
Advent Capital	Convertibles
Allianz Global Investors	Convertibles
Anchorage Capital	Hedge Fund, Opportunistic High-Yield
Beach Point Capital Management	Distressed, Leveraged Loans, Opportunistic
Pacific Investment Management Co.	Emerging Market Debt, High-Yield
Payden & Rygel	Emerging Market Debt
Prudential	High-Yield, Investment-Grade, Mezzanine
Schroders	Mortgage-Backed Securities, Private Debt
Solus	Hedge Fund, Leveraged Loan
Zazove Associates	Convertibles
PRIVATE INVESTMENT PARTNERSHIPS	Style Description
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
Global Infrastructure Partners	Global Infrastructure
Industry Funds Management	Global Infrastructure
J.P. Morgan Asset Management Inc.	Core Real Estate
Morgan Stanley	Core, Enhanced Core, Opportunistic Real Estate, International REITs & Global Infrastructure
Pantheon Ventures	Global Infrastructure, Global Natural Resources
PGIM	Core & Enhanced Core Real Estate
Pritzker Realty Group	Opportunistic Real Estate
VRS – Internal Equity Management	U.S. REITs
MULTI-ASSET PUBLIC STRATEGIES	Style Description
AQR	Multi-Asset Class Public Investments
Blackrock	Multi-Asset Class Public Investments
Bridgewater	Multi-Asset Class Public Investments
Capstone	Multi-Asset Class Public Investments
J.P. Morgan	Multi-Asset Class Public Investments
Morgan Stanley	Multi-Asset Class Public Investments
Internal Fixed Income	Long-Duration Treasuries

Public Equity Commissions

AS OF JUNE 30, 2019

Broker	Commission	Broker	Commission
National Financial Services Corp., New York	\$ 1,390,159.02	Deutsche Bank Securities Inc., New York	
Goldman Sachs & Co., New York	1,288,297.22	(NWSCUS33)	140,911.87
Credit Suisse, New York (CSUS)	701,423.04	Instinet Europe Limited, London	139,795.78
Morgan Stanley & Co. Inc., New York	325,725.73	UBS Equities, London	110,235.18
Merrill Lynch Pierce Fenner Smith Inc., New York	316,601.81	JP Morgan Securities Ltd., London	109,016.12
Merrill Lynch International London Equities	311,948.80	Other Brokers	1,914,826.41
Sanford C. Bernstein & Co. Inc., New York	250,097.18	Total FY 2019	\$ 7,208,610.65
Sanford C. Bernstein & Co. Inc., London	209,572.49		

SCHEDULE OF INVESTMENT EXPENSES

FOR THE YEAR ENDED JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

	Assets Under Management	Management Fees and Expenses
External Management:		
Public Equity Managers	\$ 12,022,625	\$ 48,864
Fixed Income Managers	3,269,586	1,241
Credit Strategies Managers	11,172,952	58,953
Real Assets Managers	11,194,351	100,780
Alternative Investment Managers	9,592,339	127,552
Hedge Funds Managers	7,655,380	75,183
Risk-Based Investments Managers	2,267,360	15,492
Currency Managers*	—	2,700
Dynamic Strategy	907,534	4,329
Internal Management:	26,023,077	37,122
Miscellaneous Fees and Expenses:		
Custodial Fees	—	4,500
Legal Fees	—	614
Other Fees and Expenses	—	9,169
Total	\$ 84,105,204	\$ 486,499

* The fees related to Active Currency Overlay Program are based on the managers' notional account values. The total notional value at June 30, 2019, 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, 2019 and 2018:

(EXPRESSED IN THOUSANDS)

	2019 Fair Value	Percent of Total Value	2018 Fair Value	Percent of Total Value
Bonds and Mortgage Securities:				
U.S. Government and Agencies	\$ 4,317,660	5.11%	\$ 4,056,580	5.04%
Mortgage Securities	4,889,973	5.79%	4,361,474	5.42%
Corporate and Other Bonds	12,689,298	15.04%	13,355,608	16.60%
Total Bonds and Mortgage Securities	21,896,931	25.94%	21,773,662	27.06%
Common and Preferred Stocks	24,722,983	29.28%	24,452,265	30.40%
Index and Pooled Funds				
Equity Index and Pooled Funds	11,069,496	13.10%	10,502,999	13.06%
Fixed-Income Commingled Funds	1,342,413	1.59%	1,360,209	1.69%
Total Index and Pooled Funds	12,411,909	14.69%	11,863,208	14.75%
Real Assets	9,877,199	11.70%	9,242,121	11.49%
Private Equity	15,083,638	17.87%	12,919,297	16.07%
Short-Term Investments				
Treasurer of Virginia – LGIP Investment Pool	331,823	0.38%	99,344	0.12%
Foreign Currencies	112,545	0.14%	84,056	0.11%
Total Short-Term Investments	444,368	0.52%	183,400	0.23%
Total Investments	\$ 84,437,028	100.00%	\$ 80,433,953	100.00%

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, 2019

Fund Name	Hybrid 401(a)	Hybrid 457	Total
Retirement Portfolio	\$ 3,098,668	\$ 1,496,228	\$ 4,594,896
Target Date 2020 Portfolio	12,415,383	6,333,720	18,749,103
Target Date 2025 Portfolio	22,687,848	11,269,156	33,957,004
Target Date 2030 Portfolio	30,300,937	15,996,764	46,297,701
Target Date 2035 Portfolio	36,285,958	17,515,707	53,801,665
Target Date 2040 Portfolio	36,582,128	16,260,867	52,842,995
Target Date 2045 Portfolio	42,115,252	17,880,926	59,996,178
Target Date 2050 Portfolio	52,563,415	20,095,956	72,659,371
Target Date 2055 Portfolio	83,984,779	25,890,929	109,875,708
Target Date 2060 Portfolio	26,516,325	7,462,941	33,979,266
Money Market Fund	2,495,184	440,023	2,935,207
Stable Value Fund	682,695	1,050,943	1,733,638
Bond Fund	548,720	656,579	1,205,299
Inflation-Protected Bond Fund	155,190	211,972	367,162
High-Yield Bond Fund	525,263	844,575	1,369,838
Stock Fund	6,934,513	8,332,424	15,266,937
Small/Mid-Cap Stock Fund	2,661,763	3,104,449	5,766,212
International Stock Fund	1,397,704	1,722,751	3,120,455
Global Real Estate Fund	702,462	863,392	1,565,854
VRS Investment Portfolio – PIPVRSIP	4,055	3,678	7,733
VRS Investment Portfolio	72,342	50,413	122,755
Self-Directed Brokerage	176,456	127,502	303,958
Total Plan Assets	\$ 362,907,040	\$ 157,611,895	\$ 520,518,935

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, 2019, the plans provided the following core investment options to participants. *Note: Some sector allocations may not total 100% due to rounding.*

DO-IT-FOR-ME FUNDS

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: 53.1% U.S. Large/Mid-Cap Stocks: 21.8% International Stocks: 11.6%
U.S. Inflation-Index Bonds: 6.8% U.S. Small-Cap Stocks: 3.3%
Commodities: 2.3% Developed Real Estate: 1.1%

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: 51.0% U.S. Large/Mid-Cap Stocks: 22.7% International Stocks: 12.6%
U.S. Inflation-Index Bonds: 6.4% U.S. Small-Cap Stocks: 3.3%
Commodities: 2.2% Developed Real Estate: 1.8%

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: 38.7% U.S. Large/Mid-Cap Stocks: 29.5% International Stocks: 18.6%
U.S. Inflation-Index Bonds: 5.3% U.S. Small-Cap Stocks: 3.0%
Developed Real Estate: 2.9% Commodities: 2.0%

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

U.S. Large/Mid-Cap Stocks: 35.3% U.S. Bonds: 28.0% International Stocks: 23.8%
Developed Real Estate: 4.2% U.S. Inflation-Index Bonds: 4.1%
U.S. Small-Cap Stocks: 2.8% Commodities: 1.8%

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: 40.5% International Stocks: 28.5% U.S. Bonds: 18.2%
Developed Real Estate: 5.4% U.S. Inflation-Index Bonds: 2.9%
U.S. Small-Cap Stocks: 2.7% Commodities: 1.8%

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: 45.4% International Stocks: 33.0%
U.S. Bonds: 9.5% Developed Real Estate: 6.5% U.S. Small-Cap Stocks: 2.4%
U.S. Inflation-Index Bonds: 1.6% Commodities: 1.6%

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: 48.6% International Stocks: 36.3%
Developed Real Estate: 7.3% U.S. Bonds: 3.6% U.S. Small-Cap Stocks: 2.3%
Commodities: 1.3% U.S. Inflation-Index Bonds: 0.6%

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: 49.9% International Stocks: 37.8% Developed Real Estate: 7.6%
U.S. Small-Cap Stocks: 2.4% Commodities: 1.2% U.S. Bonds: 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: 49.9% International Stocks: 37.9% Developed Real Estate: 7.7%
U.S. Small-Cap Stocks: 2.4% Commodities: 1.1% U.S. Bonds: 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: 49.9% International Stocks: 37.9% Developed Real Estate: 7.7%
U.S. Small-Cap Stocks: 2.4% Commodities: 1.1% U.S. Bonds: 1.0%

HELP-ME-DO-IT FUNDS

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

Other Repurchase Agreement: 38.3% Certificate of Deposit: 14.3%
Asset-Backed Commercial Paper: 12.4% Commercial Paper: 11.5% Time Deposits: 8.4%
Treasury Repurchase Agreement: 7.5% Government Agency Repurchase Agreement: 4.8%
Supranational: 1.7% Government Agency Debt: 1.1%

Stable Value Fund: Seeks to provide safety of principal, while earning a 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: 32.7% Agency MBS: 20.4% Asset-Backed: 14.7% U.S. Treasury/Agency: 10.7%
CMBS: 7.3% Other U.S. Government: 5.0% Cash/Equivalents: 4.6%
Taxable Municipals: 3.2% Non-Agency MBS: 1.4%

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: 37.8% Mortgages: 27.1% Industrials: 15.0% Financials: 7.9%
Non-U.S. Credit: 3.9% Agencies: 2.7% CMBS: 2.0% Utilities: 1.8%
Cash: 0.7% Taxable Municipals: 0.6% Asset-Backed Securities: 0.5%

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: 99.4% Cash: 0.6%

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: 23.7% Consumer Non-Cyclical: 17.1% Consumer Cyclical: 13.7%
Other/Cash: 13.1% Energy: 9.1% Capital Goods: 7.9% Technology: 7.5% Basic Industry: 3.5%
Finance: 1.8% Transportation: 1.8% Utilities: 0.5% Other Industrial: 0.3%

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: 21.5% Health Care: 14.2% Financials: 13.1% Communication Services: 10.2%
Consumer Discretionary: 10.2% Industrials: 9.4% Consumer Staples: 7.3% Energy: 5.0%
Utilities: 3.3% Real Estate: 3.0% Materials: 2.8%

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

Financials: 16.0% Information Technology: 15.9% Industrials: 15.1%
Health Care: 13.3% Consumer Discretionary: 11.7% Real Estate: 9.9% Materials: 5.2%
Utilities: 3.7% Energy: 3.3% Communication Services: 3.2% Consumer Staples: 2.7%

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: 20.5% Industrials: 12.9% Consumer Discretionary: 11.4%
Consumer Staples: 9.3% Information Technology: 8.7% Health Care: 8.1% Materials: 8.0%
Energy: 6.7% Communication Services: 6.6% Real Estate: 4.4% Utilities: 3.4%

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: 17.8% Office REITs: 12.4% Residential REITs: 12.2%
Diversified REITs: 9.6% Industrial REITs: 9.5% Real Estate Operating Companies: 9.4%
Specialized REITs: 8.2% Health Care REITs: 7.9% Diversified Real Estate Activities: 7.7%
Hotel & Resort REITs: 3.5% Real Estate Development: 1.7%
Hotels, Resorts & Cruise Lines: 0.1%

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: 40.1% Fixed Income: 15.9% Credit Strategies: 14.5% Real Assets: 13.5%
Private Equity: 11.5% MAPS: 2.7%
PIP: 1.3% Cash: 0.5%

DO-IT-MYSELF FUNDS

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.

Investment Option Performance Summary: Defined Contribution Plans

AS OF JUNE 30, 2019

(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
Retirement Portfolio	08/01/05	6.56%	5.83%	4.23%	6.77%	0.08%	\$0.80
Custom Benchmark ¹		6.58%	5.81%	4.20%	6.76%		
Target Date 2020 Portfolio	08/01/05	6.44%	6.57%	4.56%	7.91%	0.08%	\$0.80
Custom Benchmark ¹		6.46%	6.54%	4.51%	7.88%		
Target Date 2025 Portfolio	07/05/06	6.50%	7.61%	5.06%	8.62%	0.08%	\$0.80
Custom Benchmark ¹		6.47%	7.54%	4.99%	8.58%		
Target Date 2030 Portfolio	08/01/05	6.50%	8.53%	5.51%	9.25%	0.08%	\$0.80
Custom Benchmark ¹		6.44%	8.43%	5.40%	9.18%		
Target Date 2035 Portfolio	07/05/06	6.49%	9.41%	5.91%	9.82%	0.08%	\$0.80
Custom Benchmark ¹		6.38%	9.26%	5.78%	9.73%		
Target Date 2040 Portfolio	08/01/05	6.43%	10.17%	6.25%	10.32%	0.08%	\$0.80
Custom Benchmark ¹		6.30%	10.00%	6.10%	10.21%		
Target Date 2045 Portfolio	07/05/06	6.31%	10.61%	6.45%	10.71%	0.08%	\$0.80
Custom Benchmark ¹		6.15%	10.41%	6.27%	10.59%		
Target Date 2050 Portfolio	09/30/07	6.28%	10.74%	6.49%	11.01%	0.08%	\$0.80
Custom Benchmark ¹		6.07%	10.55%	6.32%	10.90%		
Target Date 2055 Portfolio	05/19/10	6.29%	10.74%	6.45%	9.85%	0.08%	\$0.80
Custom Benchmark ¹		6.07%	10.55%	6.28%	9.73%		
Target Date 2060 Portfolio	11/17/14	6.28%	10.72%	N/A	7.14%	0.08%	\$0.80
Custom Benchmark ¹		6.07%	10.55%	N/A	6.96%		

HELP-ME-DO-IT PATH: INDIVIDUAL OPTIONS

Investment Options	Inception Date	1 Year	3 Years	5 Years	10 Years or Since Inception	Total Annual Operating Expenses	
						As a %	Per \$1,000
Money Market Fund	11/01/99	2.50%	1.65%	1.03%	0.58%	0.08%	\$0.80
Benchmark: Bloomberg Barclays 3-Month Treasury Bill Index							
Yield as of June 30, 2019, was 2.57%		2.33%	1.40%	0.89%	0.50%		
Stable Value Fund	02/01/95	2.37%	2.04%	1.83%	2.11%	0.26%	\$2.60
Custom Benchmark ²							
Yield as of June 30, 2019, was 2.53%		2.78%	2.16%	1.90%	1.59%		
Bond Fund	11/01/99	7.92%	2.36%	3.01%	3.95%	0.03%	\$0.30
Benchmark: Bloomberg Barclays U.S. Aggregate Bond Index		7.87%	2.31%	2.95%	3.90%		
Inflation-Protected Bond Fund	07/30/02	4.90%	2.22%	1.85%	3.71%	0.03%	\$0.30
Benchmark: Bloomberg Barclays U.S. Treasury Inflation-Protected Securities Index		4.84%	2.08%	1.76%	3.64%		
High-Yield Bond Fund	05/31/04	8.19%	7.45%	5.17%	8.99%	0.40%	\$4.00
Benchmark: ICE BofAML U.S. High-Yield BB-B Constrained Index		8.62%	7.13%	4.81%	8.58%		
Stock Fund	11/01/99	10.48%	14.22%	10.75%	14.73%	0.01%	\$0.10
Benchmark: S&P 500 Index		10.42%	14.19%	10.71%	14.70%		
Small/Mid-Cap Stock Fund	11/01/99	1.77%	12.40%	7.78%	14.38%	0.03%	\$0.30
Benchmark: Russell 2500 Index ³		1.77%	12.34%	7.66%	14.30%		
International Stock Fund	11/01/99	0.56%	9.41%	2.39%	7.00%	0.06%	\$0.60
Benchmark: MSCI ACWI ex-U.S. IMI Index ⁴		0.26%	9.13%	2.11%	6.71%		
Global Real Estate Fund	10/01/02	8.82%	5.40%	5.75%	15.00%	0.08%	\$0.80
Benchmark: FTSE EPRA/NAREIT Developed Index ⁵		7.68%	4.46%	4.85%	14.54%		
VRS Investment Portfolio (VRSIP)	07/01/08	6.66%	8.75%	6.53%	9.36%	0.58%	\$5.80
VRS Custom Benchmark ⁶		6.79%	8.75%	6.30%	8.92%		

INVESTMENT OPTION PERFORMANCE SUMMARY: DEFINED CONTRIBUTION PLANS, cont.

- ¹ 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.
- ² 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.
- ³ 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.
- ⁴ 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.
- ⁵ 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.
- ⁶ The VRS Custom Benchmark is a blend of the asset class benchmarks at policy weights.

Actuarial Section4

TRANSFORMING FOR TOMORROW



Actuarial Section 4

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Actuary's Certification Letter: Pension Plans



Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

February 20, 2019

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, 2018.

- 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, 2018. 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, 2018, and to recommend rates of contribution. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The funded status of the Plan is the ratio of the assets to the actuarial accrued liability. While the market value of assets gives an indication of the funded status of a plan at a particular point in time and is used for financial reporting, it is not used directly in the calculation of the employer contribution rates. A less volatile actuarial value of assets, which smooths the effect of market fluctuations over a five-year period, is applied to determine the funded status for rate-setting purposes. For informational purposes, we exhibit the funded status based on this smoothed actuarial value of assets basis as well as the market value in this report. 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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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, 2018, 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 Plan.

System	Fiscal Years 2017 & 2018		Fiscal Years 2019 & 2020		Informational Only		
	Board Approved	General Assembly Approved	Board Approved	General Assembly Approved	Full Employer Contribution Rate for Defined Benefit Plan	Employer Rate for Hybrid DC Component	Total Employer Rate for Retirement Plans
	2015 Valuation		2017 Valuation		2018 Valuation		
State	14.46%	13.49%	13.52%	13.52%	12.64%	0.72%	13.36%
Teacher	16.32%	14.66%/16.32%	15.68%	15.68%	14.72%	0.51%	15.23%
SPORS	28.99%	28.54%	24.88%	24.88%	23.87%	N/A	23.87%
ValORS	22.21%	21.05%	21.61%	21.61%	20.81%	N/A	20.81%
Judicial	45.15%	41.97%	34.39%	34.39%	30.10%	1.31%	31.41%
Political Subdivisions (average rates)	8.15%	8.15%	7.60%	7.60%	6.76%	0.53%	7.29%

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 HB 1130 and SB 498, Plan 2 members, and the Hybrid 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.

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 'LL'.

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

On April 26, 2017, the VRS Board of Trustees adopted most of the actuarial assumptions and methods on the recommendation of its actuary. 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, 2018, valuation.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS: PENSION PLANS

	2009	2010	2011-2012	2013	2014-2016	2017	2018
Investment Rate of Return	7.50%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
Inflation Assumption	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Cost of Living (COLA) Assumption							
Plan 1	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Plan 2	N/A	N/A	2.25%	2.25%	2.25%	2.25%	2.25%
Hybrid	N/A	N/A	N/A	N/A	2.25%	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	Yes	No	No	Yes	No	Yes	No
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				Portion of		
	(1) Active	(2) Retirees	(3) Active	Valuation	Accrued Liabilities		
	Member	and			Members*	Assets	Covered by Assets
	Contributions	Beneficiaries		Assets	(1)	(2)	(3)
VIRGINIA RETIREMENT SYSTEM (VRS)							
2018	\$ 13,221,525	\$ 54,132,392	\$ 25,820,901	\$ 73,204,795	100.00%	100.00%	22.66%
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%
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)							
2018	\$ 103,710	\$ 646,580	\$ 362,603	\$ 830,978	100.00%	100.00%	22.25%
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%
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)							
2018	\$ 240,390	\$ 1,317,732	\$ 499,382	\$ 1,413,876	100.00%	89.05%	0.00%
2017	240,517	1,219,673	517,591	1,328,178	100.00%	89.18%	0.00%
2016	237,416	1,160,507	586,334	1,235,490	100.00%	86.00%	0.00%
2015	232,824	1,088,742	585,155	1,155,767	100.00%	84.77%	0.00%
2014	230,522	977,848	611,675	1,058,010	100.00%	84.60%	0.00%
2013	223,467	916,886	601,757	941,933	100.00%	78.40%	0.00%
2012	176,172	861,342	715,499	909,399	100.00%	85.10%	0.00%
2011	174,963	763,631	744,597	926,082	100.00%	98.40%	0.00%
2010	186,792	682,378	710,151	925,443	100.00%	100.00%	7.92%
2009	181,760	581,887	648,197	912,922	100.00%	100.00%	23.03%
JUDICIAL RETIREMENT SYSTEM (JRS)							
2018	\$ 41,009	\$ 413,609	\$ 191,044	\$ 536,022	100.00%	100.00%	42.61%
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%

* 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										
2018	\$	3,416,685	\$	14,911,769	\$	5,786,703	\$18,392,939	100.00%	100.00%	1.11%
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%
VRS – TEACHER										
2018	\$	6,282,723	\$	26,726,567	\$	13,506,886	\$34,673,952	100.00%	100.00%	12.32%
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%
VRS – POLITICAL SUBDIVISIONS										
2018	\$	3,522,117	\$	12,494,055	\$	6,527,313	\$20,137,904	100.00%	100.00%	63.15%
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%
VRS – TOTAL										
2018	\$	13,221,525	\$	54,132,391	\$	25,820,902	\$73,204,795	100.00%	100.00%	22.66%
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%

* 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)	Actuarial Accrued 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)
VIRGINIA RETIREMENT SYSTEM (VRS) **						
2018	\$ 73,204,795	\$ 93,174,818	\$ 19,970,023	78.6%	\$ 17,614,448	113.4%
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%
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)						
2018	\$ 830,978	\$ 1,112,893	\$ 281,915	74.7%	\$ 126,523	222.8%
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%
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)						
2018	\$ 1,413,876	\$ 2,057,504	\$ 643,628	68.7%	\$ 346,106	186.0%
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%
JUDICIAL RETIREMENT SYSTEM (JRS)						
2018	\$ 536,022	\$ 645,662	\$ 109,640	83.0%	\$ 67,424	162.6%
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%

* 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 Accrued 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)
VIRGINIA RETIREMENT SYSTEM (VRS) – STATE						
2018	\$ 18,392,939	\$ 24,115,157	\$ 5,722,218	76.3%	\$ 4,161,922	137.5%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER						
2018	\$ 34,673,952	\$ 46,516,176	\$ 11,842,224	74.5%	\$ 8,479,023	139.7%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS						
2018	\$ 20,137,904	\$ 22,543,485	\$ 2,405,581	89.3%	\$ 4,973,503	48.4%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – TOTAL						
2018	\$ 73,204,795	\$ 93,174,818	\$ 19,970,023	78.6%	\$ 17,614,448	113.4%
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%

* Revised economic and demographic assumptions due to experience study.

SCHEDULE OF ACTIVE MEMBER VALUATION DATA: PENSION PLANS

Valuation Date (June 30)	Active Members				Number of Employers
	Number	Annual Payroll (000s)	Average Annual Pay	Annualized % Change in Average Pay	
VIRGINIA RETIREMENT SYSTEM (VRS)					
2018	334,858	\$ 17,614,448	\$ 52,603	4.3%	604
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2018	1,885	\$ 126,523	\$ 67,121	14.6%	1
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2018	8,718	\$ 346,106	\$ 39,700	2.1%	1
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
JUDICIAL RETIREMENT SYSTEM (JRS)					
2018	416	\$ 67,424	\$ 162,077	2.9%	1
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

SCHEDULE OF ACTIVE MEMBER VALUATION DATA: VRS PENSION PLANS

Valuation Date (June 30)	Active Members					Number of Employers
	Number	Annual Payroll (000s)	Average Annual Pay	Annualized % Change in Average Pay		
VRS – STATE						
2018	74,582	\$ 4,161,922	\$ 55,803	3.4%	1	
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						
2018	151,585	\$ 8,479,023	\$ 55,936	6.2%	144	
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						
2018	108,691	\$ 4,973,503	\$ 45,758	2.1%	459	
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						
2018	334,858	\$ 17,614,448	\$ 52,603	4.3%	604	
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)								
2018	12,633	\$ 369,352,000	5,618	\$ 113,124,000	201,118	\$ 4,497,849,000	6.0%	\$ 22,364
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)								
2018	63	\$ 3,942,000	29	\$ 1,618,000	1,380	\$ 57,572,000	4.2%	\$ 41,719
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)								
2018	422	\$ 11,565,000	74	\$ 3,584,000	4,761	\$ 103,588,000	8.3%	\$ 21,758
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
JUDICIAL RETIREMENT SYSTEM (JRS)								
2018	22	\$ 2,442,000	16	\$ 1,537,000	526	\$ 41,562,000	2.2%	\$ 79,015
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

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

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								
2018	3,448	\$ 107,317,000	1,943	\$ 39,665,000	57,173	\$1,291,501,000	5.5%	\$ 22,589
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**	1,432	88,557,000	1,432	22,536,000	46,064	861,362,000	N/A	189,699
VRS – TEACHER								
2018	5,030	\$ 157,985,000	1,997	\$ 45,558,000	90,030	\$2,202,632,000	5.4%	\$ 24,466
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								
2018	4,155	\$ 104,050,000	1,678	\$ 27,901,000	53,915	\$1,003,716,000	8.2%	\$ 18,617
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								
2018	12,633	\$ 369,352,000	5,618	\$ 113,124,000	201,118	\$4,497,849,000	6.0%	\$ 22,364
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, 2018

(EXPRESSED IN THOUSANDS)

	VRS	SPORS	ValORS	JRS	Total
A. Calculation of Expected Unfunded Actuarial Accrued Liability (UAAL)					
1. UAAL as of June 30, 2017	\$ 20,637,038	\$ 254,951	\$ 649,603	\$ 125,688	\$ 21,667,280
2. Normal Cost for Previous Year	1,688,071	16,997	42,223	17,970	1,765,261
3. Actual Contributions During the Year	(3,116,930)	(41,545)	(90,181)	(30,959)	(3,279,615)
4. Interest at Previous Year's Rate of 7.00%					
a. On UAAL	1,444,592	17,847	45,472	8,798	1,516,709
b. On Normal Cost	118,166	1,190	2,956	1,258	123,570
c. On contributions	(109,093)	(1,454)	(3,156)	(1,084)	(114,787)
d. Total	1,453,665	17,583	45,272	8,972	1,525,492
5. Expected UAAL as of June 30, 2018 (A1+A2+A3+A4)	20,661,844	247,986	646,917	121,671	21,678,418
6. Actual UAAL as of June 30, 2018	19,970,023	281,915	643,628	109,640	21,005,206
7. Total Gain/(Loss) (A5-A6)	691,821	(33,929)	3,289	12,031	673,212
B. Calculation of Asset Gain/(Loss)					
1. Actuarial Value of Assets (AVA) as of June 30, 2017	69,214,246	785,677	1,328,178	505,834	71,833,935
2. Contributions During the Year	3,116,930	41,545	90,181	30,959	3,279,615
3. Benefit Payments During the Year	(4,660,889)	(59,064)	(110,380)	(41,165)	(4,871,498)
4. Interest at Previous Year's Rate of 7.00%					
a. On AVA at Beginning of Year	4,844,997	54,997	92,972	35,408	5,028,374
b. On Contributions	109,093	1,454	3,156	1,084	114,787
c. On Benefit Payments	(163,131)	(2,067)	(3,863)	(1,441)	(170,502)
d. Total	4,790,959	54,384	92,265	35,051	4,972,659
5. Expected AVA as of June 30, 2018 (B1+B2+B3+B4)	72,461,246	822,542	1,400,244	530,679	75,214,711
6. Actual AVA as of June 30, 2018	73,204,795	830,978	1,413,876	536,022	75,985,671
7. Total Gain/(Loss) on Assets (B6-B5)	743,549	8,436	13,632	5,343	770,960
C. Calculation of Liability Gain/(Loss)					
1. Gain/(Loss) Due to Changes in Actuarial Assumptions	(372,849)	(4,172)	(7,136)	(1,344)	(385,501)
2. Gain/(Loss) Due to Plan Amendments	(3,690)	—	—	—	(3,690)
3. Gain/(Loss) Due to Change in Asset Method	—	—	—	—	—
4. Liability Experience Gain/(Loss) (A7-B7-C1-C2-C3)	\$ 324,811	\$ (38,193)	\$ (3,207)	\$ 8,032	\$ 291,443

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

FOR THE YEAR ENDED JUNE 30, 2018

(EXPRESSED IN THOUSANDS)

	State	Teacher	Political Subdivisions	Total
A. Calculation of Expected Unfunded Actuarial Accrued Liability (UAAL)				
1. UAAL as of June 30, 2017	\$ 5,763,770	\$ 12,321,149	\$ 2,552,119	\$ 20,637,038
2. Normal Cost for Previous Year	351,369	827,579	509,123	1,688,071
3. Actual Contributions During the Year	(737,447)	(1,661,366)	(718,117)	(3,116,930)
4. Interest at Previous Year's Rate of 7.00%				
a. On UAAL	403,464	862,480	178,648	1,444,592
b. On Normal Cost	24,596	57,931	35,639	118,166
c. On Contributions	(25,811)	(58,148)	(25,134)	(109,093)
d. Total	402,249	862,263	189,153	1,453,665
5. Expected UAAL as of June 30, 2018 (A1+A2+A3+A4)	5,779,941	12,349,625	2,532,278	20,661,844
6. Actual UAAL as of June 30, 2018	5,722,218	11,842,224	2,405,581	19,970,023
7. Total Gain/(Loss) (A5-A6)	57,723	507,401	126,697	691,821
B. Calculation of Asset Gain/(Loss)				
1. Actuarial Value of Assets (AVA) as of June 30, 2017	17,547,764	32,684,868	18,981,614	69,214,246
2. Contributions During the Year	737,447	1,661,366	718,117	3,116,930
3. Benefit Payments During the Year	(1,327,039)	(2,282,505)	(1,051,345)	(4,660,889)
4. Interest at Previous Year's Rate of 7.00%				
a. On AVA at Beginning of Year	1,228,343	2,287,941	1,328,713	4,844,997
b. On Contributions	25,811	58,148	25,134	109,093
c. On Benefit Payments	(46,446)	(79,888)	(36,797)	(163,131)
d. Total	1,207,708	2,266,201	1,317,050	4,790,959
5. Expected AVA as of June 30, 2018 (B1+B2+B3+B4)	18,165,880	34,329,930	19,965,436	72,461,246
6. Actual AVA as of June 30, 2018	18,392,939	34,673,952	20,137,904	73,204,795
7. Total Gain/(Loss) on Assets (B6-B5)	227,059	344,022	172,468	743,549
C. Calculation of Liability Gain/(Loss)				
1. Gain/(Loss) Due to Changes in Actuarial Assumptions	(150,190)	(177,499)	(45,160)	(372,849)
2. Gain/(Loss) Due to Plan Amendments	—	—	(3,690)	(3,690)
3. Gain/(Loss) Due to Change in Asset Method	—	—	—	—
4. Liability Experience Gain/(Loss) (A7-B7-C1-C2-C3)	\$ (19,146)	\$ 340,878	\$ 3,079	\$ 324,811

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, 2018, valuation.

ACTUARIAL ASSUMPTIONS AND METHODS: PENSION PLANS

FOR THE JUNE 30, 2018, 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 to 2020

- 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%	3.30%	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 4.3: 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%

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%

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	23.500%	14.000%	0.000%		25.500%	16.500%	0.000%
35	18.500%	10.500%	5.500%		19.000%	11.500%	6.000%
45	15.500%	8.000%	3.000%		15.000%	8.000%	3.500%
55	12.000%	6.500%	1.000%		12.500%	6.500%	0.000%
65	12.000%	8.000%	0.000%		13.000%	9.000%	0.000%

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 liability 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 (ORP) 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 service credit 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 ORP 2 if they have an ORP membership date on or after July 1, 2010, and maintain an account balance. If a member of VaLORS, SPORS, VRS with enhanced hazardous duty benefits or the hazardous duty alternate option 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 ORP, 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. Members' contribution accounts accrue 4% interest each year, calculated on the balance as of the previous June 30. 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.

CREDITABLE COMPENSATION

Creditable compensation is the member's current annual base salary excluding overtime; extraordinary pay; bonus pay; housing and moving expenses; mobile device and internet costs; vehicle allowances; termination pay for leave; non-permanent shift differentials; payments of a temporary nature including but not limited to acting pay (if not

permanently confirmed for the position); or payments for extra duties, such as pay for teachers who serve as coaches. A member's election to defer salary to a deferred compensation plan, such as a 403(b), a 457(b) or a 125 plan, may only be included in creditable compensation if the member voluntarily elects the deferral, the deferral is not conditional or performance based, and the deferral would otherwise be included in the member's gross income. Other exclusions apply.

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 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
VRS: Age 65 with at least five years of service credit, or age 50 with at least 30 years of service credit. Note: Some political subdivisions require employees to reach age 55 with at least 30 years of service credit.	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.	- Plan 1: 1.70% of average final compensation X years of service. - Plan 2: 1.65% of average final compensation X years of service. - Hybrid Retirement Plan: 1.00% of average final compensation X years of service. 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.
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.	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.)	- SPORS, sheriffs and regional jail superintendents: 1.85% of average final compensation for each year of service credit. - 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. - 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. - 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.

NORMAL (UNREDUCED) AND REDUCED RETIREMENT ELIGIBILITY AND BENEFIT CALCULATIONS, cont.

EARLIEST UNREDUCED RETIREMENT ELIGIBILITY

PLAN 1	PLAN 2 & HYBRID PLAN	BENEFIT CALCULATIONS
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.	Plan 1 and Plan 2: - 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. - 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. Hybrid Retirement Plan: 1.00% of average final compensation for each year of service credit beginning on the date of appointment or election to an original term.

EARLIEST REDUCED RETIREMENT ELIGIBILITY

PLAN 1	PLAN 2 & HYBRID PLAN	BENEFIT CALCULATIONS
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.	- 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. - For VRS Plan 1 members, an additional reduction of 0.60% is applied for each month the member's age precedes age 55. - 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.
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 service credit 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, 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, 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, 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, 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.

If a member is vested and has a non-work-related disability, the amount of the disability retirement benefit will be the VRS formula amount, as described below, or the guaranteed benefit, whichever is higher.

For vested members under age 60, the benefit will be equal to 1.70% for Plan 1 members or 1.65% for Plan 2 members of average final compensation multiplied by (a) twice the amount of total service

credit or (b) actual service credit plus the number of years remaining between the member's age at disability retirement and age 60, whichever is less. For vested members age 60 or older, the benefit will be equal to 1.70% for Plan 1 members or 1.65% for Plan 2 members of average final compensation multiplied by total service credit.

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.

2019 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

March 21, 2019

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, 2018:

- 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, 2018. 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, 2018. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The funded status of the Plan is the ratio of the assets to the actuarial accrued liability. While the market value of assets gives an indication of the funded status of a plan at a particular point in time and is used for financial reporting, for GLI, HIC – State Employees, HIC – Teachers, VSDP and VLDP, it is not used directly in the calculation of the employer contribution rates. A less volatile actuarial value of assets, which smooths the effect of market fluctuations over a five-year period, is applied to determine the funded status for rate-setting purposes. For informational purposes, we exhibit the funded status based on this smoothed actuarial value of assets basis as well as the market value in this report. 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, 2018, 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, 2017, 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, 2018, actuarial valuation.

OPEB Plan	Fiscal Years 2019 & 2020		
			2018 Valuation (Informational Only)
	Board Approved	General Assembly Approved	
	2017 Valuation		
GLI*	1.31%	1.31%	1.29%
HIC – State Employees	1.17%	1.17%	1.15%
HIC – Teachers	1.20%	1.20%	1.19%
HIC – Participating Political Subdivisions**	0.32%	0.32%	0.46%
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%	0.42%
VSDP	0.62%	0.62%	0.67%
VLDP – Teachers	0.41%	0.41%	0.43%
VLDP – Political Subdivisions	0.72%	0.72%	0.88%

* 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 HB 1130 and SB 498, Plan 2 members and Hybrid 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, 2018, 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,

Handwritten signature of Alisa Bennett in black ink.

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

Handwritten signature of Larry Langer in black ink.

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

Handwritten signature of Bradley R. Wild in black ink.

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 18, 2019

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, 2018.

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 participant data from the Virginia Retirement System (VRS). 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 state-wide health insurance plans for all LODA beneficiaries, with separate plans based on Medicare eligibility. The legislation became effective July 1, 2017, and is included in this valuation. Here, the assumed health care costs were based upon the premium amounts provided by the DHRM actuaries which used experience of those State Employees currently receiving health care benefits from the Plan.

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Contribution rates for participating employer groups are established every two years. Based upon the June 30, 2017, valuation results, the Board approved rate for fiscal years 2019 and 2020 is \$705.77. The results of the June 30, 2018, valuation are for informational purposes only. The informational contribution rates assume Plan participation of 11,394.40 State Employee FTEs and 7,619.25 Political Subdivision Employee FTEs, for a total of 19,013.65 FTEs. The informational contribution rate of \$729.25 represents, in total, the estimated cost of providing benefits payable in fiscal years 2020 and 2021, including administrative expenses, if this were a rate-setting year.

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.

Since the prior valuation, this valuation reflects 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
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

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, 2018, valuation.

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

FOR THE JUNE 30, 2018, ACTUARIAL VALUATION

Actuarial Assumptions and Methods	Group Life Insurance Program	Retiree Health Insurance Credit Program	Virginia Sickness and Disability Program	Line of Duty Act Program	Virginia Local Disability Program
Valuation Interest Rate	7%	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
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 Open
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								
2018	N/A	\$ 1,901,090	\$ 1,265,443	\$ 1,574,017	N/A	82.80%	0.00%	
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%	
RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES**								
2018	N/A	\$ 651,476	\$ 344,183	\$ 96,294	N/A	14.78%	0.00%	
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%	
RETIREE HEALTH INSURANCE CREDIT – TEACHERS								
2018	N/A	\$ 851,963	\$ 527,110	\$ 113,136	N/A	13.28%	0.00%	
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%	
RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS								
2018	N/A	\$ 27,195	\$ 17,259	\$ 4,655	N/A	17.12%	0.00%	
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%	

SOLVENCY TEST: OPEB PLANS, cont.

(EXPRESSED IN THOUSANDS)

RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS										
2018	N/A	\$	22,409	\$	18,534	\$	23,161	N/A	100.00%	4.06%
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%
VIRGINIA SICKNESS AND DISABILITY PROGRAM – LONG-TERM DISABILITY (LTD) BENEFITS										
2018****	N/A	\$	187,514	\$	77,778	\$	460,466	N/A	100.00%	350.94%
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%
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS										
2018****	N/A	\$	271	\$	1,112	\$	674	N/A	100.00%	36.24%
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										
2018****	N/A	\$	1,571	\$	1,161	\$	853	N/A	54.30%	0.00%
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										
2018	N/A	\$	257,076	\$	36,766	\$	1,889	N/A	0.73%	0.00%
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				
2018	367,903	\$ 19,783,323	\$ 53,773	2.14%
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	N/A
RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES*				
2018	107,234	\$ 6,635,983	\$ 61,883	3.15%
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	N/A
RETIREE HEALTH INSURANCE CREDIT – TEACHERS				
2018	151,585	\$ 8,479,023	\$ 55,936	1.33%
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	0.0329

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

RETIREE HEALTH INSURANCE CREDIT – STATE-FUNDED LOCALITY BENEFITS						
2018	18,836	\$	924,785	\$	49,097	1.85%
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	N/A
RETIREE HEALTH INSURANCE CREDIT – POLITICAL SUBDIVISIONS						
2018	23,034	\$	1,048,068	\$	45,501	3.52%
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						
2018	75,164	\$	3,993,073	\$	53,125	3.82%
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	N/A
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS						
2018	9,332	\$	377,798	\$	40,484	(4.05)%
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						
2018	7,915	\$	268,121	\$	33,875	3.66%
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				
2018	11,464	\$ 1,357,284,000	5,269	\$ 1,071,515,000	185,605	\$ 7,354,358,000	4.04%	\$ 39,624
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**	8296	N/A	10816	N/A	126,029	5,416,588,000	8.66%	42,979
RETIREE HEALTH INSURANCE CREDIT – STATE EMPLOYEES*								
Valuation Date (June 30)	Retirees					Current Total Annual Health Insurance Credit	Annualized % Increase in Health Insurance Credit	Average Annual Health Insurance Credit
	Added to Rolls		Removed from Rolls		Total			
	Number	Amount	Number	Amount				
2018	2,558	\$ 3,779,000	4,105	\$ 5,981,000	44,741	\$ 66,554,000	(3.20)%	\$ 1,488
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**	3201	N/A	1368	N/A	36,020	52,382,000	8.98%	1,454
RETIREE HEALTH INSURANCE CREDIT – TEACHERS								
Valuation Date (June 30)	Retirees					Current Total Annual Health Insurance Credit	Annualized % Increase in Health Insurance Credit	Average Annual Health Insurance Credit
	Added to Rolls		Removed from Rolls		Total			
	Number	Amount	Number	Amount				
2018	3,511	\$ 4,719,000	1,534	\$ 2,067,000	66,332	\$ 91,306,000	2.99%	\$ 1,377
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**	5375	N/A	1002	N/A	46,464	63,789,000	9.90%	1,373

* 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 Insurance Credit	Average Annual Health Insurance Credit	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2018	439	\$ 218,000	115	\$ 58,000	5,832	\$ 2,958,000	5.72 %	\$ 507	
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 Insurance Credit	Average Annual Health Insurance Credit	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2018	439	\$ 216,000	156	\$ 84,000	5,113	\$ 2,515,000	5.54 %	\$ 492	
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 Payment	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2018	339	\$ 5,994,000	407	\$ 4,424,000	2,653	\$ 32,201,000	5.13 %	\$ 12,138	
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	
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS									
Valuation Date (June 30)	Retirees					Current Total Annual LTD Payments	Annualized % Increase in LTD Payments	Average Annual LTD Payment	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2018	6	\$ 75,000	—	—	6	\$ 75,000	N/A	\$ 12,500	
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 Payment	
	Added to Rolls		Removed from Rolls		Total				
	Number	Amount	Number	Amount					
2018	20	\$ 244,000	—	—	25	\$ 313,000	(3.69)%	\$ 12,520	
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

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 4.8: 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	22.300%	22.300%	22.060%	20.170%	16.920%	13.670%	10.950%	9.130%	8.250%	7.730%	7.210%
35	15.120%	14.550%	13.630%	12.200%	10.690%	9.580%	8.900%	8.390%	7.570%	5.880%	4.180%
45	14.220%	11.470%	9.620%	8.320%	7.350%	6.890%	6.600%	6.410%	5.930%	4.280%	2.630%
55	13.240%	10.030%	8.050%	7.090%	6.490%	6.350%	5.950%	5.390%	4.470%	3.550%	2.630%
65	13.040%	9.480%	7.860%	7.090%	6.490%	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	26.750%	26.750%	25.590%	23.170%	20.060%	16.600%	13.660%	11.710%	11.140%	11.140%	11.140%
35	19.260%	17.080%	15.530%	14.100%	12.760%	11.660%	10.630%	9.380%	8.240%	7.180%	6.020%
45	17.030%	13.340%	11.250%	9.980%	8.920%	8.280%	7.530%	6.870%	6.280%	5.210%	3.030%
55	16.700%	11.690%	9.150%	8.240%	7.660%	7.040%	6.180%	5.710%	5.140%	5.090%	3.030%
65	16.700%	11.660%	9.060%	8.240%	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	18.730%	14.290%	12.180%	11.080%	9.450%	8.070%	7.570%	6.720%	5.060%	4.290%	4.290%
35	16.960%	13.890%	12.460%	10.910%	9.350%	7.930%	6.710%	5.880%	5.210%	4.360%	3.310%
45	16.960%	13.890%	11.570%	10.120%	7.860%	6.940%	6.230%	5.730%	5.240%	4.240%	2.410%
55	16.960%	13.890%	11.220%	10.120%	7.040%	5.840%	5.810%	5.730%	5.230%	4.240%	2.410%
65	16.960%	13.890%	11.220%	10.120%	7.040%	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	18.040%	12.330%	10.860%	10.640%	9.380%	7.730%	6.570%	6.510%	5.450%	4.930%	4.930%
35	16.500%	14.140%	12.600%	11.310%	10.180%	9.520%	8.650%	7.390%	6.390%	5.290%	3.930%
45	15.060%	12.050%	9.930%	8.540%	7.690%	7.180%	6.620%	5.910%	5.390%	4.420%	2.290%
55	14.910%	11.620%	9.450%	8.040%	7.090%	6.250%	5.450%	5.330%	4.770%	4.360%	2.290%
65	14.910%	11.620%	9.450%	8.040%	7.090%	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%	20.510%	18.630%	17.320%	16.250%	14.430%	11.710%	9.290%	8.230%	6.880%	6.880%
35	19.130%	16.820%	15.080%	13.690%	12.400%	11.190%	10.160%	9.220%	8.230%	6.880%	5.220%
45	16.930%	14.550%	12.560%	10.920%	9.440%	8.920%	8.520%	8.180%	7.550%	6.300%	3.940%
55	15.610%	12.540%	10.330%	8.980%	8.450%	7.340%	6.690%	5.860%	4.830%	4.320%	3.940%
65	15.340%	9.240%	6.480%	6.480%	6.480%	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	22.850%	20.860%	19.800%	19.430%	19.260%	18.890%	17.960%	15.780%	13.040%	13.040%	13.040%
35	21.390%	18.770%	17.210%	16.240%	15.440%	14.420%	13.000%	11.320%	9.790%	8.500%	7.340%
45	19.070%	15.750%	13.540%	12.140%	11.040%	10.260%	9.180%	8.100%	7.250%	6.010%	3.670%
55	17.300%	12.750%	9.920%	8.540%	8.210%	7.160%	6.950%	6.590%	5.560%	5.540%	3.670%
65	17.280%	11.780%	8.110%	6.920%	6.920%	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	25.060%	23.020%	20.930%	18.370%	15.690%	13.360%	11.960%	10.840%	9.990%	9.990%	9.990%
35	20.650%	18.220%	16.210%	14.310%	12.750%	11.430%	10.350%	9.570%	8.810%	7.800%	6.550%
45	18.400%	14.900%	12.720%	11.400%	10.570%	9.880%	9.090%	8.210%	7.360%	6.230%	4.630%
55	16.070%	12.970%	12.000%	10.500%	10.450%	9.750%	8.930%	8.110%	6.490%	6.230%	4.630%
65	15.360%	12.880%	12.000%	10.500%	10.450%	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%	25.710%	23.400%	20.380%	17.490%	15.450%	13.810%	12.030%	10.660%	10.640%	10.640%
35	22.330%	20.210%	18.740%	17.240%	15.850%	14.350%	12.840%	11.560%	10.450%	9.120%	7.610%
45	19.510%	16.560%	14.580%	13.210%	12.280%	11.550%	10.660%	9.710%	9.000%	7.640%	5.320%
55	16.930%	14.490%	12.400%	10.930%	10.010%	9.280%	9.280%	9.280%	8.450%	7.560%	5.320%
65	15.630%	14.010%	12.290%	10.880%	10.010%	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	16.010%	14.520%	13.810%	13.250%	12.170%	10.520%	8.850%	7.770%	6.900%	6.900%	6.900%
35	15.310%	12.570%	10.920%	9.900%	9.160%	8.900%	8.440%	7.640%	6.610%	5.430%	4.190%
45	15.280%	11.790%	9.480%	8.220%	7.800%	7.020%	6.630%	6.270%	5.630%	4.560%	3.020%
55	14.070%	10.550%	8.410%	7.690%	7.690%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	11.090%	8.670%	7.760%	7.690%	7.690%	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	18.760%	15.470%	13.050%	11.600%	11.000%	10.650%	10.220%	8.770%	6.590%	5.830%	5.830%
35	20.890%	16.400%	13.400%	11.540%	10.340%	9.330%	8.330%	7.400%	6.590%	5.830%	5.040%
45	18.250%	14.690%	12.280%	10.840%	9.900%	8.820%	7.990%	7.250%	6.590%	5.310%	3.440%
55	11.230%	10.210%	9.680%	9.680%	9.600%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	1.270%	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	30.260%	26.920%	23.840%	20.790%	17.800%	14.760%	12.540%	11.510%	11.510%	11.510%	11.510%
35	25.750%	21.970%	18.820%	16.020%	13.400%	11.600%	10.240%	9.350%	8.620%	7.590%	6.050%
45	22.180%	17.030%	13.790%	12.030%	11.170%	9.580%	8.480%	7.390%	6.240%	5.160%	4.280%
55	21.690%	14.710%	10.530%	9.930%	9.930%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	21.690%	14.670%	9.800%	9.790%	9.790%	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	33.630%	30.650%	27.160%	23.160%	19.210%	15.380%	13.570%	10.070%	9.920%	9.920%	9.920%
35	32.030%	25.200%	20.730%	17.950%	15.980%	14.870%	13.530%	10.070%	9.910%	8.070%	6.060%
45	30.590%	21.490%	15.690%	12.720%	11.800%	10.980%	10.130%	9.110%	7.800%	6.040%	3.690%
55	28.000%	17.540%	10.160%	6.520%	6.490%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
65	23.880%	12.930%	3.570%	0.000%	0.180%	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 UAAL 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 service credit, 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.

2019 VALUATION: No actuarially material changes are made to the plan provisions.

Statistical Section5

TRANSFORMING FOR TOMORROW



Statistical Section 5

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)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 41,348	\$ 46,287	\$ 53,151	\$ 52,091	\$ 56,979	\$ 64,522	\$ 66,431	\$ 66,439	\$ 73,000	\$ 76,889
Funding:										
Member and Employer Contributions and Other Additions	1,862	1,549	1,821	2,600	2,697	3,250	3,375	3,244	3,466	3,511
Less: Benefits and Administrative Expenses and Transfers	3,157	3,397	3,518	3,791	4,029	4,263	4,505	4,698	4,931	5,168
Net Funding	(1,295)	(1,848)	(1,697)	(1,191)	(1,332)	(1,013)	(1,130)	(1,454)	(1,465)	(1,657)
Investment Income:										
Interest, Dividends and Other Investment Income	775	1,031	1,052	911	984	912	907	905	895	970
Net Appreciation (Depreciation) in Fair Value	5,459	7,681	(415)	5,168	7,891	2,010	231	7,110	4,459	4,116
Net Investment Income	6,234	8,712	637	6,079	8,875	2,922	1,138	8,015	5,354	5,086
Net Increase (Decrease)	4,939	6,864	(1,060)	4,888	7,543	1,909	8	6,561	3,889	3,429
Fiduciary Net Position										
Restricted – End of Year	\$ 46,287	\$ 53,151	\$ 52,091	\$ 56,979	\$ 64,522	\$ 66,431	\$ 66,439	\$ 73,000	\$ 76,889	\$ 80,318

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)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 11,301	\$ 12,432	\$ 14,040	\$ 13,516	\$ 14,502	\$ 16,169	\$ 16,399	\$ 16,368	\$ 17,790	\$ 18,532
Funding:										
Member and Employer Contributions and Other Additions	360	253	309	520	541	676	923	737	750	747
Less: Benefits and Administrative Expenses and	931	968	992	1,054	1,119	1,175	1,231	1,279	1,340	1,401
Net Funding	(571)	(715)	(683)	(534)	(578)	(499)	(308)	(542)	(590)	(654)
Investment Income:										
Interest, Dividends and Other Investment Income	212	275	263	235	249	228	221	222	248	232
Net Appreciation (Depreciation) in Fair Value	1,490	2,048	(104)	1,285	1,996	501	56	1,742	1,084	980
Net Investment Income	1,702	2,323	159	1,520	2,245	729	277	1,964	1,332	1,212
Net Increase (Decrease)	1,131	1,608	(524)	986	1,667	230	(31)	1,422	742	558
Fiduciary Net Position										
Restricted – End of Year	\$ 12,432	\$ 14,040	\$ 13,516	\$ 14,502	\$ 16,169	\$ 16,399	\$ 16,368	\$ 17,790	\$ 18,532	\$ 19,090

VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER

(EXPRESSED IN MILLIONS)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 19,299	\$ 21,515	\$ 24,518	\$ 23,928	\$ 26,076	\$ 29,411	\$ 30,344	\$ 30,168	\$ 33,120	\$ 34,920
Funding:										
Member and Employer Contributions and Other Additions	821	623	816	1,204	1,225	1,641	1,443	1,531	1,684	1,684
Less: Benefits and Administrative Expenses and Transfers	1,509	1,651	1,697	1,834	1,933	2,036	2,136	2,212	2,306	2,393
Net Funding	(688)	(1,028)	(881)	(630)	(708)	(395)	(693)	(681)	(622)	(709)
Investment Income:										
Interest, Dividends and Other Investment Income	361	477	481	415	449	415	413	412	407	443
Net Appreciation (Depreciation) in Fair Value	2,543	3,554	(190)	2,363	3,594	913	104	3,221	2,015	1,869
Net Investment Income	2,904	4,031	291	2,778	4,043	1,328	517	3,633	2,422	2,312
Net Increase (Decrease)	2,216	3,003	(590)	2,148	3,335	933	(176)	2,952	1,800	1,603
Fiduciary Net Position										
Restricted – End of Year	\$ 21,515	\$ 24,518	\$ 23,928	\$ 26,076	\$ 29,411	\$ 30,344	\$ 30,168	\$ 33,120	\$ 34,920	\$ 36,523

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)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 9,290	\$ 10,699	\$ 12,722	\$ 12,823	\$ 14,395	\$ 16,628	\$ 17,283	\$ 17,418	\$ 19,250	\$ 20,303
Funding:										
Member and Employer Contributions and Other Additions	584	606	615	747	765	761	776	716	732	748
Less: Benefits and Administrative Expenses and Transfers	584	635	679	741	804	867	942	998	1,095	1,138
Net Funding	—	(29)	(64)	6	(39)	(106)	(166)	(282)	(363)	(390)
Investment Income:										
Interest, Dividends and Other Investment Income	175	243	272	228	252	237	241	239	237	258
Net Appreciation (Depreciation) in Fair Value	1,234	1,809	(107)	1,338	2,020	524	60	1,875	1,179	1,088
Net Investment Income	1,409	2,052	165	1,566	2,272	761	301	2,114	1,416	1,346
Net Increase (Decrease)	1,409	2,023	101	1,572	2,233	655	135	1,832	1,053	956
Fiduciary Net Position										
Restricted – End of Year	\$ 10,699	\$ 12,722	\$ 12,823	\$ 14,395	\$ 16,628	\$ 17,283	\$ 17,418	\$ 19,250	\$ 20,303	\$ 21,259

VIRGINIA RETIREMENT SYSTEM (VRS) – HYBRID DEFINED CONTRIBUTION PLAN

(EXPRESSED IN MILLIONS)

	2010	2011	2012	2013	2014*	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 1	\$ 24	\$ 75	\$ 183	\$ 329
Funding:										
Member and Employer Contributions and Other Additions	—	—	—	—	1	23	52	97	134	174
Less: Benefits and Administrative Expenses and Transfers	—	—	—	—	—	—	2	4	7	12
Net Funding	—	—	—	—	1	23	50	93	127	162
Investment Income:										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	—	—	—
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	—	—	1	15	19	30
Net Investment Income	—	—	—	—	—	—	1	15	19	30
Net Increase (Decrease)	—	—	—	—	1	23	51	108	146	192
Fiduciary Net Position										
Restricted – End of Year	\$ —	\$ —	\$ —	\$ —	\$ 1	\$ 24	\$ 75	\$ 183	\$ 329	\$ 521

* Fiscal year 2014 is the first year the data is available.

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)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 484	\$ 534	\$ 599	\$ 575	\$ 625	\$ 721	\$ 733	\$ 731	\$ 796	\$ 837
Funding:										
Member and Employer Contributions and Other Additions	21	13	16	31	48	34	39	38	42	38
Less: Benefits and Administrative Expenses and Transfers	43	47	47	49	51	54	55	59	59	64
Net Funding	(22)	(34)	(31)	(18)	(3)	(20)	(16)	(21)	(17)	(26)
Investment Income:										
Interest, Dividends and Other Investment Income	9	12	12	11	11	10	11	9	10	10
Net Appreciation (Depreciation) in Fair Value	63	87	(5)	57	88	22	3	77	48	44
Net Investment Income	72	99	7	68	99	32	14	86	58	54
Net Increase (Decrease)	50	65	(24)	50	96	12	(2)	65	41	28
Fiduciary Net Position										
Restricted – End of Year	\$ 534	\$ 599	\$ 575	\$ 625	\$ 721	\$ 733	\$ 731	\$ 796	\$ 837	\$ 865

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

(EXPRESSED IN MILLIONS)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 691	\$ 792	\$ 911	\$ 895	\$ 992	\$ 1,150	\$ 1,191	\$ 1,211	\$ 1,346	\$ 1,424
Funding:										
Member and Employer Contributions and Other Additions	56	35	42	68	85	79	97	91	91	93
Less: Benefits and Administrative Expenses and Transfers	58	64	69	76	84	90	98	103	111	115
Net Funding	(2)	(29)	(27)	(8)	1	(11)	(1)	(12)	(20)	(22)
Investment Income:										
Interest, Dividends and Other Investment Income	12	18	18	16	18	16	16	17	17	18
Net Appreciation (Depreciation) in Fair Value	91	130	(7)	89	139	36	5	130	81	76
Net Investment Income	103	148	11	105	157	52	21	147	98	94
Net Increase (Decrease)	101	119	(16)	97	158	41	20	135	78	72
Fiduciary Net Position										
Restricted – End of Year	\$ 792	\$ 911	\$ 895	\$ 992	\$ 1,150	\$ 1,191	\$ 1,211	\$ 1,346	\$ 1,424	\$ 1,496

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)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ 284	\$ 315	\$ 361	\$ 354	\$ 389	\$ 442	\$ 457	\$ 467	\$ 512	\$ 540
Funding:										
Member and Employer Contributions and Other Additions	20	20	22	30	31	35	45	31	32	28
Less: Benefits and Administrative Expenses and Transfers	31	32	34	37	39	41	42	41	42	44
Net Funding	(11)	(12)	(12)	(7)	(8)	(6)	3	(10)	(10)	(18)
Investment Income:										
Interest, Dividends and Other Investment Income	5	7	7	6	7	7	5	5	7	6
Net Appreciation (Depreciation) in Fair Value	37	51	(2)	36	54	14	2	50	31	29
Net Investment Income	42	58	5	42	61	21	7	55	38	36
Net Increase (Decrease)	31	46	(7)	35	53	15	10	45	28	18
Fiduciary Net Position										
Restricted – End of Year	\$ 315	\$ 361	\$ 354	\$ 389	\$ 442	\$ 457	\$ 467	\$ 512	\$ 540	\$ 558

JUDICIAL RETIREMENT SYSTEM (JRS) – HYBRID DEFINED CONTRIBUTION PLAN

(EXPRESSED IN MILLIONS)

	2010	2011	2012	2013	2014*	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 1	\$ 3	\$ 4
Funding:										
Member and Employer Contributions and Other Additions	—	—	—	—	—	—	1	2	1	1
Less: Benefits and Administrative Expenses and Transfers	—	—	—	—	—	—	—	—	—	—
Net Funding	—	—	—	—	—	—	1	2	1	1
Investment Income:										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	—	—	—
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	—	—	—	—	—	—
Net Investment Income	—	—	—	—	—	—	—	—	—	—
Net Increase (Decrease)	—	—	—	—	—	—	1	2	1	1
Fiduciary Net Position										
Restricted – End of Year	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 1	\$ 3	\$ 4	\$ 5

* Fiscal year 2014 is the first year the data is available.

SCHEDULE OF RETIREMENT CONTRIBUTIONS BY SYSTEM AND PLAN

FISCAL YEARS 2010-2019

(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	Hybrid Defined Contribution	Sub-Total			Judicial Retirement	Hybrid Defined Contribution	Sub-Total	
2019	\$ 747,065	\$ 1,684,222	\$ 747,714	\$ 173,807	\$ 3,352,808	\$37,816	\$93,198	\$26,098	\$ 1,423	\$ 27,521	\$ 3,511,343
2018	750,078	1,684,478	731,625	133,698	3,299,879	42,117	91,288	31,327	1,303	32,630	3,465,914
2017	736,815	1,530,706	716,199	97,200	3,080,920	37,589	91,414	30,884	1,589	32,473	3,242,396
2016	922,801	1,442,652	775,881	51,931	3,193,265	39,414	96,966	44,738	674	45,412	3,375,057
2015	676,239	1,640,775	760,937	23,658	3,101,609	34,107	79,165	34,518	216	34,734	3,249,615
2014	541,294	1,224,875	764,921	1,380	2,532,470	48,329	85,391	30,778	—	30,778	2,696,968
2013	519,319	1,204,021	746,040	—	2,469,380	31,553	67,654	30,000	—	30,000	2,598,587
2012**	307,843	814,681	613,572	—	1,736,096	16,611	42,202	21,875	—	21,875	1,816,784
2011**	252,110	622,904	605,908	—	1,480,922	12,343	34,423	20,338	—	20,338	1,548,026
2010*	359,827	820,193	583,864	—	1,763,884	20,747	56,347	20,206	—	20,206	1,861,184

* 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, 2010-2019

(EXPRESSED IN MILLIONS)



SCHEDULE OF PENSION TRUST FUND ADDITIONS BY SOURCE

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Member Contributions	Employer Contributions		Investment Income (Loss)	Other	Total
		For Members	Employer Share			
VIRGINIA RETIREMENT SYSTEM (VRS)						
2019	\$ 953,343	\$ —	\$ 2,399,465	\$ 4,898,307	\$ 2,299	\$ 8,253,414
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)						
2019	\$ 6,379	\$ —	\$ 31,437	\$ 54,792	\$ —	\$ 92,608
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)						
2019	\$ 17,871	\$ —	\$ 75,327	\$ 93,872	\$ —	\$ 187,070
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
JUDICIAL RETIREMENT SYSTEM (JRS)						
2019	\$ 4,031	\$ —	\$ 23,490	\$ 35,719	\$ —	\$ 63,240
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

* 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 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Retirement Benefits	Refunds	Administrative Expenses	Other	Total
VIRGINIA RETIREMENT SYSTEM (VRS)					
2019	\$ 4,774,664	\$ 112,169	\$ 48,586	\$ 9,282	\$ 4,944,701
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)					
2019	\$ 62,683	\$ 805	\$ 488	\$ 61	\$ 64,037
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)					
2019	\$ 109,193	\$ 4,933	\$ 831	\$ 103	\$ 115,060
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
JUDICIAL RETIREMENT SYSTEM (JRS)					
2019	\$ 43,584	\$ —	\$ 315	\$ 43	\$ 43,942
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

SCHEDULE OF RETIREMENT BENEFITS BY SYSTEM AND PLAN

FISCAL YEARS 2010-2019

(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				
2019	\$ 1,360,833	\$ 2,331,038	\$ 1,082,793	\$ 4,774,664	\$62,683	\$109,193	\$43,584	\$ 4,990,124
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

SCHEDULE OF RETIREMENT BENEFITS BY TYPE

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
STATE				
2019	\$ 1,277,123	\$ 66,909	\$ 16,801	\$ 1,360,833
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
TEACHER				
2019	\$ 2,210,585	\$ 110,690	\$ 9,763	\$ 2,331,038
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

SCHEDULE OF RETIREMENT BENEFITS BY TYPE, cont.

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
POLITICAL SUBDIVISIONS				
2019	\$ 930,161	\$ 142,828	\$ 9,804	\$ 1,082,793
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
TOTAL VIRGINIA RETIREMENT SYSTEM (VRS)				
2019	\$ 4,417,869	\$ 320,427	\$ 36,368	\$ 4,774,664
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
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)				
2019	\$ 55,125	\$ 6,892	\$ 666	\$ 62,683
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

SCHEDULE OF RETIREMENT BENEFITS BY TYPE, cont.

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Service Benefits	Disability Benefits	Survivor Benefits	Total
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)				
2019	\$ 104,023	\$ 4,312	\$ 858	\$ 109,193
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
JUDICIAL RETIREMENT SYSTEM (JRS)				
2019	\$ 42,091	\$ 235	\$ 1,258	\$ 43,584
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

SCHEDULE OF REFUNDS BY TYPE

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
STATE (VRS)			
2019	\$ 20,068	\$ 6,829	\$ 26,897
2018	22,114	8,122	30,236
2017	23,294	7,543	30,837
2016	18,623	6,617	25,240
2015	20,768	6,956	27,724
2014	19,662	5,374	25,036
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

SCHEDULE OF REFUNDS BY TYPE, cont.

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
TEACHER (VRS)			
2019	\$ 31,115	\$ 5,600	\$ 36,715
2018	34,057	6,521	40,578
2017	34,320	5,201	39,521
2016	30,070	4,997	35,067
2015	30,314	5,744	36,058
2014	30,947	5,156	36,103
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
POLITICAL SUBDIVISIONS (VRS)			
2019	\$ 35,015	\$ 5,234	\$ 40,249
2018	35,900	5,425	41,325
2017	37,717	4,351	42,068
2016	32,832	4,548	37,380
2015	31,571	5,327	36,898
2014	32,483	4,393	36,876
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
HYBRID DEFINED CONTRIBUTION PLAN			
2019	\$ 8,308	\$ —	\$ 8,308
2018	4,334	—	4,334
2017	1,711	—	1,711
2016	1,757	—	1,757
2015	313	—	313
2014	34	—	34
TOTAL VIRGINIA RETIREMENT SYSTEM (VRS)			
2019	\$ 94,506	\$ 17,663	\$ 112,169
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

SCHEDULE OF REFUNDS BY TYPE, cont.

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)			
2019	\$ 774	\$ 31	\$ 805
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
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)			
2019	\$ 4,592	\$ 341	\$ 4,933
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
JUDICIAL RETIREMENT SYSTEM (JRS)			
2019	\$ —	\$ —	\$ —
2018	—	—	—
2017	—	—	—
2016	—	—	—
2015	—	—	—
2014	—	—	—
2013	—	—	—
2012	—	—	—
2011	5	—	5
2010	—	—	—
JRS HYBRID DEFINED CONTRIBUTION PLAN			
2019	\$ —	\$ —	\$ —
2018	24	—	24
2017	—	—	—
2016	—	—	—
2015	—	—	—
2014	—	—	—

SCHEDULE OF REFUNDS BY TYPE, cont.

FISCAL YEARS 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Separation	Death	Total
TOTAL JUDICIAL RETIREMENT SYSTEM (JRS)			
2019	\$ —	\$ —	\$ —
2018	24	—	24
2017	—	—	—
2016	—	—	—
2015	—	—	—
2014	—	—	—
2013	—	—	—
2012	—	—	—
2011	5	—	5
2010	—	—	—

SCHEDULE OF RETIREES AND BENEFICIARIES BY TYPE OF RETIREMENT

AS OF JUNE 30, 2019

Minimum Guaranteed Benefit Amount	Number of Retirees	Type of Retirement		
		Service Retirement	Disability Retirement	Pre-Retirement Death
\$ 1-200	14,148	12,783	723	642
201-400	21,933	19,730	1633	570
401-600	19,588	16,860	2309	419
601-800	16,742	14,167	2284	291
801-1,000	15,414	13,125	2067	222
1,001-1,200	14,141	12,220	1753	168
1,201-1,400	12,136	10,544	1449	143
1,401-1,600	11,407	10,186	1119	102
1,601-1,800	10,899	9,885	939	75
1,801-2,000	11,394	10,502	798	94
2,001-2,500	25,115	23,589	1389	137
2,501-3,000	16,214	15,442	703	69
3,001-3,500	10,213	9,811	352	50
3,501-4,000	5,967	5,807	134	26
4,001-4,500	3,664	3,575	74	15
Over 4,500	5,570	5,476	61	33
Totals	214,545	193,702	17,787	3,056

SCHEDULE OF RETIREES AND BENEFICIARIES BY TYPE OF RETIREMENT AND PLAN

AS OF JUNE 30, 2019

Plan	Number of Retirees	Type of Retirement		
		Service Retirement	Disability Retirement	Pre-Retirement Death
VRS – State	58,797	53,693	3,852	1,252
VRS – Teacher	92,723	86,889	5,096	738
VRS – Political Subdivisions	56,094	46,812	8,387	895
SPORS	1,410	1,165	208	37
ValORS	4,991	4,648	237	106
JRS	530	495	7	28
All Plans	214,545	193,702	17,787	3,056

SCHEDULE OF RETIREES AND BENEFICIARIES BY PAYOUT OPTION SELECTED

AS OF JUNE 30, 2019

Minimum Guaranteed Benefit Amount	Payout Option Selected							
	Basic Benefit	Survivor Option	PLOP with Basic Benefit	PLOP with Survivor Option	Advance Pension Option	Leveling Option	Increased Basic Benefit	Social Security Leveling Benefit
\$ 1-200	10,464	2,328	260	43	203	492	11	347
201-400	16,944	3,333	521	94	247	459	4	331
401-600	14,847	3,064	565	118	212	376	3	403
601-800	12,594	2,523	586	105	218	319	8	389
801-1,000	11,119	2,364	679	153	226	390	3	480
1,001-1,200	9,737	2,231	945	219	267	258	0	484
1,201-1,400	8,134	1,923	1,068	221	244	182	0	364
1,401-1,600	7,348	1,781	1,400	289	199	133	0	257
1,601-1,800	6,915	1,596	1,607	333	210	92	0	146
1,801-2,000	7,091	1,485	2,029	421	190	69	0	109
2,001-2,500	14,227	3,126	6,223	945	388	87	0	119
2,501-3,000	9,112	1,953	4,175	612	275	36	0	51
3,001-3,500	5,481	1,498	2,564	462	181	10	0	17
3,501-4,000	3,274	874	1,412	267	134	4	0	2
4,001-4,500	1,922	597	896	183	64	1	0	1
Over 4,500	2,866	1,301	983	343	69	2	0	6
Totals	142,075	31,977	25,913	4,808	3,327	2,910	29	3,506

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2010, TO JUNE 30, 2019

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2019	State	Average Monthly Benefit	\$ 556.77	\$ 1,130.53	\$ 2,220.79	\$ 3,096.43	\$ 4,017.05	\$ 6,231.70
		Number of Active Retirees	425	843	738	680	242	5
		Average AFC	\$ 48,438.21	\$ 53,122.77	\$ 60,109.13	\$ 67,482.06	\$ 73,075.21	\$ 92,173.89
	Teacher	Average Monthly Benefit	\$ 476.86	\$ 1,065.89	\$ 2,315.80	\$ 3,207.99	\$ 4,293.18	\$ 4,423.04
		Number of Active Retirees	490	1,485	1,416	871	132	4
		Average Benefit	\$ 41,487.37	\$ 52,765.27	\$ 66,479.2	\$ 73,634.63	\$ 83,052.23	\$ 79,395.87
	Political	Average Monthly Benefit	\$ 442.07	\$ 906.12	\$ 2,142.88	\$ 2,887.59	\$ 3,729.12	\$ 5,607.75
		Number of Active Retirees	554	1,027	1,023	543	72	2
		Average Benefit	\$ 34,890.16	\$ 43,392.24	\$ 59,749.44	\$ 66,564.07	\$ 75,715.07	\$ 81,452.4
	Total VRS	Average Monthly Benefit	\$ 486.86	\$ 1,033.22	\$ 2,238.05	\$ 3,088.68	\$ 4,052.29	\$ 5,460.56
		Number of Active Retirees	1,469	3,355	3,177	2,094	446	11
		Weighted Average AFC	\$ 41,010.35	\$ 49,985.92	\$ 62,832.47	\$ 69,803.18	\$ 76,454.22	\$ 85,577.98
	SPORS	Average Monthly Benefit	\$ —	\$ 1,677.61	\$ 3,040.45	\$ 4,156.60	\$ 5,375.07	\$ —
		Number of Active Retirees	—	2	24	26	6	—
		Average Benefit	\$ —	\$ 56,913.25	\$ 75,116.44	\$ 89,192.84	\$ 102,437.81	\$ —
	VaLORS	Average Monthly Benefit	\$ 480.85	\$ 983.78	\$ 1,644.12	\$ 2,774.46	\$ 4,785.22	\$ —
		Number of Active Retirees	23	129	121	25	3	—
		Average Benefit	\$ 40,863.42	\$ 40,995.09	\$ 47,746.88	\$ 60,974.57	\$ 83,333.98	\$ —
	JRS	Average Monthly Benefit	\$ 422.28	\$ —	\$ 6,166.24	\$ 7,382.26	\$ 7,546.48	\$ 8,028.31
		Number of Active Retirees	2	—	1	3	5	8
		Average Benefit	\$ 91,640	\$ —	\$ 168,489.58	\$ 162,497.43	\$ 155,159.32	\$ 157,977.8
	All Plans	Average Monthly Benefit	\$ 486.68	\$ 1,031.76	\$ 2,223.40	\$ 3,103.94	\$ 4,112.31	\$ 6,541.72
		Number of Active Retirees	1,494	3,486	3,323	2,148	460	19
		Weighted Average AFC	\$ 41,075.86	\$ 49,657.19	\$ 62,403.68	\$ 70,064.58	\$ 77,693.49	\$ 116,062.11
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	\$ 46,191.00	\$ 51,341.00	\$ 51,470.00	\$ 56,655.00	\$ 59,536.00	\$ 70,115.00
	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	\$ 39,946.00	\$ 47,785.00	\$ 55,420.00	\$ 58,933.00	\$ 65,809.00	\$ 73,067.00
	Political Subdivisions	Average Monthly Benefit	\$ 348.9	\$ 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	\$ 35,320.00	\$ 40,381.00	\$ 42,941.00	\$ 53,511.00	\$ 61,134.00	\$ 68,504.00
	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	\$ 39,849.00	\$ 45,747.00	\$ 50,480.00	\$ 56,551.00	\$ 62,808.00	\$ 70,906.00
	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	\$ —	\$ 54,484.00	\$ —	\$ 60,252.00	\$ 75,772.00	\$ 92,743.00
	VaLORS	Average Monthly Benefit	\$ 457.08	\$ 706.48	\$ 1,001.35	\$ 1,231.97	\$ 1,846.1	\$ 2,624.09
		Number of Active Retirees	22	51	63	131	81	41
		Average Benefit	\$ 37,163.00	\$ 37,664.00	\$ 40,782.00	\$ 44,121.00	\$ 51,789.00	\$ 59,481.00
	JRS	Average Monthly Benefit	\$ —	\$ 2,287.69	\$ —	\$ —	\$ 2,020.72	\$ 7,766.95
		Number of Active Retirees	—	1	—	—	3	14
		Average Benefit	\$ —	\$ 148,351.00	\$ —	\$ —	\$ 149,709.00	\$ 158,830.00
	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	\$ 39,803.00	\$ 45,578.00	\$ 50,155.00	\$ 55,567.00	\$ 62,583.00	\$ 71,251.00

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2010, TO JUNE 30, 2019

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2017	State	Average Monthly Benefit	\$ 413.21	\$ 743.04	\$ 1,034.43	\$ 1,550.8	\$ 2,059.13	\$ 3,066.54
		Number of Active Retirees	320	374	414	338	374	1,200
		Average AFC	\$ 45,412.00	\$ 49,487.00	\$ 48,208.00	\$ 58,190.00	\$ 56,901.00	\$ 65,405.00
	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	\$ 39,773.00	\$ 45,512.00	\$ 52,398.00	\$ 58,570.00	\$ 65,087.00	\$ 70,892.00
	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	\$ 33,216.00	\$ 35,209.00	\$ 41,290	\$ 48,136.00	\$ 59,764.00	\$ 65,487.00
	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	\$ 38,637.00	\$ 42,656.00	\$ 47,834.00	\$ 55,076.00	\$ 61,480.00	\$ 67,646.00
	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	\$ 74,016.00	\$ 85,256.00
	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	\$ 35,913.00	\$ 36,428.00	\$ 41,026.00	\$ 43,808.00	\$ 47,182.00	\$ 58,498.00
	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	\$ —	\$142,367.00	\$ —	\$147,295.00	\$156,110.00	\$153,865.00
	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	\$ 38,614.00	\$ 42,619.00	\$ 47,663.00	\$ 54,440.00	\$ 61,100.00	\$ 68,130.00
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	\$ 43,993.00	\$ 49,585.00	\$ 49,392.00	\$ 55,174.00	\$ 54,986.00	\$ 64,126.00
	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	\$ 65,786.00	\$ 70,336.00
	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	\$ 31,052.00	\$ 38,544.00	\$ 41,480.00	\$ 45,989.00	\$ 58,617.00	\$ 68,431.00
	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	\$ 38,138.00	\$ 45,589.00	\$ 48,851.00	\$ 53,743.00	\$ 60,893.00	\$ 67,660.00
	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	\$ —	\$ 24,869.00	\$ 53,438.00	\$ 62,731.00	\$ 75,082.00	\$ 92,720.00
	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	\$ 43,542.00	\$ 45,962.00	\$ 55,791.00
	JRS	Average Monthly Benefit	\$ —	\$ —	\$ —	\$ 4,396.22	\$ 5,647.58	\$ 8,048.62
		Number of Active Retirees	—	—	—	1	1	17
		Average AFC	\$ —	\$ —	\$ —	\$146,295.00	\$146,294.00	\$154,562.00

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2010, TO JUNE 30, 2019

			Years of Credited Service					
			1-10	11-15	16-20	21-25	26-30	Over 30
FY 2016* (cont.)	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	\$ 38,156.00	\$ 45,433.00	\$ 48,581.00	\$ 53,239.00	\$ 60,411.00	\$ 68,012.00
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	\$ 843.1	\$ 1,254.45	\$ 2,059.4	\$ 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	\$ 455.8	\$ 585.05	\$ 946.2	\$ 1,161.28	\$ 1,715.68	\$ 2,141.37
		Number of Active Retirees	23	50	52	95	93	56
	JRS	Average Monthly Benefit	\$ —	\$ —	\$ —	\$ —	\$ 5,408.75	\$ 7,674.09
		Number of Active Retirees	—	—	—	—	1	31
	All Plans	Average Monthly Benefit	\$ 365.45	\$ 631.90	\$ 987.05	\$ 1,417.08	\$ 2,189.44	\$ 3,009.36
		Number of Active Retirees	1,504	1,667	1,595	1,560	1,802	3,590
FY 2014	State	Average Monthly Benefit	\$ 374.40	\$ 674.96	\$ 1,035.41	\$ 1,308.58	\$ 1,913.24	\$ 2,766.37
		Number of Active Retirees	341	363	299	315	333	1,185
	Teacher	Average Monthly Benefit	\$ 408.27	\$ 701.52	\$ 1,083.91	\$ 1,559.04	\$ 2,383.18	\$ 3,055.18
		Number of Active Retirees	604	651	611	690	804	1,463
	Political Subdivisions	Average Monthly Benefit	\$ 308.87	\$ 542.75	\$ 855.38	\$ 1,248.49	\$ 2,007.63	\$ 2,668.41
		Number of Active Retirees	569	563	456	448	524	676
	Total VRS	Average Monthly Benefit	\$ 363.28	\$ 638.73	\$ 997.01	\$ 1,408.99	\$ 2,170.49	\$ 2,873.56
		Number of Active Retirees	1,514	1,577	1,366	1,453	1,661	3,324
	SPORS	Average Monthly Benefit	\$ —	\$ —	\$ 615.19	\$ 1,631.99	\$ 2,809.19	\$ 3,597.68
		Number of Active Retirees	—	—	1	2	10	28
	VaLORS	Average Monthly Benefit	\$ 383.32	\$ 695.40	\$ 899.70	\$ 1,133.65	\$ 1,700.98	\$ 2,537.26
		Number of Active Retirees	25	29	45	75	72	36
	JRS	Average Monthly Benefit	\$ —	\$ —	\$ —	\$ —	\$ 5,051.59	\$ 7,400.90
		Number of Active Retirees	—	—	—	—	3	22
	All Plans	Average Monthly Benefit	\$ 363.61	\$ 639.75	\$ 993.63	\$ 1,395.78	\$ 2,159.73	\$ 2,905.16
		Number of Active Retirees	1,539	1,606	1,412	1,530	1,746	3,410
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

SCHEDULE OF AVERAGE BENEFIT PAYMENTS

FOR RETIREMENTS EFFECTIVE JULY 1, 2010, TO JUNE 30, 2019

			Years of Credited Service											
			1-10	11-15	16-20	21-25	26-30	Over 30						
FY 2013 (cont.)	SPORS	Average Monthly Benefit	\$	—	\$	—	\$	—	\$	2,263.68	\$	2,752.85	\$	3,282.00
		Number of Active Retirees		—		—		—		3		10		17
	VaLORS	Average Monthly Benefit	\$	332.59	\$	632.67	\$	883.09	\$	1,223.64	\$	1,709.19	\$	2,246.63
		Number of Active Retirees		29		30		39		67		70		49
	JRS	Average Monthly Benefit	\$	—	\$	—	\$	3,645.63	\$	4,738.37	\$	—	\$	7,490.90
		Number of Active Retirees		—		—		3		1		—		28
	All Plans	Average Monthly Benefit	\$	362.24	\$	617.66	\$	1,003.13	\$	1,400.06	\$	2,080.06	\$	2,860.90
		Number of Active Retirees		1,413		1,415		1,235		1,384		1,663		3,605
FY 2012	All Plans	Average Monthly Benefit	\$	349.17	\$	628.04	\$	950.15	\$	1,360.69	\$	2,149.70	\$	2,843.02
		Number of Active Retirees		1,331		1,309		1,176		1,273		1,453		3,367
FY 2011	All Plans	Average Monthly Benefit	\$	346.15	\$	590.10	\$	923.89	\$	1,364.97	\$	2,058.50	\$	2,791.19
		Number of Active Retirees		1,218		1,196		1,164		1,383		1,637		4,318
FY 2010	All Plans	Average Monthly Benefit	\$	319.83	\$	585.59	\$	895.47	\$	1,309.38	\$	1,977.48	\$	2,750.03
		Number of Active Retirees		1,106		954		980		1,251		1,543		4,303

* 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, 2019

	Basic Benefit	Survivor Option	PLOP with Basic Benefit	PLOP with Survivor Option	Advance Pension Option	Total
VRS – State	59.16%	19.21%	11.76%	3.01%	6.86%	100.00%
VRS – Teacher	70.75%	10.14%	13.10%	1.33%	4.68%	100.00%
VRS – Political Subdivisions	67.69%	17.23%	10.36%	2.56%	2.16%	100.00%
SPORS	41.49%	34.89%	14.18%	8.87%	0.57%	100.00%
VaLORS	60.38%	17.31%	15.57%	3.49%	3.25%	100.00%
JRS	24.15%	49.06%	11.51%	13.21%	2.07%	100.00%
All Plans	66.23%	14.90%	12.08%	2.24%	4.55%	100.00%

FISCAL YEAR 2019 RETIREES

	Basic Benefit	Survivor Option	PLOP with Basic Benefit	PLOP with Survivor Option	Advance Pension Option	Total
VRS – State	63.55%	14.56%	16.84%	3.17%	1.88%	100.00%
VRS – Teacher	69.36%	10.50%	17.14%	1.82%	1.18%	100.00%
VRS – Political Subdivisions	65.23%	14.19%	16.11%	3.54%	0.93%	100.00%
SPORS	46.56%	10.34%	25.86%	15.52%	1.72%	100.00%
VaLORS	70.77%	16.94%	9.30%	1.99%	1.00%	100.00%
JRS	21.04%	42.11%	10.53%	26.32%	0.00%	100.00%
All Plans	66.41%	12.91%	16.58%	2.81%	1.29%	100.00%

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, 2019

	1-10 Years	11-20 Years	21-30 Years	31-40 Years	41-50 Years	Over 50 Years	Total
VRS – State	19.51%	21.47%	28.04%	26.72%	4.18%	0.08%	100.00%
VRS – Teacher	13.14%	23.32%	33.87%	28.04%	1.61%	0.02%	100.00%
VRS – Political Subdivisions	24.52%	28.26%	30.17%	15.92%	1.10%	0.03%	100.00%
SPORS	14.33%	3.19%	32.20%	44.68%	5.46%	0.14%	100.00%
VaLORS	13.52%	27.61%	47.03%	11.32%	0.50%	0.02%	100.00%
JRS	23.96%	2.08%	6.42%	9.62%	12.26%	45.66%	100.00%
All Plans	17.90%	24.02%	31.54%	24.18%	2.21%	0.15%	100.00%

FISCAL YEAR 2019 RETIREES

	1-10 Years	11-20 Years	21-30 Years	31-40 Years	41-50 Years	Over 50 Years	Total
VRS – State	14.49%	28.75%	25.16%	23.18%	8.25%	0.17%	100.00%
VRS – Teacher	11.14%	33.77%	32.20%	19.80%	3.00%	0.09%	100.00%
VRS – Political Subdivisions	17.20%	31.88%	31.76%	16.86%	2.24%	0.06%	100.00%
SPORS	0.00%	3.45%	41.38%	44.83%	10.34%	0.00%	100.00%
VaLORS	7.64%	42.85%	40.20%	8.31%	1.00%	0.00%	100.00%
JRS	10.53%	0.00%	5.26%	15.79%	26.31%	42.11%	100.00%
All Plans	13.67%	31.90%	30.40%	19.65%	4.21%	0.17%	100.00%

FIGURE 5.8: DISTRIBUTION OF RETIREES BY AGE AT RETIREMENT

ALL RETIREES AT JUNE 30, 2019

	Under 55	55-59	60-65	Over Age 65	Total
VRS – State	16.84%	21.88%	34.00%	27.28%	100.00%
VRS – Teacher	14.26%	34.08%	33.80%	17.86%	100.00%
VRS – Political Subdivisions	24.30%	19.92%	30.43%	25.35%	100.00%
SPORS	54.12%	29.57%	11.42%	4.89%	100.00%
VaLORS	43.56%	24.36%	23.64%	8.44%	100.00%
JRS	5.66%	15.85%	33.21%	45.28%	100.00%
All Plans	18.51%	26.73%	32.60%	22.16%	100.00%

FISCAL YEAR 2019 RETIREES

	Under 55	55-59	60-65	Over Age 65	Total
VRS – State	5.32%	11.86%	36.14%	46.68%	100.00%
VRS – Teacher	6.75%	19.05%	39.73%	34.47%	100.00%
VRS – Political Subdivisions	16.49%	16.58%	32.00%	34.93%	100.00%
SPORS	41.38%	25.86%	24.14%	8.62%	100.00%
VaLORS	39.54%	24.58%	24.25%	11.63%	100.00%
JRS	0.00%	5.26%	15.79%	78.95%	100.00%
All Plans	10.31%	16.56%	35.94%	37.19%	100.00%

FIGURE 5.9: DISTRIBUTION OF RETIREES BY AVERAGE FINAL COMPENSATION

ALL RETIREES AT JUNE 30, 2019

	Up to \$10,000	\$10,001- 20,000	\$20,001- 30,000	\$30,001- 40,000	\$40,001- 50,000	\$50,001- 60,000	\$60,001- 70,000	\$70,001- 80,000	\$80,001- 90,000	\$90,001- 100,000	Over \$100,000	Total
VRS – State	5.98%	7.21%	17.34%	20.01%	16.07%	10.94%	7.75%	5.10%	3.27%	2.12%	4.21%	100.00%
VRS – Teacher	2.93%	7.33%	9.36%	12.45%	17.79%	18.48%	12.88%	7.26%	5.04%	3.41%	3.07%	100.00%
VRS – Political Subdivisions	7.53%	13.98%	17.38%	17.84%	14.69%	9.99%	6.75%	4.31%	2.61%	1.72%	3.20%	100.00%
SPORS	10.21%	0.85%	3.19%	8.44%	14.69%	14.54%	15.60%	14.76%	9.50%	4.89%	3.33%	100.00%
VaLORS	2.64%	0.04%	6.67%	44.59%	29.71%	10.34%	3.57%	1.36%	0.46%	0.30%	0.32%	100.00%
JRS	19.43%	0.75%	0.19%	0.19%	0.38%	0.57%	1.13%	0.94%	2.64%	4.91%	68.87%	100.00%
All Plans	5.05%	8.81%	13.52%	16.63%	16.72%	13.93%	9.64%	5.79%	3.84%	2.55%	3.52%	100.00%

FISCAL YEAR 2019 RETIREES

	Up to \$10,000	\$10,001- 20,000	\$20,001- 30,000	\$30,001- 40,000	\$40,001- 50,000	\$50,001- 60,000	\$60,001- 70,000	\$70,001- 80,000	\$80,001- 90,000	\$90,001- 100,000	Over \$100,000	Total
VRS – State	0.17%	1.57%	8.73%	16.20%	20.42%	15.55%	10.43%	8.49%	5.86%	4.09%	8.49%	100.00%
VRS – Teacher	0.39%	4.52%	9.73%	8.16%	10.64%	16.42%	17.79%	10.89%	6.84%	7.21%	7.41%	100.00%
VRS – Political Subdivisions	1.21%	9.72%	11.86%	15.68%	16.98%	13.97%	9.84%	6.64%	4.41%	2.89%	6.80%	100.00%
SPORS	0.00%	0.00%	0.00%	1.72%	0.00%	5.17%	15.52%	20.69%	25.86%	15.52%	15.52%	100.00%
VaLORS	0.00%	0.00%	0.66%	37.21%	41.87%	10.30%	5.32%	1.99%	0.33%	0.66%	1.66%	100.00%
JRS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.53%	89.47%	100.00%
All Plans	0.56%	5.11%	9.77%	13.28%	15.92%	15.21%	13.08%	8.78%	5.77%	4.97%	7.55%	100.00%

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)**						
2018	\$ 73,754,573	\$ 93,174,818	\$ 19,420,245	79.2%	\$17,614,448	110.3%
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%
STATE POLICE OFFICERS' RETIREMENT SYSTEM (SPORS)						
2018	\$ 836,702	\$ 1,112,893	\$ 276,191	75.2%	\$ 126,523	218.3%
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%
VIRGINIA LAW OFFICERS' RETIREMENT SYSTEM (VaLORS)						
2018	\$ 1,423,980	\$ 2,057,504	\$ 633,524	69.2%	\$ 346,106	183.0%
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%
JUDICIAL RETIREMENT SYSTEM (JRS)						
2018	\$ 540,009	\$ 645,662	\$ 105,653	83.6%	\$ 67,424	179.2%
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%

* 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 Funded (MVA/ AAL)	Covered Payroll (c)	Net Pension Liability as a Percentage of Covered Payroll (b-a)/(c)
VIRGINIA RETIREMENT SYSTEM (VRS) – STATE						
2018	\$ 18,532,189	\$ 24,115,157	\$ 5,582,968	76.8%	\$ 4,161,922	134.1%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – TEACHER						
2018	\$ 34,919,563	\$ 46,516,176	\$ 11,596,613	75.1%	\$ 8,479,023	136.8%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – POLITICAL SUBDIVISIONS						
2018	\$ 20,302,821	\$ 22,543,485	\$ 2,240,664	90.1%	\$ 4,973,503	45.1%
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%
VIRGINIA RETIREMENT SYSTEM (VRS) – TOTAL						
2018	\$ 73,754,573	\$ 93,174,818	\$ 19,420,245	79.2%	\$ 17,614,448	110.3%
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%

* 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 MILLIONS)

	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position Restricted – Beginning of Year	\$ 714	\$ 783	\$ 833	\$ 747	\$ 888	\$ 1,079	\$ 1,163	\$ 1,225	\$ 1,438	\$ 1,595
Funding:										
Member and Employer Contributions and Other Additions	95	45	47	202	206	208	214	240	249	257
Benefits and Administrative Expenses	139	147	141	151	161	177	175	186	203	203
Net Funding	(44)	(102)	(94)	51	45	31	39	54	46	55
Investment Income:										
Interest, Dividends and Other Investment Income	14	18	16	14	17	16	17	18	19	21
Net Appreciation (Depreciation) in Fair Value	100	134	(9)	76	130	36	6	140	92	92
Net Investment Income	114	152	7	90	147	52	23	158	111	113
Net Increase (Decrease)	69	50	(86)	141	192	83	62	213	157	168
Fiduciary Net Position Restricted – End of Year	\$ 783	\$ 833	\$ 747	\$ 888	\$ 1,079	\$ 1,163	\$ 1,225	\$ 1,438	\$ 1,595	\$ 1,763

* 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 2010–2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions				Investment Income (Loss)	Other	Total
	State	Teacher	Political Subdivisions	Sub-Total			
2019	\$ 77,778	\$ 110,262	\$ 69,288	\$ 257,328	\$ 113,440	\$ —	\$ 370,768
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

* 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 2010–2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Group Life Claims			Administrative Expenses	Other	Total
	Active	Retired	Sub-Total			
2019	\$ 66,036	\$ 133,843	\$ 199,879	\$ 709	\$ 1,981	\$ 202,569
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

**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)

	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$231,994	\$244,958	\$209,033	\$127,234	\$146,472	\$170,048	\$173,194	\$173,211	\$201,315	\$235,372
Funding:										
Employer Contributions and Other Additions	100,613	50,052	51,356	145,031	146,742	144,834	151,916	168,271	184,706	187,652
Less: Reimbursements and Administrative Expenses	120,872	126,963	131,435	137,906	143,088	148,459	154,320	159,280	164,295	169,072
Net Funding	(20,259)	(76,911)	(80,079)	7,125	3,654	(3,625)	(2,404)	8,991	20,411	18,580
Investment Income:										
Interest, Dividends and Other Investment Income	4,127	4,849	2,997	1,856	2,226	2,140	2,098	2,168	2,343	2,785
Net Appreciation (Depreciation) in Fair Value	29,096	36,137	(4,717)	10,257	17,696	4,631	323	16,945	11,303	12,609
Net Investment Income	33,223	40,986	(1,720)	12,113	19,922	6,771	2,421	19,113	13,646	15,394
Net Increase (Decrease)	12,964	(35,925)	(81,799)	19,238	23,576	3,146	17	28,104	34,057	33,974
Fiduciary Net Position Restricted – End of Year	\$244,958	\$209,033	\$127,234	\$146,472	\$170,048	\$173,194	\$173,211	\$201,315	\$235,372	\$269,346

VIRGINIA RETIREMENT SYSTEM – STATE

	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$129,040	\$136,242	\$107,777	\$ 54,290	\$ 59,880	\$ 65,202	\$ 67,434	\$ 68,685	\$ 79,516	\$ 95,908
Funding:										
Employer Contributions and Other Additions	43,208	5,425	5,859	60,848	59,438	63,907	66,410	74,520	79,952	79,926
Less: Reimbursements and Administrative Expenses	55,117	57,013	58,224	60,911	61,249	64,551	66,157	71,395	69,272	73,000
Net Funding	(11,909)	(51,588)	(52,365)	(63)	(1,811)	(644)	253	3,125	10,680	6,926
Investment Income:										
Interest, Dividends and Other Investment Income	2,373	2,735	1,977	866	941	910	864	875	981	1,121
Net Appreciation (Depreciation) in Fair Value	16,738	20,388	(3,099)	4,787	6,192	1,966	134	6,831	4,731	5,068
Net Investment Income	19,111	23,123	(1,122)	5,653	7,133	2,876	998	7,706	5,712	6,189
Net Increase (Decrease)	7,202	(28,465)	(53,487)	5,590	5,322	2,232	1,251	10,831	16,392	13,115
Fiduciary Net Position Restricted – End of Year	\$136,242	\$107,777	\$ 54,290	\$ 59,880	\$ 65,202	\$ 67,434	\$ 68,685	\$ 79,516	\$ 95,908	\$109,023

**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									
	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position Restricted – Beginning of Year	\$ 91,582	\$ 94,755	\$ 85,006	\$ 56,869	\$ 68,955	\$ 82,108	\$ 84,386	\$ 82,854	\$ 96,091	\$111,639
Funding:										
Employer Contributions and Other Additions	53,114	41,410	42,245	80,489	80,720	78,875	80,831	88,059	99,019	100,643
Less: Reimbursements and Administrative Expenses	62,799	66,779	69,777	73,147	75,033	79,670	83,510	83,640	89,578	90,616
Net Funding	(9,685)	(25,369)	(27,532)	7,342	5,687	(795)	(2,679)	4,419	9,441	10,027
Investment Income:										
Interest, Dividends and Other Investment Income	1,598	1,849	1,033	728	1,012	970	995	1,000	1,049	1,330
Net Appreciation (Depreciation) in Fair Value	11,260	13,771	(1,638)	4,016	6,454	2,103	152	7,818	5,058	6,020
Net Investment Income	12,858	15,620	(605)	4,744	7,466	3,073	1,147	8,818	6,107	7,350
Net Increase (Decrease)	3,173	(9,749)	(28,137)	12,086	13,153	2,278	(1,532)	13,237	15,548	17,377
Fiduciary Net Position Restricted – End of Year	\$ 94,755	\$ 85,006	\$ 56,869	\$ 68,955	\$ 82,108	\$ 84,386	\$ 82,854	\$ 96,091	\$111,639	\$129,016

	VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS									
	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position Restricted – Beginning of Year	\$ 8,331	\$ 11,217	\$ 13,911	\$ 14,267	\$ 16,126	\$ 18,592	\$ 19,332	\$ 19,321	\$ 22,156	\$ 23,170
Funding:										
Employer Contributions and Other Additions	3,014	1,940	1,975	1,945	1,876	1,933	1,991	2,278	2,179	2,406
Less: Reimbursements and Administrative Expenses	1,382	1,489	1,626	1,802	1,817	2,015	2,278	1,717	2,735	2,598
Net Funding	1,632	451	349	143	59	(82)	(287)	561	(556)	(192)
Investment Income:										
Interest, Dividends and Other Investment Income	156	265	(13)	262	273	260	239	258	270	270
Net Appreciation (Depreciation) in Fair Value	1,098	1,978	20	1,454	2,134	562	37	2,016	1,300	1,220
Net Investment Income	1,254	2,243	7	1,716	2,407	822	276	2,274	1,570	1,490
Net Increase (Decrease)	2,886	2,694	356	1,859	2,466	740	(11)	2,835	1,014	1,298
Fiduciary Net Position Restricted – End of Year	\$ 11,217	\$ 13,911	\$ 14,267	\$ 16,126	\$ 18,592	\$ 19,332	\$ 19,321	\$ 22,156	\$ 23,170	\$ 24,468

**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 – CONSTITUTIONAL OFFICERS										
	2010**	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position Restricted – Beginning of Year	\$ 2,089	\$ 1,898	\$ 1,651	\$ 1,337	\$ 830	\$ 2,377	\$ 1,120	\$ 1,479	\$ 2,427	\$ 3,278
Funding:										
Employer Contributions and Other Additions	805	805	805	805	2,833	113	1,830	2,305	2,397	2,794
Less: Reimbursements and Administrative Expenses	996	1,052	1,119	1,312	3,245	1,370	1,471	1,572	1,727	1,831
Net Funding	(191)	(247)	(314)	(507)	(412)	(1,257)	359	733	670	963
Investment Income:										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	24	31	41
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	1,959	—	—	191	150	197
Net Investment Income	—	—	—	—	1,959	—	—	215	181	238
Net Increase (Decrease)	(191)	(247)	(314)	(507)	1,547	(1,257)	359	948	851	1,201
Fiduciary Net Position Restricted – End of Year	\$ 1,898	\$ 1,651	\$ 1,337	\$ 830	\$ 2,377	\$ 1,120	\$ 1,479	\$ 2,427	\$ 3,278	\$ 4,479

VIRGINIA RETIREMENT SYSTEM – SOCIAL SERVICES										
	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position Restricted – Beginning of Year	\$ 972	\$ 877	\$ 732	\$ 534	\$ 683	\$ 1,738	\$ 915	\$ 861	\$ 1,091	\$ 1,319
Funding:										
Employer Contributions and Other Additions	472	472	472	862	1,818	5	824	1,062	1,126	1,847
Less: Reimbursements and Administrative Expenses	567	617	670	713	1,683	828	878	929	971	1,015
Net Funding	(95)	(145)	(198)	149	135	(823)	(54)	133	155	832
Investment Income:										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	11	12	22
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	920	—	—	86	61	100
Net Investment Income	—	—	—	—	920	—	—	97	73	122
Net Increase (Decrease)	(95)	(145)	(198)	149	1,055	(823)	(54)	230	228	954
Fiduciary Net Position Restricted – End of Year	\$ 877	\$ 732	\$ 534	\$ 683	\$ 1,738	\$ 915	\$ 861	\$ 1,091	\$ 1,319	\$ 2,273

**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										
	2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$	(20) \$	(31) \$	(44) \$	(63) \$	(2) \$	31 \$	7 \$	11 \$	34 \$
Funding:										
Employer Contributions and Other Additions	—	—	—	82	57	1	30	47	33	36
Less: Reimbursements and Administrative Expenses	11	13	19	21	61	25	26	27	12	12
Net Funding	(11)	(13)	(19)	61	(4)	(24)	4	20	21	24
Investment Income:										
Interest, Dividends and Other Investment Income	—	—	—	—	—	—	—	—	—	1
Net Appreciation (Depreciation) in Fair Value	—	—	—	—	37	—	—	3	3	4
Net Investment Income	—	—	—	—	37	—	—	3	3	5
Net Increase (Decrease)	(11)	(13)	(19)	61	33	(24)	4	23	24	29
Fiduciary Net Position										
Restricted – End of Year	\$	(31) \$	(44) \$	(63) \$	(2) \$	31 \$	7 \$	11 \$	34 \$	58 \$

* 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 2010–2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions					Investment Income (Loss)	Other	Total
	State	Teacher	Political Subdivisions	State-Funded HIC	Sub-Total			
2019	\$ 79,926	\$ 100,643	\$ 2,406	\$ 4,677	\$ 187,652	\$ 15,394	\$ —	\$ 203,046
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

* 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 2010–2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Retiree Health Insurance Reimbursements					Administrative Expenses	Other	Total
	State	Teacher	Political Subdivisions	State- Funded HIC	Sub-Total			
2019	\$ 72,857	\$ 90,455	\$ 2,564	\$ 2,849	\$ 168,725	\$ 328	\$ 19	\$ 169,072
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

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)

	2010*	2011*	2012*	2013	2014	2015	2016	2017	2018	2019
Fiduciary Net Position										
Restricted – Beginning of Year	\$290,481	\$336,213	\$369,071	\$343,972	\$370,121	\$410,097	\$414,518	\$407,826	\$442,334	\$462,961
Funding:										
Employer Contributions and Other Additions	31,021	6	78	17,267	17,693	24,026	25,156	24,768	25,982	25,263
Less: Disability Insurance Benefits and Administrative Expenses	28,415	29,001	28,955	30,668	34,290	37,942	38,782	38,466	38,706	31,627
Net Funding	2,606	(28,995)	(28,877)	(13,401)	(16,597)	(13,916)	(13,626)	(13,698)	(12,724)	(6,364)
Investment Income:										
Interest, Dividends and Other Investment Income	5,358	7,317	7,048	5,919	6,264	5,705	5,576	5,458	6,609	6,923
Net Appreciation (Depreciation) in Fair Value	37,768	54,536	(3,270)	33,631	50,309	12,632	1,358	42,748	26,742	24,721
Net Investment Income	43,126	61,853	3,778	39,550	56,573	18,337	6,934	48,206	33,351	31,644
Net Increase (Decrease)	45,732	32,858	(25,099)	26,149	39,976	4,421	(6,692)	34,508	20,627	25,280
Fiduciary Net Position										
Restricted – End of Year	\$336,213	\$369,071	\$343,972	\$370,121	\$410,097	\$414,518	\$407,826	\$442,334	\$462,961	\$488,241

* 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 2010–2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Contributions	Investment Income	Transfers and Other Additions*	Total
LONG-TERM DISABILITY PROGRAM				
2019	\$ 24,856	\$ 25,197	\$ —	\$ 50,053
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
LONG-TERM CARE PROGRAM				
2019	\$ 1,557	\$ 5,297	\$ —	\$ 6,854
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
TOTAL DISABILITY INSURANCE TRUST FUND				
2019	\$ 26,413	\$ 30,494	\$ —	\$ 56,907
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

* 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 2010-2019

(EXPRESSED IN THOUSANDS)

Year Ended June 30	Long-Term Disability Benefits	Long-Term Care and Costs	TPA Administrative Services	VRS Administrative Expenses	Transfers and Other Expenses*	Total
LONG-TERM DISABILITY PROGRAM						
2019	\$ 23,045	\$ —	\$ 6,431	\$ 650	\$ 27	\$ 30,153
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
LONG-TERM CARE PROGRAM						
2019	\$ —	\$ 1,331	\$ —	\$ 137	\$ 6	\$ 1,474
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
TOTAL DISABILITY INSURANCE TRUST FUND						
2019	\$ 23,045	\$ 1,331	\$ 6,431	\$ 787	\$ 33	\$ 31,627
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

* 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	2019
Net Position Restricted – Beginning of Year	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 728	\$ 2,708	\$ 3,461	\$ 1,889
Funding:									
Employer Contributions and Other Additions	10,678	11,554	6,869	7,229	9,121	10,881	11,608	10,890	13,377
Less: Disability Insurance Benefits and Administrative Expenses	10,678	11,559	7,814	8,668	8,572	9,026	11,538	13,140	13,362
Net Funding	—	(5)	(945)	(1,439)	549	1,855	70	(2,250)	15
Investment Income:									
Interest, Dividends and Other Investment Income	—	1	144	157	64	62	77	96	769
Net Appreciation (Depreciation) in Fair Value	—	4	801	1,282	115	63	606	582	166
Net Investment Income	—	5	945	1,439	179	125	683	678	935
Net Increase (Decrease)	—	9	—	—	728	1,980	753	(1,572)	950
Net Position Restricted – End of Year	\$ —	\$ 9	\$ —	\$ —	\$ 728	\$ 2,708	\$ 3,461	\$ 1,889	\$ 2,839

* 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	2019
Net Position Restricted – Beginning of Year	\$ —	\$ —	\$ —	\$ —	\$ 630	\$ 1,463
Funding:						
Employer Contributions and Other Additions	429	875	1,351	1,993	3,030	4,192
Less: Disability Insurance Benefits and Administrative Expenses	429	873	1,351	1,363	2,261	2,208
Net Funding	—	2	—	630	769	1,984
Investment Income:						
Interest, Dividends and Other Investment Income	—	—	—	—	14	26
Net Appreciation (Depreciation) in Fair Value	—	(2)	—	—	50	150
Net Investment Income	—	(2)	—	—	64	176
Net Increase (Decrease)	—	—	—	630	833	2,160
Net Position Restricted – End of Year	\$ —	\$ —	\$ —	\$ 630	\$ 1,463	\$ 3,623

* 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	2019
Net Position Restricted – Beginning of Year	\$ —	\$ —	\$ —	\$ —	\$ 279	\$ 647
Funding:						
Employer Contributions and Other Additions	182	370	567	883	1,339	1,966
Less: Disability Insurance Benefits and Administrative Expenses	182	369	567	604	1,000	1,035
Net Funding	—	1	—	279	339	931
Investment Income:						
Interest, Dividends and Other Investment Income	—	—	—	—	7	13
Net Appreciation (Depreciation) in Fair Value	—	(1)	—	—	22	70
Net Investment Income	—	(1)	—	—	29	83
Net Increase (Decrease)	\$ —	\$ —	\$ —	\$ 279	\$ 368	\$ 1,014
Net Position Restricted – End of Year	\$ —	\$ —	\$ —	\$ 279	\$ 647	\$ 1,661

VIRGINIA RETIREMENT SYSTEM – POLITICAL SUBDIVISIONS

	2014*	2015	2016	2017	2018	2019
Net Position Restricted – Beginning of Year	\$ —	\$ —	\$ —	\$ —	\$ 351	\$ 816
Funding:						
Employer Contributions and Other Additions	247	505	784	1,110	1,691	2,226
Less: Disability Insurance Benefits and Administrative Expenses	247	504	784	759	1,261	1,173
Net Funding	—	1	—	351	430	1,053
Investment Income:						
Interest, Dividends and Other Investment Income	—	—	—	—	7	13
Net Appreciation (Depreciation) in Fair Value	—	(1)	—	—	28	80
Net Investment Income	—	(1)	—	—	35	93
Net Increase (Decrease)	\$ —	\$ —	\$ —	\$ 351	\$ 465	\$ 1,146
Net Position Restricted – End of Year	\$ —	\$ —	\$ —	\$ 351	\$ 816	\$ 1,962

* 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*
2019	188,370	127,802	2,579	726
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

* 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.

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
2019	2,171	\$ 24,307	June 2019	127,802	\$ 108
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

Disability Insurance			
Payment Period	Number of Claims Paid	Average Gross Monthly Benefit	Average Net Monthly Benefit*
June 2019	2,579	\$ 2,181	\$ 1,252
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

* The net monthly benefit reflects adjustments for Social Security, workers' compensation and other offsets.

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
2019	1	3	2019	726	\$ 17,464
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, 2019:

PARTICIPATING POLITICAL SUBDIVISIONS: 459

A: retirement only

B: retirement and group life insurance

C: retirement, group life insurance and retiree health insurance credit

D: retirement and retiree health insurance credit

COUNTIES: 93			
Accomack County: C	Dickenson County: A	Lancaster County: B	Rappahannock County: C
Albemarle County: B	Dinwiddie County: B	Lee County: B	Richmond County: B
Alleghany County: B	Essex County: C	Loudoun County: B	Roanoke County: C
Amelia County: C	Fauquier County: B	Louisa County: C	Rockbridge County: B
Amherst County: C	Floyd County: B	Lunenburg County: B	Rockingham County: B
Appomattox County: B	Fluvanna County: C	Madison County: C	Russell County: C
Augusta County: B	Franklin County: B	Mathews County: C	Scott County: B
Bath County: B	Frederick County: B	Mecklenburg County: B	Shenandoah County: C
Bedford County: B	Giles County: B	Middlesex County: B	Smyth County: B
Bland County: C	Gloucester County: C	Montgomery County: B	Southampton County: C
Botetourt County: B	Goochland County: B	Nelson County: B	Spotsylvania County: B
Brunswick County: B	Grayson County: B	New Kent County: C	Stafford County: C
Buchanan County: B	Greene County: C	Northampton County: B	Surry County: B
Buckingham County: B	Greensville County: C	Northumberland County: C	Sussex County: B
Campbell County: B	Halifax County: C	Nottoway County: B	Tazewell County: C
Caroline County: B	Hanover County: C	Orange County: B	Warren County: B
Carroll County: B	Henrico County: B	Page County: B	Washington County: C
Charles City County: B	Henry County: C	Patrick County: 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	

CITIES AND TOWNS: 159

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

AUTHORITIES, COMMISSIONS, DISTRICTS, REGIONAL INSTITUTIONS AND COMMUNITY SERVICES BOARDS: 207

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

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

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

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

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

SCHOOLS: 144*

E: professional employees covered by retirement, group life insurance and the retiree health insurance credit and non-professional employees (as applicable) covered by retirement and group life insurance

F: professional and non-professional employees covered by retirement, group life insurance and the retiree health insurance credit

COUNTY SCHOOLS: 94

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

CITY AND TOWN SCHOOLS: 39

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	

OTHER SCHOOLS: 11

Amelia-Nottoway Technical Center: E	Charlottesville-Albemarle Vocational Technical Center: E	New Horizons Technical Center: E	Rowanty Vocational Technical Center: E
Appomattox Regional Governor's School: E	Jackson River Vocational Technical Center: F	Northern Neck Regional Special Education Program: E	Valley Vocational Technical Center: E
Bridging Communities Regional Career Center & Technical Center: E	Maggie Walker Governor's School for Government and International Studies: E	Northern Neck Regional Vocational Center: E	

** Of the 144 school boards, 132 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: 833

FIGURE 5.16: VRS EMPLOYER RANKING CURRENT YEAR

AS OF JUNE 30, 2019

Employer	Active Employees	Percentage of Total
1. Fairfax County Public Schools – Professional Employees	22,007	6.36%
2. Loudoun County Schools – Professional Employees	9,397	2.71%
3. Prince William County Schools – Professional Employees	9,031	2.61%
4. Virginia Beach City Schools - Professional Employees	7,693	2.22%
5. Chesterfield County Schools – Professional Employees	6,149	1.78%
6. City of Virginia Beach – General Government	6,085	1.76%
7. University of Virginia – Academic Division	5,228	1.51%
8. Henrico County – General Government	5,224	1.51%
9. Henrico County Schools – Professional Employees	5,144	1.49%
10. Virginia Polytechnic Institute and State University – Academic	4,681	1.35%
11. All Other	265,634	76.70%
Total	346,273	100.00%

HISTORICAL COMPARISON

AS OF JUNE 30, 2009

Employer	Active Employees	Percentage of Total
1. Fairfax County Public Schools – Professional Employees	19,492	5.62%
2. Virginia Beach City Schools – Professional Employees	8,466	2.44%
3. Prince William County Schools – Professional Employees	7,495	2.16%
4. Loudoun County Schools – Professional Employees	6,856	1.98%
5. Chesterfield County Schools – Professional Employees	6,300	1.82%
6. City of Virginia Beach – General Government	6,006	1.73%
7. University of Virginia – Academic Division	5,512	1.59%
8. Norfolk City Schools – Professional Employees	5,214	1.50%
9. Henrico County – General Government	5,036	1.45%
10. Henrico County Schools – Professional Employees	4,992	1.44%
11. All Other	271,560	78.27%
Total	346,929	100.00%

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, 2019, 2018 and 2017.

Contributions to the Deferred Compensation Plan during fiscal year 2019 and fiscal year 2018 were \$146,380,483 and \$140,758,585, respectively.

Contributions to the Cash Match Plan during fiscal year 2019 and fiscal year 2018 were \$15,494,911 and \$15,814,125, respectively.

As shown in Figures 5.18 and 5.19, there were approximately 80,187 employees in the Deferred Compensation Plan and 71,088 employees in the Cash Match Plan as of June 30, 2019.

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)		
	2019	2018	2017	2019	2018	2017
Plan Assets on July 1	\$ 2,700,559,681	\$ 2,434,472,689	\$ 2,184,755,502	\$ 456,617,544	\$ 418,697,759	\$ 379,078,068
Contributions	146,380,483	140,758,585	134,004,333	15,494,911	15,814,125	15,697,347
Distributions	(153,953,494)	(134,736,315)	(132,536,740)	(27,910,128)	(22,630,405)	(23,664,326)
Plan Transfers*	17,625,303.08	47,159,971	11,252,987	7,589,365	9,932,909	8,850,618
Third-Party Administrative Fees**	(2,298,608)	(2,293,173)	(2,292,692)	(71,792)	(70,186)	(67,058)
Period Earnings	167,205,656	215,197,925	239,289,299	27,599,388	34,873,341	38,803,110
Plan Assets on June 30	\$ 2,875,519,022	\$ 2,700,559,681	\$ 2,434,472,689	\$ 479,319,288	\$ 456,617,543	\$ 418,697,759

* 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 \$885,931 and \$705,921 in fiscal year 2019 and fiscal year 2018, respectively. For the Cash Match Plan, they were \$432,190 and \$344,977 in fiscal year 2019 and fiscal year 2018, 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

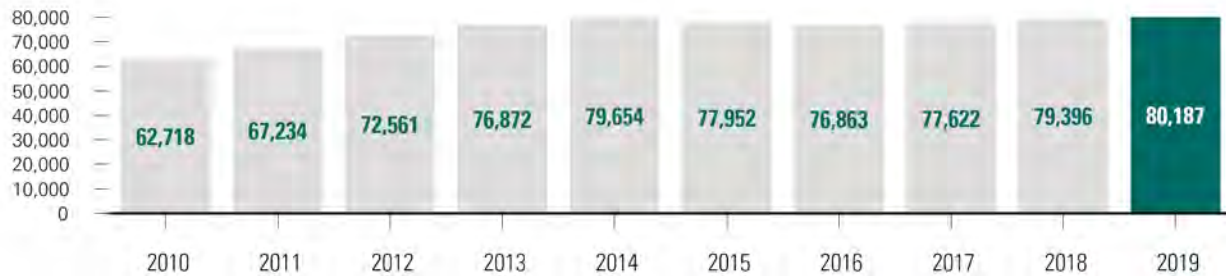


FIGURE 5.19: 401(a) ACTIVE AND INACTIVE PLAN PARTICIPANTS

AT JUNE 30



FIGURE 5.20: TOTAL PARTICIPANT ACCOUNTS IN EACH FUND OPTION

AT JUNE 30, 2019

(EXPRESSED IN THOUSANDS)

Fund Name	Deferred Compensation Plan – 457(b)	Cash Match Plan – 401(a)
Retirement Portfolio	4,363	3,209
Target Date 2020 Portfolio	5,195	4,318
Target Date 2025 Portfolio	6,871	5,758
Target Date 2030 Portfolio	6,952	5,882
Target Date 2035 Portfolio	7,033	5,956
Target Date 2040 Portfolio	6,525	5,544
Target Date 2045 Portfolio	7,214	6,205
Target Date 2050 Portfolio	7,378	6,445
Target Date 2055 Portfolio	5,720	5,060
Target Date 2060 Portfolio	2,224	1,909
Money Market Fund	4,253	3,010
Stable Value Fund	16,657	15,936
Bond Fund	8,413	6,071
Inflation-Protected Bond Fund	3,524	2,272
High-Yield Bond Fund	4,250	2,583
Stock Fund	22,688	18,224
Small/Mid-Cap Stock Fund	12,632	9,331
International Stock Fund	10,905	7,949
Global Real Estate Fund	7,696	5,592
VRS Investment Portfolio	1,514	911
Self-Directed Brokerage	529	73

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)		
	2019	2018	2017	2019	2018	2017
Retirement Portfolio	\$ 135,928,598	\$ 135,724,324	\$ 136,923,374	\$ 23,163,540	\$ 22,971,035	\$ 23,077,644
Target Date 2015 Portfolio	—	—	—	—	—	—
Target Date 2020 Portfolio	145,120,377	139,041,358	128,169,224	21,495,258	21,036,785	19,070,807
Target Date 2025 Portfolio	141,773,944	125,171,097	102,240,948	22,036,269	19,437,366	16,988,439
Target Date 2030 Portfolio	109,054,604	91,168,880	72,100,189	20,158,988	17,736,619	14,567,392
Target Date 2035 Portfolio	87,791,153	73,276,299	58,868,973	18,585,381	16,576,793	13,821,879
Target Date 2040 Portfolio	65,549,881	56,290,750	43,107,808	14,495,065	15,170,392	12,872,472
Target Date 2045 Portfolio	45,030,640	37,638,565	30,327,098	13,154,787	11,564,019	9,530,850
Target Date 2050 Portfolio	32,308,833	26,628,342	20,467,326	10,381,616	9,049,164	7,366,990
Target Date 2055 Portfolio	18,348,922	16,349,669	12,700,919	5,733,889	4,862,559	3,745,756
Target Date 2060 Portfolio	3,987,917	2,528,246	1,725,904	995,785	647,091	347,498
Money Market Fund	53,921,201	48,209,841	45,172,232	6,739,266	6,561,359	5,813,042
Stable Value Fund	411,350,637	401,846,607	392,843,573	96,730,425	95,743,802	96,033,260
Bond Fund	118,389,045	108,752,967	106,512,214	13,990,477	13,506,497	13,421,044
Inflation-Protected Bond Fund	34,277,998	32,288,234	31,794,113	3,319,138	3,260,090	3,155,104
High-Yield Bond Fund	36,982,014	31,318,366	29,550,219	4,533,496	3,765,406	3,556,159
Stock Fund	860,917,003	799,484,027	712,477,931	132,204,644	123,776,849	111,054,172
Small/Mid-Cap Stock Fund	265,760,065	268,354,513	230,756,132	35,672,477	35,332,087	30,984,324
International Stock Fund	141,061,592	147,777,818	130,285,820	15,854,876	16,730,996	15,253,669
Emerging Markets Stock Fund	—	—	—	—	—	—
Global Real Estate Fund	87,334,070	83,913,575	84,411,045	13,406,658	12,749,519	12,670,590
VRS Investment Portfolio – Interim Account	672,588	853,066	437,310	19,907	27,156	117,265
VRS Investment Portfolio	32,784,987	29,377,287	26,810,905	5,227,836	4,879,534	4,363,367
Self-Directed Brokerage	47,172,954	44,565,850	36,789,432	1,419,509	1,232,425	886,036
Total Accumulation Plan	\$ 2,875,519,022	\$ 2,700,559,681	\$ 2,434,472,689	\$ 479,319,287	\$ 456,617,543	\$ 418,697,759

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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