

2019

COMPREHENSIVE ANNUAL FINANCIAL REPORT

For Fiscal Year Ended March 31, 2019



New York State and Local Retirement System

A pension trust fund of the State of New York

Office of the New York State Comptroller
Thomas P. DiNapoli

2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT

For Fiscal Year Ended March 31, 2019

New York State and Local Retirement System

Employees' Retirement System

Police and Fire Retirement System

A pension trust fund of the State of New York

Prepared by the staff of the



New York State and Local Retirement System

CONTENTS

INTRODUCTION

Professional Awards.....	9
Letter of Transmittal	11
Administrative Organization.....	17
Advisory Committees	17
New York State and Local Retirement System Organization Chart.....	22
Overview of the New York State and Local Retirement System.....	23
By the Numbers.....	27
Members and Retirees.....	27
Retirees in New York State	28
Annual Benefit Payments Within New York State	29
Annual Benefit Payments Within the United States	30
Annual Benefit Payments Outside the United States.....	30

CONTENTS

CONTINUED

FINANCIAL

Independent Auditors' Report	33
Management's Discussion and Analysis (Unaudited)	35
Basic Financial Statements.....	40
Combining Basic Statement of Fiduciary Net Position	40
Combining Basic Statement of Changes in Fiduciary Net Position.....	41
Notes to Basic Financial Statements	42
Required Supplementary Information (Unaudited)	70
Schedule of Changes in the Employers' Net Pension Liability and Related Ratios (Unaudited)	70
Schedule of Employer Contributions (Unaudited)	72
Schedule of Investment Returns (Unaudited).....	73
Notes to Required Supplementary Information (Unaudited).....	73
Other Supplementary Information (Unaudited)	74
Schedule of Administrative Expenses (Unaudited)	74
Schedule of Investment Expenses (Unaudited).....	75
Schedule of Consulting Fees (Unaudited).....	76
Independent Auditors' Report on Internal Control	77

CONTENTS

CONTINUED

INVESTMENT

Overview of Investments.....	81
Corporate Governance.....	90
Investment Results	94
Investment Summary	95
Asset Allocation — March 31, 2019	96
Public Equity Performance.....	97
Public Equity Fund of Fund Performance	99
Domestic Equity Portfolio — Ten Largest Holdings	101
Fixed Income Portfolio and Comparison	102
Fixed Income Performance	103
Fixed Income Portfolio — Ten Largest Holdings	104
Real Estate Portfolio.....	105
Alternative Investments Summary	106
Public Equity Management Fees	107
Public Equity Commissions — Internally Managed	108
Public Equity Commissions — Externally Managed	109
Global Fixed Income Management Fees	112
Long-Term Domestic Bond Transactions — Internally Managed.....	113
Long-Term Domestic Bond Transactions — Externally Managed	114
Short-Term Domestic Bond Transactions — Internally Managed.....	115
Real Estate Management and Incentive Fees (Expensed)	116
Real Estate Management and Incentive Fees (Capitalized)	117
Private Equity Management Fees (Expensed)	118
Private Equity Management Fees (Capitalized).....	119
Private Equity — Fee, Expense and Carried Interest Analysis	120
Absolute Return Strategy Management and Incentive Fees.....	121
Opportunistic Funds Management and Incentive Fees (Expensed)	122
Opportunistic Funds Management and Incentive Fees (Capitalized)	123
Real Assets Management Fees (Expensed).....	124
Real Assets Management Fees (Capitalized)	125
Consultant and Advisor Fees	126

CONTENTS

CONTINUED

ACTUARIAL

Statement of the Actuary	129
Actuarial Cost Method and Valuation	131
Elements of the Actuarial Valuation	133
Actuarial Valuation Balance Sheets	137
Local Government Employers' Final Contribution Rates for Select Plans	139
Contribution Rate Trends for Local Governments	141
Employer Contributions	144
Historical Trends (Rates as a Percentage of Salary, 1975 – 2020).....	146
Changes in Contributions	147
Assets and Accrued Liabilities.....	148
Solvency Test	149
Schedule of Active Member Data	150
Schedule of Retired Members and Beneficiaries.....	151

CONTENTS

CONTINUED

STATISTICAL

Schedule of Additions to Fiduciary Net Position	155
Schedule of Investment Income/(Loss).....	156
Schedule of Deductions from Fiduciary Net Position	157
Schedule of Total Changes in Fiduciary Net Position	158
Service Retirees — ERS	160
Service Retirees — PFRS.....	162
Disability Retirees — ERS	164
Disability Retirees — PFRS.....	166
New Option Selections	168
Option Selections — Total Payments	169
Average Pension Benefits Paid During Year Shown.....	170
Average Benefit Pay Types	171
New Benefits — Service Retirements by Age and Service	173
New Benefits — Accidental and Ordinary Death.....	174
Combined System Participants.....	175
Membership by Age and Years of Service	176
Membership by Tier.....	177
Membership by Status.....	178
Number of Employers	179
Total Membership by Employer Type	180
Average Salary by Employer Type	181
Members and Salaries by Plan — ERS.....	182
Members and Salaries by Plan — PFRS	184
Retirees and Beneficiaries by Age.....	186
Retirees and Beneficiaries — ERS	187
Retirees and Beneficiaries — PFRS.....	188
Local Government Salaries and Billings — ERS	189
Local Government Salaries and Billings — PFRS.....	191
Contributions Recorded 2010 – 2019	193
20-Year Summary	194
Notes to 20-Year Summary	196

Introduction

CONTENTS

Professional Awards.....	9
Letter of Transmittal	11
Administrative Organization.....	17
Advisory Committees	17
New York State and Local Retirement System Organization Chart.....	22
Overview of the New York State and Local Retirement System.....	23
By the Numbers.....	27
Members and Retirees.....	27
Retirees in New York State	28
Annual Benefit Payments Within New York State.....	29
Annual Benefit Payments Within the United States	30
Annual Benefit Payments Outside the United States.....	30

PROFESSIONAL AWARDS



Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

New York State and Local Retirement System

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

March 31, 2018

Christopher P. Morrill

Executive Director/CEO



Public Pension Coordinating Council

***Public Pension Standards Award
For Funding and Administration
2018***

Presented to

New York State and Local Retirement System

In recognition of meeting professional standards for
plan funding and administration as
set forth in the Public Pension Standards.

Presented by the Public Pension Coordinating Council, a confederation of

National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

A handwritten signature in cursive script that reads "Alan H. Winkle".

Alan H. Winkle
Program Administrator

LETTER OF TRANSMITTAL



Office of the New York State Comptroller
Thomas P. DiNapoli

New York State and Local Retirement System
110 State Street, Albany, New York 12244-0001

Phone: 1-866-805-0990

518-474-7736

Web: www.osc.state.ny.us/retire

September 30, 2019



To the Governor, the State Legislature
and the People of New York State:

I am pleased to present the Comprehensive Annual Financial Report (CAFR) for the New York State and Local Retirement System (the System or NYSLRS) for the fiscal year ended March 31, 2019.

I am proud that the System was awarded a Certificate of Achievement for Excellence in Financial Reporting from GFOA for its CAFR for the fiscal year ended March 31, 2018. The Certificate of Achievement is a prestigious national award recognizing excellence in the preparation of state and local government financial reports. GFOA awards these certificates to those governments whose comprehensive annual financial reports meet or exceed the Association's strict criteria. To be awarded a Certificate of Achievement, a governmental unit must publish an easily readable and efficiently organized comprehensive annual financial report that conforms to program standards and that satisfies both generally accepted accounting principles and applicable legal requirements.

The System has received this respected award for each of the past 15 years. We believe that our current report continues to meet the Certificate of Achievement program requirements and are submitting it to the GFOA for consideration again this year.

Responsibility for the accuracy of the data, and the completeness and fairness of the report, including all disclosures, rests with the System. All disclosures required and necessary to enable the public and the financial community to gain an understanding of the System's financial activities have been included.

We believe the enclosed financial statements and data are fairly presented in all material respects and are reported in a manner designed to present the financial position and results of the System's operations accurately. This report is intended to provide complete and reliable information as a basis for making management decisions, adhering to and complying with legal requirements, and ensuring responsible stewardship of the System's assets.

The Financial Section of this CAFR was prepared to conform with Generally Accepted Accounting Principles (GAAP) for governmental units, as set forth by the Governmental Accounting Standards Board (GASB), as well as the reporting requirements prescribed by the Government Finance Officers Association of the United States and Canada (GFOA). GAAP defines uniform minimum standards of, and guidelines for, financial accounting and reporting. These principles establish the framework within which financial transactions are recorded and reported, resulting in financial statements that provide comparability between government entities, consistency between accounting periods, and reliability for both internal and external users of financial statements.

The System's transactions are reported on the accrual basis of accounting. Sufficient internal accounting controls exist to provide reasonable assurance regarding the safekeeping of assets and the fair presentation of the financial statements and supporting schedules.

The Financial Section features a Management's Discussion and Analysis (MD&A). GASB requires that the System provide a narrative introduction, overview and analysis to accompany the basic financial statements in the form of an MD&A. This letter of transmittal complements the MD&A and should be read in conjunction with it. The MD&A can be found in the Financial Section immediately following the report of the independent auditors.

The System comprises the New York State and Local Employees' Retirement System (ERS) and the New York State and Local Police and Fire Retirement System (PFRS). The assets of ERS and PFRS are held in the New York State Common Retirement Fund (Fund) and managed by the Division of Pension Investment and Cash Management in the Office of the State Comptroller.

With more than one million participants, the System is one of the largest public retirement systems in the nation.

The System offers retirement benefits for members who reach specific ages or have completed a specified number of years of service, depending on the system and plan in which they are enrolled, as well as disability and death benefits. At the end of fiscal year 2018-19, the System had a total of 1,139,971 members, retirees and beneficiaries, and 3,020 participating employers.

The following highlights some of the System's operations for the 2018-19 fiscal year.

FUNDING

The Fund's assets come from three main sources: employee (or member) contributions, employer contributions and investment income. The System is committed to meeting its long-term benefit obligations prudently and fairly. Member contributions are fixed by law. Annual employer contributions are actuarially determined. Employer contributions are the greater of a minimum contribution of 4.5 percent of member payroll, or the actuarially determined contributions.

The System announced in August 2018 that the estimated average contribution rate for participating employers in ERS will decrease in fiscal year 2019-20 from 14.9 percent of payroll to 14.6 percent of payroll. The estimated average contribution rate for employers in PFRS will remain at 23.5 percent of payroll.

GASB no longer requires the computation of the traditional funded ratio. The ratio of fiduciary plan position to total pension liability is now a required financial disclosure. For the fiscal year ended March 31, 2019, fiduciary plan position represented 96.27 percent of total pension liability for ERS and 95.09 percent for PFRS. The traditional funded ratios for ERS and PFRS can be found in the CAFR's Actuarial Section.

In April 2018, the Pew Charitable Trusts ranked the Fund as the fourth best-funded retirement system among states. According to Pew, only New York, South Dakota, Tennessee and Wisconsin were at least 90 percent funded. NYSLRS remains vigilant about maintaining an industry-leading funded status, recognizing that more than one million members, retirees and their families rely on NYSLRS for their financial security in retirement.

The Actuarial Section also provides a detailed discussion of the System's funding.

INVESTMENTS

Our investment policies are designed to obtain optimal risk-adjusted returns and ensure that investments are made for the exclusive benefit of the participants and beneficiaries of the System, on whose behalf the assets of the Fund are invested. Fund investments are made consistent with the "prudence" and "exclusive benefit" fiduciary standards of investment. Additionally, we have adopted policies and practices to ensure that the Fund is managed with high levels of ethical conduct and transparency. In fact, the independent triennial fiduciary and conflict of interest review conducted in 2016 by Funston Advisory Services commended the Fund for its strong policies and ethical management.

One of those policies is now State law, thanks to a bill introduced by my office. Chapter 203 of the Laws of 2018 prohibits the Fund from engaging, hiring, investing with or committing to an investment manager that uses the services of a placement agent or intermediary to obtain investments by the Fund. The use of placement agents, in my view, is corrosive and unnecessary and, will never be a part of the Fund's investment strategy.

Our other policies include protecting the value of our holdings through some of the most robust corporate engagement initiatives of any public pension fund in the country. For instance, we have urged our portfolio companies to adopt more inclusive policies to diversify their boards. The Fund is a member of the Thirty Percent Coalition, which is committed to the goal of women, including women of color, holding 30 percent or more of corporate board seats across U.S. public companies. Having boards that are inclusive of diversity in gender, race, ethnicity and sexual orientation is an essential measure of sound governance.

We've also strengthened our sustainable investment strategy. We believe in addressing investment risks presented by climate change, which could disrupt the global economy. In December 2018, we increased the Fund's Sustainable Investment Program from \$7 billion to \$10 billion. The Fund was also the first public pension fund in the country to create an index that excludes or reduces holdings in the worst carbon emitters and shifts investments to lower-emitting corporations. As a result, for two consecutive years, the Asset Owners Disclosure Project has ranked the Fund as the top U.S. pension fund, and third globally, for its efforts to assess and combat climate-related investment risk.

A transition to a low-carbon economy is not only inevitable, it's already underway, and has opened up the doors to innovation and opportunity. Smart, sustainable investments protect the long-term value of the Fund, while serving as a powerful tool to help fight climate change. You can read more about how some of the Fund's portfolio companies have adopted new, long-term targets for lowering greenhouse gas emissions, or agreed to address the risks and opportunities presented by the worldwide efforts to mitigate climate change, in the Overview of Investments on page 81.

Of course, the Fund's primary mission is to provide the means to pay benefits to the System's participants and to minimize employer contributions through an investment program designed to protect and enhance the long-term value of our assets. That is why we have implemented an asset allocation strategy with an appropriate balance of risk and return. Our long-term target allocation for the investment portfolio is 22 percent in fixed income assets (cash, bonds, mortgages and Treasury Inflation-Protected Securities or "TIPS") and 78 percent in equity, including domestic and international public equities, as well as private equity investments, real estate, real assets, absolute return strategies, and opportunistic funds.

At the end of the 2018-19 fiscal year, the estimated market value of invested assets of the Fund was \$210.5 billion, which represents a rate of return on investments of 5.2 percent. The Fund ended 2017-18 at \$207.4 billion.

ACCOUNTING PRACTICES

My staff is responsible for identifying control objectives for the protection of assets and the proper recording of all transactions in order to permit the preparation of financial statements in accordance with GAAP. The objective of internal controls is to provide reasonable, rather than absolute, assurance that the financial statements are free of material misstatements. We have designed, implemented and maintained adequate internal controls to provide reasonable assurance that our control objectives are achieved.

The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits likely to be derived, and that the valuation of costs and benefits requires estimates and judgments by management. An internal control system includes the organization plan, the appropriate segregation of duties and responsibilities, the implementation of sound practices in the performance of duties, and the employment of personnel whose capabilities are commensurate with their responsibilities.

The System's financial information and internal controls are subject to examination by the New York State Department of Financial Services. Additionally, KPMG LLP, an independent, certified public accountant, audits the System's financial statements. KPMG's opinion appears on page 33 of this report. Lastly, pursuant to the New York State Government Accountability, Audit and Internal Control Act, the System is subject to an audit of its internal controls every three years.

We believe the internal controls in effect during the fiscal year ended March 31, 2019 adequately safeguard the System's assets and provide reasonable assurance regarding the proper recording of financial transactions.

PROGRAMS AND INITIATIVES

NYSLRS completed another phase of its multiyear project to upgrade the computer systems we use to calculate benefits and administer accounts.

Since *Retirement Online* was first offered to our members in January 2017, we've introduced online applications that give Retirement System members and retirees a convenient way to conduct business with NYSLRS. During fiscal year 2019-20, we will expand *Retirement Online* features to include retirement benefit estimates and the ability to apply for retirement. As of March 31, 2019, nearly 200,000 members and retirees had registered for *Retirement Online*.

More information about this, as well as other key programs and initiatives, can be found in the Overview of the New York State & Local Retirement System on page 23 and the Overview of Investments on page 81.

ACKNOWLEDGEMENTS

I thank the dedicated staff of the Office of the State Comptroller for doing the important work of our agency day in and day out. I also wish to thank the members of the Advisory Council for the Retirement System, the Investment Advisory Committee, the Real Estate Advisory Committee, the Actuarial Advisory Committee and the Audit Advisory Committee for their dedicated service and commitment to the System's members, retirees and beneficiaries. We are deeply indebted to them for their continued support and counsel. Lastly, I would like to thank the staff in our Division of Retirement Services and our Division of Pension Investment and Cash Management, who are responsible for preparing this report. Their professionalism and dedication are greatly appreciated.

I am confident you will find this report to be a complete and reliable accounting of the System.

Sincerely,



Thomas P. DiNapoli
State Comptroller

ADMINISTRATIVE ORGANIZATION

ADVISORY COMMITTEES

Advisory Council for the Retirement System

The Advisory Council for the Retirement System, appointed by the Comptroller pursuant to regulations of the Comptroller (2 NYCRR Part 320), advises and makes recommendations to the Comptroller on the formulation of policies in relation to the administration and management of the Common Retirement Fund and the Retirement System. At the annual meetings of the Council, the Comptroller and senior staff also exchange information and insights with the Council to help stakeholders understand the status and challenges of the Common Retirement Fund and the Retirement System.

Honorable Peter J. Abbate, Jr.

Chair
Assembly Governmental Employees Committee
New York State Assembly

Stephen J. Acquario

Executive Director
New York State Association of Counties

Peter A. Baynes

Executive Director
New York State Conference of Mayors

Heather Briccetti

President & CEO
Business Council of New York State, Inc.

Mario Cilento

President
New York State AFL-CIO

Sam Fresina

President
NYS Professional Firefighters Association

Gerry Geist

Executive Director
Association of Towns of the State of New York

Honorable Andrew Gouardes

Chair
Senate Civil Service and Pensions Committee
New York State Senate

Don Kelly

Director of Research
CSEA Local 1000, AFSCME

Bryant Kolner

President
Alliance of Public Retiree Organizations of New York

Timothy G. Kremer

Executive Director
New York State School Boards Association

Bing Markee

Legislative Director
New York State Association of
Police Benevolent Associations

John J. McPadden

President
Retired Public Employees Association, Inc.

Andrew Pallotta

President
New York State United Teachers

Michael Powers

President
New York State Correctional Officers
& Police Benevolent Association

Raymond Santander

Assistant Director
AFSCME District Council 37

Wayne Spence

President
New York State Public Employees Federation

Ronald J. Walsh, Jr.

President
Council 82, AFSCME

Richard Wells

President
Police Conference of New York, Inc.

Barbara Zaron

President
New York State Organization of
Management Confidential Employees

Investment Advisory Committee

The Investment Advisory Committee is appointed by the Comptroller pursuant to Section 423 of the Retirement and Social Security Law. The Investment Advisory Committee advises the Comptroller on general investment issues. The Investment Advisory Committee reviews the investment policy statement and any amendments to it, and reviews and provides a recommendation to the Comptroller on the proposed asset allocation plan developed by the Chief Investment Officer after the completion of an asset liability study. The Investment Advisory Committee also periodically reviews the strategic plan of each Common Retirement Fund asset class, and monitors the Common Retirement Fund's risk profile, investment activity and performance on a periodic basis.

Catherine A. Lynch, CFA

Chair

Former Chief Executive Officer & Chief Investment Officer
National Railroad Retirement Investment Trust

Philippe Brugere-Trelat

(Retired)

William G. Clark

Chief Investment Officer

Federal Reserve Employee Benefits System

Timothy C. Collins

CEO & Senior Managing Director

Ripplewood Holdings, LLC

Hugh Johnson

Chairman & Chief Investment Officer

Hugh Johnson Advisors, LLC

Aren LeeKong

Executive Chairman

Organix Recycling, LLC

Valerie Mosley

Chair & CEO

Valmo Ventures

Diane C. Nordin

CFA

Private Investor and Philanthropist

Catherine James Paglia

Director

Enterprise Asset Management

ADMINISTRATIVE ORGANIZATION

CONTINUED

Real Estate Advisory Committee

The Real Estate Advisory Committee is appointed by the Comptroller, with the consent of the Investment Advisory Committee, pursuant to Section 423 of the Retirement and Social Security Law. The Real Estate Advisory Committee reviews proposed mortgage and real estate investments. In the event the Real Estate Advisory Committee disapproves of a proposed mortgage or real estate investment, the investment will not be presented to the Comptroller and cannot be made by the Common Retirement Fund.

David H. Peirez, Esq.

Chair

Senior Partner

Reisman Peirez Reisman & Capobianco, LLP

Camille Douglas

Senior Marketing Director

LeFrak Organization

Louis M. Dubin

Executive Vice President

Redbrick LMD

G. Gail Edwards

(Retired)

Michael Giliberto

S. Michael Giliberto & Company, Inc.

James M. Gottstine

Chief Operating Officer

Ciminelli Real Estate Corporation

Jo Ann Hanson

President

Church Investment Group

Peter Tilles

(Retired)

ADMINISTRATIVE ORGANIZATION

CONTINUED

Actuarial Advisory Committee

The Actuarial Advisory Committee, appointed by the Comptroller pursuant to regulation (11 NYCRR 136-2), reviews and advises the Comptroller on the actuarial soundness and financial condition of the Retirement System and the Common Retirement Fund, and annually reviews the proposed actuarial assumptions and employer contributions.

Edward W. Brown
(Retired)

Armand de Palo
(Retired)

Michael Heller
(Retired)

Mark T. Koehne
Senior Vice President & Actuary
Mutual of America Life Insurance Company

Stanley Talbi
Executive Vice President
Metropolitan Life Insurance

ADMINISTRATIVE ORGANIZATION

CONTINUED

Audit Advisory Committee

The Audit Advisory Committee, appointed by the Comptroller pursuant to regulation (11 NYCRR 136-2), reviews and reports to the Comptroller on the annual internal and external audit process related to the Retirement System and the Common Retirement Fund and the Comprehensive Annual Financial Report.

Jennifer Mulligan

Chair

Business Office Manager/Controller

Questar III BOCES

Ruben Cardona

Partner

WithumSmith + Brown, PC

Alan Lubin

(Retired)

Julie McDonnell

Schenectady County Auditor

Paul Moore

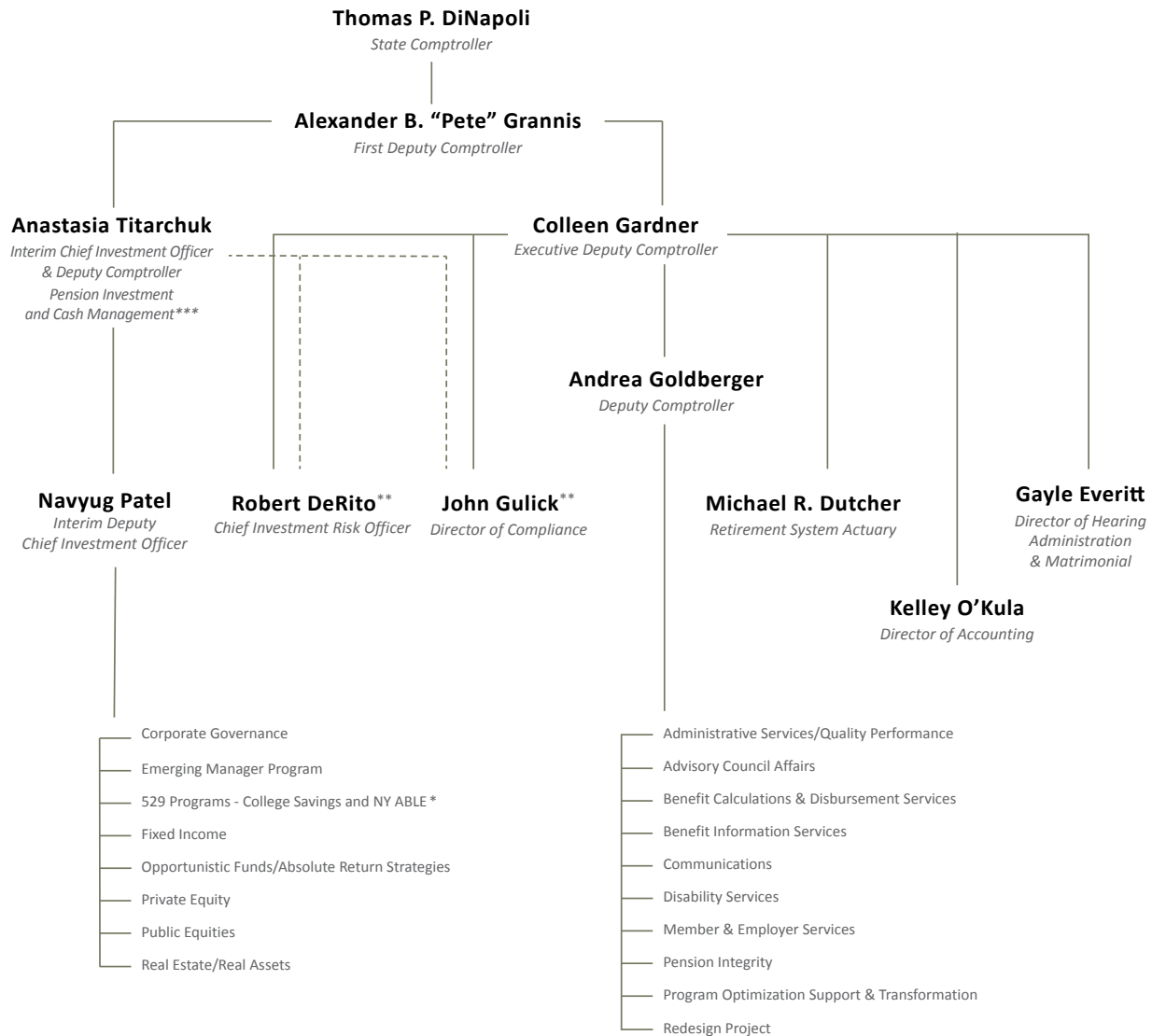
Past President

Retired Public Employees Association, Inc.

ADMINISTRATIVE ORGANIZATION

CONTINUED

NEW YORK STATE AND LOCAL RETIREMENT SYSTEM ORGANIZATION CHART



*College Savings and NY ABLÉ are independent programs within OSC.

**Administrative reporting to the Chief Investment Officer.

***Vicki Fuller held this position through July 2018

Notes:

Information regarding investment managers and consultants can be found in the Investment Section on pages 107, 112, 116-119 and 121-125. Information regarding consultants other than investment advisors can be found on page 76 in the Financial Section.

OVERVIEW OF THE NEW YORK STATE AND LOCAL RETIREMENT SYSTEM

Report from Executive Deputy Comptroller Colleen Gardner

For several years, NYSLRS has been redesigning and replacing the information systems that we have been using for more than three decades. Through the changes we've made and those that are still to come, this upcoming year will provide more opportunity for our members and employers to interact with us and get the information they need about retirement benefits online.

What follows are some highlights of the system upgrade, as well as other initiatives we have undertaken during Fiscal Year 2018-19.

OUR EMPLOYER PARTNERSHIP

In Fiscal Year 2018-19, NYSLRS worked with our participating employers to prepare them to use *Retirement Online* for enrolling members and submitting monthly reports.

The Employer Services unit of our Member & Employer Services Bureau (MESB) conducted 44 all-day, on-location employer seminars during fiscal year 2018-19. We gave employers access to an online environment where they could practice the new reporting and enrollment processes. This, in combination with online training and question-and-answer webinars, gave employers the opportunity to hone their skills in *Retirement Online*.

Employers also have access to an interactive tool for identifying job codes, an important addition to the member enrollment process. Instead of using job titles, employers will now associate each employee with one of 66 job codes. These codes help identify an employee's Retirement System (Employees' Retirement System [ERS] or Police and Fire Retirement System [PFRS]), employer type (State, county, town, etc.) and their retirement benefit plan eligibility.

As part of our ongoing effort to help our participating employers, our Pension Integrity Bureau (PIB) developed new tools and conducted training on reporting elected and appointed officials. PIB teamed up with our Retirement Communications Bureau to build calculators on our website to aid employers in determining the average number of days their officials worked per month and the number of days worked to report to NYSLRS. PIB also held training for county employers and statewide groups, including the New York State Town Clerks Association and the New York State Association of Counties. Employers were educated on reporting service credit for officials, setting a standard work day, creating and calculating a record of activities, and completing a Standard Work Day and Reporting Resolution.

Our employers are key partners in our mission to provide benefits to our members. We will continue to identify reporting efficiencies and develop the tools and resources employers need to understand and carry out their responsibilities.

OVERVIEW OF THE NEW YORK STATE AND LOCAL RETIREMENT SYSTEM

Report from Executive Deputy Comptroller Colleen Gardner

CONTINUED

CUSTOMER SERVICE

During Fiscal Year 2018-19, the number of members and retirees who registered for and used *Retirement Online* grew to 191,062, indicating a high level of customer enthusiasm for this evolving online service. Our *Retirement Online* loan application, in particular, has proven to be a popular feature among our members. Our MESB Loans Unit processed 60,022 loan requests during the year, 34 percent of which were submitted and processed through *Retirement Online*. Members can get detailed information about the impact of taking out a loan by using *Retirement Online*. The online loan application informs members how taking out a loan can affect their retirement benefit and taxes, the taxable amounts of the loan, and the required minimum payment amount. This ensures that members continue to make informed decisions about borrowing against their retirement contributions and making sufficient repayment.

We have also made several improvements to increase the timeliness of hearings. We've hired a full-time hearing officer and recruited additional hearing officers. Using *Retirement Online*, members can now request a hearing online and follow their case developments, and their representatives are able to view hearing documents electronically and securely. We also make arrangements for videoconferencing and telephone testimony during hearings for those unable to attend in person.

Our medical board is leveraging technology, too. For many years, the work of the six NYSLRS medical board members was done the old-fashioned way: on paper. The board members now use a wide variety of computer-based digital imaging tools to view medical images like X-rays and CAT scans that they may need to render a determination on a disability case.

CUSTOMER COMMUNICATION

Our Benefit Information Services (BIS) Bureau is often the first point of contact our customers have with NYSLRS, and is a key factor in achieving our customer service goals.

During Fiscal Year 2018-19, BIS representatives:

- Answered 437,437 calls (including 11,659 callbacks) and responded to 21,288 email requests;
- Assisted 42,467 customers at on-site consultations and another 2,894 customers off-site;
- Delivered presentations to 18,414 members and retirees; and
- Assisted 21,642 customers at information tables at events.

As part of our upgrade, BIS revamped its automated phone system. When incoming calls are routed to Call Center agents, screen pop-ups now automatically appear on staff computers, allowing staff to verify customer information more quickly. The new coding also makes it easier to route customer calls to the correct staff members for assistance. These improvements, among others, help streamline incoming calls and reduce wait times.

In the last year, we've continued to ramp up our electronic communication efforts. NYSLRS blog posts, Facebook posts and tweets reached more than 1.3 million people. Our electronic newsletters, which are sent to members, retirees and employers, reached more than 67,000 subscribers each month, and the NYSLRS website received more than 7 million page views. In addition to our electronic communication efforts, we distributed eight printed newsletters to more than one million employers, members and retirees. We also distributed account information statements to all our members and retirees.

OVERVIEW OF THE NEW YORK STATE AND LOCAL RETIREMENT SYSTEM

Report from Executive Deputy Comptroller Colleen Gardner

CONTINUED

MORE EFFICIENT RETIREMENT APPLICATION PROCESSING

Our Benefit Calculations & Disbursement Services (BCDS) Bureau changed how it completes retirement application processing work. In the past year, this new process helped BCDS staff efficiently complete the growing number of retirement applications. We've continued our effort to put new retirees on our pension payroll sooner, so they can begin receiving their first benefit payment through direct deposit instead of by check. In the past year, 23,603 of our new 25,682 retirees were placed on direct deposit. New retirees receive a benefit based on the salary and service information we have on file for them at retirement. If we receive additional earnings information from their employer that results in an increase in their pension, they receive a retroactive payment. Providing retirees with the benefits they've earned is NYSLRS' top priority, and we will continue to increase efficiency in order to address the rising number of retirements effectively.

FIGHTING FRAUD

NYSLRS has many processes in place to prevent the continued payment of benefits after a retiree's or beneficiary's death. NYSLRS recovered more than \$600,000 in disallowed post-death pension disbursements during Fiscal Year 2018-19. NYSLRS will continue to search out unreported and falsely reported retiree deaths and will pursue full restitution.

NYSLRS REVIEW

Under New York State Insurance Law and regulation, the New York State Department of Financial Services (DFS) is required to perform an examination of the System every five years. DFS concluded its examination of the System for the five-year period from April 1, 2011 through March 31, 2016, and issued a satisfactory report to the System, which was posted on the DFS website in February 2019. The report recommended that the System include a fraud warning statement on its disability claim forms as a best practice; the System added this information to applicable forms.

OVERVIEW OF THE NEW YORK STATE AND LOCAL RETIREMENT SYSTEM

Report from Executive Deputy Comptroller Colleen Gardner

CONTINUED

NEW LAWS ENACTED IN THE PAST YEAR THAT IMPACT NYSLRS

Special Accidental Death Benefits Increased

Chapter 179 of the Laws of 2018 increases certain special accidental death benefits paid to widows, widowers or children of police officers and firefighters killed in the line of duty.

Placement Agents Prohibited

Chapter 203 of the Laws of 2018, which was proposed by the Comptroller, prohibits the use of placement agents by managers doing business with the New York State Common Retirement Fund.

World Trade Center Filing Period Extended

Chapter 266 of the Laws of 2018 extends the period for filing a claim relating to World Trade Center rescue, recovery, and clean-up operations to September 11, 2022.

Actuarial Reduction Suspended

Chapter 426 of the Laws of 2018 permits the repayment of a New York State and Local Employees' Retirement System loan at any time by a retiree of such System by suspending the actuarial reduction when the outstanding balance is paid in full.

Our computer system upgrade continues to redefine how we do our work at NYSLRS, as well as how we serve all our customers – our members, retirees, beneficiaries and employers. We've set high customer service standards for ourselves. We will meet those standards by continuing to improve our online service technology and internal processes. I look forward to telling you about our future successes in 2020.

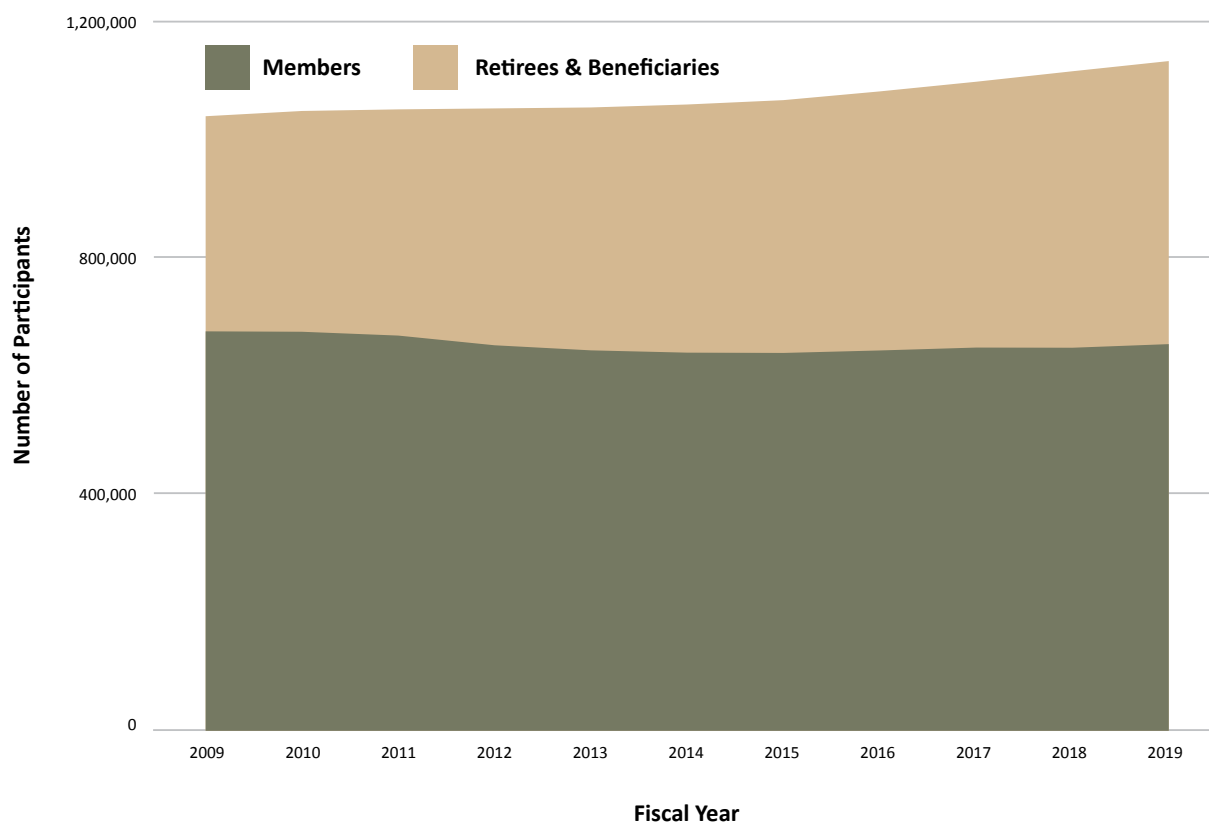
BY THE NUMBERS

MEMBERS AND RETIREES

There are 1,139,971 participants in the System, including 658,176 members and 481,795 retirees and beneficiaries.

The percentage of retirees is increasing more quickly than members. For example, in 1999 retirees represented 33 percent of the System's participants. By fiscal year 2019, that number had increased to approximately 42 percent.






Benefit payments continue to rise, reflecting improvements in final average salaries over the past decades, cost-of-living adjustment (COLA) payments and benefit improvements enacted over the years.

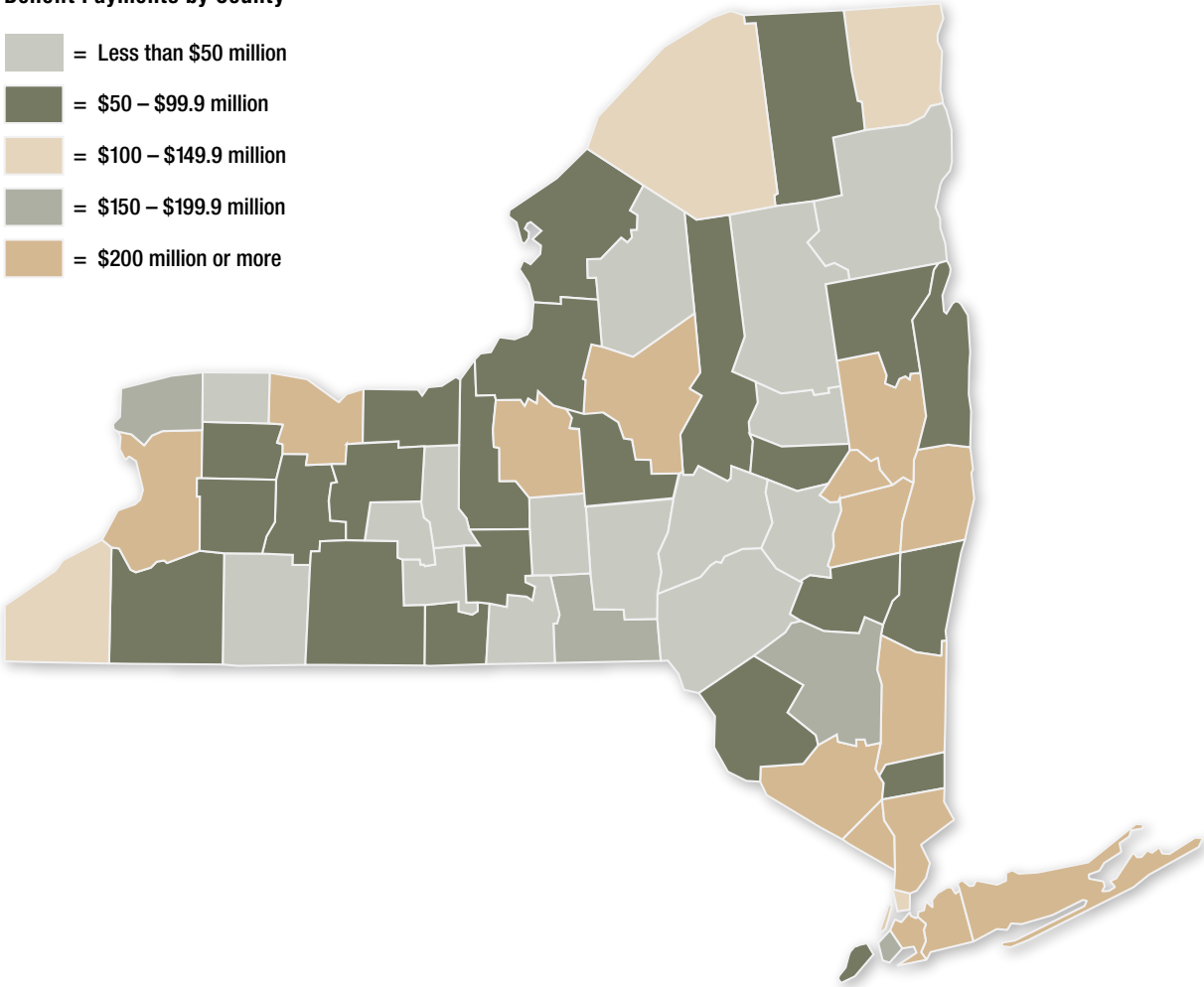


RETIREES IN NEW YORK STATE

Of the 481,795 retirees and beneficiaries in the System, 379,057 (79 percent) remain New York State residents. As such, benefit payments surpassing \$10.3 billion this year alone reach the State’s communities and businesses, representing a significant stimulus to the State’s economy.

Benefit Payments by County

-  = Less than \$50 million
-  = \$50 – \$99.9 million
-  = \$100 – \$149.9 million
-  = \$150 – \$199.9 million
-  = \$200 million or more



ANNUAL BENEFIT PAYMENTS WITHIN NEW YORK STATE

As of March 31, 2019.

County	Annuitants	Annual Payments
Albany	19,363	\$ 617,808,932
Allegany	1,721	33,307,147
Bronx	3,833	106,911,391
Broome	8,086	166,711,923
Cattaraugus	3,539	75,045,671
Cayuga	3,355	79,130,475
Chautauqua	4,969	103,475,426
Chemung	3,811	92,518,190
Chenango	2,207	41,903,626
Clinton	4,600	121,175,644
Columbia	3,155	82,617,636
Cortland	1,827	37,596,272
Delaware	1,882	38,480,899
Dutchess	10,126	297,709,730
Erie	31,724	839,615,824
Essex	2,102	46,441,163
Franklin	3,218	79,010,108
Fulton	2,278	48,553,269
Genesee	2,460	56,199,811
Greene	2,570	66,756,221
Hamilton	479	10,111,882
Herkimer	2,548	52,077,940
Jefferson	3,667	83,831,113
Kings	6,166	188,219,863
Lewis	1,273	23,165,474
Livingston	3,039	69,775,416
Madison	2,615	55,672,537
Monroe	17,720	403,940,297
Montgomery	2,459	56,479,848
Nassau	24,517	855,499,877
New York	4,636	154,281,804
Niagara	6,582	155,303,859

County	Annuitants	Annual Payments
NY Military	10	\$ 103,842
Oneida	10,341	252,808,297
Onondaga	14,285	336,137,336
Ontario	3,645	81,365,093
Orange	9,653	269,684,382
Orleans	1,633	35,141,762
Oswego	4,482	91,173,498
Otsego	2,278	43,099,176
Putnam	2,506	80,245,158
Queens	6,469	202,797,797
Rensselaer	9,395	279,833,159
Richmond	2,572	85,297,176
Rockland	7,149	225,867,924
Saratoga	11,290	330,715,439
Schenectady	8,752	257,374,955
Schoharie	1,675	39,643,439
Schuyler	859	18,060,139
Seneca	1,527	32,579,518
St. Lawrence	5,491	129,855,626
Steuben	3,426	73,057,635
Suffolk	36,503	1,221,718,622
Sullivan	3,032	75,788,067
Tioga	1,704	32,505,409
Tompkins	2,844	61,110,431
Ulster	6,167	151,325,051
Warren	3,060	71,512,489
Washington	2,874	66,403,938
Wayne	3,487	71,774,589
Westchester	16,405	534,059,730
Wyoming	2,169	50,434,627
Yates	847	17,119,191
Total	379,057	\$ 10,357,922,761

Note: The objective of this chart is to show the relative amounts paid to annuitants in the various locations within New York State. The numbers do not match the figures in the basic financial statements because the financial statement figures represent the sum of all benefit payments (including death benefits) made during the fiscal year, in accordance with Generally Accepted Accounting Principles (GAAP). The above numbers represent the sum of the annual benefits payable to all annuitants actively collecting as of the end of the fiscal year. The latter numbers are easier to organize by county than the former.

ANNUAL BENEFIT PAYMENTS WITHIN THE UNITED STATES

As of March 31, 2019.

State	Annuitants	Annual Payments
Alabama	864	\$ 15,661,382
Alaska	57	1,036,398
Arizona	2,792	59,586,159
Arkansas	171	2,593,550
California	2,257	42,267,279
Colorado	878	17,589,274
Connecticut	2,401	59,715,198
Delaware	917	24,842,560
Florida	38,093	926,664,410
Georgia	3,997	82,778,065
Guam	1	9,791
Hawaii	119	2,464,951
Idaho	108	2,234,753
Illinois	377	6,535,028
Indiana	297	5,052,900
Iowa	81	1,251,496
Kansas	119	1,934,723
Kentucky	379	6,309,640
Louisiana	189	3,374,521
Maine	617	12,603,970
Maryland	1,557	30,000,483
Massachusetts	1,609	35,423,427
Michigan	358	5,801,327
Minnesota	158	2,094,400
Mississippi	222	4,257,889
Missouri	266	4,130,543
Montana	127	2,279,452

State	Annuitants	Annual Payments
Nebraska	57	\$ 892,459
Nevada	1,457	35,743,987
New Hampshire	653	16,218,236
New Jersey	7,899	289,484,437
New Mexico	436	8,044,200
New York	379,057	10,357,922,761
North Carolina	9,315	206,681,394
North Dakota	24	290,197
Ohio	810	12,847,143
Oklahoma	159	2,299,240
Oregon	307	5,327,994
Pennsylvania	4,934	115,365,477
Puerto Rico	435	7,066,546
Rhode Island	271	6,408,212
South Carolina	6,225	153,064,846
South Dakota	85	2,284,855
Tennessee	1,964	45,327,885
Texas	2,319	46,785,539
Utah	158	2,911,895
Vermont	607	12,790,011
Virginia	3,827	79,311,891
Washington	538	10,359,571
Washington, D.C.	118	2,503,862
West Virginia	197	3,563,129
Wisconsin	169	2,916,755
Wyoming	68	1,430,496
Total	481,100	\$ 12,786,336,583

ANNUAL BENEFIT PAYMENTS OUTSIDE THE UNITED STATES

As of March 31, 2019.

Annuitants	Total Annual Payments
695	\$ 11,489,718

Note: The objective of this chart is to show the relative amounts paid to annuitants within the United States and outside the United States. The numbers do not match the figures in the basic financial statements because the financial statement figures represent the sum of all benefit payments (including death benefits) made during the fiscal year, in accordance with Generally Accepted Accounting Principles (GAAP). The above numbers represent the sum of the annual benefits payable to all annuitants actively collecting as of the end of the fiscal year. The latter numbers are easier to organize by country and state than the former.

Financial

CONTENTS

Independent Auditors' Report	33
Management's Discussion and Analysis (Unaudited)	35
Basic Financial Statements.....	40
Combining Basic Statement of Fiduciary Net Position	40
Combining Basic Statement of Changes in Fiduciary Net Position.....	41
Notes to Basic Financial Statements	42
Required Supplementary Information (Unaudited)	70
Schedule of Changes in the Employers' Net Pension Liability and Related Ratios (Unaudited)	70
Schedule of Employer Contributions (Unaudited)	72
Schedule of Investment Returns (Unaudited).....	73
Notes to Required Supplementary Information (Unaudited).....	73
Other Supplementary Information (Unaudited)	74
Schedule of Administrative Expenses (Unaudited)	74
Schedule of Investment Expenses (Unaudited).....	75
Schedule of Consulting Fees (Unaudited).....	76
Independent Auditors' Report on Internal Control	77

INDEPENDENT AUDITORS' REPORT



KPMG LLP
515 Broadway
Albany, NY 12207-2974

Independent Auditors' Report

The Trustee
New York State and Local Retirement System:

Report on the Financial Statements

We have audited the accompanying financial statements of the New York State and Local Retirement System (the System) as of and for the year ended March 31, 2019, and the related notes to the financial statements, which collectively comprise the System's basic financial statements for the year then ended 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 U.S. generally accepted accounting principles; 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.

Auditors' 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 from 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 auditors' 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 auditors consider 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 presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a 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 System as of March 31, 2019, and the changes in fiduciary net position for the year then ended, in accordance with U.S. generally accepted accounting principles.

KPMG LLP is a Delaware limited liability partnership and the U.S. member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity.

*Other Matters**Required Supplementary Information*

U.S. generally accepted accounting principles require that the management's discussion and analysis and required supplementary information as listed in the accompanying table of contents 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 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.

Other Supplementary 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 schedules of administrative expenses, investment expenses and consulting fees on pages 74-76, as well as the introduction, investment, actuarial and statistical sections are presented for purposes of additional analysis and are not a required part of the basic financial statements.

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

The introduction, 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 July 19, 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 solely 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 effectiveness of the System's 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.

KPMG LLP

July 19, 2019

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

March 31, 2019

The following overview of the financial activity of the New York State and Local Retirement System (the System) for the fiscal year ended March 31, 2019 is intended to provide the reader with an analysis of the System's overall financial position. The System is comprised of the New York State and Local Employees' Retirement System (ERS) and the New York State and Local Police and Fire Retirement System (PFRS). The net position of the System is held in the New York State Common Retirement Fund (the Fund), which was established to hold all assets and record changes in fiduciary net position allocated to the System. This management's discussion and analysis should be read in conjunction with the basic financial statements of the System, which follow.

FINANCIAL HIGHLIGHTS

The fiduciary net position of the System held in trust to pay pension benefits was \$215.17 billion as of March 31, 2019. This amount reflects an increase of \$3.1 billion from the prior fiscal year. This change is primarily the result of the net appreciation of the fair value of the investment portfolio. Investment appreciation for the fiscal years ended March 31, 2019 and 2018 was \$7.18 billion and \$17.86 billion, respectively.

- The System's investments reported a positive money-weighted rate of return, net of investment expense, of 5.14 percent for the fiscal year ended March 31, 2019 and a positive money-weighted rate of return, net of investment expense, of 11.29 percent for the fiscal year ended March 31, 2018.
- Retirement and death benefits paid during the fiscal year ended March 31, 2019 to 481,795 annuitants totaled \$12.74 billion, as compared to \$12.03 billion paid to 470,596 annuitants for the fiscal year ended March 31, 2018. The increase is primarily due to the number of new retirees.
- Contributions from employers decreased to \$4.75 billion for the fiscal year ended March 31, 2019, from \$4.82 billion for the fiscal year ended March 31, 2018. The decrease in contributions is attributable to the decrease in the average employer contribution rates from the previous fiscal year.
- The Net Pension Liability (NPL) for ERS was \$7.09 billion for the measurement period ended March 31, 2019 as compared to \$3.23 billion for the measurement period ended March 31, 2018. The fiduciary net position, restricted for pension benefits as of March 31, 2019, was \$182.72 billion, which represents 96.27 percent of the calculated total pension liability for ERS. The NPL is allocated to participating employers and reported pursuant to Governmental Accounting Standards Board (GASB) Statements 67 and 68.
- The NPL for PFRS was \$1.68 billion for the measurement period ended March 31, 2019 as compared to \$1.01 billion for the measurement period ended March 31, 2018. The fiduciary net position, restricted for pension benefits as of March 31, 2019, was \$32.45 billion, which represents 95.09 percent of the calculated total pension liability for PFRS. The NPL is allocated to participating employers and reported pursuant to GASB Statements 67 and 68.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

CONTINUED

OVERVIEW OF THE FINANCIAL STATEMENTS

The financial statements consist of the combining basic statement of fiduciary net position, the combining basic statement of changes in fiduciary net position, and the notes to the basic financial statements. The required supplementary information that appears after the notes to the basic financial statements is not a required part of the basic financial statements, but is supplementary information required by the Governmental Accounting Standards Board (GASB). The other supplementary information following the required supplementary information is not required, but management has chosen to include such information to increase transparency.

The combining basic statement of fiduciary net position reflects the resources available to pay members, retirees and beneficiaries at the close of the System's fiscal year. This statement also provides information about the fair value and composition of the System's net position.

The combining basic statement of changes in fiduciary net position presents the changes to the System's net position for the fiscal year, including net investment income (loss), which includes net appreciation (depreciation) in fair value of the investment portfolio, and contributions from members and employers. Benefits and administrative expenses paid by the System are included under the deductions section of the statement.

The notes to the financial statements are an integral part of the basic financial statements and provide additional information about the plans, policies, and performance of the System.

The required supplementary information includes: Management's Discussion and Analysis, Schedule of Changes in the Employers' Net Pension Liability and Related Ratios, Schedule of Employer Contributions and Schedule of Investment Returns.

The additional supplementary information includes: Schedule of Administrative Expenses, Schedule of Investment Expenses, and Schedule of Consulting Fees.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

CONTINUED

ANALYSIS OF THE OVERALL FINANCIAL POSITION OF THE SYSTEM

The purpose of the System's investments is to provide for long-term growth, while also ensuring a reliable cash flow that meets the funding requirements of the near-term pension obligation. To achieve these goals, the investments are allocated to a variety of asset types and strategies in order to meet the System's current funding needs as well as future growth requirements. Equity-related investments are included for their long-term return and growth characteristics. While a majority of fixed income and debt-related investments are generally included in the allocation for their ability to control investment risk and provide for a reliable cash flow that meets the funding requirements, a portion is strategically invested in more actively traded markets. It is important to note that the change from year to year is due not only to changes in fair values but also to purchases, sales, and redemptions. Tables 1, 2, and 3 summarize and compare financial data for the current and prior years.

Table 1

Summary schedule of fiduciary net position as of March 31, 2019, as compared to March 31, 2018:

	(Dollars in Thousands)			Percentage Change
	2019	2018	Dollar Change	
Assets:				
Investments	\$ 210,523,715	\$ 207,415,970	\$ 3,107,745	1.5%
Securities lending collateral — invested	5,742,731	5,606,936	135,795	2.4
Receivables and other assets	<u>5,368,698</u>	<u>5,525,416</u>	<u>(156,718)</u>	<u>(2.8)</u>
Total assets	221,635,144	218,548,322	3,086,822	1.4
Liabilities:				
Securities lending obligations	5,749,147	5,614,883	134,264	2.4
Payables and other liabilities	<u>716,836</u>	<u>856,628</u>	<u>(139,792)</u>	<u>(16.3)</u>
Total liabilities	6,465,983	6,471,511	(5,528)	(0.1)
Net position, restricted for pension benefits	\$ 215,169,161	\$ 212,076,811	\$ 3,092,350	1.5%

The fiduciary net position of the System totaled \$215.2 billion as of March 31, 2019, an increase of \$3.1 billion from the prior fiscal year, primarily attributable to the net appreciation of invested assets.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

CONTINUED

Table 2

Schedule of invested assets as of March 31, 2019, as compared to March 31, 2018:

	(Dollars in Thousands)			Percentage Change
	2019	2018	Dollar Change	
Domestic equity	\$ 73,303,652	\$ 75,771,363	\$ (2,467,711)	(3.3)%
Global fixed income	45,651,602	44,820,784	830,818	1.9
International equity	36,256,971	39,025,688	(2,768,717)	(7.1)
Private equity	19,750,977	17,500,516	2,250,461	12.9
Real estate	15,678,555	14,182,669	1,495,886	10.5
Absolute return strategy investments	7,812,169	7,879,320	(67,151)	(0.9)
Short-term investments	6,118,985	3,366,569	2,752,416	81.8
Opportunistic funds	2,833,785	2,507,027	326,758	13.0
Real assets	2,220,026	1,518,624	701,402	46.2
Mortgage loans	896,993	843,410	53,583	6.4
Total investments	\$ 210,523,715	\$ 207,415,970	\$ 3,107,745	1.5%

The largest percentage increases to the invested assets were in short-term investments, real assets, opportunistic funds and private equity investments, which represent 2.91 percent, 1.05 percent, 1.35 percent and 9.38 percent of the total portfolio, respectively. The increase in short-term investments reflects higher rates available in cash markets as well as increased focus on liquidity. In the real assets and opportunistic portfolios, the growth largely reflected new allocations to bring these newer portfolios closer to their targeted asset allocations as well as deployment of committed capital by underlying asset managers. The increase in private equity investments was primarily due to positive performance and continued efforts to meet the target allocation. The public equity portfolios provided the bulk of liquidity for the Fund, which is reflected in the nominal decrease in value of both the domestic equity and international equity portfolios.

Absolute return strategy investments include equity-oriented long-only global funds of \$2.82 billion. Though these funds are in an absolute return strategy vehicle, the underlying assets are long-only equity positions.

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)

CONTINUED

Table 3

Summary schedule of changes in fiduciary net position for the year ended March 31, 2019, as compared to the year ended March 31, 2018:

	(Dollars in Thousands)			Percentage Change
	2019	2018	Dollar Change	
Additions:				
Net investment income	\$ 10,761,776	\$ 21,338,033	\$ (10,576,257)	(49.6)%
Total contributions	5,300,982	5,388,310	(87,328)	(1.6)
Total additions	16,062,758	26,726,343	(10,663,585)	(39.9)
Deductions:				
Total benefits paid	12,833,931	12,128,919	705,012	5.8
Administrative expenses	136,477	122,806	13,671	11.1
Total deductions	12,970,408	12,251,725	718,683	5.9
Net increase	3,092,350	14,474,618	(11,382,268)	(78.6)
Net position, restricted for pension benefits — beginning of year	212,076,811	197,602,193	14,474,618	7.3
Net position, restricted for pension benefits — end of year	\$ 215,169,161	\$ 212,076,811	\$ 3,092,350	1.5%

The change in net investment income is primarily attributable to the decrease in net appreciation in fair value of investments from 2018 to 2019. The increase in total benefits paid is attributable to the number of new retirees.

ECONOMIC FACTORS AND RATES OF RETURN

The Fund announced positive investment performance for the fiscal year ended March 31, 2019, with a time-weighted rate of return of 5.23 percent, a strong result despite a volatile 4th quarter in which both the equity and fixed income markets saw dramatic moves. The Fund saw a positive result across its portfolios. Alternatives outperformed public markets attesting to the Fund's long term diversification strategy.

General market volatility continued to pick up over the year and the Fund continues to monitor the increasing uncertainty in the markets. This was the tenth consecutive year of positive performance for the Fund following the fiscal crisis of 2008.

REQUESTS FOR INFORMATION

This financial report is designed to provide a general overview of the System's finances for all interested parties. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the New York State and Local Retirement System, 110 State Street, Albany, New York 12244-0001. The report can also be accessed on the Comptroller's website at: www.osc.state.ny.us/retire/about_us/financial_statements_index.php.

BASIC FINANCIAL STATEMENTS

COMBINING BASIC STATEMENT OF FIDUCIARY NET POSITION

March 31, 2019

	(Dollars in Thousands)		
	Employees' Retirement System	Police and Fire Retirement System	Total
Assets:			
Investments (notes 2(b), 4, 5, 8, and 11):			
Domestic equity	\$ 62,209,365	\$ 11,094,287	\$ 73,303,652
Global fixed income	38,742,369	6,909,233	45,651,602
International equity	30,769,587	5,487,384	36,256,971
Private equity	16,761,726	2,989,251	19,750,977
Real estate	13,305,653	2,372,902	15,678,555
Absolute return strategy investments	6,629,821	1,182,348	7,812,169
Short-term investments	5,192,895	926,090	6,118,985
Opportunistic funds	2,404,900	428,885	2,833,785
Real assets	1,884,032	335,994	2,220,026
Mortgage loans	761,236	135,757	896,993
Total investments	178,661,584	31,862,131	210,523,715
Securities lending collateral — invested (notes 7 and 8)	4,873,586	869,145	5,742,731
Forward foreign exchange contracts (notes 6 and 8)	15,224	2,715	17,939
Receivables:			
Employers' contributions	2,448,689	398,915	2,847,604
Members' contributions	2,687	223	2,910
Member loans	1,018,678	4,817	1,023,495
Investment income	331,014	59,032	390,046
Investment sales	248,470	44,312	292,782
Other	296,140	116,629	412,769
Total receivables	4,345,678	623,928	4,969,606
Capital assets, at cost, net of accumulated depreciation	323,467	57,686	381,153
Total assets	188,219,539	33,415,605	221,635,144
Liabilities:			
Securities lending obligations (notes 7 and 8)	4,879,031	870,116	5,749,147
Forward foreign exchange contracts (notes 6 and 8)	15,060	2,686	17,746
Accounts payable — investments	304,953	54,385	359,338
Benefits payable	125,120	13,352	138,472
Other liabilities	177,251	24,029	201,280
Total liabilities	5,501,415	964,568	6,465,983
Net position, restricted for pension benefits	\$ 182,718,124	\$ 32,451,037	\$ 215,169,161

See accompanying notes to basic financial statements.

BASIC FINANCIAL STATEMENTS

CONTINUED

COMBINING BASIC STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

Year Ended March 31, 2019

	(Dollars in Thousands)		
	Employees' Retirement System	Police and Fire Retirement System	Total
Additions:			
Income from investing activities:			
Net appreciation in fair value of investments	\$ 6,098,261	\$ 1,081,673	\$ 7,179,934
Interest income	1,122,135	199,039	1,321,174
Dividend income	1,550,157	274,960	1,825,117
Other income	946,751	167,930	1,114,681
Less investment expenses	(614,230)	(108,949)	(723,179)
Total income from investing activities	9,103,074	1,614,653	10,717,727
Income from securities lending activities:			
Securities lending income	148,975	26,424	175,399
Securities lending rebates	(107,406)	(19,051)	(126,457)
Less securities lending management fees	(4,156)	(737)	(4,893)
Total income from securities lending activities	37,413	6,636	44,049
Total net investment income	9,140,487	1,621,289	10,761,776
Contributions:			
Employers	3,890,215	854,094	4,744,309
Members	345,846	40,673	386,519
Interest on accounts receivable	94,893	15,109	110,002
Other, net	65,538	(5,386)	60,152
Total contributions	4,396,492	904,490	5,300,982
Total additions	13,536,979	2,525,779	16,062,758
Deductions:			
Benefits paid:			
Retirement benefits	10,578,972	1,947,974	12,526,946
Death benefits	202,809	11,857	214,666
Other, net	90,915	1,404	92,319
Total benefits paid	10,872,696	1,961,235	12,833,931
Administrative expenses	119,304	17,173	136,477
Total deductions	10,992,000	1,978,408	12,970,408
Net increase	2,544,979	547,371	3,092,350
Net position, restricted for pension benefits — beginning of year	180,173,145	31,903,666	212,076,811
Net position, restricted for pension benefits — end of year	\$ 182,718,124	\$ 32,451,037	\$ 215,169,161

See accompanying notes to basic financial statements.

NOTES TO BASIC FINANCIAL STATEMENTS

March 31, 2019

1. DESCRIPTION OF PLANS

The Office of the New York State Comptroller administers the following plans: the New York State and Local Employees' Retirement System (ERS) and the New York State and Local Police and Fire Retirement System (PFRS), which are collectively referred to as the New York State and Local Retirement System (the System). The net position of the System is held in the New York State Common Retirement Fund (the Fund), which was established to hold all assets and record changes in fiduciary net position allocated to the System.

The Comptroller of the State of New York serves as the trustee of the Fund and is the administrative head of the System. The Comptroller is an elected official determined in a direct statewide election and serves a four-year term. Thomas P. DiNapoli has served as Comptroller since February 7, 2007. In November 2018, he was elected for a new term commencing January 1, 2019.

The external advisory committees appointed by the Comptroller meet periodically throughout the year and provide independent, expert assistance in guiding the Fund. These committees include: the Advisory Council for the Retirement System; the Investment Advisory Committee; the Real Estate Advisory Committee; the Actuarial Advisory Committee; and the Audit Advisory Committee.

System benefits are established under the provisions of the New York State Retirement and Social Security Law (RSSL). Once a public employer elects to participate in the System, the election is irrevocable. The New York State Constitution provides that pension membership is a contractual relationship and plan benefits cannot be diminished or impaired. Benefits can be changed for future members only by enactment of a State statute. Generally, members of the System are employees, other than teachers, of the State and its municipalities, other than New York City.

ERS and PFRS are cost-sharing, multiple-employer, defined benefit pension plans. The System is included in the State of New York's financial report as a pension trust fund. The Public Employees' Group Life Insurance Plan (GLIP) provides death benefits in the form of life insurance. In these statements, GLIP amounts are apportioned to and included in ERS and PFRS.

As of March 31, 2019, the number of participating employers for ERS and PFRS consisted of the following:

	ERS	PFRS
State	1	1
Counties	57	4
Cities	61	61
Towns	914	207
Villages	483	365
Other	802	39
School districts	697	-
Total	3,015	677

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

As of March 31, 2019, the System membership for ERS and PFRS consisted of the following:

	ERS	PFRS
Retirees and beneficiaries currently receiving benefits	444,719	37,076
Active members	501,037	32,573
Inactive members*	122,053	2,513
Total members and benefit recipients	1,067,809	72,162
* Includes vested members not currently receiving benefits and nonvested members.		

(a) Membership Tiers

Pension legislation enacted in 1973, 1976, 1983, 2009 and 2012 established distinct classes of membership. For convenience, the System uses a tier concept to distinguish these groups, generally:

ERS

- Tier 1** Those persons who last became members before July 1, 1973.
- Tier 2** Those persons who last became members on or after July 1, 1973, but before July 27, 1976.
- Tier 3** Generally, those persons who are State correction officers who last became members on or after July 27, 1976, but before January 1, 2010, and all others who last became members on or after July 27, 1976, but before September 1, 1983.
- Tier 4** Generally, except for correction officers, those persons who last became members on or after September 1, 1983, but before January 1, 2010.
- Tier 5** Those persons who last became members on or after January 1, 2010, but before April 1, 2012.
- Tier 6** Those persons who first became members on or after April 1, 2012.

PFRS

- Tier 1** Those persons who last became members before July 31, 1973.
- Tier 2** Those persons who last became members on or after July 31, 1973, but before July 1, 2009.
- Tier 3** Those persons who last became members on or after July 1, 2009, but before January 9, 2010.
- Tier 4** Not Applicable
- Tier 5** Those persons who last became members on or after January 9, 2010, but before April 1, 2012, or who were previously PFRS Tier 3 members who elected to become Tier 5.
- Tier 6** Those persons who first became members on or after April 1, 2012.

(b) Vesting

Members who joined the System prior to January 1, 2010 need five years of service to be 100 percent vested. Members who joined on or after January 1, 2010 (ERS) or January 9, 2010 (PFRS) require ten years of service credit to be 100 percent vested.

(c) Employer Contributions

Participating employers are required under the RSSL to contribute to the System at an actuarially determined rate adopted annually by the Comptroller. The average contribution rate for ERS for the fiscal year ended March 31, 2019 was approximately 14.9 percent of covered payroll. The average contribution rate for PFRS for the fiscal year ended March 31, 2019 was approximately 23.5 percent of covered payroll. Delinquent annual bills for employer contributions accrue interest at the actuarial interest rate applicable during the year. For the fiscal year ended March 31, 2019, the applicable interest rate was 7 percent.

(d) Member Contributions

Generally, Tier 3, 4, and 5 members must contribute 3 percent of their salary to the System. As a result of Article 19 of the RSSL, eligible Tier 3 and 4 employees, with a membership date on or after July 27, 1976, who have ten or more years of membership or credited service with the System, are not required to contribute. Members cannot be required to begin making contributions or to make increased contributions beyond what was required when membership began. For Tier 6 members, the contribution rate varies from 3 percent to 6 percent depending on salary. Generally, Tier 5 and 6 members are required to contribute for all years of service.

(e) Benefits

Tiers 1 and 2

Eligibility: Tier 1 members, with the exception of those retiring under special retirement plans, must be at least age 55 to be eligible to collect a retirement benefit. There is no minimum service requirement for Tier 1 members. Tier 2 members, with the exception of those retiring under special retirement plans, must have five years of service and be at least age 55 to be eligible to collect a retirement benefit. The age at which full benefits may be collected for Tier 1 is 55, and the full benefit age for Tier 2 is 62.

Benefit Calculation: Generally, the benefit is 1.67 percent of final average salary for each year of service if the member retires with less than 20 years. If the member retires with 20 or more years of service, the benefit is 2 percent of final average salary for each year of service. Tier 2 members with five or more years of service can retire as early as age 55 with reduced benefits. Tier 2 members age 55 or older with 30 or more years of service can retire with no reduction in benefits. As a result of Article 19 of the RSSL, Tier 1 and Tier 2 members who worked continuously from April 1, 1999 through October 1, 2000 received an additional month of service credit for each year of credited service they have at retirement, up to a maximum of 24 additional months.

Final average salary is the average of the wages earned in the three highest consecutive years of employment. For Tier 1 members who joined on or after June 17, 1971, each year's compensation used in the final average salary calculation is limited to no more than 20 percent greater than the previous year. For Tier 2 members, each year of final average salary is limited to no more than 20 percent greater than the average of the previous two years.

Tiers 3, 4, and 5

Eligibility: Tier 3 and 4 members, with the exception of those retiring under special retirement plans, must have five years of service and be at least age 55 to be eligible to collect a retirement benefit. Tier 5 members, with the exception of those retiring under special retirement plans, must have ten years of service and be at least age 55 to be eligible to collect a retirement benefit. The full benefit age for Tiers 3, 4 and 5 is 62.

Benefit Calculation: Generally, the benefit is 1.67 percent of final average salary for each year of service if the member retires with less than 20 years. If a member retires with between 20 and 30 years of service, the benefit is 2 percent of final average salary for each year of service. If a member retires with more than 30 years of service, an additional benefit of 1.5 percent of final average salary is applied for each year of service over 30 years. Tier 3 and 4 members with five or more years of service and Tier 5 members with ten or more years of service can retire as early as age 55 with reduced benefits. Tier 3 and 4 members age 55 or older with 30 or more years of service can retire with no reduction in benefits.

Final average salary is the average of the wages earned in the three highest consecutive years of employment. For Tier 3, 4 and 5 members, each year's compensation used in the final average salary calculation is limited to no more than 10 percent greater than the average of the previous two years.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

Tier 6

Eligibility: Tier 6 members, with the exception of those retiring under special retirement plans, must have ten years of service and be at least age 55 to be eligible to collect a retirement benefit. The full benefit age for Tier 6 is 63 for ERS members and 62 for PFRS members.

Benefit Calculation: Generally, the benefit is 1.67 percent of final average salary for each year of service if the member retires with less than 20 years. If a member retires with 20 years of service, the benefit is 1.75 percent of final average salary for each year of service. If a member retires with more than 20 years of service, an additional benefit of 2 percent of final average salary is applied for each year of service over 20 years. Tier 6 members with ten or more years of service can retire as early as age 55 with reduced benefits.

Final average salary is the average of the wages earned in the five highest consecutive years of employment. For Tier 6 members, each year's compensation used in the final average salary calculation is limited to no more than 10 percent greater than the average of the previous four years.

Special Plans

The 25-Year Plans allow a retirement after 25 years of service with a benefit of one-half of final average salary, and the 20-Year Plans allow a retirement after 20 years of service with a benefit of one-half of final average salary. These plans are available to certain PFRS members, sheriffs, and correction officers.

Disability Retirement Benefits

Disability retirement benefits are available to ERS and PFRS members unable to perform their job duties because of permanent physical or mental incapacity. There are three general types of disability benefits: ordinary, performance of duty, and accidental disability benefits. Eligibility, benefit amounts, and other rules such as any offsets of other benefits depend on a member's tier, years of service, and plan.

Ordinary Death Benefits

Death benefits are payable upon the death, before retirement, of a member who meets eligibility requirements as set forth by law. The first \$50,000 of an ordinary death benefit is paid in the form of group term life insurance. The benefit is generally three times the member's annual salary. For most members, there is also a reduced post-retirement ordinary death benefit available.

Post-Retirement Benefit Increases

A cost-of-living adjustment is provided annually to: (i) all retirees who have attained age 62 and have been retired for five years; (ii) all retirees who have attained age 55 and have been retired for ten years; (iii) all disability retirees, regardless of age, who have been retired for five years; (iv) ERS recipients of an accidental death benefit, regardless of age, who have been receiving such benefit for five years; and (v) the spouse of a deceased retiree receiving a lifetime benefit under an option elected by the retiree at retirement. An eligible spouse is entitled to one-half the cost-of-living adjustment amount that would have been paid to the retiree when the retiree would have met the eligibility criteria. This cost-of-living adjustment is a percentage of the annual retirement benefit of the eligible retiree as computed on a base benefit amount not to exceed \$18,000 of the annual retirement benefit. The cost-of-living percentage shall be 50 percent of the annual Consumer Price Index as published by the U.S. Bureau of Labor, but cannot be less than 1 percent or exceed 3 percent.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

(a) Basis of Accounting

The System maintains records and accounts, and prepares financial statements using the accrual basis of accounting. Employer contributions are recognized when legally due, pursuant to statutory requirements, in accordance with the terms of each plan. Member contributions are based on earned member salaries and are recognized when due. Benefits, expenses, and refunds are recognized when due and payable.

(b) Investments

Investments are recorded on a trade date basis and reported at fair value. Fair value is defined as the amount that can reasonably be expected to be received for an investment in a current sale between a willing buyer and a willing seller. Due to the nature of investments, it is reasonable that changes in the value of investments will occur in the near future, and such changes could materially affect the amounts reported. The amounts reported as investments on the financial statements are allocated between ERS and PFRS based on each system's monthly average equity in the Fund. See note 4(c) for detailed information on the System's policy on investment valuation and note 8 for more detail regarding the methods used to measure the fair value of investments.

(c) Member Loan Programs

Members who joined prior to January 1, 2018 are entitled to participate in a loan program that allows them to borrow up to 75 percent of their member contributions or \$50,000, whichever is less. Members who joined on or after January 1, 2018, may borrow up to 50 percent of their contribution balance or \$50,000, whichever is less. Repayment of outstanding amounts is generally made through payroll deductions within five years. The interest rate charged for COESC Member Loans is fixed at 1 percent below the actuarial interest rate at the time the loan is granted. The rate for loans issued during the fiscal year ended March 31, 2019 was 6 percent.

(d) Capital Assets

Capital assets are capitalized at cost and depreciated on a straight line basis over the related assets' estimated useful lives.

During the fiscal year ended March 31, 2014, the System began capitalizing outlays associated with the redesign of its pension administration system. As of March 31, 2019, capitalized outlays for the project total \$332.51 million. This project is currently ongoing and is expected to be completed in the period ending December 31, 2020, at which time depreciation of the capitalized costs will begin.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

(e) Contributions Receivable

Employers' contributions receivable are presented net of withdrawals, refunds, advance employer payments, and credits due employers. Receivable amounts from participating employers include \$23.3 million for amortization of retirement incentives, new plan adoptions, and retroactive membership.

The RSSL includes several provisions related to the amortization of employer contribution amounts. These include:

- Chapter 57 of the Laws of 2010 authorized the State and local employers to amortize a portion of their annual pension costs during periods when actuarial contribution rates exceed thresholds established by the statute. Amortized amounts will be paid in equal annual installments over a ten year period including a rate of interest set by the Comptroller annually. Employers may prepay these amounts at any time without penalty. The first payment will be due in the fiscal year following the decision to amortize. Chapter 57 further provides that when contribution rates fall below legally specified levels and all outstanding amortizations have been paid, employers that elected to amortize will be required to pay additional moneys into reserve funds, specific to each employer, which will be used to offset their contributions in the future. These reserve funds will be invested separately from pension assets.

The following represents the amortized receivable balance from the State and Local participating employers as of March 31, 2019, including the statutory amortization threshold and interest rate, for each respective fiscal year:

CHAPTER 57, LAWS OF 2010

Year	(Percentage of Payroll)		Interest	(Dollars in Millions)	
	ERS	PFRS		State	Local
2011	9.5%	17.5%	5.00%	\$ 52.3	\$ 7.2
2012	10.5	18.5	3.75	191.7	57.8
2013	11.5	19.5	3.00	340.1	135.3
2014	12.5	20.5	3.67	512.1	95.9
2015	13.5	21.5	3.15	455.3	84.4
2016	14.5	22.5	3.21	261.5	47.3
2017	15.1	23.5	2.33	—	5.0
2018	14.9	24.3	2.84	—	4.0
2019	14.4	23.5	3.64	—	4.2
				<u>\$ 1,813.00</u>	<u>\$ 441.1</u>

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

- The fiscal year 2014 Enacted Budget included an alternate contribution program (the Alternate Contribution Stabilization Program) that provided certain participating employers with a one-time election to amortize slightly more of their required contributions than would be available for amortization under the 2010 legislation. In addition, the maximum payment period was increased from ten years to twelve years. The election was available to: counties, cities, towns, villages, BOCES, school districts and the four public health care centers operated in the counties of Nassau, Westchester and Erie. The State was not eligible to participate in the Alternate Contribution Stabilization Program.

The following represents the amortized receivable balance from Local participating employers as of March 31, 2019, including the statutory amortization threshold and interest rate, for each respective fiscal year:

CHAPTER 57, LAWS OF 2013

Year	(Percentage of Payroll)			(Dollars in Millions)	
	ERS	PFRS	Interest	Local	
2014	12.0%	20.0%	3.76%	\$	142.8
2015	12.0	20.0	3.50		135.2
2016	12.5	20.5	3.31		105.3
2017	13.0	21.0	2.63		79.4
2018	13.5	21.5	3.31		69.8
2019	14.0	22.0	3.99		25.1
				\$	557.6

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

(f) Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingencies. These estimates are subject to a certain amount of uncertainty in the near term, which could result in changes in the values reported for those assets in the combined statement of fiduciary net position. Estimates also affect the reported amounts of income/additions and expenses/deductions during the reporting period. Actual results could differ from these estimates.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

3. SYSTEM RESERVES

The legally required reserves, as covered by provisions of the RSSL, are maintained by the System, are fully funded as of March 31, 2019, and are described below:

- *Annuity Savings Funds* – Funds in which contributions of Tier 1 and Tier 2 members are accumulated.
- *Annuity Reserve Funds* – Funds from which member contribution annuities are paid.
- *Pension Accumulation Funds* – Funds in which employer contributions and income from the investments of the System are accumulated.
- *Pension Reserve Funds* – Funds from which pensions are paid.
- *Designated Annuitant Funds* – Funds from which beneficiary annuities are paid.
- *Loan Insurance Funds* – Funds that provide loan insurance coverage for members with existing no default loan balances at time of death.
- *Group Life Insurance Plan Reserve* – Reserves that provide group term death benefits not to exceed \$50,000, payable upon the death of eligible members.
- *Coescalation (COESC) Contribution Funds* – Funds in which member contributions are accumulated. These funds are transferred to the Pension Accumulation Fund at retirement.

As of March 31, 2019, the System reserves for ERS and PFRS consisted of the following:

	(Dollars in Thousands)	
	ERS	PFRS
Annuity savings	\$ 286	\$ 60,818
Annuity reserve	64,627	14,242
Pension accumulation	71,044,262	12,079,734
Pension reserve	102,881,489	20,146,830
Designated annuitant	49,718	19,956
Loan insurance	2,018	105
Group Life Insurance Plan reserve	108,743	4,384
COESC contributions	8,566,981	124,968
Total	\$ 182,718,124	\$ 32,451,037

4. INVESTMENTS

(a) Investment Policy

The State Comptroller, currently Comptroller Thomas P. DiNapoli, is Trustee of the Fund. He is directly accountable for the investment of Fund assets and for the oversight and management of the Fund. Comptroller DiNapoli is responsible for implementing an asset allocation with an appropriate balance of risk and return. The Trustee has put in place investment policies and practices designed to ensure that investments are made for the exclusive benefit of the participants and beneficiaries of the System, on whose behalf the assets of the Fund are invested, and that Fund investments are made with the care that a prudent person serving in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims – the “prudence” and “exclusive benefit” fiduciary standards of investment. Additionally, the Trustee has adopted policies and practices to ensure that the Fund is managed with high levels of ethical conduct and transparency.

The Comptroller seeks the input of a wide range of internal and external advisors to determine the allocation of assets and the appropriate investment choices for the Fund. The Comptroller appoints a Chief Investment Officer to oversee PICM operations, manage staff, and supervise investments on a day-to-day basis. The Fund also relies on advice from a network of outside advisors, consultants, and legal counsel, as well as the members of independent external advisory committees appointed by the Comptroller. Outside advisors and internal investment staff are part of the chain of approval that must recommend all investment decisions before they reach the Comptroller for final approval.

The asset allocation is not intended to be an absolute limit on the type of investments that can be made by the Comptroller or considered by staff. The Comptroller is expressly permitted to invest the assets of the Fund pursuant to various provisions of State law, including, among others, Article 4-A of the RSSL, which also contains limitations on the amount and quality of investments the Fund may hold in certain asset categories. Investments purchased pursuant to these provisions are so-called “legal list” investments. In addition to the foregoing, section 177(9) of the RSSL contains a provision that currently provides that up to 25 percent of the Fund’s assets may be placed in investments not specifically authorized by any other provision of law. In making investments under this provision, the Comptroller is subject to the exclusive benefit and prudence standards in the statute. Subject to such standards, investments made under this provision must also, to the extent reasonably possible, benefit the overall economic health of the State. Investments made pursuant to section 177(9) of the RSSL are so-called “basket clause” investments.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

(b) Asset Allocation

The following was the adopted asset allocation policy as of March 31, 2019:

Asset Class	Target Allocation
Domestic equity	36.0%
International equity	14.0
Private equity	10.0
Real estate	10.0
Absolute return strategies*	2.0
Opportunistic funds	3.0
Real assets	3.0
Bonds and mortgages	17.0
Cash	1.0
Inflation-indexed bonds	4.0
	100.0%
* Excludes equity-oriented long-only global funds of \$2.82 billion. For investment management purposes, these funds are included in domestic equity and international equity.	

(c) Methods Used to Value Investments

Equity securities traded on a national or international exchange are reported at current quoted fair values.

Bonds and other fixed income assets are primarily reported at fair values obtained from independent pricing services.

Mortgages are valued on the basis of future principal and interest payments and are discounted at prevailing interest rates for similar instruments.

Direct investments in real estate are valued based on independent appraisals made every three years or according to the contract.

Real estate partnerships, global fixed income funds, commingled international equity funds and various alternative investments (private equity, absolute return strategies, opportunistic funds, and real assets) are reported at net asset values as provided by the general partners or investment managers.

Information on securities lending is available in note 7. Information on foreign currency risks and derivative financial instruments can be found in note 5(f) and note 6, respectively.

The Fund trades in foreign exchange contracts in the normal course of its investing activities in order to manage exposure to market risks. Such contracts, which are generally for a period of less than one year, are used to purchase and sell foreign currency at a guaranteed future price. These contracts are recorded at fair value using foreign currency exchange rates.

(d) Rates of Return

In accordance with U.S. generally accepted accounting principles, the money weighted rate of return on plan investments, net of investment expenses, was 5.14 percent for the year ended March 31, 2019. For internal purposes, the System evaluates investment performance using the time weighted rate of return, gross of certain investment fees, which was 5.23 percent for the year ended March 31, 2019.

5. DEPOSIT AND INVESTMENT RISK DISCLOSURE

(a) Custodial Credit Risk for Investments

Investment securities are exposed to custodial credit risk if the securities are not registered in the name of the Fund, or are held either by the counterparty or the counterparty's trust department or agent, but not in the name of the Fund.

Equity and fixed income investments owned directly by the Fund, which trade in the United States (U.S.) markets, are generally held by the Fund's custodian, in separate accounts, in the name of the Comptroller of the State of New York in Trust for the Fund. These securities are typically held in electronic form through the Federal Book Entry System and by the Depository Trust Company (DTC) and its subsidiaries acting as an agent of the Fund's custodian bank. Securities held directly by the Fund that trade in markets outside the U.S. are held by a subsidiary of the Fund's custodian bank in the local market, a bank performing custodial services in the local market acting as an agent for the Fund's custodian bank, and in some foreign markets, the securities are held in electronic form by a DTC subsidiary or an organization similar to DTC.

Equity investments held indirectly by the Fund via limited partnerships, commingled investment funds, joint ventures, and other similar vehicles are held in custody by an organization contracted by the general partner and/or the investment management firm responsible for the management of each investment organization.

Title to real estate invested in by the Fund is held either by a real estate holding company or a real estate investment fund. Ownership of mortgage assets is documented by the Fund's holding of original mortgage and note documents by the Office of the State Comptroller's PICM.

(b) Custodial Credit Risk for Deposits

Deposits are exposed to custodial credit risk if the deposits are not covered by depository insurance or the deposits are uncollateralized, collateralized with securities held by the pledging financial institution, or collateralized with securities held by the pledging institution's trust department or agent, but not in the name of the Fund.

In accordance with existing policies and procedures, the PICM in the Office of the State Comptroller monitors deposit balances for the purpose of determining collateralization levels. Collateral sufficient to cover all uninsured deposits is held at the State's custodial bank.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

(c) Interest Rate Risk

The System is subject to interest rate risk, which is the risk that changes in market interest rates will adversely affect the fair value of the Fund's fixed income securities. Pursuant to the Fund's investment policies and procedures and to address changing economic factors and their impact on various sectors of the economy, PICM staff meets regularly to discuss the investment strategy for the fixed income portfolio. Several factors are taken into account when formulating this strategy, including sector weightings and the current duration of the portfolio.

The price volatility of the Fund's fixed income holdings is measured by duration. Effective duration is a measure of the price sensitivity of a bond to interest rate movements. Effective duration follows the concept that interest rates and bond prices move in opposite directions.

As of March 31, 2019, the duration of the fixed income portfolio is as follows (dollars in thousands):

Category	Fair Value	Percentage of Bond Portfolio	Effective Duration (In Years)
Bonds:			
Core Portfolio:			
Treasury	\$ 9,665,736	21.1%	7.80
Federal agency	46,246	0.1	4.99
Corporate	11,455,506	25.1	6.91
Asset-backed	992,139	2.2	3.19
Commercial mortgage-backed	1,595,253	3.5	4.82
Mortgage-backed	5,371,583	11.8	3.79
Collateralized loan obligations	2,740,120	6.0	0.09
Municipal bonds	131,209	0.3	6.10
Core Portfolio	31,997,792	70.1	5.51
Treasury Inflation-Protected Securities (TIPS)	7,740,463	17.0	7.22
Externally managed funds:			
Advent Capital	389,566	0.9	3.30
BlackRock	2,419,848	5.3	2.35
DoubleLine Capital	255,977	0.5	14.20
Neuberger Berman	1,783,178	3.9	3.60
New Century Advisors	257,717	0.6	7.92
Semper Capital	292,391	0.6	3.21
Smith Graham	514,670	1.1	3.85
Total Bonds	\$ 45,651,602	100.0%	
Mortgages:			
Berkadia	425,317	47.4	3.81
CPC	471,676	52.6	7.61
Total Mortgages	\$ 896,993	100.0%	
Total	\$ 46,548,595		

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

(d) Credit Risk of Debt Securities

Fixed income obligations purchased pursuant to section 177(1-a) of the RSSL must be investment grade at the time of their acquisition. A bond is considered investment grade if its credit rating is Baa or higher by Moody's or BBB- or higher by Standard & Poor's. Fixed income obligations purchased pursuant to section 177(9) of the RSSL, the "basket clause," are subject to a standard of prudence. As of March 31, 2019, credit ratings, obtained from several industry rating services, for the fixed income portfolio are as follows (dollars in thousands):

Quality Rating	Fair Value	Percentage of Fair Value
Bonds:		
AAA	\$ 26,921,025	58.97%
AA	2,810,072	6.16
A	5,363,323	11.75
BBB	5,634,225	12.34
BB	157,235	0.34
B	18,261	0.04
CCC	15,728	0.03
CC	5,383	0.01
C	10,297	0.02
D	21,316	0.05
Not Rated	199,320	0.44
Externally managed funds:*		
BlackRock Range AAA to D & Not Rated	2,419,848	5.30
Neuberger Berman Range AAA to D & Not Rated	1,783,178	3.91
Semper Capital Range AAA to D & Not Rated	292,391	0.64
Total Bonds	\$ 45,651,602	100.0%
Mortgages:		
Not Rated	\$ 896,993	100.0%
Total	\$ 46,548,595	
* These externally managed funds are considered investments under the "basket clause," subject to the standards of prudence. All or a part of the holdings can be non-investment grade.		

(e) Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the Fund's investment in a single issuer.

As of March 31, 2019, the System did not hold any investments in any one issuer that totaled 5 percent or more of the pension plan's fiduciary net position. Investments issued or explicitly guaranteed by the U.S. government and pooled investments are excluded.

Issuer limits for investments held by the Fund are established by law and by policy guidelines adopted by the PICM.

Short-term fixed income investments not purchased pursuant to section 177(9) of the RSSL are generally limited to the following investment types maturing in one year or less:

- Obligations for which the full faith and credit of the U.S. government is pledged to provide payment of interest and principal.
- Obligations issued by any Federal Home Loan Bank or obligations fully guaranteed as to principal and interest by the Federal National Mortgage Association or the Federal Home Loan Mortgage Corporation.
- Commercial paper that has received the highest rating from two nationally recognized rating services. A maximum of \$1 billion of the short-term portfolio may be invested in any one commercial paper issuer.
- Simultaneous purchase and sale of U.S. Treasury obligations may be executed with Primary Government dealers. A maximum of \$200 million may be invested with any one Primary Government dealer.
- Corporate and asset-backed securities (ABS) that are rated investment grade by two nationally recognized rating services. ABS must have a weighted average life of one year or less.

Fixed income investments not purchased pursuant to section 177(9) of the RSSL are generally limited to the following investment types with maturities longer than one year:

- Obligations for which the full faith and credit of the U.S. government is pledged to provide payment of principal and interest.
- Obligations payable in U.S. dollars issued by any department, agency, or political subdivision of the U.S. government or issued by any corporation, company, or other issuer of any kind or description created or existing under the laws of the U.S., any state of the U.S., the District of Columbia, or the Commonwealth of Puerto Rico, and obligations payable in U.S. funds of Canada or any province or city of Canada, provided each obligation at the time of investment shall be rated investment grade by two nationally recognized rating services (or by one nationally recognized rating service in the event only one such service rates such obligation). The aggregate investment by the Fund in the obligations of any one issuer shall not exceed 2 percent of the assets of the Fund or 5 percent of the direct liabilities of the issuer.
- Interest-bearing obligations payable in U.S. funds, which at the time of investment are rated in one of the three highest rating grades by each rating service approved by the New York State Department of Financial Services that has rated such obligations. The aggregate amount invested in the obligations of any single issuer may not exceed 1 percent of the assets of the Fund.
- Bonds issued or guaranteed by the State of Israel and approved by the United States Comptroller of the Currency, payable in U.S. dollars, not to exceed 5 percent of the assets of the Fund.
- Obligations issued or guaranteed by the International Bank for Reconstruction and Development (not to exceed 5 percent of the assets of the Fund), the Inter-American Development Bank, the Asian Development Bank, or the African Development Bank.

Fixed income investments purchased pursuant to section 177(9) of the RSSL are subject to standards of prudence and the exclusion benefit rules. Subject to such standards, investments made under section 177(9) must, to the extent reasonably possible, benefit the overall economic health of the State.

(f) Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or a deposit. The Fund has exposure through direct investments in international equities, international equity commingled funds, international fixed income investments, international real estate investments, international absolute return strategies, international private equity investments, international opportunistic funds, and international real asset funds. The Fund's asset allocation and investment policies allow for active and passive investments in international securities. The Fund permits the managers of direct investments in international equities to use forward currency contracts to manage their exposure to foreign currencies relative to the U.S. dollar. Where the Fund participates in commingled funds, limited partnerships, or other investment arrangements, the decision whether or not to use forward currency contracts to manage their foreign currency exposure is left up to the individual investment managers. To address the impact of changes in exchange rates, only forward foreign exchange contracts of one year or less are allowed when used to lessen portfolio volatility or hedge the portfolio's currency exposure.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

Foreign investments included in the combining basic statement of fiduciary net position as of March 31, 2019 are as follows (dollars in thousands):

	Fixed Income	Equity	Cash	Real Estate	Private Equity, Opportunistic, Absolute Return Strategy and Real Asset Funds	Total
Afgan Afgani	\$ —	\$ —	\$ —	\$ —	\$ 16	\$ 16
Albanian Lek	—	—	—	28	14	42
Angolan Kwanza	—	—	—	—	75	75
Argentine Peso	619	—	—	—	38,359	38,978
Australian Dollar	—	394,073	8,406	107,041	233,286	742,806
Bahamian Dollar	—	—	—	85	79	164
Bahraini Dinar	—	—	—	—	217	217
Bermudian Dollar	—	—	—	—	88,375	88,375
Botswana Pula	—	—	—	—	3,067	3,067
Brazilian Real	—	246,925	147	65,452	436,430	748,954
British Pound	23,240	2,350,444	5,826	275,802	1,519,991	4,175,303
Bulgarian Lev	—	—	—	136	10,217	10,353
Burmese Kyat	—	—	—	—	10,720	10,720
Cambodian Riel	—	—	—	—	11,214	11,214
Canadian Dollar	—	439,899	5,959	98,075	443,309	987,242
Cayman Islands Dollar	—	—	—	24,287	2,334,641	2,358,928
Chilean Peso	—	17,309	30	—	5,110	22,449
Chinese Yuan Renminbi	1,858	103,234	—	110,420	1,161,758	1,377,270
Colombian Peso	—	10,736	—	6	38,952	49,694
Costa Rican Colon	—	—	—	—	703	703
Croatian Kuna	—	—	—	11	25,948	25,959
Czech Koruna	—	3,797	—	968	9,786	14,551
Danish Krone	—	307,341	786	176,432	170,682	655,241
Egyptian Pound	—	5,503	94	—	15,474	21,071
Euro	134,081	3,736,628	4,548	1,446,768	2,864,515	8,186,540
Ghanaian Cedi	—	—	—	—	3,101	3,101
Hong Kong Dollar	2,028	1,262,867	1,001	39,538	266,450	1,571,884
Hungarian Forint	—	28,719	—	—	20,846	49,565
Indian Rupee	—	348,205	133	181,434	448,038	977,810
Indonesian Rupiah	6,486	103,790	—	—	82,090	192,366
Israeli Shekel	—	72,103	(334)	—	131,093	202,862
Jamaican Dollar	—	—	—	—	5	5
Japanese Yen	1,526	2,174,638	948	55,599	232,971	2,465,682
Kenyan Shilling	—	—	—	—	19,348	19,348
Liberian Dollar	—	—	—	—	3,281	3,281
Macanese Pataca	—	—	—	—	(859)	(859)
Malaysian Ringgit	—	94,590	170	—	57,616	152,376
Mauritian Rupee	—	—	—	396	10,809	11,205
Mexican Peso	7,482	80,916	105	8,883	82,375	179,761

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

	Fixed Income	Equity	Cash	Real Estate	Private Equity, Opportunistic, Absolute Return Strategy and Real Asset Funds	Total
Mongolian Togrog	\$ —	\$ —	\$ —	\$ —	\$ (82)	\$ (82)
Moroccan Dirham	—	—	—	2	10,112	10,114
Mozambique Metical	—	—	—	—	1,263	1,263
New Taiwan Dollar	—	339,977	296	3,787	6,849	350,909
New Zealand Dollar	—	9,473	27	—	50,613	60,113
Nigerian Naira	302	—	—	—	100,860	101,162
Norwegian Krone	—	68,604	535	578	70,577	140,294
Pakistani Rupee	—	1,294	—	—	(1,420)	(126)
Panamanian Balboa	—	—	—	—	(116)	(116)
Paraguayan Guarani	—	—	—	—	(1,079)	(1,079)
Peruvian Sol	—	1,386	1	—	53,618	55,005
Philippine Peso	—	9,960	9	—	10,447	20,416
Polish Zloty	—	38,004	560	36,629	112,305	187,498
Qatari Riyal	—	7,332	32	—	—	7,364
Romanian Leu	—	—	—	136	7,316	7,452
Russian Ruble	—	—	—	2,879	47,115	49,994
Saudi Riyal	—	—	—	—	92	92
Serbian Dinar	—	—	—	408	65	473
Singapore Dollar	—	225,604	2,449	46,276	136,647	410,976
South African Rand	9,462	165,458	7,217	—	33,364	215,501
South Korean Won	356	472,303	337	34,969	128,565	636,530
Sri Lankan Rupee	—	—	—	—	3,764	3,764
Swedish Krona	—	407,806	2,025	20,759	630,350	1,060,940
Swiss Franc	80	919,353	701	13	217,971	1,138,118
Tanzanian Shilling	—	—	—	—	3	3
Thai Baht	—	90,534	1	—	4,845	95,380
Turkish Lira	—	52,428	114	11,003	47,460	111,005
Ugandan Shilling	—	—	—	—	87	87
Ukrainian Hryvnia	—	—	—	85	5,173	5,258
United Arab Emirates Dirham	—	2,226	—	9	27,435	29,670
Uruguayan Peso	—	—	—	—	115	115
Venezuelan Bolivar	—	—	—	—	6,077	6,077
Vietnamese Dong	—	—	—	—	30,591	30,591
West African CFA Franc	—	—	—	—	1,848	1,848
Zambian Kwacha	—	—	—	—	197	197
Other	—	—	—	3,316	949	4,265
Total subject to foreign currency risk	187,520	14,593,459	42,123	2,752,210	12,524,078	30,099,390
Commingled international equity in U.S. Dollars	—	16,965,733	—	—	—	16,965,733
Foreign investments in U.S. Dollars	1,546,723	4,697,779	—	—	5,480,710	11,725,212
Total foreign investments	\$ 1,734,243	\$ 36,256,971	\$ 42,123	\$ 2,752,210	\$ 18,004,788	\$ 58,790,335

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

6. DERIVATIVES

A derivative is generally defined as an investment contract or security with a value that depends on, or is derived from, the value of an underlying asset, reference rate, or financial index.

Forward Currency Contracts

The System may enter into forward currency contracts to manage exposure to fluctuations in foreign currency exchange rates on portfolio holdings. The System also enters into forward exchange contracts to settle future obligations. A forward exchange contract is a commitment to purchase or sell a foreign currency at a future date at a negotiated forward rate. A contract is classified as a forward contract when the settlement date is more than two days after the trade date. Risk associated with such contracts includes movement in the value of a foreign currency relative to the U.S. dollar. The contracts are valued at forward exchange rates and include net appreciation/depreciation in the combining statement of fiduciary net position. Realized gain or loss on forward currency contracts is the difference between the original contract and the closing value of such contract and is included in the combining basic statement of changes in fiduciary net position.

The table below summarizes the fair value of foreign currency contracts as of March 31, 2019 (dollars in thousands):

Currency	Forward Currency Contracts	Spot Currency Contracts	Totals
Australian Dollar	\$ —	\$ 1,239	\$ 1,239
Brazilian Real	—	765	765
British Pound	—	1,697	1,697
Canadian Dollar	—	1,921	1,921
Danish Krone	—	7,138	7,138
Euro	—	(2,117)	(2,117)
Hong Kong Dollar	—	987	987
Israeli Shekel	69	408	477
Japanese Yen	(992)	(1,704)	(2,696)
Malaysian Ringgit	—	(80)	(80)
New Taiwan Dollar	—	(65)	(65)
New Zealand Dollar	—	(139)	(139)
Norwegian Krone	—	115	115
Singapore Dollar	—	39	39
South African Rand	—	(329)	(329)
South Korean Won	—	(146)	(146)
Swedish Krona	—	(1,009)	(1,009)
Swiss Franc	(4,406)	774	(3,632)
Thai Baht	—	(94)	(94)
U.S. Dollar	5,522	(9,395)	(3,873)
Total	\$ 193	\$ 5	\$ 198

7. SECURITIES LENDING PROGRAM

Section 177-d of the RSSL authorizes the Fund to enter into security loan agreements with broker/dealers and state or national banks. The Fund has designated its master custodian bank (the custodian) to manage a securities lending program. This program is subject to a written contract between the Fund and the custodian who acts as securities lending agent for the Fund. The custodian is authorized to lend securities within the borrower limits and guidelines established by the Fund. Types of collateral received from borrowers for securities loaned are cash, government securities, and obligations of federal agencies. The custodian is authorized to invest the cash collateral in short-term investments in accordance with reinvestment guidelines for the Fund. These include domestic corporate and bank notes, U.S. Treasury obligations, obligations of federal agencies, repurchase agreements, and specific asset-backed securities. All rights of ownership to securities pledged as collateral remain with the borrower except in the event of default. As of March 31, 2019, there were no violations of legal or contractual provisions. The Fund has not experienced any losses resulting from the default of a borrower or lending agent during the year ended March 31, 2019.

The Fund lends fixed income, domestic equity, and international equity securities to approved broker/dealers. Collateral for securities loaned equals 102 percent of fair market value for domestic securities and 105 percent for international securities. Credit risk associated with the investment of cash collateral pledged by borrowers is mitigated by the maturity restrictions, percentage limitations, and rating requirements for individual asset classes included in the Fund's reinvestment guidelines. The custodian acknowledges responsibility to reimburse the Fund for losses that might arise from managing the program in a manner inconsistent with the contract. The Fund manages its market risk by recording investments at market value daily and maintaining the value of the collateral held by the Fund in excess of the value of the securities loaned. As of March 31, 2019, the fair value of securities on loan was \$7.24 billion. The associated collateral was \$7.41 billion, of which \$5.74 billion was cash collateral and \$1.67 billion was securities. The cash collateral has been reinvested in other instruments, which had a fair value of \$5.74 billion as of March 31, 2019. The securities lending obligations were \$5.75 billion. The unrealized loss in invested cash collateral on March 31, 2019 was \$6.42 million, which is reported in the combining basic statement of changes in fiduciary net position as part of "Net appreciation in fair value of investments."

All open security loans can be terminated on demand by either the Fund or the borrower. To provide sufficient liquidity, the policy of the Fund is to maintain a minimum of 10 percent collateral in overnight investments. While the Fund's Securities Lending Investment Guidelines allow investments up to a maximum of three years for U.S. Treasury and federal agency obligations and one year for all other investments, the average term of open security loans at March 31, 2019 was 31 days. All loans were open loans. There were no direct matching loans.

The collateral pool is valued at fair value obtained from independent pricing services.

8. FAIR VALUE MEASUREMENT

The System's investments, measured and reported at fair value, including securities lending collateral and obligations and forward foreign exchange contracts, are classified according to the following hierarchy in which the levels are based on the nature of inputs used to measure the fair value of the investment:

Level 1 – Investment fair values based on prices quoted in active markets for identical assets.

Level 2 – Investment fair values based on observable inputs for the assets either directly or indirectly, other than those considered Level 1 inputs, which may include quoted prices for identical assets in markets that are not considered to be active, and quoted prices of similar assets in active or inactive markets.

Level 3 – Investment fair values based on unobservable inputs.

The categorization of investments within the hierarchy above is based solely upon the objectivity of the inputs used in the measurement of the fair value of the investments and does not reflect the level of risk associated with the investments.

Investments classified in Level 1 of the fair value hierarchy are valued from predetermined external pricing vendors or primary dealers who source quoted prices in active markets which are readily attainable exit values of these securities. Investments classified in Level 2 are subject to alternative pricing sources, including a combination of price sources, descriptive data and pricing models based on attributes such as spread data, sector, quality, duration, and prepayment characteristics. Investments classified as Level 3 are valued using best available sources such as property appraisals, discounted cash flow models and public market comparables of similar assets where applicable. The values are supplied by advisors or general partners who hold those or similar assets in investment vehicles they oversee. These pricing sources may or may not be indicative of realizable exit values attainable for the assets.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

The table below summarizes assets and liabilities carried at fair value based on levels from the fair value hierarchy as of March 31, 2019, with certain assets carried at net asset value (NAV) and cost also included to allow reconciliation to the statement of fiduciary net position (dollars in thousands):

	Total	Level 1	Level 2	Level 3
Assets:				
Investments by fair value level:				
Fixed income securities:				
Short-term instruments	\$ 5,564,731	\$ —	\$ 5,564,731	\$ —
Global fixed income securities	41,031,185	—	41,031,185	—
Total fixed income securities	46,595,916	—	46,595,916	—
Equity securities:				
Domestic equities	73,303,652	73,303,652	—	—
International equities	32,000,957	31,999,444	15	1,498
Total equity securities	105,304,609	105,303,096	15	1,498
Mortgages	896,993	—	—	896,993
Private equity	526,396	—	—	526,396
Opportunistic	229,474	—	—	229,474
Real assets	15,863	—	—	15,863
Real estate	812,847	—	—	812,847
Securities lending collateral	4,076,905	—	4,076,905	—
Forward foreign exchange contracts	17,939	—	17,939	—
Total investment assets by fair value level	\$ 158,476,942	\$ 105,303,096	\$ 50,690,775	\$ 2,483,071
Investments measured at cost:				
Global fixed income securities	\$ 125,000			
Securities lending collateral	\$ 1,665,826			
Total investments measured at cost	\$ 1,790,826			
Investments measured at Net Asset Value (NAV):				
Global fixed income funds ¹	\$ 4,495,417			
Commingled international equity funds ²	4,256,014			
Alternative investments:³				
Private equity	19,224,581			
Absolute return strategy investments	7,812,169			
Opportunistic funds	2,604,311			
Real assets	2,204,163			
Real estate	14,865,708			
Total alternative investments	46,710,932			
Total investments measured at NAV	\$ 55,462,363			
Investment related cash and cash equivalents not included in above	554,254			
Total investment assets	\$ 216,284,385			
Liabilities:				
Investments by fair value level:				
Forward foreign exchange contracts	(17,746)	—	(17,746)	—
Total investment liabilities by fair value level	\$ (17,746)	\$ —	\$ (17,746)	\$ —

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

The table below summarizes liquidity information for investments valued at NAV (dollars in thousands):

Investments measured at NAV	Amount	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Global fixed income funds ¹	\$ 4,495,417	\$ —	Daily	0-30 days
Commingled international equity funds ²	4,256,014	—	Daily, Weekly, Monthly, Quarterly	2-120 days
Alternative investments: ³				
Private equity	19,224,581	14,551,123	N/A	N/A
Absolute return strategy investments	7,812,169	257,972	Monthly, Quarterly, Annually, Semi-annually	5-120 days
Opportunistic	2,604,311	2,497,254	N/A, Monthly, Quarterly	N/A, 30-540 days
Real assets	2,204,163	2,113,207	N/A	N/A
Real estate	14,865,708	3,598,681	N/A	N/A
Total investments measured at NAV	\$ 55,462,363	\$ 23,018,237		

¹Global fixed income funds consist of three funds for which the System is the only investor. These funds invest primarily in both privately and publicly issued global fixed income securities. The investments are valued at the net asset value of units held at the end of the period based upon the fair value of the underlying investments.

²Commingled international equity funds consist of five commingled investment vehicles which invest primarily in publicly traded global equity securities. The funds are valued at the net asset value of units held at the end of the period based upon the fair value of the underlying investments.

³Alternative investments include private equity, absolute return strategy investments, opportunistic funds, real assets and real estate through various fund structures. Private equity (9.0 percent* at March 31, 2019) consists of buyout, co-investments, distressed debt and turnaround funds, fund of funds, growth equity, special situations, and venture capital. Absolute return strategy investments (3.6 percent* at March 31, 2019) consist of investments in strategies including hedged equity, credit, global macro, managed futures, distressed debt, emerging markets, and long-only equity strategies. Opportunistic (1.3 percent* at March 31, 2019) consists of investments in both public and private companies, property, and real assets. Real assets (1.0 percent* at March 31, 2019) consist of commodities, farmland, inflation-linked bonds, infrastructure, and renewables. Real estate (7.2 percent* at March 31, 2019) consists of investments in closed-end, open-end, and fund of funds. The fair values of the alternative investments have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partner's capital. NAV is used as a practical expedient to estimate fair value. Private equity, opportunistic, real assets, and real estate are not eligible for redemption. Distributions are received as underlying investments within the funds are liquidated, which on average can occur over a span of 5-10 years.

See note 7 for detailed securities lending information and note 6 for detailed forward foreign currency information.

*Percentages are stated relative to total investments and securities lending collateral invested.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

9. NET PENSION LIABILITY OF PARTICIPATING EMPLOYERS

The components of the net pension liability of the employers participating in the System as of March 31, 2019, were as follows:

	(Dollars in Thousands)		
	Employees' Retirement System	Police and Fire Retirement System	Total
Employers' total pension liability	\$ 189,803,429	\$ 34,128,100	\$ 223,931,529
Fiduciary net position	182,718,124	32,451,037	215,169,161
Employers' net pension liability	\$ 7,085,305	\$ 1,677,063	\$ 8,762,368
Ratio of fiduciary net position to the employers' total pension liability	96.27%	95.09%	96.09%

(a) Actuarial Assumptions

The total pension liability at March 31, 2019 was determined by using an actuarial valuation as of April 1, 2018, with update procedures used to roll forward the total pension liability to March 31, 2019. The actuarial valuation used the following actuarial assumptions:

	ERS	PFRS
Inflation	2.5%	2.5%
Salary increases	4.2	5.0
Investment rate of return (net of investment expense, including inflation)	7.0	7.0
Cost-of-living adjustments	1.3%	1.3%

Annuitant mortality rates are based on April 1, 2010 – March 31, 2015 System experience with adjustments for mortality improvements based on the Society of Actuaries' Scale MP-2014.

The actuarial assumptions used in the April 1, 2018 valuation are based on the results of an actuarial experience study for the period April 1, 2010 – March 31, 2015.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected return, net of investment expenses 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.

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation as of March 31, 2019 (see Investment policy – note 4(a)) are summarized below:

Asset Class	Long-Term Expected Real Rate of Return
Domestic equity	4.55%
International equity	6.35
Private equity	7.50
Real estate	5.55
Absolute return strategies*	3.75
Opportunistic portfolio	5.68
Real assets	5.29
Bonds and mortgages	1.31
Cash	(0.25)
Inflation-indexed bonds	1.25

* Excludes equity-oriented long-only funds. For investment management purposes, these funds are included in domestic equity and international equity.

The real rate of return is net of the long-term inflation assumption of 2.50 percent.

(b) Discount Rate

The discount rate used to calculate the total pension liability was 7.0 percent. The projection of cash flows used to determine the discount rate assumes that contributions from plan members will be made at the current contribution rates and that contributions from employers will be made at statutorily required rates, actuarially. Based upon the assumptions, the System's fiduciary net position was projected to be available to make all 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 projected benefit payments to determine the total pension liability.

(c) Sensitivity of the Net Pension Liability to the Discount Rate Assumption

The following presents the current-period net pension liability of the employers calculated using the current period discount rate assumption of 7.0 percent, as well as what the net pension liability (asset) would be if it were calculated using a discount rate that is one percentage-point lower (6.0 percent) or one percentage-point higher (8.0 percent) than the current assumption (dollars in thousands):

	One Percent Decrease (6.0%)	Current Assumption (7.0%)	One Percent Increase (8.0%)
ERS net pension liability (asset)	\$ 30,978,082	\$ 7,085,305	\$ (12,986,323)
PFRS net pension liability (asset)	\$ 6,060,656	\$ 1,677,063	\$ (1,983,745)

BASIC FINANCIAL STATEMENTS

CONTINUED
Notes to Basic Financial Statements

10. FEDERAL INCOME TAX STATUS

ERS and PFRS are qualified defined benefit retirement plans under section 401(a) of the Internal Revenue Code (IRC) and are exempt from federal income taxes under section 501(a) of the IRC. ERS and PFRS last received favorable determination letters from the Internal Revenue Service dated August 28, 2014 stating that ERS and PFRS are in compliance with the applicable requirements of the Internal Revenue Code. Therefore, no provision for income taxes has been included in the System's financial statements.

11. COMMITMENTS

As of March 31, 2019, the System had contractual commitments totaling \$16.72 billion to fund future private equity investments, \$5.04 billion to fund future real estate investments, \$2.95 billion to fund future investments in opportunistic funds, \$2.4 billion to fund future real asset investments and \$258 million to fund future absolute return strategy investments. When compared to note 8 the variances that exist in the private equity commitments and real estate equity commitments, are due to the above representing total commitments of the investment type inclusive of investments measured at fair value and net asset value. Future commitments will be funded over the commitment period through transaction income including distributions, redemptions, and maturities.

12. CONTINGENCIES

The System is a defendant in litigation proceedings involving individual benefit payments, participant eligibility, and other issues arising from its normal activities. Management of the System believes there will be no material adverse effect on the basic financial statements as a result of the outcome of these matters.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)

SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY AND RELATED RATIOS (UNAUDITED)

(Dollars in Thousands)

	2019 Employees' Retirement System	2018 Employees' Retirement System	2017 Employees' Retirement System	2016 Employees' Retirement System	2015 Employees' Retirement System
Total pension liability:					
Service cost	\$ 3,218,553	\$ 3,004,697	\$ 2,951,979	\$ 2,916,374	\$ 2,989,807
Interest	12,463,933	12,063,525	11,723,859	11,198,823	11,581,437
Difference between expected and actual experience	704,393	1,235,058	226,737	(2,378,116)	135,177
Changes in assumptions	888,656	—	—	5,350,157	—
Benefit payments	(10,781,781)	(10,200,205)	(9,740,272)	(9,224,904)	(8,829,751)
Other, net	(90,915)	(103,071)	(65,261)	(150,294)	(77,388)
Net change in total pension liability	6,402,839	6,000,004	5,097,042	7,712,040	5,799,282
Total pension liability — beginning	183,400,590	177,400,586	172,303,544	164,591,504	158,792,222
Total pension liability — ending (a)	189,803,429	183,400,590	177,400,586	172,303,544	164,591,504
Fiduciary net position:					
Contributions — employer	3,890,215	3,949,873	3,949,710	4,347,619	4,893,110
Contributions — member	345,846	318,439	306,218	289,332	272,004
Net investment income (loss)	9,140,487	18,128,993	17,194,267	(327,068)	10,582,102
Benefit payments	(10,781,781)	(10,200,205)	(9,740,272)	(9,224,904)	(8,829,751)
Refunds of contributions	(90,915)	(103,071)	(65,261)	(150,294)	(77,388)
Administrative expense	(119,304)	(106,972)	(93,943)	(93,012)	(93,357)
Other additions	160,431	181,725	200,379	198,333	193,176
Net change in fiduciary net position	2,544,979	12,168,782	11,751,098	(4,959,994)	6,939,896
Fiduciary net position — beginning	180,173,145	168,004,363	156,253,265	161,213,259	154,273,363
Fiduciary net position — ending (b)	182,718,124	180,173,145	168,004,363	156,253,265	161,213,259
Net pension liability — ending (a) – (b)	\$ 7,085,305	\$ 3,227,445	\$ 9,396,223	\$ 16,050,279	\$ 3,378,245
Ratio of fiduciary net position to total pension liability	96.27%	98.24%	94.70%	90.68%	97.95%
Covered payroll	\$ 27,374,387	\$ 26,686,412	\$ 26,200,001	\$ 25,644,078	\$ 24,480,045
Net pension liability as a percentage of covered payroll	25.88%	12.09%	35.86%	62.59%	13.80%

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available. See accompanying independent auditors' report and notes to required supplementary information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)

CONTINUED

SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY AND RELATED RATIOS (UNAUDITED)

(Dollars in Thousands)

	2019 Police and Fire Retirement System	2018 Police and Fire Retirement System	2017 Police and Fire Retirement System	2016 Police and Fire Retirement System	2015 Police and Fire Retirement System
Total pension liability:					
Service cost	\$ 713,480	\$ 674,079	\$ 657,407	\$ 628,863	\$ 625,648
Interest	2,236,527	2,154,117	2,065,752	1,935,222	1,997,215
Difference between expected and actual experience	106,384	241,387	302,375	(537,163)	39,833
Changes in assumptions	118,521	—	—	1,531,662	—
Benefit payments	(1,959,831)	(1,827,136)	(1,708,410)	(1,683,580)	(1,606,417)
Other, net	(1,404)	1,493	5,632	(1,694)	(158)
Net change in total pension liability	1,213,677	1,243,940	1,322,756	1,873,310	1,056,121
Total pension liability — beginning	32,914,423	31,670,483	30,347,727	28,474,417	27,418,296
Total pension liability — ending (a)	34,128,100	32,914,423	31,670,483	30,347,727	28,474,417
Fiduciary net position:					
Contributions — employer	854,094	873,434	837,253	792,585	904,339
Contributions — member	40,673	30,950	22,609	17,297	12,789
Net investment income (loss)	1,621,289	3,209,040	3,030,977	(57,765)	1,862,789
Benefit payments	(1,959,831)	(1,827,136)	(1,708,410)	(1,683,580)	(1,606,417)
Refunds of contributions	(1,404)	1,493	5,631	(1,694)	(158)
Administrative expense	(17,173)	(15,834)	(13,191)	(13,608)	(13,794)
Other additions	9,723	33,889	36,021	134,548	37,623
Net change in fiduciary net position	547,371	2,305,836	2,210,890	(812,217)	1,197,171
Fiduciary net position — beginning	31,903,666	29,597,830	27,386,940	28,199,157	27,001,986
Fiduciary net position — ending (b)	32,451,037	31,903,666	29,597,830	27,386,940	28,199,157
Net pension liability — ending (a) – (b)	\$ 1,677,063	\$ 1,010,757	\$ 2,072,653	\$ 2,960,787	\$ 275,260
Ratio of fiduciary net position to total pension liability	95.09%	96.93%	93.46%	90.24%	99.03%
Covered payroll	\$ 3,730,337	\$ 3,683,960	\$ 3,633,237	\$ 3,526,980	\$ 3,257,100
Net pension liability as a percentage of covered payroll	44.96%	27.44%	57.05%	83.95%	8.45%

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available. See accompanying independent auditors' report and notes to required supplementary information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)

CONTINUED

SCHEDULE OF EMPLOYER CONTRIBUTIONS (UNAUDITED)

(Dollars in Millions)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
ERS										
Actuarially determined contribution (1)	\$ 3,890	\$ 3,950	\$ 3,950	\$ 4,348	\$ 4,893	\$ 5,138	\$ 4,524	\$ 3,879	\$ 3,623	\$ 1,879
Contributions in relation to the actuarial determined contribution (2)	3,890	3,950	3,950	4,348	4,893	5,138	4,524	3,879	3,623	1,879
Contribution deficiency (excess)	-	-	-	-	-	-	-	-	-	-
Covered payroll	27,374	26,686	26,200	25,644	24,480	24,361	24,405	24,291	24,389	24,972
Contributions as a percentage of covered payroll	14.21%	14.80%	15.08%	16.96%	19.99%	21.09%	18.54%	15.97%	14.86%	7.52%
PFRS										
Actuarially determined contribution (1)	\$ 854	\$ 873	\$ 837	\$ 793	\$ 904	\$ 926	\$ 812	\$ 706	\$ 542	\$ 465
Contributions in relation to the actuarially determined contribution (2)	854	873	837	793	904	926	812	706	542	465
Contribution deficiency (excess)	-	-	-	-	-	-	-	-	-	-
Covered payroll	3,730	3,684	3,633	3,527	3,257	3,233	3,163	3,191	3,146	3,113
Contributions as a percentage of covered payroll	22.90%	23.70%	23.04%	22.48%	27.76%	28.64%	25.67%	22.12%	17.23%	14.94%
(1) The actuarially determined contribution includes normal costs, the GLIP amounts, adjustments made to record the reconciliation of projected salary to actual salary and miscellaneous accounting adjustments.										
(2) The contributions in relation to the actuarially determined contribution reflects actual payments and installment payment plans.										

See accompanying independent auditors' report and notes to required supplementary information.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)

CONTINUED

SCHEDULE OF INVESTMENT RETURNS (UNAUDITED)

	2019	2018	2017	2016	2015
Annual money-weighted rate of return, net of investment expenses*	5.14%	11.29%	11.40%	0.03%	6.98%

* Investment expenses include management fees, investment and accounting staff salaries and benefits, and other investment-related expenses.

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available. See accompanying independent auditors' report.

NOTES TO REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)

Year Ended March 31, 2019

Changes in Benefit Terms

There were no significant legislative changes in benefits for the April 1, 2018 actuarial valuation.

Changes of Assumptions

2016: There were changes in the economic (investment rate of return, inflation, COLA, and salary scales) and demographic (pensioner mortality and active member decrements) assumptions used in the April 1, 2015 actuarial valuation.

2019: The salary scales for both plans used in the April 1, 2018 actuarial valuation were increased by 10%.

Methods and Assumptions Used in Calculations of Actuarially Determined Contributions

The April 1, 2017 actuarial valuation determines the employer rates for contributions payable in fiscal year 2019. The following actuarial methods and assumptions were used:

Actuarial cost method	The System is funded using the Aggregate Cost Method. All unfunded actuarial liabilities are evenly amortized (as a percentage of projected pay) over the remaining worker lifetimes of the valuation cohort.
Asset valuation period	5-year level smoothing of the difference between the actual gain and the expected gain using the assumed investment rate of return.
Inflation	2.5%
Salary scale	3.8% in ERS, 4.5% in PFRS, indexed by service
Investment rate of return	7.0% compounded annually, net of investment expenses, including inflation.
Cost-of-living adjustments	1.3% annually
Active member decrements	Based upon FY 2011-2015 experience
Pensioner mortality	Gender/Collar specific tables based upon FY 2011-2015 experience
Mortality improvement	Society of Actuaries' Scale MP-2014

OTHER SUPPLEMENTARY INFORMATION (UNAUDITED)

SCHEDULE OF ADMINISTRATIVE EXPENSES (UNAUDITED)

Year Ended March 31, 2019

(Dollars in Thousands)

	2019
Personal services:	
Salaries	\$ 56,527
Overtime salaries	2,217
Fringe benefits	47,721
Total personal services	106,465
Building occupancy expenses:	
Building, lease, and condominium fees	2,763
Utilities and municipal assessments	127
Office supplies and services	987
Telephone	30
Total building occupancy expenses	3,907
Computer expenses:	
IT shared services*	18,026
Total computer expenses	18,026
Personal and operating expenses:	
Training	124
Travel and auto expenses — includes pre-retirement seminars	1,006
Postage — includes member and retiree communication	1,842
Depreciation expense — Imaging System	1,832
Printing — includes member and retiree communication	153
Subscriptions/memberships	176
Total personal and operating expenses	5,133
Professional expenses:	
Audit services	224
Medical/clinical services	1,679
Miscellaneous consulting services	1,043
Total professional expenses	2,946
Total	\$ 136,477
* The System has implemented a shared service, information technology (IT) model within the New York State Office of the State Comptroller, wherein all IT costs, including personal services, will be incorporated into the IT shared services and reflected as nonpersonal service expenditures.	

See accompanying independent auditors' report.

OTHER SUPPLEMENTARY INFORMATION (UNAUDITED)

CONTINUED

SCHEDULE OF INVESTMENT EXPENSES (UNAUDITED)

Year Ended March 31, 2019

(Dollars in Thousands)

	2019
Investment expenses:	
Investment management and incentive fees:	
Private equity	\$ 204,295
Absolute return strategy funds (ARS)*	152,590
International equity	142,823
Real estate	60,114
Domestic equity	52,085
Opportunistic funds	43,906
Real assets	23,348
Fixed income	<u>18,612</u>
Total investment management and incentive fees	697,773
Investment-related expenses:	
Data processing expenses/licenses	6,163
Mortgage loan servicing fees	3,286
Legal fees	2,453
ARS/Opportunistic consulting and monitoring	2,375
Private equity consulting and monitoring	2,236
Miscellaneous expenses	2,189
Compliance/Risk monitoring	1,687
Administrative expenses	984
Real estate consulting and monitoring	941
General consulting	810
Research services	780
Real assets consulting and monitoring	367
Global equity consulting	365
Audit and audit-related fees	298
Fixed income consulting	250
Emerging manager program consulting and monitoring	142
Domestic equity consulting and monitoring	<u>80</u>
Total investment-related expenses	25,406
Total investment expenses	\$ 723,179
* Absolute return strategy investments include equity-oriented long-only global funds. Though these funds are in an absolute return strategy vehicle, the underlying assets are long-only equity positions.	

See accompanying independent auditors' report.

OTHER SUPPLEMENTARY INFORMATION (UNAUDITED)

CONTINUED

SCHEDULE OF CONSULTING FEES (UNAUDITED)

Year Ended March 31, 2019

Fees in excess of \$50,000 paid to outside professionals other than investment advisors.

	Amount	Nature
Morgan Lewis & Bockius LLP	\$ 833,902	Legal Services
MSCI BarraOne	725,000	Compliance/Risk Monitoring
Certified Management Consultants, Inc.	631,563	Medical/Clinical Services
KPMG LLP	521,937	Auditor Fees
J.P. Morgan Chase Bank	452,466	Retail Banking Services
Foster Pepper PLLC	409,933	Legal Services
Intex Solutions, Inc.	362,400	Compliance/Risk Monitoring
D & D Medical Associates, PC	278,471	Medical/Clinical Services
Strategas Securities, LLC	250,000	Research Services
DLA Piper LLP	229,546	Legal Services
First Choice Evaluations LLC	219,260	Medical/Clinical Services
BDO USA LLP	203,200	Compliance/Risk Monitoring
K&L Gates LLP	177,374	Legal Services
Glass Lewis & Co, LLC	174,000	Administrative Expense
Seward & Kissel LLP	167,986	Legal Services
First Advantage Back Track Reports, LLC	158,000	Compliance/Risk Monitoring
BCA Research, Inc	150,000	Research Services
MSCI ESG Research, Inc.	149,900	Research Services
Jackson Walker LLP	119,891	Legal Services
Ernst & Young LLP	119,264	Legal/Tax Consultant
Nixon Peabody LLP	101,974	Legal Services
NPC, Inc.	95,120	Medical/Clinical Services
CoStar Group, Inc.	93,600	Research Services
Marcum Accountants/Advisors	92,250	Compliance/Risk Monitoring
Seyfarth Shaw LLP	90,000	Legal Services
Orrick Herrington & Sutcliffe LLP	86,086	Legal Services
RELX, Inc.	86,008	Miscellaneous Consulting Services
Jeffrey M Meyer MD, PLLC	79,122	Medical/Clinical Services
New Wave People, Inc.	78,322	Miscellaneous Consulting Services
Groom Law Group	77,503	Legal/Tax Consultant
Cornerstone Macro LLC	75,138	Research Services
Corporate Resolutions, Inc.	67,500	Compliance/Risk Monitoring
Lenox Park Solutions LLC	65,000	Administrative Expense
Cox, Castle & Nicholson LLP	53,998	Legal Services
West Publishing	51,332	Miscellaneous Consulting Services

See accompanying independent auditors' report.

INDEPENDENT AUDITORS' REPORT ON INTERNAL CONTROL



KPMG LLP
515 Broadway
Albany, NY 12207-2974

Independent Auditors' Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with Government Auditing Standards

The Trustee
New York State and Local Retirement System:

We have audited, in accordance with the 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, the financial statements of the New York State and Local Retirement System (the System), which comprise the combining statement of fiduciary net position as of March 31, 2019, and the related combining statement of changes in fiduciary net position for the year then ended, and the related notes to the financial statements, and have issued our report thereon dated July 19, 2019.

Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the System's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the System's internal control. Accordingly, we do not express an opinion on the effectiveness of the System's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the System's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

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INDEPENDENT AUDITORS' REPORT ON INTERNAL CONTROL

CONTINUED



Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the System's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the System's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

KPMG LLP

July 19, 2019

Investment

CONTENTS

- Overview of Investments..... 81
- Corporate Governance..... 90
- Investment Results 94
- Investment Summary 95
- Asset Allocation — March 31, 2019 96
- Public Equity Performance..... 97
- Public Equity Fund of Fund Performance 99
- Domestic Equity Portfolio — Ten Largest Holdings 101
- Fixed Income Portfolio and Comparison 102
- Fixed Income Performance 103
- Fixed Income Portfolio — Ten Largest Holdings 104
- Real Estate Portfolio..... 105
- Alternative Investments Summary 106
- Public Equity Management Fees 107
- Public Equity Commissions — Internally Managed 108
- Public Equity Commissions — Externally Managed 109
- Global Fixed Income Management Fees 112
- Long-Term Domestic Bond Transactions — Internally Managed..... 113
- Long-Term Domestic Bond Transactions — Externally Managed 114
- Short-Term Domestic Bond Transactions — Internally Managed 115
- Real Estate Management and Incentive Fees (Expensed) 116
- Real Estate Management and Incentive Fees (Capitalized) 117
- Private Equity Management Fees (Expensed) 118
- Private Equity Management Fees (Capitalized)..... 119
- Private Equity — Fee, Expense and Carried Interest Analysis 120
- Absolute Return Strategy Management and Incentive Fees..... 121
- Opportunistic Funds Management and Incentive Fees (Expensed) 122
- Opportunistic Funds Management and Incentive Fees (Capitalized) 123
- Real Assets Management Fees (Expensed)..... 124
- Real Assets Management Fees (Capitalized) 125
- Consultant and Advisor Fees 126

OVERVIEW OF INVESTMENTS

OVERALL OBJECTIVES AND PERFORMANCE

The Division of Pension Investment and Cash Management (PICM) in the Office of the State Comptroller is responsible for the management of the assets of the New York State Common Retirement Fund (Fund or CRF). The Fund's primary objective is to provide the means to pay benefits to the participants in the New York State and Local Retirement System (System) through an investment program designed to protect and enhance the long-term value of the assets. We are responsible for implementing an asset allocation strategy with an appropriate balance of risk and return. Investments in equities, although historically volatile, provide superior long-term performance and growth characteristics, while fixed income investments provide less volatility and more predictable cash flow to meet the System's funding requirements and pension obligations. Alternative investments provide diversification and incremental returns.

The Fund's investment performance for the fiscal year ended March 31, 2019 was 5.23 percent gross of certain investment fees. In spite of a volatile year with continued political uncertainty and growth concerns around the world, all of the asset classes produced positive returns. In the U.S, the markets saw a major monetary policy change with the Federal Reserve reversing course from its earlier stance of raising rates. The Fund's diversification strategy worked well, demonstrated by the strength of the alternative portfolio returns, which generally outperformed the public markets.

The Fund's positive performance reflects gains across all asset classes. The equity portfolio returned 4.86 percent, the real estate portfolio returned 7.09 percent, the private equity portfolio returned 9.90 percent, the absolute return strategies portfolio returned 2.07 percent, opportunistic funds returned 7.29 percent and real assets returned 8.15 percent. The core fixed income portfolio returned 4.84 percent, the non-core fixed income portfolio returned 3.92 percent and Treasury Inflation-Protected Securities (TIPS) returned 2.76 percent.

The investment performance information provided in this section of the Comprehensive Annual Financial Report was calculated by the Fund's custodian, J.P. Morgan, using a daily time-weighted rate of return based on the market value of assets.

PENSION RISK MANAGEMENT

Overall Objectives

Pension Risk Management (PRM) provides an investment risk framework for the Fund as a whole, within the context of the Fund's actuarial liabilities. Recognizing that prudent risk-taking is a key to providing adequate returns and affordable pension plan funding, PRM controls risks within and among asset classes, to help maintain the economic viability of the System. PRM also works to monitor liquidity and other non-investment risks, to the extent that these risks may affect the overall objectives of the Fund.

Risk Authorities

The Chief Investment Risk Officer (CIRO) has the ability to escalate risk issues directly to the Fund's Trustee. The CIRO reports to the Executive Deputy Comptroller for Retirement Services (EDCRS) and administratively reports to the Chief Investment Officer (CIO). An internal Risk Committee (RC) assists the CIRO; the RC has multi-divisional representation within OSC and provides support and advice on risk and risk management at the Fund.

Investment Risk Framework

Central to the Fund's risk framework is the Risk Appetite Statement, which was approved by the Fund's Trustee in 2018:

The CRF is dedicated to providing a secure pension for generations of NYSLRS members, retirees and beneficiaries. In the pursuit of this mission, the CRF is committed to the highest standards of ethics and prudent investment management. In their decision making, the Trustee and staff of the CRF may take prudent investment risks when compensated by higher expected returns in order to generate stronger long-term performance. Regardless of potential returns, the CRF endeavors to avoid the risk of a loss of asset value that could compromise the economic viability of the current plan structure or call into question the integrity and responsibility of the CRF or its staff. Therefore, the CRF diligently seeks to identify and avoid such risk.

COMPLIANCE

The Compliance Office for the Fund is headed by the Director of Compliance, who reports to the EDCRS and administratively reports to the CIO. The primary purpose of the Compliance Program is to monitor compliance by PICM staff and external managers with applicable statutes, policies and procedures, conflict of interest and other ethical standards governing the Fund. In an effort to meet this objective, the activities of the Compliance Office primarily include the reporting, development or monitoring of: the Fund's investment-related policies and procedures; statutory and policy mandates for trading by both internal staff and external equity managers; personal trading activities of employees pursuant to the "Insider Trading Policies"; Annual Compliance Questionnaire for external managers, broker-dealers and consultants; and regulatory filings required under Section 13 of the Securities and Exchange Act of 1934.

PUBLIC EQUITIES

The role of the Fund's public equities portfolio is to provide the largest source of returns in the Fund's portfolio over the long-term through diversified, global equity market exposure. For the fiscal year ended March 31, 2019, the \$113.3 billion Common Retirement Fund global public equity portfolio posted a positive 4.86 percent return, as compared to a positive 2.60 percent return for the MSCI All Country World Index (ACWI) benchmark. The Fund continues to benefit from its long-term overweight to U.S. equities, with the five-year return for the total public equity portfolio a positive 8.20 percent. For the fiscal year ending March 2019, the domestic equity portfolio rose 8.84 percent. Strong Gross Domestic Product numbers and historic low unemployment in the U.S. were offset by weakening economies around the globe as well as trade tensions between China and the U.S. Volatility in equity returns added to an uncertain outlook for equities. The U.S. equity portfolio was valued at \$75.1 billion at the end of the fiscal year, lower than the prior fiscal year number, as the Fund rebalanced out of U.S. equities.

Slower global growth hurt the Fund's non-U.S. equity portfolio, which posted lower returns for the fiscal year, down 4.46 percent to reach \$27.1 billion. The all actively managed \$11.1 billion global portfolio, in which managers allocate between U.S. and international equities, outperformed, posting a gain of 3.03 percent as compared to the MSCI ACWI return of 2.60 percent. The Fund's emerging markets portfolio suffered the most in fiscal year 2018-19, posting a drop of 10.41 percent as emerging markets were particularly effected by the specter of worsening global trade.

The public equities program continues to rely on broad passive index funds in the more efficient segments of the equity markets. This allows the Fund to maintain exposure to market returns at very low costs. The staff continues to employ active manager mandates in less efficient markets where active management is likely to outperform.

The Fund updated its approved equity broker list in 2018 and, as a result of this extensive review, the Fund now has 18 approved broker-dealer firms to execute trades for the internally managed public equity portfolios. Twenty-two percent of these trading partners are women-owned or minority-owned (MWBE) firms. For the fiscal year, these brokers accounted for 35 percent of the internally managed global equity commissions.

FIXED INCOME

The fixed income portfolio is designed to provide a consistent source of funds to help address the cash flow needs of the Fund. Additionally, these assets provide downside protection against the volatility of the overall portfolio's equity-like strategies, while achieving efficiency in the risk/return profile for fixed income. The Fund accomplishes these goals by investing internally in long-term and short-term assets, while external managers focus on increasing returns and diversification, primarily through non-core fixed income investments. The short-term fixed income portfolio offers liquidity to meet monthly pension fund liabilities, as well as providing funding needs for the other asset classes within the Fund.

The core fixed income portfolio uses the Bloomberg Barclays U.S. Aggregate Bond Index as a benchmark and seeks to add value through sector allocation and security selection. The long-term core fixed income portfolio consists primarily of U.S. Treasury securities, government-sponsored agency debentures, corporate bonds, commercial mortgage-backed securities, mortgage-backed securities, asset-backed securities, collateralized loan obligations, and municipal bonds. For the internal fixed income accounts, the Fund does not invest in securities that are below investment grade. The non-core, externally managed fixed income allocation consists primarily of higher yielding credit-focused investments. The Fund also has a large allocation to Treasury Inflation-Protected Securities (TIPS). The Fund's short-term fixed income portfolio may be invested in high quality commercial paper, U.S. Treasury bills, bank certificates of deposit, and agency discount notes, as well as short-term corporate bonds and asset-backed securities.

The Fund's core long-term fixed income portfolio (excluding TIPS) returned 4.84 percent for the year as compared to 4.48 percent for the Bloomberg Barclays U.S. Aggregate Bond Index. The outperformance was attributable to a number of factors, including the superior total return performance of the Fund's corporate bond holdings relative to the benchmark and an underweight to lower-yielding Treasury securities. The Fund continues to maintain overweight positions in corporate bonds and structured products, although its allocation to corporate bonds was substantially reduced over the fiscal year. The average credit quality of the core portfolio improved to Aa2/AA- as a result of an increase in Treasury holdings and a reduction in corporate bonds.

The Fund's internally managed TIPS portfolio, which assists in hedging inflation risk in the United States, returned 2.76 percent as compared to the Bloomberg Barclays U.S. TIPS Index return of 2.70 percent. The Fund's holdings of older, higher coupon TIPS provided incremental income, which in part accounted for the six basis points of outperformance. Short-term cash investments returned 2.59 percent for the fiscal year. External non-core fixed income gained 3.92 percent for the fiscal year.

The Fund completed an extensive review of brokerage counterparties in 2018, and as a result, the Fund now has 23 approved broker-dealer firms to execute trades in the long-term and short-term fixed income portfolios. Seventeen percent of these trading partners are women-owned or minority-owned firms; firms owned by Disabled American Veterans represent another 9 percent. Women-owned and minority-owned firms continue to play a central role in the Fund's long-term and short-term fixed income strategy, executing 16.8 percent of all long-term trades and 13.5 percent of all short-term broker trades during the past fiscal year.

The Fund participates in a securities lending program, whereby the custodian bank loans a portion of the fixed income and equity securities to qualified counterparties, providing incremental income. For the fiscal year ended March 31, 2019, the securities lending program earned the Fund \$44.0 million in revenue, net of management fees and rebates.

REAL ESTATE

The Real Estate Group seeks to create a diversified real estate portfolio by investing predominantly in office, industrial, retail, and apartment properties across various geographic locations and risk profiles, including core, core-plus/value-add and opportunistic strategies. The real estate allocation's mandate to the overall Fund is to provide a steady stream of income through less risky core investments, and capture excess returns through riskier, core-plus/value-add and opportunistic investments.

The Real Estate Group mainly invests through four primary investment structures: wholly owned; joint ventures; separately managed accounts; and commingled funds (closed-end, open-end, and fund of funds). For wholly owned assets, the Fund works with an external advisor and third party service providers to manage the property. For all other structures, the Fund invests alongside a sponsor, or general partner, whose interests are aligned with the Fund's via shared risk and incentive.

As of March 31, 2019, equity real estate represented 7 percent of total Fund assets, producing a total return of 7.1 percent for the fiscal year, as compared to the National Council of Real Estate Fiduciaries (NCREIF) Index of 6.7 percent. Over time, the real estate portfolio has exhibited sustained, strong net performance relative to its benchmark. Looking forward, the Fund will continue to structure and manage a balanced real estate portfolio that is capable of weathering economic cycles through its broad diversification across sectors, markets and risk profiles – core, core-plus/value-add and opportunistic.

Core strategies include investing in fully leased, trophy properties located in top markets in the U.S. The primary purpose of core investing is to provide the Fund a reliable source of current income and moderate value appreciation with limited downside. Core assets are found in highly liquid, gateway cities, often in irreplaceable locations with demonstrated strong tenant demand. Currently, a significant percentage of the real estate portfolio is being allocated to core properties.

Core plus/value-add investments may include under-managed real estate with existing vacancy or near-term tenant rollover or opportunities for a light to moderate renovation, allowing for an asset to be repositioned and re-leased to create value. Opportunistic investments include strategies such as ground-up development or substantial renovation that can deliver enhanced yield; however, it also carries the increased risk of construction and exposure to market conditions.

When underwriting potential investments, the Fund maintains a disciplined approach to its evaluation of sustainable investing and Environmental, Social and Governance (ESG) considerations. The Fund believes that this is a sound policy that can be impactful across various sectors, and that it can also generate excess investment returns. Many of the Fund's real estate assets are LEED (Leadership in Energy and Environmental Design) certified, an internationally recognized green building certification system that verifies that a building was designed and built to minimum environmental standards. The market has shown that many tenants prefer, or have a mandate, to lease assets in LEED certified buildings, further justifying the focus on this effort. Notably, the Fund is completing construction on a significant office redevelopment that will be LEED Gold.

The Fund manages risk within the real estate portfolio through maintaining strong relationships and diversifying investments by property type, geography, investment strategy and capital pacing. In order to achieve long-term appreciation and sustainable returns, the Real Estate Group will seek to continue to leverage existing relationships, and when starting new relationships, select best-in-class sponsors, joint venture partners, consultants and advisors. In addition, the Fund recognizes the importance of investing with smaller firms and Minority and Women-Owned Business Enterprise (MWBE) real estate managers. Through dedicated programs, the Fund will look to capitalize on MWBE talent and expertise.

AFFORDABLE HOUSING PERMANENT LOAN PROGRAM

In 1991, the Fund developed a program to support the rehabilitation and development of affordable housing in New York State. Under the program, the Fund's designated manager, the Community Preservation Corporation (CPC), originates affordable long-term housing mortgages across New York State. CPC provides the construction financing, and when construction is completed, CPC sells the permanent loans to the Fund. All mortgages are 100 percent insured by the State of New York Mortgage Agency (SONYMA).

Through this program with CPC, the Fund has been able to provide moderate-income and low-income families across the State with the opportunity to rent affordable housing. By purchasing permanent mortgages, the Fund provides for the production of affordable new multi-family housing and the revitalization of deteriorated or obsolete housing units.

Since the inception of this program, 20,614 units representing \$890 million have been completed and 2,455 are in the pipeline. In the 2018-19 fiscal year, the Fund invested in affordable housing throughout the State, including Albany, Dutchess, Monroe, Rensselaer, Orange, and Oswego counties. The Fund remains dedicated to working with CPC and SONYMA to provide New York State residents with opportunities in affordable housing, as long as the investment structures and potential returns fulfill the fiduciary mandate of the Fund to its beneficiaries and retirees.

HELPING NY/EQUITY REAL ESTATE INVESTMENTS

Alongside the CPC program, the Fund also invests in New York State commercial real estate properties through a mix of investment structures such as joint ventures, commingled funds and club fund investments, as well as wholly owned properties. The Fund owns, in whole or in part, shopping centers, office buildings, residential properties and hotels. Through these investment vehicles, the Fund has been able to acquire, develop, re-lease and reposition properties that are in need of upgrading with the goal of increasing jobs, helping the community and increasing property values. In line with these goals, the Fund is near completion of a major redevelopment of an office building in New York City and has co-invested in a multi-family sidecar investment vehicle which focuses on affordable housing in the State.

ALTERNATIVE INVESTMENTS

Private Equity

The Fund's private equity portfolio is designed to generate long-term returns that exceed those of public equities. As of March 31, 2019, the private equity program generated a one-year total return of 9.90 percent, as compared to the Cambridge U.S. Private Equity Index benchmark of 10.69 percent.

The Fund seeks to participate in private equity investments primarily through partnerships consisting of pooled funds managed by specialized investment managers for the purpose of investing in private companies. The Fund seeks to partner with the very best private equity investors, including emerging and diverse managers, across various investment strategies. Private equity investments are generally held for long-term appreciation and are less liquid than publicly-traded securities.

The Fund will commit capital to private equity at a disciplined pace to ensure the diversification of the portfolio over time. In addition, the Fund seeks to commit capital across various geographies, including international managers who have the expertise to source attractive investment opportunities in global markets and, more locally, to managers that focus their investments in New York State (In-State Investments). The Fund also seeks to commit capital to industry sectors that show high potential for economic growth and capital appreciation, and that will further enhance the diversification of the portfolio.

Because private equity investments involve long-term contractual commitments to a manager, the Fund will seek to invest with managers who have the ability to consistently deliver superior returns. The Fund can better achieve such superior returns through active portfolio monitoring, which requires frequent and direct interaction with investment managers to monitor performance and ensure proper alignment of interests between manager and investor.

The private equity program will seek to exploit those long-term commitments and alignment of interests by making co-investments alongside select managers on improved economic terms. During the past year, the Fund made 19 equity co-investments totaling over \$302 million in invested capital in portfolio companies alongside Fund managers. The Fund has established equity co-investment programs focused on opportunities sourced from its core private equity portfolio, the emerging manager program, and In-State Investments. The In-State program also has the capability to make credit co-investments, and two credit co-investments totaling approximately \$21.8 million have been made during the past year in companies in New York State.

Absolute Return Strategies

The investment goals for the absolute return strategies program are to provide diversified superior risk-adjusted returns with low correlation to other asset classes. The absolute return strategies portfolio invests with hedge fund managers on a global basis across multiple security types and asset classes. The portfolio values long-term partnerships with investment managers who have shown an ability to consistently deliver top-quartile returns and who partner with the Fund to better align investor and fund manager interests.

The portfolio consists of investments across strategies, including hedged equity, credit, global macro, managed futures, distressed debt and emerging markets. The portfolio seeks diversification through a multi-manager and multi-strategy approach, typically investing in vehicles which generate uncorrelated returns and those which can lower the overall risk and volatility of the Fund's portfolio.

As of March 31, 2019, the absolute return strategies portfolio generated a return of 2.07 percent for the fiscal year as compared to the HFRX Global Hedge Fund Index return of negative 4.10 percent.

Opportunistic Funds

The opportunistic portfolio invests across a broad range of investment strategies that do not fit neatly into the definition of traditional asset classes, or that share characteristics of multiple asset classes. The portfolio includes investments across the capital structures of both public and private companies, property, and real assets that are distinguished from the mandates of the other asset classes by their history, investment structures, terms, duration, risk/return profiles or other relevant characteristics. Additionally, the portfolio seeks to take advantage of short-to-medium term market dislocations. The role of the opportunistic asset class is to add alpha (excess return) to the Fund's overall return with relatively low correlation to other asset classes. We do this by capitalizing on market dislocations that create unique investment opportunities and identifying skilled external managers who can generate excess returns in all market environments.

The investment objectives are accomplished by investing in opportunities that have resulted from market dislocations, regulatory reforms, capital shortages, structural changes, and stress or distress among asset owners. These opportunities may exhibit lower risk and higher current income than the Fund's more traditional asset classes, and provide a source of capital to investment ideas that do not fit neatly into existing asset categories, or that span multiple categories.

The opportunistic portfolio affords the Fund the opportunity to capture returns in advance of heavy institutional asset flows (early mover advantage) or to take a preferential position in situations that are capacity constrained. The portfolio also allows the Fund to invest more flexibly across asset classes, geographies and capital structures.

The structures of these investments will vary greatly depending on the opportunity and may range from broad strategic partnerships, where the Fund's staff is able to leverage the resources of an institution to invest across a wide number of asset classes or strategies, to a more targeted approach that may include investments through various vehicles. In addition to commingled funds, separate accounts and minority investment stakes, the Opportunistic team may also at times seed new investment platforms or take an anchor position in new investment strategies within existing managers by providing acceleration capital.

As of March 31, 2019, the portfolio has generated a one-year total return of 7.29 percent.

Real Assets

The Real Assets portfolio is the Fund's newest alternative asset allocation, having first launched in 2014. To date, the Real Assets portfolio has made investments in a diverse basket of assets including commodities, farmland, inflation-linked bonds, infrastructure and renewables. The Real Assets portfolio's objectives are to add alpha to the Fund's overall portfolio return and offer inflation participation opportunities while maintaining a low correlation to traditional asset classes over time. The performance of the asset class is primarily driven by broad, macroeconomic factors, including commodity prices and resource demand, demographics, inflation and idiosyncratic supply shocks.

The portfolio also seeks to benefit from investment themes that will play out over multiple economic cycles. The investment narratives being prudently explored include global energy transitions, which are leading to the increased use of renewables.

As we invest within the asset class, we seek to source best-in-class real asset fund managers with strong track records. To date, we have invested approximately \$2.1 billion across a number of real asset strategies, including agriculture, aircraft financing, telecommunications, energy and infrastructure. The Real Assets portfolio's allocation was 1.0 percent at fiscal year-end. The modest weight is due to the limited maturity of the portfolio, though our total commitments exceed \$4.1 billion. These commitments include allocations to emerging and secondary managers.

Geographically, we have focused largely on North America, followed by Western Europe and Latin America.

As of March 31, 2019, the portfolio returned 8.15 percent for one year and an annualized 10.03 percent over three years, exceeding the U.S. Consumer Price Index +5 percent benchmark for both periods. This positive result is attributed to continued strength in infrastructure and our private market investments overcoming the ‘j-curve’ effect. Overall, the performance is consistent with a developing real assets portfolio.

New York Business Development Corporation

The Fund seeks to diversify its investments and achieve a risk-adjusted rate of return through a commitment to the New York Business Development Corporation (NYBDC). NYBDC underwrites loans to small businesses in New York State, often with guarantees from the U.S. Small Business Administration, for working capital, equipment, the acquisition of real property, capital improvements and the refinancing of existing loans. NYBDC has successfully completed loans to a wide range of business enterprises, including retailers, restaurants, small manufacturers and a variety of other service businesses across the State. By focusing exclusively on small business lending, NYBDC can frequently offer more favorable terms than other lenders. NYBDC has an active Veteran’s Loan Program where New York business owners who serve in the National Guard or Reserve, along with honorably-discharged former active duty members, can access small business loans.

NYBDC also has a goal of making at least 25 percent of its loans to women- or minority-owned businesses. In 2018, 35 percent of NYBDC loans that were due to Fund investments were to women-owned businesses and 47 percent were to minority-owned businesses.

The Common Retirement Fund has been an investor in NYBDC since 1987, with commitments totaling \$400 million. In 2010, the Fund approved a fourth \$100 million commitment to support NYBDC’s small business loan program. Since this program began in 1987, NYBDC has made 1,156 loans totaling \$400 million to businesses that employ over 23,500 New Yorkers. During the fiscal year ended March 31, 2019, NYBDC made 17 loans totaling \$6.1 million.

Financing for Businesses in New York State

In 2000, the Fund initiated the New York (In-State) Private Equity Investment Program. The In-State Program is designed to generate a market rate of return consistent with the risk of private equity while increasing the diversification of the Fund’s investment portfolio and expanding the availability of capital for New York State businesses. By making sound strategic investments in new and expanding New York companies, and making equity and debt capital available to small businesses often overlooked by investment professionals in this asset class, the program is also proving to be an important contributor to the State’s economy. The In-State Program provides a model for how the pension fund can identify profitable investment opportunities and generate market rate returns, while supporting business development and job growth in New York State.

On March 31, 2019, the Fund’s private equity portfolio included investments in over 400 New York businesses with a market value of \$2.0 billion. This figure reflects only the Fund’s share of these investments; the total value of New York companies held by the Fund’s partnerships was more than \$20.9 billion as of December 31, 2018 (the most recent data available). Included in the Fund’s New York State portfolio are: 901D in Airmont, Corelle Brands in Corning, Southern Tier Brewery in Lakewood,

LeverPoint in Clifton Park, Movable Ink in New York City, Vnomics in Rochester and ACV Auctions in Buffalo.

As of March 31, 2019, the Fund had over \$500 million of remaining commitments available for investment in the In-State Program. Commitments to this program totaled \$1.8 billion. These commitments are devoted exclusively to New York State investment opportunities. The 18 managers in the program are:

- *Armory Square Ventures*, an early-stage venture capital fund located in Syracuse.
- *Ascent Biomedical Ventures NY*, a New York City-based venture capital fund focusing on life sciences.
- *Grosvenor Capital Management*, a fund that makes investments alongside other private equity funds investing in New York State.
- *Contour Venture Partners*, an early-stage venture fund based in New York City.
- *DeltaPoint Capital*, a growth equity fund located in Rochester.
- *Gotham Ventures (fka. DFJ Gotham)*, a New York City-based fund focused on early-stage venture capital investments.
- *Easton Hunt Capital Partners*, a New York City-based fund that pursues a broad strategy of investing in companies in a wide range of industries and stages of development.
- *Founders Equity*, a New York City-based fund that makes growth equity investments.
- *Graycliff Partners*, a New York City-based fund that targets buyout and growth equity investments.
- *Tribeca Venture Partners*, a New York City-based early-stage applied technology venture firm focused on investing in business information and technology-enabled services companies.
- *Primary Venture Partners (fka High Peaks Ventures)*, an early-stage venture capital fund based in New York City and Albany.
- *Hamilton Lane*, three special situations funds that make equity and credit investments alongside other private equity managers investing in New York State.
- *Activate Venture Partners (fka. Milestone Venture Partners)*, a New York City-based fund that focuses on companies providing technology-enhanced businesses services.
- *Paladin Homeland Security Fund (NY)*, a Washington, D.C.-based fund that opened a New York office to invest in companies that address a broad range of government and commercial security needs.
- *SoftBank Capital NY*, a New York City and Buffalo-based fund that invests in digital media and technologies that leverage broadband.
- *Summer Street Capital Partners*, a growth equity investment fund located in Buffalo.
- *Trillium Lakefront Partners NY*, a Rochester-based fund that focuses on investing in technology companies in upstate New York.
- *Wheatley Partners*, a technology venture fund with a focus on information and medical technology located in New York City and Long Island.

CORPORATE GOVERNANCE

Corporate Governance Program and Environmental, Social and Governance (ESG) Integration

The Fund's investment philosophy requires the consideration of environmental, social, and governance (ESG) factors in the investment process because they can influence both risk and return. Assessing corporate performance with respect to ESG factors and encouraging portfolio companies to embrace the best ESG practices can help ensure the long-term value of the Fund's investments.

The Fund incorporates ESG factors into its investment analyses and decisions, recognizing that the relevance of particular ESG factors may vary across companies, sectors, regions, asset classes, and over time. Risk assessments that identify material ESG factors are systematically applied across all asset classes. Due diligence of external managers includes an evaluation of their ESG policies. In addition, annual surveys of the Fund's managers provide regularly updated information about their ESG policies and practices.

The Fund's Bureau of Corporate Governance works to promote sound ESG practices at companies held in the Fund's portfolio through active ownership that strategically focuses on sustainability, diversity and accountability.

Sustainability is of vital interest to the Fund because the System's long-dated pension obligations require us to assess the long-range vision and prospects of the public companies in our portfolio. Sustainable corporate practices are of critical importance in a variety of areas, including anticipating and responding effectively to environmental challenges, managing changes in the political and regulatory landscape, and protecting the health, safety and rights of employees in the company's workforce and supply chain to ensure productivity while diminishing the risks of liability and reputational damage. A commitment to sustainability provides a framework for companies—and the Fund's investments—to flourish for decades to come.

Diversity — in its many forms — is another key component of the Fund's long-term strategy for success. Research shows that the ability to draw on a wide range of viewpoints, backgrounds, skills and experiences is increasingly critical to corporations' long-term success in the global marketplace. Encouraging diversity of the boards, executive management and workforce of the companies in which the Fund invests is an integral component of the responsible stewardship of our capital.

Accountability is essential to the Fund because of the vast scale and scope of its investments and its nature as a long-term, universal investor. With an array of investments in companies with many different businesses and projects, the Fund relies on independent corporate boards to represent investors. The Fund therefore looks for compensation structures that properly incentivize strong long-term returns, and expects the full disclosure of risks, opportunities and strategies necessary to allow for informed decision-making. Accountability and transparency are critical to an effective, long-term investment strategy.

The Fund's strategic focus on enhancing long-term value through sustainability, diversity and accountability is, in part, implemented through the Fund's engagement processes with a commitment to active ownership — using the Fund's voice and votes to seek to ensure the long-term success of companies in which we are invested. The Fund's active ownership program takes many forms, including voting on nearly 30,000 proxy ballot items annually, filing shareholder resolutions, writing letters to portfolio companies and to regulatory authorities as specific issues arise, discussing important ESG issues directly with corporate directors and management, and advocating for public policies that will help protect the long-term value of our investments.

During the 2018–19 fiscal year, the Fund advanced its strategy in several ways.

ESG Principles and Proxy Voting Guidelines were updated and implemented in 2018. Proxy voting is an effective means of communicating with boards of directors and management about the Fund's ESG priorities, and a powerful tool for enhancing long-term value. Not only do these principles and guidelines provide direction on our independent voting decisions, they also guide other corporate engagements and policy initiatives, articulating to the capital markets the Fund's view of what constitutes good corporate governance and ESG best practices.

Shareholder Proposals are a powerful engagement tool that provide an opportunity to bring specific issues to the attention of the board, management and fellow investors. When filing a shareholder proposal, the Fund seeks a productive dialogue with the company. This includes discussing the proposal with the company, allowing the company to highlight its work on the given issue, and determining how the company can address the Fund's concerns. If the company and the Fund reach an agreement regarding the implementation of the proposal, the Fund withdraws the proposal.

Public Policy Advocacy can improve the long-term value of the Fund's investments. By supporting specific policies that promote the overall stability, transparency and functionality of financial markets and the economy generally, the Fund can improve returns and reduce risk. The Fund's public policy engagement includes meetings with and letters to elected representatives, regulators and other public officials, testimony at hearings and forums, comments on regulatory and legislative proposals, and participation in State, national and international forums and initiatives.

Climate-Related Financial Disclosures

The purpose of this section is to report on the Fund's efforts to address climate risk in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), an organization established by the Financial Stability Board of the G20 (a forum convened by 19 leading industrial nations and the European Union) to guide the financial community in its understanding and reporting of climate risks. The Fund supports the TCFD recommendations.

1. Governance

As Trustee, the Comptroller is responsible for the prudent investment of the Fund. The Comptroller believes that climate change presents significant risks to the Fund's investments, as well as unique investment opportunities. The Fund's CIO formulates an overall investment strategy for the Comptroller, including climate-related strategy, with the assistance of investment, risk and corporate governance staff, consultants, and external advisory committees.

The six-member Decarbonization Advisory Panel formed by Governor Andrew Cuomo and Comptroller DiNapoli met for the first time in May 2018. This group of investment, financial, environmental, energy and legal experts worked for nearly a year to deliver recommendations to the Comptroller that focused on climate-change-related investment opportunities and risk mitigation. The Panel's primary recommendation was for the Fund to align its entire portfolio with a 2 degree or lower future as called for in the Paris Agreement. The Panel suggested that this would be accomplished by ramping up investment in sustainable assets and climate solutions, and establishing minimum standards to prioritize engagement with companies and assess investments.

The Comptroller is also advised by staff of the Bureau of Corporate Governance who monitor climate-related issues. The Executive Director of Corporate Governance reports directly to the CIO and works with other investment staff to identify and monitor climate risks.

2. Strategy

The Fund recognizes that there are different short-, medium-, and long-term risks posed by climate change. Because the Fund expects to exist in perpetuity, it must consider all of these time horizons. The transition to a low-carbon economy is already underway and accelerating globally; it is likely to affect virtually every investment in the Fund's broadly diversified portfolio.

The Fund has identified significant short- and medium-term **transition risks** due to implementation of the Paris Agreement, technological advances and changing market demand. In 2015, the Fund released a tailored climate change scenario analysis, produced in partnership with Mercer Consulting, describing transition risks under a variety of scenarios.

The Fund also believes **physical risks** are significant on all time horizons. Extreme weather events and tidal flooding are already affecting businesses around the world and pose a growing threat to the Fund's investments. Measuring these risks is challenging due to difficulties in accurately projecting weather events, but the Fund expects that better climate, weather and financial modeling will allow for improved assessments in the near term.

The Fund's Climate Action Plan sets out the processes that the Fund may use to determine which risks and opportunities could have a material impact on the Fund. These include advanced scenario analysis, asset-class-specific physical risk analyses, and alternative criteria for measurement of investment performance.

3. Risk Management

The Fund's staff reviews studies to stay informed about the science associated with climate change and actively seeks to identify advanced climate risk assessments to inform investment strategies. The Fund's Climate Action Plan includes a process for regularly assessing the Fund's exposure to high-impact sectors as defined by the TCFD recommendations. This will include industry- and company-specific assessments in light of the metrics and targets discussed below.

The Fund's primary strategy for managing climate-related risks is to increase sustainable investments while decreasing exposure to high-climate-risk investments, in accordance with the Fund's investment policies and the Comptroller's fiduciary duty. The Sustainable Investment-Climate Solutions Program (SICSP) is part of the Fund's plan to position its entire portfolio for a low-carbon economy. This builds on the Fund's current \$10 billion commitment to sustainable investment strategies, with a goal of doubling the commitment over the next decade. This includes a \$4 billion investment in a low-carbon index that has a 75 percent lower carbon emissions intensity than its benchmark, achieved by underweighting investments in high emitters. The Fund has also begun establishing minimum standards to evaluate the transition readiness and resiliency of thermal coal mining companies, and plans to do so with other high-impact sectors.

Finally, the Fund has undertaken significant corporate engagement as described in the Corporate Governance Stewardship Report.* This includes 141 climate-change-related shareholder resolutions since 2008 and 67 agreements with portfolio companies on climate issues. The Fund has joined with other investors in the International Climate Action 100+ to engage with companies on these issues, and has sought greater disclosure of climate risks through public policy changes and by its proxy voting. The Fund withholds support from directors when a board fails to appropriately manage and comprehensively report on climate risks.

The Fund continues to provide public policy leadership at the international, federal, and State levels on climate change issues that may impact its returns on a variety of issues, including the Paris Agreement, the Clean Power Plan, tax credits for solar and wind power, low-carbon fuel standards, carbon pricing, the Regional Greenhouse Gas Initiative, and Securities and Exchange Commission requirements for corporate disclosure of material carbon risks.

*<https://www.osc.state.ny.us/reports/esg-report-jan-2019.pdf>

4. Metrics and Targets

The Fund uses the following metrics to assess climate risks and opportunities:

- Annual average weighted emissions intensity assessment of public equity holdings (including Scope 1 and 2 greenhouse gas emissions). In 2018, the Fund's emissions intensity was 8.8 percent lower than its benchmark (75 percent Russell 3000/25 percent MSCI ACWI ex-US). It was 14.2 percent lower than its 2017 intensity. The Fund believes that this metric is useful in assessing transition risks, especially regulatory risks, but does not capture trends over time or the future direction of companies. The Fund also recognizes the significance of Scope 3 emissions as a risk metric in investment analyses, but faces challenges in assessing these emissions due to the limited availability of accurate data.
- Portfolio exposure to assets that are mostly affected by climate change and the low carbon transition as defined by the TCFD. The usefulness of this data is limited because it provides only backward-looking information.
- Shareholder engagement outcomes, such as whether companies agree to improve their climate disclosure and climate risk management practices.
- Capital allocation to sustainable or climate solutions investments. The Fund currently has a \$10 billion commitment.

INVESTMENT RESULTS

Based on Fair Market Values as of March 31, 2019.

	Annualized Rate of Return			
	1 Year	3 Years	5 Years	10 Years
Total Fund	5.23%	9.32%	7.00%	10.34%
Public Equity	4.86	12.17	8.20	13.96
MSCI All Country World Index	2.60	10.67	6.45	11.98
Private Equity	9.90	12.04	10.88	12.20
Cambridge U.S. Private Equity Index	10.69	14.07	11.75	14.33
Real Estate	7.09	8.96	10.08	8.66
National Council of Real Estate Investment Fiduciaries (NCREIF)	6.70	7.21	9.33	7.49
Absolute Return Strategy	2.07	5.04	3.16	5.38
HFRX Global Hedge Fund Index	(4.10)	2.43	(0.31)	1.75
Opportunistic Funds	7.29	7.81	6.87	–
Real Assets	8.15	10.03	–	–
U.S. CPI +5%	6.90	7.20	–	–
Treasury Inflation-Indexed Securities	2.76	1.77	2.16	4.20
Bloomberg Barclays U.S. TIPS Index	2.70	1.70	1.94	3.41
Core Fixed Income	4.84	3.12	3.19	4.02
Bloomberg Barclays Aggregate Bond Index	4.48	2.03	2.74	3.77
Non Core Fixed Income	3.92	6.81	–	–
Non Core Fixed Income Blended Benchmark	4.41	6.95	–	–
Short-Term Investments	2.59	1.72	1.29	0.87

Investment return calculations were prepared by the Custodian using a time-weighted rate of return. These figures are for investment management purposes and may not agree with audited statements. Due to reporting timing differences, actual results may differ from reported results.

Private Equity, Real Estate and Real Assets are reported on a three-month lag (adjusted by cash flows); Opportunistic Funds and Absolute Return Strategy are reported on a one-month lag (adjusted by cash flows). Alternative asset classes and non-core fixed income are generally reported net of fees.

INVESTMENT SUMMARY

The following table summarizes the fair values of Fund investments by asset type for March 31, 2019 and 2018 (Dollars In Thousands).

Asset Type	Fair Value March 31, 2019	Percentage of Total Fair Value	Fair Value March 31, 2018	Percentage of Total Fair Value
Domestic Equity	\$ 73,303,652	34.8%	\$ 75,771,363	36.5%
Global Fixed Income	45,651,602	21.7	44,820,784	21.6
International Equity	36,256,971	17.2	39,025,688	18.8
Private Equity	19,750,977	9.4	17,500,516	8.5
Real Estate	15,678,555	7.5	14,182,669	6.9
Absolute Return Strategy	7,812,169	3.7	7,879,320	3.8
Short-Term Investments	6,118,985	2.9	3,366,569	1.6
Opportunistic Funds	2,833,785	1.3	2,507,027	1.2
Real Assets	2,220,026	1.1	1,518,624	0.7
Mortgage Loans	896,993	0.4	843,410	0.4
Total Investments	\$ 210,523,715	100.0%	\$ 207,415,970	100.0%

Note: This table reflects percentages derived from financial statement figures and may differ slightly from the asset allocation figures because certain investments have been reclassified.

ASSET ALLOCATION — MARCH 31, 2019

The Fund diversifies its assets among various classes including domestic and international equity, fixed income, inflation-indexed securities, real estate, private equity, absolute return strategies, opportunistic funds and real assets.

Asset liability studies, conducted periodically with help from an investment consultant, identify the optimal mix of assets to meet the growth requirements of the System's pension obligations while controlling risk as measured by return volatility. In the fiscal year ended March 31, 2015, the Fund completed an asset liability analysis and adopted a Long-Term Policy Allocation, which was updated on June 16, 2017. As implementation of the updated Long-Term Policy Allocation is expected to take several years, the Fund updated the Interim Policy Allocation for the transition period.

The Fund has formal rebalancing guidelines which ensure a disciplined process for meeting asset allocation goals, as well as allocation ranges for individual asset classes which minimize unnecessary turnover.

Asset Type	Allocation as of March 31, 2019	Current Interim Policy	Long-Term Policy Allocation
Equity			
Domestic Equity	38.46%	36.0%	36.0%
International Equity	15.45	15.0	14.0
Alternatives			
Private Equity	9.10%	9.0%	10.0%
Real Estate	7.33	8.0	10.0
Absolute Return Strategy	2.52	3.0	2.0
Opportunistic Funds	1.31	2.0	3.0
Real Assets	1.04	2.0	3.0
Bonds & Mortgages	19.29%	20.0%	17.0%
Cash	1.54%	1.0%	1.0%
Inflation-Indexed Bonds	3.96%	4.0%	4.0%

Note: A detailed listing of the New York State and Local Retirement System's assets as of March 31, 2019, is on our website at www.osc.state.ny.us.

PUBLIC EQUITY PERFORMANCE

For the Fiscal Year Ending March 31, 2019.

	Total Assets (Dollars in Millions)	Annualized Rate of Return				Portfolio Since Inception	Benchmark Since Inception*	Inception Date
		1 Year	3 Years	5 Years	10 Years			
Total Global Equity	\$ 113,302.1	4.86%	12.17%	8.20%	13.96%			
MSCI All Country World Index		2.60%	10.67%	6.45%	11.98%			
Total Large Cap Composite	\$ 53,078.4	10.26%	13.98%	11.14%	16.00%	11.28%	11.27%	2/1/83
CRF Large Cap Index Fund	40,238.0	10.52	14.21	11.30	16.07	11.67	11.64	8/1/78
CRF High Efficiency Defensive Index Fund	3,634.5	14.38	14.31	–	–	14.58	14.18	1/1/16
CRF Low Emission Index Fund	4,714.3	9.72	13.42	–	–	12.66	12.75	1/1/16
Aronson + Johnson + Ortiz, LP	912.7	1.42	9.01	6.24	14.11	7.66	7.32	12/1/04
AQR Capital Management	2,556.3	–	–	–	–	2.74	6.22	6/1/18
Eagle Capital Management	1,022.6	7.10	14.86	–	–	10.18	10.11	9/1/14
Russell Top 200 (S&P 500 To 1/1/16)		10.43%	14.19%	11.17%	16.06%			
Total Mid Cap Composite	\$ 14,371.2	5.76%	11.51%	7.72%	15.78%	11.49%	12.08%	7/1/91
CRF Mid Cap Index Fund	12,766.9	6.49	11.80	8.53	16.32	11.74	11.75	11/1/91
Fiera Capital	497.1	3.99	14.76	8.51	18.15	11.50	10.63	3/1/08
Iridian Asset Management	442.8	(6.66)	5.90	–	–	3.92	8.51	1/8/15
Progress Investment Management	664.4	4.57	11.41	6.75	14.98	11.04	10.87	9/1/94
Russell Midcap (S&P 400 Mid Cap To 1/1/16)		6.47%	11.82%	8.30%	16.28%			
Total Small Cap Composite	\$ 6,335.8	5.12%	15.16%	8.65%	16.77%	10.54%	9.95%	7/1/91
CRF Small Cap Index Fund	2,036.3	2.02	12.71	7.36	16.12	8.56	8.45	10/1/05
Artisan Partners	578.7	18.45	23.19	12.34	–	13.66	9.85	8/26/13
Brown Capital Management	1,254.4	14.51	23.33	15.60	22.39	15.48	9.15	9/1/94
Channing Capital Management	279.1	(2.56)	10.19	–	–	5.02	5.89	4/1/15
EARNEST Partners	1,064.2	(1.90)	12.02	8.19	15.91	10.09	8.31	6/1/01
Leading Edge Investment Advisors	429.5	3.80	13.37	–	–	7.11	6.77	4/1/15
Palisade Capital Management	307.7	–	–	–	–	(.58)	(4.61)	6/1/18
PENN Capital Management	385.9	3.91	13.97	4.54	–	5.40	8.03	9/27/13
Russell 2000 Index		2.05%	12.92%	7.05%	15.36%			
Total Long-Only Alpha Composite	\$ 1,334.6	7.15%	8.40%	7.11%	–	12.28%	6.36%	9/1/11
Trihan Partners Strategic Fund II LP	145.8	8.10	6.46	6.86	–	9.43	5.80	1/7/13
Trihan Partners Strategic Investment Fund-N, L.P.	525.3	10.41	6.69	–	–	7.01	3.86	2/1/15
ValueAct Capital Partners II, LP	663.5	4.22	10.06	6.65	–	12.44	6.36	9/1/11
HFRI Event Driven Activist Index		(0.02)%	4.93%	4.01%	–			
Total Domestic Transition Accounts	\$ 18.7							

* Benchmarks for all accounts will vary according to mandate.

PUBLIC EQUITY PERFORMANCE

CONTINUED

For the Fiscal Year Ending March 31, 2019.

	Total Assets (Dollars in Millions)	Annualized Rate of Return				Portfolio Since Inception	Benchmark Since Inception*	Inception Date
		1 Year	3 Years	5 Years	10 Years			
Total Non U.S. Equity Composite	\$ 27,097.0	(4.46)%	8.79%	3.22%	9.22%	5.93%	5.13%	10/1/89
MSCI ACWI Ex U.S. IMI (MSCI ACWI Ex U.S. to 1/1/17)		(4.96)%	8.16%	2.79%	9.21%			
Total Non U.S. Passive Composite	\$ 11,634.7	(4.07)%	8.29%	2.67%	9.05%	5.78%	5.55%	11/1/04
BlackRock ACWI Ex U.S. IMI	11,634.7	(4.47)	8.33	2.80	9.12	5.82	5.55	11/1/04
Total Active ACWI Ex U.S. Composite	\$ 5,891.0	(4.00)%	10.21%	4.22%	10.39%	6.62%	5.56%	11/1/04
Acadian Asset Management	1,639.0	(6.60)	10.70	4.93	11.17	7.06	5.56	11/1/04
Ariel Investments	298.5	-	-	-	-	2.94	6.31	11/1/18
Baillie Gifford	2,021.5	(4.32)	8.38	4.18	12.40	5.86	4.08	2/1/99
GQG Partners	504.5	4.28	-	-	-	4.28	(4.22)	4/1/18
Wellington Management	1,427.5	(2.00)	11.86	-	-	13.55	10.78	3/1/16
MSCI ACWI Ex U.S.		(4.22)%	8.09%	2.57%	8.85%			
Total EAFE Composite	\$ 4,854.8	(1.04)%	8.70%	3.43%	9.81%	5.98%	4.40%	10/1/89
Barings International	730.8	(2.88)	7.61	2.56	9.61	6.63	5.67	4/1/02
Capital Guardian	1,727.8	2.82	11.04	4.52	10.37	7.40	4.55	9/1/89
Mondrian Investment Partners	1,697.7	(1.09)	6.92	2.54	8.86	6.60	4.67	1/1/98
Total EAFE Small Cap Composite	698.5	-	-	-	-	(5.80)	(7.92)	7/1/18
Acadian Asset Management Small Cap	281.9	-	-	-	-	(4.81)	(7.92)	7/1/18
Barings International Small Cap	114.3	-	-	-	-	(7.99)	(8.52)	8/1/18
Global Alpha Capital Management Small Cap	302.4	(4.02)	12.16	9.49	-	11.47	5.78	10/1/13
MSCI EAFE Index		(3.71)%	7.27%	2.33%	8.96%			
Total Emerging Markets Composite	\$ 3,779.9	(10.41)%	9.75%	3.17%	8.65%	8.15%	7.50%	1/1/92
Genesis Investment Management	799.1	(3.40)	11.76	4.72	-	4.30	2.17	3/1/12
Morgan Stanley Emerging Markets	1,074.0	(11.48)	8.29	3.20	9.46	7.05	5.43	11/1/93
Morgan Stanley Frontier Markets	151.7	(21.18)	2.67	-	-	0.44	4.23	11/1/15
Quantitative Management Associates	1,210.7	(10.66)	9.94	3.59	-	3.55	2.90	2/1/12
Rock Creek Group	544.4	(13.75)	11.85	1.90	-	1.53	3.44	10/18/13
MSCI Emerging Markets Index		(7.41)%	10.68%	3.68%	8.94%			
Cevian Capital II, LP	\$ 936.6	(4.61)%	6.51%	2.73%	-	8.57%	6.36%	9/1/11
HFRI Event Driven Activist Index		(0.02)%	4.93%	4.01%	-			
Total Global Equity Composite	\$ 11,066.0	3.03%	12.31%	7.35%	12.83%	8.37%	7.15%	9/1/94
CRF FTSE Environmental Technology 50	127.7	(3.40)	6.08	2.57	-	3.40	3.52	11/1/09
Brandes Investment Partners	1,289.2	(2.55)	7.59	3.82	10.75	6.46	4.62	11/1/99
FIS Group	1,141.9	(2.28)	8.91	5.16	-	6.38	7.43	10/1/13
Generation Investment Management	1,605.4	13.36	20.49	15.66	18.02	18.02	12.00	4/8/09
Goldman Sachs Asset Management	2,766.0	5.73	12.94	-	-	9.00	7.12	1/1/15
Progress Investment Management	597.7	2.60	-	-	-	8.22	8.26	5/1/17
Rockefeller & Company Asset Management	388.8	1.79	11.27	-	-	6.73	6.12	2/23/15
T. Rowe Price	1,457.7	8.97	19.23	13.15	-	12.31	7.73	3/1/11
Templeton Investments	1,691.6	(4.91)	7.37	2.93	-	7.03	7.73	3/1/11
MSCI All Country World Index		2.60%	10.67%	6.45%	11.98%			
Global Transition Account	\$ 0.4							

* Benchmarks for all accounts will vary according to mandate.
Composite market values include transition accounts and accrued management fees.

PUBLIC EQUITY FUND OF FUND PERFORMANCE

For the Fiscal Year Ending March 31, 2019.

	Total Assets (Dollars in Millions)	Annualized Rate of Return				Portfolio Since Inception	Benchmark Since Inception*	Inception Date
		1 Year	3 Years	5 Years	10 Years			
Total Progress Mid Cap Composite	\$ 664.4	4.57%	11.41%	6.75%	14.98%	11.04%	10.87%	9/1/94
Denali Advisors	89.0	2.80	10.32	8.18	17.44	10.19	8.99	3/1/08
Fairpointe Capital	141.6	–	–	–	–	(3.61)	(1.82)	8/31/18
Lisanti Capital	49.7	14.57	20.67	–	–	12.55	9.60	7/1/14
Matarin Capital Management	40.7	–	–	–	–	(3.93)	(1.33)	8/31/18
OakBrook Investments	119.2	–	–	–	–	(2.45)	(1.82)	8/31/18
Poplar Forest Capital	74.6	–	–	–	–	(9.97)	(1.05)	8/31/18
Sapience Investments	68.7	–	–	–	–	(8.85)	(7.55)	8/31/18
Twin Capital Management	82.0	–	–	–	–	(2.58)	(1.33)	8/31/18
Progress Composite Benchmark		5.46%	11.94%	8.53%	16.72%			
Total Progress Global Composite	\$ 597.7	2.60%	–	–	–	8.22%	8.26%	5/1/17
ARGA Investment Management	142.4	(0.40)	–	–	–	5.95	8.06	5/1/17
Ativo Capital Management	116.9	7.30	–	–	–	11.98	8.26	5/1/17
Bell Asset Management	79.9	11.13	–	–	–	11.94	8.26	5/1/17
Strategic Global Advisors	189.4	0.68	–	–	–	7.66	8.26	5/1/17
Trinity Alps Capital	69.6	–	–	–	–	12.45	10.15	1/8/19
MSCI World Index		4.01%	–	–	–			
Total FIS Composite	\$ 1,141.9	(2.28)%	8.91%	5.16%	–	6.38%	7.43%	10/1/13
Aubrey Capital	56.7	(8.72)	–	–	–	1.15	1.63	8/10/17
Change Global Investment	57.7	(9.44)	–	–	–	0.44	6.63	3/1/17
Clifford Capital	159.2	9.32	–	–	–	13.54	5.68	8/10/17
Decatur Capital Management	307.0	10.12	15.22	11.89	–	13.73	14.47	10/1/13
Denali Advisors	233.7	(0.01)	–	–	–	9.00	9.69	6/1/16
FIS Frontier Markets	16.8	(19.75)	9.72	3.95	–	3.60	3.02	10/1/13
Metis Global Partners	40.9	(9.80)	–	–	–	2.24	5.14	4/20/17
Osmosis Investment Management	138.2	(8.54)	7.38	–	–	5.55	4.51	11/1/15
Redwood Investments	132.7	(3.29)	–	–	–	8.60	4.47	3/1/17
MSCI All Country World Index		2.60%	10.67%	6.45%	–			
Total Leading Edge Investment Advisors Composite	\$ 429.5	3.80%	13.37%	–	–	7.11%	6.77%	4/1/15
Bowling Portfolio Management	53.8	(6.68)	–	–	–	(7.00)	(1.96)	12/20/17
Granahan Investment Management	71.3	27.97	–	–	–	29.96	7.12	9/29/17
Granite Investment Partners	64.3	7.55	16.27	–	–	8.85	6.77	4/1/15
Matarin Capital Management	63.3	(3.42)	9.44	–	–	5.58	6.77	4/1/15
Nicholas Investment Partners	32.9	4.99	16.64	–	–	6.67	7.52	4/1/15
Palisades Investment Partners	38.9	0.73	11.95	–	–	6.91	6.77	4/1/15
Phocas Financial Corporation	58.3	(4.07)	8.73	–	–	4.68	5.89	4/1/15
Redwood Investments	47.5	5.39	11.56	–	–	7.05	7.52	4/1/15
Russell 2000 Index		2.05%	12.94%	–	–			

* Benchmarks for all accounts will vary according to mandate.
Composite market values include transition accounts and accrued management fees.

PUBLIC EQUITY FUND OF FUND PERFORMANCE

CONTINUED

	Total Assets (Dollars in Millions)	Annualized Rate of Return				Portfolio Since Inception	Benchmark Since Inception*	Inception Date
		1 Year	3 Years	5 Years	10 Years			
Total GSAM Composite	\$ 2,766.0	5.73%	12.92%	–	–	9.00%	7.12%	1/1/15
GSAM AIMS Global Account Cayuga	326.4	4.06	14.66	–	–	12.00	6.57	12/23/14
GSAM AIMS Global Account Iroquois	314.9	1.85	15.29	–	–	10.16	6.37	11/20/14
GSAM AIMS Global Account Mohawk	368.6	4.39	10.09	–	–	4.42	6.49	11/26/14
GSAM AIMS Global Account Mohican	350.1	6.53	–	–	–	10.52	9.96	7/22/16
GSAM AIMS Global Account Onondaga	466.3	13.08	14.87	–	–	11.72	7.79	12/17/14
GSAM AIMS Global Account Oneida	204.6	(4.15)	12.15	–	–	5.68	7.16	12/11/14
GSAM AIMS Global Account Seneca	430.1	13.30	13.52	–	–	11.00	7.34	1/30/15
GSAM AIMS Global Account Tuscarora	305.9	(0.36)	10.67	–	–	7.03	6.88	12/22/14
MSCI World Index		4.01%	10.68%	–	–			
* Benchmarks for all accounts will vary according to mandate. Composite market values include transition accounts and accrued management fees.								

DOMESTIC EQUITY PORTFOLIO — TEN LARGEST HOLDINGS

For the Fiscal Year Ending March 31, 2019.

Company	Shares	Fair Value	Percentage of Domestic Equity
Microsoft Corp.	20,420,194	\$ 2,408,357,680	3.3%
Apple, Inc.	11,729,132	2,227,948,623	3.0
Amazon.com, Inc.	1,049,806	1,869,442,035	2.6
Alphabet, Inc. - Class C	938,721	1,101,410,737	1.5
Facebook, Inc.	6,551,513	1,092,071,702	1.5
Berkshire Hathaway, Inc. - Class B	5,175,424	1,039,690,927	1.4
Johnson & Johnson	6,981,011	975,875,528	1.3
Alphabet, Inc. - Class A	825,199	971,168,451	1.3
Exxon Mobil Corp.	10,783,677	871,321,102	1.2
J.P. Morgan Chase & Company	8,127,725	822,769,602	1.1

Note: A detailed listing of the New York State and Local Retirement System's assets as of March 31, 2019 is on our website at www.osc.state.ny.us.

FIXED INCOME PORTFOLIO AND COMPARISON

As of March 31, 2019.

Sector	Fair Value (Dollars in Millions)	Fair Value Percentage	Effective Duration	Current Yield
Treasury	\$ 9,665.7	30.2%	7.80	2.20%
Federal Agency	46.2	0.1	4.99	2.66
Corporate	11,455.5	35.8	6.91	3.80
Asset-Backed	992.1	3.1	3.19	3.56
Commercial Mortgage-Backed	1,595.3	5.0	4.82	3.50
Mortgage-Backed	5,371.6	16.8	3.79	3.84
Collateralized Loan Obligations	2,740.1	8.6	0.09	4.13
Municipal Bonds	131.2	0.4	6.10	4.92
Total	\$ 31,997.8	100.0%	5.51	3.30%
Treasury Inflation-Protected Securities (TIPS)	\$ 7,740.5		7.22	1.39%
Externally Managed Funds:				
Advent Capital	\$ 389.6		3.30	2.11%
BlackRock	\$ 2,419.8		2.35	5.79%
DoubleLine Capital	\$ 256.0		14.20	2.65%
Neuberger Berman	\$ 1,783.2		3.60	5.44%
New Century Advisors	\$ 257.7		7.92	0.95%
Semper Capital	\$ 292.4		3.21	4.00%
Smith Graham	\$ 514.7		3.85	3.00%

FIXED INCOME PERFORMANCE

As of March 31, 2019.

	Annualized Rate of Return		
	1 Year	3 Years	5 Years
Common Retirement Fund — Internal Core	4.87%	3.14%	3.31%
Treasuries	4.44	0.67	2.31
Agencies	4.55	1.74	2.25
Corporate Bonds	5.32	4.11	4.08
Municipal Bonds	5.99	4.79	N/A
Asset-Backed	4.17	3.03	2.36
Commerical Mortgage-Backed	5.29	2.53	2.71
Mortgage-Backed	4.36	2.22	2.89
Collateralized Loan Obligations	2.81	4.65	N/A
Bloomberg Barclays U.S. Aggregate Bond Index	4.48%	2.03%	2.74%
Common Retirement Fund — Internal TIPS	2.76%	1.77%	2.16%
Bloomberg Barclays U.S. TIPS Index	2.70%	1.70%	1.94%

FIXED INCOME PORTFOLIO — TEN LARGEST HOLDINGS

As of March 31, 2019.

Issue	Fair Value (Dollars in Millions)	Percentage of Fixed Income
Treasury Inflation Indexed Securities Due 1/15/25	\$ 869.4	2.11%
Treasury Inflation Indexed Securities Due 4/15/29	806.2	1.96
Treasury Bonds Due 11/30/2021	715.6	1.74
Treasury Inflation Indexed Securities Due 7/15/19	616.7	1.50
Treasury Inflation Indexed Securities Due 2/15/46	560.4	1.36
Treasury Inflation Indexed Securities Due 4/15/28	518.4	1.26
Treasury Bonds Due 8/15/2045	463.6	1.13
Treasury Bonds Due 2/15/2039	424.9	1.03
Treasury Inflation Indexed Securities Due 1/15/26	417.7	1.02
Treasury Inflation Indexed Securities Due 2/15/42	388.0	0.94
Total	\$ 5,781.0	14.05%

REAL ESTATE PORTFOLIO

As of March 31, 2019.

	Equity Amount	Percentage	Mortgage Amount	Percentage
Property Diversification				
Industrial/R&D	\$ 2,715,739,975	17.3%	\$ –	0.0%
Land for Development	94,187,513	0.6	–	0.0
Lodging	361,052,135	2.3	–	0.0
Office	4,583,792,327	29.2	92,243,793	10.3
Other*	2,260,500,326	14.4	–	0.0
Residential	1,993,635,704	12.7	471,676,238	52.6
Retail	3,689,010,948	23.5	333,073,214	37.1
Total	\$ 15,697,918,928	100.0%	\$ 896,993,245	100.0%
Regional Diversification				
Northeast	\$ 3,500,635,921	22.3%	\$ 896,993,245	100.0%
Mideast	1,240,135,595	7.9	–	0.0
Southeast	1,177,343,920	7.5	–	0.0
Southwest	1,758,166,920	11.2	–	0.0
Midwest	800,593,865	5.1	–	0.0
Mountain	408,145,892	2.6	–	0.0
Pacific	3,908,781,813	24.9	–	0.0
Non-U.S.	2,904,115,002	18.5	–	0.0
Total	\$ 15,697,918,928	100.0%	\$ 896,993,245	100.0%

Note: Equity and mortgage amounts are based on the fair value of the Fund's full real estate portfolio.

* Other includes alternative property types (e.g., self storage, medical offices, data centers, student housing).

These figures may not agree with the audited statements due to timing and classification differences made for investment management purposes.

OPPORTUNISTIC REAL ESTATE

Number of Active Partnerships	Capital Committed (Dollars in Millions)	Capital Contributed (Dollars in Millions)	Current Fair Value (Dollars in Millions)	Cumulative Distributions (Dollars in Millions)	Total Value / Exposure (Dollars in Millions)
82	\$ 15,869.7	\$ 11,629.5	\$ 4,414.4	\$ 10,637.0	\$ 15,051.4

These figures may not agree with the audited statements due to timing and classification differences made for investment management purposes.

ALTERNATIVE INVESTMENTS SUMMARY

As of March 31, 2019.

	Number of Partnerships	Capital Committed	Capital Contributed	Fair Value	Cumulative Distributions	Total Value
Private Equity Funds						
Corporate Finance/Buyout	144	\$ 27,663,332,153	\$ 21,496,555,455	\$ 10,249,976,655	\$ 22,444,734,607	\$ 32,694,711,262
Co-Investment	19	3,524,512,387	1,978,725,375	1,412,834,687	1,310,420,680	2,723,255,367
Distressed/Turnaround	17	2,244,040,178	1,700,728,874	663,861,141	1,666,757,865	2,330,619,006
Fund of Funds	40	7,957,785,393	7,600,390,928	2,046,384,131	8,284,962,099	10,331,346,230
Growth Equity	36	5,322,053,540	4,379,024,194	3,004,462,469	3,482,738,373	6,487,200,842
Special Situations	29	5,017,791,081	4,051,326,706	1,798,492,769	3,357,062,778	5,155,555,547
Venture Capital	32	1,100,798,060	931,137,425	523,913,223	715,687,100	1,239,600,323
Other	N/A	N/A	51,052,175	51,052,175	N/A	51,052,175
Total Private Equity	317	\$ 52,830,312,792	\$ 42,188,941,132	\$ 19,750,977,250	\$ 41,262,363,502	\$ 61,013,340,752
Absolute Return Strategy Funds						
Equity Long-Bias	4	N/A	N/A	\$ 2,271,196,590	N/A	\$ 2,271,196,590
Equity Long-Short	6	N/A	N/A	825,414,051	N/A	825,414,051
Event Driven	14	N/A	N/A	1,231,956,248	N/A	1,231,956,248
Fund of Funds	4	N/A	N/A	766,905,826	N/A	766,905,826
Quantitative	1	N/A	N/A	136,179,351	N/A	136,179,351
Relative Value	2	N/A	N/A	567,240,800	N/A	567,240,800
Structured Credit	2	N/A	N/A	541,119,033	N/A	541,119,033
Tactical Trading	6	N/A	N/A	1,472,157,453	N/A	1,472,157,453
Total Absolute Return Strategy	39			\$ 7,812,169,352		\$ 7,812,169,352
Opportunistic Funds	24	\$ 6,609,935,720	\$ 4,076,497,463	\$ 2,833,785,227	\$ 2,122,102,558	\$ 4,955,887,785
Real Assets	13	\$ 4,407,625,000	\$ 2,010,363,291	\$ 2,220,026,055	\$ 223,618,259	\$ 2,443,644,314
Note: The total figures include the Fund's private equity investments and other investments through the New York Business Development Corporation (NYBDC).						

PUBLIC EQUITY MANAGEMENT FEES

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees	Incentive Fees	Total
Acadian Asset Management, LLC	\$ 6,781,581	\$ –	\$ 6,781,581
AQR Capital Management, LLC	2,595,758	–	2,595,758
Ariel Investments, LLC	943,224	–	943,224
Aronson + Johnson + Ortiz, LP	865,026	–	865,026
Artisan Partners, LP	5,434,200	–	5,434,200
Baillie Gifford Overseas, Ltd.	5,817,072	–	5,817,072
Baring International Investment, Ltd.	3,121,831	–	3,121,831
BlackRock Institutional Trust Company, NA	4,279,036	–	4,279,036
Brandes Investment Partners, LP	3,062,120	–	3,062,120
Brown Capital Management, Inc.	9,205,791	–	9,205,791
Capital Guardian Trust Company	2,167,840	7,683,957	9,851,797
Channing Capital Management, LLC	1,728,029	–	1,728,029
Consilium Frontier Equity Fund, LP	176,244	–	176,244
Eagle Capital Management, LLC	7,497,817	–	7,497,817
EARNEST Partners, LLC	3,906,021	–	3,906,021
Fiera Capital, Inc.	2,406,401	–	2,406,401
First Pacific Advisors, LLC	829,961	–	829,961
FIS Group, Inc.*	4,915,511	–	4,915,511
Generation Investment Management, LLP	11,337,025	23,663,271	35,000,296
Genesis Investment Management, LLP	5,337,497	–	5,337,497
Global Alpha Capital Management, Ltd.	138,316	–	138,316
Goldman Sachs Asset Management	1,420,287	–	1,420,287
Goldman Sachs Asset Management *	19,495,660	–	19,495,660
GQG Partners, LLC	2,467,737	–	2,467,737
Iridian Asset Management, LLC	2,424,832	–	2,424,832
Leading Edge Investment Advisors, LP*	3,229,889	–	3,229,889
Mondrian Investment Partners, Inc.	5,068,821	–	5,068,821
Morgan Stanley Emerging Markets Fund, Inc.	8,291,705	–	8,291,705
Morgan Stanley Investment Management, Inc.	1,628,635	–	1,628,635
Palisade Capital Management, LLC	1,637,562	–	1,637,562
Penn Capital Management Company, Inc.	1,947,036	–	1,947,036
Progress Investment Management Company*	7,315,127	–	7,315,127
Quantitative Management Associates, LLC	4,345,319	–	4,345,319
Rockefeller & Company Asset Management	2,318,609	–	2,318,609
Russell Investments Group, LLC	2,554,836	–	2,554,836
T. Rowe Price Associates, Inc.	5,432,025	–	5,432,025
Templeton Investment Counsel, LLC	4,076,393	–	4,076,393
Wellington Management Company, LLP	7,359,853	–	7,359,853
Total	\$ 163,560,627	\$ 31,347,228	\$ 194,907,855

* Represents Fund of Funds relationship and includes sub-manager fee payments.

PUBLIC EQUITY COMMISSIONS — INTERNALLY MANAGED

For the Fiscal Year Ended March 31, 2019.

Broker	Shares	Commission \$ U.S.
Barclays Capital, Inc.	10,193,436	\$ 103,883
Bloomberg Tradebook, LLC	1,094,871	10,949
BTIG, LLC	8,444,750	84,448
Citigroup Global Markets, Inc.	10,476,728	104,767
Cowen & Company, LLC	9,350,904	93,509
Goldman Sachs & Company	9,455,185	94,552
Great Pacific Securities, Inc.	17,540,403	175,404
Instinet	11,313,761	113,138
Investment Technology Group	7,245,650	72,457
J.P. Morgan Securities, LLC	12,184,051	95,685
Loop Capital Markets, LLC	17,601,363	176,014
Merrill Lynch Pierce Fenner & Smith, Inc.	9,249,599	92,496
Morgan Stanley & Company, Inc.	10,088,604	100,886
Sanford C. Bernstein & Company, LLC	9,147,381	91,474
Siebert Cisneros Shank & Company, LLC	16,800,942	168,009
Virtu Americas, LLC	9,685,937	96,819
Weeden & Company	8,564,359	85,644
Williams Capital Group, LP	16,650,089	166,501
Total	195,088,013	\$ 1,926,635

PUBLIC EQUITY COMMISSIONS — EXTERNALLY MANAGED

For the Fiscal Year Ended March 31, 2019.

Broker	Shares	Commission \$ U.S.
Abel Noser Corp.	1,456,823	\$ 60,243
ABG Sundal Collier, Inc.	798,658	8,466
Academy Securities, Inc.	104,599	2,092
Allen & Company, Inc.	13,958	236
Andes Capital Group, LLC	21,520	434
Arqaam Securities, LLC	175,526	6,898
Atlantic Equities, LLP	17,100	579
Auerbach Grayson & Company, Inc.	6,826,599	15,987
Axis Capital, Ltd.	174,964	1,361
B. Riley FBR, Inc.	1,007,944	31,062
Baader Bank AG	53,703	4,627
Baird, Robert W. & Company, Inc.	4,107,754	134,598
Banco BICE	6,904	106
Banco Bradesco S.A.	243,783	4,231
Banco BTG Pactual S.A.	388,476	5,580
Banco Itau	717,900	13,542
Banco Santander	2,567,911	9,284
Bank of New York Mellon Corp.	425,411	8,006
Bank Vontobel AG	10,926	838
Bankhaus Lampe KG	174,500	6,315
Banque Degroof Petercam S.A.	3,232	112
Barclays Capital, Inc.	18,808,728	284,172
Barrington Research Associates, Inc.	830	33
Bay Crest Partners, LLC	571,805	10,064
Bell Potter Securities, Ltd.	871,047	941
Berenberg Bank	3,443,318	47,588
Blair, William & Company	3,082,679	108,297
Bloomberg Tradebook, LLC	476,561	3,574
BMO Capital Markets Corp.	2,190,924	66,272
BNP Paribas Securities Corp.	7,136,778	96,456
Boenning & Scattergood, Inc.	15,899	636
Brockhouse & Cooper, Inc.	26,667,839	45,463
BTIG, LLC	14,299,468	228,431
Buckingham Research Group, Inc.	249,476	11,772
C.L. King & Associates, Inc.	347,422	12,049
Cabrera Capital Markets, Inc.	3,536,234	45,235
Canaccord Genuity Group, Inc.	329,087	1,066

Broker	Shares	Commission \$ U.S.
Cantor Fitzgerald & Company	2,908,636	\$ 108,386
Capital Institutional Services, Inc.	5,311,107	54,214
CastleOak Securities, LP	1,882,652	18,200
China International Corp.	4,449,000	7,422
CIBC World Markets Corp.	3,985,432	20,216
CIMB Securities	468,600	950
Citadel Securities Institutional, LLC	2,884,153	14,421
Citibank	350,504	7,804
Citigroup Global Markets, Inc.	319,267,926	701,495
CJS Securities, Inc.	80,690	2,990
Clearview Trading Advisors, Inc.	225,116	714
CLSA Americas, LLC	6,219	249
Collins Stewart, LLC	1,803,632	71,785
Commercial Bank of Qatar, Ltd.	399,341	2,694
Commerzbank AG	111,500	4,078
Compass Point Research & Trading, LLC	76,513	3,061
Concept Capital Markets, LLC	167,702	4,176
Cornerstone Macro, LLC	319,247	10,726
Cowen and Company, LLC	12,696,511	313,562
Craig-Hallum Capital Group, LLC	1,150,000	32,902
Credit Agricole S.A.	3,488,676	68,082
Credit Lyonnais Securities, Inc.	168,573,105	335,280
Credit Suisse Securities, Ltd.	314,150,361	798,355
Crest Depository, Ltd.	170,487	177
Cuttone & Company, Inc.	3,000	30
CV Brokerage, Inc.	67,133	2,014
D. Carnegie & Company AB	835,943	14,974
D.A. Davidson & Company, Inc.	185,643	6,019
Daiwa Capital Markets America, Inc.	16,070,543	93,631
Danske Bank A/S	1,019,010	13,714
Davy Securities, Ltd.	481,090	15,395
Deutsche Bank Securities, Inc.	289,471,756	600,242
Divine Capital Markets, LLC	78,200	1,948
DNB ASA	22,647	669
Dougherty & Company, LLC	433,867	9,630
Dowling & Partners Securities, LLC	169,200	6,768
Drexel Hamilton, LLC	24,962	164

PUBLIC EQUITY COMMISSIONS — EXTERNALLY MANAGED

CONTINUED

Broker	Shares	Commission \$ U.S.
Edelweiss Securities	888,717	\$ 26,111
Erste Bank	99,781	5,257
Evans and Partners Pty., Ltd	14,808	282
Evercore ISI	8,046,947	152,318
Exane S.A.	10,825,955	127,362
FBN Securities, Inc.	2,641	106
Fidelity Capital Markets	695,909	7,502
First Manhattan Company	14,027	710
First New York Securities, LLC	139,255	2,377
Fox River Execution Technology, LLC	724,436	2,954
Gabelli & Company	24,934	1,247
Goldman Sachs & Company	193,049,663	547,482
Goodbody Stockbrokers	611,608	5,454
Guggenheim Securities, LLC	51,437	762
Guzman & Company	1,900,285	20,057
Haitong International Securities Company, Ltd.	17,000	81
Helvea S.A.	139,141	10,723
HSBC Securities, Inc.	205,435,831	271,760
ICICI Brokerage Services Mumbai	464,710	2,607
IFS Securities	77,869	1,947
Imperial Capital, LLC	18,485	739
India Infoline, Ltd.	619,833	5,151
Instinet	134,288,863	567,660
Interacciones Casa de Bolsa S.A. de C.V	281,850	706
INTL FCStone Financial, Inc.	933	23
Investec Henderson Crosthwaite Securities	844,240	8,001
Investment Technology Group	91,201,184	550,730
Ipopema Securities S.A.	18,112	683
Is Yatirim Menkul Degerler A.S.	3,376,497	5,927
Ivy Securities, Inc.	872,254	9,565
J.P. Morgan Securities, LLC	85,914,135	710,894
Janney Montgomery Scott, Inc.	54,009	2,160
Jefferies & Company, Inc.	88,097,347	521,074
JMP Securities	772,341	22,607
JNK Securities, Inc.	845,735	9,297
Johnson Rice & Company, LLC	440,712	12,652
JonesTrading Institutional Services, LLC	17,819,085	620,212
Kallpa Securities S.A.B.	8,655	1,129

Broker	Shares	Commission \$ U.S.
KAS Bank N.V.	77,707	\$ 1,124
KBC Securities	45,322	3,396
Keefe Bruyette & Wood, Inc.	1,701,986	36,130
Kempen & Company N.V.	16,250	431
Kepler Cheuvreux S.A.	1,608,436	35,319
KeyBanc Capital Markets, Inc.	1,507,412	54,902
KGI Securities Company, Ltd.	585,000	2,312
Korea Investment & Securities Company	89,267	4,089
Leerink Partners, LLC	304,975	8,072
Liberum Capital, Ltd.	1,224,518	4,252
Liquidnet, Inc.	100,618,013	648,603
Longbow Securities, LLC	192,865	8,200
Loop Capital Markets, LLC	38,184,068	382,429
Luminex Trading & Analytics, LLC	1,643,205	8,348
Macquarie Group, Ltd.	127,114,640	322,629
Mainfirst Bank AG	468,942	12,194
Maxim Group	119,611	2,439
Maybank Kim Eng Securities Pte, Ltd.	1,764,212	9,840
Mediobanca S.p.A.	793,199	18,950
Merrill Lynch Pierce Fenner & Smith, Inc.	101,178,242	664,285
Mirabaud Securities, LLP	642,200	10,042
Mischler Financial Group, Inc.	8,204,909	59,243
Mitsubishi UFJ Securities Holdings Company, Ltd.	904,000	21,144
Mizuho Securities	3,702,252	105,900
MKM Partners, LLC	161,852	5,345
Monness, Crespi, Hardt & Company, Inc.	436,384	17,559
Morgan Stanley & Company, Inc.	572,584,885	1,177,161
National Bank Financial, Inc.	1,645	25
NBC Clearing Services, Inc.	2,494,219	16,208
Needham & Company, LLC	1,594,550	63,842
Nomura Securities International, Inc.	14,098,102	68,353
Nordea Bank AB	434,509	13,194
North South Capital, LLC	1,189,479	29,300
Northcoast Research Partners, LLC	175,534	7,085
Northern Trust Company	51,100	917
Northland Securities, Inc.	97,337	3,606
Numis Securities, Ltd.	4,081,300	28,739

PUBLIC EQUITY COMMISSIONS — EXTERNALLY MANAGED

CONTINUED

Broker	Shares	Commission \$ U.S.
Oddo Securities	522,758	\$ 24,075
Olivetree Financial, LLC	1,406,988	10,441
O'Neil, William & Company, Inc.	198,070	6,367
Oppenheimer & Company, Inc.	1,110,850	31,043
Panmure Gordon & Company	399,560	707
Parel Paris	397,487	7,422
Pavilion Global Markets, Ltd.	675,120	5,646
Peel Hunt, LLP	5,319,054	1,185
Penserra Securities, Inc.	36,368,545	249,939
Pershing, LLC	4,047,572	37,439
Pickering Energy Partners, Inc.	95,286	2,617
Piper Jaffray	1,253,636	40,614
Precision Securities, LLC	689,800	5,863
PT Danareksa Sekuritas	6,595,400	7,057
Raymond James & Associates, Inc.	5,249,062	156,387
RBC Capital Markets	14,107,925	227,253
Redburn Partners, LLP	7,688,588	72,129
Renaissance Capital Investments, Inc.	1,582	32
Rosenblatt Securities, Inc.	5,512,370	53,720
Roth Capital Partners, Inc.	207,900	6,686
Russell Implementation Services, Inc.	257,425	2,574
Russell Investments Group, LLC	3,779,060	37,791
Samsung Securities	340,600	20,749
Samuel A. Ramirez & Company, Inc.	193,690	1,136
Sandler O'Neill & Partners, LP	561,406	11,084
Sanford C. Bernstein & Company, LLC	81,871,919	289,131
SBICAP Securities, Ltd.	26,193	566
Scotia Capital, Inc.	4,356,601	12,969
Seaport Group Securities, LLC	1,266,936	35,519
SEB Copenhagen	790,935	18,883
SG Americas Securities, LLC	2,909,324	19,746
Shenyin & Wanguo Securities Company, Ltd	9,289,415	4,815
Shinhan Investment Corp.	1,546	441
Sidoti & Company, LLC	447,553	13,684
SinoPac Securities Corp.	12,249	122
Skandinaviska Enskilda Banken AB	613,167	12,852
SMBC Nikko Securities	1,986,566	51,889

Broker	Shares	Commission \$ U.S.
Societe Generale S.A.	51,882,999	\$ 83,650
State Street Global Markets, LLC	109,113	2,141
Stephens, Inc.	1,844,923	70,806
Stifel Nicolaus & Company, Inc.	3,843,593	105,629
Strategas Securities, LLC	416,186	15,981
Stuart Frankel & Company, Inc.	118,194	4,728
Sturdivant & Company, Inc.	72,200	1,805
SunTrust Robinson Humphrey, Inc.	1,471,730	49,790
Susquehanna Financial Group, LLLP	57,332	2,125
Svenska Handelsbanken AB	741,106	15,441
TD Securities, Inc.	700	16
Telsey Advisory Group, LLC	293,352	11,240
The Benchmark Company, LLC	53,069	1,905
Themis Trading, LLC	2,931,110	33,034
Tourmaline Partners, LLC	1,240	19
UBS Securities, LLC	412,312,278	1,215,002
UOB Kay Hian Pte, Ltd.	3,072,046	3,270
Virtu Americas, LLC	2,468,360	37,044
Wall Street Access	435,933	3,955
Wedbush Securities, Inc.	851,056	28,306
Weeden & Company	4,214,594	47,824
Wells Fargo Advisors	1,600	40
Wells Fargo Securities, LLC	3,173,973	86,409
Williams Capital Group, LP	4,110,046	91,724
Wilson HTM, Ltd.	41,835	125
Wolfe Research Securities	984,165	32,371
Woori Investment & Securities Company, Ltd.	355,557	2,565
XP Investimentos	722,000	4,297
Yamner & Company, Inc.	7,824	78
Total	3,791,047,993	\$ 16,147,592

GLOBAL FIXED INCOME MANAGEMENT FEES

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees	Incentive Fees	Total
Advent Capital Management, LLC	\$ 1,245,050	\$ -	\$ 1,245,050
BlackRock Institutional Trust Company, NA	8,035,804	2,666,290	10,702,094
DoubleLine Capital, LP	613,296	-	613,296
Neuberger Berman Fixed Income, LLC	3,970,036	-	3,970,036
New Century Advisors, LLC	221,981	-	221,981
Semper Capital Management, LP	1,001,695	-	1,001,695
Smith Graham & Company Investment Advisors, LP	857,910	-	857,910
Total	\$ 15,945,772	\$ 2,666,290	\$ 18,612,062

LONG-TERM DOMESTIC BOND TRANSACTIONS — INTERNALLY MANAGED

For the Fiscal Year Ended March 31, 2019.

Summarized by Broker or Direct Issuer.

Long-Term Broker	Par \$ U.S.
Academy Securities, Inc.	\$ 3,000,000
Bank of America Merrill Lynch	1,309,396,254
Barclays Capital, Inc.	1,187,298,326
Citigroup Global Markets, Inc.	1,703,035,000
Credit Suisse Securities, Ltd.	671,655,000
Deutsche Bank Securities, Inc.	927,523,000
Development Corp. for Israel	20,000,000
Goldman Sachs & Company	1,410,358,960
Great Pacific Securities, Inc.	1,744,111,000
HSBC Securities, Inc.	858,600,000
J.P. Morgan Securities, LLC	743,392,741
Mischler Financial Group, Inc.	2,500,000
Morgan Stanley & Company, Inc.	2,897,811,731
RBC Capital Markets	1,090,781,750
Samuel A. Ramirez & Company, Inc.	123,310,000
Scotia Capital (USA), Inc.	985,000,000
Siebert Cisneros Shank & Company, LLC	555,342,000
SunTrust Robinson Humphey, Inc.	305,638,000
Toronto Dominion Securities (USA), Inc.	980,210,000
UBS Securities, LLC	442,056,014
Wells Fargo Securities, LLC	1,946,007,000
Williams Capital Group, LP	1,096,925,000
Total	\$ 21,003,951,776

LONG-TERM DOMESTIC BOND TRANSACTIONS — EXTERNALLY MANAGED

For the Fiscal Year Ended March 31, 2019.

Summarized by Broker or Direct Issuer.

Long-Term Broker	Par \$ U.S.
Amherst Pierpont Securities, LLC	\$ 7,640,000
Bank of America Merrill Lynch	182,281,236
Barclays Capital, Inc.	280,747,175
Blaylock & Company, Inc.	14,645,000
BMO Capital Markets Corp.	10,832,162
BNP Paribas Securities Corp.	74,398,000
BNY Mellon Capital Markets, LLC	2,100,000
BTIG, LLC	11,095,000
Cabrera Capital Markets, Inc.	21,255,000
Cantor Fitzgerald & Company	1,591,000
Capital Institutional Services, Inc.	176,820,000
Citadel Securities Institutional, LLC	9,700,000
Citigroup Global Markets, Inc.	95,229,239
Credit Lyonnais Securities, Inc.	26,350,000
Credit Suisse Securities, Ltd.	34,355,000
Deutsche Bank Securities, Inc.	88,750,940
First Tennessee Bank	3,125,455
First Tryon Securities, LLC	900,000
GMP Securities, LLC	12,874,500
Goldman Sachs & Company	89,202,441
HSBC Securities, Inc.	38,800,000
INTL FCStone Financial, Inc.	1,678,412
J.P. Morgan Securities, LLC	141,277,161
Jefferies & Company, Inc.	84,838,000
KeyBanc Capital Markets, Inc.	1,228,559
Loop Capital Markets, LLC	8,120,000
MarketAxess Corp.	525,000
Mitsubishi UFJ Securities (USA), Inc.	493,975
Mizuho Securities USA, Inc.	6,338,000
Morgan Stanley & Company, Inc.	69,061,936
NatWest Markets Securities, Inc.	11,110,000
Nomura Securities International, Inc.	258,109,000
Oppenheimer & Company, Inc.	4,729,000
Raymond James & Associates, Inc.	4,784,000
RBC Capital Markets	27,821,000
RBS Securities, Inc.	23,440,000

Long-Term Broker	Par \$ U.S.
Scotia Capital (USA), Inc.	\$ 14,875,000
Societe Generale Securities Corp.	73,280,000
Stifel Nicolaus & Company, Inc.	236,275
SunTrust Robinson Humphrey, Inc.	660,000
Toronto Dominion Securities (USA), Inc.	47,220,000
UBS Securities, LLC	984,000
Wells Fargo Securities, LLC	190,214,109
Total	\$ 2,153,715,575

SHORT-TERM DOMESTIC BOND TRANSACTIONS — INTERNALLY MANAGED

For the Fiscal Year Ended March 31, 2019.

Summarized by Broker or Direct Issuer.

Short-Term Broker	Par \$ U.S.
Bank of America Merrill Lynch	\$ 13,154,188,000
BNY Mellon Capital Markets, LLC	18,791,121,000
Barclays Capital, Inc.	292,237,000
Citigroup Global Markets, Inc.	24,440,867,000
Credit Suisse Securities, Ltd.	5,808,433,000
Deutsche Bank Securities, Inc.	89,355,000
Goldman Sachs & Company	219,927,000
Great Pacific Securities, Inc.	13,095,712,000
J.P. Morgan Securities, LLC	13,748,529,000
Morgan Stanley & Company, Inc.	131,750,000
RBC Capital Markets	7,145,657,000
Scotia Capital (USA), Inc.	50,000,000
Toronto Dominion Securities (USA), Inc.	129,947,000
Toyota Motor Credit Corp.	200,000,000
UBS Securities, LLC	50,000,000
Wells Fargo Securities, LLC	103,687,000
Williams Capital Group, LP	55,000,000
Total	\$ 97,506,410,000

REAL ESTATE MANAGEMENT AND INCENTIVE FEES (EXPENSED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees	Incentive Fees	Total
ARA Fund Management, Ltd.	\$ 1,137,500	\$ –	\$ 1,137,500
ARES Management	8,546,881	–	8,546,881
Artemis Real Estate Partners, LLC	3,490,923	–	3,490,923
Avanath Capital Management, LLC, Series C	625,000	–	625,000
BCP Strategic Partners (Beacon)	2,344,093	–	2,344,093
Blackstone Real Estate Advisors	6,874,654	–	6,874,654
Brookfield Strategic Real Estate Partners II GP, LP	3,582,313	–	3,582,313
Carlyle Group	618,662	–	618,662
Cherokee Advisers, LLC	258,141	–	258,141
CIF-H GP, LLC (Cayuga Lake Fund, LP)	461,065	–	461,065
CIM Group, LP	3,499,616	–	3,499,616
Clarion Partners	3,602,707	–	3,602,707
Franklin Templeton Institutional, LLC (Lake Montauk)	1,164,362	–	1,164,362
Heitman Capital Management, LLC	6,452,468	651,231	7,103,699
GreenOak Real Estate Advisors	1,952,525	–	1,952,525
HL Lake Hempstead GP, LLC	71,524	–	71,524
HL Lake Success GP, LLC	109,716	–	109,716
J.P. Morgan Investment Management, Inc.	6,316,654	–	6,316,654
Jamestown Premier GP, LP	262,601	–	262,601
LaSalle Investment Management, Inc.	2,648,104	–	2,648,104
MetLife Investment Advisors, LLC	668	–	668
Morgan Stanley Group	58,384	–	58,384
NIAM AB	1,878,662	–	1,878,662
Rockpoint Real Estate Funds	722,947	–	722,947
Westbrook Realty Management	2,782,243	–	2,782,243
Total	\$ 59,462,413	\$ 651,231	\$ 60,113,644

REAL ESTATE MANAGEMENT AND INCENTIVE FEES (CAPITALIZED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees	Incentive Fees	Total
ACA Advisors (Aetos)	\$ 33,051	\$ –	\$ 33,051
ARA Fund Management, Ltd.	28,622	–	28,622
ARES Management	804,005	–	804,005
Asana Partners, LP	1,328,861	–	1,328,861
Avanath Capital Management, LLC, Series C	16,527	–	16,527
BCP Strategic Partners (Beacon)	385,112	–	385,112
Blackstone Real Estate Advisors	8,456,640	–	8,456,640
City Investment Fund Associates, LLC	26,250	–	26,250
Clarion Partners	1,709,213	–	1,709,213
Colony Advisors, LLC	151,943	–	151,943
Exeter Europe	1,289,312	–	1,289,312
Heitman Capital Management, LLC	1,749,517	–	1,749,517
J.P. Morgan Investment Management, Inc.	711,685	–	711,685
Kimex	60,184	–	60,184
Landmark	688,529	–	688,529
LaSalle Investment Management, Inc.	2,172,233	2,445,246	4,617,479
LSP (Lone Star)	5,537	–	5,537
MetLife Investment Advisors, LLC	4,760,366	–	4,760,366
Metropolitan Workforce Housing Fund, LLC	3,746	–	3,746
NIAM AB	1,432,546	–	1,432,546
PGIM Fund Management Ltd.	998,605	–	998,605
Prologis, LP	5,367,824	–	5,367,824
Stockbridge Real Estate Funds	651,680	–	651,680
UBS Realty Investors LLC	2,443,696	–	2,443,696
Total	\$ 35,275,684	\$ 2,445,246	\$ 37,720,930

PRIVATE EQUITY MANAGEMENT FEES (EXPENSED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees
57 Stars, LLC	\$ 671,192
Access Capital Advisors, LLC	539,279
ACON Investments, LLC	2,688,846
Affinity Equity Partners	4,658,183
African Capital Alliance Limited	1,698,802
Aisling Capital, LLC	61,898
Apollo Management, LP	10,304,916
Ares Management, LP	6,205,906
Ascent Biomedical Ventures	222,478
Asia Alternatives Management, LLC	2,523,960
Blackstone Group	9,266,881
Bridgepoint Capital Ltd.	4,407,329
Brookfield Asset Management	7,841,364
Carlyle Group	666,937
CCMP Capital Associates III, LP	2,204,089
Centerbridge Partners, LP	2,039,323
Cinven Capital Management	3,508,977
Clearlake Capital Group, LP	1,359,108
Contour Venture Partners	646,450
Credit Suisse First Boston	314,778
CVC Capital Partners	13,264,790
DeltaPoint Capital Management, LLC	164,734
Draper Fisher Jurvetson	189,040
Dyal Capital Partners	4,267,556
EQT Partners	6,264,665
Fairview Capital Partners, Inc.	632,049
Falcon Investment Advisors, LLC	242,239
Farol Asset Management, LP	1,651,865
FIMI Opportunity Funds	163,636
Founders Equity, Inc.	271,591
FountainVest Partners (Asia), Ltd.	938,504
Freeman, Spogli & Company	1,311,213
GenNx360 Capital Partners	1,408,345
Graycliff Partners LP	275,130
Hamilton Lane Advisors, LLC	4,108,286
HarbourVest Partners, LLC	1,163,234
Helios Investment Partners	2,000,000

Manager	Management Fees
Hellman & Friedman Investors, Inc.	\$ 2,970,281
High Peaks Venture Partners	1,489,767
Hony Capital	3,984,463
Hudson Clean Energy Partners, LP	1,054,020
ICV Partners, LLC	2,838,639
Insight Partners, LLC	2,200,000
J.P. Morgan Partners, LLC	1,792,058
KKR & Company, LP	2,304,630
KSL Capital Partners, LLC	4,254,244
Leonard Green & Partners, LP	1,277,879
Levine Leichtman Capital Partners, Inc.	132,816
Lindsay Goldberg & Company, LLC	6,356,670
Lion Capital, LLP	496,902
Muller & Monroe Asset Management, LLC	1,226,354
Neuberger Berman Group, LLC	1,232,459
Nordic Capital	1,899,676
Paladin Capital Group	159,636
Palladium Equity Partners	2,837,999
Patria Investments, Ltd	461,528
Performance Equity Management, LLC	859,652
Pine Brook Road Partners, LLC	1,908,806
Providence Equity Partners, LLC	1,732,310
RRJ Capital	1,805,378
Searchlight Capital Partners	4,808,812
Siris Capital Group, LLC	827,104
Snow Phipps Group, LLC	4,291,875
SoftBank Capital	432,999
Stepstone Group, LP	120,080
Summer Street Capital Partners, LLC	24,426
TA Associates Management, LP	2,991,703
Thoma Bravo, LLC	4,531,285
Thomas H. Lee Partners, LP	109,475
TPG Capital, LP	17,912,614
Trillium Group, LLC	202,906
Vista Equity Partners, LLC	22,129,364
Warburg Pincus, LLC	488,489
Total	\$ 204,294,872

PRIVATE EQUITY MANAGEMENT FEES (CAPITALIZED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees
Activate Venture Partners	\$ 190,549
Apollo Management, LP	429,196
Ardian	52
Ascent Biomedical Ventures	193,534
Bridgepoint Capital Ltd.	862
Centerbridge Partners, LP	324,518
Cerberus Capital Management, LP	8,181
Clearwater Capital Partners, LLC	1,056,127
Contour Venture Partners	159,545
CVC Capital Partners	(628)
First Albany, Inc.	125,558
Francisco Partners Management, L.P.	976,208
Gilde, LP	346,271
Hamilton Lane Advisors, LLC	1,564,442
HarbourVest Partners, LLC	860,392
High Peaks Venture Partners	245,019
IK Investment Partners	2,868,057
Institutional Venture Partners	848,961
JMI Equity	535,387
Leonard Green & Partners, LP	23,259
NCH Capital Inc.	905,682
Oaktree Capital Management, LP	1,610,171
Quadrangle Group, LLC	123,511
RRJ Capital	(13,839,110)
SAIF Partners	1,546,112
Softbank Capital	300,000
Stepstone Group, LP	20,305
Summer Street Capital Partners, LLC	47,662
TPG Capital, LP	13,755
Tribeca Venture Partners, LLC	733,309
VCFA Group	330,604
Warburg Pincus, LLC	1,147,533
Total	\$ 3,695,024

PRIVATE EQUITY — FEE, EXPENSE AND CARRIED INTEREST ANALYSIS

For the Fiscal Year Ended March 31, 2019.

Total Expenses		
Net Management Fees	\$	207,989,896
Partnership Expenses		<u>122,736,679</u>
Total Expenses	\$	330,726,575
Ratio — Total Expenses/Total Private Equity Allocation		0.81%
Total Profit Sharing (Carried Interest)		
Profit Sharing (Carried Interest)	\$	<u>313,874,150</u>
Total Profit Sharing	\$	313,874,150
Ratio — Total Profit Sharing/Total Actively Invested Private Equity Allocation		1.31%
Total Expenses + Profit Sharing (Carried Interest)		
Total Expenses	\$	330,726,575
Total Profit Sharing		<u>313,874,150</u>
Total Expenses and Profit Sharing (Carried Interest)	\$	644,600,725
Total Private Equity Allocation		
Unfunded Capital Commitments	\$	16,723,184,566
Net Asset Value (NAV) as of 3/31/2019		<u>19,750,977,250</u>
Distributions for FY 2019		<u>4,228,319,542</u>
Total Private Equity Allocation	\$	40,702,481,358
Ratio — Total Expenses + Profit Sharing/Total Private Equity Allocation		1.58%
Total Actively Invested Private Equity Allocation		
Net Asset Value (NAV) as of 3/31/2019	\$	19,750,977,250
Distributions for FY 2019		<u>4,228,319,542</u>
Total Actively Invested Private Equity Allocation	\$	23,979,296,792
Ratio — Total Expenses + Profit Sharing/Total Actively Invested Private Equity Allocation		2.69%

Note: The profit-sharing and partnership expenses were compiled based on information provided directly by the General Partner or calculated by the Fund's consultant applying the Fund's pro-rata ownership to carried interest and/or distribution and expense information provided in the Audited Financial Statements and Quarterly Financial Statements. Materials provided by General Partners consist of partners' capital statements, Institutional Limited Partners Association (ILPA) templates, and/or templates the consultant provided for the purposes of this analysis.

ABSOLUTE RETURN STRATEGY MANAGEMENT AND INCENTIVE FEES

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees	Incentive Fees	Total
Angelo, Gordon & Company, LP	\$ 1,833,573	\$ 1,365,244	\$ 3,198,817
Bain Capital, LP	1,560,687	–	1,560,687
Bridgewater Associates, LP	1,449,438	–	1,449,438
Brigade Capital Management, LLC	2,563,861	693,115	3,256,976
Caspian Capital Management, LLC	3,662,687	986,524	4,649,211
Cevian Capital, LLP	8,825,474	15,579,706	24,405,180
D.E. Shaw and Company, LP	15,320,116	15,917,618	31,237,734
Discovery Capital Management, LLC	2,665,614	–	2,665,614
Fortress Investment Group, LLC	478,807	–	478,807
Graticule Asset Management Asia, LP	4,864,234	–	4,864,234
HBK Capital Management, LP	4,055,039	2,238,433	6,293,472
Highfields Associates, LLC	2,911,297	–	2,911,297
Highland Capital Management, LP	265	–	265
Horizon Asset LLP	2,693,615	674,390	3,368,005
King Street Capital Management LP	3,558,227	72,184	3,630,411
Knighthood Capital Management LLC	2,746,573	–	2,746,573
Lansdowne Partners, Ltd	3,732,595	–	3,732,595
Mariner Investment Group LLC	1,083,254	449,792	1,533,046
Marshall Wace, LLP	5,452,826	9,319,417	14,772,243
Mezzacappa Management, LLC	16,287	–	16,287
OxFORD Asset Management, LLP	2,699,185	–	2,699,185
Pharo Management, LLC	3,324,514	(485,823)	2,838,691
Rock Creek Group, LP	3,221,997	–	3,221,997
Schultze Asset Management, LLC	91,142	549	91,691
Systematica Investments, Ltd	1,300,092	–	1,300,092
Tilden Park Capital Management LP	4,713,184	6,618,937	11,332,121
Triam Fund Management, LP	7,525,224	1,823,206	9,348,430
ValueAct Capital Management, LP	4,986,928	–	4,986,928
Total	\$ 97,336,735	\$ 55,253,292	\$ 152,590,027

OPPORTUNISTIC FUNDS MANAGEMENT AND INCENTIVE FEES (EXPENSED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees	Incentive Fees	Total
ADV Partners, Ltd.	\$ 5,498,288	\$ –	\$ 5,498,288
Blackstone Group, LP	5,453,022	5,309,493	10,762,515
Clearlake Capital Group, LP	736,502	–	736,502
Finisterre Capital, LLP	2,152,582	822,672	2,975,254
Hollis Park Partners, LP	87,500	–	87,500
Invesco, Ltd.	75,684	–	75,684
Landmark Partners, LLC	3,500,000	–	3,500,000
Pacific Alternative Asset Management Company, LLC	1,770,941	–	1,770,941
Oak Hill Advisors, LP	491,726	–	491,726
Pine Street Alternative Asset Management, LLC	–	12,011	12,011
Stellex Capital Management, LP	3,199,210	–	3,199,210
Strategic Value Partners, LLC	1,114,460	–	1,114,460
Orchard Global Asset Management, LLP	268,681	–	268,681
Värde Partners, Inc	1,250,000	–	1,250,000
TPG Capital, LP	5,967,626	5,836,970	11,804,596
Vivo Capital, LLC	358,463	–	358,463
Total	\$ 31,924,685	\$ 11,981,146	\$ 43,905,831

OPPORTUNISTIC FUNDS MANAGEMENT AND INCENTIVE FEES (CAPITALIZED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees
Landmark Partners, LLC	\$ 4,000,000
Varde Partners, Inc.	362,903
Total	\$ 4,362,903

REAL ASSETS MANAGEMENT FEES (EXPENSED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees
Brookfield Asset Management	\$ 3,218,161
Grain Management, LLC	2,695,055
I Squared Capital, LLC	4,868,532
Kayne Anderson Capital Advisors, LP	1,192,995
KKR & Company , LP	843,260
Meridiam	2,400,000
Morgan Stanley Investment Management, Ltd.	2,374,999
Patria Investments, Ltd.	2,062,500
Apollo Aviation Group, LLC	599,092
Stonepeak Infrastructure Partners, LP	3,093,851
Total	\$ 23,348,445

REAL ASSETS MANAGEMENT FEES (CAPITALIZED)

For the Fiscal Year Ended March 31, 2019.

Manager	Management Fees
Brookfield Asset Management	\$ 6,840
EQT Partners	316,735
IFM Investors, Ltd.	3,635,833
KKR & Company, LP	1,274,990
Pantheon Ventures, LP	2,357,236
TIAA	3,300,000
Total	\$ 10,891,634

CONSULTANT AND ADVISOR FEES

For the Fiscal Year Ended March 31, 2019.

Aksia, LLC	\$	600,000
Albourne America, LLC		366,667
Bank of New York Mellon		1,185,313
Bard Consulting, LLC		473,656
FX Transparency, LLC		35,000
Hamilton Lane Advisors, LLC		1,875,000
J.P. Morgan Asset Management, Inc.		8,863
McLagan Partners, Inc.		7,750
Mosaic Global Partners Inc.		312,500
Pavillion Alternatives Group, LLC		489,102
Pension Consulting Alliance, Inc.		225,000
Pine Street Alternative Asset Management LP		400,000
RV Kuhns & Associates, Inc.		1,070,000
Stockbridge Risk Management, Inc.		10,956
Townsend Group		426,503
Wilshire Associates, Inc.		80,395
Total	\$	7,566,704

Actuarial

CONTENTS

Statement of the Actuary	129
Actuarial Cost Method and Valuation	131
Elements of the Actuarial Valuation	133
Actuarial Valuation Balance Sheets	137
Local Government Employers' Final Contribution Rates for Select Plans	139
Contribution Rate Trends for Local Governments	141
Employer Contributions	144
Historical Trends (Rates as a Percentage of Salary, 1975 – 2020).....	146
Changes in Contributions	147
Assets and Accrued Liabilities.....	148
Solvency Test	149
Schedule of Active Member Data	150
Schedule of Retired Members and Beneficiaries.....	151

STATEMENT OF THE ACTUARY

September 30, 2019

As the Actuary for the Employees' Retirement System (ERS) and the Police and Fire Retirement System (PFRS), it is my duty to ensure that the New York State and Local Retirement System (the System) properly funds the benefits of members, retirees, and beneficiaries. A discussion of the plan provisions can be found at the beginning of the Notes to Basic Financial Statements. The System's funding policy is established by New York State Retirement and Social Security Law. The System has a funding objective of employer contributions that, over time, are a level percentage of payroll and accumulate assets over an employee's working lifetime sufficient to pay benefits as they become due.

The Actuarial Bureau annually generates actuarial valuations which determine the annual contributions required of employers. The most recent valuation was for valuation date April 1, 2018 and determined the employer contribution rates for February 1, 2020. A valuation relies on valuation date data for active members, retirees, and beneficiaries. Data for active members includes date of birth, salary, credited service, tier, and plan. For retired members and beneficiaries, data includes date of birth, monthly benefits and benefit option. In preparation for the valuation, we extensively validate the System's data by running reasonableness tests and accounting for every individual on a year-to-year basis. We also review the information contained in the financial statements.

For active members, the valuation projects expected benefits at retirement, death, disablement, and withdrawal based on estimated pay and service, as well as the member's plan benefit formula. For retirees, the valuation determines the present value of payments expected to be made for the retiree's and beneficiary's lifetimes.

Proper funding requires that liabilities and employer contribution rates be determined on the basis of reasonable actuarial assumptions and methods. The types of assumptions that must be made include both demographic (rates of employee mortality, disability, turnover, and retirement) and economic (interest rates, inflation, and salary growth). Therefore, valuations include assumptions about these uncertainties.

The Actuary performs annual experience studies, ascertaining how closely the System's experience is conforming to the assumptions. If significant differences occur that the Actuary believes may indicate permanent shifts, the Actuary may recommend assumption changes.

The System retains an external auditor to independently review its financial records every year. Furthermore, an Actuarial Advisory Committee meets annually to review the actuarial assumptions and the results of the actuarial valuation. The System also engages the services of an outside actuarial consultant to perform a review every five years; similarly, every five years, the System is audited by the New York State Department of Financial Services. Lastly, the Comptroller of the State of New York, in his role as sole trustee of the System, established an Office of Internal Audit to help fulfill his fiduciary objectives.

STATEMENT OF THE ACTUARY

CONTINUED

The April 1, 2017 valuation for determining the February 1, 2019 employer contribution rates found in this report was performed under my direction and supervision, using the assumptions adopted by the Comptroller, a summary of which is included later in this section. The assumptions and methods used for funding purposes meet the parameters set by Actuarial Standards of Practice.

I am responsible for all of the valuation results and other actuarial calculations contained in this report. In the Notes to Basic Financial Statements, I prepared the Net Pension Liability of Participating Employers. While I prepared the employer contribution rates that determined the 2019 employer billing, I did not prepare the Schedule of Employer Contributions. I prepared the following schedules in the Actuarial section: Actuarial Valuation Balance Sheets, Local Government Employers' Final Contribution Rates for Select Plans, Contribution Rate Trends for Local Governments, Employer Contributions, Historical Trends, Changes in Contributions, Assets and Accrued Liabilities, Solvency Test, Schedule of Active Member Data, and Schedule of Retired Members and Beneficiaries.

In addition to the funding valuation report for ERS and PFRS, separate reports are issued to provide financial reporting for NYSLRS in accordance with Governmental Accounting Standard Board (GASB) Statement No. 67. Reports containing the actuarial results of the financial reporting valuations are based upon the measurement date of March 31, 2019.

On the basis of the foregoing, I hereby certify that, to the best of my knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial practices which are consistent with the principles prescribed by the Actuarial Standards Board as well as the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries, of which I am a member.



Michael Dutcher, E.A., A.S.A., M.A.A.A.

Actuary

New York State and Local Employees' Retirement System

New York State and Local Police and Fire Retirement System

ACTUARIAL COST METHOD AND VALUATION

ACTUARIAL COST METHOD

An actuarial cost method is a procedure for allocating the costs of a retirement system to particular time periods. It does not determine how much a system will ultimately cost; rather, it determines the portion of the estimated total cost that is to be allocated to a particular year.

For 70 years, by virtue of applying the definition of normal cost found in New York State Retirement and Social Security Law, the actuarial funding method used by the System was the aggregate method (AGG). Chapter 210 of the Laws of 1990 changed the funding method to a modified projected unit credit (PUC) method beginning in the fiscal year ending March 31, 1991 (referred to as fiscal year 1991). This law was challenged and the challenge was upheld by the New York State Supreme Court. On appeal, both the Appellate Division and the New York State Court of Appeals unanimously agreed with the New York State Supreme Court. These decisions allowed the Comptroller to return to the aggregate funding method beginning with the 1995 fiscal year. To ease the transition in the Employees' Retirement System (ERS) and to help prevent budget crises among participating employers, the Comptroller devised a plan to phase-in non-GLIP (New York State Public Employees' Group Life Insurance Plan) rates beginning in the 1995 fiscal year when the rates were zero. The rates increased by 1.5 percent per year until 1999, when the transition would cease. However, due to excellent investment gains and favorable experience, almost all ERS employer bills were below the transition rates in 1997, and in 1998 all were below the transition rates, so the transition ceased in 1998.

The aggregate method is ultimately an amortization policy. All valuation gains and losses are amortized evenly over the remaining working lifetimes of the active membership. The fact that the method does not allow arbitrary amortization periods or increasing payments is useful in a public setting, as budgetary pressures can inspire a temptation to fund benefits over time frames that extend beyond the working lifetimes of the benefit recipients, and/or with back-loaded payments, which is not prudent and compromises intergenerational equity.

The "drawback" of the aggregate cost method is that it defines the accrued liability to be the actuarial value of assets. Thus the unfunded accrued liability is always zero, and the system's funded ratio is always 100 percent. This "drawback" is overcome by using the entry age normal cost method for purposes of financial disclosures. In this report, the reader should assume that any funding data provided is under the aggregate cost method unless otherwise noted as under the entry age normal method. The actuarial assumptions used are the same under either method.

ACTUARIAL VALUATION

At the beginning of the fiscal year, the Actuary, by law, determines the System's actuarial assets and liabilities. The actuarial valuation is important since it determines the rates of employer contributions. Chapter 49 of the Laws of 2003 mandates that the actuarial valuation undertaken on the first day of a fiscal year be used to determine contribution rates for the next succeeding fiscal year, to be applied to salaries as of the end of that fiscal year. Chapter 94 of the Laws of 2015 changed the billable salary to compensation earned during the previous fiscal year.

Each valuation differs markedly from the March 31 point-in-time snapshot of the System provided by the Financial Statements. The two measurements serve different purposes and use different techniques.

Two examples help make this clear:

- The actuarial assets for valuation purposes include the current value of all the future contributions employers and employees will make on behalf of current members. The Financial Statement balance sheet asset figure includes only contributions previously received and invested.
- The actuarial assets smooth out the investment performance by using a multiyear smoothing procedure. Techniques like this are widely practiced and professionally recommended to protect employers from volatile contribution rates. The Financial Statements, on the other hand, simply present fair values of assets on the last day of the fiscal year.

AGGREGATE ACTUARIAL FUNDING METHOD

Actuarial liabilities are the valuation date values (called the actuarial present values) of the benefits the Retirement System expects to pay to current members, retirees, and beneficiaries. The actuarial present value of benefits is calculated by projecting the amount of future service retirement, death, and disability benefits (based on past and future service, salary, and plan) to be paid, and then discounting for assumed investment earnings, employee turnover, and other contingencies.

The actuarial present value of the contributions that employers must make to the System to fund the projected benefit payment is equal to the actuarial liabilities, minus the sum of the actuarial value of present assets and the present value of employee contributions.

Under the aggregate funding method, the actuarial present value of the contributions that employers must make to the System is funded as a level percentage of salary over the projected future working lifetimes of current members.

ELEMENTS OF THE ACTUARIAL VALUATION

ACTUARIAL ASSUMPTIONS

The actuarial assumptions for employer contribution rates for the fiscal year ending 2019 were adopted effective April 1, 2015. These assumptions and their predecessors are shown below. All assumptions presume ongoing systems.

Fiscal Year Ended 3/31	Salary Scale*			Interest Rate	Multiple-Decrement Tables Based on Systems' Experience
1987 – 88	Inflation Productivity & Merit	5.00% <u>2.30%</u> 7.30%		8.00%	4/1/81– 3/31/86 experience
1989 – 92	Inflation Productivity & Merit	5.00% <u>2.00%</u> 7.00%		8.75%	4/1/81– 3/31/86 experience
1993 – 96	Inflation Productivity & Merit	5.00% <u>2.00%</u> 7.00%		8.75%	4/1/86 – 3/31/91 experience
		ERS	PFRS		
1997 – 98	Inflation Productivity & Merit	4.75% <u>1.25%</u> 6.00%	4.75% <u>1.75%</u> 6.50%	8.50%	4/1/90 – 3/31/95 experience
1999 – 2000	Inflation Productivity & Merit	3.50% <u>2.50%</u> 6.00%	3.50% <u>3.00%</u> 6.50%	8.50%	4/1/90 – 3/31/95 experience
2001	Inflation Productivity & Merit	3.00% <u>2.50%</u> 5.50%	3.00% <u>3.00%</u> 6.00%	8.00%	4/1/90 – 3/31/95 experience
2002 – 04	Inflation Productivity & Merit	3.00% <u>2.90%</u> 5.90%	3.00% <u>3.90%</u> 6.90%	8.00%	4/1/95 – 3/31/00 experience
2005	Inflation Productivity & Merit	3.00% <u>2.40%</u> 5.40%	3.00% <u>3.90%</u> 6.90%	8.00%	4/1/95 – 3/31/00 experience
2006	Inflation Productivity & Merit	3.00% <u>2.40%</u> 5.40%	3.00% <u>3.90%</u> 6.90%	8.00%	4/1/95 – 3/31/00 experience with subsequent adjustments
2007 – 11	Inflation Productivity & Merit	3.00% <u>2.40%</u> 5.40%	3.00% <u>3.70%</u> 6.70%	8.00%	4/1/00 – 3/31/05 experience with subsequent adjustments
2012 – 16	Inflation Productivity & Merit	2.70% <u>2.20%</u> 4.90%	2.70% <u>3.30%</u> 6.00%	7.50%	4/1/05 – 3/31/10 experience with subsequent adjustments
2017 – 19	Inflation Productivity & Merit	2.50% <u>1.30%</u> 3.80%	2.50% <u>2.00%</u> 4.50%	7.00%	4/1/10 – 3/31/15 experience with subsequent adjustments

* This is an approximate value. Salary scales vary by age and plan and are based on each System's experience.

ELEMENTS OF THE ACTUARIAL VALUATION

CONTINUED

SELECTED ACTUARIAL ASSUMPTIONS USED IN THE APRIL 1, 2017 VALUATION

These illustrations show the number of people expected to decrement during the year (i.e., decease, retire, become disabled, withdraw, etc.). Demographic assumptions below show counts per 10,000 members. Assumptions are computed by the Actuary and adopted by the Comptroller. They are based on recent member experience.

Service Retirement — ERS

Age	Service (in years)		
	< 20	20 – 29.99	≥ 30
Tier 1			
55	1,566	2,977	5,586
60	982	1,600	1,930
65	2,050	2,553	2,321
Tiers 2–4			
55	555	925	3,977
60	526	812	1,919
65	1,532	2,527	2,058
Tiers 5–6			
55	447	747	925
60	423	655	812
65	1,532	2,527	2,058

Service Retirement — PFRS

Service	20-year (All Tiers)	20-year with additional 60ths (All Tiers)
20	2,292	887
25	770	714
30	735	1,625

Service Retirees — Mortality

Age	ERS Male Clerk	ERS Female Clerk	PFRS
55	50	37	28
60	69	46	48
70	136	106	134
80	440	313	469

Disability Retirees — Mortality

Age	ERS Male	ERS Female	PFRS
30	35	36	13
40	81	111	14
60	300	261	61
80	730	610	576

ELEMENTS OF THE ACTUARIAL VALUATION

CONTINUED

Disability Retirement — Ordinary and Accidental

Age	ERS Ordinary	ERS Accidental	PFRS Ordinary*	PFRS Accidental
35	9	0	14	13
40	11	0	23	23
45	21	1	37	34
50	35	1	44	38

* Includes performance of duty.

Ordinary Death

Age	ERS	PFRS
35	5	4
40	7	4
45	10	6
50	14	8

Withdrawal — ERS (Ten-year ultimate rates)

Age	ERS
35	192
40	168
45	157
50	130

Withdrawal — PFRS

Service	PFRS
5	117
10	55
15	28

Salary Scale — Annual Percentage Increase

Service	ERS	PFRS
5	4.5	7.5
10	3.8	4.1
15	3.3	3.6
20	3.0	3.3
25	3.0	3.3

ACTUARIAL VALUE OF ASSETS

The actuarial asset values are determined by applying the assumed return on investments (7.0 percent for the April 1, 2017 valuation) to the financial statement plan net position with adjustments for cash flow (contributions and deductions). This smoothing method expects and immediately recognizes the assumed return on assets while phasing in unexpected gains/ losses over a five-year period. The method treats realized and unrealized gains in the same manner. The Group Term Life Insurance Plan assets appreciate at the same rate as our short-term investment pool.

In the April 1, 2017 valuation of the System and Group Life Insurance Plan (GLIP) for fiscal year 2019, the difference between market and actuarial values of smoothed investments was:

	Investments (Dollars in Millions)	
Actuarial Value	\$	192,884
Market Value		<u>192,411</u>
Difference	\$	473

ADMINISTRATIVE EXPENSES

The cost of administering the System is borne by the State and local employers on a current disbursement basis.

GROUP LIFE INSURANCE PLAN (GLIP)

GLIP provides for up to \$50,000 of member and certain post-retirement death benefits to be paid as life insurance. All benefits provided are on a one-year term insurance basis. Participating employers are billed each year based on the aggregate of anticipated claims for the plan year. Premiums are set so that the reserve will, at its lowest amount during any year, be approximately equal to payables. Payables is an estimate of the amount of claims currently being processed, plus claims incurred but not yet reported.

DEFICIENCY COSTS

An employer may also have a deficiency contribution. When a new employer joins a System, any past service liability is paid for by separate annual payments over a period of up to 25 years. These payments are not affected by the funding method.

RATE AND CONTRIBUTION COMPARABILITY

Unless stated otherwise, rates and contributions assume a payment date of February 1, before the fiscal year end, to provide for comparability of State and local government rates and costs.

ACTUARIAL VALUATION BALANCE SHEETS

Actuarial assets and liabilities are used to determine employer contributions for the fiscal year ending March 31. Values are in millions of dollars, as calculated in the April 1, 2016 valuation for fiscal year end (FYE) 2018 billing and the April 1, 2017 valuation for fiscal year end 2019 billing.

	FYE 2018 Billing*	FYE 2019 Billing*
	(Dollars in Millions)	
ERS		
Actuarial Assets		
Actuarial Value of Present Assets:		
Held for Current Retirees & Beneficiaries	\$ 95,102	\$ 100,320
Held for Members	58,382	59,260
Member Contributions	8,635	8,666
Total	\$ 162,119	\$ 168,246
Actuarial Present Value of Prospective Contributions:		
From Employers	\$ 31,332	\$ 31,148
From Members	2,788	3,351
Total	\$ 34,120	\$ 34,499
Total Actuarial Assets	\$ 196,238	\$ 202,745
Actuarial Liabilities		
Actuarial Present Value of Benefits for Current Retirees & Beneficiaries:		
Service Retirement Benefits	\$ 90,646	\$ 95,772
Disability Retirement Benefits	4,344	4,438
Death Benefits	112	110
Total	\$ 95,102	\$ 100,320
Actuarial Present Value of Benefits for Members:		
Service Retirement Benefits	\$ 97,988	\$ 99,137
Disability Retirement Benefits	1,724	1,773
Death Benefits	960	992
Other	464	522
Total	\$ 101,137	\$ 102,425
Total Actuarial Liabilities	\$ 196,238	\$ 202,745

* Numbers may not add up due to rounding.

ACTUARIAL VALUATION BALANCE SHEETS

CONTINUED

	FYE 2018 Billing*	FYE 2019 Billing*
	(Dollars in Millions)	
PFRS		
Actuarial Assets		
Actuarial Value of Present Assets:		
Held for Current Retirees & Beneficiaries	\$ 17,599	\$ 18,920
Held for Members	10,730	10,612
Member Contributions	34	55
Total	\$ 28,362	\$ 29,586
Actuarial Present Value of Prospective Contributions:		
From Employers	\$ 7,889	\$ 7,844
From Members	374	501
Total	\$ 8,263	\$ 8,344
Total Actuarial Assets	\$ 36,626	\$ 37,931
Actuarial Liabilities		
Actuarial Present Value of Benefits for Current Retirees & Beneficiaries:		
Service Retirement Benefits	\$ 14,209	\$ 15,447
Disability Retirement Benefits	3,208	3,285
Death Benefits	181	187
Total	\$ 17,599	\$ 18,920
Actuarial Present Value of Benefits for Members:		
Service Retirement Benefits	\$ 17,125	\$ 17,061
Disability Retirement Benefits	1,605	1,644
Death Benefits	283	289
Other	13	17
Total	\$ 19,027	\$ 19,011
Total Actuarial Liabilities	\$ 36,626	\$ 37,931
* Numbers may not add up due to rounding.		

New York Public Employees' Group Life Insurance Plan

Actuarial Assets	2018	2019
	(Dollars in Millions)	
Assets		
Investments	\$ 135	\$ 147
Premiums Receivable	-	-
Total Assets	\$ 135	\$ 147
Liabilities		
Managed Overdraft (cash)	6	6
Claims Being Processed	45	44
Claims Unreported	18	16
Reserve for Mortality Fluctuations	66	81
Total Liabilities	\$ 135	\$ 147

LOCAL GOVERNMENT EMPLOYERS’ FINAL CONTRIBUTION RATES FOR SELECT PLANS

The following contribution rates are for the fiscal year ending March 31, 2019 and assume a February 1, 2019 payment date.

All rates exclude any contribution rates due to amortization payments, prior years’ adjustments, deficiency costs, retirement incentive programs and certain benefits electable by local governments, such as credit for unused sick leave or one-year final average salary. All rates include Group Life Insurance.

	Plan ID	Percentage of Payroll				
		Tier 1	Tier 2	Tiers 3 & 4	Tier 5	Tier 6
ERS						
Age-based plans						
Basic, Age 55, Age 60 Contributory	71-a	10.6	9.7	n/a	n/a	n/a
Article 14	A14	n/a	n/a	15.7	n/a	n/a
Article 15	A15	n/a	n/a	15.7	12.9	9.2
Guaranteed Benefits	75-e	19.4	17.4	n/a	n/a	n/a
Career	75-g	20.5	18.6	n/a	n/a	n/a
New Career	75-h/75-i	21.4	19.4	n/a	n/a	n/a
25-year plans						
Sheriffs and Deputies	89-a	24.0	22.3	n/a	n/a	n/a
Article 14B Sheriffs — 25-year	551	22.5	22.1	20.1	17.6	12.8
Article 14B Sheriffs — 25-year + 1/60th	551-e	23.7	23.5	21.4	19.2	14.3
full service for 1/60th	551-ee	24.7	24.5	22.3	19.9	14.9
County Law Enforcement	89-e, etc.	24.4	24.1	18.0	15.4	10.8
20-year plans						
Sheriffs and Deputies	89-b	27.3	22.1	n/a	n/a	n/a
additional 1/60th	89-b(m)	27.5	23.4	n/a	n/a	n/a
Article 14B Sheriffs — 20-year	552	27.8	27.6	25.1	22.7	17.8
Article 14B Sheriffs — 20-year + 1/60th	553	27.8	27.6	25.6	23.4	18.7
full service for 1/60th	553b	28.9	28.7	26.6	24.3	19.5
Detective Investigators	89-d	26.7	26.5	n/a	n/a	n/a
additional 1/60th	89-d(m)	26.9	26.6	n/a	n/a	n/a

LOCAL GOVERNMENT EMPLOYERS' FINAL CONTRIBUTION RATES FOR SELECT PLANS

CONTINUED

	Plan ID	Percentage of Payroll				
		Tier 1	Tier 2	Tier 3	Tier 5*	Tier 6*
PFRS						
Age-based plans						
Basic, Age 55, Age 60 Contributory	371-a	11.8	10.3	10.3	6.6	2.7
Guaranteed Benefits	375-e	18.5	15.3	15.3	11.3	7.0
Career	375-g	20.3	16.7	16.7	12.6	8.2
New Career	375-i	21.0	17.2	17.2	13.1	8.5
Improved Career	375-j	21.0	17.2	17.2	13.1	8.5
25-year plans						
Contributory	384	n/a	n/a	n/a	15.8	11.0
additional 1/60th	384(f)	n/a	n/a	n/a	17.2	12.3
Non-Contributory	384	20.8	20.1	20.1	19.2	17.6
additional 1/60th	384(f)	21.9	21.7	21.7	20.7	18.9
20-year plans						
Contributory	384-d	n/a	n/a	n/a	19.4	14.4
additional 1/60th	384-e	n/a	n/a	n/a	20.1	15.0
Non-Contributory	384-d	24.6	24.0	23.7	22.9	20.9
additional 1/60th	384-e	25.0	24.7	23.7	23.6	21.6
* Age-based plans in Tier 5 and Tier 6 are contributory.						
There is no Tier 4 in PFRS.						

CONTRIBUTION RATE TRENDS FOR LOCAL GOVERNMENTS

Contribution rates are based on a February 1 payment date. Each rate is applied to the salary of members covered by that particular plan. Rates were calculated under the aggregate method. All rates include Group Life Insurance and administrative rates.

Actual costs borne by employers are shown in the Statistical Section.

Plan Name (Section)	Percentage of Payroll									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ERS										
Guaranteed Benefits (75-e)										
Tier 1	8.4	13.8	19.4	22.9	25.8	24.8	22.6	19.6	19.5	19.4
Tier 2	7.6	12.5	17.5	20.7	23.3	22.5	20.5	17.6	17.5	17.4
Career (75-g)										
Tier 1	8.9	14.6	20.4	24.1	27.3	26.3	24.0	20.7	20.7	20.5
Tier 2	8.1	13.3	18.6	22.0	24.9	24.0	21.9	18.7	18.7	18.6
New Career (75-i)										
Tier 1	9.2	15.2	21.3	25.2	28.5	27.4	25.0	21.6	21.5	21.4
Tier 2	8.5	13.9	19.5	23.0	26.0	25.1	22.9	19.6	19.5	19.4
Article 14/15 — Tier 3	6.9	11.2	15.6	18.4	20.8	20.1	18.6	15.8	15.8	15.7
Article 15 — Tier 4	6.9	11.2	15.6	18.4	20.8	20.1	18.6	15.8	15.8	15.7
Article 15 — Tier 5	—	—	12.6	14.9	16.7	16.4	15.3	13.0	13.0	12.9
Article 15 — Tier 6	—	—	—	9.9	11.3	10.8	10.4	9.2	9.2	9.2

CONTRIBUTION RATE TRENDS FOR LOCAL GOVERNMENTS

CONTINUED

Plan Name (Section)	Percentage of Payroll									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PFRS										
Guaranteed Benefits (375-e)										
Tier 1	10.8	13.2	16.1	19.6	22.1	21.4	19.4	18.6	19.0	18.5
Tiers 2 & 3	9.2	11.1	13.0	16.2	18.1	17.8	16.1	15.4	15.7	15.3
Tier 5*	—	—	9.3	11.8	13.0	12.7	12.1	11.4	11.7	11.3
Tier 6*	—	—	—	7.0	7.3	7.2	6.4	7.1	7.3	7.0
Career (375-g)										
Tier 1	11.8	14.4	17.6	21.3	24.1	23.4	21.2	20.3	20.8	20.3
Tiers 2 & 3	10.0	12.1	14.2	17.6	19.7	19.4	17.6	16.8	17.2	16.7
Tier 5*	—	—	10.4	13.1	14.5	14.2	13.5	12.8	13.0	12.6
Tier 6*	—	—	—	8.2	8.6	8.5	7.6	8.4	8.5	8.2
New Career (375-i)										
Tier 1	12.2	14.9	18.1	22.1	24.9	24.2	21.9	21.0	21.5	21.0
Tiers 2 & 3	10.3	12.5	14.6	18.1	20.3	19.9	18.1	17.3	17.7	17.2
Tier 5*	—	—	10.8	13.6	15.1	14.7	14.0	13.2	13.5	13.1
Tier 6*	—	—	—	8.5	8.9	8.7	7.9	8.6	8.8	8.5
25-Year (384) — Contributory										
Tiers 1, 2 & 3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tier 5	—	—	13.7	16.5	18.4	18.1	16.6	15.9	16.2	15.8
Tier 6	—	—	—	11.4	12.3	12.0	11.2	11.2	11.4	11.0
25-Year + 1/60ths (384(f)) — Contributory										
Tiers 1, 2 & 3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tier 5	—	—	15.0	18.0	20.2	19.7	17.9	17.3	17.7	17.2
Tier 6	—	—	—	12.8	13.8	13.3	12.4	12.4	12.7	12.3
25-Year (384) — Non-Contributory										
Tier 1	11.9	14.7	17.7	21.2	24.0	23.2	21.2	20.9	21.4	20.8
Tiers 2 & 3	11.9	14.7	17.6	21.2	23.9	23.1	21.0	20.2	20.6	20.1
Tier 5	—	—	16.9	20.4	22.9	22.1	20.1	19.3	19.7	19.2
Tier 6	—	—	—	18.4	20.4	19.6	17.9	17.7	18.1	17.6
25-Year + 1/60ths (384(f)) — Non-Contributory										
Tier 1	12.4	15.2	19.2	23.1	26.1	25.1	22.7	22.0	22.5	21.9
Tiers 2 & 3	12.2	15.0	19.0	22.9	25.9	24.8	22.5	21.8	22.3	21.7
Tier 5	—	—	18.3	21.9	24.7	23.7	21.5	20.8	21.2	20.7
Tier 6	—	—	—	19.9	22.0	21.1	19.2	19.0	19.4	18.9
* Age-based plans in Tier 5 and Tier 6 are contributory.										
There is no Tier 4 in PFRS.										

CONTRIBUTION RATE TRENDS FOR LOCAL GOVERNMENTS

CONTINUED

Plan Name (Section)	Percentage of Payroll									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
20-Year (384-d) — Contributory										
Tiers 1, 2 & 3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tier 5	—	—	16.7	20.1	22.7	22.0	20.1	19.5	19.9	19.4
Tier 6	—	—	—	14.6	16.0	15.4	14.3	14.5	14.8	14.4
20-Year + 1/60ths (384-e) — Contributory										
Tiers 1, 2 & 3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tier 5	—	—	17.0	20.5	23.0	22.3	20.4	20.2	20.6	20.1
Tier 6	—	—	—	14.9	16.3	15.6	14.5	15.1	15.4	15.0
20-Year (384-d) — Non-Contributory										
Tier 1	14.2	17.4	21.5	25.7	29.2	28.0	25.4	24.7	25.2	24.6
Tier 2	13.8	16.8	20.9	25.1	28.4	27.3	24.7	24.1	24.6	24.0
Tier 3	—	—	20.4	24.2	27.5	26.1	24.4	23.8	24.3	23.7
Tier 5	—	—	20.0	24.1	27.1	26.1	23.6	22.9	23.4	22.9
Tier 6	—	—	—	21.6	24.1	23.1	21.0	21.0	21.5	20.9
20-Year + 1/60ths (384-e) — Non-Contributory										
Tier 1										
1990-1998 elections (avg.)	19.9	23.1	21.8	26.1	29.6	28.4	25.8	25.0	25.6	25.0
all other years	14.5	17.7	21.8	26.1	29.6	28.4	25.8	25.0	25.6	25.0
Tier 2										
1990-1998 elections (avg.)	15.3	18.4	21.2	25.4	28.8	27.6	25.1	24.8	25.3	24.7
all other years	14.4	17.5	21.2	25.4	28.8	27.6	25.1	24.8	25.3	24.7
Tier 3	—	—	20.4	24.2	27.5	26.1	24.4	23.8	24.3	23.7
Tier 5	—	—	20.3	24.4	27.5	26.3	23.9	23.7	24.2	23.6
Tier 6	—	—	—	22.0	24.4	23.3	21.3	21.7	22.1	21.6

There is no Tier 4 in PFRS.

EMPLOYER CONTRIBUTIONS

Contributions shown here may differ from those appearing elsewhere in the Actuarial Section because these tables deal only with the contributions attributable to the fiscal year shown. Actual contributions may include adjustments due to previous years, such as amortization payments/credits and reconciliation of other years' bills. Employers who opted into either of the Contribution Stabilization Programs (Chapter 57 of the Laws of 2010 and Chapter 57 of the Laws of 2013) are allowed to amortize a portion of their contribution. The following amounts show their total obligation. The average rates below are for normal, administrative and Group Life Insurance contributions.

COMPARISON OF EMPLOYER CONTRIBUTIONS*

For fiscal years ending 2018 and 2019. (Dollars in Millions)

	2019 Contribution			2018 Contribution		
	Salary	Contribution	Average Rate	Salary	Contribution	Average Rate
ERS						
Tier 1	\$ 109	\$ 24	21.6%	\$ 141	\$ 31	21.7%
Tier 2	136	27	19.7	168	33	19.7
Tiers 3 & 4	19,103	3,117	16.3	19,645	3,227	16.4
Tier 5	1,521	205	13.4	1,481	201	13.5
Tier 6	6,505	631	9.7	5,252	510	9.7
Total	\$ 27,374	\$ 4,003	14.6%	\$ 26,686	\$ 4,001	15.0%
PFRS						
Tier 1	\$ 3	\$ 1	28.8%	\$ 5	\$ 1	28.9%
Tier 2	2,857	718	25.1	2,977	767	25.8
Tier 3	19	4	22.4	17	4	22.9
Tier 5	174	36	20.5	158	33	21.0
Tier 6	677	102	15.1	527	82	15.5
Total	\$ 3,730	\$ 861	23.1%	\$ 3,684	\$ 887	24.1%
There is no Tier 4 in PFRS.						

Deficiency contributions for Fiscal Year 2019 (as of February 1, 2019) totaled \$1,528,948.

*Numbers may not add up due to rounding.

EMPLOYER CONTRIBUTIONS

CONTINUED

FINAL EMPLOYER CONTRIBUTIONS BY EMPLOYER TYPE*

Attributable to fiscal year 2019 costs only. (Dollars in Millions)

Employer	Normal	Administrative	GLIP	Total
ERS				
State	\$ 1,586	\$ 34	\$ 50	\$ 1,669
Counties	689	14	19	723
Cities	100	2	4	106
Towns	223	5	8	237
Villages	70	2	3	75
Miscellaneous	623	14	24	661
Schools	502	11	19	532
Total	\$ 3,794	\$ 82	\$ 126	\$ 4,003
PFRS				
State	\$ 168	\$ 2	\$ —	\$ 170
Counties	192	2	—	195
Cities	244	3	—	247
Towns	91	1	—	92
Villages	74	1	—	75
Miscellaneous	82	1	—	83
Total	\$ 850	\$ 11	\$ —	\$ 861

EMPLOYER CONTRIBUTIONS BY TIER*

(Dollars in Millions)

	2019 (as of February 1, 2019)		2018 (as of February 1, 2018)	
	Employer Contributions Attributable to Year	Percentage	Employer Contributions Attributable to Year	Percentage
ERS				
Tier 1	\$ 24	0.6%	\$ 31	0.8%
Tier 2	27	0.7	33	0.8
Tiers 3 & 4	3,117	77.9	3,227	80.6
Tier 5	205	5.1	201	5.0
Tier 6	631	15.8	510	12.8
Total	\$ 4,003	100.0%	\$ 4,001	100.0%
PFRS				
Tier 1	\$ 1	0.1%	\$ 1	0.2%
Tier 2	718	83.4	767	86.4
Tier 3	4	0.5	4	0.4
Tier 5	36	4.2	33	3.7
Tier 6	102	11.8	82	9.2
Total	\$ 861	100.0%	\$ 887	100.0%

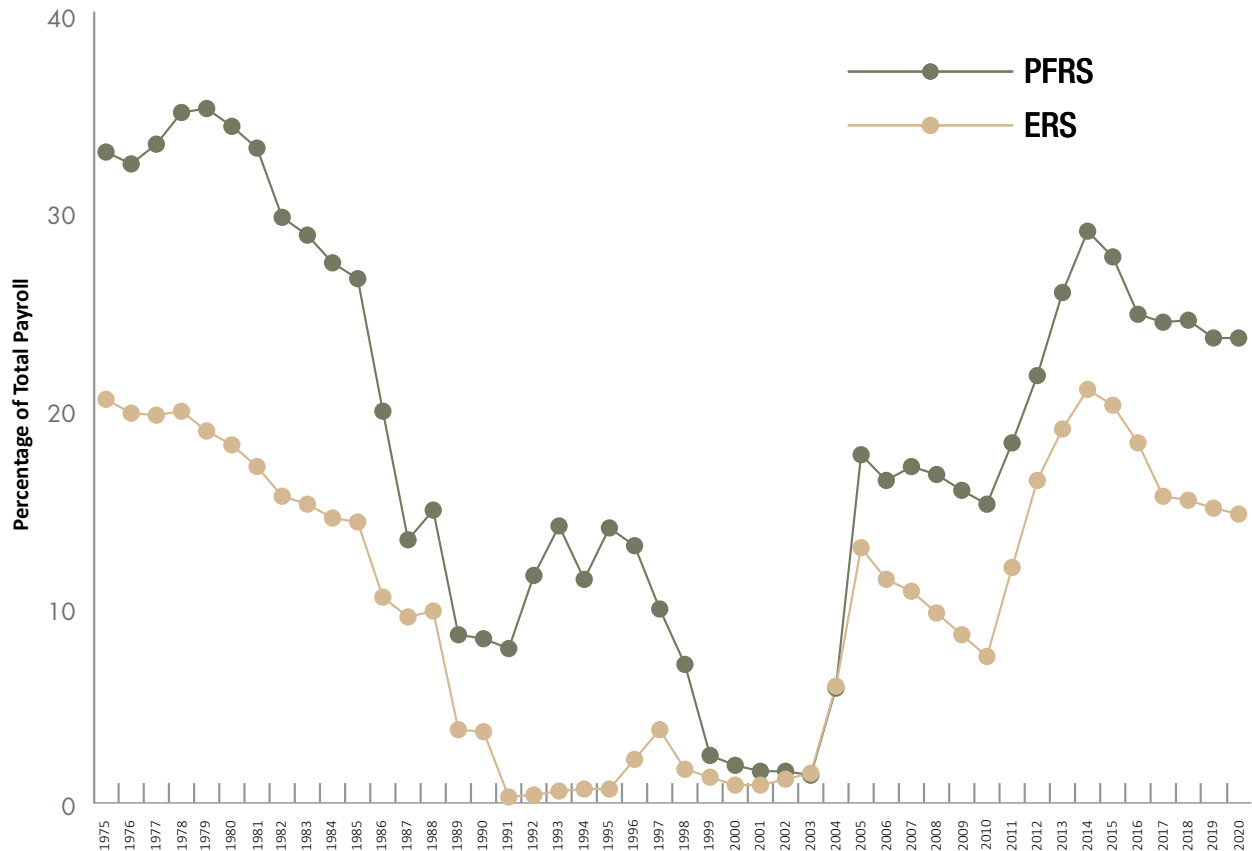
There is no Tier 4 in PFRS.

*Numbers may not add up due to rounding.

HISTORICAL TRENDS (RATES AS A PERCENTAGE OF SALARY, 1975 – 2020)

The State is obligated to pay its bill on March 1, one month before the end of the fiscal year. Through 2004, local employers paid their bills by December 15, three and one-half months before the end of the fiscal year. Beginning in 2005, the payment date for local employers was changed to February 1.

TRENDS IN EMPLOYER CONTRIBUTIONS



CHANGES IN CONTRIBUTIONS

The System's experience in many areas (employee salary growth or decrease, investment return, legislative enactment of benefits) is assessed and quantified yearly. Each element exerts an increasing, decreasing or neutral pressure on contributions to be charged for that year.

ANALYSIS OF CHANGES (BY SOURCE)

Experience during one fiscal year produces the increase or decrease in contributions for the following year.

(Dollars in Millions)

Fiscal Year Valuation Date	Fiscal Year Bill Date	Contributions for Preceding Fiscal Year Bill	Salary Growth	Return on Investments	Assumption Changes	Changes in Benefits	Other Adjustments	Projected Contributions for Fiscal Year Shown*
ERS								
2009	2011	1,854	135	1,098	(75)	n/a	130	3,142
2010	2012	3,029	89	782	417	n/a	(71)	4,246
2011	2013	3,948	15	570	202	n/a	(81)	4,654
2012	2014	4,627	119	870	(9)	n/a	(343)	5,264
2013	2015	5,243	97	521	(539)	n/a	(182)	5,140
2014	2016	5,143	(24)	(937)	633	n/a	(187)	4,628
2015	2017	4,515	35	(396)	273	n/a	(433)	3,994
2016	2018	3,995	85	120	22	n/a	(195)	4,027
2017	2019	4,005	108	(123)	131	n/a	(111)	4,010
2018	2020	3,977	39	(210)	298	n/a	(123)	3,981
PFRS								
2009	2011	474	31	152	(13)	n/a	(42)	602
2010	2012	576	10	117	22	n/a	(31)	694
2011	2013	693	18	93	(8)	n/a	53	849
2012	2014	827	25	142	(1)	n/a	(36)	957
2013	2015	936	3	79	(83)	n/a	(18)	917
2014	2016	917	23	(143)	52	n/a	(7)	842
2015	2017	809	1	(70)	161	n/a	(73)	828
2016	2018	857	60	17	36	n/a	(75)	895
2017	2019	888	31	(21)	12	n/a	(19)	891
2018	2020	866	(3)	(34)	49	n/a	8	886

* This is an estimated figure. Minor adjustments, mostly salary-related, result in the final contribution figure for the year as shown in the Contributions for Preceding Fiscal Year Bill column.

Note: Chapter 94 of the Laws of 2015 changed the definition of billing salary beginning with fiscal year 2016. The billing rates are now applied to salaries as of the end of the previous fiscal year, rather than the end of the fiscal year when the contributions are made.

The Projected Contributions for Fiscal Year Shown is now based on one year of salary projection (previously a two-year projection) and the Contributions for Preceding Fiscal Year Bill is based on known salaries from the previous fiscal year (previously a one-year projection). This explains the large decrease in contributions from the projected to the actual amount for fiscal year 2016.

ASSETS AND ACCRUED LIABILITIES

Plan assets can be expressed as the market value or the actuarial value of assets. The market value of assets represents the market value of investments as of the last day of the fiscal year. The actuarial value of assets smoothes the volatility in the market value by phasing in unexpected gains and losses over a period of five years. The actuarial accrued liability is the portion of the actuarial present value of future benefits that is attributed to service rendered as of the valuation date. Note that the asset values do not include the following dedicated assets: Group Life Insurance Plan, Non-Member Contributions, Administrative Overbill Account, Loan Insurance Reserve and Annuity Savings Fund.

(Dollars in Millions)

Valuation Date	Market Value of Assets (MVA)	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AL)	Ratio of Assets to AL based on	
				MVA	AVA
ERS					
4/1/09	\$ 94,242	\$ 126,438	\$ 125,136	75.3%	101.0%
4/1/10	114,058	125,482	133,574	85.4	93.9
4/1/11	127,192	126,395	140,087	90.8	90.2
4/1/12	130,349	125,688	144,107	90.5	87.2
4/1/13	139,580	132,067	149,211	93.5	88.5
4/1/14	154,119	145,985	158,638	97.2	92.0
4/1/15	161,065	156,648	167,065	96.4	93.8
4/1/16	156,088	162,119	172,246	90.6	94.1
4/1/17	167,820	168,246	178,216	94.2	94.4
4/1/18	179,995	175,430	184,504	97.6	95.1
PFRS					
4/1/09	\$ 16,695	\$ 22,423	\$ 21,597	77.3%	103.8%
4/1/10	20,194	22,230	22,998	87.8	96.7
4/1/11	22,357	22,205	24,169	92.5	91.9
4/1/12	22,837	22,009	25,048	91.2	87.9
4/1/13	24,436	23,112	25,815	94.7	89.5
4/1/14	26,961	25,474	27,377	98.5	93.0
4/1/15	28,154	27,330	29,336	96.0	93.2
4/1/16	27,337	28,362	30,620	89.3	92.6
4/1/17	29,539	29,586	31,776	93.0	93.1
4/1/18	31,838	31,009	32,989	96.5	94.0

SOLVENCY TEST

The System is funded in accordance with the aggregate method. The following solvency test is one means of checking the System's funding progress. In this test, the System's actuarial value of assets is compared to:

- (1) the required member contributions on deposit;
- (2) the liabilities for future benefits to persons who have retired; and
- (3) the employer-financed liabilities for service already rendered by active members.

The accrued liabilities in this chart are calculated in accordance with the entry age normal method.

Valuation Date	Accrued Liability (Dollars in Millions)				Actuarial Assets (Dollars in Millions)	Portion of Actuarial Accrued Liabilities Covered by Actuarial Assets		
	Member Contributions (1)	Retiree (2)	Active (3)	Total (1) + (2) + (3)		(1)	(2)	(3)
ERS								
4/1/09	\$ 7,718	\$ 57,419	\$ 59,999	\$ 125,136	\$ 126,438	100.0%	100.0%	102.2%
4/1/10	7,979	62,692	62,903	133,574	125,482	100.0	100.0	87.1
4/1/11	8,214	67,412	64,461	140,087	126,395	100.0	100.0	78.8
4/1/12	8,168	75,210	60,729	144,107	125,688	100.0	100.0	69.7
4/1/13	8,328	78,743	62,140	149,211	132,067	100.0	100.0	72.4
4/1/14	8,462	85,528	64,648	158,638	145,985	100.0	100.0	80.4
4/1/15	8,608	90,163	68,294	167,065	156,648	100.0	100.0	84.7
4/1/16	8,635	95,102	68,509	172,246	162,119	100.0	100.0	85.2
4/1/17	8,666	100,320	69,230	178,216	168,246	100.0	100.0	85.6
4/1/18	8,537	107,506	68,461	184,504	175,430	100.0	100.0	86.7
PFRS								
4/1/09	\$ 26	\$ 11,588	\$ 9,983	\$ 21,597	\$ 22,423	100.0%	100.0%	108.3%
4/1/10	27	12,891	10,080	22,998	22,230	100.0	100.0	92.4
4/1/11	29	13,383	10,757	24,169	22,205	100.0	100.0	81.7
4/1/12	2	14,060	10,986	25,048	22,009	100.0	100.0	72.3
4/1/13	5	14,948	10,862	25,815	23,112	100.0	100.0	75.1
4/1/14	10	15,958	11,409	27,377	25,474	100.0	100.0	83.3
4/1/15	20	17,072	12,244	29,336	27,330	100.0	100.0	83.6
4/1/16	34	17,599	12,987	30,620	28,362	100.0	100.0	82.6
4/1/17	55	18,920	12,801	31,776	29,586	100.0	100.0	82.9
4/1/18	85	20,265	12,639	32,989	31,009	100.0	100.0	84.3

SCHEDULE OF ACTIVE MEMBER DATA

Fiscal Year Ending March 31	Active Members	Annual Member Payroll (Dollars in Millions)	Percentage Increase in Annual Member Payroll	Average Salary
ERS				
2009	530,023	\$ 24,099	5.8%	\$ 45,468
2010	529,466	24,972	3.6	47,164
2011	513,092	24,389	(2.3)	47,534
2012	505,575	24,291	(0.4)	48,046
2013	498,266	24,405	0.5	48,979
2014	493,209	24,361	(0.2)	49,392
2015	491,558	24,480	0.5	49,801
2016	494,411	24,985	2.1	50,536
2017	496,441	25,520	2.1	51,406
2018	500,945	25,973	1.8	51,847
PFRS				
2009	33,052	\$ 2,970	1.5%	\$ 89,854
2010	32,449	3,113	4.8	95,934
2011	31,659	3,146	1.0	99,357
2012	31,024	3,191	1.4	102,850
2013	30,780	3,163	(0.9)	102,754
2014	31,218	3,233	2.2	103,549
2015	31,372	3,257	0.8	103,822
2016	31,720	3,416	4.9	107,700
2017	32,332	3,522	3.1	108,930
2018	32,470	3,548	0.7	109,265

SCHEDULE OF RETIRED MEMBERS AND BENEFICIARIES

Added to and Removed from Benefit Payroll

Fiscal Year	Number of Retired Members and Beneficiaries		Annual Benefits of Retired Members and Beneficiaries		Total Number of Retired Members and Beneficiaries	Total Annual Benefit	Percentage Increase in Total Annual Benefits	Average Annual Benefit
	Added During the Year	Removed During the Year	Added During the Year	Removed During the Year				
ERS								
2009	21,585	14,038	\$ 565,713,502	\$ 173,445,214	336,273	\$ 6,382,065,397	6.55%	\$ 18,979
2010	22,885	14,052	604,707,420	181,343,790	345,106	6,805,429,027	6.63	19,720
2011	22,733	13,899	683,435,574	186,508,676	353,940	7,302,355,926	7.30	20,632
2012	31,906	14,378	990,541,993	198,660,208	371,468	8,094,237,711	10.84	21,790
2013	23,424	13,993	627,992,358	207,014,141	380,899	8,515,215,928	5.20	22,356
2014	23,320	14,931	636,672,277	229,131,028	389,288	8,922,757,178	4.79	22,921
2015	21,832	14,339	615,594,488	225,462,412	396,781	9,312,889,254	4.37	23,471
2016	25,517	15,186	764,025,727	247,047,150	407,112	9,829,867,831	5.55	24,145
2017	25,828	15,441	783,795,021	260,190,707	417,499	10,353,472,145	5.33	24,799
2018	31,709	14,655	974,084,983	248,074,441	434,553	11,079,482,687	7.01	25,496
PFRS								
2009	1,270	748	\$ 85,132,844	\$ 21,203,012	29,905	\$ 1,212,445,300	5.57%	\$ 40,543
2010	1,606	814	106,721,728	25,637,123	30,697	1,293,529,905	6.69	42,139
2011	1,184	790	80,517,204	24,073,826	31,091	1,349,973,282	4.36	43,420
2012	1,403	788	97,599,791	23,890,471	31,706	1,423,682,602	5.46	44,903
2013	1,629	798	120,115,279	25,836,637	32,537	1,517,961,244	6.62	46,653
2014	1,431	851	99,767,882	27,650,778	33,117	1,590,078,348	4.75	48,014
2015	1,222	812	89,763,321	27,980,968	33,527	1,651,860,701	3.89	49,270
2016	1,163	859	90,801,381	30,667,776	33,831	1,711,994,306	3.64	50,604
2017	2,028	903	157,020,746	32,764,190	34,956	1,836,250,862	7.26	52,530
2018	2,027	940	162,851,223	34,346,639	36,043	1,964,755,446	7.00	54,511

For both systems, annual benefits are based on option 0 benefits (prior to option selection and partial lump sum distribution) plus cost-of-living adjustments (COLA).

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Statistical

CONTENTS

Schedule of Additions to Fiduciary Net Position	155
Schedule of Investment Income/(Loss).....	156
Schedule of Deductions from Fiduciary Net Position	157
Schedule of Total Changes in Fiduciary Net Position	158
Service Retirees — ERS	160
Service Retirees — PFRS.....	162
Disability Retirees — ERS	164
Disability Retirees — PFRS.....	166
New Option Selections	168
Option Selections — Total Payments	169
Average Pension Benefits Paid During Year Shown.....	170
Average Benefit Pay Types	171
New Benefits — Service Retirements by Age and Service	173
New Benefits — Accidental and Ordinary Death.....	174
Combined System Participants.....	175
Membership by Age and Years of Service	176
Membership by Tier.....	177
Membership by Status.....	178
Number of Employers	179
Total Membership by Employer Type	180
Average Salary by Employer Type	181
Members and Salaries by Plan — ERS.....	182
Members and Salaries by Plan — PFRS	184
Retirees and Beneficiaries by Age.....	186
Retirees and Beneficiaries — ERS	187
Retirees and Beneficiaries — PFRS.....	188
Local Government Salaries and Billings — ERS	189
Local Government Salaries and Billings — PFRS.....	191
Contributions Recorded 2010 – 2019	193
20-Year Summary	194
Notes to 20-Year Summary	196

SCHEDULE OF ADDITIONS TO FIDUCIARY NET POSITION

(Dollars in Thousands)

Year Ending	Member Contributions	Employer Contributions	Other Income*	Investment Income/(Loss)	Total
2019	\$ 386,519	\$ 4,744,309	\$ 170,154	\$ 10,761,776	\$ 16,062,758
ERS	345,846	3,890,215	160,431	9,140,487	13,536,979
PFRS	40,673	854,094	9,723	1,621,289	2,525,779
2018	\$ 349,389	\$ 4,823,307	\$ 215,614	\$ 21,338,033	\$ 26,726,343
ERS	318,439	3,949,873	181,725	18,128,993	22,579,030
PFRS	30,950	873,434	33,889	3,209,040	4,147,313
2017	\$ 328,827	\$ 4,786,963	\$ 236,401	\$ 20,225,244	\$ 25,577,435
ERS	306,218	3,949,710	200,379	17,194,267	21,650,574
PFRS	22,609	837,253	36,022	3,030,977	3,926,861
2016	\$ 306,631	\$ 5,140,204	\$ 332,880	\$ (384,834)	\$ 5,394,881
ERS	289,333	4,347,619	198,332	(327,069)	4,508,215
PFRS	17,298	792,585	134,548	(57,765)	886,666
2015	\$ 284,793	\$ 5,797,449	\$ 230,799	\$ 12,444,891	\$ 18,757,932
ERS	272,004	4,893,110	193,176	10,582,102	15,940,392
PFRS	12,789	904,339	37,623	1,862,789	2,817,540
2014	\$ 281,398	\$ 6,064,133	\$ 192,581	\$ 20,598,593	\$ 27,136,705
ERS	273,545	5,137,935	175,677	17,496,541	23,083,698
PFRS	7,853	926,198	16,904	3,102,052	4,053,007
2013	\$ 269,134	\$ 5,336,045	\$ 131,853	\$ 14,717,622	\$ 20,454,654
ERS	264,788	4,524,395	122,931	12,496,378	17,408,492
PFRS	4,346	811,650	8,922	2,221,244	3,046,162
2012	\$ 273,247	\$ 4,585,178	\$ 157,625	\$ 7,868,313	\$ 12,884,363
ERS	268,545	3,878,717	134,821	6,681,603	10,963,686
PFRS	4,702	706,461	22,804	1,186,710	1,920,677
2011	\$ 286,199	\$ 4,164,571	\$ 127,709	\$ 19,339,896	\$ 23,918,375
ERS	284,486	3,622,638	101,730	16,427,023	20,435,877
PFRS	1,713	541,933	25,979	2,912,873	3,482,498
2010	\$ 284,291	\$ 2,344,222	\$ 81,981	\$ 28,422,361	\$ 31,132,855
ERS	282,791	1,879,209	76,466	24,145,393	26,383,859
PFRS	1,500	465,013	5,515	4,276,968	4,748,996

* Includes interest earned on member loans, interest on accounts receivable and transfers from other systems.

SCHEDULE OF INVESTMENT INCOME/(LOSS)

(Dollars in Thousands)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Net Change in Fair Value of Investments	\$ 7,179,934	\$ 17,859,769	\$ 16,923,203	\$ (3,934,853)	\$ 9,275,335	\$ 17,432,110	\$ 11,592,363	\$ 4,958,927	\$ 16,740,555	\$ 25,631,185
Interest	1,321,174	1,312,608	1,349,658	1,446,569	1,447,757	1,366,175	1,394,442	1,379,423	1,426,941	1,540,095
Dividends	1,825,117	1,723,896	1,611,929	1,593,010	1,589,248	1,498,622	1,512,908	1,405,870	1,269,009	1,202,421
Real Estate and Mortgages	523,165	472,188	531,225	491,949	414,345	353,821	382,315	239,038	97,844	155,974
Alternative	354,214	352,488	230,919	174,552	174,850	259,960	377,664	170,225	234,940	109,603
Security Lending Income	48,942	73,563	74,428	52,878	35,639	28,381	32,617	33,323	31,328	62,224
International	242,877	295,388	153,368	360,723	137,227	220,090	146,314	153,157	46,127	5,748
Other Including Prior Year Adjustment	(5,575)	(14,581)	33,456	1,461	(40,881)	17,187	(247,988)	(44,790)	(57,241)	81,669
Security Lending Expenses	(4,893)	(49,128)	(18,001)	(5,278)	(3,563)	(2,838)	(3,261)	(3,332)	(2,744)	(2,080)
Investment Expenses	(723,179)	(688,158)	(664,941)	(565,845)	(585,066)	(574,915)	(469,752)	(423,528)	(446,863)	(364,478)
Net Investment Income/(Loss)	\$ 10,761,776	\$ 21,338,033	\$ 20,225,244	\$ (384,834)	\$ 12,444,891	\$ 20,598,593	\$ 14,717,622	\$ 7,868,313	\$ 19,339,896	\$ 28,422,361

SCHEDULE OF DEDUCTIONS FROM FIDUCIARY NET POSITION

(Dollars in Thousands)

Year Ending	Retirement Allowances	Post-Retirement Supplements	Death Benefits	Separation from Service	Administrative Expenses	Other Expenses	Total
2019	\$ 11,880,340	\$ 646,606	\$ 214,666	\$ 34,645	\$ 136,477	\$ 57,674	\$ 12,970,408
ERS	10,030,590	548,382	202,809	32,984	119,304	57,931	10,992,000
PFRS	1,849,750	98,224	11,857	1,661	17,173	(257)	1,978,408
2018	\$ 11,197,802	\$ 628,287	\$ 201,252	\$ 34,969	\$ 122,806	\$ 66,609	\$ 12,251,725
ERS	9,478,272	530,354	191,579	34,302	106,972	68,769	10,410,248
PFRS	1,719,530	97,933	9,673	667	15,834	(2,160)	1,841,477
2017	\$ 10,617,500	\$ 615,032	\$ 216,150	\$ (5,406)	\$ 107,134	\$ 65,037	\$ 11,615,447
ERS	9,015,444	516,852	207,976	820	93,943	64,441	9,899,476
PFRS	1,602,056	98,180	8,174	(6,226)	13,191	596	1,715,971
2016	\$ 10,113,758	\$ 606,536	\$ 188,190	\$ 34,488	\$ 106,620	\$ 117,500	\$ 11,167,092
ERS	8,536,930	508,112	179,861	33,097	93,012	117,197	9,468,209
PFRS	1,576,828	98,424	8,329	1,391	13,608	303	1,698,883
2015	\$ 9,651,227	\$ 601,850	\$ 183,091	\$ 27,628	\$ 107,151	\$ 49,918	\$ 10,620,865
ERS	8,152,183	502,916	174,652	26,067	93,357	51,321	9,000,496
PFRS	1,499,044	98,934	8,439	1,561	13,794	(1,403)	1,620,369
2014	\$ 9,098,453	\$ 596,556	\$ 203,820	\$ 29,972	\$ 105,662	\$ 48,725	\$ 10,083,188
ERS	7,702,970	497,142	185,169	28,439	92,266	51,341	8,557,327
PFRS	1,395,483	99,414	18,651	1,533	13,396	(2,616)	1,525,861
2013	\$ 8,669,843	\$ 586,209	\$ 194,170	\$ 29,265	\$ 105,720	\$ 42,049	\$ 9,627,256
ERS	7,339,678	487,100	177,113	28,294	92,134	43,221	8,167,540
PFRS	1,330,165	99,109	17,057	971	13,586	(1,172)	1,459,716
2012	\$ 8,109,356	\$ 568,466	\$ 184,960	\$ 29,789	\$ 100,649	\$ 45,260	\$ 9,038,480
ERS	6,845,843	470,310	172,340	28,866	87,232	44,949	7,649,540
PFRS	1,263,513	98,156	12,620	923	13,417	311	1,388,940
2011	\$ 7,717,007	\$ 555,255	\$ 192,265	\$ 27,745	\$ 101,333	\$ 27,951	\$ 8,621,556
ERS	6,520,651	457,931	179,301	26,653	87,760	29,328	7,301,624
PFRS	1,196,356	97,324	12,964	1,092	13,573	(1,377)	1,319,932
2010	\$ 6,931,780	\$ 548,321	\$ 183,023	\$ 25,805	\$ 100,029	\$ 29,943	\$ 7,818,901
ERS	5,807,070	451,277	170,188	23,940	86,769	29,318	6,568,562
PFRS	1,124,710	97,044	12,835	1,865	13,260	625	1,250,339

SCHEDULE OF TOTAL CHANGES IN FIDUCIARY NET POSITION

(Dollars in Thousands)

Year Ending	Member Contributions	Employer Contributions	Other Income	Investment Income/(Loss)	Total Additions
2019	\$ 386,519	\$ 4,744,309	\$ 170,154	\$ 10,761,776	\$ 16,062,758
ERS	345,846	3,890,215	160,431	9,140,487	13,536,979
PFRS	40,673	854,094	9,723	1,621,289	2,525,779
2018	\$ 349,389	\$ 4,823,307	\$ 215,614	\$ 21,338,033	\$ 26,726,343
ERS	318,439	3,949,873	181,725	18,128,993	22,579,030
PFRS	30,950	873,434	33,889	3,209,040	4,147,313
2017	\$ 328,827	\$ 4,786,963	\$ 236,401	\$ 20,225,244	\$ 25,577,435
ERS	306,218	3,949,710	200,379	17,194,267	21,650,574
PFRS	22,609	837,253	36,022	3,030,977	3,926,861
2016	\$ 306,631	\$ 5,140,204	\$ 332,880	\$ (384,834)	\$ 5,394,881
ERS	289,333	4,347,619	198,332	(327,069)	4,508,215
PFRS	17,298	792,585	134,548	(57,765)	886,666
2015	\$ 284,793	\$ 5,797,449	\$ 230,799	\$ 12,444,891	\$ 18,757,932
ERS	272,004	4,893,110	193,176	10,582,102	15,940,392
PFRS	12,789	904,339	37,623	1,862,789	2,817,540
2014	\$ 281,398	\$ 6,064,133	\$ 192,581	\$ 20,598,593	\$ 27,136,705
ERS	273,545	5,137,935	175,677	17,496,541	23,083,698
PFRS	7,853	926,198	16,904	3,102,052	4,053,007
2013	\$ 269,134	\$ 5,336,045	\$ 131,853	\$ 14,717,622	\$ 20,454,654
ERS	264,788	4,524,395	122,931	12,496,378	17,408,492
PFRS	4,346	811,650	8,922	2,221,244	3,046,162
2012	\$ 273,247	\$ 4,585,178	\$ 157,625	\$ 7,868,313	\$ 12,884,363
ERS	268,545	3,878,717	134,821	6,681,603	10,963,686
PFRS	4,702	706,461	22,804	1,186,710	1,920,677
2011	\$ 286,199	\$ 4,164,571	\$ 127,709	\$ 19,339,896	\$ 23,918,375
ERS	284,486	3,622,638	101,730	16,427,023	20,435,877
PFRS	1,713	541,933	25,979	2,912,873	3,482,498
2010	\$ 284,291	\$ 2,344,222	\$ 81,981	\$ 28,442,361	\$ 31,132,855
ERS	282,791	1,879,209	76,466	24,145,393	26,383,859
PFRS	1,500	465,013	5,515	4,276,968	4,748,996

SCHEDULE OF TOTAL CHANGES IN FIDUCIARY NET POSITION

CONTINUED

Retirement Allowances	Post-Retirement Supplement	Death Benefits	Separation from Service	Administrative Expenses	Other Expenses	Total Deductions	Net Increase / Decrease
\$ 11,880,340	\$ 646,606	\$ 214,666	\$ 34,646	\$ 136,477	\$ 57,674	\$ 12,970,408	\$ 3,092,350
10,030,590	548,382	202,809	32,984	119,304	57,931	10,992,000	2,544,979
1,849,750	98,224	11,857	1,661	17,173	(257)	1,978,408	547,371
\$ 11,197,802	\$ 628,287	\$ 201,252	\$ 34,969	\$ 122,806	\$ 66,609	\$ 12,251,725	\$ 14,474,618
9,478,272	530,354	191,579	34,302	106,972	68,769	10,410,248	12,168,782
1,719,530	97,933	9,673	667	15,834	(2,160)	1,841,477	2,305,836
\$ 10,617,500	\$ 615,032	\$ 216,150	\$ (5,406)	\$ 107,134	\$ 65,037	\$ 11,615,447	\$ 13,961,988
9,015,444	516,852	207,976	820	93,943	64,441	9,899,476	11,751,098
1,602,056	98,180	8,174	(6,226)	13,191	596	1,715,971	2,210,890
\$ 10,113,758	\$ 606,536	\$ 188,190	\$ 34,488	\$ 106,620	\$ 117,500	\$ 11,167,092	\$ (5,772,211)
8,536,930	508,112	179,861	33,097	93,012	117,197	9,468,209	(4,959,994)
1,576,828	98,424	8,329	1,391	13,608	303	1,698,883	(812,217)
\$ 9,651,227	\$ 601,850	\$ 183,091	\$ 27,628	\$ 107,151	\$ 49,918	\$ 10,620,865	\$ 8,137,067
8,152,183	502,916	174,652	26,067	93,357	51,321	9,000,496	6,939,896
1,499,044	98,934	8,439	1,561	13,794	(1,403)	1,620,369	1,197,171
\$ 9,098,453	\$ 596,556	\$ 203,820	\$ 29,972	\$ 105,662	\$ 48,725	\$ 10,083,188	\$ 17,053,517
7,702,970	497,142	185,169	28,439	92,266	51,341	8,557,327	14,526,371
1,395,483	99,414	18,651	1,533	13,396	(2,616)	1,525,861	2,527,146
\$ 8,669,843	\$ 586,209	\$ 194,170	\$ 29,265	\$ 105,720	\$ 42,049	\$ 9,627,256	\$ 10,827,398
7,339,678	487,100	177,113	28,294	92,134	43,221	8,167,540	9,240,952
1,330,165	99,109	17,057	971	13,586	(1,172)	1,459,716	1,586,446
\$ 8,109,356	\$ 568,466	\$ 184,960	\$ 29,789	\$ 100,649	\$ 45,260	\$ 9,038,480	\$ 3,845,883
6,845,843	470,310	172,340	28,866	87,232	44,949	7,649,540	3,314,146
1,263,513	98,156	12,620	923	13,417	311	1,388,940	531,737
\$ 7,717,007	\$ 555,255	\$ 192,265	\$ 27,745	\$ 101,333	\$ 27,951	\$ 8,621,556	\$ 15,296,819
6,520,651	457,931	179,301	26,653	87,760	29,328	7,301,624	13,134,253
1,196,356	97,324	12,964	1,092	13,573	(1,377)	1,319,932	2,162,566
\$ 6,931,780	\$ 548,321	\$ 183,023	\$ 25,805	\$ 100,029	\$ 29,943	\$ 7,818,901	\$ 23,313,954
5,807,070	451,277	170,188	23,940	86,769	29,318	6,568,562	19,815,297
1,124,710	97,044	12,835	1,865	13,260	625	1,250,339	3,498,657

SERVICE RETIREES — ERS

This table shows the number (*Number*), average final average salary (*Avg FAS*), and average annual pension benefit prior to option selection, including any cost-of-living adjustment (*Avg Pen*), of surviving Employees' Retirement System service retirees on March 31, 2019. Groupings are based on years of service and age, with a breakdown by category of employer.

Years of Service	Nearest Age														
	Under 55			55 – 64			65 – 74			75 – 84			85 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
State															
Under 10	–	–	–	1,167	44,919	4,239	2,268	44,329	5,292	1,098	36,092	4,671	437	22,961	3,623
10 – 14	–	–	–	3,370	44,190	6,875	8,248	40,160	7,772	4,713	34,281	7,466	2,737	26,846	6,994
15 – 19	–	–	–	2,189	51,159	11,317	5,154	49,247	13,339	3,849	40,155	12,347	2,272	30,525	11,374
20 – 24	–	–	–	2,558	64,485	23,380	7,777	59,727	25,603	6,010	47,167	22,369	3,245	34,953	19,320
25 – 29	1,016	90,940	45,192	6,586	77,112	37,748	10,299	66,329	35,279	6,342	50,635	29,987	2,506	38,453	25,899
30 – 34	63	98,369	49,009	10,878	79,237	48,504	13,806	69,653	44,763	6,232	53,904	37,511	1,825	43,043	33,291
35 & Over	2	113,544	56,074	7,393	75,442	53,321	19,592	70,165	54,103	7,236	61,302	50,001	1,950	52,543	46,241
Total	1,081	91,415	45,435	34,141	70,467	37,583	67,144	62,098	35,525	35,480	49,038	28,411	14,972	36,312	21,713
Counties															
Under 10	–	–	–	999	40,535	3,851	2,007	37,515	4,360	1,002	33,193	4,394	302	21,457	3,458
10 – 14	–	–	–	2,114	41,483	6,496	5,131	37,012	7,141	3,211	31,055	6,772	1,803	23,411	6,095
15 – 19	–	–	–	1,287	46,118	10,017	3,399	43,614	11,762	2,525	36,750	11,283	1,591	26,785	10,037
20 – 24	299	86,138	44,687	1,916	57,050	22,441	5,058	52,405	22,619	3,414	42,031	20,105	1,727	31,323	17,108
25 – 29	586	91,810	47,210	2,307	74,114	36,292	4,566	58,982	31,438	2,704	45,987	27,143	1,195	35,192	23,470
30 – 34	32	100,536	60,907	4,226	71,438	44,653	5,117	61,021	39,382	2,134	49,658	34,619	581	38,846	29,712
35 & Over	–	–	–	2,232	69,145	49,614	6,186	67,337	51,925	2,073	59,273	48,413	502	45,922	40,193
Total	917	90,265	46,865	15,081	61,273	30,279	31,464	53,287	27,525	17,063	42,340	21,737	7,701	30,266	15,976
Cities															
Under 10	–	–	–	135	36,743	3,507	320	33,901	3,992	158	28,065	3,648	64	16,803	2,719
10 – 14	–	–	–	368	38,567	5,820	792	33,134	6,364	498	28,530	6,327	270	19,960	5,235
15 – 19	–	–	–	208	41,185	9,158	551	41,974	11,434	361	32,789	10,030	249	23,219	8,865
20 – 24	–	–	–	222	53,229	19,249	655	50,438	21,228	452	37,957	18,030	263	26,004	14,454
25 – 29	–	–	–	206	58,902	26,668	670	55,754	29,570	426	42,084	25,259	214	29,671	20,547
30 – 34	–	–	–	809	64,187	40,163	918	57,031	36,701	435	45,324	31,930	172	32,242	25,825
35 & Over	–	–	–	478	65,897	47,264	1,314	59,734	46,238	421	47,252	39,088	130	37,534	34,055
Total	–	–	–	2,426	55,687	28,595	5,220	50,087	26,970	2,751	38,231	20,576	1,362	26,329	15,317
Towns															
Under 10	–	–	–	300	35,590	3,464	804	30,097	3,561	530	27,293	3,586	142	19,278	2,742
10 – 14	–	–	–	522	42,737	6,790	1,413	36,877	7,216	1,021	29,029	6,284	543	22,063	5,615
15 – 19	–	–	–	445	47,473	10,849	1,131	42,182	11,464	864	34,396	10,528	470	25,900	9,460
20 – 24	–	–	–	484	56,918	20,669	1,384	51,918	22,257	1,032	41,402	19,552	499	32,239	17,285
25 – 29	–	–	–	405	63,182	29,542	1,193	59,108	31,368	794	45,637	26,745	346	34,271	22,159
30 – 34	–	–	–	1,295	75,138	46,964	1,275	62,604	40,226	670	48,590	33,603	219	38,204	28,711
35 & Over	–	–	–	1,025	80,601	57,980	2,005	71,128	55,185	661	56,771	46,012	178	40,892	34,872
Total	–	–	–	4,476	64,157	33,876	9,205	53,103	27,831	5,572	39,998	20,056	2,397	29,404	15,299

SERVICE RETIREES — ERS

CONTINUED

Years of Service	Nearest Age														
	Under 55			55 – 64			65 – 74			75 – 84			85 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
Villages															
Under 10	–	–	–	88	35,693	3,526	235	32,393	3,688	141	27,063	3,608	42	16,313	2,347
10 – 14	–	–	–	183	38,699	5,899	426	35,613	6,825	337	28,817	6,215	166	21,636	5,496
15 – 19	–	–	–	123	51,217	11,822	334	43,595	11,925	248	35,289	10,807	169	23,946	8,979
20 – 24	–	–	–	156	56,758	20,666	419	55,229	23,546	284	44,550	20,976	177	27,490	14,894
25 – 29	–	–	–	104	66,412	30,693	316	59,463	31,433	255	43,951	25,888	119	31,324	20,572
30 – 34	–	–	–	374	73,923	46,291	438	58,199	37,219	210	48,290	33,587	80	33,647	26,079
35 & Over	–	–	–	227	76,560	54,706	550	66,658	51,584	218	54,017	44,445	57	40,189	35,034
Total	–	–	–	1,255	61,602	31,069	2,718	52,034	26,574	1,693	40,198	20,428	810	27,036	14,439
Miscellaneous															
Under 10	–	–	–	864	49,223	4,746	1,604	47,559	5,386	743	38,623	5,049	140	25,983	3,903
10 – 14	–	–	–	1,669	52,853	8,304	3,424	47,322	9,058	1,901	38,269	8,235	883	27,577	7,024
15 – 19	–	–	–	1,338	59,612	13,126	2,571	54,482	14,646	1,528	42,817	12,991	643	30,391	11,008
20 – 24	–	–	–	1,428	67,685	24,089	3,670	61,771	26,025	1,970	51,381	23,750	738	34,610	18,369
25 – 29	–	–	–	1,025	73,112	33,834	3,054	68,881	36,205	1,531	56,145	32,230	524	41,707	27,229
30 – 34	–	–	–	3,069	88,195	55,069	3,257	77,352	49,229	1,202	61,761	42,109	410	45,152	34,085
35 & Over	–	–	–	1,548	85,490	60,768	3,485	78,896	60,704	1,388	72,301	58,121	400	55,636	47,801
Total	–	–	–	10,941	71,758	33,605	21,065	63,724	31,108	10,263	51,509	25,984	3,738	36,301	19,996
School Districts															
Under 10	–	–	–	1,400	24,818	2,403	2,964	22,188	2,622	1,796	19,286	2,529	629	11,647	1,850
10 – 14	–	–	–	2,327	30,269	4,863	5,393	28,426	5,529	4,315	23,247	5,012	2,573	16,223	4,229
15 – 19	–	–	–	1,820	34,932	8,052	4,720	32,756	8,926	3,490	27,849	8,536	2,178	18,161	6,934
20 – 24	–	–	–	2,142	42,485	15,950	7,120	40,580	17,513	4,384	32,721	15,631	2,473	21,160	11,584
25 – 29	–	–	–	1,249	48,336	22,745	5,025	45,039	24,068	3,275	34,458	20,501	1,667	23,454	15,831
30 – 34	–	–	–	1,938	60,677	37,759	3,258	50,096	32,113	1,918	38,151	26,330	720	28,019	21,317
35 & Over	–	–	–	993	66,502	47,829	2,100	56,566	43,370	1,092	44,401	35,907	399	33,085	29,438
Total	–	–	–	11,869	42,444	17,911	30,580	38,291	17,039	20,270	30,099	13,879	10,639	20,060	10,272

SERVICE RETIREES — PFRS

This table shows the number (*Number*), average final average salary (*Avg FAS*), and average annual pension benefit prior to option selection, including any cost-of-living adjustment (*Avg Pen*), of surviving Police and Fire Retirement System service retirees on March 31, 2019. Groupings are based on years of service and age, with a breakdown by category of employer.

Years of Service	Nearest Age														
	Under 40			40 – 49			50 – 59			60 – 69			70 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
State															
Under 10	-	-	-	-	-	-	10	44,960	6,265	2	70,146	42,549	12	24,113	4,452
10 – 14	-	-	-	-	-	-	19	50,574	9,695	27	40,727	8,712	28	19,755	4,796
15 – 19	-	-	-	-	-	-	9	78,331	22,192	17	63,645	21,734	19	31,661	12,892
20 – 24	-	-	-	115	135,231	71,722	453	115,023	61,506	327	77,213	42,545	821	35,285	26,153
25 – 29	-	-	-	25	139,356	82,140	466	135,144	83,062	308	103,766	63,954	368	52,720	37,479
30 – 34	-	-	-	-	-	-	376	146,946	100,363	423	126,951	86,844	429	69,842	51,276
35 & Over	-	-	-	-	-	-	15	145,574	99,285	166	136,389	94,462	235	82,154	64,452
Total	-	-	-	140	135,968	73,583	1,348	129,550	78,814	1,270	106,985	68,280	1,912	51,821	38,097
Counties															
Under 10	-	-	-	-	-	-	7	60,725	7,228	3	62,286	8,973	3	46,492	23,804
10 – 14	-	-	-	-	-	-	8	77,436	15,161	11	58,514	12,039	21	29,532	6,678
15 – 19	-	-	-	-	-	-	2	120,807	37,505	6	54,812	16,493	14	38,065	13,461
20 – 24	-	-	-	68	168,015	87,229	364	153,866	81,618	264	107,817	58,640	1,152	57,216	36,998
25 – 29	-	-	-	12	190,373	114,362	373	179,824	110,829	283	149,428	93,860	418	87,903	58,004
30 – 34	-	-	-	-	-	-	348	200,263	137,581	515	171,476	118,959	711	116,700	84,600
35 & Over	-	-	-	-	-	-	12	220,438	154,330	233	191,532	140,250	623	142,577	110,095
Total	-	-	-	80	171,368	91,299	1,114	176,575	108,640	1,315	155,778	103,607	2,942	93,728	66,624
Cities															
Under 10	-	-	-	-	-	-	19	36,685	4,101	11	36,664	5,190	9	47,177	9,098
10 – 14	-	-	-	-	-	-	17	49,009	10,387	78	35,860	7,812	76	20,182	4,869
15 – 19	-	-	-	-	-	-	11	58,434	16,934	53	47,268	14,003	38	29,318	11,025
20 – 24	-	-	-	361	102,651	52,249	1,614	93,863	48,289	1,297	69,667	37,603	1,704	39,245	26,394
25 – 29	-	-	-	16	115,849	66,314	592	106,224	61,980	799	95,184	57,275	842	53,398	35,194
30 – 34	-	-	-	-	-	-	269	125,661	83,360	801	106,750	70,931	1,019	65,779	47,830
35 & Over	-	-	-	-	-	-	12	107,496	67,360	373	107,060	74,127	773	80,329	62,728
Total	-	-	-	377	103,211	52,845	2,534	99,308	54,579	3,412	87,209	52,874	4,461	54,703	38,715
Towns															
Under 10	-	-	-	-	-	-	11	41,188	4,682	26	33,534	4,485	36	19,690	3,089
10 – 14	-	-	-	-	-	-	15	58,915	12,083	34	37,576	7,483	52	24,447	6,048
15 – 19	-	-	-	-	-	-	6	54,515	15,669	20	53,623	15,989	27	30,625	11,038
20 – 24	-	-	-	146	121,504	61,529	508	101,051	51,410	404	77,623	41,277	381	47,822	30,719
25 – 29	-	-	-	6	124,492	66,466	168	121,731	69,309	199	97,701	56,017	120	62,125	38,711
30 – 34	-	-	-	-	-	-	93	155,502	99,872	192	117,845	77,240	198	84,464	59,741
35 & Over	-	-	-	-	-	-	5	161,780	106,122	119	141,950	97,073	160	101,121	77,433
Total	-	-	-	152	121,622	61,724	806	110,073	59,436	994	94,107	55,227	974	63,024	42,393

SERVICE RETIREES — PFRS

CONTINUED

Years of Service	Nearest Age														
	Under 40			40 – 49			50 – 59			60 – 69			70 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
Villages															
Under 10	-	-	-	-	-	-	16	33,395	3,869	40	27,423	3,176	39	14,045	1,787
10 – 14	-	-	-	-	-	-	15	44,726	8,456	42	35,871	7,320	72	21,830	5,521
15 – 19	-	-	-	-	-	-	5	51,119	13,683	26	46,512	15,112	44	26,885	10,051
20 – 24	-	-	-	120	108,145	54,571	481	95,855	48,570	360	70,329	37,017	430	44,128	28,606
25 – 29	-	-	-	4	138,663	74,610	166	128,418	70,578	143	96,204	52,628	151	53,916	33,675
30 – 34	-	-	-	-	-	-	65	165,866	102,862	146	132,168	84,820	156	75,213	52,268
35 & Over	-	-	-	-	-	-	2	211,592	143,099	114	152,949	103,475	137	101,615	77,917
Total	-	-	-	124	109,130	55,218	750	106,785	56,410	871	91,414	52,651	1,029	54,493	36,077
Miscellaneous															
Under 10	-	-	-	-	-	-	7	56,118	6,947	5	64,558	7,403	2	97,672	10,042
10 – 14	-	-	-	-	-	-	2	75,810	15,357	9	56,671	12,457	12	23,771	5,748
15 – 19	-	-	-	-	-	-	4	127,570	34,838	6	75,669	22,039	7	50,456	19,405
20 – 24	-	-	-	54	149,419	78,984	127	145,318	76,787	237	118,863	63,801	344	66,493	41,868
25 – 29	-	-	-	8	161,968	96,041	95	161,354	97,559	203	147,463	91,257	132	98,473	62,495
30 – 34	-	-	-	-	-	-	48	155,174	105,304	156	171,141	117,389	132	133,776	94,655
35 & Over	-	-	-	-	-	-	2	243,820	142,140	49	170,890	121,026	91	123,467	95,394
Total	-	-	-	62	151,039	81,185	285	150,087	86,237	665	142,051	87,474	720	91,111	61,183

DISABILITY RETIREES — ERS

This table shows the number (*Number*), average final average salary (*Avg FAS*), and average annual pension benefit prior to option selection, including any cost-of-living adjustment (*Avg Pen*), of surviving Employees' Retirement System disability retirees on March 31, 2019. Groupings are based on years of service and age, with a breakdown by category of employer.

Years of Service	Nearest Age														
	Under 55			55 – 64			65 – 74			75 – 84			85 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
State															
Under 10	127	43,533	25,608	311	28,787	12,337	308	24,074	12,243	135	19,640	11,087	57	17,136	6,375
10 – 14	395	53,021	22,914	1,014	41,457	15,218	964	33,878	13,659	458	26,511	11,858	168	20,090	10,087
15 – 19	346	59,781	25,760	966	47,933	19,108	969	38,640	17,385	476	30,332	15,879	120	21,228	15,326
20 – 24	184	65,300	31,542	861	54,105	24,081	796	42,555	21,635	377	32,287	20,957	70	21,579	17,591
25 – 29	115	71,885	42,051	672	62,104	34,774	417	45,198	26,333	187	35,362	24,416	34	21,533	19,640
30 – 34	20	68,393	39,659	190	63,461	38,438	193	43,985	28,685	73	35,218	27,283	6	26,198	25,895
35 & Over	–	–	–	17	63,070	40,573	56	45,966	31,368	6	38,455	32,701	–	–	–
Total	1,187	57,966	27,505	4,031	49,303	22,283	3,703	38,158	18,709	1,712	29,684	17,021	455	20,437	13,080
Counties															
Under 10	45	64,617	41,615	60	35,295	17,268	67	26,974	13,565	29	19,536	9,730	18	18,572	8,837
10 – 14	222	59,460	29,246	358	46,954	19,366	353	33,430	12,639	202	25,708	10,603	59	17,303	8,942
15 – 19	193	72,119	36,522	383	50,306	22,044	343	41,586	18,436	175	29,403	14,361	45	22,341	13,966
20 – 24	111	77,619	40,096	349	64,286	32,603	263	44,686	23,272	89	36,144	24,924	22	22,957	18,286
25 – 29	38	88,857	55,273	229	69,054	39,695	146	47,133	27,652	36	37,279	28,086	11	22,975	21,788
30 – 34	5	55,553	28,425	53	72,374	43,571	57	56,173	38,436	14	34,918	26,171	–	–	–
35 & Over	–	–	–	4	77,035	52,134	13	59,988	41,887	–	–	–	–	–	–
Total	614	68,887	36,005	1,436	56,120	27,436	1,242	40,650	19,796	545	29,271	15,657	155	20,118	12,626
Cities															
Under 10	4	51,732	17,457	15	26,577	10,035	21	24,952	11,572	9	23,814	12,011	5	14,753	8,810
10 – 14	20	46,501	15,892	70	39,675	13,140	76	34,064	11,497	36	25,253	10,955	14	16,597	9,720
15 – 19	21	49,625	16,702	77	44,813	15,375	83	35,463	13,698	34	28,270	12,798	9	17,219	10,482
20 – 24	13	54,278	19,307	58	47,797	18,331	49	35,654	17,195	23	32,329	19,629	9	21,460	17,841
25 – 29	10	62,018	26,965	44	46,968	21,565	51	37,902	21,119	17	31,672	22,151	1	25,207	24,856
30 – 34	1	85,275	43,703	13	60,582	31,748	14	37,816	24,585	3	24,715	15,905	1	12,787	14,408
35 & Over	–	–	–	2	71,083	41,566	2	41,646	26,385	–	–	–	1	22,668	27,213
Total	69	52,031	18,881	279	44,427	17,068	296	34,963	15,440	122	28,203	14,863	40	17,872	12,538
Towns															
Under 10	12	37,692	13,780	16	30,784	11,981	15	29,863	15,721	8	17,108	10,156	6	13,116	8,394
10 – 14	40	51,165	17,573	111	44,108	14,504	83	34,710	13,430	41	26,175	12,258	19	18,590	8,375
15 – 19	36	57,246	19,653	138	49,457	17,157	102	39,343	15,663	39	30,384	13,528	7	23,915	11,044
20 – 24	44	64,320	23,965	100	57,612	22,270	84	42,531	22,079	28	31,888	21,564	11	28,894	26,156
25 – 29	12	72,263	32,517	76	60,906	27,889	47	47,481	27,447	19	35,425	26,298	1	24,803	12,640
30 – 34	2	75,557	39,163	31	66,197	36,979	24	47,116	30,371	7	37,366	31,306	3	21,744	22,603
35 & Over	–	–	–	2	61,053	36,551	6	64,419	42,900	1	30,632	22,238	–	–	–
Total	146	57,590	21,224	474	52,274	20,539	361	40,619	19,610	143	29,742	17,176	47	21,430	13,936

DISABILITY RETIREES — ERS

CONTINUED

Years of Service	Nearest Age														
	Under 55			55 – 64			65 – 74			75 – 84			85 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
Villages															
Under 10	2	49,803	16,600	8	32,605	12,367	6	22,821	13,316	5	18,267	10,026	-	-	-
10 – 14	21	51,771	17,577	32	44,950	14,909	27	32,237	13,096	13	26,104	11,017	1	15,496	6,262
15 – 19	15	56,645	19,047	30	50,904	17,627	26	37,553	16,289	14	33,223	16,332	3	22,554	9,303
20 – 24	9	58,403	21,378	35	58,002	22,444	19	38,125	20,025	8	30,004	23,074	5	18,256	17,293
25 – 29	10	75,933	32,991	24	64,275	29,542	14	41,635	21,270	10	32,397	21,015	2	28,452	27,833
30 – 34	2	79,624	40,368	6	64,271	34,749	8	61,098	36,667	7	35,401	26,188	2	28,217	28,159
35 & Over	-	-	-	-	-	-	1	58,962	35,672	-	-	-	-	-	-
Total	59	58,995	21,883	135	53,220	20,799	101	38,007	18,458	57	29,958	17,545	13	22,137	17,894
Miscellaneous															
Under 10	12	41,770	14,544	45	36,031	13,575	32	30,113	13,680	20	24,552	10,197	8	21,625	10,711
10 – 14	67	48,134	16,558	204	46,340	15,031	212	42,919	13,730	74	31,409	12,458	21	20,693	10,039
15 – 19	50	54,317	18,554	203	51,014	17,537	208	42,932	15,773	69	35,404	15,005	11	25,340	12,761
20 – 24	39	62,509	22,657	175	55,526	20,747	105	48,549	19,970	30	36,117	18,336	9	23,122	17,050
25 – 29	29	67,756	29,724	122	59,464	26,906	56	47,893	26,072	14	41,904	31,731	2	38,009	30,996
30 – 34	6	56,504	29,405	44	60,238	32,176	24	60,590	37,411	8	44,268	33,833	3	36,739	31,496
35 & Over	1	92,720	53,014	1	48,296	29,552	6	46,356	35,190	1	28,043	22,128	-	-	-
Total	204	55,277	20,523	794	51,764	19,642	643	44,330	17,566	216	33,845	15,964	54	23,715	13,830
School Districts															
Under 10	4	24,840	9,298	31	25,298	9,506	52	18,214	7,807	41	16,177	6,762	24	14,405	7,148
10 – 14	87	39,857	13,620	350	32,205	10,342	348	28,868	9,104	204	22,814	8,015	55	15,419	6,571
15 – 19	44	46,579	15,617	289	37,554	12,581	341	33,200	11,668	125	27,759	10,764	39	15,838	10,531
20 – 24	36	45,710	16,522	204	42,608	16,075	118	34,234	15,152	56	27,543	14,830	12	22,513	15,692
25 – 29	13	54,744	23,999	108	50,560	22,713	64	38,546	19,795	30	28,358	18,870	6	23,587	16,462
30 – 34	3	41,090	20,485	31	53,871	28,627	26	44,437	25,853	3	52,471	37,919	-	-	-
35 & Over	-	-	-	3	61,524	37,243	4	48,920	31,387	1	22,658	19,497	-	-	-
Total	187	43,299	15,388	1,016	38,303	14,057	953	31,660	11,968	460	24,696	10,408	136	16,347	9,050

DISABILITY RETIREES — PFRS

This table shows the number (*Number*), average final average salary (*Avg FAS*), and average annual pension benefit prior to option selection, including any cost-of-living adjustment (*Avg Pen*), of surviving Police and Fire Retirement System disability retirees on March 31, 2019. Groupings are based on years of service and age, with a breakdown by category of employer.

Years of Service	Nearest Age														
	Under 40			40 – 49			50 – 59			60 – 69			70 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
State															
Under 10	1	86,025	43,624	20	74,139	48,162	40	46,125	29,373	35	28,447	20,428	24	17,315	18,915
10 – 14	1	112,513	84,385	11	101,016	55,982	32	69,057	40,306	34	40,070	25,942	56	20,144	22,116
15 – 19	–	–	–	16	119,637	75,552	42	83,096	51,133	39	52,884	31,769	94	26,411	24,946
20 – 24	–	–	–	9	122,697	86,471	54	108,710	70,732	24	69,474	45,357	87	41,398	32,965
25 – 29	–	–	–	–	–	–	30	136,200	89,755	31	99,018	66,919	39	52,609	38,762
30 – 34	–	–	–	–	–	–	1	119,299	90,087	23	122,869	87,453	17	63,625	50,985
35 & Over	–	–	–	–	–	–	–	–	–	3	141,137	101,568	13	82,316	65,170
Total	2	99,269	64,004	56	100,222	63,681	199	88,545	56,355	189	65,645	43,996	330	35,853	30,700
Counties															
Under 10	1	89,295	67,187	19	93,762	61,308	24	66,208	40,968	21	45,880	35,034	31	22,018	32,679
10 – 14	7	137,485	83,066	36	125,581	85,690	76	99,252	68,440	54	53,521	41,148	110	32,671	32,643
15 – 19	–	–	–	45	140,416	95,284	98	115,662	83,266	54	70,115	52,763	211	48,063	42,699
20 – 24	–	–	–	20	169,070	117,108	140	139,298	93,881	70	105,892	76,507	261	63,193	52,307
25 – 29	–	–	–	2	175,410	111,684	65	162,424	115,635	45	132,327	94,475	78	73,348	58,037
30 – 34	–	–	–	–	–	–	13	191,940	145,045	28	151,282	112,224	34	104,822	79,488
35 & Over	–	–	–	–	–	–	–	–	–	5	154,181	99,523	22	131,607	101,739
Total	8	131,461	81,081	122	134,044	91,008	416	127,456	88,678	277	93,913	68,786	747	57,686	49,174
Cities															
Under 10	10	77,299	47,261	28	67,276	42,090	58	52,974	34,903	39	34,500	24,948	22	21,491	22,806
10 – 14	11	89,342	55,960	67	82,620	51,383	127	62,616	38,864	105	40,429	28,104	91	23,083	22,646
15 – 19	1	79,930	26,643	74	91,203	53,789	183	74,202	47,014	125	49,121	33,855	130	31,793	27,924
20 – 24	–	–	–	20	98,510	57,720	174	94,373	58,644	180	66,625	44,267	237	41,194	34,139
25 – 29	–	–	–	2	102,060	65,511	74	101,809	63,702	117	83,511	54,436	141	47,368	37,115
30 – 34	–	–	–	–	–	–	14	111,035	70,635	55	86,431	59,459	83	57,829	43,187
35 & Over	–	–	–	–	–	–	–	–	–	14	106,146	72,812	27	65,697	49,645
Total	22	83,440	50,673	191	85,564	51,765	630	79,544	49,953	635	62,573	42,177	731	40,659	33,436
Towns															
Under 10	1	89,005	66,754	19	79,154	53,015	25	52,637	32,685	20	42,399	28,468	6	18,617	22,681
10 – 14	5	108,298	60,591	30	95,605	58,949	37	67,627	44,106	44	49,726	30,733	39	28,666	25,600
15 – 19	–	–	–	23	110,637	71,310	52	88,915	57,417	26	56,364	38,148	48	36,484	33,032
20 – 24	–	–	–	9	115,887	74,904	69	110,211	74,946	60	72,314	49,715	57	50,801	39,896
25 – 29	–	–	–	3	128,003	79,257	24	121,781	72,758	35	93,321	65,834	17	62,230	48,960
30 – 34	–	–	–	–	–	–	6	143,396	77,875	15	130,023	90,648	13	84,725	61,651
35 & Over	–	–	–	–	–	–	–	–	–	1	120,255	60,128	4	128,010	98,530
Total	6	105,083	61,618	84	99,330	63,426	213	93,096	60,185	201	70,533	47,863	184	46,456	38,163

DISABILITY RETIREES — PFRS

CONTINUED

Years of Service	Nearest Age														
	Under 40			40 – 49			50 – 59			60 – 69			70 & Over		
	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen	Number	Avg FAS	Avg Pen
Villages															
Under 10	2	82,612	61,959	14	74,986	50,567	20	54,239	33,370	24	33,641	24,852	16	18,071	22,408
10 – 14	2	71,178	43,417	23	93,753	58,373	42	73,700	49,201	36	46,290	31,143	34	27,296	25,277
15 – 19	1	72,002	36,001	19	105,264	65,101	67	87,815	55,442	44	63,648	43,129	57	39,353	33,722
20 – 24	–	–	–	13	136,500	81,290	51	100,752	64,248	46	77,660	53,058	44	45,929	36,983
25 – 29	–	–	–	–	–	–	17	149,619	96,164	19	96,303	62,228	20	57,054	43,583
30 – 34	–	–	–	–	–	–	3	172,698	103,358	13	136,413	86,691	8	71,912	55,143
35 & Over	–	–	–	–	–	–	–	–	–	5	113,647	57,191	5	77,167	50,944
Total	5	75,917	49,351	69	101,168	62,960	200	91,319	58,350	187	69,615	46,263	184	41,214	34,429
Miscellaneous															
Under 10	2	105,363	65,588	12	85,391	59,771	16	62,320	39,465	13	46,225	32,164	6	55,056	49,180
10 – 14	1	123,988	41,329	29	111,908	76,007	33	105,512	73,711	24	65,138	42,722	11	43,333	30,577
15 – 19	–	–	–	19	130,414	85,719	19	124,541	85,724	32	79,371	55,647	34	54,097	44,008
20 – 24	–	–	–	9	144,662	89,710	35	144,488	95,800	71	114,607	81,113	37	79,308	60,875
25 – 29	–	–	–	1	182,588	136,941	8	156,792	106,618	38	136,764	99,500	13	89,168	65,169
30 – 34	–	–	–	–	–	–	1	176,564	135,597	10	155,736	114,053	4	137,104	102,129
35 & Over	–	–	–	–	–	–	–	–	–	1	127,090	95,318	5	122,576	95,609
Total	3	111,571	57,502	70	117,606	78,492	112	119,047	80,663	189	104,353	74,074	110	71,829	55,580

NEW OPTION SELECTIONS

This table shows the number (*Number*), and the total amount paid in annual benefits after option selection and any partial lump sum distribution* (*\$ Amount*), of new retirees during the given fiscal year. Groupings are based on option selected, with breakdowns by retirement system and member gender.

Options	2015		2016		2017		2018		2019	
	Number	\$ Amount	Number	\$ Amount	Number	\$ Amount	Number	\$ Amount	Number	\$ Amount
ERS Females										
Single Life Allowance**	6,320	142,513,916	7,683	182,550,124	7,413	183,872,745	8,852	209,575,192	7,072	175,527,699
Cash Refund	19	561,834	19	685,299	7	234,374	16	580,262	3	116,424
Joint Allowance — Full	588	8,007,103	715	12,033,549	803	13,434,417	1,050	16,771,815	867	14,305,912
Joint Allowance — Half	124	3,115,553	137	3,495,837	131	3,357,590	147	4,065,239	164	4,603,746
Five Year Certain	123	2,979,134	136	3,039,451	109	2,729,206	142	3,612,207	122	3,271,204
Ten Year Certain	208	4,043,326	273	5,215,831	361	8,035,482	439	9,949,556	390	8,617,407
Pop-Up — Full	1,097	23,550,358	1,402	29,934,874	1,696	40,354,572	2,413	58,537,182	1,922	49,174,363
Pop-Up — Half	678	20,062,741	800	24,575,129	789	25,869,734	1,046	34,464,128	862	30,449,620
Other (Option 4)	559	18,418,160	687	23,740,784	660	22,628,793	776	28,321,409	676	24,896,907
Total	9,716	223,252,128	11,852	285,270,881	11,969	300,516,917	14,881	365,876,993	12,078	310,963,285
ERS Males										
Single Life Allowance**	2,997	88,942,511	3,613	113,480,787	3,397	108,315,670	4,416	135,424,027	3,489	112,196,278
Cash Refund	9	311,243	4	127,476	6	242,131	8	95,032	2	89,243
Joint Allowance — Full	1,475	40,833,756	1,778	54,076,972	1,742	54,862,090	2,300	71,932,738	1,740	55,387,988
Joint Allowance — Half	233	8,521,708	281	11,080,053	219	9,282,560	303	12,609,739	239	9,581,695
Five Year Certain	52	1,617,199	80	2,708,720	66	1,910,993	89	2,895,753	55	1,895,058
Ten Year Certain	172	4,932,061	207	7,085,157	206	5,973,927	321	10,313,589	229	6,929,664
Pop-Up — Full	1,651	51,382,784	2,074	66,784,431	2,452	83,670,111	3,237	113,230,443	2,559	93,913,676
Pop-Up — Half	624	24,050,864	736	29,476,086	741	31,599,049	894	41,086,014	728	33,166,966
Other (Option 4)	804	33,899,200	1,010	43,559,235	886	39,641,518	1,040	47,525,434	956	46,899,818
Total	8,017	254,491,330	9,783	328,378,921	9,715	335,498,055	12,608	435,112,773	9,997	360,060,391
PFRS Females										
Single Life Allowance**	64	4,451,492	62	4,622,315	85	6,071,215	75	5,769,780	66	4,677,275
Cash Refund	—	—	—	—	—	—	—	—	—	—
Joint Allowance — Full	1	146,116	2	117,042	4	288,938	5	329,517	6	296,999
Joint Allowance — Half	3	169,021	4	344,922	3	259,007	1	88,083	1	77,433
Five Year Certain	—	—	—	—	2	220,344	1	89,883	1	77,829
Ten Year Certain	4	312,565	1	88,018	6	406,985	6	395,390	6	464,880
Pop-Up — Full	10	434,592	10	625,473	13	878,840	12	629,577	18	1,049,748
Pop-Up — Half	11	624,942	5	321,668	9	654,009	8	416,178	8	531,088
Other (Option 4)	2	162,922	8	629,196	8	714,073	1	115,472	9	762,431
Total	95	6,301,653	92	6,748,638	130	9,493,415	109	7,833,885	115	7,937,687
PFRS Males										
Single Life Allowance**	354	24,590,267	320	22,112,233	499	35,551,463	433	31,209,987	421	29,947,306
Cash Refund	1	87,958	—	—	—	—	—	—	—	—
Joint Allowance — Full	136	8,872,941	105	6,873,667	232	16,971,860	272	20,499,283	244	18,881,698
Joint Allowance — Half	46	3,585,725	45	3,825,860	84	7,826,713	46	3,635,453	52	4,741,723
Five Year Certain	3	372,785	3	202,398	6	387,703	9	514,073	6	469,869
Ten Year Certain	24	1,530,830	24	1,817,821	39	2,722,041	33	2,622,059	47	3,861,153
Pop-Up — Full	157	9,271,264	146	8,746,372	399	25,316,535	468	33,096,113	430	30,376,811
Pop-Up — Half	86	5,813,128	86	6,921,576	185	15,082,654	146	11,290,976	174	14,765,782
Other (Option 4)	124	9,765,795	154	12,564,460	222	19,064,090	229	19,787,409	247	22,890,719
Total	931	63,890,698	883	63,064,391	1,666	122,923,063	1,636	122,655,356	1,621	125,935,066
* In 2019, eight ERS retirees selected partial lump sums, which totaled \$942,379, and 173 PFRS retirees selected partial lump sums, which totaled \$31,191,318.										
** Includes Single Life Allowance and Option ½.										

OPTION SELECTIONS — TOTAL PAYMENTS

This table shows the number (*Number*), and the total amount paid in annual benefits after option selection and any partial lump sum distribution* (*\$ Amount*), of surviving retirees on March 31 of the given year. Groupings are based on option selected, with breakdowns by retirement system and member gender.

Options	2015		2016		2017		2018		2019	
	Number	\$ Amount	Number	\$ Amount	Number	\$ Amount	Number	\$ Amount	Number	\$ Amount
ERS Females										
Single Life Allowance**	139,436	2,301,148,172	142,738	2,439,709,589	145,621	2,576,016,448	150,277	2,739,135,518	152,563	2,862,124,619
Cash Refund	7,116	90,210,442	6,590	87,017,005	6,107	83,233,943	5,714	80,322,054	5,299	76,843,755
Joint Allowance — Full	9,255	108,355,697	9,680	117,472,217	10,183	127,899,065	10,913	141,398,327	11,421	152,048,415
Joint Allowance — Half	2,722	50,311,548	2,742	52,664,945	2,769	54,789,535	2,807	57,380,922	2,872	60,904,589
Five Year Certain	3,999	64,218,334	3,948	65,278,096	3,886	66,210,411	3,862	67,906,786	3,779	69,125,708
Ten Year Certain	6,656	91,970,160	6,654	94,602,238	6,743	99,655,096	6,940	107,287,519	7,041	112,567,552
Pop-Up — Full	16,151	279,589,915	17,261	306,609,960	18,662	343,869,918	20,800	399,772,716	22,346	444,996,611
Pop-Up — Half	13,367	302,832,057	13,851	323,518,033	14,316	345,395,206	15,051	375,601,607	15,549	401,594,114
Other (Option 4)	5,702	160,017,110	6,304	182,213,350	6,861	202,888,985	7,533	229,338,653	8,110	252,826,035
Total	204,404	3,448,653,436	209,768	3,669,085,432	215,148	3,899,958,607	223,897	4,198,144,103	228,980	4,433,031,398
ERS Males										
Single Life Allowance**	61,693	1,564,822,972	62,964	1,639,051,171	64,058	1,707,602,045	66,276	1,803,709,752	67,333	1,873,321,039
Cash Refund	4,357	93,603,693	4,011	88,404,869	3,696	83,476,833	3,441	78,804,268	3,178	74,872,721
Joint Allowance — Full	29,636	721,763,534	30,276	756,073,178	30,795	788,151,000	31,961	839,107,754	32,422	871,363,515
Joint Allowance — Half	8,571	272,110,655	8,419	274,645,486	8,229	274,227,687	8,135	277,712,944	7,976	278,040,483
Five Year Certain	1,917	45,841,030	1,871	46,354,166	1,842	46,702,985	1,830	47,617,006	1,785	47,612,911
Ten Year Certain	4,552	102,446,498	4,564	106,314,614	4,567	108,728,127	4,683	115,864,288	4,675	118,606,728
Pop-Up — Full	24,925	668,777,757	26,450	725,671,552	28,304	798,701,377	30,932	900,951,147	32,789	982,552,440
Pop-Up — Half	13,537	460,462,999	13,892	481,396,053	14,241	504,090,575	14,760	536,626,853	15,050	558,862,486
Other (Option 4)	8,969	351,108,729	9,814	390,307,216	10,541	426,193,527	11,411	469,149,907	12,191	511,565,281
Total	158,157	4,280,937,867	162,261	4,508,218,305	166,273	4,737,874,156	173,429	5,069,543,917	177,399	5,316,797,601
PFRS Females										
Single Life Allowance**	863	45,682,000	919	50,244,911	998	56,133,650	1,071	62,012,419	1,135	66,721,803
Cash Refund	5	295,261	5	295,261	5	295,261	5	295,261	4	253,161
Joint Allowance — Full	48	2,076,810	47	2,071,752	51	2,360,691	55	2,661,736	57	2,785,671
Joint Allowance — Half	23	1,203,342	27	1,548,818	30	1,807,825	31	1,904,049	32	1,981,483
Five Year Certain	14	723,914	14	723,914	16	944,258	17	1,034,142	18	1,114,808
Ten Year Certain	89	4,905,198	90	4,995,739	95	5,349,217	101	5,744,608	105	6,090,277
Pop-Up — Full	143	7,029,555	152	7,598,667	165	8,484,706	176	9,100,567	194	10,236,019
Pop-Up — Half	85	4,223,475	90	4,566,055	98	5,205,253	105	5,615,901	112	6,088,553
Other (Option 4)	31	2,216,352	38	2,782,268	46	3,514,927	47	3,642,814	56	4,412,811
Total	1,301	68,355,906	1,382	74,827,385	1,504	84,095,788	1,608	92,011,497	1,713	99,684,586
PFRS Males										
Single Life Allowance**	15,154	582,235,830	15,042	594,625,064	15,088	620,012,783	15,090	641,656,655	15,058	662,634,652
Cash Refund	1,465	48,293,210	1,396	46,766,372	1,349	45,479,028	1,271	43,185,558	1,198	41,381,216
Joint Allowance — Full	3,021	141,254,474	3,084	146,707,445	3,258	161,342,953	3,459	179,355,572	3,641	196,644,810
Joint Allowance — Half	1,406	75,063,474	1,422	77,666,165	1,456	83,747,797	1,461	86,401,483	1,477	90,168,956
Five Year Certain	362	13,971,786	354	13,899,664	345	13,749,301	345	13,967,834	330	13,837,335
Ten Year Certain	1,396	53,234,819	1,375	53,781,392	1,375	55,505,892	1,371	57,290,017	1,375	59,847,097
Pop-Up — Full	3,260	149,724,858	3,374	157,327,923	3,733	181,480,456	4,159	214,127,077	4,544	244,142,774
Pop-Up — Half	2,634	154,828,074	2,682	160,406,683	2,821	173,548,925	2,920	183,945,752	3,055	197,956,731
Other (Option 4)	1,516	115,219,264	1,662	127,363,319	1,870	145,785,609	2,085	165,413,074	2,318	188,071,753
Total	30,214	1,333,825,789	30,391	1,378,544,027	31,295	1,480,652,744	32,161	1,585,343,023	32,996	1,694,685,323

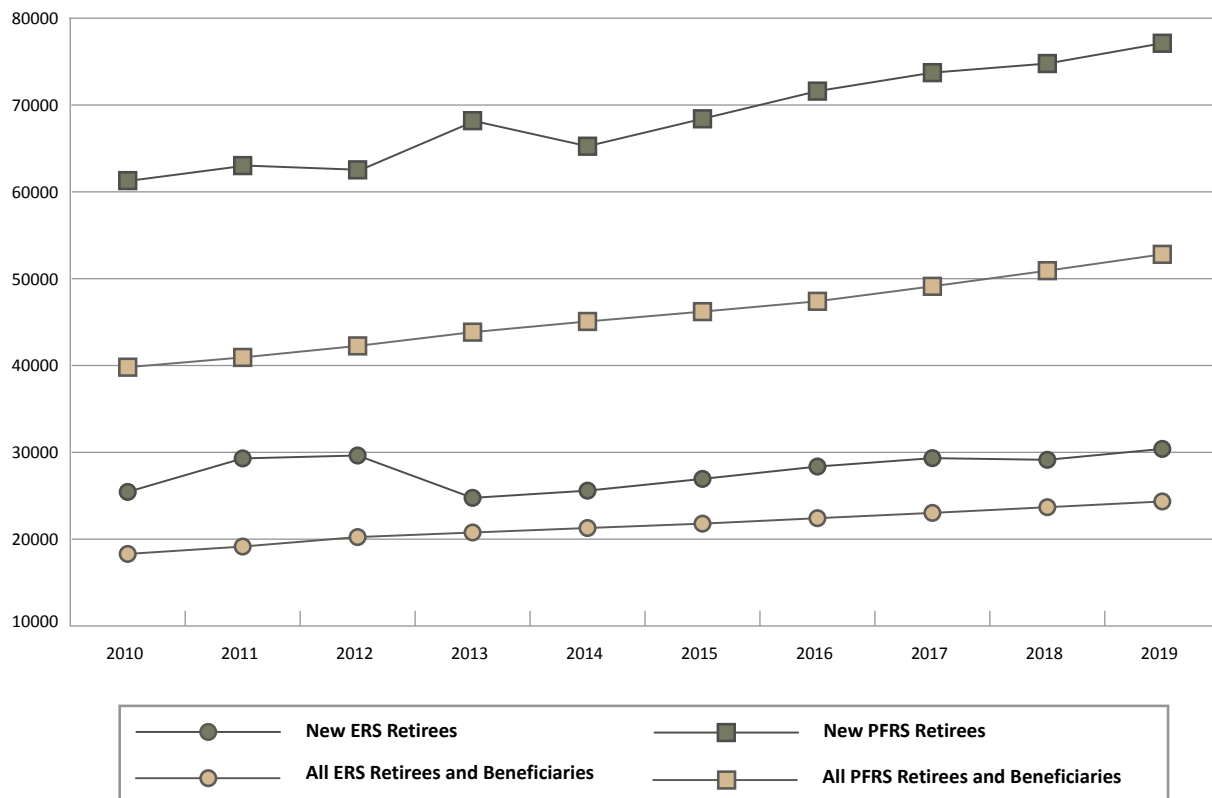
* In the five years since this program began, 20 ERS retirees have selected partial lump sums, which totaled approximately \$2,341,405. In the 11 years since this program began, 1,550 PFRS retirees have selected partial lump sums, which totaled \$201,869,888.

** Includes Single Life Allowance and Option ½.

AVERAGE PENSION BENEFITS PAID DURING YEAR SHOWN

This table shows the average annual benefit payments to all retirees and beneficiaries receiving benefits during the given fiscal year compared with average annual benefit payments to new retirees during the year. The benefit consists of actual payments — after option selection and any partial lump sum distribution, plus any cost-of-living adjustment. A breakdown is provided by retirement system. The marked line graph (below) shows the trends in these benefit payments over the past 10 years.

Year	ERS		PFRS	
	All Retirees & Beneficiaries	New Retirees	All Retirees & Beneficiaries	New Retirees
2010	\$ 18,300	\$ 25,441	\$ 39,808	\$ 61,295
2011	19,151	29,300	40,932	63,026
2012	20,241	29,636	42,259	62,535
2013	20,766	24,756	43,844	68,197
2014	21,285	25,588	45,074	65,256
2015	21,788	26,941	46,207	68,414
2016	22,415	28,364	47,397	71,603
2017	23,026	29,331	49,123	73,729
2018	23,680	29,139	50,922	74,779
2019	24,345	30,397	52,804	77,116



AVERAGE BENEFIT PAY TYPES

NEW BENEFITS: ERS

This table shows the number of retirements granted (*Number*), the average monthly retirement allowance prior to option selection or any partial lump sum distribution (*Monthly Allowance*), and the average final average salary (*Average FAS*) of members retiring during the fiscal year ending March 31, 2019. Groupings are based on years of service, with a breakdown by retirement type.

Years of Service	Number	Monthly Allowance	Average FAS
Service Retirements			
Under 5	5	\$ 93	\$ 20,149
5 – 9	1,214	341	38,017
10 – 14	3,236	725	48,244
15 – 19	2,481	1,103	51,769
20 – 24	3,456	2,125	62,168
25 – 29	2,963	3,094	72,747
30 – 34	5,108	4,104	79,656
35 – 39	2,246	4,825	83,566
40 & Over	694	5,941	90,136
Total	21,403	\$ 2,707	\$ 66,268
Ordinary Disability Retirements			
Under 5	7	\$ 1,462	\$ 53,011
5 – 9	15	1,235	44,817
10 – 14	147	1,396	54,311
15 – 19	154	1,593	58,813
20 – 24	120	1,831	61,312
25 – 29	93	2,464	66,497
30 – 34	31	2,702	61,954
35 – 39	5	3,447	69,873
40 & Over	–	–	–
Total	572	\$ 1,799	\$ 59,259
Performance of Duty Disability Retirements			
Under 5	2	\$ 3,363	\$ 53,813
5 – 9	11	5,038	80,720
10 – 14	20	5,017	82,553
15 – 19	23	5,974	98,423
20 – 24	28	5,575	88,328
25 – 29	10	6,035	99,396
30 – 34	5	7,918	127,110
35 – 39	–	–	–
40 & Over	–	–	–
Total	99	\$ 5,615	\$ 91,041
Accidental Disability Retirements			
Under 5	–	\$ –	\$ –
5 – 9	–	–	–
10 – 14	–	–	–
15 – 19	1	4,934	78,951
20 – 24	–	–	–
25 – 29	–	–	–
30 – 34	–	–	–
35 – 39	–	–	–
40 & Over	–	–	–
Total	1	\$ 4,934	\$ 78,951

AVERAGE BENEFIT PAY TYPES

CONTINUED

NEW BENEFITS: PFRS

This table shows the number of retirements granted (*Number*), the average monthly retirement allowance prior to option selection or any partial lump sum distribution (*Monthly Allowance*), and the average final average salary (*Average FAS*) of members retiring during the fiscal year ending March 31, 2019. Groupings are based on years of service, with a breakdown by retirement type.

Years of Service	Number	Monthly Allowance	Average FAS
Service Retirements			
Under 5	–	\$ –	\$ –
5 – 9	33	398	39,963
10 – 14	24	1,087	57,324
15 – 19	13	2,224	79,814
20 – 24	511	5,246	121,320
25 – 29	319	7,029	141,675
30 – 34	492	8,900	157,431
35 – 39	100	9,140	163,276
40 & Over	33	9,858	164,494
Total	1,525	\$ 6,957	\$ 137,792
Ordinary Disability Retirements			
Under 5	–	\$ –	\$ –
5 – 9	–	–	–
10 – 14	4	2,732	98,365
15 – 19	4	3,598	98,490
20 – 24	–	–	–
25 – 29	2	6,856	136,053
30 – 34	–	–	–
35 – 39	–	–	–
40 & Over	–	–	–
Total	10	\$ 3,903	\$ 105,953
Performance of Duty Disability Retirements			
Under 5	2	\$ 1,628	\$ 39,077
5 – 9	3	3,030	72,742
10 – 14	16	4,038	96,812
15 – 19	31	4,245	101,662
20 – 24	26	5,296	126,176
25 – 29	14	4,566	109,155
30 – 34	3	6,942	166,625
35 – 39	2	7,005	167,372
40 & Over	1	3,324	79,781
Total	98	\$ 4,575	\$ 109,388
Accidental Disability Retirements			
Under 5	2	\$ 4,021	\$ 76,016
5 – 9	2	7,010	112,170
10 – 14	11	6,747	107,952
15 – 19	28	7,347	120,798
20 – 24	28	8,866	142,028
25 – 29	17	9,807	157,862
30 – 34	15	9,204	145,775
35 – 39	–	–	–
40 & Over	–	–	–
Total	103	\$ 8,301	\$ 133,915

NEW BENEFITS — SERVICE RETIREMENTS BY AGE AND SERVICE

This table shows the number of retirements granted (*Number*), the average annual retirement allowance prior to option selection or any partial lump sum distribution (*Allowance*), and the average allowance as a percentage of the average final average salary (%) of new service retirees during the fiscal year ending March 31, 2019. Groupings are based on years of service and age at retirement, within each retirement system.

Years of Service	Age at Retirement											
	50 – 59			60 – 64			65 – 69			70 & Over		
	Number	Allowance	%	Number	Allowance	%	Number	Allowance	%	Number	Allowance	%
ERS												
Under 5	–	\$ –	–	–	\$ –	–	1	\$ 1,867	4	4	\$ 942	7
5 – 9	439	3,620	9	380	4,497	12	269	4,427	12	126	3,904	12
10 – 14	1,034	6,569	14	1,005	9,011	19	812	10,285	20	385	10,298	20
15 – 19	700	10,104	20	820	13,854	27	652	15,099	28	309	14,779	28
20 – 24	705	21,193	34	1,393	25,653	42	981	27,787	43	377	27,124	43
25 – 29	893	37,466	46	1,195	37,577	53	626	35,679	54	249	37,407	54
30 – 34	2,433	49,746	62	1,826	49,126	62	619	47,914	62	230	48,537	62
35 – 39	1,057	55,174	69	794	59,773	70	298	62,450	71	97	58,514	70
40 & Over	23	55,073	75	295	66,064	77	245	73,505	79	131	81,802	85
Total	7,284	\$ 33,562	44	7,708	\$ 33,655	46	4,503	\$ 30,038	43	1,908	\$ 29,414	42

Years of Service	Age at Retirement											
	40 – 49			50 – 54			55 – 59			60 & Over		
	Number	Allowance	%	Number	Allowance	%	Number	Allowance	%	Number	Allowance	%
PFRS												
Under 5	–	\$ –	–	–	\$ –	–	–	\$ –	–	–	\$ –	–
5 – 9	–	–	–	–	–	–	29	4,839	11	4	4,318	14
10 – 14	–	–	–	–	–	–	18	11,860	21	6	16,637	25
15 – 19	–	–	–	–	–	–	9	23,129	29	4	34,726	41
20 – 24	277	63,614	51	153	62,688	52	57	62,183	52	24	58,821	51
25 – 29	59	86,449	59	168	85,575	59	76	84,890	60	16	61,256	59
30 – 34	–	–	–	101	104,049	66	308	109,465	68	83	100,320	67
35 – 39	–	–	–	1	128,780	70	24	126,677	67	75	103,988	66
40 & Over	–	–	–	–	–	–	–	–	–	33	118,302	71
Total	336	\$ 67,624	53	423	\$ 81,810	58	521	\$ 90,813	59	245	\$ 92,561	63

NEW BENEFITS — ACCIDENTAL AND ORDINARY DEATH

ACCIDENTAL DEATH BENEFITS

During the fiscal year ending March 31, 2019, the Employees' Retirement System approved two accidental death benefits, which averaged \$21,126 annually. The Police and Fire Retirement System approved 14 accidental death benefits, which averaged \$72,119 annually.

ORDINARY DEATH BENEFITS

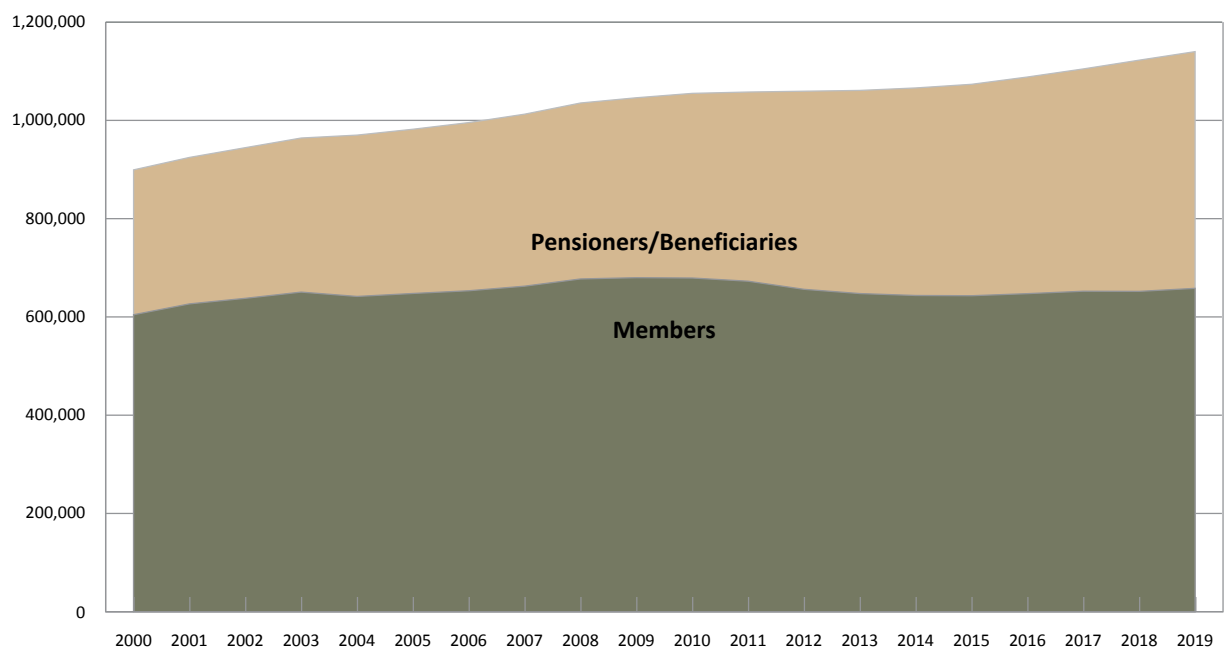
This table shows the number of ordinary death benefits granted (*Number*), the average benefit paid (*Average Benefit*), and the average benefit paid as a percentage of average final average salary (*Percentage of Salary*) of new ordinary death beneficiaries during the fiscal year ending March 31, 2019. Groupings are based on years of service, with a breakdown by retirement system.

Years of Service	ERS			PFRS		
	Number	Average Benefit	Percentage of Salary	Number	Average Benefit	Percentage of Salary
Under 5	99	\$ 89,924	211.2	5	\$ 175,442	280.8
5 – 9	101	136,224	275.0	–	–	–
10 – 14	181	123,049	236.4	7	308,186	278.9
15 – 19	146	152,166	245.8	2	143,750	150.4
20 – 24	86	174,280	261.6	2	1,201,903	627.1
25 – 29	63	192,405	260.6	2	669,105	519.5
30 – 34	44	183,346	281.8	2	1,414,362	760.6
35 – 39	25	195,787	276.4	1	938,726	953.3
40 & Over	10	606,010	487.7	1	553,189	774.9
Total	755	\$ 150,041	252.3	22	\$ 517,485	418.2

COMBINED SYSTEM PARTICIPANTS

This table shows participant counts for ERS and PFRS combined. Members represent those participants not currently collecting a benefit, while Retirees/Beneficiaries represent those currently collecting a benefit. The Total Participants column represents the sum of the member and retiree/beneficiary counts. The percentage changed column shows the percentage change increase or decrease in counts calculated on a year-over-year basis. The stacked line graph (below) shows the trends in these counts over the prior 20 years.

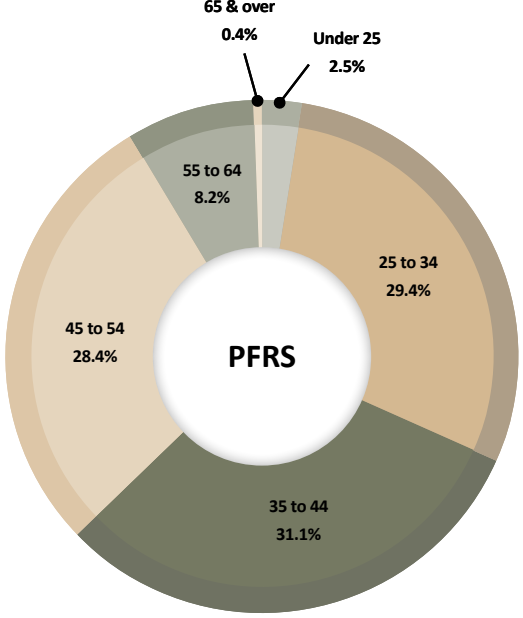
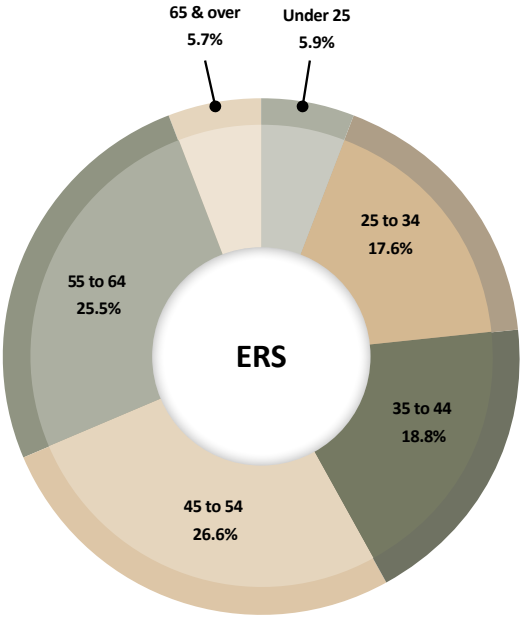
Fiscal Year	Members	Percentage Changed	Retirees/ Beneficiaries	Percentage Changed	Total Participants	Percentage Changed
2000	604,479	2	294,835	2	899,314	2
2001	626,565	4	298,078	1	924,643	3
2002	637,896	2	306,604	3	944,500	2
2003	650,543	2	313,597	2	964,140	2
2004	641,721	(1)	328,357	5	970,078	1
2005	647,758	1	334,251	2	982,009	1
2006	653,291	1	342,245	2	995,536	1
2007	662,633	1	350,066	2	1,012,699	2
2008	677,321	2	358,109	2	1,035,430	2
2009	679,908	0	366,178	2	1,046,086	1
2010	679,217	0	375,803	3	1,055,020	1
2011	672,723	(1)	385,031	2	1,057,754	0
2012	656,224	(2)	403,174	5	1,059,398	0
2013	647,574	(1)	413,436	3	1,061,010	0
2014	643,659	(1)	422,405	2	1,066,064	0
2015	643,178	0	430,308	2	1,073,486	1
2016	647,399	1	440,943	2	1,088,342	1
2017	652,324	1	452,455	3	1,104,779	2
2018	652,030	0	470,596	4	1,122,626	2
2019	658,176	1	481,795	2	1,139,971	2



MEMBERSHIP BY AGE AND YEARS OF SERVICE

This table shows membership counts (*Number*), and percentage of the system’s total membership count (*Percentage*), as of the fiscal year ending March 31, 2019. Groupings are based on age and years of service, with a breakdown by retirement system.

Age	Years of Service											
	Total		0 – 4		5 – 9		10 – 19		20 – 29		30 & Over	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
ERS												
Under 25	36,516	5.9	36,382	5.8	134	–	–	–	–	–	–	–
25 – 34	109,535	17.6	83,233	13.4	20,340	3.3	5,962	1.0	–	–	–	–
35 – 44	117,013	18.8	46,788	7.5	25,592	4.1	41,408	6.6	3,225	0.5	–	–
45 – 54	165,793	26.6	39,835	6.4	28,538	4.6	56,620	9.1	33,078	5.3	7,722	1.2
55 – 64	158,869	25.5	25,161	4.0	22,758	3.7	54,508	8.7	35,893	5.8	20,549	3.3
65 & Over	35,364	5.7	5,590	0.9	5,387	0.9	11,917	1.9	7,549	1.2	4,921	0.8
Total	623,090	100.0	236,989	38.0	102,749	16.5	170,415	27.3	79,745	12.8	33,192	5.3
PFRS												
Under 25	882	2.5	880	2.5	2	–	–	–	–	–	–	–
25 – 34	10,321	29.4	6,366	18.1	2,993	8.5	962	2.7	–	–	–	–
35 – 44	10,907	31.1	1,419	4.0	1,918	5.5	6,857	19.5	713	2.0	–	–
45 – 54	9,957	28.4	329	0.9	596	1.7	3,407	9.7	5,018	14.3	607	1.7
55 – 64	2,885	8.2	79	0.2	218	0.6	287	0.8	893	2.5	1,408	4.0
65 & Over	134	0.4	25	0.1	26	0.1	20	0.1	4	–	59	0.2
Total	35,086	100.0	9,098	25.9	5,753	16.4	11,533	32.9	6,628	18.9	2,074	5.9



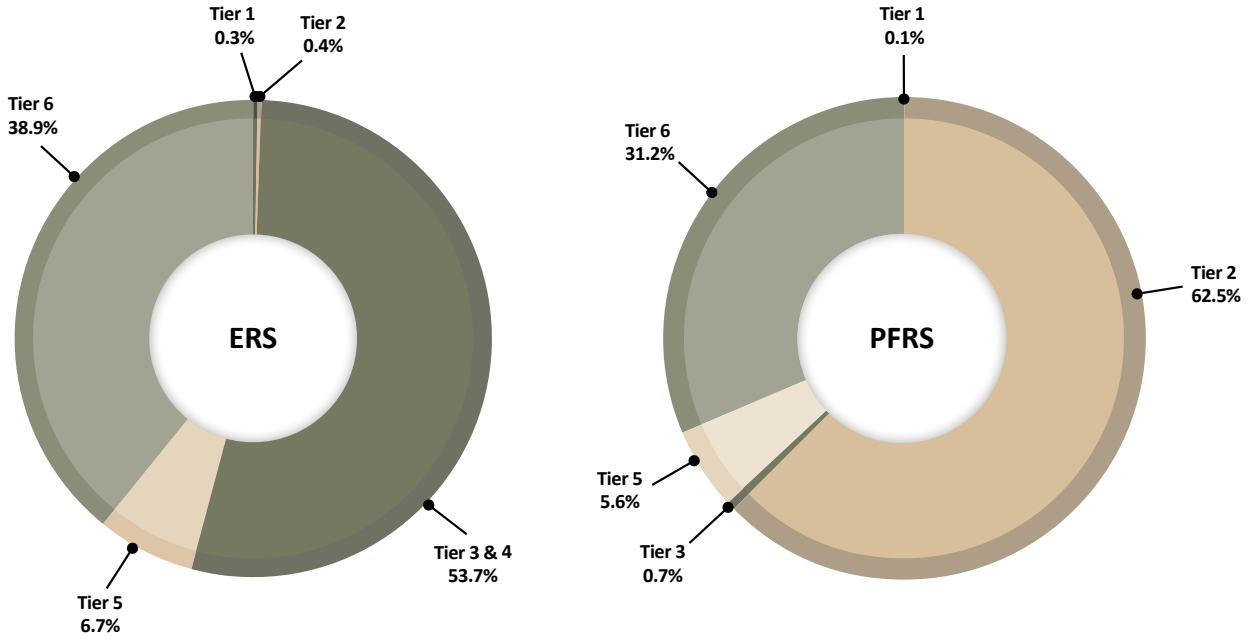
Note: Percentages may not sum to 100% due to rounding.

MEMBERSHIP BY TIER

This table shows membership counts (*Number*), and percentage of the system’s total membership count (*Percentage*), as of the fiscal year ending March 31, 2019. Groupings are based on tier, with a breakdown by retirement system.

	ERS		PFRS		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Tier 1	1,937	0.3	27	0.1	1,964	0.3
Tier 2	2,278	0.4	21,938	62.5	24,216	3.7
Tiers 3 & 4*	334,606	53.7	230	0.7	334,836	50.9
Tier 5	41,578	6.7	1,949	5.6	43,527	6.6
Tier 6	242,691	38.9	10,942	31.2	253,633	38.5
Total	623,090	100.0	35,086	100.0	658,176	100.0

* There is no Tier 4 in the Police and Fire Retirement System.



Note: Percentages may not sum to 100% due to rounding.

MEMBERSHIP BY STATUS

This table shows membership counts by status — active or inactive — as of the fiscal year ending March 31, 2019, with a breakdown by retirement system. Active status means the member was reported on payroll at the fiscal year end. Inactive status means the member was not reported on payroll (including pending retirement and pending deaths) at the fiscal year end. The sum of these two statuses represent the total membership count for the system.

	ERS			PFRS		
	Active	Inactive	Total	Active	Inactive	Total
2010	529,466	114,409	643,875	32,449	2,893	35,342
2011	513,092	124,829	637,921	31,659	3,143	34,802
2012	505,575	116,532	622,107	31,024	3,093	34,117
2013	498,266	115,664	613,930	30,780	2,864	33,644
2014	493,209	116,356	609,565	31,218	2,876	34,094
2015	491,558	117,079	608,637	31,372	3,169	34,541
2016	494,411	117,883	612,294	31,720	3,385	35,105
2017	496,441	120,702	617,143	32,332	2,849	35,181
2018	500,945	115,961	616,906	32,470	2,654	35,124
2019	501,037	122,053	623,090	32,573	2,513	35,086

NUMBER OF EMPLOYERS

As of March 31, 2019.

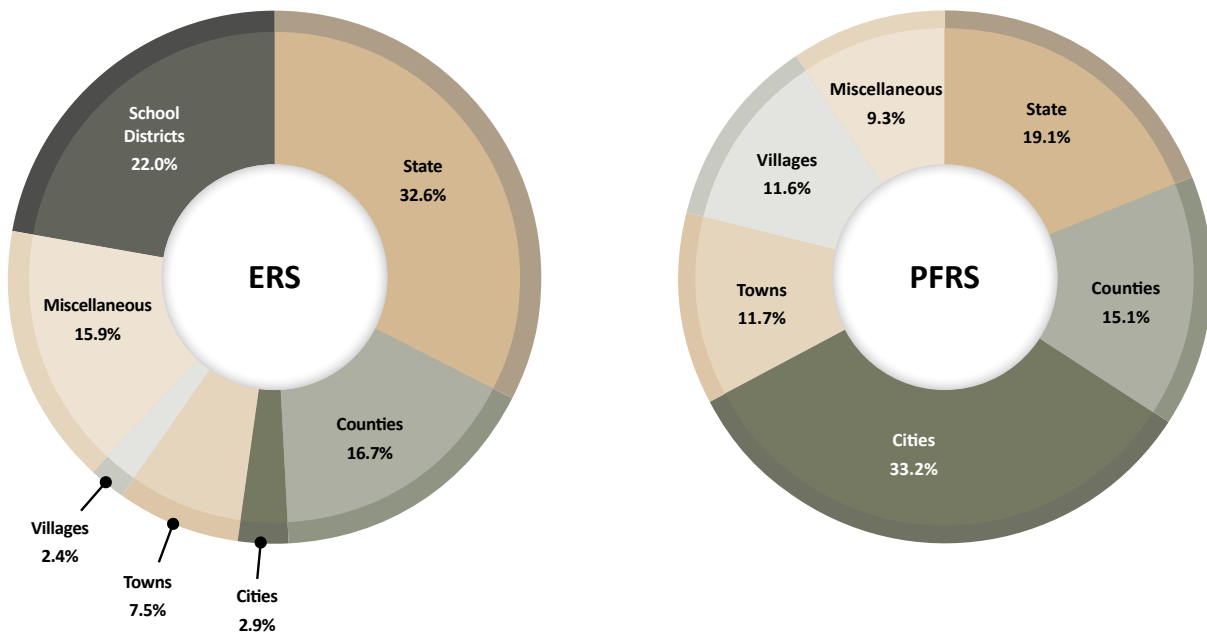
Category	ERS	PFRS
State	1	1
Counties	57	4
Cities	61	61
Towns	914	207
Villages	483	365
Miscellaneous	802	39
School Districts	697	0
Total*	3,015	677

* Please note that some ERS employers are also PFRS employers. Therefore the total of ERS employers and PFRS employers above will not equal the total number of NYSLRS participating employers.

TOTAL MEMBERSHIP BY EMPLOYER TYPE

This table shows total and active membership counts, grouped by primary employer type as of the fiscal year ending March 31, 2019, with a breakdown by retirement system. Active status means the member was reported on payroll at the fiscal year end.

	ERS		PFRS		Total	
	Total	Active	Total	Active	Total	Active
State	203,421	169,708	6,712	6,264	210,133	175,972
Counties	103,965	82,339	5,303	5,173	109,268	87,512
Cities	18,251	14,535	11,659	10,956	29,910	25,491
Towns	46,611	35,804	4,090	3,709	50,701	39,513
Villages	14,867	11,271	4,072	3,402	18,939	14,673
Miscellaneous	99,042	76,804	3,250	3,069	102,292	79,873
School Districts	136,933	110,576	–	–	136,933	110,576
Total	623,090	501,037	35,086	32,573	658,176	533,610



Note: Numbers may not add up due to rounding. A detailed listing of employers as of March 31, 2019 is available on our website at www.osc.state.ny.us/retire/employers/index.php.

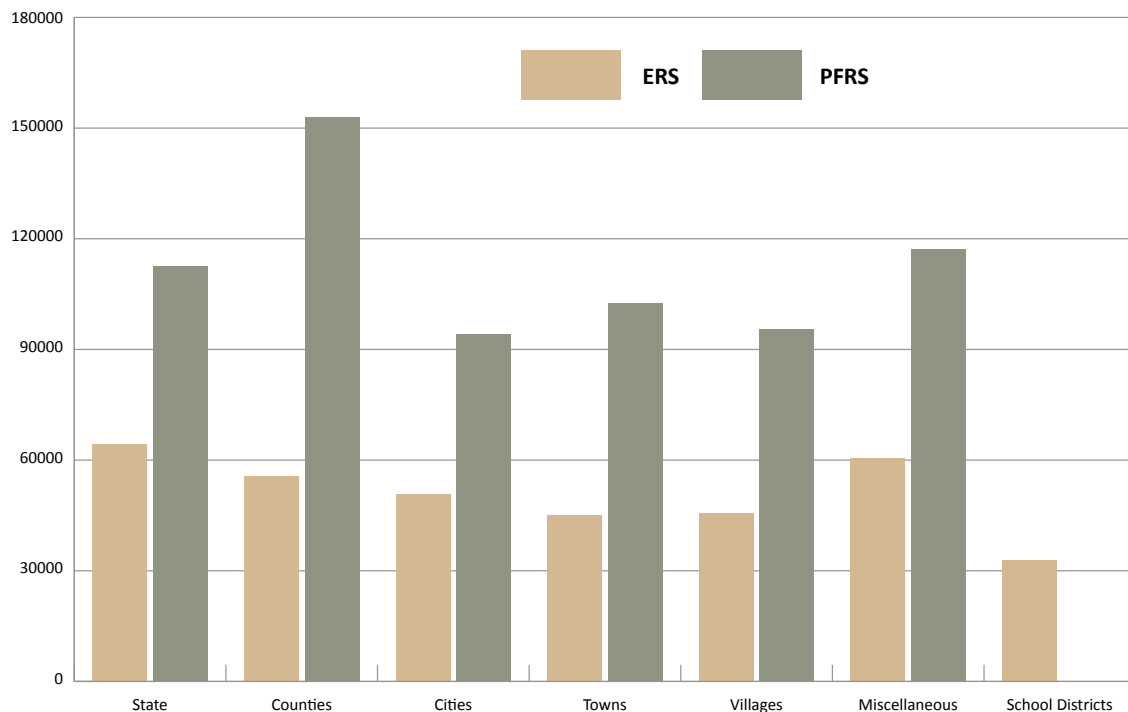
AVERAGE SALARY BY EMPLOYER TYPE

This table shows the average salary (*Average Salary*), membership counts (*Total Members**), and total salary (*Total Salaries*) for active members as of the fiscal year ending March 31, 2019. Groupings are based on primary employer type, with a breakdown by retirement system. Active status means the member was reported on payroll at the fiscal year end.

	Average Salary	Total Members*	Total Salaries
ERS			
State	\$ 64,309	169,708	\$ 10,913,727,419
Counties	55,735	82,339	4,589,160,206
Cities	50,885	14,535	739,607,664
Towns	45,013	35,804	1,611,642,672
Villages	45,555	11,271	513,450,929
Miscellaneous	60,622	76,804	4,655,993,257
School Districts	32,961	110,576	3,644,711,574
Total	\$ 53,226	501,037	\$ 26,668,293,721
PFRS			
State	\$ 112,509	6,264	\$ 704,757,382
Counties	152,998	5,173	791,460,040
Cities	94,161	10,956	1,031,624,290
Towns	102,702	3,709	380,920,291
Villages	95,455	3,402	324,738,116
Miscellaneous	117,169	3,069	359,590,757
Total	\$ 110,309	32,573	\$ 3,593,090,876

* Active members receiving salary.

The bar graph below represents the average salary by retirement system for each primary employer type.



MEMBERS AND SALARIES BY PLAN — ERS

These tables show membership counts (*Members*) and total salary (*Total Salaries*) for active members in the Employees' Retirement System, as of the fiscal year ending March 31, 2019. Groupings are based on plan, with a breakdown by tier. Active status means the member was reported on payroll at the end of the fiscal year.

Plan	Tier 1		Tier 2	
	Members	Total Salaries	Members	Total Salaries
Age 55/60 Contributory	2	\$ 25,917	2	\$ 124,246
Age 55 75-c	11	406,433	17	576,567
Age 55 75-e	3	177,732	5	182,571
Age 55 75-g	20	987,169	22	1,018,672
Age 55 75-h	552	48,563,179	612	53,205,704
Age 55 75-i	774	44,124,670	1,032	59,814,076
Regular Correction Officers/Security Hospital Treatment Asst. ½ Disability	–	–	–	–
Correction Officers 89	5	418,952	6	605,318
Sheriffs 89-a	1	125,182	–	–
Sheriffs 89-b	–	–	–	–
Sheriffs 89-b(m)	–	–	–	–
Investigators 89-d	–	–	–	–
Investigators 89-d(m)	2	367,534	–	–
Sheriffs — 551	–	–	–	–
Sheriffs — 551e	–	–	–	–
Sheriffs — 552	–	–	–	–
Sheriffs — 553	–	–	–	–
Legislators 80-a	2	202,327	–	–
Unified Court Peace Officers	–	–	12	1,546,069
25-Year Correction Officers/Sheriffs/Office of Mental Health	6	684,985	9	808,206
25-Year 1/60 Peace Officers, Amb Med Techs, Paramedics	1	136,100	1	140,255
Total	1,379	\$ 96,220,182	1,718	\$ 118,021,684

MEMBERS AND SALARIES BY PLAN — ERS

CONTINUED

Plan	Tier 3 & 4		Tier 5		Tier 6	
	Members	Total Salaries	Members	Total Salaries	Members	Total Salaries*
Article 14 & 15	252,608	\$ 16,128,962,506	27,484	\$ 1,358,694,385	178,164	\$ 5,772,992,070
Regular Correction Officers/ Security Hospital Treatment Asst. % Disability	374	34,486,359	28	1,909,029	132	7,454,583
Article 14 Correction Officers	11,745	1,014,479,093	889	61,529,076	7,905	429,772,750
Sheriffs — 551	200	18,879,118	13	815,875	65	3,896,674
Sheriffs — 551e	60	4,341,382	9	542,514	35	1,451,375
Sheriffs — 552	339	28,986,231	36	2,512,054	158	8,319,288
Sheriffs — 553	1,270	140,254,793	161	13,906,982	541	32,388,778
Unified Court Peace Officers	4,917	515,369,181	259	21,505,918	914	60,102,473
25-Year Correction Officers/Sheriffs/Office of Mental Health	5,582	547,015,011	649	53,744,914	3,169	161,558,894
25-Year 1/60 Peace Officers, Paramedics	11	751,067	1	40,922	5	172,293
20-Year 1/60 Investigators	14	2,715,298	1	148,696	1	108,125
Westchester County Criminal Investigators	25	3,463,669	1	137,583	5	624,761
25-Year 1/60 % Accidental Disability Amb Med Techs	113	13,949,536	5	499,669	3	211,982
25-Year % Accidental Disability Fire Marshalls	36	4,491,947	4	393,898	9	471,101
Total	277,294	\$ 18,458,145,192	29,540	\$ 1,516,381,515	191,106	\$ 6,479,525,147
* Reportable Tier 6 salaries are capped at the Governor's salary, which was initially \$179,000 for fiscal year 2019. The Governor's salary was increased to \$200,000 effective January 1, 2019, \$225,000 effective January 1, 2020, and \$250,000 effective January 1, 2021. These increases will be reflected in future CAFRs.						

There may be plans with no member count and salary greater than zero. Members who work for multiple employers may receive salary under multiple plans but will only be counted once, under their primary plan.

MEMBERS AND SALARIES BY PLAN — PFRS

These tables show membership counts (*Members*) and total salary (*Total Salaries*) for active members in the Police and Fire Retirement System, as of the fiscal year ending March 31, 2019. Groupings are based on plan, with a breakdown by tier and contributory status. Active status means the member was reported on payroll at the end of the fiscal year.

Plan	Tier 1		Tier 2		Tier 3	
	Members	Total Salaries	Members	Total Salaries	Members	Total Salaries
Age 55/60 Basic	–	\$ –	20	\$ 254,789	1	\$ 16,767
Age 55 375-c	–	–	96	2,328,855	2	26,444
Age 55 375-e	–	–	24	473,204	–	–
Age 55 375-g	–	–	30	825,040	1	12,864
Age 55 375-h	–	–	2	139,378	–	–
Age 55 375-i	4	389,835	118	7,768,265	3	154,838
Age 55 375-j	–	–	3	420,580	–	–
State Police 381-b	–	–	3,273	450,482,644	10	1,040,053
Regional Park Police 383-a	–	–	148	13,745,271	1	75,811
EnCon Police 383-b	–	–	204	21,388,390	2	156,167
Forest Ranger 383-c	–	–	101	9,740,577	2	150,932
SUNY Police 383-d	–	–	254	22,193,637	10	748,432
25-Year 384	–	–	31	1,758,472	16	1,735,756
25-Year 384(f)	–	–	74	9,284,407	71	6,876,081
20-Year 384-d	–	–	5,900	678,328,816	52	4,457,196
20-Year 1/60 384-e	10	2,064,875	10,128	1,501,894,411	40	3,652,230
Total	14	\$ 2,454,710	20,406	\$ 2,721,026,735	211	\$ 19,103,571

MEMBERS AND SALARIES BY PLAN — PFRS

CONTINUED

Tier 5 Contributory		Tier 5 Non-Contributory		Tier 6 Contributory		Tier 6 Non-Contributory	
Members	Total Salaries	Members	Total Salaries	Members	Total Salaries*	Members	Total Salaries*
2	\$ 28,092	–	\$ –	23	\$ 165,167	–	\$ –
10	119,080	–	–	54	941,106	–	–
6	64,799	–	–	15	112,481	–	–
2	31,399	–	–	11	286,577	–	–
–	–	–	–	4	52,428	–	–
10	495,089	–	–	38	2,282,131	–	–
–	–	–	–	–	–	–	–
111	11,987,364	–	–	1,673	142,531,281	–	–
4	401,301	–	–	131	7,328,146	–	–
8	604,804	–	–	73	5,430,504	–	–
2	156,543	–	–	27	1,930,955	–	–
50	4,057,670	–	–	190	11,310,242	–	–
8	390,080	–	–	34	2,152,158	1	23,423
7	972,639	6	997,325	21	1,528,700	2	216,979
606	53,985,305	107	8,494,931	3,155	190,395,408	6	493,723
795	82,407,500	88	8,769,711	4,619	303,731,750	43	5,629,071
1,621	\$ 155,701,665	201	\$ 18,261,967	10,068	\$ 670,179,032	52	\$ 6,363,196

* Reportable Tier 6 salaries are capped at the Governor's salary, which was initially \$179,000 for fiscal year 2019. The Governor's salary was increased to \$200,000 effective January 1, 2019, \$225,000 effective January 1, 2020, and \$250,000 effective January 1, 2021. These increases will be reflected in future CAFRs.

There may be plans with no member count and salary greater than zero. Members who work for multiple employers may receive salary under multiple plans but will only be counted once, under their primary plan.

RETIREES AND BENEFICIARIES BY AGE

This table shows retiree and beneficiary counts as of the fiscal year ending March 31, 2019, grouped by age, with a breakdown by retirement system.

Age	ERS			PFRS		
	Retirees & Beneficiaries	Retirees	Beneficiaries	Retirees & Beneficiaries	Retirees	Beneficiaries
0 – 25	183	–	183	14	–	14
26 – 30	224	–	224	9	–	9
31 – 35	325	11	314	19	11	8
36 – 40	536	69	467	73	55	18
41 – 45	774	240	534	366	337	29
46 – 50	1,897	1,134	763	1,697	1,646	51
51 – 55	6,368	5,214	1,154	4,008	3,902	106
56 – 60	36,800	34,775	2,025	5,333	5,175	158
61 – 65	70,565	67,256	3,309	4,968	4,764	204
66 – 70	96,112	91,396	4,716	6,099	5,747	352
71 – 75	86,062	80,383	5,679	5,885	5,479	406
76 – 80	59,967	54,121	5,846	4,314	3,919	395
81 – 85	40,303	35,043	5,260	2,360	2,084	276
86 – 90	26,522	22,322	4,200	1,271	1,089	182
91 – 95	13,516	10,841	2,675	554	430	124
96 – 100	3,944	3,122	822	97	66	31
101+	621	452	169	9	5	4
Total	444,719	406,379	38,340	37,076	34,709	2,367

RETIREES AND BENEFICIARIES — ERS

This table shows the number (*Number*), the average annual modified pension benefit prior to option selection and without any cost-of-living adjustment (*Average Option 0 Benefit w/o COLA*), and the average cost-of-living adjustment (*Average COLA*) of surviving Employees' Retirement System retirees and beneficiaries* as of March 31, 2019. Groupings are based on the fiscal year of the member's retirement. The modified pension benefit has been reduced for any partial lump sum distribution.

Year of Retirement	Number	Average Option 0 Benefit w/o COLA	Average COLA*	Total
1955	–	\$ –	\$ –	\$ –
1956	–	–	–	–
1957	–	–	–	–
1958	–	–	–	–
1959	1	3,518	10,102	13,620
1960	1	2,721	7,958	10,679
1961	–	–	–	–
1962	–	–	–	–
1963	2	2,112	7,416	9,528
1964	2	4,520	3,388	7,908
1965	2	7,302	19,204	26,506
1966	3	2,745	8,545	11,291
1967	3	2,860	8,631	11,491
1968	3	1,265	1,263	2,528
1969	9	1,680	3,000	4,681
1970	13	2,862	3,908	6,771
1971	23	3,992	4,207	8,198
1972	35	4,712	4,210	8,923
1973	61	4,753	4,783	9,536
1974	80	6,297	5,993	12,290
1975	118	5,943	5,601	11,543
1976	217	5,304	4,359	9,662
1977	310	5,834	5,111	10,945
1978	386	6,023	5,001	11,024
1979	477	5,459	4,505	9,964
1980	688	5,843	4,035	9,879
1981	830	5,771	3,445	9,216
1982	1,088	6,654	3,486	10,140
1983	1,189	6,897	3,382	10,279
1984	1,758	8,862	3,859	12,721
1985	1,782	8,631	3,573	12,204
1986	2,377	9,231	3,562	12,793
1987	2,714	10,116	3,710	13,826

Year of Retirement	Number	Average Option 0 Benefit w/o COLA	Average COLA*	Total
1988	2,902	\$ 10,942	\$ 3,701	\$ 14,642
1989	3,405	11,851	3,632	15,484
1990	4,025	13,361	3,565	16,926
1991	6,613	17,364	3,854	21,219
1992	6,387	14,440	3,308	17,748
1993	5,362	15,306	3,153	18,459
1994	5,017	15,132	2,939	18,071
1995	6,261	16,138	2,916	19,054
1996	11,407	21,039	3,189	24,228
1997	10,522	19,470	2,837	22,307
1998	8,092	17,239	2,386	19,625
1999	8,993	16,954	2,218	19,173
2000	10,911	18,256	2,127	20,383
2001	11,889	21,792	2,151	23,943
2002	9,941	19,677	1,913	21,589
2003	21,989	28,519	1,991	30,510
2004	11,077	19,726	1,500	21,226
2005	13,495	21,805	1,396	23,201
2006	14,968	22,666	1,259	23,925
2007	15,696	25,054	1,156	26,210
2008	16,234	26,789	1,027	27,816
2009	15,131	26,808	864	27,672
2010	17,381	28,428	731	29,159
2011	26,985	34,669	632	35,301
2012	17,329	27,456	455	27,912
2013	17,469	27,109	308	27,417
2014	19,052	28,037	189	28,225
2015	20,157	29,322	–	29,322
2016	20,570	30,907	–	30,907
2017	20,857	31,690	–	31,690
2018	21,931	32,033	–	32,033
2019	20,176	\$ 32,710	\$ –	\$ 32,710

* 8,323 of the 38,340 beneficiaries are not eligible for COLA and are not included in the above counts.

RETIREES AND BENEFICIARIES — PFRS

This table shows the number (*Number*), the average annual modified pension benefit prior to option selection and without any cost-of-living adjustment (*Average Option 0 Benefit w/o COLA*), and the average cost-of-living adjustment (*Average COLA*) of surviving Police and Fire Retirement System retirees and beneficiaries* as of March 31, 2019. Groupings are based on the fiscal year of the member's retirement. The modified pension benefit has been reduced for any partial lump sum distribution.

Year of Retirement	Number	Average Option 0 w/o COLA	Average COLA*	Total
1955	2	\$ 2,482	\$ 8,014	\$ 10,496
1956	1	3,614	22,221	25,835
1957	–	–	–	–
1958	–	–	–	–
1959	–	–	–	–
1960	–	–	–	–
1961	–	–	–	–
1962	–	–	–	–
1963	1	4,134	18,447	22,581
1964	–	–	–	–
1965	2	5,365	10,904	16,268
1966	2	4,280	14,106	18,386
1967	4	5,204	13,941	19,145
1968	4	6,423	16,689	23,112
1969	6	5,078	11,001	16,078
1970	11	6,099	10,129	16,229
1971	14	7,581	13,390	20,971
1972	50	7,499	11,940	19,439
1973	48	7,866	12,877	20,743
1974	64	8,079	12,316	20,395
1975	48	8,513	12,006	20,519
1976	66	9,840	11,989	21,829
1977	139	10,725	12,524	23,249
1978	139	10,923	12,009	22,932
1979	203	11,231	11,274	22,505
1980	207	12,490	10,283	22,773
1981	192	13,578	9,226	22,805
1982	286	14,391	8,619	23,010
1983	302	15,798	8,334	24,132
1984	307	17,639	8,239	25,878
1985	363	19,232	7,781	27,013
1986	539	20,651	7,652	28,304
1987	575	22,668	7,543	30,212

Year of Retirement	Number	Average Option 0 w/o COLA	Average COLA*	Total
1988	705	\$ 24,655	\$ 7,117	\$ 31,772
1989	748	24,850	6,811	31,661
1990	782	27,672	6,235	33,908
1991	897	30,683	5,721	36,405
1992	986	35,003	5,157	40,161
1993	924	33,901	4,888	38,789
1994	844	33,199	4,415	37,614
1995	732	37,758	4,002	41,759
1996	743	36,476	3,750	40,226
1997	732	40,572	3,464	44,036
1998	695	39,226	3,015	42,241
1999	733	40,473	2,887	43,360
2000	866	47,222	2,573	49,795
2001	1,072	52,596	2,481	55,077
2002	927	53,364	2,241	55,604
2003	1,246	60,909	2,030	62,938
2004	1,186	58,287	1,835	60,123
2005	1,078	58,669	1,547	60,216
2006	1,089	59,392	1,306	60,698
2007	1,097	60,439	1,137	61,576
2008	1,119	62,626	890	63,516
2009	1,061	66,101	752	66,853
2010	1,101	68,173	559	68,732
2011	1,245	68,650	428	69,077
2012	1,209	70,337	311	70,647
2013	1,224	68,993	203	69,197
2014	1,217	72,307	117	72,424
2015	1,319	75,202	–	75,202
2016	1,273	78,038	–	78,038
2017	1,220	79,405	–	79,405
2018	1,520	83,998	–	83,998
2019	1,449	\$ 81,984	\$ –	\$ 81,984

* 462 of the 2,367 beneficiaries are not eligible for COLA and are not included in the above counts.

LOCAL GOVERNMENT SALARIES AND BILLINGS — ERS CONTINUED

FYE	Salaries	Contributions	Normal	Deficiency	GLIP	Administrative
Miscellaneous						
2010	\$ 4,053,679,047	\$ 288,402,076	\$ 258,729,069	\$ 1,396,742	\$ 16,157,869	\$ 12,118,396
2011	4,009,081,340	476,258,246	441,882,050	1,123,038	16,626,579	16,626,579
2012	4,074,206,349	705,637,232	676,397,501	1,117,975	16,069,562	12,052,194
2013	3,971,661,743	749,635,292	716,057,300	835,444	16,371,274	16,371,274
2014	3,968,529,764	826,997,637	797,752,084	791,616	16,258,823	12,195,114
2015	4,016,329,736	786,826,716	753,471,524	785,464	16,284,864	16,284,864
2016	4,016,329,736	692,441,164	656,011,033	285,120	20,080,556	16,064,455
2017	4,218,674,267	624,983,230	590,938,378	295,426	16,874,713	16,874,713
2018	4,400,266,244	636,996,945	601,504,023	292,092	17,600,415	17,600,415
2019	4,548,171,902	639,193,644	602,507,287	300,990	22,740,865	13,644,502
Schools						
2010	3,277,959,694	237,870,801	214,479,105	111,442	13,303,002	9,977,252
2011	3,299,608,584	387,560,100	360,157,255	414,165	13,494,340	13,494,340
2012	3,363,257,728	530,456,512	507,067,857	433,238	13,117,370	9,838,047
2013	3,295,559,464	623,154,200	595,786,408	426,060	13,470,866	13,470,866
2014	3,295,866,762	685,241,928	661,805,954	135,753	13,314,400	9,985,821
2015	3,337,348,846	654,771,133	627,945,059	139,518	13,343,278	13,343,278
2016	3,337,348,846	593,311,380	563,142,438	134,423	16,685,833	13,348,686
2017	3,463,921,681	524,114,526	496,273,503	129,599	13,855,712	13,855,712
2018	3,591,452,866	533,074,424	504,209,323	133,487	14,365,807	14,365,807
2019	3,656,797,566	527,849,814	498,457,959	137,491	18,283,980	10,970,384

For the FYEs 2010-2015, the contribution amounts include the normal cost of benefits including supplemental pensions and, in some cases, the Retirement Incentive Program, Deficiency Contributions, the Group Life Insurance Plan (GLIP), and the administrative cost of the System for the fiscal year.

For FYE 2016, and all subsequent FYEs, the contribution amounts include the normal cost of benefits including supplemental pensions, Deficiency Contributions, GLIP, the administrative cost of the System for the fiscal year, and accounting adjustments. Accounting adjustments include prior year adjustments, prepayment discounts, and reconciliation of actual versus estimated salary amounts.

Legislation enacted in July 2015 (Chapter 94, Laws of 2015) requires the System to use prior year actual salaries rather than current year estimated salaries in the calculation of required contributions. This change eliminates the need for reconciliation of actual versus estimated salaries, the result of which is reflected in the FYE 2016 salaries.

LOCAL GOVERNMENT SALARIES AND BILLINGS — PFRS CONTINUED

FYE	Salaries	Contributions	Normal	Deficiency	GLIP	Administrative
Miscellaneous						
2010	\$ 276,719,595	\$ 44,766,923	\$ 43,309,191	\$ -	\$ -	\$ 1,457,732
2011	277,823,751	51,630,642	49,951,567	-	279,846	1,399,229
2012	305,193,545	60,344,419	59,216,144	-	-	1,128,275
2013	303,608,075	77,558,504	75,734,743	-	303,957	1,519,804
2014	324,198,568	88,966,389	87,744,530	-	-	1,221,859
2015	322,131,168	89,840,321	88,189,827	-	330,099	1,320,395
2016	322,131,168	73,328,115	72,039,593	-	-	1,288,522
2017	332,682,130	78,709,281	77,045,873	-	-	1,663,408
2018	345,926,023	82,341,868	80,612,241	-	345,923	1,383,704
2019	355,303,151	81,963,609	80,897,700	-	-	1,065,909

For the FYEs 2010-2015, the contribution amounts include the normal cost of benefits including supplemental pensions and, in some cases, the Retirement Incentive Program, Deficiency Contributions, the Group Life Insurance Plan (GLIP), and the administrative cost of the System for the fiscal year.

For FYE 2016, and all subsequent FYEs, the contribution amounts include the normal cost of benefits including supplemental pensions, Deficiency Contributions, GLIP, the administrative cost of the System for the fiscal year, and accounting adjustments. Accounting adjustments include prior year adjustments, prepayment discounts, and reconciliation of actual versus estimated salary amounts.

Legislation enacted in July 2015 (Chapter 94, Laws of 2015) requires the System to use prior year actual salaries rather than current year estimated salaries in the calculation of required contributions. This change eliminates the need for reconciliation of actual versus estimated salaries, the result of which is reflected in the FYE 2016 salaries.

CONTRIBUTIONS RECORDED 2010 – 2019

(Dollars in Millions)

Contributions recorded are the amounts presented in the System’s financial statements and include employer costs plus or minus any adjustments in amounts receivable and changes resulting from legislation.

Year Ended 3/31	Employer Contributions*	Member Contributions
2010		
Total	\$ 2,344.2	\$ 284.3
State	897.5	
Local	1,446.7	
2011		
Total	\$ 4,164.6	\$ 286.2
State	1,759.0	
Local	2,405.6	
2012		
Total	\$ 4,585.2	\$ 273.2
State	1,785.6	
Local	2,799.6	
2013		
Total	\$ 5,336.0	\$ 269.1
State	1,950.1	
Local	3,385.9	
2014		
Total	\$ 6,064.1	\$ 281.4
State	2,372.7	
Local	3,691.4	
* Includes employer premiums to Group Life Insurance Plan.		

Year Ended 3/31	Employer Contributions*	Member Contributions
2015		
Total	\$ 5,797.4	\$ 284.8
State	2,263.0	
Local	3,534.4	
2016		
Total	\$ 5,140.2	\$ 306.6
State	1,958.4	
Local	3,181.8	
2017		
Total	\$ 4,787.0	\$ 328.8
State	1,813.6	
Local	2,973.4	
2018		
Total	\$ 4,823.3	\$ 349.4
State	1,802.1	
Local	3,021.2	
2019		
Total	\$ 4,744.3	\$ 386.5
State	1,771.5	
Local	2,972.8	
* Includes employer premiums to Group Life Insurance Plan.		

NOTES TO 20-YEAR SUMMARY

* Combined systems, unless noted; dollars in millions; data as of March 31 fiscal year end.

- (a) Includes active members and inactive members identified with their last employer.
- (b) Membership statistics for Tiers 3 through 6 are combined. Tier 6 was enacted on April 1, 2012.
- (c) Total does not include Employee Contributions Refunded or Other Benefits found in the Financial Statements.
- (d) Beginning in the 2006 fiscal year, all rates assume a February 1 payment date prior to the close of the fiscal year. Previous years assume rates based on a December 15 payment date. Contributions include normal, administrative, retirement incentive and deficiency costs.
- (e) Investments for 1995 and later years are shown at (and rate of return is calculated on) fair value as required by GASB 25, which the System adopted that year.
- (f) Generally, the Rate of Return is calculated on a time-weighted, gross-of-fees, basis.



Office of the New York State Comptroller
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