

# Comprehensive Annual Financial Report

*for the fiscal year ended June 30, 2017*

Serving  
Missouri's  
Public Schools  
Past, Present  
and Future

**PSRS/PEERS**

PUBLIC SCHOOL & EDUCATION EMPLOYEE  
RETIREMENT SYSTEMS OF MISSOURI

# Comprehensive Annual Financial Report

*for the fiscal year ended June 30, 2017*

## **Newcomer Schoolhouse**

The Newcomer Schoolhouse is a replica of the 19<sup>th</sup> century one-room schoolhouse where seven men met in 1914 to form what would become MFA, Inc. The schoolhouse's interior stays true to its historic roots, and is open to visitors. It is located in Shelter Gardens, a five-acre garden at the Shelter Insurance headquarters in Columbia, Missouri, and part of the Columbia Public School District.

**M. Steve Yoakum**  
Executive Director

Prepared by PSRS/PEERS Staff

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Cover photo of Newcomer Schoolhouse  
in Columbia, MO, and other  
schoolhouses by Renette Reiske.

Newcomer Schoolhouse  
Columbia, Missouri  
1900s

**PSRS/PEERS**

PUBLIC SCHOOL & EDUCATION EMPLOYEE  
RETIREMENT SYSTEMS OF MISSOURI

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### Mission Statement

The Public School Retirement System of Missouri and the Public Education Employee Retirement System of Missouri (PSRS and PEERS) work in partnership with the member school districts of this state to provide eligible employees and their beneficiaries with a significant source of income based on the employee's length of service and compensation in order to enhance retirement, disability and death benefits received from other sources.

It is the fiduciary responsibility of those charged with the administration of PSRS and PEERS to:

- Effectively collect contributions,
- Prudently invest the assets to obtain optimum returns,
- Equitably provide benefits,
- Impartially and in accordance with applicable law administer the benefit programs, and
- Set contribution rates that are adequate to fund promised benefits.

The PSRS/PEERS Board of Trustees and staff are committed to providing services to the members and beneficiaries professionally, promptly, courteously and efficiently.

### Mission Statement Principles

- We will conduct the business of the Retirement Systems in accordance with the mission statement.
- We will act as fiduciaries in the management of all funds for the exclusive benefit of our members.
- We will adhere to our investment policy to ensure the highest possible investment return consistent with the prudent investment of plan assets.
- We will have as our goal the replacement of 80% of a member's final average salary after a 30-year career through the combination of income from public pensions and, when applicable, the federal Social Security system.
- We will have as our goal the retention of purchasing power of the initial retirement benefit through the retirement years.
- We will maintain an independent retirement system that retains the power of the trustees to set actuarial assumptions, appoint consultants, employ staff, establish a budget and conduct all business of the Retirement Systems.
- We will prepare and distribute an annual financial report that adheres to U.S. generally accepted accounting principles.
- We will provide prompt, courteous and accurate service to our members.
- We will provide clear and complete information to the members and the districts through the use of a summary plan document, newsletters, an annual member account statement and any other documents deemed necessary.
- We will adhere to the highest standards of ethical conduct.

**Mt. Sterling Schoolhouse**

From 1896 through 1963, Mt. Sterling Schoolhouse served students within a three-mile radius of its location in Gasconade County. Mt. Sterling's highest enrollments occurred in the 1920s and 1930s, with enrollments in the thirties, and was the last one-room schoolhouse in Gasconade County to close. Now completely restored, tours are available upon request. Students in the area today attend Gasconade County R-II School District.



Mt. Sterling Schoolhouse  
Mt. Sterling, Missouri  
1896 ~ 1963

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## Board of Trustees

As of June 30, 2017



**Dr. Aaron Zalis**  
Chair  
Elected PSRS  
Member



**Jason Hoffman**  
Vice Chair  
Elected PEERS  
Member



**Charles Bryant**  
Appointed  
Member



**Yvonne Heath**  
Elected PSRS  
Member



**Scott Hunt**  
Appointed  
Member



**Jason Steliga**  
Elected PSRS  
Member

NOTE: As of June 30, 2017, one appointed Board position was vacant.



## Transmittal Letter



PUBLIC SCHOOL & EDUCATION EMPLOYEE  
RETIREMENT SYSTEMS OF MISSOURI

December 1, 2017

To the Board of Trustees and Members of the Retirement Systems:

We are pleased to present the *Comprehensive Annual Financial Report (CAFR)* of the Public School Retirement System of Missouri (PSRS) and the Public Education Employee Retirement System of Missouri (PEERS) for the fiscal year ended June 30, 2017. The PSRS/PEERS' Board of Trustees and staff take great pride in *Serving Missouri's Public Schools Past, Present and Future*. Sound governance decisions of the *past* allowed PSRS and PEERS a unique opportunity in the current year to evaluate enhancing the cost-of-living adjustment (COLA) policy and lowering the assumed rate of return on investments, while maintaining the Systems' financial security and stability for the *present* and *future*. The financial strength and stability of the Systems combined with a strong governance structure allowed such discussions to occur during one of the most challenging times for public pension plans across the nation. These discussions and analyses are covered in additional detail later in this letter.

In addition to providing information to our Board of Trustees and members concerning the financial condition of the Systems, this report also meets our reporting requirements under Sections 169.020.(4).16 and 169.450(4).11 of the Revised Statutes of Missouri (RSMo). Printed copies are available to the public upon request and the complete report is also posted on our website, [www.psr-peers.org](http://www.psr-peers.org).

This letter provides a brief overview of the contents of the CAFR. We encourage you to read the Management's Discussion and Analysis on pages 15 to 20 for a more detailed analysis of our financial position for the fiscal year.

## Report Contents and Structure

Responsibility for the preparation, accuracy and completeness of this report, including all disclosures, rests with the management staff of PSRS/PEERS (the Systems). The Systems' financial statements are prepared in accordance with U.S. generally accepted accounting principles (GAAP) within the guidelines established by the Governmental Accounting Standards Board (GASB). To the best of our knowledge, the enclosed data is accurate in all material respects and fairly presents our financial position and operating results.

The management of the Systems is responsible for internal accounting controls, which are designed to provide reasonable but not absolute assurance that the financial statements are free of any material misstatements and assets are safeguarded. The cost of internal controls should not exceed the benefits to be derived. The Systems employ two internal auditors who perform operational reviews to ensure that the internal controls are functioning effectively. We believe the internal controls in place are adequate to meet the purpose for which they were intended.

Our independent external auditors, selected by the Board of Trustees, have conducted an audit of the basic financial statements in accordance with U.S. generally accepted auditing standards. This audit and the financial statements and related footnotes are presented on pages 13 to 52 of this report.

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Toll Free (800) 392-6848 Email [psrpeers@psrpeers.org](mailto:psrpeers@psrpeers.org) Member Services FAX (573) 634-7934 Employer Services FAX (573) 634-7911

## Overview of the Retirement Systems

The Public School Retirement System of Missouri (PSRS), a cost-sharing multiple employer retirement system, was established in 1946 by an act of the Missouri legislature to provide certificated public school employees and their families with a significant and stable source of retirement income, disability and survivor benefits. The majority of PSRS members do not contribute to Social Security.

The Non-Teacher School Employee Retirement System of Missouri (NTRS), also a cost-sharing multiple employer retirement system, was established in 1965 by an act of the Missouri legislature to build a plan similar to PSRS, but for non-certificated public school personnel. The name of the non-teacher system was changed to the Public Education Employee Retirement System of Missouri (PEERS) in August 2005 to more positively represent the members of the System. Members of PEERS contribute to Social Security.

PSRS and PEERS are governed jointly by a seven-member Board of Trustees, composed of three elected PSRS members, one elected PEERS member and three members appointed by the governor.

Unlike most public pension systems, the members of PSRS and PEERS share equally in funding the contributions to the Retirement Systems. The contribution rates in total approximate the contribution rates of similar public plans. However, this funding mechanism has kept the employer contributions lower and the employee contributions higher than many similar public plans.

The combined Systems serve approximately 265,000 total members in 535 districts and other employers. In excess of \$2.7 billion is paid annually to approximately 89,000 service retirees and beneficiary recipients. At June 30, 2017, PSRS/PEERS had a market value of net assets of approximately \$41.7 billion, making it larger than all other public retirement systems in the state of Missouri combined.

## Funding Status and Valuation Results

The Board of Trustees evaluates a large amount of information each year including, but not limited to, the annual actuarial valuations prepared by the Systems' external actuaries, PricewaterhouseCoopers, LLC. During the current year, staff and the Board of Trustees reviewed multiple scenarios to enhance the COLA policy as well as lower the assumed rate of return on investments. A lower assumed rate of return decreases the risk profile of the plans, which was an important consideration when reviewing the COLA policy. It's important to note that decreased risk provides for greater stability of future contribution rates and COLAs.

The Board of Trustees amended the Systems' Actuarial Funding Policies at their November 3, 2017 meeting. The Actuarial Funding Policy amendments included a change to the COLA policy and the assumed rate of return on investments. The Board of Trustees adopted a revision to the COLA policy effective with the January 1, 2019 COLA. The only change from the prior policy occurs when the CPI-U is between 0.0% and 2.0%. The prior policy indicated if the CPI-U was between 0.0% and 2.0%, the COLA would be 0.0%. The new policy provides a 2.0% COLA when the CPI-U is between 0.0% and 2.0%, *and* cumulatively reaches 2.0%. During the COLA policy review, the Board of Trustees approved a 1.63% January 1, 2018 COLA. The January 1, 2018 COLA is equal to CPI-U for the fiscal year ended June 30, 2017. The Board of Trustees also reduced the assumed rate of return from 7.75% to 7.6% effective with the June 30, 2017 actuarial valuations. The amendments were based on two critical elements that are at the forefront of all System decisions: the Board of Trustees' fiduciary responsibility and PSRS/PEERS' Continuous Goals.

Fiduciary responsibility includes the duties of loyalty and impartiality. The duty of loyalty requires the operation of the Systems for the exclusive benefit of the members and retirees of those Systems, and must supersede the interests of all other parties. The duty of impartiality requires that the Board not favor any one type of plan participant over another (e.g. active, inactive, retired members). The Board has a fiduciary duty to: 1. Effectively collect contributions, 2. Prudently invest the assets to obtain optimum returns, 3. Equitably provide benefits, 4. Impartially and in accordance with applicable law, administer the benefit program, and 5. Set contribution rates that are adequate to fund promised benefits.

## Transmittal Letter, continued

PSRS/PEERS' continuous goals are: 1. Provide for the security and financial stability of the Systems, including maintaining at least an 80% pre-funded ratio, continuing to amortize the unfunded liability until PSRS/PEERS is 100% pre-funded, and allowing for a reasonable assumed rate of return given capital market estimates, 2. Maintain the contribution rates of both Systems at or below current levels, and 3. Provide a consistent COLA for PSRS/PEERS benefit recipients to maintain their purchasing power, noting COLAs should be dependable and affordable without harming the financial stability of the Systems.

The Systems' funding objective continues to achieve a funded ratio of 100% over a closed 30-year period. For this purpose, funded ratio is defined as the actuarial value of assets divided by the actuarial accrued liability determined under the entry age normal cost method and the actuarial assumptions adopted by the Board of Trustees. As of June 30, 2017, PSRS was 84.0% pre-funded, while PEERS was 85.8% pre-funded. Both Systems' showed a slight decrease in funding from the June 30, 2016 funded percentage of 84.8% for PSRS and 86.4% for PEERS. The changes in funded status are primarily due to the investment return assumption being lowered and the future COLA assumption being increased because of changes to the COLA policy. The assumption changes were partially offset by favorable investment experience. Additional information on actuarial assumptions and funding can be found in the actuarial section of this report. Based upon the June 30, 2017 valuations and overall financial projections, the Board of Trustees set the fiscal year 2019 contribution rates at the fiscal year 2018 level for both members and employers.

### Investment Activities

The Systems achieved strong absolute and relative returns in fiscal year 2017. The Systems' investment portfolio added approximately \$4.6 billion in investment earnings to the growth of assets during fiscal year 2017. The Systems earned an investment return of 12.5% for fiscal year 2017 (12.3% net of all investment expenses and fees). The total plan return, net of all investment expenses and fees, exceeded both the long-term investment goal (actuarial required rate of return) of 7.75% and the total plan policy benchmark return of 11.0%. PSRS and PEERS are long-term investors with a diversified portfolio that continues to produce strong long-term returns where the annualized investment return is 8.4% (8.3% net of all investment expenses and fees) over the last 30 years.

Additional detailed information regarding the Systems' investments, including policies and strategies, can be found in the Investment Section of this report beginning on page 53.

### Legislative Changes During Fiscal Year 2017

Governor Eric Greitens signed legislation (CCS HCS SS Senate Bill 62) impacting the Systems that became effective August 28, 2017. This bill allows retired members of the Systems who have elected a reduced retirement allowance to provide for survivor benefits for his or her spouse to have the retirement allowance increased to the single life annuity amount, with no survivor benefits, if the member and his or her spouse become divorced on or after September 1, 2017 only if the dissolution decree provides for sole retention by the retired person of all rights in the retirement allowance. This bill also changed the deadline for a retired member to nominate a successor beneficiary from 90 days to one year from the date of the remarriage. In addition, the bill expands the statutory provision regarding working after retirement to any individual who is employed by a third party or working as an independent contractor as a substitute teacher or other position normally requiring certification.

## Awards

### Public Pension Coordinating Council (PPCC), Public Pension Standards Award

PSRS and PEERS each received the Public Pension Standards Awards in 2017 in recognition of meeting professional standards for plan administration and plan funding as set forth in the Public Pension Standards of the PPCC. These awards are presented by the PPCC, a confederation of the National Association of State Retirement Administrators (NASRA), the National Conference on Public Employee Retirement Systems (NCPERS), and the National Council on Teacher Retirement (NCTR).

### Certificate of Achievement for Excellence in Financial Reporting

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to PSRS and PEERS for the *Comprehensive Annual Financial Report* for the fiscal year ended June 30, 2016. The Certificate of Achievement is a prestigious national award recognizing excellence in the preparation of state and local government financial reports. To be awarded the Certificate of Achievement, a government unit must publish an easily readable and efficiently organized CAFR whose contents meet or exceed program standards. This report must satisfy both U.S. generally accepted accounting principles, applicable legal requirements and GFOA standards. A Certificate of Achievement is valid for only one year. We believe our current report continues to meet the Certificate of Achievement program requirements and are submitting it to GFOA for consideration again this year.

## Professional Services

Certain professional services are provided to the Systems by retained consultants. The required opinion letters from two of those consultants, PricewaterhouseCoopers, LLC, actuaries, and Williams Keepers LLC, independent certified public accountants, are contained elsewhere in this report.

Investment consulting services have been provided by Willis Towers Watson.

## Acknowledgements

We would like to express our thanks and gratitude to the Board of Trustees, staff, and consultants who have worked diligently to produce this report and to ensure the successful operation of the Systems.

Respectfully submitted,

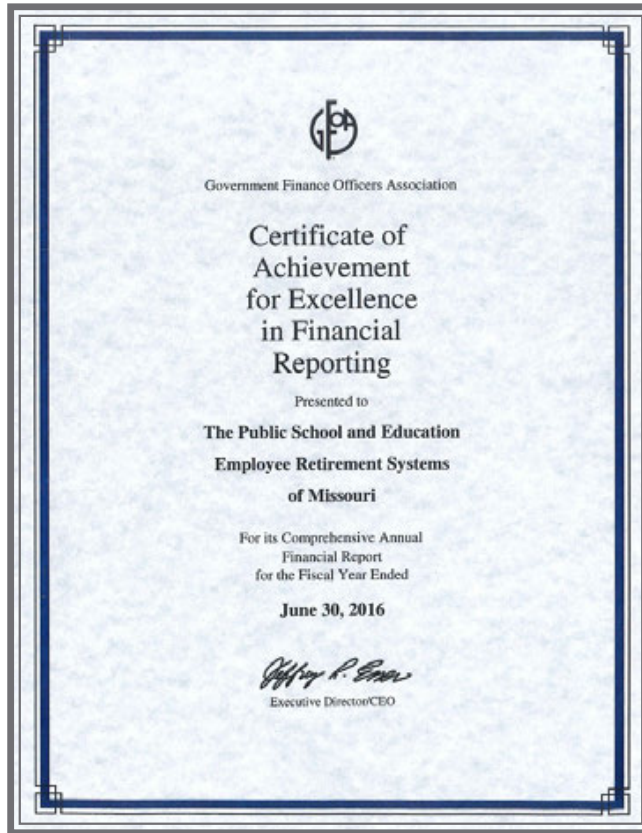


M. Steve Yoakum  
Executive Director

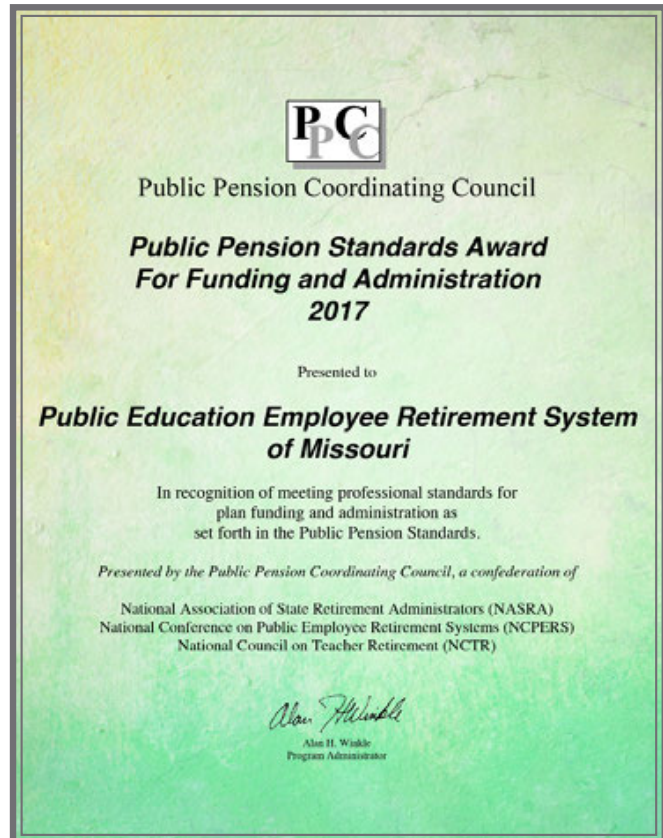


Anita Brand, CPA  
Chief Financial Officer

Certificate of Achievement for Excellence in Financial Reporting



Public Pension Coordinating Council Public Pension Standards Awards



# Administrative Organization

As of June 30, 2017



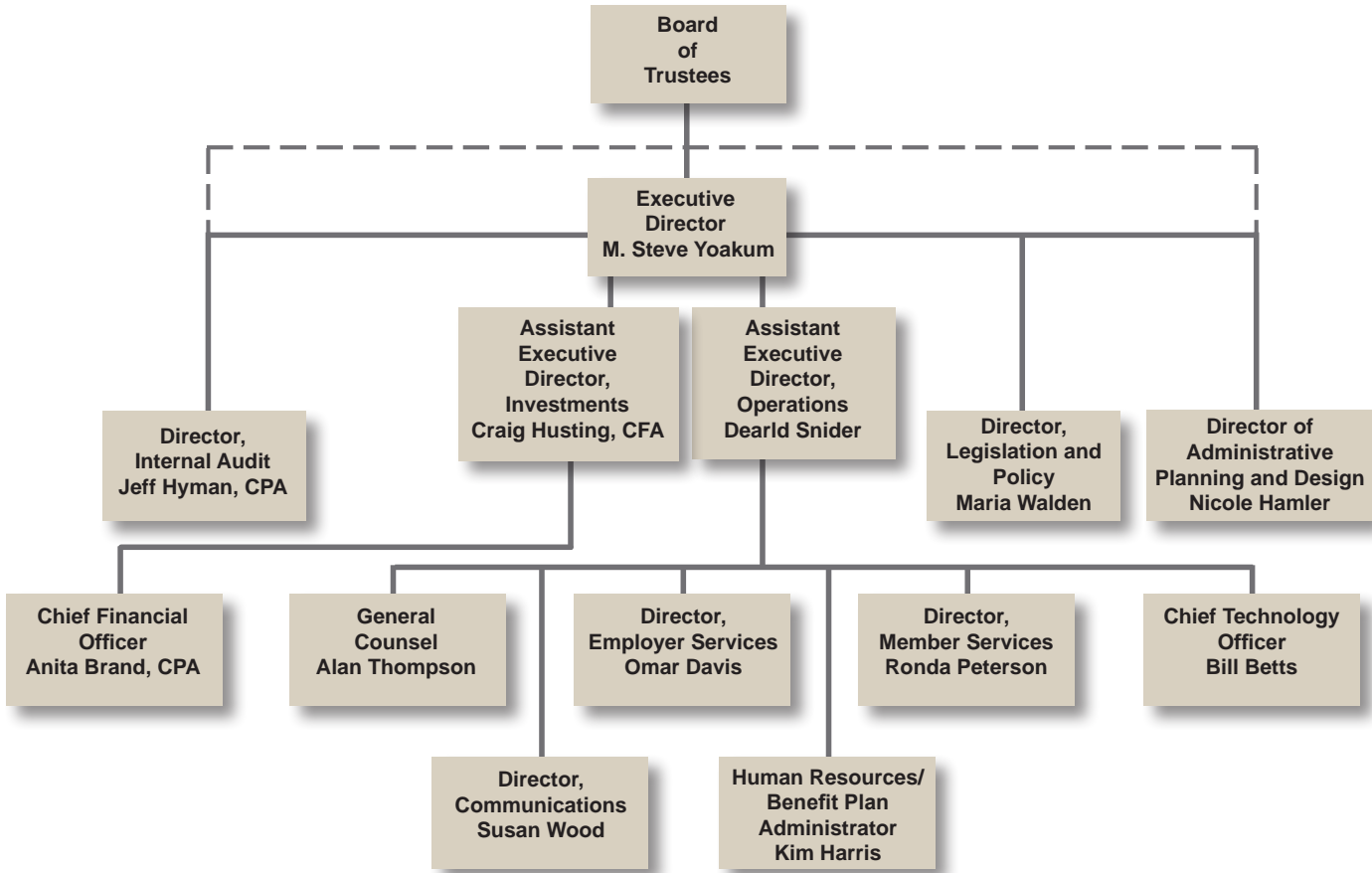
**M. Steve Yoakum**  
Executive Director



**Craig Husting, CFA**  
Assistant Executive  
Director, Investments



**Dearld Snider**  
Assistant Executive  
Director, Operations



## Professional Services

As of June 30, 2017

### Actuaries

**PricewaterhouseCoopers, LLP**

Cindy Fraterrigo, FSA, EA, MAAA  
 Brandon Robertson, ASA, EA, MAAA  
 Kelly Stolyar, ASA, EA, MAAA  
 Chicago, Illinois  
 New York, NY

### Auditors

**Williams Keepers, LLC**

Heidi A. Chick, CPA  
 Nick Mestres, CPA  
 Columbia, Missouri

### Technology Consultants

**Huber & Associates**

James Huber  
 Jefferson City, Missouri

**Nexum**

Mike Scher  
 Chicago, Illinois

**Sagitec Solutions, LLC**

Paul Eberhart  
 Roseville, Minnesota

**Secure Works, Inc.**

Andy Held  
 Atlanta, GA

### Insurance Consultants

**Charlesworth & Associates**

Bob Charlesworth  
 Overland Park, Kansas

**The Insurance Group**

Jason Swindle  
 Columbia, Missouri

### Other Consultants

**CBIZ Human Capital Services**

Ed Rataj  
 Joe Rice  
 St. Louis, Missouri

**Cortex**

Tom Iannucci  
 Toronto, Ontario

### Legal Counsel

**Groom Law Group**

David Levine  
 Washington, D.C.

**Pillsbury, Winthrop, Shaw, Pittman, LLP**

Semma Arzapalo  
 Los Angeles, California

**Thompson Coburn, LLP**

Allen Allred  
 St. Louis, Missouri

### Legislative Consultant

**Statehouse Strategies, LLC**

James "Jim" Moody  
 Jefferson City, Missouri

### Medical Advisor

**Andrew Matera, M.D.**

Columbia, Missouri

Investment Management, Custodial and Consulting fees can be found in the Schedule of Investment Expenses on page 98. Schedules of broker commissions can be found on page 96. Additional information on Investment Managers can also be found in the Investment Section of this report.



**Story's Creek Schoolhouse**

Story's Creek is a one-room schoolhouse just west of Eminence, Missouri built in 1896 and used until 1957 when the local school district was consolidated. In 1903, the school had an enrollment of 42 students and hosted church services for the community. The school was moved to Alley Spring Park in 1971 and is open for visitors Memorial Day through Labor Day. The area is now served by the Eminence R-1 School District.

Story's Creek Schoolhouse  
Eminence, Missouri  
1896 ~ 1957



## Financial Section

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## Independent Auditors' Report



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The Board of Trustees of the  
Public School and Public Education Employee  
Retirement Systems of Missouri

We have audited the accompanying financial statements of the Public School and Public Education Employee Retirement Systems of Missouri (the Systems), which comprise the statements of fiduciary net position as of June 30, 2017, the related statements of changes in fiduciary net position for the year then ended, and the related notes to the financial statements.

### *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 opinions on these financial statements based on our audit. We conducted our audit in accordance with U.S. generally accepted auditing standards. 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 auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall 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 opinions.

### *Opinions*

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Public School and Public Education Employee Retirement Systems of Missouri as of June 30, 2017, and the respective changes in fiduciary net position for the year then ended, in conformity with U.S. generally accepted accounting principles.

## Independent Auditors' Report, continued

### *Other Matters*

#### *Prior Year Information*

The prior year combined total information has been derived from the Systems' 2016 financial statements and, in our report dated October 20, 2016, we expressed unmodified opinions on the respective financial statements of the Systems' fiduciary net position.

#### *Required Supplementary Information*

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 15-20, schedules related to the defined benefit plans (schedules of changes in the employers' net pension liability, employers' net pension liability, employer contributions, investment returns, and notes to schedules) on pages 45-49, and schedules related to the defined benefit OPEB plan (schedules of funding progress, employer contributions, and notes to schedules) on page 50 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 U.S. generally accepted auditing standards, 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 audits 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 Information*

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the Public School and Public Education Employee Retirement Systems of Missouri basic financial statements. The introductory, investment, actuarial and statistical sections and the additional information presented on pages 51 and 52 are presented for purposes of additional analysis and are not a required part of the financial statements.

The additional information presented on pages 51 and 52 is the responsibility of management and was derived from and relate directly to the underlying accounting and other records used to prepare the 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 U.S. generally accepted auditing standards. In our opinion, the additional information presented on pages 51 and 52 is fairly stated in all material respects in relation to the basic financial statements as a whole.

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

*Williams Keiper LLC*

November 29, 2017

# Management's Discussion and Analysis

## Introduction

This discussion and analysis of the financial position of the Public School Retirement System of Missouri (PSRS) and the Public Education Employee Retirement System of Missouri (PEERS), collectively referred to as the Systems, provides an overview of the Systems' financial activities for the fiscal year ended June 30, 2017. We encourage you to consider the information presented here in conjunction with the *Transmittal Letter* included in the *Introductory Section*, the financial statements and other information presented in the *Financial Section* of this *Comprehensive Annual Financial Report* (CAFR).

## Financial Highlights

The following highlights are explained in more detail for each System later in this discussion.

- The Board of Trustees adopts actuarial assumptions, each of which individually represents a reasonable long-term estimate of anticipated experience for the Systems, derived from experience studies conducted every fifth year. The most recent comprehensive experience study was completed in June 2016. All economic and demographic assumptions were reviewed and updated, where appropriate, based on the results of the study and effective with the June 30, 2016 valuation. For the June 30, 2017 valuations, the investment rate of return was reduced from 7.75% to 7.6% and the assumption for annual cost-of-living adjustments was updated in accordance with the funding policies amended by the Board of Trustees at their November 3, 2017 meeting. The actuarial assumed rate of return of 7.6% is effective with the June 30, 2017 valuations and fiscal year 2018 investment performance. All other assumptions remained consistent with the prior year. The significant actuarial assumptions are detailed in the notes to the financial statements and the notes to the schedules of required supplementary information.
- As of June 30, 2017, PSRS' fiduciary net position as a percentage of the total pension liability was 83.8% and the net pension liability approximated \$7.2 billion. PEERS' fiduciary net position as a percentage of the total pension liability was 85.4% and the net pension liability approximated \$763.0 million as of June 30, 2017. The net pension liability is calculated utilizing the market value of assets in accordance with Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans*, for accounting presentation purposes.
- The pre-funded status of the Systems is measured as the ratio of assets available for benefits to a benefit liability measure for the Systems. While there are several such measures that could be appropriately used, the benefit liability measure that ties most closely to the Systems' funding policies is the actuarial accrued liability (AAL) computed in accordance with assumptions and methods approved by the Board of Trustees. Using the actuarial value of assets (AVA), a smoothed asset value that recognizes 20% of the total investment gain or loss on the AVA for each of the preceding five years. This is the significant difference between accounting measurements in accordance with GASB Statement No. 67 and funding calculations. As of June 30, 2017, the pre-funded ratios for funding purposes were 84.0% for PSRS and 85.8% for PEERS.
- The Systems achieved strong absolute and relative returns in fiscal year 2017. The Systems' investment program added approximately \$4.6 billion in investment earnings to the growth of total assets for the fiscal year ended June 30, 2017. These significant investment earnings are a result of a 12.5% investment return (12.3% net of all investment expenses and fees). The total plan return, net of all investment expenses and fees, substantially exceeded both the long-term investment goal (actuarially assumed return) of 7.75% and the total plan policy benchmark return of 11.0%.
- The Systems' investment returns for the last five years have exceeded 65% of the peer group as defined by the Wilshire TUCS universe of public pension plans with assets in excess of \$1 billion. Additionally, the Systems generated the returns (and longer-term investment returns) while taking less risk than approximately two-thirds of comparable public funds in the United States.
- The net position of the combined Systems increased by \$3.4 billion. The net position of PSRS increased by \$3.0 billion while the net position of PEERS increased by \$439.1 million.
- Total revenues for fiscal year 2017 were comprised of contribution revenue of \$1.63 billion and investment gains of \$4.6 billion, compared to contribution revenue of \$1.60 billion and investment gains of \$593.5 million for fiscal year 2016.

- Expenses increased 4.0% over the prior year from \$2.7 billion to \$2.8 billion. Retirement benefits and member refunds increased by \$110.0 million from the prior year, while administrative expenses decreased by \$1.7 million during the same time period. The decrease in expenditures is related to a reduction in software maintenance agreement expenses and a reduction in actuarial costs due to the completion of the five-year actuarial experience study during fiscal year 2016.

## Overview of the Financial Statements

The CAFR reflects the activities of the Systems as reported in Statements of Fiduciary Net Position and the Statements of Changes in Fiduciary Net Position (the Systems' financial statements). The Systems' financial statements, notes to the financial statements, and required supplementary information were prepared in conformity with GASB Statement No. 67, *Financial Reporting for Pension Plans*. This discussion and analysis is intended to serve as an introduction to the financial section of the CAFR. The financial section of the CAFR consists of: the basic financial statements comprised of the Statements of Fiduciary Net Position and the Statements of Changes in Fiduciary Net Position, the notes to the basic financial statements, required supplementary information and other supplementary information.

The Statements of Fiduciary Net Position present information on the assets and liabilities of the Systems, with the difference between the two reported as net position. The net position of the Systems reflects the resources available to pay benefits to members when due. Over time, increases and decreases in net position measure whether the Systems' financial position is improving or deteriorating.

The Statements of Changes in Fiduciary Net Position present information detailing the changes in net position that occurred during the current fiscal year. All changes in net position are reported on an accrual basis. This means that the revenue or expense is recognized as soon as the underlying event giving rise to the change occurs, regardless of when the actual cash is received or paid. Thus, revenues and expenses are reported in this statement for some items that will not result in cash flows until future fiscal periods. For example, contributions due from an employer, even though not yet paid by year end, will be reflected as revenue. Earned vacation accruals will be reflected as an expense, even though they have not been paid to employees.

The notes to the financial statements provide additional information that is essential to a full understanding of the data provided in the financial statements. The notes can be found on pages 24 through 44.

The report also contains required supplementary information in addition to the basic financial statements themselves. The required supplementary information consists of the following schedules and related notes:

- The Schedules of Changes in the Employers' Net Pension Liability include historical trend information about the annual changes of the net pension liability, including assumption changes and variances of assumed experience.
- The Schedules of Employers' Net Pension Liability include historical trend information about whether each System's net position is increasing or decreasing over time relative to the total pension liability. The schedules provide a long-term, ongoing perspective of the accumulation of assets to pay benefits when due.
- The Schedules of Employer Contributions present historical trend information about the annual determined contributions of employers and the actual contributions made by employers.
- The Schedules of Investment Returns present historical annual money-weighted rate of returns.
- The Schedule of Funding Progress includes historical trend information about the actuarially funded status of the defined benefit other post-employment benefit (OPEB) plan from a long-term, ongoing perspective and the progress made in accumulating assets to pay benefits when due.
- The Schedule of Employer Contributions presents historical trend information about the annual required contributions of the employer and the actual employer contributions made for the defined benefit OPEB plan.
- The Notes to the Schedules of Required Supplementary Information provide additional information that is essential to a full understanding of the data provided in the schedules.

Other supplementary schedules are also included. The Schedules of Administrative Expenses present the overall cost of administering the Systems. The Schedules of Professional Services further detail this category of administrative expense. The Schedules of Investment Expenses show the costs associated with investing the assets of the Systems. These expenses are shown as a reduction of revenue on the Statements of Changes in Fiduciary Net Position.

## Financial Analysis of the Public School Retirement System of Missouri (PSRS)

PSRS is a mandatory cost-sharing multiple employer retirement system for full-time certificated employees and certain part-time employees of participating employers. PSRS members were required to contribute 14.5% of their annual covered salary during fiscal year 2017. The employer was required to match that amount. Most PSRS members do not contribute to Social Security, except for employees hired after 1986 who contribute to Medicare only. In some instances, positions may be determined not to be exempt from Social Security contributions. PSRS members required to contribute to Social Security are required to contribute two-thirds of the approved PSRS contribution rate and their employer is required to match the contribution. The members' benefits are further calculated at two-thirds the normal benefit amount.

	2017	2016	Change
Cash & investments	\$ 37,858,027	\$ 34,857,203	\$ 3,000,824
Receivables	1,937,380	1,725,180	212,200
Other	24,115	25,523	(1,408)
Total assets	39,819,522	36,607,906	3,211,616
Total liabilities	2,539,276	2,303,936	235,340
Fiduciary net position	\$ 37,280,246	\$ 34,303,970	\$ 2,976,276

### Assets

Total assets of PSRS as of June 30, 2017 were \$39.8 billion and were mostly comprised of cash, investments, investment sales receivables and contributions due from employers. Total assets increased by \$3.2 billion or 8.8% from the prior year due to investment earnings during the year.

### Liabilities

Total liabilities as of June 30, 2017, were \$2.5 billion and were mostly comprised of payables from the purchase of investments and obligations under security lending arrangements. Total liabilities increased by \$235.3 million from the prior year. This was due to an increase in investment purchase liabilities and accounts payable that was partially offset by a decrease in obligations under security lending arrangements.

### Net Position

PSRS assets exceeded liabilities at June 30, 2017, by \$37.3 billion. This was an increase of \$3.0 billion from the 2016 net position. This increase was a result of

investment earnings that totaled \$4.1 billion for the year offset by benefit payments and other expenses which exceeded contribution revenue by \$1.1 billion.

	2017	2016	Change
<b>Additions</b>			
Member contributions	\$ 719,625	\$ 704,786	\$ 14,839
Employer contributions	684,858	670,794	14,064
Investment income	4,104,110	533,174	3,570,936
Other	13	6	7
Total additions	5,508,606	1,908,760	3,599,846
<b>Deductions</b>			
Monthly benefits	2,471,215	2,376,276	94,939
Refunds of contributions	50,618	54,631	(4,013)
Administrative expenses	10,496	11,548	(1,052)
Other	1	15	(14)
Total deductions	2,532,330	2,442,470	89,860
Change in fiduciary net position	\$2,976,276	\$ (533,710)	\$ 3,509,986

## Revenues – Additions to Fiduciary Net Position

The reserves needed to finance retirement benefits are accumulated through the collection of employer and employee contributions and through investment earnings. Total contribution revenue for the year increased by \$28.9 million to \$1.4 billion. This was a 2.1% increase over the prior year. Retirement contributions were calculated at 14.5% of retirement salary for each member during fiscal year 2017. The employer matched this amount. Contribution rates were unchanged from the prior year. In addition to contributions on salary, members may also pay contributions to reinstate previously refunded service or to purchase various types of elective service. Such contributions were consistent with the prior year. An increased retirement salary base and the addition of new members resulted in the overall increase in contributions.

The net investment gain was \$4.1 billion as compared to a net investment gain of \$533.2 million in 2016. Prior year investment earnings included \$113.3 million of securities lending revenue from the settlement of legal proceedings with the System's prior custodian. The current year gains are reflective of a 12.3% net return on the Systems' diversified investment portfolio. All investment related expenses, such as fees paid to investment managers, are reflected as a reduction in revenue and are accounted for in this net figure. The *Investment Section* of this report contains additional information regarding investments and securities lending activity.

## Expenses – Deductions from Fiduciary Net Position

The primary expenses of PSRS include the payment of pension benefits to members and beneficiaries, refunds of contributions to former members, and the cost of administering the System. Total expenses for fiscal year 2017 were \$2.5 billion, an increase of 3.7% over fiscal year 2016.

Benefit expenses increased by \$94.9 million to \$2.47 billion. This was a result of an overall increase of 1,752 monthly benefit recipients from the prior year end. There were no changes to the benefit formula during 2017. Refunds of contributions decreased by \$4.0 million during the current year to a total \$50.6 million.

Administrative expenses decreased by \$1.1 million to \$10.5 million. The decrease in expenditures is related to a reduction in software maintenance agreement expenses and a reduction in actuarial costs due to the completion of the five-year actuarial experience study during fiscal year 2016. The cost of administrative items was charged 62% to PSRS and 38% to PEERS, unless the expense was determined to be of direct benefit to only one System. In such instance, the allocation of expense was 100% to the benefited System. As always, we will continue to look for ways to streamline costs when prudent.

## Financial Analysis of the Public Education Employee Retirement System of Missouri (PEERS)

PEERS is a mandatory cost-sharing multiple employer retirement system for non-certificated employees and certain part-time certificated employees of participating employers. PEERS members were required to contribute 6.86% of their annual covered salary during 2017. The employer was required to match that amount. PEERS members also contribute to Social Security.

Public Education Employee Retirement System of Missouri Fiduciary Net Position (000's)			
	2017	2016	Change
Cash & investments	\$ 4,519,700	\$ 4,076,435	\$ 443,265
Receivables	231,308	202,284	29,024
Total assets	4,751,008	4,278,719	472,289
Total liabilities	304,590	271,389	33,201
Fiduciary net position	\$ 4,446,418	\$ 4,007,330	\$ 439,088

## Assets

Total assets of PEERS as of June 30, 2017 were \$4.8 billion and were mostly comprised of cash, investments, investment sales receivables and contributions due from employers. Total assets increased by \$472.3 million or 11.0% from the prior year due to investment earnings during the year.

## Liabilities

Total liabilities as of June 30, 2017 were \$304.6 million and were mostly comprised of payables from the purchase of investments and obligations under security lending arrangements. Total liabilities increased by \$33.2 million. This was due to an increase in investment purchase liabilities and accounts payable that was partially offset by a decrease in obligations under security lending arrangements.

## Net Position

PEERS assets exceeded liabilities at June 30, 2017 by \$4.4 billion. This was up from the 2016 net position of \$4.0 billion by \$439.1 million. This increase was a result of investment earnings that totaled \$485.0 million for the year offset by benefit payments and other expenses which exceeded contribution revenue by \$45.9 million.

Public Education Employee Retirement System of Missouri Changes in Fiduciary Net Position (000's)			
	2017	2016	Change
<b>Additions</b>			
Member contributions	\$ 118,447	\$ 114,258	\$ 4,189
Employer contributions	111,240	106,717	4,523
Investment income	485,047	60,317	424,730
Total additions	714,734	281,292	433,442
<b>Deductions</b>			
Monthly benefits	251,078	230,686	20,392
Refunds of contributions	18,191	19,705	(1,514)
Administrative expenses	6,364	6,981	(617)
Other	13	-	13
Total deductions	275,646	257,372	18,274
Change in fiduciary net position	\$ 439,088	\$ 23,920	\$ 415,168

## Revenues – Additions to Fiduciary Net Position

The reserves needed to finance retirement benefits are accumulated through the collection of employer and employee contributions and through investment earnings. Total contribution revenue for the year increased by \$8.7 million to \$229.7 million. Retirement contributions were calculated at 6.86% of retirement salary for each member during fiscal year 2017. The

employer matched this amount. Contribution rates were unchanged from the prior year. Overall contribution revenue increased by 3.9%. In addition to contributions on salary, members may also pay contributions to reinstate previously refunded service or to purchase various types of elective service. Such contributions were consistent with the prior year. The remainder of the increase in total contributions is attributable to a higher retirement salary base and the addition new members.

The net investment gain was \$485.0 million as compared to a net investment gain of \$60.3 million in 2016. Prior year investment earnings included \$9.7 million of securities lending revenue from the settlement of legal proceedings with the System's prior custodian. The current year gains are reflective of a 12.3% net return on the Systems' diversified investment portfolio. All investment related expenses, such as fees paid to investment managers, are reflected as a reduction in revenue and are accounted for in this net figure. The *Investment Section* of this report contains additional information regarding investments and securities lending activity.

## Expenses – Deductions from Fiduciary Net Position

The primary expenses of PEERS include the payment of pension benefits to members and beneficiaries, refunds of contributions to former members, and the cost of administering the System. Total expenses for fiscal year 2017 were \$275.6 million, an increase of 7.1% over fiscal year 2016.

Benefit expenses increased by \$20.4 million to \$251.1 million. This was a result of an overall increase of 1,419 monthly benefit recipients from the prior year end. There were no changes to the benefit formula during 2017. Refunds of contributions decreased by \$1.5 million during the current year to a total \$18.2 million.

Administrative expenses decreased by \$0.6 million. The decrease in expenditures is related to a reduction in software maintenance agreement expenses and a reduction in actuarial costs due to the completion of the five-year actuarial experience study during fiscal year 2016. The cost of administrative items was charged 62% to PSRS and 38% to PEERS, unless the expense was determined to be of direct benefit to only one System. In such instance, the allocation of expense was 100% to the benefited System. As always, we will continue to look for ways to streamline costs when prudent.

## Summary

The total net returns of 12.3% for PSRS and PEERS exceeded both the long-term investment goal of earning 7.75% and the total plan policy benchmark return of 11.0%. Due to the long-term nature of defined benefit pension plans, it is important to look at the financial performance of the Systems over a period of years and not just at this single point in time. Over long periods of time, the Systems continue to produce investment returns that meet or exceed the Systems' objectives. The annualized investment return for the Systems over the last 30 years is 8.3%, net of all fees and expenses.

The actuarial assumed rate of return was 8.0% from 1980 through fiscal year 2016. The Board of Trustees set the actuarial assumed rate of return at 7.75%, effective with the June 30, 2016 actuarial valuations and fiscal year 2017 investment performance measurement. The Board of Trustees considered the current funded status of the Systems, expectations of capital markets and other factors during fiscal year 2017. Based on these considerations the Board of Trustees approved reducing the risk profile of the plans by approving a further reduction of the actuarial assumed rate of return to 7.6%. The actuarial assumed rate of return of 7.6% is effective with the June 30, 2017 valuations and fiscal year 2018 investment performance. Detailed information regarding the Systems' investment portfolio is included in the *Investment Section* of this report.

The Board of Trustees' revised the Actuarial Funding Policies at their November 3, 2017 Board meeting. The revisions include the reduction in the actuarial assumed rate of return discussed above and a change to the assumption for annual cost-of-living adjustments. The revisions are effective with the June 30, 2017 valuations. The Board of Trustees approved these revisions based on two critical elements: the Board's fiduciary responsibility and the Systems' continuous goals. The Systems' funding objective is to achieve a funded ratio of 100% over a closed 30-year period. For this purpose, funded ratio is defined as the actuarial value of assets divided by the actuarial accrued liability determined under the entry age normal cost method and the actuarial assumptions adopted by the Board. Detailed information regarding the Systems' actuarial assumptions is included in the *Actuarial Section* of this report.

The economic factor that is of primary significance to the Systems is the investment rate of return earned in global capital markets. Legislative, demographic, and actuarial assumption changes can also have a significant



impact on the funded status of the Systems. All of these factors are incorporated into the annual actuarial valuations, which determine the contribution rates at which participating employers must contribute in order to appropriately fund benefits.

The fiscal year 2019 contribution rates remain unchanged from the fiscal year 2018 rates. The fiscal year 2019 contribution rate for PSRS remains 29.0%. The year 2019 contribution rate for PEERS remains 13.72%. The fiscal year 2019 contribution rates are in compliance with the PSRS/PEERS' Board of Trustees' Funding Policy and represent the continued stability of contribution rates for employers and members.

The Board of Trustees, management and staff continually strive to improve the financial position of the Systems through a prudent investment program and long-term strategic planning.

### Requests for Information

This financial report is designed to provide the Board of Trustees, our members, and other users of our financial report with a general overview of the Systems' finances and to demonstrate the Systems' accountability for the money it receives. If you have any questions about this report or need additional financial information, contact the Public School and Education Employee Retirement Systems of Missouri (PSRS/PEERS), P.O. Box 268, Jefferson City, MO 65102.

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Public School Retirement System of Missouri  
Public Education Employee Retirement System of Missouri  
Statements of Fiduciary Net Position

*as of June 30, 2017  
with comparative totals for June 30, 2016*

			<b>Combined Totals</b>	
	<b>PSRS</b>	<b>PEERS</b>	<b>June 30, 2017</b>	<b>June 30, 2016</b>
<b>ASSETS</b>				
Cash	\$ 119,922,113	\$ 19,214,380	\$ 139,136,493	\$ 88,946,114
Receivables				
Contributions	193,541,180	23,511,853	217,053,033	215,585,240
Accrued interest and dividends	74,361,968	8,861,891	83,223,859	70,936,667
Investment sales	1,668,787,254	198,930,997	1,867,718,251	1,639,938,617
Receivable from PEERS for allocated expenses	669,925	-	669,925	994,703
Other	19,548	3,124	22,672	8,649
Total receivables	1,937,379,875	231,307,865	2,168,687,740	1,927,463,876
Investments, at fair value				
U.S. Treasuries and TIPS	6,258,989,568	746,114,898	7,005,104,466	6,587,571,917
U.S. public equities	11,421,263,275	1,361,493,671	12,782,756,946	12,075,736,517
Non-U.S. public equities	6,262,112,866	746,487,217	7,008,600,083	5,754,643,311
Short term investments	591,855,101	72,395,763	664,250,864	560,392,553
Public debt	2,511,518,494	299,390,396	2,810,908,890	2,321,529,351
Private equity	3,117,883,178	371,673,265	3,489,556,443	3,050,186,246
Private credit	250,093,671	29,812,897	279,906,568	250,525,907
Private real estate	2,821,364,153	336,326,144	3,157,690,297	3,014,823,787
Hedged assets	4,251,928,500	506,859,320	4,758,787,820	4,821,313,863
Total investments	37,487,008,806	4,470,553,571	41,957,562,377	38,436,723,452
Invested securities lending collateral	251,096,575	29,932,451	281,029,026	407,969,041
Prepaid expenses	110,800	-	110,800	308,247
Capital assets, net of accumulated depreciation	24,004,180	-	24,004,180	25,214,511
Total assets	39,819,522,349	4,751,008,267	44,570,530,616	40,886,625,241
<b>LIABILITIES</b>				
Accounts payable	14,142,542	1,625,009	15,767,551	13,913,167
Interest payable	509,410	60,725	570,135	171,190
Securities lending collateral	251,078,923	29,930,346	281,009,269	407,970,010
Investment purchases	2,270,745,753	270,688,618	2,541,434,371	2,147,826,551
Payable due PSRS for allocated expenses	-	669,925	669,925	994,703
Accrued medical claims	49,600	30,400	80,000	260,000
Net other post employment benefit obligation	1,271,062	779,038	2,050,100	1,952,800
Compensated absences	1,478,996	806,198	2,285,194	2,236,313
Total liabilities	2,539,276,286	304,590,259	2,843,866,545	2,575,324,734
<b>NET POSITION - RESTRICTED FOR PENSIONS</b>				
	\$ 37,280,246,063	\$ 4,446,418,008	\$ 41,726,664,071	\$ 38,311,300,507

See accompanying Notes to the Financial Statements.

Public School Retirement System of Missouri  
Public Education Employee Retirement System of Missouri  
Statements of Changes in Fiduciary Net Position

*for the year ended June 30, 2017  
with comparative totals for the year ended June 30, 2016*

	Combined Totals Year Ended			
	PSRS	PEERS	June 30, 2017	June 30, 2016
<b>ADDITIONS</b>				
Contributions				
Employer	\$ 684,857,718	\$ 111,239,585	\$ 796,097,303	\$ 777,511,066
Member	719,625,373	118,446,790	838,072,163	819,043,231
Total contributions	1,404,483,091	229,686,375	1,634,169,466	1,596,554,297
Investment income				
<i>From investing activities:</i>				
Net appreciation in fair value of investments	4,158,487,457	488,430,780	4,646,918,237	422,454,923
Interest from investments	182,426,138	21,531,518	203,957,656	193,456,062
Interest from bank deposits	91,912	11,033	102,945	74,737
Dividends	197,394,983	23,322,281	220,717,264	198,440,201
Total investment income	4,538,400,490	533,295,612	5,071,696,102	814,425,923
Less investment expenses	439,194,853	48,825,931	488,020,784	351,861,028
Net income from investing activities	4,099,205,637	484,469,681	4,583,675,318	462,564,895
<i>From security lending activities:</i>				
Security lending gross income	3,569,723	428,772	3,998,495	126,161,794
Net (depreciation) appreciation in fair value of security lending collateral	18,540	2,186	20,726	(4,421)
Less security lending activity expenses:				
Agent fees	1,039,782	115,531	1,155,313	1,662,418
Broker rebates (received) paid	(2,355,629)	(261,737)	(2,617,366)	(6,431,352)
Total security lending expenses	(1,315,847)	(146,206)	(1,462,053)	(4,768,934)
Net income from security lending activities	4,904,110	577,164	5,481,274	130,926,307
Total net investment income	4,104,109,747	485,046,845	4,589,156,592	593,491,202
Other income				
Miscellaneous income	13,504	22	13,526	6,430
Total other income	13,504	22	13,526	6,430
Total additions	5,508,606,342	714,733,242	6,223,339,584	2,190,051,929
<b>DEDUCTIONS</b>				
Monthly benefits	2,471,214,464	251,077,530	2,722,291,994	2,606,962,019
Refunds of contributions	50,617,935	18,190,571	68,808,506	74,335,191
Administrative expenses	10,496,287	6,365,275	16,861,562	18,529,150
Other expenses	1,425	12,533	13,958	15,388
Total deductions	2,532,330,111	275,645,909	2,807,976,020	2,699,841,748
Net increase (decrease) in net position	2,976,276,231	439,087,333	3,415,363,564	(509,789,819)
<b>NET POSITION - RESTRICTED FOR PENSIONS</b>				
Beginning of year	34,303,969,832	4,007,330,675	38,311,300,507	38,821,090,326
End of year	\$ 37,280,246,063	\$ 4,446,418,008	\$ 41,726,664,071	\$ 38,311,300,507

See accompanying Notes to the Financial Statements.

## Notes to the Financial Statements

## Note 1 - Plan Descriptions

The Board of Trustees of the Public School Retirement System of Missouri administers two separate retirement systems, the Public School Retirement System of Missouri (PSRS) and the Public Education Employee Retirement System of Missouri (PEERS). The Board of Trustees consists of seven members, three of whom are elected PSRS active members, one an elected active member of PEERS and three persons appointed by the governor, one of whom must be a retired member of either PSRS or PEERS.

The funds of the two Systems are managed simultaneously. Investments of the Systems are combined in a commingled investment pool as allowed by state statute. Each System owns an equity position in the pool and receives proportionate investment income from the pool in accordance with their respective ownership percentage. Each System's allocated share of each type of investment in the pool is shown on the Statements of Fiduciary Net Position. Investment gains and losses are reported in the Statements of Changes in Fiduciary Net Position. Each System's assets may be used only for the payment of benefits to the members of the separate System in accordance with the statutes governing that System as well as expenses required to administer the System.

## The Public School Retirement System of Missouri (PSRS)

PSRS is a mandatory cost-sharing multiple employer retirement system for all full-time certificated employees and certain part-time certificated employees of all public school districts in Missouri (except the school districts of St. Louis and Kansas City) and all public community colleges. The System also includes certificated employees of PSRS, Missouri State Teachers' Association, Missouri State High School Activities Association, and certain employees of the state of Missouri who elected to remain covered by PSRS under legislation enacted in 1986, 1987 and 1989. The majority of PSRS members are exempt from Social Security contributions. In some instances, positions may be determined not to be exempt from Social Security contributions. Any PSRS member who is required to contribute to Social Security comes under the requirements of Section 169.070 (9) RSMo, known as the "2/3's statute." PSRS members required to contribute to Social Security are required to contribute two-thirds of the approved PSRS contribution rate and their employer is required to match the contribution.

The members' benefits are further calculated at two-thirds the normal benefit amount.

PSRS was established as an independent trust fund by an Act of the Missouri General Assembly effective August 1, 1945. Statutes governing the System are found in Sections 169.010-169.141 and Sections 169.560-169.595 RSMo. It is a defined benefit plan providing service retirement, death and disability benefits to its members. Members are vested for service retirement benefits after accruing five years of service. Individuals who (a) are at least age 60 and have a minimum of 5 years of service, (b) have 30 years of service, or (c) qualify for benefits under the "Rule of 80" (service and age total at least 80) are entitled to a monthly benefit for life, which is calculated using a 2.5% benefit factor. Actuarially age-reduced benefits are available for members with five to 24.9 years of service at age 55 or with 25 years of service (if not yet age 55). Members who are younger than age 55 and who do not qualify under the "Rule of 80" but have between 25 and 29.9 years of service may retire with a lesser benefit factor. Members that are three years beyond normal retirement can elect to have their lifetime monthly benefits actuarially reduced in exchange for the right to also receive a one-time partial lump sum (PLSO) payment at retirement equal to 12, 24, or 36 times the Single Life benefit amount. Annual cost-of-living adjustments (COLAs) are provided for eligible service and disability retirees and for surviving beneficiaries receiving payments under optional benefit plans, up to a lifetime maximum of 80% of the original benefit amount.

For a more detailed summary of benefits for the members of PSRS, refer to the *Summary Plan Description* in the *Actuarial Section* of this report.

**Contributions** – PSRS members were required to contribute 14.5% of their annual covered salary during fiscal year 2017. Employers were required to match the contributions made by employees. The contribution rate is set each year by the PSRS/PEERS Board of Trustees upon the recommendation of the independent actuary within the contribution restrictions set in Section 169.030 RSMo. The annual statutory increase in the total contribution rate may not exceed 1% of pay. Administrative costs are financed through investment earnings. Contributions for employees of the State of Missouri were made by the state in accordance with the actuarially determined contribution rate needed to fund current costs and prior service costs of state employees as authorized in Section 104.342.8 RSMo.

**Members** – The number of PSRS members and benefit recipients served by the System at June 30, 2017:

Retirees and beneficiaries receiving benefits		59,772
Inactive members entitled to, but not yet receiving benefits		8,500
Active members:	Vested	58,848
	Non-vested	<u>19,426</u>
Total active members		78,274
Other inactive members and terminated accounts		<u>8,256</u>
Total		<u><u>154,802</u></u>

**Employers** – PSRS had 534 contributing employers during fiscal year 2017.

### The Public Education Employee Retirement System of Missouri (PEERS)

PEERS is a mandatory cost-sharing multiple employer retirement system for all public school district employees (except the school districts of St. Louis and Kansas City), employees of the Missouri Association of School Administrators, and community college employees (except the Community College of St. Louis). Employees of covered districts who work 20 or more hours per week on a regular basis and who are not contributing members of the Public School Retirement System of Missouri (PSRS) must contribute to PEERS. Employees of PSRS who do not hold Missouri educator certificates also contribute to PEERS.

PEERS was established as a trust fund by an Act of the Missouri General Assembly effective October 13, 1965. Statutes governing the System are found in Sections 169.600 - 169.715 and Sections 169.560-169.595 RSMo. The statutes place responsibility for the operation of PEERS on the Board of Trustees of the Public School Retirement System of Missouri.

PEERS is a defined benefit plan providing service retirement and disability benefits to its members. Members are vested for service retirement benefits after accruing five years of service. Individuals who (a) are at least age 60 and have a minimum of five years of service, (b) have 30 years of service, or (c) qualify for benefits under the “Rule of 80” (service and age total at least 80) are entitled to a monthly benefit for life, which is calculated using a 1.61% benefit factor. Members qualifying for “Rule of 80” or “30-and-out” are entitled to an additional temporary .8% benefit multiplier until

reaching minimum Social Security age (currently age 62). Actuarially age-reduced retirement benefits are available with five years of service at age 55. Members who are younger than age 55 and who do not qualify under the “Rule of 80” but have between 25 and 29.9 years of service may retire with a lesser benefit factor. Members that are three years beyond normal retirement can elect to have their lifetime monthly benefits actuarially reduced in exchange for the right to also receive a one-time partial lump sum (PLSO) payment at retirement equal to 12, 24, or 36 times the Single Life benefit amount. Annual cost-of-living adjustments (COLAs) up to a lifetime maximum of 80% of the original benefit amount are provided for eligible service and disability retirees and for surviving beneficiaries receiving payments under optional benefit plans.

For a more detailed summary of benefits for the members of PEERS, refer to the *Summary Plan Description* in the *Actuarial Section* of this report.

**Contributions** – PEERS members were required to contribute 6.86% of their annual covered salary during fiscal year 2017. Employers were required to match the contributions made by their employees. The contribution rate is set each year by the PSRS/PEERS Board of Trustees upon the recommendation of the independent actuary within the contribution restrictions in Section 169.620 RSMo. The annual statutory increase in the total contribution rate may not exceed 0.5% of pay. Administrative costs proportional to its membership size are reimbursed by PEERS to the Public School Retirement System of Missouri (PSRS) and are financed through investment earnings.

**Members** - The number of PEERS members and benefit recipients served by the System at June 30, 2017:

Retirees and beneficiaries receiving benefits		29,002
Inactive members entitled to, but not yet receiving benefits		6,373
Active members:	Vested	27,071
	Non-vested	<u>20,882</u>
Total active members		47,953
Other inactive members and terminated accounts		<u>26,779</u>
Total		<u><u>110,107</u></u>

**Employers** – PEERS had 530 contributing employers during fiscal year 2017.

## Note 2 – Summary of Significant Accounting Policies

### Basis of Accounting

Basis of Accounting – For financial reporting purposes, the Systems adhere to accounting principles generally accepted in the United States of America (US GAAP). The Systems apply all applicable pronouncements of the Governmental Accounting Standards Board (GASB).

The Systems' financial statements, notes to the financial statements, and required supplementary information were prepared in conformity with GASB Statement No. 67, *Financial Reporting for Pension Plans*. GASB Statement No. 67 addresses accounting and financial reporting requirements for pension plans. Significant requirements include an actuarial calculation of total and net pension liability. It also includes comprehensive footnote disclosures regarding the pension liability, the sensitivity of the net pension liability to the discount rate and increased investment activity disclosures. The total pension liability, determined in accordance with GASB Statement No. 67 is presented in Note 5 - *Net Pension Liability of Employers*.

The financial statements of both Systems were prepared using the accrual basis of accounting. For both Systems, member and employer contributions are recognized when due, pursuant to formal commitments and statutory requirements. Benefits and refunds are recognized when due and payable in accordance with the statutes governing the Systems. Expenses are recognized when the liability is incurred, regardless of when payment is made. Administrative expenses are funded through investment earnings.

### Cash

Cash includes cash on hand, demand deposits, and short-term investments with original maturities of three months or less from the date of acquisition.

### Receivables

Receivables consist primarily of contributions owed and yet to be remitted by employers, pending investment trades and interest and dividends payable to the Systems as of the end of each fiscal year.

### Method Used to Value Investments

Investments are reported at fair value. The fair value of investments is based on published market prices and quotations from major investment brokers at current exchange rates, as available. Many factors are considered in arriving at fair value. Fixed income securities not

traded on a national or international exchange are based on equivalent values of comparable securities with similar yield and risk. The value of private equity, credit and real investments that do not have an established market is determined based upon the most current net asset values and activities through year end. When values are not readily available, alternative investments are valued based on a good faith determination by the General Partner.

GASB Statement No. 72 addresses accounting and reporting issues related to fair value measurements. The Statement requires disclosures to be made about fair value measurements, the level of fair value hierarchy, and valuation techniques. Comprehensive footnote disclosure regarding this Statement is presented in Note 4 - *Deposits, Investments and Securities Lending Program*.

### Capital Assets

The building and other capital assets are owned by PSRS and are stated at cost less depreciation accumulated since acquisition. The stated value does not purport to represent replacement or realized value. Costs of major additions and improvements are capitalized. Expenditures for maintenance and repairs are charged to operations as incurred. Depreciation is calculated using the straight-line method, with estimated lives ranging from three to 40 years in the following major classes: computers and software, three years; vehicles, five years; equipment, five years; building and land improvements, 15 years; pension administration system, 20 years; building, 40 years.

PSRS allocates depreciation expense to PEERS for the use of capital assets.

### 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 net position restricted for pension benefits at June 30, 2017. Actual results could differ from those estimates.

### Total Columns

The financial statements include total column information for the prior year. Such information does not include sufficient detail to constitute a presentation in conformity with U.S. generally accepted accounting principles. Accordingly, such information should be read in conjunction with both Systems' financial statements for the year ended June 30, 2016, from which the information was derived. Certain reclassifications have been made to the 2016 totals to conform with the classifications for 2017.

### Note 3 – Designations of Net Position – Restricted for Pensions

The Systems designate the net position – restricted for pensions for the following specific purposes:

#### Public School Retirement System of Missouri

	2017
<b>Designated for Members' Contributions (Member Reserves)</b> – Accumulation of active and terminated member contributions plus interest.	\$ 7,646,144,711
<b>Designated for the Payment of Benefits to Present Retirees</b> – Transfers from Member Reserves at retirement and an actuarially determined transfer from Operating Reserves to fund the System's obligation for benefit payments and cost-of-living adjustments to current retirees and beneficiary recipients.	27,544,081,740
<b>Designated for Operating Expenses/Benefits to Future Retirees (Operating Reserves)</b> – Accumulation of employer contributions and investment income used to fund future benefit payments, interest on member accounts and, administration and maintenance expenses of the System.	<u>2,090,019,612</u>
Net Position – Restricted For Pensions	<u>\$ 37,280,246,063</u>

#### Public Education Employee Retirement System of Missouri

	2017
<b>Designated for Members' Contributions (Member Reserves)</b> – Accumulation of active and terminated member contributions plus interest.	\$ 1,001,414,352
<b>Designated for the Payment of Benefits to Present Retirees</b> – Transfers from Member Reserves at retirement and an actuarially determined transfer from Operating Reserves to fund the System's obligation for benefit payments and cost-of-living adjustments to current retirees and beneficiary recipients.	2,453,877,197
<b>Designated for Operating Expenses/Benefits to Future Retirees (Operating Reserves)</b> – Accumulation of employer contributions and investment income used to fund future benefit payments, interest on member accounts, and administration and maintenance expenses of the System.	<u>991,126,459</u>
Net Position – Restricted For Pensions	<u>\$ 4,446,418,008</u>



## Note 4 – Deposits, Investments and Securities Lending Program

### Custodial Credit Risk

Custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, the Systems will not be able to recover deposits or will not be able to recover collateral securities that are in the possession of an outside party. The custodial credit risk for investments is the risk that, in the event of the failure of the counterparty to a transaction, the Systems would not be able to recover the value of investment or collateral securities that are in the possession of an outside party. To mitigate custodial credit risk, the Systems require that all deposits be 100% collateralized with securities held in the Systems' name and held by a third party agent.

### Deposits

Cash balances include short-term securities held by the custodial bank in a pooled short-term investment fund and operating balances held by the depository banks.

At June 30, 2017, the PSRS carrying amount of deposits at the depository bank was \$17,261,849 and the bank balance was \$3,707,731. Of the bank balance, \$250,000 was covered by federal depository insurance. In addition the deposits were collateralized with U.S. agency securities held by a third-party institution in the System's name, totaling \$57,567,208. An additional \$3,083,427 was held in overnight repurchase agreements with a book value of \$3,083,427. The overnight repurchase agreements were collateralized with U.S. agency securities held by a third-party institution in the System's name totaling \$3,083,427.

At June 30, 2017, the PEERS carrying amount of deposits at the depository bank was \$1,702,646 and the bank balance was \$477,405. Of the bank balance, \$250,000 was covered by federal depository insurance. In addition the deposits were collateralized with U.S. agency securities held by a third-party institution in the System's name, totaling \$3,402,198. An additional \$192,601 was held in overnight repurchase agreements with a book value of \$192,601. The overnight repurchase agreements were collateralized with U.S. agency securities held by a third-party institution in the System's name totaling \$192,601.

### Investment Policy and Asset Allocation

Funds for both Systems that are in excess of a safe operating balance are invested under policies and

procedures established by the Board of Trustees. Chapter 169.040 RSMo as amended effective August 13, 1984, authorizes any investment which a prudent person acting in a like capacity and familiar with similar matters would use in the conduct of an enterprise of a like character and with like aims. Any person with fiduciary responsibility with respect to the Systems is covered by this "prudent person" rule.

The Board of Trustees of PSRS and PEERS approved the commingling of assets for purposes of investment as allowed by state statute. In order to implement this change, PSRS and PEERS adopted the Missouri Education Pension Trust Agreement. The Missouri Education Pension Trust (MEPT) is managed by the PSRS and PEERS Board of Trustees and Investment Staff. Effective July 1, 2013, the invested assets of the Systems were pooled and invested in MEPT. All assets held by MEPT are for the exclusive benefit of PSRS and PEERS. Each of the Systems has equity in MEPT based on funds contributed and earnings allocated. Earnings of MEPT are allocated based on the average daily balances of each of the respective Systems. Individual investments in MEPT are not specifically identified to the respective Systems. For financial statement presentation, MEPT assets, liabilities, revenues, and expenses have been allocated to and presented in each respective system in the basic financial statements as required by investment pools. Due to the fact all invested assets are invested in MEPT, the rate of return for each of the Systems is approximately the same.

The Systems' policy in regard to the allocation of invested assets is established and may be amended by the Board of Trustees. System assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided by the Systems. The Board of Trustees amended the long term asset allocation at their June 2016 Trustees' meeting. The long-term target for Public Credit was decreased from 12.0% to 7.0%, which resulted in Public Risk Assets decreasing from 60.0% to 55.0%. Private Equity increased from 10.5% to 12.0%, Private Real Estate increased from 7.5% to 9.0% and Private Credit increased from 2.0% to 4.0%, resulting in Private Risk Assets increasing from 20.0% to 25.0%. Implementation of the amended long-term targets will be achieved over a number of years through a disciplined investment approach. The policy benchmarks will change over time as the Systems make meaningful progress towards the new long-term targets. The following table illustrates the Systems' Board of Trustees approved asset allocation as of June 30, 2017.

Investment Type	Long-term Target	Policy Ranges
<i>Public Risk Asset Programs</i>		
U.S. Public Equity	27.0%	16% - 48%
Public Credit	7.0%	0% - 20%
Hedged Assets	6.0%	0% - 25%
Non-U.S. Public Equity	<u>15.0%</u>	<u>8% - 28%</u>
<b>Total Public Risk Assets</b>	<b>55.0%</b>	<b>35% - 75%</b>
<i>Safe Assets</i>		
U.S. Treasuries	16.0%	0% - 40%
U.S. TIPS	4.0%	0% - 40%
Cash Equivalents	<u>0.0%</u>	<u>0% - 10%</u>
<b>Total Safe Assets</b>	<b>20.0%</b>	<b>10% - 40%</b>
<i>Private Risk Asset Programs</i>		
Private Equity	12.00%	4% - 15%
Private Real Estate	9.00%	4% - 12%
Private Credit	<u>4.00%</u>	<u>0% - 8%</u>
<b>Total Private Risk Assets</b>	<b><u>25.00%</u></b>	<b>10% - 30%</b>
<b>Total Fund</b>	<b><u>100.0%</u></b>	

The Systems categorize their fair value measurements within the fair value hierarchy established by U.S. generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements). The Systems have classified the fair value measurements on the following page in accordance with the Board approved asset allocation discussed on page 30. The classifications will not directly reconcile to total investments per the Statements of Fiduciary Net Position due to the considerations of cash holdings, other liabilities and accruals.

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

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

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

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

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation.

The Systems' assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset or liability. The tables on the following page show the fair value leveling of the investments for the Systems.

Short-term securities generally include investments in money market-type securities reported at cost which approximates market or fair value.

Equities within all assets classes that are classified in Level 1 are valued using prices quoted in active markets for those securities. Equity and equity derivative securities classified in Level 2 are securities whose values are derived daily from associated traded securities. Equity securities classified in Level 3 are valued with last trade data having limited trading volume.

Fixed income securities and derivatives within all assets classes that are classified in Level 2 are valued using either a bid evaluation or a matrix pricing technique. Bid evaluations may include market quotations, yields, maturities, call features and ratings. Matrix pricing is used to value securities based on the securities relationship to benchmark quoted prices. Such securities include U.S. Treasuries, corporate and agency bonds, bank loans, and mortgage backed securities. Level 2 fixed income securities have non-proprietary information that was readily available to market participants, from multiple independent sources, which are known to be actively involved in the market.

**Investments and Derivatives Measured at Fair Value**

Investments by fair value level	Total at 6/30/2017	Fair Value Measurements		
		Level 1	Level 2	Level 3
<b>U.S. Treasuries and TIPS</b>				
U.S. Treasuries	\$ 7,005,104,466	\$ -	\$ 7,005,104,466	\$ -
<b>Total U.S. Treasuries and TIPS</b>	<b>7,005,104,466</b>	<b>-</b>	<b>7,005,104,466</b>	<b>-</b>
<b>U.S. public equities</b>				
Equities	6,397,974,349	6,397,953,402	20,947	-
U.S. Treasuries	718,144,549	-	718,144,549	-
<b>Total U.S. public equities</b>	<b>7,116,118,898</b>	<b>6,397,953,402</b>	<b>718,165,496</b>	<b>-</b>
<b>Non-U.S. public equities</b>				
Equities	4,520,911,939	4,517,783,693	2,766,137	362,109
<b>Total Non-U.S. public equities</b>	<b>4,520,911,939</b>	<b>4,517,783,693</b>	<b>2,766,137</b>	<b>362,109</b>
<b>Short term investments</b>				
Short term investment fund	729,853,107	-	729,853,107	-
<b>Total Short term investments</b>	<b>729,853,107</b>	<b>-</b>	<b>729,853,107</b>	<b>-</b>
<b>Public debt</b>				
Corporate Bonds	2,392,138,859	-	2,392,138,859	-
Bank Loans	354,295,955	-	354,295,955	-
U.S. Treasuries	49,385,288	-	49,385,288	-
Equities	1,932,776	1,577,933	331,937	22,906
Municipal Bonds	17,853,258	-	17,853,258	-
<b>Total Public Debt</b>	<b>2,815,606,136</b>	<b>1,577,933</b>	<b>2,814,005,297</b>	<b>22,906</b>
<b>Hedged assets</b>				
U.S. Treasuries	502,899,678	-	502,899,678	-
Equities	197,121,167	197,121,167	-	-
Corporate Bonds	24,630,914	-	24,630,914	-
Agency Bonds	5,952,605	-	5,952,605	-
<b>Total Hedged assets</b>	<b>730,604,364</b>	<b>197,121,167</b>	<b>533,483,197</b>	<b>-</b>
<b>Private equity</b>				
Equities	1,595,883	1,595,883	-	-
<b>Total Private equity</b>	<b>1,595,883</b>	<b>1,595,883</b>	<b>-</b>	<b>-</b>
<b>Total investments by fair value level</b>	<b>\$ 22,919,794,793</b>	<b>\$ 11,116,032,078</b>	<b>\$ 11,803,377,700</b>	<b>\$ 385,015</b>
<b>Total investments measured at the NAV</b> <i>(See detailed schedule on the following page)</i>	<b>\$ 18,542,625,529</b>			
<b>Total Investments measured at fair value</b>	<b>\$ 41,462,420,322</b>			
<b>Investment derivative instruments:</b>				
	<b>6/30/17</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
Equity total return swaps	\$ (6,693,452)	\$ -	\$ (6,693,452)	\$ -
Foreign currency forwards	(22,264,448)	-	(22,264,448)	-
<b>Total investment derivative instruments</b>	<b>\$ (28,957,900)</b>	<b>\$ -</b>	<b>\$ (28,957,900)</b>	<b>\$ -</b>
	<b>6/30/17</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
<b>Total invested securities lending collateral</b>	<b>\$ 281,029,026</b>	<b>\$ -</b>	<b>\$ 281,029,026</b>	<b>\$ -</b>

Investments Measured at the NAV	Fair Value	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
<b>Public Equity Investments</b>				
Passive U.S. Equity Funds	\$ 3,200,858,241	\$ -	Daily	1 day
Passive Non-U.S. Equity Fund	742,870,205	-	Daily	2 days
Active Non-U.S. Equity Funds	1,764,194,280	-	Monthly	15 - 30 days
<b>Total Public Equity Investments</b>	<b>5,707,922,726</b>	<b>-</b>		
<b>Hedge Fund Investments</b>				
Asset Allocation/Global Macro	849,576,938	-	Monthly	5 days
Distressed Debt/Credit	726,838,030	-	Quarterly, semi-annual	65 - 90 days
Diversified Beta/Inflation	298,676,958	-	Quarterly	30 days
Equity Long/Short	1,477,205,176	-	Monthly, quarterly	5 - 60 days
Multi-Strategy	2,556,848,275	-	Monthly, quarterly	15 - 120 days
<b>Total Hedge Fund Investments</b>	<b>5,909,145,377</b>	<b>-</b>		
<b>Private Risk Investments</b>				
Private Equity	3,487,960,560	3,474,411,377	Not eligible	N/A
Private Credit	279,906,569	362,939,782	Not eligible	N/A
Private Real Estate - closed end funds	1,099,332,828	741,717,494	Not eligible	N/A
Private Real Estate - open end funds	2,058,357,469	-	Quarterly	15 - 180 days
<b>Total Private Risk Investments</b>	<b>6,925,557,426</b>	<b>4,579,068,653</b>		
<b>Total investments measured at the NAV</b>	<b>\$ 18,542,625,529</b>	<b>\$ 4,579,068,653</b>		

The fair values of investments in certain public equity, hedged assets, and private risk assets are based on the investments' net asset value (NAV) per share (or its equivalent) and are presented in the above table. Investments that are measured at fair value using the net asset value (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

### Public Equity Investments

The public equity investments include three passive U.S. equity funds, one passive non-U.S. equity fund and four active non-U.S. equity funds. The passive equity funds provide for basic market exposure with daily liquidity while the four active funds provide active investment strategies in the global equity and emerging markets.

### Hedged Assets

The hedged assets investment strategy provides diversification and reduced volatility to the total portfolio. The purpose of this program is to enhance the overall risk/return profile through the inclusion of specialized investment strategies that typically generate returns in a different fashion (i.e., absent a high correlation to equities or bonds).

*Asset Allocation/Global Macro* includes investments in two funds with the strategy of taking long and short positions based on top-down macroeconomic analysis (i.e., interest rates, foreign exchange rates, and commodity prices). Global strategies involve long and short positions in securities of diverse geographical regions such as developed and emerging markets.

*Distressed Debt/Credit* includes investments in two funds which seek returns by capitalizing on opportunities in financially distressed companies' debt and credit securities.

*Diversified Beta/Inflation* includes investments in three funds with a risk parity approach which focuses on the allocation of risk across the portfolio.

*Equity Long/short* includes investments in six funds with the strategy of taking long positions in attractive equity securities and short positions in unattractive equity securities.

*Multi-Strategy* includes investments in eleven funds which represent a broad style of investing that seeks diverse sources of alpha generation and positive absolute returns by employing a variety of investment strategies.

Strategies utilized may include, but are not limited to, convertible bond arbitrage, equity long/short, statistical arbitrage, and merger arbitrage.

### *Private Risk Assets*

Private risk investments are typically very long term in nature, not publicly traded and relatively illiquid. Investments are made in limited partnerships where redemptions are restricted over the life of the partnership. During the life of the partnerships, distributions are received as underlying portfolio investments are realized.

*Private Equity* investments provide financing for start-up companies, private middle market companies, firms in financial distress and public and non-public firms seeking buyout financing. Private equity investments can be classified into three basic sub-asset class categories: Venture Capital, Buyouts, and Debt-Related.

*Private Credit* investments are comprised primarily of debt-related investments that provide a current yield along with equity participation (usually warrants). Primary strategies are distressed debt, bankruptcy restructurings, mezzanine debt, bank loans, and other credit-drive or debt-related strategies.

*Real Estate* investments are intended to provide exposure to a diversified portfolio of institutional quality private real estate investments that will provide meaningful, consistent returns, and act as a hedge against inflation and a diversifier to the overall investment portfolio. The real estate portfolio includes closed-end funds where distributions from each investment will be received as the underlying investments are liquidated and open-end funds which offer redemption options.

### Rate of Return

For the year ended June 30, 2017, the money-weighted rate of return, net of all investment expenses and fees was 12.3%. The money weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested. Time weighted returns (geometric return) for the year ended June 30, 2017 net of all investment expenses and fees, was 12.3%.

### Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the Systems' investment in a single issue. To mitigate this risk, the Systems' investment policy prohibits investing more than 5% of the total investment portfolio into any single financial institution or issuer, excluding U.S. government securities. At June 30, 2017, the Systems did not have more than 5% of total investments in a single issue except for U.S. government securities.

## Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. The Systems' investment policy restricts duration as a means of managing its exposure to fair value losses arising from increased interest rates. In addition, each manager must follow guidelines established relative to the duration of its benchmark. The portfolios are continually monitored to ensure compliance with these guidelines. The following table includes collateral pledged for securities lending collateral. The maturities of all debt securities are presented below:

Security Type	Fair Value at June 30, 2017	< 1 year to maturity	1 to 5 years to maturity	6 to 10 years to maturity	Over 10 years to maturity
U.S. treasuries	\$ 8,319,618,198	\$ 1,329,091,780	\$ 3,722,462,381	\$ 2,361,992,507	\$ 906,071,530
Agencies	23,848,176	22,338,066	1,510,110	-	-
Corporate bonds	2,771,065,728	23,676,323	1,217,074,283	1,426,028,901	104,286,221
Repurchase agreements	109,491,887	109,491,887	-	-	-
Commercial Paper	18,797,016	18,797,016	-	-	-
Certificate of Deposit	90,761,041	90,761,041	-	-	-
Derivatives	861,271	861,271	-	-	-
Municipals	17,853,257	-	17,197,772	655,485	-
Bank Deposits	729,853,107	729,853,107	-	-	-
<b>Commingled Funds (see note)</b>					
Bridgewater STIF II	22,789,249	22,789,249	-	-	-
Bridgewater US IL Bond Fund	9,126,573	-	-	9,126,573	-
Bridgewater International Bond Fund	11,206,163	-	-	-	11,206,163
Currency	38,981,265	38,981,265	-	-	-
Total	\$12,164,252,931	\$ 2,386,641,005	\$ 4,958,244,546	\$ 3,797,803,466	\$ 1,021,563,914
<b>Percentage of Total Fixed Income</b>	<b>100%</b>	<b>20%</b>	<b>41%</b>	<b>31%</b>	<b>8%</b>

*Note: Commingled Funds are presented at the weighted average maturity. These funds do not have a single maturity date; however, the underlying securities have maturity dates. To more accurately reflect the interest rate risk of the Systems, these weighted averages are displayed.*

The following table includes the debt maturities for the Systems' deposits and repurchase agreements collateral.

Security Type	Fair Value at June 30, 2017	< 1 year to maturity	1 to 5 years to maturity	6 to 10 years to maturity	Over 10 years to maturity
PSRS - Agencies	\$ 60,650,635	\$ 9,941,490	\$ 22,410,233	\$ 1,941,187	\$ 26,357,725
PEERS - Agencies	3,594,799	-	1,168,488	1,209,134	1,217,177

**Credit Risk**

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The Systems do not have a single investment policy designating the minimum allowable credit rating; however, each manager must follow guidelines established specifically for its managed portfolio. The portfolios are continually monitored to ensure compliance with these guidelines. The following tables include collateral pledged for securities lending collateral. The Systems' debt investments by credit rating category as of June 30, 2017 are presented in the following table.

Security Type	Fair Value at June 30, 2017	%	FDIC Insured	AAA	AA	A	BBB	BB	B	CCC	Not Rated
U.S. treasuries	\$ 8,319,618,198	69%	\$ -	\$ 8,319,618,198	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Agencies	23,848,176	0%	-	23,848,176	-	-	-	-	-	-	-
Corporate bonds	2,771,065,728	23%	-	15,469,488	109,650,850	907,060,455	1,248,695,649	222,901,245	226,276,793	17,388,701	23,622,547
Repurchase agreements	109,491,887	1%	-	109,491,887	-	-	-	-	-	-	-
Commercial paper	18,797,016	0%	-	18,797,016	-	-	-	-	-	-	-
Certificates of deposit	90,761,041	1%	-	90,761,041	-	-	-	-	-	-	-
Derivatives	861,271	0%	-	-	-	-	-	-	-	-	861,271
Municipals	17,853,257	0%	-	17,197,772	-	655,485	-	-	-	-	-
Bank Deposits	729,853,107	6%	729,853,107	-	-	-	-	-	-	-	-
<b>Commingled Funds (see note)</b>											
Bridgewater STIF II	22,789,249	0%	-	22,789,249	-	-	-	-	-	-	-
Bridgewater US IL Bond Fund	9,126,573	0%	-	-	9,126,573	-	-	-	-	-	-
Bridgewater International Bond Fund	11,206,163	0%	-	-	11,206,163	-	-	-	-	-	-
Currency	38,981,265	0%	-	-	-	-	-	-	-	-	38,981,265
<b>Total</b>	<b>\$ 12,164,252,931</b>	<b>100%</b>	<b>\$ 729,853,107</b>	<b>\$ 8,617,972,827</b>	<b>\$ 129,983,586</b>	<b>\$ 907,715,940</b>	<b>\$ 1,248,695,649</b>	<b>\$ 222,901,245</b>	<b>\$ 226,276,793</b>	<b>\$ 17,388,701</b>	<b>\$ 63,465,083</b>
<b>Percentage of Total Fixed Income</b>	<b>100%</b>		<b>6%</b>	<b>71%</b>	<b>1%</b>	<b>7%</b>	<b>10%</b>	<b>2%</b>	<b>2%</b>	<b>0%</b>	<b>1%</b>

*Note: Commingled Funds are presented at the weighted average credit quality. These funds do not carry a rating in and of themselves; however, the underlying securities are all rated. To more accurately reflect the credit risk of the Systems, these weighted averages are displayed. Obligations of the U.S. government or obligations explicitly guaranteed by the U.S. government are not required to be disclosed; however, we feel it shows a more true picture of our fixed income holdings.*

All collateral pledged in support of the Systems' deposits and repurchase agreements was held in agency securities with a quality rating of AA.

## 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 Systems do not have a single investment policy designating the allowable exposure to foreign currency; however, each manager must follow guidelines established specifically for its managed portfolio. The portfolios are continually monitored to ensure compliance with these guidelines. The Systems' exposure to foreign currency risk as of June 30, 2017 is presented in the following table.

Currency	Debt	Equity	Currency/Short Term	Total
Australian Dollar	\$ -	\$ 144,048,229	\$ 538,335	\$144,586,563
Brazilian Real	-	83,134,724	772,270	83,906,994
British Pound Sterling	15,850,152	364,408,824	502,664	380,761,640
Canadian Dollar	-	195,051,491	1,430,251	196,481,742
Chilean Peso	-	10,705,705	221,623	10,927,328
Colombian Peso	-	3,744,637	65,844	3,810,481
Czech Koruna	-	9,685,935	321,843	10,007,778
Danish Krone	-	61,117,160	576,892	61,694,052
Egyptian Pound	-	3,057,320	526,149	3,583,469
Euro Currency	55,373,031	1,172,811,408	(5,460,484)	1,222,723,955
Hong Kong Dollar	-	336,401,778	895,638	337,297,416
Hungarian Forint	-	8,287,661	255,504	8,543,165
Indian Rupee	-	129,151,675	832,088	129,983,763
Indonesian Rupiah	-	17,794,664	488,344	18,283,008
Israeli Shekel	-	2,717,170	(11,247)	2,705,923
Japanese Yen	-	565,061,498	2,106,176	567,167,674
Malaysian Ringgit	-	35,815,468	175,633	35,991,101
Mexican Peso	-	23,211,383	1,304,807	24,516,190
New Taiwan Dollar	-	99,917,452	767,285	100,684,737
New Turkish Lira	-	22,693,608	864,963	23,558,571
New Zealand Dollar	-	24,261,804	31,943	24,293,747
Norwegian Krone	-	9,012,101	218,721	9,230,822
Peruvian Nuevo Sol	-	130,950	1,089	132,039
Philippine Peso	-	15,238,678	180,872	15,419,550
Polish Zloty	-	14,051,148	290,525	14,341,673
Qatari Rial	-	13,496,996	70,083	13,567,079
Russian Ruble	-	2,416,765	(110,175)	2,306,590
Singapore Dollar	-	62,087,764	206,913	62,294,677
South African Rand	-	69,060,120	293,556	69,353,676
South Korean Won	-	144,166,143	4,354,940	148,521,083
Swedish Krona	-	53,681,988	(115,480)	53,566,508
Swiss Franc	-	284,924,569	(163,336)	284,761,233
Thailand Baht	-	35,758,288	231	35,758,519
UAE Dirham	-	967,960	33,020	1,000,980
Yuan Renminbi	-	902,141	64,922	967,063
<b>Total</b>	<b>\$ 71,223,183</b>	<b>\$ 4,018,975,205</b>	<b>\$ 12,532,402</b>	<b>\$ 4,102,730,790</b>



## Derivatives

Derivatives are generally defined as investment instruments whose cash flows or fair values are derived from the value of some other asset or index. The Systems are parties to derivatives which have off-balance sheet risk. These derivative instruments are used in the normal course of business to generate earnings and reduce exposure to fluctuations in market conditions. The Systems are exposed to various types of credit, market, and legal risk related to these investments. Investment staff monitors these types of investments with extreme care and is not aware of any undue risks at this time. All derivatives are considered investments. Derivatives are reported at fair value on the Statements of Fiduciary Net Position based on quoted market prices when available. In the instances that quoted market prices are unavailable, pricing is obtained via independent pricing sources.

The fair value balances and notional amounts of derivative instruments outstanding as of June 30, 2017, classified by type are as follows:

Investment Derivatives	Fair Value at June 30, 2017		
	Classification	Amount	Notional
<b>Swaps</b>			
Total return swaps - equity	Investments, at fair value	\$ (6,693,452)	\$ 1,949,386,364
<b>Total swaps</b>		<b>(6,693,452)</b>	<b>1,949,386,364</b>
<b>Futures</b>			
Equity futures long	Investments, at fair value	-	218,878,472
Equity futures short	Investments, at fair value	-	112,681,868
Treasury futures long	Investments, at fair value	-	57,386,102
Treasury futures short	Investments, at fair value	-	556,685,469
Commodity futures long	Investments, at fair value	-	17,175,130
<b>Total futures</b>		<b>-</b>	<b>962,807,041</b>
<b>Foreign currency forwards net receivable/payable</b>	Investment Sales and Purchases	(22,264,448)	-
<b>Total Investment Derivatives</b>		<b>\$ (28,957,900)</b>	<b>\$ 2,912,193,405</b>

**Swaps** - The Systems' investment managers may enter into various swaps including interest rate swaps, credit default swaps and equity and total return swaps. Swaps represent an agreement between two parties to exchange sequences of cash flows over a period in the future. In the most common type of interest rate swap arrangement, one party agrees to pay fixed interest payments on designated dates to a counterparty who, in turn, agrees to make return interest payments that float with some reference rate. A credit default swap is a contract whereby the credit risk associated with an investment is transferred by entering into an agreement with another party, who in exchange for periodic fees, agrees to make payments in the event of a default or other predetermined credit event. A total return swap is a contract in which one party makes payments based on a set rate, either fixed or variable, while the other party makes payments based on the return of the underlying asset. The underlying asset is typically an index, bond, etc. Gains and losses on swaps are determined based on market values and are recorded in net appreciation (depreciation) in fair value of investments on the Systems' Statements of Changes in Fiduciary Net Position. Net gains on swaps of \$450.4 million were recognized for the fiscal year ended June 30, 2017.

**Futures** - Futures represent commitments to purchase (asset) or sell (liability) securities at a future date and at a specified price. Futures contracts are traded on organized exchanges (exchange traded) thereby minimizing the Systems' credit risk. The net change in the value of futures contracts is settled daily in cash with the exchanges. Net gains or losses resulting from the daily settlements are included in net appreciation (depreciation) in fair value of investments on the Systems' Statements of Changes in Fiduciary Net Position. The Systems recognized net gains on futures contracts of \$56.7 million during the fiscal year ended June 30, 2017.

**Options** - Options represent or give buyers the right, but not the obligation, to buy (call) or sell (put) an asset at a preset price over a specified period. The option's price is usually a small percentage of the underlying asset's value. As a writer of financial options, the Systems' investment managers receive a premium at the outset of the agreement and bear the risk of an unfavorable change in the price of the financial instrument underlying the option. As a purchaser of financial options, the Systems' investment managers pay a premium at the outset of the agreement and the counterparty bears the risk of an unfavorable change in the price of the financial instrument underlying the option. Net gains or losses resulting from such obligations are included in net appreciation (depreciation) in fair value of investments on the Systems' Statements of Changes in Fiduciary Net Position. The Systems had no option activity during the fiscal year ended June 30, 2017.

**Currency forwards** - Currency forwards represent forward foreign exchange contracts that are entered into in order to hedge the exposure to changes in foreign currency rate on the foreign currency dominated portfolio holdings. A forward foreign exchange contract is a commitment to purchase or sell a foreign currency at a future date at a negotiated forward rate. The gain or loss arising from the difference between the original contracts and the closing of such contracts is included in net appreciation (depreciation) in fair value of investments on the Systems' Statements of Changes in Fiduciary Net Position. The Systems recognized net losses on such contracts of \$14.9 million during the fiscal year ended June 30, 2017.

**Derivative Risk** - Derivatives that are exchange traded are not subject to credit risk. No derivatives held are subject to custodial credit risk.

At June 30, 2017 the counterparties' credit ratings for currency forwards, options and swaps are subject to credit risk as shown below:

Derivative Counterparty Credit Ratings			
Quality Rating	Swaps	Forwards	Total
AA	\$ -	\$ (1,108,419)	\$ (1,108,419)
A	(7,948,100)	(21,241,174)	(29,189,274)
BBB	-	85,145	85,145
<b>Total subject to credit risk</b>	<b>\$ (7,948,100)</b>	<b>\$(22,264,448)</b>	<b>\$(30,212,548)</b>

The Systems are exposed to interest rate risk on their interest rate swaps. As the variable portion of the swaps move in the market, the Systems' exposure increases and decreases. The Systems are exposed to termination risk. The Systems' investment managers or their counterparties may terminate a derivative if the either party fails to perform under the terms of the contract.

The Systems' derivatives are governed by ISDA Master Agreements between the Systems and the Counterparties. These agreements set forth collateral requirements and applicable netting arrangements. Foreign currency risks are reflected on page 35.

The Systems could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. The Systems' investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, and exposure monitoring procedures. The Systems anticipate that the counterparties will be able to satisfy their obligations under the contracts.

The derivative financial instruments discussed involve, to varying degrees, elements of market risk to the extent of future market movements in excess of the amounts recognized in the Statements of Fiduciary Net Position. Market risk arises from the potential unfavorable change in the value of the underlying instruments. The contract or notional amounts of these instruments reflect the extent of the Systems' involvement in each class of financial instrument; however, these amounts do not represent the exposure to market loss. Additional derivatives may be held in limited partnerships and commingled funds that are not reflected below.

## Security Lending Activity

Under the “prudent person” authority of the governing statutes and in accordance with the policies set by the Board of Trustees, the Systems lend securities to broker-dealers and banks pursuant to a form of loan agreement. The Systems’ custodial bank is authorized to act as the Systems’ agent to lend available securities to approved broker-dealers and banks subject to the receipt of acceptable collateral.

During the fiscal year, the Systems’ custodial bank lent, on behalf of the Systems, securities to participating broker-dealers. The broker-dealers must provide collateral in the form of cash. The Systems did not impose restrictions during the fiscal year on the amount of loans that the custodial bank made on their behalf. Borrowers were required to deliver collateral for each loan equal to: (1) in the case of loaned securities denominated in U.S. dollars or whose primary trading market was located in the United States, or sovereign debt issued by foreign governments, 102% of the fair value of the loaned securities and (2) in the case of loaned securities not denominated in U.S. dollars or whose primary trading market was not located in the United States, 105% of the fair value of the loaned securities.

Pursuant to the lending agreement, the custodial bank has an obligation to provide a form of indemnification to the Systems in the event of default by a borrower. There were no violations of the contractual provisions nor were there any borrower or lending agent default losses during the fiscal year.

The market value of securities on loan as of June 30, 2017 was \$269,096,578. On June 30, 2017 the Systems had no credit risk exposure to borrowers as the cash and securities collateral amounts received exceeded amounts on loan. Loans are generally terminable on demand. However, with the prior approval of the Systems, loans may be made on the basis of a specified termination date, with or without providing for the right of the Systems to terminate or substitute equivalent securities. As of June 30, 2017, there were no term loans.

Cash collateral is invested in separately managed accounts in accordance with the investment guidelines approved by the Systems. The primary investment objective is the preservation of principal. As of June 30, 2017, the cost basis of the invested cash collateral totaled \$281,009,269 and the estimated market value totaled \$281,029,026.

The Systems’ recognized net appreciation of \$20,726 for the year ended June 30, 2017 on the invested collateral account. Such is reported as net (depreciation) appreciation in fair value of security lending collateral on the Statements of Changes in Fiduciary Net Position.

The weighted average duration of invested collateral as of June 30, 2017 was 11 days and an average final maturity of approximately 22 days. Because the loans were terminable at will, their duration did not match the duration of the investments made with cash collateral.

## Note 5 – Net Pension Liability of Employers

The components of the net pension liability of the Systems' employers at June 30, 2017 are as follows:

	Total Pension Liability (TPL) (a)	Plan Fiduciary Net Position-Restricted for Pensions (b)	Net Pension Liability (NPL) (a - b)	Plan Fiduciary Net Position as a % of TPL (b/a)	Covered Employee Payroll (c)	Employers' NPL as a % of Covered Payroll ((b-a)/c)
<b>PSRS</b>	\$ 44,501,771,291	\$ 37,280,246,063	\$ 7,221,525,228	83.8%	\$ 4,655,169,121	155.1%
<b>PEERS</b>	\$ 5,209,368,865	\$ 4,446,418,008	\$ 762,950,857	85.4%	\$ 1,558,183,433	49.0%

**Actuarial Assumptions** - Actuarial valuations of the Systems involve estimates of the reported amount and assumptions about probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and future salary increases. Amounts determined regarding the net pension liability are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The Board of Trustees adopts actuarial assumptions, each of which individually represents a reasonable long-term estimate of anticipated experience for the Systems, derived from experience studies conducted every fifth year. The most recent comprehensive experience studies were completed in June 2016. All economic and demographic assumptions were reviewed and updated, where appropriate, based on the results of the study and effective with the June 30, 2016 valuation. The next experience studies are scheduled for 2021. For the June 30, 2017 valuations, the investment rate of return was reduced from 7.75% to 7.6% and the assumption for annual cost-of-living adjustments was updated in accordance with the funding policies amended by the Board of Trustees at their November 2017 meeting. All other assumptions remained consistent with the prior year.

The Schedules of Employer's Net Pension Liability presents multi-year trend information about whether the plan net positions are increasing or decreasing over time relative to the total pension liability. These schedules are presented in the required supplementary information following the notes to the financial statements. The total pension liability was determined by an actuarial valuation as of June 30, 2017. A summary of the significant actuarial assumptions as of June 30, 2017 are shown on the following page.

<b>Measurement Date</b>	<b>June 30, 2017</b>															
<b>Valuation Date</b>	<b>June 30, 2017</b>															
<b>Actuarial Cost Method</b>	Entry Age Normal															
<b>Investment Rate of Return</b>	7.60%															
<b>Inflation</b>	2.25%															
<b>Total Payroll Growth</b>																
PSRS	2.75% per annum, consisting of 2.25% inflation, 0.25% additional inflation due to the inclusion of health care costs in pension earnings, and 0.25% of real wage growth.															
PEERS	3.25% per annum, consisting of 2.25% inflation, 0.50% additional inflation due to the inclusion of health care costs in pension earnings, and 0.50% of real wage growth.															
<b>Individual Salary Growth</b>																
PSRS	3.00% - 9.50%, depending on service and including 2.25% inflation, 0.25% additional inflation due to the inclusion of health care costs in pension earnings, 0.25% of real wage growth for productivity, and real wage growth for merit, promotion and seniority of 0.25% to 6.75%.															
PEERS	4.00% - 11.00%, depending on service and including 2.25% inflation, 0.50% additional inflation due to the inclusion of health care costs in pension earnings, 0.50% of real wage growth for productivity, and real wage growth for merit, promotion and seniority of 0.75% to 7.75%.															
<b>Cost-of-Living Increases</b>																
PSRS	1.65% compounded annually, beginning on the second January after retirement and capped at 80% lifetime increase. The assumption increases from 1.20% to 1.65% over nine years.															
PEERS	1.65% compounded annually, beginning on the fourth January after retirement and capped at 80% lifetime increase. The assumption increases from 1.20% to 1.65% over nine years.															
<b>Mortality Assumption</b>																
<b>Actives</b>																
PSRS	RP 2006 White Collar Employee Mortality Table, multiplied by an adjustment factor of 0.75 at all ages for both males and females, with static projection using the 2014 SSA Improvement Scale to 2028.															
PEERS	RP 2006 Total Dataset Employee Mortality Table, multiplied by an adjustment factor of 0.75 at all ages for both males and females, with static projection using the 2014 SSA Improvement Scale to 2028.															
<b>Non-Disabled Retirees, Beneficiaries and Survivors:</b>																
PSRS	RP 2006 White Collar Mortality Table multiplied by the adjustment factors shown in the table below, with static projections using the 2014 SSA Improvement Scale to 2028.															
	<table border="1"> <thead> <tr> <th>Age</th> <th>Males</th> <th>Females</th> </tr> </thead> <tbody> <tr> <td>&lt;60</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>60-74</td> <td>0.89</td> <td>0.66</td> </tr> <tr> <td>75-89</td> <td>1.05</td> <td>0.91</td> </tr> <tr> <td>&gt;=90</td> <td>1.05</td> <td>1.16</td> </tr> </tbody> </table>	Age	Males	Females	<60	1.00	1.00	60-74	0.89	0.66	75-89	1.05	0.91	>=90	1.05	1.16
Age	Males	Females														
<60	1.00	1.00														
60-74	0.89	0.66														
75-89	1.05	0.91														
>=90	1.05	1.16														
PEERS	RP 2006 Total Dataset Mortality Table multiplied by the adjustment factors shown in the table below, with static projections using the 2014 SSA Improvement Scale to 2028.															
	<table border="1"> <thead> <tr> <th>Age</th> <th>Males</th> <th>Females</th> </tr> </thead> <tbody> <tr> <td>&lt;60</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>60-74</td> <td>1.49</td> <td>0.77</td> </tr> <tr> <td>75-89</td> <td>1.27</td> <td>1.03</td> </tr> <tr> <td>&gt;=90</td> <td>1.16</td> <td>1.04</td> </tr> </tbody> </table>	Age	Males	Females	<60	1.00	1.00	60-74	1.49	0.77	75-89	1.27	1.03	>=90	1.16	1.04
Age	Males	Females														
<60	1.00	1.00														
60-74	1.49	0.77														
75-89	1.27	1.03														
>=90	1.16	1.04														
<b>Disabled Retirees</b>	RP 2006 Disabled Retiree Mortality Table, with static projections using the 2014 SSA Improvement Scale to 2028.															

**Sensitivity of Net Pension Liability**

The sensitivity of the net pension liability of employers to changes in the discount rate is presented below. The net pension liability of employers calculated using the discount rate of 7.6% is presented as well as what the employers' net pension liability would be using a discount rate that is 1.0% lower (6.6%) or 1.0% higher (8.6%) than the current rate.

		<b>1% Decrease (6.6%)</b>	<b>Current Rate (7.6%)</b>	<b>1% Increase (8.6%)</b>
<b>PSRS</b>	Net Pension Liability (Asset)	\$ 12,825,829,139	\$ 7,221,525,228	\$ 2,562,313,956
<b>PEERS</b>	Net Pension Liability (Asset)	\$ 1,405,450,435	\$ 762,950,857	\$ 224,028,056

## Long-Term Expected Rate of Return

The long-term expected rate of return on investments was determined in accordance with Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. ASOP No. 27 provides guidance on the selection of an appropriate assume rate of return. The long-term expected rate of return on the Systems' investments was determined using a building-block method in which best-estimate ranges of expected future real rates of returns (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the Systems' target allocation as of June 30, 2017 are summarized below along with the long term geometric return. Geometric return (also referred to as the time weighted return) is considered standard practice within the investment management industry. Geometric returns represent the compounded rate of growth of a portfolio. The method eliminates the effects created by cashflows.

Asset Class	Target Asset Allocation	Long-term Expected Real Return Arithmetic Basis	Weighted Long-term Expected Real Return Arithmetic Basis
U.S. Public Equity	27.0 %	5.16 %	1.39 %
Public Credit	7.0 %	2.17 %	0.15 %
Hedged Assets	6.0 %	4.42 %	0.27 %
Non-U.S. Public Equity	15.0 %	6.01 %	0.90 %
U.S. Treasuries	16.0 %	0.96 %	0.15 %
U.S. TIPS	4.0 %	0.80 %	0.03 %
Private Credit	4.0 %	5.60 %	0.22 %
Private Equity	12.0 %	9.86 %	1.18 %
Private Real Estate	9.0 %	3.56 %	0.32 %
Total	<u>100.0 %</u>		<u>4.61 %</u>
		Inflation	<u>2.25 %</u>
		Long term arithmetical nominal return	<u>6.86 %</u>
		Effect of covariance matrix	<u>0.74 %</u>
		Long term expected geometric return	<u>7.60 %</u>

The long-term expected rate of return used to measure the total pension liability was 7.6% as of June 30, 2017, and is consistent with the long-term expected geometric return on plan investments. The actuarial assumed rate of return was 8.0% from 1980 through fiscal year 2016. The Board of Trustees adopted a new actuarial assumed rate of return of 7.75% effective with the June 30, 2016 valuation based on the actuarial experience studies and asset-liability study conducted during the 2016 fiscal year. As previously discussed, the Board of Trustees further reduced the assumed rate of return to 7.6% effective with the June 30, 2017 valuation. The projection of cash flows used to determine the discount rate assumed that employer contributions would be made at the actuarially calculated rate computed in accordance with assumptions and methods stated in the funding policy adopted by the Board of Trustees, which requires payment of the normal cost and amortization of the unfunded actuarially accrued liability in level percent of employee payroll installments over 30 years utilizing a closed period, layered approach. Based on this assumption, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members.

## Note 6 – Retirement Plans

### Section 401(a) Defined Benefit Plan

All full-time System employees holding valid Missouri educator certificates are covered by PSRS. All other eligible employees are members of PEERS. Both Systems provide retirement and disability benefits, annual cost-of-living adjustments and death benefits to plan members and beneficiaries. Chapter 169 RSMo contains the statutory provisions of both Systems.

PSRS members were required to contribute 14.5% of their annual covered salary during fiscal years 2017, 2016 and 2015. PSRS, as the employer, was required to match that amount. The contribution rate is set each year by the Board of Trustees upon the recommendation of the independent actuary within the contribution restrictions set in Section 169.030 RSMo. Employer contributions to PSRS totaled \$47,196 for the 2017 fiscal year, \$34,685 for the 2016 fiscal year and \$24,712 for the 2015 fiscal year. The amounts for these years are equal to the required contributions. PEERS members were required to contribute 6.86% of their annual covered salary during fiscal years 2017, 2016 and 2015. PSRS, as the employer, was required to match that amount. The contribution rate is set each year by the Board of Trustees upon the recommendation of the independent actuary within the contribution restrictions in Section 169.620 RSMo. Employer contributions to PEERS totaled \$734,395 for the 2017 fiscal year, \$707,492 for the 2016 fiscal year and \$669,966 for the 2015 fiscal year. The amounts for these years are equal to the required contributions.

PSRS and PEERS, as the administrators for the defined pension plans, are also participating employers of the Systems. The administrative expenses of the Systems are included in the deductions to the Systems' fiduciary net position. While the employer contributions of the other participating employers are funded from outside revenue sources, the employer contributions of PSRS and PEERS are funded from sources already recognized as revenues, such as earnings on plan investments or contributions paid by the other participating employers. Attempting to allocate a portion of the net pension liability to PSRS and PEERS would result in an allocation of the net pension liability to the other participating employers.

Accordingly, PSRS and PEERS will exclude its contributions from the employer proportionate share calculation for the reporting of a net pension liability, by assigning itself a proportionate share of 0%. This exclusion in essence shifts the portion of the net pension

liability that would accrue to PSRS and PEERS to the other participating employers.

### Section 457 Deferred Compensation Plan

A voluntary Section 457 deferred compensation plan is administered to provide additional retirement benefits for employees. The plan provides for employer-matching contributions up to a set maximum. The total contributions are subject to the limitations established in IRC Section 457. The Board of Trustees has authority to establish the employer contribution levels. For most employees, the System will match \$50 plus 0.52% of salary per month. For certain employees, the System will make employer-paid contributions of \$18,000 per year plus \$6,000 in catch up contributions, if eligible. This is governed by individual employment contracts as approved by the Board of Trustees.

All employees immediately vest in the employer-matching and employer-paid contributions. Employer-matching contributions totaled \$111,008 and employer-paid contributions totaled \$66,000 for the 2017 fiscal year. Employee contributions totaled \$409,957 for the 2017 fiscal year.

Maintenance of individual member accounts and custody of assets have been contracted to a third-party administrator and investment custodian. Total contributions are sent directly to the third-party administrator by the employer. Employees can self-direct investments of their contributions and their respective share of matching contributions in a number of investment options. Because the System does not hold the plan's assets and does not have significant administrative responsibilities, the plan's assets and changes in net assets are not reported in the Systems' financial statements.

The Systems established an unfunded Section 457(f) non-qualified deferred compensation plan for certain employees. The plan is subject to Internal Revenue Code section 457(f), and to the extent applicable, Internal Revenue Code section 409A. Employees approved for participation in the plan by the Systems' Board of Trustees may acquire a vested interest in a deferred compensation award which is credited to the account of the member under terms approved by the Board of Trustees. The value of the member's account shall be subject to a risk of forfeiture based on the applicable vesting schedule determined for the member. As of June 30, 2017, no employees had a vested interest under the plan and no disbursements were made from the plan by the Systems.

### Section 401(a) Defined Contribution Plan

The Systems established a 401(a) defined contribution plan for certain employees. The employees are approved for participation in the plan by the Systems' Board of Trustees. The plan is a tax qualified plan under Section 401(a) of the Internal Revenue Code and all contributions by or on behalf of employees are tax deferred until time of withdrawal. All employees immediately vest in employer-paid contributions. Employer-paid contributions totaled \$53,000 for the 2017 fiscal year.

Maintenance of individual member accounts and custody of assets have been contracted to a third-party administrator and investment custodian. Total contributions are sent directly to the third-party administrator by the employer. Employees can self-direct investments of their contributions in a number of investment options. Because the System does not hold the plan's assets and does not have significant administrative responsibilities, the plan's assets and changes in net assets are not reported in the Systems' financial statements.

### Note 7 – Other Post-Employment Benefit Plans

#### Post-Employment Staff Retiree Healthcare Plan

**Plan Description and Funding Policy** – The Public School Retirement System of Missouri Staff Retiree Healthcare Program (SRHP) is a single-employer defined benefit other post-employment benefit (OPEB) plan administered by PSRS. SRHP provides a healthcare premium implicit rate subsidy to eligible staff retirees and their dependents provided they pay 100% of the blended healthcare premium. The blended healthcare premium is based on all active and retired employees. Retiree healthcare benefits are funded on a pay-as-you-go basis, with premiums determined annually. The

PSRS/PEERS Board of Trustees determines the funding of benefits and any benefit amendments. There is no continuing obligation to provide benefits beyond each calendar year. SRHP does not issue a stand-alone public financial report.

#### Annual OPEB Cost and Net OPEB Obligation –

PSRS' annual OPEB cost (expense) is calculated based on the annual required contribution (ARC) of the employer, an amount actuarially determined in accordance with the parameters of Governmental Accounting Standards Board (GASB) Statement 45. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover normal cost each year and amortize any unfunded actuarial liabilities (or funding excess) over a period not to exceed 30 years.

PSRS' annual OPEB cost, the amount actually contributed to the plan and changes in the net OPEB obligation are as follows:

Annual required contribution	\$ 153,900
Interest on net OPEB obligation	151,300
Amortization of net OPEB obligation	(113,000)
Annual OPEB cost	192,200
Contributions made	94,900
Increase in net OPEB obligation	97,300
Net OPEB obligation - beginning of year	1,952,800
Net OPEB obligation - end of year	<u>\$ 2,050,100</u>

PSRS' annual OPEB cost, the percentage of annual OPEB cost contributed to the plan, and the net OPEB obligation for fiscal year 2017 and the two preceding years are as follows:

Fiscal Year Ended	Annual OPEB Cost (AOC)	% of AOC Contributed	Net OPEB Obligation
6/30/15	\$ 314,800	22.1 %	\$ 1,697,600
6/30/16	\$ 321,800	20.9 %	\$ 1,952,800
6/30/17	\$ 192,200	49.4 %	\$ 2,050,100

**Funded Status and Funding Progress** – SRHP's funded status and funding progress are summarized below:

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Payroll ((b-a)/c)
6/30/17	\$ -	\$1,944,300	\$1,944,300	0.0%	\$9,982,900	19.5%



Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and healthcare cost trends. Amounts determined regarding the funded status of the plan and the annual required contributions of the employer are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The schedule of funding progress, presented as required supplementary information following the notes to the financial statements, presents trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits.

**Actuarial Method and Assumptions** – Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employer and the plan members) and include the types of benefits provided at the time of each valuation and the historical pattern of sharing of benefit costs between the employer and plan members to that point. The actuarial methods and assumptions used include techniques that are designed to reduce the effects of short-term volatility in actuarially accrued liabilities and the actuarial value of assets, consistent with the long-term perspectives of the calculations.

In the June 30, 2017 actuarial valuation, the following assumptions and method were used:

Actuarial Cost Method	Entry Age Normal
Actuarial Value of Assets	No Assets (pay-as-you-go)
Amortization Method	Level Percent Open
Remaining Amortization Period	30 Years
Actuarial Assumptions:	
Investment Rate of Return	3.3% per year for June 30, 2015 and prior years 7.75% per year effective June 30, 2016
Wage Inflation	3.5% per year per year for June 30, 2015 and prior years 3.25% per year effective June 30, 2016
Healthcare Trend	8.0% in fiscal year 2017, decreasing by one-half percentage point per year to an ultimate of 4.5% in fiscal year 2024 and after

**Post-Employment Health Plan**

PSRS maintains a Post-Employment Health Plan (“PEHP”) for employees. Upon termination, an employee will receive payment at the rate of one day of pay for each two days of accrued sick leave up to 100 days of accrued sick leave (50 days paid). Any days above 100 will be forfeited. All payments under the PEHP in excess of \$1,000 will be transferred into a PEHP account which can be used to pay health insurance premiums for the employee or dependent at any time in the future. If an employee is retiring, the payments can be transferred back to PSRS on a monthly basis to cover the cost of health insurance for the retiree. The amount paid into the PEHP was \$75,629 for eight employees during 2017.

**Note 8 – Risk Management**

The Systems are exposed to various risks of loss related to natural disasters, errors and omissions, loss of assets, torts, etc. The Systems have chosen to cover such losses through the purchase of commercial insurance. There have been no material insurance claims filed or paid during the past three years.

The Systems have a disaster recovery plan that provides for continued computer operations at a remote location should the retirement office be unavailable for normal operations.

**Note 9 – Commitments and Contingencies**

Commitments to the future purchase of investments at June 30, 2017 totaled \$2,541,434,371.

Total unfunded capital commitments to private real estate, private equity and other alternative investments totaled approximately \$4.6 billion as of June 30, 2017. The unfunded commitments are not recorded in the Statements of Fiduciary Net Position.

Certain legal proceedings are pending with PSRS and PEERS arising from normal activities. Although unable to predict the outcome of these matters, the Systems believe the final outcome of these actions will not have a material adverse effect on the Systems’ financial statements.

**Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri**
**Required Supplementary Information**
**Schedules of Changes in the Employers' Net Pension Liability**

Year Ended:	<b>Public School Retirement System of Missouri</b>			
	<u>June 30, 2017</u>	<u>June 30, 2016</u>	<u>June 30, 2015</u>	<u>June 30, 2014</u>
<b>Total pension liability</b>				
Service cost	\$ 740,176,751	\$ 842,548,463	\$ 836,085,151	\$ 849,712,130
Interest cost	3,198,060,384	3,263,288,365	3,019,050,250	2,885,182,982
Difference between actual and expected experience	60,942,067	(641,098,601)	598,417,056	226,591,816
Assumption changes	1,279,805,826	100,247,551	-	-
Plan amendments	-	-	-	-
Benefit payments	(2,521,832,399)	(2,430,906,732)	(2,326,196,773)	(2,236,468,407)
<b>Net change in total pension liability</b>	<b>2,757,152,629</b>	<b>1,134,079,046</b>	<b>2,127,355,684</b>	<b>1,725,018,521</b>
<b>Total pension liability - beginning of year</b>	<b>\$ 41,744,618,662</b>	<b>\$ 40,610,539,616</b>	<b>\$ 38,483,183,932</b>	<b>\$36,758,165,411</b>
<b>Total pension liability - end of year (a)</b>	<b>\$ 44,501,771,291</b>	<b>\$ 41,744,618,662</b>	<b>\$ 40,610,539,616</b>	<b>\$38,483,183,932</b>
<b>Plan Fiduciary Net Position</b>				
Employer contributions	\$ 684,857,718	\$ 670,794,045	\$ 656,924,899	\$ 643,989,869
Member contributions	719,625,373	704,785,734	689,187,215	679,390,918
Net investment return	4,104,123,251	533,180,245	1,447,169,205	4,927,198,588
Benefit payments, including refunds of member contributions	(2,521,832,399)	(2,430,906,732)	(2,326,196,773)	(2,236,468,407)
Administrative and other expenses	(10,497,712)	(11,562,965)	(10,013,601)	(8,919,201)
<b>Net change in plan fiduciary net position</b>	<b>2,976,276,231</b>	<b>(533,709,673)</b>	<b>457,070,945</b>	<b>4,005,191,767</b>
<b>Plan fiduciary net position - beginning of year</b>	<b>\$ 34,303,969,832</b>	<b>\$ 34,837,679,505</b>	<b>\$ 34,380,608,560</b>	<b>\$30,375,416,793</b>
<b>Plan fiduciary net position - end of year (b)</b>	<b>\$ 37,280,246,063</b>	<b>\$ 34,303,969,832</b>	<b>\$ 34,837,679,505</b>	<b>\$34,380,608,560</b>
<b>Net pension liability - end of year (a-b)</b>	<b>\$ 7,221,525,228</b>	<b>\$ 7,440,648,830</b>	<b>\$ 5,772,860,111</b>	<b>\$ 4,102,575,372</b>
Year Ended:	<b>Public Education Employee Retirement System of Missouri</b>			
	<u>June 30, 2017</u>	<u>June 30, 2016</u>	<u>June 30, 2015</u>	<u>June 30, 2014</u>
<b>Total pension liability</b>				
Service cost	\$ 150,975,958	\$ 161,391,660	\$ 156,599,641	\$ 159,672,364
Interest cost	374,497,203	372,184,628	333,780,285	315,131,402
Difference between actual and expected experience	3,076,923	(51,257,557)	45,518,402	(14,308,876)
Assumption changes	140,420,925	65,420,724	-	-
Plan amendments	-	-	-	-
Benefit payments	(269,268,101)	(250,390,477)	(235,070,181)	(216,624,810)
<b>Net change in total pension liability</b>	<b>399,702,908</b>	<b>297,348,978</b>	<b>300,828,147</b>	<b>243,870,080</b>
<b>Total pension liability - beginning of year</b>	<b>\$ 4,809,665,957</b>	<b>\$ 4,512,316,979</b>	<b>\$ 4,211,488,832</b>	<b>\$ 3,967,618,752</b>
<b>Total pension liability - end of year (a)</b>	<b>\$ 5,209,368,865</b>	<b>\$ 4,809,665,957</b>	<b>\$ 4,512,316,979</b>	<b>\$ 4,211,488,832</b>
<b>Plan Fiduciary Net Position</b>				
Employer contributions	\$ 111,239,585	\$ 106,717,021	\$ 103,624,310	\$ 100,699,735
Member contributions	118,446,790	114,257,497	110,443,660	106,420,656
Net investment return	485,046,867	60,317,387	163,719,526	544,154,941
Benefit payments, including refunds of member contributions	(269,268,101)	(250,390,478)	(235,070,010)	(216,624,810)
Administrative and other expenses	(6,377,808)	(6,981,573)	(5,629,551)	(4,840,432)
<b>Net change in plan fiduciary net position</b>	<b>\$ 439,087,333</b>	<b>\$ 23,919,854</b>	<b>\$ 137,087,935</b>	<b>\$ 529,810,090</b>
<b>Plan fiduciary net position - beginning of year</b>	<b>\$ 4,007,330,675</b>	<b>\$ 3,983,410,821</b>	<b>\$ 3,846,322,886</b>	<b>\$ 3,316,512,796</b>
<b>Plan fiduciary net position - end of year (b)</b>	<b>\$ 4,446,418,008</b>	<b>\$ 4,007,330,675</b>	<b>\$ 3,983,410,821</b>	<b>\$ 3,846,322,886</b>
<b>Net pension liability - end of year (a-b)</b>	<b>\$ 762,950,857</b>	<b>\$ 802,335,282</b>	<b>\$ 528,906,158</b>	<b>\$ 365,165,946</b>

Note: This schedule is intended to show information for ten years. Additional years will be displayed as they become available.

Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri  
Required Supplementary Information  
Schedules of Employers' Net Pension Liability

**Public School Retirement System of Missouri**

Year Ended	Total Pension Liability (TPL) (a)	Plan Fiduciary Net Position - Restricted for Pensions (b)	Net Pension Liability (NPL) (a - b)	Plan Fiduciary Net Position as a % of TPL (b/a)	Covered Employee Payroll (c)	Employers' NPL as a % of Covered Payroll ((b-a)/c)
6/30/14	\$ 38,483,183,932	\$ 34,380,608,560	\$ 4,102,575,372	89.3%	\$ 4,425,567,630	92.7%
6/30/15	40,610,539,616	34,837,679,505	5,772,860,111	85.8%	4,508,241,581	128.1%
6/30/16	41,744,618,662	34,303,969,832	7,440,648,830	82.2%	4,556,137,282	163.3%
6/30/17	44,501,771,291	37,280,246,063	7,221,525,228	83.8%	4,655,169,121	155.1%

**Public Education Employee Retirement System of Missouri**

Year Ended	Total Pension Liability (TPL) (a)	Plan Fiduciary Net Position - Restricted for Pensions (b)	Net Pension Liability (NPL) (a - b)	Plan Fiduciary Net Position as a % of TPL (b/a)	Covered Employee Payroll (c)	Employers' NPL as a % of Covered Payroll ((b-a)/c)
6/30/14	\$ 4,211,488,832	\$ 3,846,322,886	\$ 365,165,946	91.3%	\$ 1,442,700,979	25.3%
6/30/15	4,512,316,979	3,983,410,821	528,906,158	88.3%	1,469,771,528	36.0%
6/30/16	4,809,665,957	4,007,330,675	802,335,282	83.3%	1,519,081,146	52.8%
6/30/17	5,209,368,865	4,446,418,008	762,950,857	85.4%	1,558,183,433	49.0%

*Note: This schedule is intended to show information for ten years. Additional years will be displayed as they become available.*

Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri

Required Supplementary Information  
Schedules of Employer Contributions

**Public School Retirement System of Missouri**

Year Ended June 30	Actuarially Determined Contribution	Actual Employer Contributions	Contribution Excess/ (Deficiency) <sup>1</sup>	Actual Covered Member Payroll	Contributions as a Percentage of Covered Payroll
2008	\$ 656,347,298	\$ 521,241,501	\$(135,105,797)	\$ 4,169,932,008	12.50%
2009	669,643,988	563,454,487	(106,189,501)	4,334,265,285	13.00%
2010	658,161,150	594,326,122	(63,835,028)	4,402,415,719	13.50%
2011	684,366,766	594,732,137	(89,634,629)	4,248,086,693	14.00%
2012	720,303,976	620,214,231	(100,089,745)	4,277,339,524	14.50%
2013	507,232,268	634,040,335	126,808,067	4,372,691,966	14.50%
2014	608,459,393	643,989,869	35,530,476	4,441,309,441	14.50%
2015	666,438,984	656,924,899	(9,514,085)	4,530,516,545	14.50%
2016	643,155,536	669,953,683	26,798,147	4,620,370,228	14.50%
2017	642,821,624	684,857,718	42,036,094	4,723,156,676	14.50%

**Public Education Employee Retirement System of Missouri**

Year Ended June 30	Actuarially Determined Contribution	Actual Employer Contributions	Contribution Excess/ (Deficiency) <sup>1</sup>	Actual Covered Member Payroll	Contributions as a Percentage of Covered Payroll
2008	\$ 90,727,016	\$ 77,988,839	\$(12,738,177)	\$ 1,299,813,983	6.00%
2009	96,775,289	85,915,562	(10,859,727)	1,374,648,992	6.25%
2010	95,560,084	91,478,725	(4,081,359)	1,407,365,000	6.50%
2011	90,816,155	90,816,155	-	1,369,776,094	6.63%
2012	95,094,785	95,094,785	-	1,386,221,356	6.86%
2013	87,013,816	97,059,313	10,045,497	1,414,858,790	6.86%
2014	98,497,846	100,699,735	2,201,889	1,467,926,166	6.86%
2015	105,739,092	103,624,310	(2,114,782)	1,510,558,455	6.86%
2016	104,011,593	106,654,638	2,643,045	1,554,732,332	6.86%
2017	108,807,233	111,239,585	2,432,352	1,621,568,294	6.86%

<sup>1</sup>The annual statutory increase in the total contribution rate may not exceed 1% of pay for PSRS and 0.5% of pay for PEERS. The limitation on contribution increases resulted in a deficiency for some of the years presented. Contributions were funded to the maximum statutory limit each year.

Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri

Required Supplementary Information  
Schedules of Investment Returns

Year ended June 30:	2017	2016	2015	2014
Annual money-weighted rate of return, net of all investment expenses	12.3%	1.6%	4.3%	16.7%
Time-weighted rate of return, net of all investment expenses	12.3%	1.6%	4.3%	16.7%

Note: This schedule is intended to show information for ten years. Additional years will be displayed as they become available.

**Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri  
Notes to the Schedules of Required Supplementary Information**

The information presented in the required supplementary schedule was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows.

**Changes in benefit terms:**

- PSRS: The 25-and-Out and 2.55% provisions were extended in 2007 through 2013. In 2013 the state legislature provided a permanent extension of the 25-and-Out provision and extended the 2.55% provision to 2014.
- PEERS: The 25-and-Out and 2.55% provisions were extended in 2007 through 2013. In 2013 the state legislature provided a permanent extension of the 25-and-Out provision.

**Changes of assumptions:**

In 2006, 2011, 2016 payroll growth, salary increases, assumed life expectancies and mortality were adjusted to more closely reflect actual experience. In 2011, the inflation rate was adjusted to 2.5% from 3.25% and annual cost-of-living adjustments were calculated in accordance with the then adopted funding policy. In 2016, the inflation rate was adjusted to 2.25% from 2.5%, the investment rate of return from 8.00% to 7.75% and annual cost-of-living adjustments were calculated in accordance with the funding policy as amended in June 2016. During 2016, minor revisions were made to other actuarially assumptions including but not limited to, retirement rates, withdraw rates, etc. The 2016 assumption changes were a result of an actuarial experience study conducted during the 2016 fiscal year. For fiscal year 2017, the investment rate of return was further reduced from 7.75% to 7.6% and annual cost-of-living adjustments were updated in accordance with the funding policy as amended by the Board of Trustees in November 2017.

**Actuarially Methods and Assumptions:**

The actuarially determined contribution rates in the schedule of employers' contributions are calculated as of June 30, two years prior to the end of the fiscal year in which contributions are reported. The following actuarial methods and assumptions were used to determine contribution rates reported in the schedule.

- Actuarial Cost Method** Entry Age Normal Level Percent of Payroll
- Amortization Method** Closed, level percent for 30 years
- Remaining amortization period**

  - PSRS 24.2 years
  - PEERS 24.4 years

- Asset valuation method** 5-year smoothing of actual returns above or below expected returns
- Measurement Date** **June 30, 2017**
- Valuation Date** **June 30, 2017**
- Investment Rate of Return** 7.60%
- Inflation** 2.25%

**Total Payroll Growth**

- PSRS 2.75% per annum, consisting of 2.25% inflation, 0.25% additional inflation due to the inclusion of health care costs in pension earnings, and 0.25% of real wage growth.
- PEERS 3.25% per annum, consisting of 2.25% inflation, 0.50% additional inflation due to the inclusion of health care costs in pension earnings, and 0.50% of real wage growth.

**Individual Salary Growth**

- PSRS 3.00% - 9.50%, depending on service and including 2.25% inflation, 0.25% additional inflation due to the inclusion of health care costs in pension earnings, 0.25% of real wage growth for productivity, and real wage growth for merit, promotion and seniority of 0.25% to 6.75%.
- PEERS 4.00% - 11.00%, depending on service and including 2.25% inflation, 0.50% additional inflation due to the inclusion of health care costs in pension earnings, 0.50% of real wage growth for productivity, and real wage growth for merit, promotion and seniority of 0.75% to 7.75%.

**Cost-of-Living Increases**

- PSRS 1.65% compounded annually, beginning on the second January after retirement and capped at 80% lifetime increase. The assumption increases from 1.20% to 1.65% over nine years.
- PEERS 1.65% compounded annually, beginning on the fourth January after retirement and capped at 80% lifetime increase. The assumption increases from 1.20% to 1.65% over nine years.

Public School Retirement System of Missouri and  
 Public Education Employee Retirement System of Missouri  
 Notes to the Schedules of Required Supplementary Information - Continued

**Measurement Date** June 30, 2017

**Valuation Date** June 30, 2017

**Mortality Assumption**

*Actives:*

PSRS RP 2006 White Collar Employee Mortality Table, multiplied by an adjustment factor of 0.75 at all ages for both males and females, with static projection using the 2014 SSA Improvement Scale to 2028.

PEERS RP 2006 Total Dataset Employee Mortality Table, multiplied by an adjustment factor of 0.75 at all ages for both males and females, with static projection using the 2014 SSA Improvement Scale to 2028.

*Non-Disabled Retirees,  
 Beneficiaries and  
 Survivors:*

PSRS RP 2006 White Collar Mortality Table multiplied by the adjustment factors shown in the table below, with static projections using the 2014 SSA Improvement Scale to 2028.

Age	Males	Females
<60	1.00	1.00
60-74	0.89	0.66
75-89	1.05	0.91
>=90	1.05	1.16

PEERS RP 2006 Total Dataset Mortality Table multiplied by the adjustment factors shown in the table below, with static projections using the 2014 SSA Improvement Scale to 2028.

Age	Males	Females
<60	1.00	1.00
60-74	1.49	0.77
75-89	1.27	1.03
>=90	1.16	1.04

*Disabled Retirees:* RP 2006 Disabled Retiree Mortality Table, with static projections using the 2014 SSA Improvement Scale to 2028.

Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri  
Required Supplementary Information  
Staff Retiree Health Plan – Defined Benefit OPEB Plan

**Schedule of Funding Progress**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Payroll ((b-a)/c)
6/30/15	\$ -	\$ 3,422,000	\$ 3,422,000	0.0%	\$ 9,046,100	37.8%
6/30/16	\$ -	\$ 1,558,000	\$ 1,558,000	0.0%	\$ 9,651,600	16.1%
6/30/17	\$ -	\$ 1,944,300	\$ 1,944,300	0.0%	\$ 9,982,900	19.5%

**Schedule of Employer Contributions**

Year Ended	Annual Required Contribution (ARC)	Employer Contributions	Percentage Contributed
6/30/15	\$ 314,000	\$ 69,600	22.2%
6/30/16	\$ 321,800	\$ 67,600	21.0%
6/30/17	\$ 153,900	\$ 94,900	61.7%

**Notes to the Schedules of Required Supplementary Information**

The information presented in the required supplementary schedule was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows:

Actuarial cost method	Entry Age Normal
Actuarial value of assets	No Assets (pay-as-you-go)
Amortization method	Level Percent Open
Remaining amortization period	30 Years
Actuarial assumptions:	
Investment rate of return	3.3% per year for June 30, 2015 and prior years 7.75% per year effective June 30, 2016
Wage inflation	3.5% per year per year for June 30, 2015 and prior years 3.25% per year effective June 30, 2016
Healthcare trend	8.0% in fiscal year 2017, decreasing by one-half percentage point per year to an ultimate of 4.5% in fiscal year 2024 and after

Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri

Schedules of Administrative Expenses  
for the year ended June 30, 2017

	PSRS	PEERS	Combined Totals
<b>Personnel services</b>	\$ 6,546,455	\$ 3,956,632	\$ 10,503,087
<b>Professional services</b>			
Actuarial services	285,595	176,420	462,015
Legal services	86,916	24,722	111,638
Financial audit services	57,476	35,227	92,703
Other consultants	64,130	39,306	103,436
Technology consulting	291,481	178,649	470,130
Legislative consulting	27,900	17,100	45,000
Insurance consulting	3,720	2,280	6,000
Total professional services	817,218	473,704	1,290,922
<b>Communications</b>			
Information and publicity	189,413	127,661	317,074
Postage	297,122	201,798	498,920
Member education	16,954	9,565	26,519
Telephone	33,596	20,583	54,179
Total communications	537,085	359,607	896,692
<b>Miscellaneous</b>			
Building and utilities	138,305	84,767	223,072
Insurance	82,587	50,618	133,205
Office	1,110,164	680,423	1,790,587
Staff development	146,276	89,653	235,929
Miscellaneous	174,647	91,566	266,213
Total miscellaneous	1,651,979	997,027	2,649,006
<b>Depreciation expense</b>	943,550	578,305	1,521,855
<b>Total administrative expenses</b>	\$ 10,496,287	\$ 6,365,275	\$ 16,861,562



Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri

Schedules of Investment Expenses  
for the year ended June 30, 2017

	PSRS	PEERS	Combined Totals
<b>Investment management expenses</b>			
U.S. Treasuries and TIPS	\$ 3,883,953	\$ 431,550	\$ 4,315,503
U.S. public equities	62,929,376	7,012,357	69,941,733
Non-U.S. public equities	22,450,813	2,494,536	24,945,349
Public debt	3,389,944	376,660	3,766,604
Private equity	191,970,357	21,330,040	213,300,397
Private credit	13,221,409	1,469,045	14,690,454
Private real estate	41,917,752	4,657,528	46,575,280
Hedged assets	90,164,699	10,018,300	100,182,999
Total investment management expenses	429,928,303	47,790,016	477,718,319
<b>Investment consultant fees</b>	4,636,650	515,183	5,151,833
<b>Custodial bank fees</b>	382,560	47,250	429,810
<b>Investment legal and staff expenses</b>	4,413,578	493,112	4,906,690
<b>Commission recapture income</b>	(166,238)	(19,630)	(185,868)
Total investment expenses	\$ 439,194,853	\$ 48,825,931	\$ 488,020,784
<b>Security lending expenses</b>			
Agent fees	\$ 1,039,782	\$ 115,531	\$ 1,155,313
Broker rebates	(2,355,629)	(261,737)	(2,617,366)
Total security lending expenses (income)	\$ (1,315,847)	\$ (146,206)	\$ (1,462,053)

Public School Retirement System of Missouri and  
Public Education Employee Retirement System of Missouri

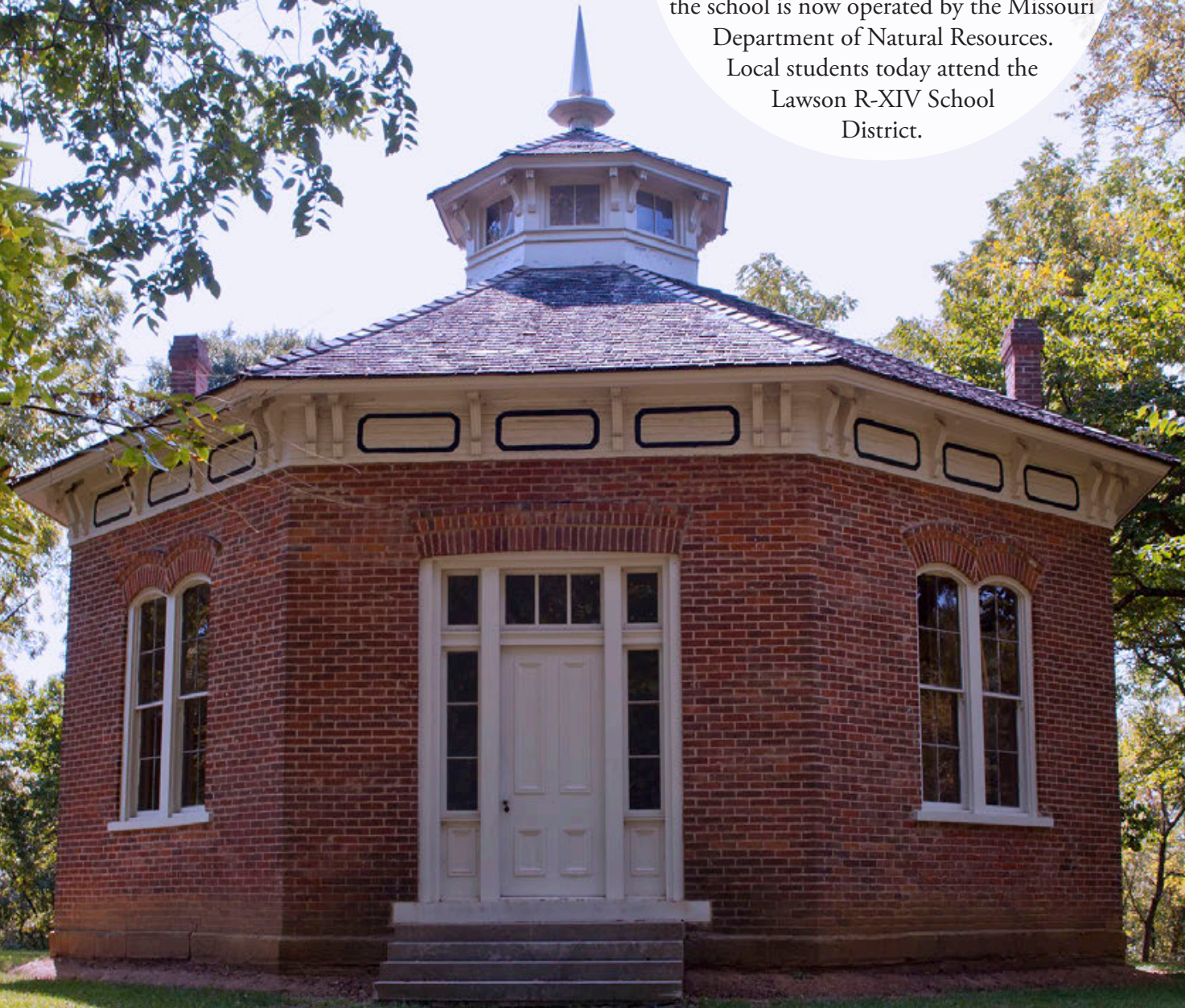
Schedules of Professional Services  
for the year ended June 30, 2017

	PSRS	PEERS	Combined Totals
Actuarial services	\$ 285,595	\$ 176,420	\$ 462,015
Legal expenses	86,916	24,722	111,638
Financial audit services	57,476	35,227	92,703
Other consulting	64,130	39,306	103,436
Technology consulting	291,481	178,649	470,130
Legislative consulting	27,900	17,100	45,000
Insurance consulting	3,720	2,280	6,000
Total fees	\$ 817,218	\$ 473,704	\$ 1,290,922

**Franklin Academy  
Schoolhouse**

Also known as Octagonal School, Franklin Academy schoolhouse was built in 1856, and used by the Watkins family and the employees of their textile mill until the 1870s when it became a residence for mill workers. Located in the Watkins Woolen Mill State Historic Site, the school is now operated by the Missouri Department of Natural Resources.

Local students today attend the Lawson R-XIV School District.



Franklin Academy Schoolhouse  
Lawson, Missouri  
1856

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# Letter from Willis Towers Watson

WillisTowersWatson 

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Suite 3100  
Seattle, WA 98101-2933  
T +1 206 625 1125  
willistowerswatson.com

October 27, 2017

To the Members of the Board:

Fiscal year 2017 saw strong results in equity markets, with U.S., international developed, and emerging markets all finishing the year in positive territory, with double-digit returns. The year began with uncertainty surrounding the Brexit vote and its ultimate effect on markets, which left a residue of increased volatility through the end of the first quarter of the fiscal year. Domestic equity markets were already experiencing strong performance prior to the U.S. Presidential election in November, which continued through the end of the fiscal year. Emerging markets posted strong results for the fiscal year as the global economy has stabilized and demonstrated continued improvement broadly. Domestic fixed income markets struggled to recover from a negative second quarter fiscal year, as rates increased in anticipation of business friendly policies from the new administration. Longer dated U.S. government bonds finished negative for the year, while credit bonds posted modestly positive returns. As expected, the Fed raised its policy rate by 0.25% in April, and again by the same amount in June. The focus of the coming year will be on the ability of global central banks to tighten monetary policy while maintaining positive and improving global economic growth.

PSRS and PEERS plans are combined to show one performance number for the consolidated Missouri Education Pension Trust (MEPT). The Total Fund return for the fiscal year ended June 30, 2017 was 12.5% for MEPT, which outperformed the policy benchmark return of 11.0%. The MEPT fiscal year return for Public Risk assets was positive with a return of 15.9%, beating the benchmark return of 14.6%, while Safe Assets were negative for the year at -1.7%. MEPT Private Risk assets returned 14.9% and were ahead of the benchmark return of 13.5%.

The Fund continues to evolve through the implementation of the target asset allocation strategy, both at the Total Fund and asset class levels. In doing so, PSRS/PEERS uses to its advantage both internal and external resources in an effort to manage the portfolio on a forward looking basis, and when considering the attractiveness of available investment opportunities.

In the next fiscal year, Willis Towers Watson will continue to work with the PSRS/PEERS internal investment staff, supporting the implementation of the new asset allocation, idea generation and overall governance framework.

We at Willis Towers Watson have enjoyed our relationship with Missouri PSRS/PEERS and are looking forward to the coming year.

Regards,

Towers Watson Investment Services, Inc.



Jim Neill, CFA  
Director, Pennsylvania Investment Leader

## Letter from the Chief Investment Officer



PUBLIC SCHOOL & EDUCATION EMPLOYEE  
RETIREMENT SYSTEMS OF MISSOURI

December 1, 2017

To the Members of the Systems:

Throughout this year's Financial Report, you will see the phrase: "***Serving Missouri's Public Schools Past, Present and Future***". While this statement certainly addresses the PSRS/PEERS commitment to help members manage their retirement security, it also refers to the investment process at the Systems. We continue to build on the ***past*** success of the PSRS/PEERS' investment program by seeking sound investment returns in the ***present*** as well as developing a deeper and more robust investment platform that will provide financial security for our members well into the ***future***.

With that in mind, I present the following report on the Systems' investments for the fiscal year ended June 30, 2017 on behalf of the PSRS and PEERS' Board of Trustees and the internal investment staff.

An improving global economy coupled with low interest rates and low inflation led to a perfect backdrop to make money in most asset classes in fiscal year 2017. The strength in the investment markets directly resulted in solid gains for PSRS/PEERS as the Systems' assets increased through investment earnings by almost \$4.6 billion from the previous year with a total fund performance of 12.5% for both PSRS and PEERS.

### Key Points within this year's Financial Report

As you review the financial information in this report for the fiscal year ended June 30, 2017, it is important to be aware of the following points:

- PSRS and PEERS significantly outperformed the assumed investment return of 7.75%,
- The Systems generated the investment return while taking less risk than approximately two-thirds of comparable public funds,
- The PSRS/PEERS internal investment staff and external investment managers added value above the policy benchmark of over \$500 million, net of all fees and expenses. This outperformance in 2017 was due to portfolio construction and tactical asset allocation decisions by internal investment staff (overweighting and underweighting asset classes around targets) as well as active management on the part of external managers,
- The PSRS/PEERS investment expenses (including accrued performance based fees and all internal investment staff expenses) for fiscal year 2017 were 1.2%, or \$1.20 for every \$100 managed. The investment returns reported throughout this publication are mostly net of these fees. The investment return net of all fees and expenses was 12.3% for PSRS and PEERS,
- The PSRS and PEERS investment returns for the last five years exceeded 65% of the peer group as defined by the Wilshire TUCS universe of public pension plans with assets in excess of \$1 billion,

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Toll Free (800) 392-6848 Email psrspeers@psrspeers.org Member Services FAX (573) 634-7934 Employer Services FAX (573) 634-7911

- Investment performance throughout this report is calculated using a time-weighted rate of return based on market values, and
- The total invested assets of both PSRS and PEERS were approximately \$41.5 billion on June 30, 2017, making the combined entity larger than all other public retirement plans in the state combined, and the 43<sup>rd</sup> largest defined benefit plan in the United States.

## Fiscal Year 2017 Year in Review

The internal investment staff, under the direction of the PSRS/PEERS' Board of Trustees, has adopted a disciplined and diversified investment portfolio that includes allocations to multiple asset classes. Over time, every specific asset class within the PSRS/PEERS' investment portfolio performs a valuable function.

In fiscal year 2017, the combined asset allocation provided the Systems with substantial absolute returns, led by above average returns from global stocks. U.S. stocks returned 18.5% for the fiscal year ended June 30, 2017 (as measured by the Russell 3000 Index), non-U.S. developed stocks moved 20.3% higher (as measured by the MSCI EAFE Index), and emerging market stocks increased 23.8% (as measured by the MSCI Emerging Markets Index). In contrast, while interest rates remained near historical lows throughout the year, the yield on the 10-year Treasury Bond did increase from 1.5% at the beginning of the fiscal year to 2.3% on June 30, 2017. This increase in yield contributed to negative absolute returns for the PSRS/PEERS' Safe Asset Portfolio (U.S. Treasury Bonds and U.S. Treasury Inflation Protection Securities).

The PSRS/PEERS non-traditional asset classes also provided strong returns in fiscal year 2017. The Hedged Asset Program represented 12.1% of total fund assets at fiscal year-end and generated a 9.6% return. The objective of the Hedged Assets Program is to provide competitive returns, diversification and lower volatility (risk) than the Systems' stock portfolios. Diversification into private equity, private real estate and private credit proved beneficial for the year as the Private Equity Composite returned 20.1%, the Real Estate Composite increased 8.9%, and the Private Credit Composite increased 23.6%.

As noted above, significant absolute returns in most of the major asset classes contributed to the 12.5% return for PSRS and PEERS. Additionally, the investment returns were supported by solid implementation (security selection) and tactical asset allocation decisions. For example, the PSRS/PEERS' Public Credit Portfolio outperformed its benchmark (Barclays U.S. Intermediate Credit Index) by 1.7% in fiscal year 2017, while the PSRS/PEERS' Real Estate Portfolio outperformed its benchmark (NFI-ODCE Index) by 2.0%. From a portfolio construction and tactical standpoint, the internal investment staff maintained a modest underweight to safe assets (Treasury bonds) throughout the year (due to historically low interest rates) and a significant overweight to stocks (both U.S. and non-U.S.). Additionally, within the global stock allocation, the Systems were overweight to emerging market stocks relative to Europe. The underweight to safe assets and the overweight to stocks for the fiscal year provided meaningful contribution to the overall PSRS/PEERS return.

## Fiscal Year 2018: Assumed rate of return and risk

As I write this annual letter on December 1, 2017, we are five months into fiscal year 2018 and the global economy has continued to improve. Equity markets throughout the world have reached new record highs supported by the synchronized global expansion growing at a steady (but moderate) rate, low interest rates, stable inflation and only gradual declining monetary accommodation.

## Letter from the Chief Investment Officer, continued

The Systems utilized a 7.0% assumed rate of return for the decade of the 1970's. The assumption was increased to 8.0% in 1980 as bond yields increased. This historical assumption was reasonable and supported by market expectations over many years. For example, the 30-year realized return for PSRS/PEERS is 8.4%. However, in the current environment, virtually every asset class (specifically global stock markets) is fully valued and interest rates remain near historical lows. As such, we believe that the expected investment returns going forward could be lower than historical returns. To that end, the Board of Trustees, with input from both internal investment staff and external advisors, have worked to reduce the long-term assumed rate of return for the Systems. The Board moved from the 8.0% assumed rate of return in fiscal year 2016 to 7.75% in fiscal year 2017 and 7.6% for fiscal year 2018. We believe that the directional move to a lower assumed rate of return is prudent and in concert with the Board's objective to provide for the long-term security and financial stability of the Systems.

The strategic asset allocation for PSRS/PEERS is designed to achieve the assumed investment return over long periods of time. To achieve that goal, the Systems will always have a high allocation to stocks (both public and private). Nevertheless, we are very focused on many risk factors in the portfolio including liquidity (ability to meet benefit payments), downside protection (how does the portfolio react in a down market) and tail risk (how does the portfolio perform in a substantial market correction). As you may note within the financial report, the Systems have generated a strong investment return (9.5%) over the last five years while taking less risk than approximately 85% of comparable public funds. This risk level is intentional. The best way to compound wealth over time is to limit losses. The PSRS/PEERS investment portfolio is therefore structured to capture growth in the global economy but also offer protection in the event of an economic downturn.

### Fiscal Year 2018: Portfolio structure

The Board has adopted an Investment Policy that provides the PSRS/PEERS' internal investment staff and external advisors with the flexibility to deviate from the strategic asset allocation within appropriate bands. At times the investment staff has deviated significantly from the target allocation as valuations in specific asset classes were attractive relative to historical pricing.

As mentioned previously in this letter, most asset classes appeared close to full valuation at the end of fiscal year 2017. The same asset classes are even more 'fully' valued as we approach the half way point in fiscal year 2018. Consequently, the Systems currently have allocations that are close to the long-term targets for most of the asset classes in the portfolio.

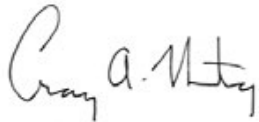
The largest underweight in the portfolio remains the allocation to Public Credit. Bond yields are very low and credit spreads (the amount an investor is compensated for in owning a credit bond) are even lower. Alternatively, we are modestly overweight to Hedged Assets. The Hedged Asset portfolio is designed to offer the diversification benefits traditionally associated with bonds but at higher levels of expected return.

Within the public equity allocation, the investment staff has been re-allocating a portion of the assets from U.S. equity to both non-U.S. equity developed and emerging markets throughout the last year. The valuation levels for the equity markets outside the U.S. and the additional growth potential in emerging markets has supported the rebalancing effort.

The Systems private markets portfolios will continue to be a focus for the investment staff in fiscal year 2018. PSRS/PEERS began building private investment portfolios (including private equity, private credit and private real estate) in 2003 to generate long-term returns superior to the public markets, take advantage of market inefficiencies, and increase diversification. The nature of private investing requires a process of portfolio construction that takes years to develop. This is particularly true for a plan with the substantial assets of PSRS/PEERS. Over the years, the Systems have continued to build on this successful investment platform that serves as an alternative to traditional public markets. At the close of fiscal year 2017, the Systems had almost \$7.0 billion invested in Private Risk Assets.

The PSRS/PEERS investment platform has provided long-term results that have benefited *past* members of the Systems. We believe that through strong Board governance and an adherence to a disciplined and prudent investment process, PSRS/PEERS can continue to maximize *risk-adjusted* returns for *present* and *future* members.

Respectfully,



Craig A. Husting, CFA  
Chief Investment Officer



## Investment Policy Summary

The Board of Trustees of the Public School Retirement System of Missouri and Public Education Employee Retirement System of Missouri (PSRS and PEERS, also referred to as the Systems) is charged with the responsibility for investing the assets of the Systems in a manner consistent with the fiduciary standards set forth in the 'prudent person' rule. To that end, the Board has adopted the following principles to guide all investment-related decisions:

1. Act in the exclusive interest of the members of the Systems,
2. Maximize total return within prudent risk parameters, and
3. Preserve the long-term purchasing power of the Systems.

The investment portfolios of PSRS and PEERS represent all contributions to the plans, from members and their employers, as well as all net earnings on these assets. These funds are held in support of both current and future liabilities. In total, approximately 61% of every dollar used to pay retirees is generated from investment earnings.<sup>1</sup>

The Board of Trustees of PSRS and PEERS approved the commingling of assets for purposes of investment as allowed by state statute in January 2013. In order to implement this change, PSRS and PEERS adopted the Missouri Education Pension Trust Agreement (MEPT), which is managed by the PSRS and PEERS Board of Trustees and Investment Staff. Effective July 1, 2013, the invested assets of the Systems were pooled and invested in MEPT. All assets held by MEPT are for the exclusive benefit of PSRS and PEERS. Each of the Systems has equity in MEPT based on funds contributed and earnings allocated. Earnings of MEPT are allocated based on the average daily balances of each of the respective Systems. Individual investments in MEPT are not specifically identified to the respective Systems. Due to the fact all invested assets are invested in MEPT, the rate of return for each of the Systems is approximately the same. Therefore, the following discussions focus on MEPT in total and not the individual Systems.

## Roles and Responsibilities

### Board of Trustees

It is the responsibility of the Board of Trustees (Board) to establish and maintain policies and objectives for all

aspects of the Systems' investment program including the determination of long-term policies for risk tolerance and asset allocation.

In keeping with its obligation to serve as the governing fiduciary, any changes to the investment policy or investment implementation manuals require the Board's approval.

As one of the largest public pension funds in the United States, the Systems' operational requirements are complex. In order to properly administer the Systems and carry out investment strategies, the Board relies heavily on both internal staff and external service providers. Due to the number of parties involved, their roles as fiduciaries are clearly identified to ensure distinct lines of responsibility and proper controls exist, while providing increased operational efficiency and elimination of duplication of effort.

### Executive Director

The Executive Director (Director) is appointed by, and serves at the pleasure of the Board. The Director is responsible for planning, organizing, and administering all operations of the Systems under the broad policy guidance and direction of the Board. The Director, with the assistance of the investment staff, monitors the performance of the investment portfolio; ensures that funds are invested in accordance with Board policies; and, ensures that proper internal controls are developed to safeguard the assets of the Systems. In fulfilling these responsibilities, the Director relies heavily on the Chief Investment Officer and external asset consultants.

### Chief Investment Officer

The Chief Investment Officer (CIO) serves at the pleasure of the Director yet has a direct, but limited, link to the Board on investment-related issues. The CIO's sole access to the Board is for submission of investment reports, information, or communications required by the investment policy and any other information or opinions specifically requested by the Board with regard to the investment program. The CIO is the individual primarily responsible for providing direction for the investment program. It is the CIO's responsibility to work with the Director, the general consultant, specialty consultants, and other external service providers, with the assistance of the internal staff, in advising the Board on policies related to the investment program. The CIO has responsibilities related to hiring and terminating service providers.

<sup>1</sup> Based on a twenty-year average for fiscal years 1997-2017.

Critical functions of the CIO include recommendations for implementation decisions related to the investment plan and for the strategic allocation of the portfolio within broad ranges approved by the Board.

### External Asset Consultants

The Systems employ Willis Towers Watson (WTW) as a general consultant and Albourne America, LLC (Albourne), Pathway Capital Management (Pathway) and The Townsend Group (Townsend) as specialty consultants. WTW is an independent resource available to collaborate with the Board and staff on the investment process. This typically includes regular meetings with the Board to provide an independent perspective on the Systems' goals, structure, performance and external service providers. Additionally, WTW may be involved with the strategic allocation shifts for the portfolio.

The specialty consultants work on specific programs within the overall investment program. Albourne is utilized for the Private Credit, Private Equity, Hedged Assets and Alpha Overlay programs. Pathway is a consultant for the Private Equity and Private Credit programs and Townsend consults on the Real Estate program.

### External Investment Managers

The Systems employ external investment managers that include external money managers which may be structured as public or private entities in the form of a partnership, limited liability company, trust, separately managed account, commingled account, or some other form of operational structure in which assets may be held by an external custodian selected and monitored by the external manager.

Managers are given explicit written directions detailing their particular assignments or they follow the investment program outlined in their offering documents or Limited Partnership Agreements, and will construct and manage investment portfolios that are consistent with the investment philosophy and disciplines for which they were hired. Discretion is delegated to the managers to carry out investment actions as directed by the Systems.

### Master Custodian

JP Morgan Chase Bank, NA (JP Morgan) serves as the master custodian for the Systems. The master custodian holds most cash and securities for the Systems, except in cases where investment in a partnership, commingled

account, or unique asset class makes it impossible to do so. The Systems thoroughly evaluate the structure of all investments and their custody arrangements. JP Morgan is responsible for providing the official book of record for investment performance reporting and accounting, and serves as an additional layer of risk control in safekeeping the Systems' assets.

### Investment Objective

Based on the long-term investment returns available from a well-diversified, prudently invested portfolio, the Board has adopted an objective to achieve a **total nominal investment return of 7.75% with a real rate of return of at least 5.5% per annum over time.**<sup>2</sup> The Board of Trustees revised the long-term investment return objective to 7.75% effective for fiscal year 2017 investment performance and 7.60% effective for fiscal year 2018 investment performance. The investment objective of 8.0% was effective from 1980 through fiscal year 2016.

In order to achieve the investment objective, the Systems have developed a portfolio that is prudently invested across a broad array of assets that reflects the long-term nature of the Systems' pension obligations. The principles of diversification, risk control, and competitive rates of return provide the framework for selecting an asset allocation that is expected, over longer periods of time and in the aggregate, to give the Systems the most competitive long-term return within a prudent level of risk.

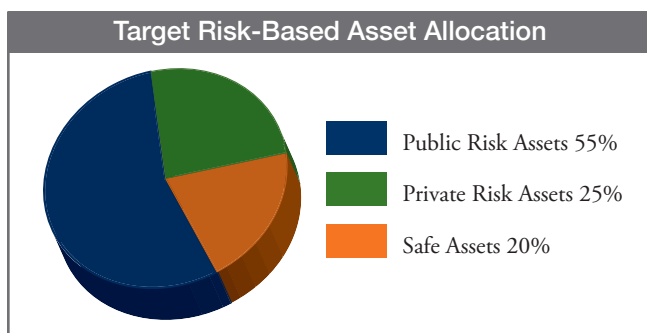
### Understanding Risk

Selection of an appropriate asset allocation is one of the most important decisions made by a retirement plan. Within that asset allocation, it is important to not only consider the expected investment return, but also to understand the risks. The importance of risk consideration for institutional investors is critical to long-term success. To that end, the Systems employ an effective and intuitive risk-based approach to setting and reporting the asset allocation decision. The Systems developed a risk-based asset allocation to clearly define the prudent risks taken within its investment portfolios.

<sup>2</sup> The real rate of return is the rate by which the long-term total return exceeds the long-term inflation rate. The Board of Trustees shall employ an actuarial consultant for purposes of determining the inflation rate to be used in calculating the pension obligations. The assumed inflation rate as of June 30, 2017 was 2.25% per annum.

The Systems consider a variety of risks including, but not limited to, liquidity risk, volatility, tail risk (the possibility that an investment will move much more than expected) and the ability to meet the Systems' assumed rate of return when structuring the portfolio.

This analysis results in an asset allocation to Public Risk Assets, Safe Assets and Private Risk Assets. Within each risk allocation, the Systems' investment portfolio includes long-term commitments to specific asset programs. The target risk-based asset allocation is illustrated in the pie chart below. The Board of Trustees recently increased the Private Risk Assets target by 5% and proportionately decreased the Public Risk Assets target. These changes are discussed further in the following Asset Allocation section.



### Asset Allocation

The asset allocation decision is generally regarded as the most important decision in the investment management process since it is crucial to achieving the long-term objectives established by the Board. In that light, it is the Board's responsibility to determine the appropriate policy asset allocation based upon several criteria with input and guidance from internal staff and WTW. These criteria are as follows:

1. The expected rate of return for each asset classification;
2. The expected risk of each asset classification (expressed as the standard deviation of the rate of return);
3. The correlation of returns between asset types;
4. The investment objectives and risk constraints of the Systems (including, but not limited to, liquidity needs and the expected time horizon);
5. The funded ratio and cash flow requirements for PSRS and PEERS; and
6. The impact of the Systems' return volatility on the contribution rate.

The Board of Trustees amended the long-term target asset allocation at the June 2016 Board of Trustees meeting. The allocation to each investment program considers both the risk tolerance of the Systems and the long-term return objective. The new long-term target asset allocation is expected to maintain similar levels of total portfolio risk while allowing for more efficient investment returns. However, given the nature of investing in Private Risk assets, it is expected to take several years to implement. Implementation will be achieved over a number of years through a disciplined investment approach. The policy benchmarks will change over time as the Systems make meaningful progress to the new long-term targets. The changes to the asset allocation are as follows: Public Risk Assets decreased 5% and Private Risk Assets increased 5%. Within Public Risk Assets, Public Credit decreased from 12% to 7%. Within Private Risk Assets, Private Equity increased from 10.5% to 12%, Real Estate increased from 7.5% to 9% and Private Credit increased from 2% to 4%.

The following chart on page 61 details the long-term target and interim target asset allocations for fiscal year 2017. The interim policy allocations have been established to reflect the continued funding of Private Risk Assets and progress towards the Systems' long-term asset allocation objective. For performance measurement purposes, the interim policy will serve as the basis for establishing the Total Fund policy benchmark until the on-going process of funding Private Risk investments is meaningfully complete.

Long-term Target and Policy Ranges				
Investment Type	Fiscal Year 2017 Interim		As Recently Amended	
	Long-Term Target	Policy Ranges	Long-Term Target	Policy Ranges
<b>Public Risk Asset Programs</b>				
U.S. Public Equity	27.00%	16% - 48%	27.00%	16% - 48%
Public Credit	12.00%	0% - 20%	7.00%	0% - 20%
Hedged Assets	6.00%	0% - 25%	6.00%	0% - 25%
Non-U.S. Public Equity	15.00%	8% - 28%	15.00%	8% - 28%
<b>Total Public Risk Assets</b>	<b>60.00%</b>	<b>35% - 75%</b>	<b>55.00%</b>	<b>35% - 75%</b>
<b>Safe Assets Programs</b>				
U.S. Treasuries	16.00%	0% - 40%	16.00%	0% - 40%
U.S. TIPS	4.00%	0% - 40%	4.00%	0% - 40%
Cash Equivalents	0.00%	0% - 10%	0.00%	0% - 10%
<b>Total Safe Assets</b>	<b>20.00%</b>	<b>10% - 40%</b>	<b>20.00%</b>	<b>10% - 40%</b>
<b>Private Risk Asset Programs</b>				
Private Equity	10.50%	4% - 14%	12.00%	4% - 15%
Private Real Estate	7.50%	4% - 10%	9.00%	4% - 12%
Private Credit	2.00%	0% - 7%	4.00%	0% - 8%
<b>Total Private Risk Assets</b>	<b>20.00%</b>	<b>5% - 25%</b>	<b>25.00%</b>	<b>10% - 30%</b>
<b>Total Fund</b>	<b>100.0%</b>		<b>100.0%</b>	

The Board recognizes the cyclical nature of the investment markets and it has allowed the internal staff to capitalize upon opportunities by changing the allocation of each asset class or sub-asset class within broad strategic bands or policy ranges (as indicated in the previous table). The flexibility given to the internal staff in establishing the strategic mix provides opportunities for the Systems to take advantage of changing market conditions. To ensure appropriate controls, the Director, CIO and WTW must unanimously agree upon all material strategic changes prior to implementation.

## Performance Objectives and Monitoring Process

Generating a total nominal rate of return net of expenses of at least 7.75% and a real rate of return net of expenses of at least 5.5% per annum is an important consideration in the asset allocation decision and the primary performance objective for the Systems over long periods of time. The need for a long-term focus is necessary to preclude the temptation to overreact to events in the financial markets that have no relevance to long-term asset/liability management of the Systems. The resulting dilemma is the conflicting requirement to

evaluate investment policy implementation over shorter time periods while maintaining a long-term focus on meeting the return objectives. In order to determine if the Systems' short-term and long-term objectives are being achieved, the Board evaluates performance relative to policy and strategic benchmarks. The policy benchmarks allow the Systems to be judged by performance relative to a defined set of broad market indices (i.e., the Systems' long-term asset allocation objective). The strategic benchmarks allow the Board to consider the additional value generated from the latitude given to the internal staff to alter the asset class or sub-asset class allocations.

## Policy Decisions

The value added through policy decisions is measured by the difference between the policy benchmark return and the actuarial required rate of return objective (defined as Real Return Objective + Inflation). A policy benchmark return greater than the actuarial required rate of return reflects value added. A policy benchmark return less than the actuarial required rate of return reflects losses or shortfalls in performance in funding the liabilities of the Systems. These policy decisions are measured over long periods of time.

### Strategy Decisions

Strategy decisions are asset class or sub-asset class asset allocation choices made by the internal staff to deviate from the policy benchmark weights, with approval from WTW and the Director that the proposed material deviation is in compliance with the Board's investment policy. The value added through these decisions to overweight and/or underweight these sub-asset classes is measured by the difference between the strategic benchmark return and the policy benchmark return. This difference captures the value added by internal staff through asset class or sub-asset class strategic decisions relative to the Board's broad policy allocation decisions. A strategic benchmark return greater than the policy benchmark return reflects value added through the allocation decisions. A strategic benchmark return less than the policy benchmark return reflects losses to the fund's performance based upon strategy decisions.

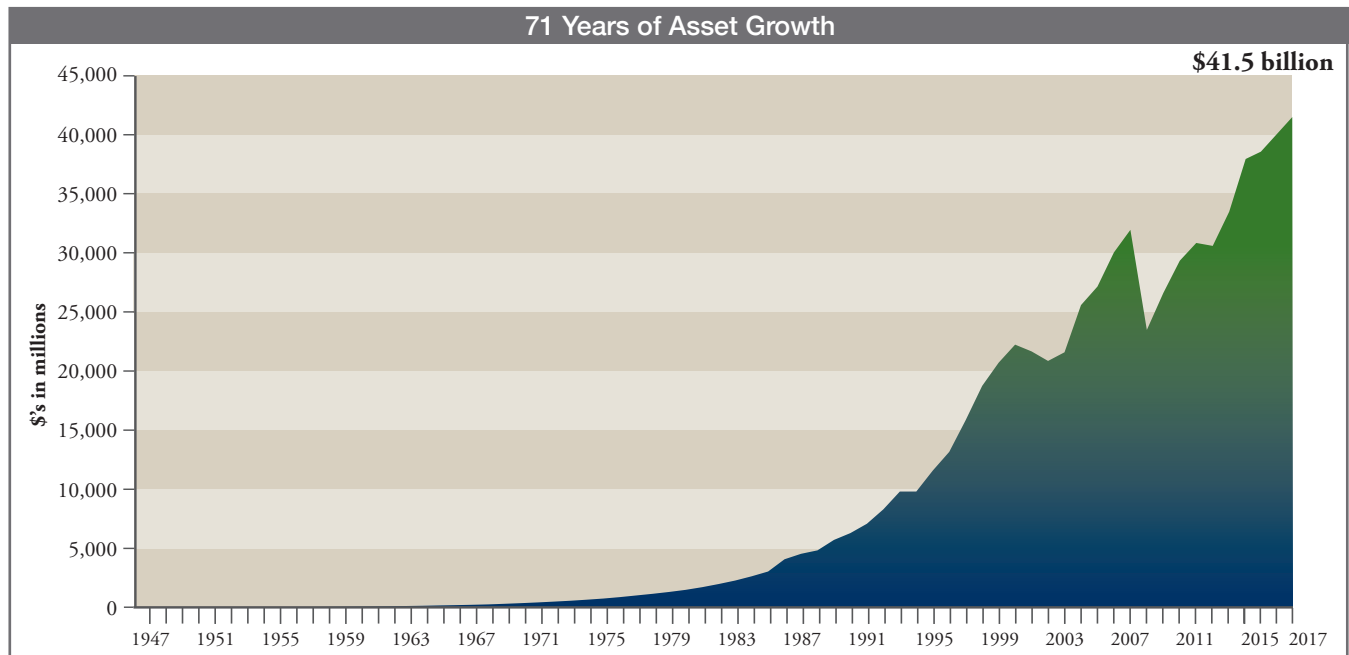
### Implementation Decisions

Implementation decisions are manager selection choices made by the internal staff with the approval of a consultant(s) and the Director. The value added through these manager selection decisions is measured by the difference between the actual portfolio return and the strategic benchmark return. An actual portfolio return greater than the strategic benchmark return reflects value added through these manager selection decisions. An actual portfolio return less than the strategic benchmark return reflects losses to the fund's performance based upon implementation decisions.

### Risk Controls

The Board recognizes that even though the Systems' investments are subject to short-term volatility, it is critical that a long-term investment focus be maintained. Given the importance of the broad asset allocation decision to the Systems' long-term investment success, internal staff is required to conduct an asset allocation/ liability study at least every five years to examine the appropriate long-term investment strategies for the Systems. The most recent asset/liability study was conducted in fiscal year 2016 and the next study is scheduled for 2021. In addition, the CIO must annually evaluate the asset allocation mix and any strategic allocation of the portfolio and provide a report to the Board on the results of that evaluation. This ongoing review of the asset allocation process helps to ensure the asset allocation is being monitored and modified as needed to meet the financial obligations of the Systems.

## Total Fund Review



The Systems' total invested assets were \$41.5 billion as of June 30, 2017. There has been a long-term growth in assets since the inception of PSRS in 1946 and PEERS in 1965, as shown in the graph above.

### Investment Performance<sup>3</sup>

The Systems achieved strong absolute and relative returns in fiscal year 2017. The Systems' well-structured investment portfolio added approximately \$4.6 billion in investment earnings to the growth of assets during the fiscal year 2017. The Systems earned an investment return of 12.5% for fiscal year 2017 (12.3% net of all investment expenses and fees) with an ending market value of invested assets at \$41.5 billion. The total plan return, net of all investment expenses and fees, exceeded both the long-term investment goal (actuarial required rate of return) of 7.75% and the total plan policy benchmark return of 11.0%. PSRS and PEERS are long-term investors with a diversified portfolio that continues to produce strong long-term returns where the annualized investment return is 8.4% (8.3% net of all investment expenses and fees) over the last 30 years.

As illustrated in the table below, within the Systems' investment portfolio, U.S. equities delivered a return of 18.7%, non-U.S. equities returned 20.4%, private equity (investments in private companies) increased 20.1%, real estate produced 8.9% returns, and hedged assets returned 9.6%. Each of these asset classes strongly contributed to the total returns of the Systems while providing diversification from fixed income securities.

Total Fund Performance		
Assets	Total Return	Weighted Contribution*
U.S. Public Equity	18.7%	5.6%
Public Credit	3.1%	0.2%
Hedged Assets	9.6%	1.1%
Non-U.S. Public Equity	20.4%	3.5%
<b>Public Risk Assets</b>	<b>15.9%</b>	<b>10.4%</b>
U.S. Treasuries	-1.9%	-0.3%
U.S. TIPS	-0.3%	0.0%
Cash Equivalents	0.4%	0.0%
<b>Safe Assets</b>	<b>-1.7%</b>	<b>-0.3%</b>
Private Equity	20.1%	1.7%
Private Real Estate	8.9%	0.6%
Private Credit	23.6%	0.1%
<b>Private Risk Assets</b>	<b>14.9%</b>	<b>2.4%</b>
<b>TOTAL RETURN</b>	<b>12.5%</b>	<b>12.5%</b>

\*Percentages have been adjusted to reflect compounding effects and changes in asset weights.

<sup>3</sup> Investment returns were prepared using a time-weighted rate of return based on market values.

## INVESTMENT SECTION

Investment Performance Relative to Benchmarks*				
	Fiscal Year	3-Year	5-Year	10-Year**
<b>Public Risk Assets Programs</b>				
<b>U.S. Public Equity</b>	<b>18.7%</b>	<b>8.6%</b>	<b>14.7%</b>	<b>7.5%</b>
Russell 3000 Index	18.5%	9.1%	14.6%	7.3%
<b>Public Credit</b>	<b>3.1%</b>	<b>2.7%</b>	<b>2.9%</b>	<b>n/a</b>
Barclays U.S. Intermediate Credit Index	1.4%	2.6%	3.0%	n/a
<b>Hedged Assets</b>	<b>9.6%</b>	<b>3.7%</b>	<b>7.0%</b>	<b>n/a</b>
Hedged Assets Benchmark	10.2%	3.9%	7.0%	n/a
<i>Benchmark consists of:</i>				
50.0%	Barclays U.S. Intermediate Credit Index			
25.0%	MSCI ACWI ex-USA Index			
25.0%	Russell 3000 Index			
<b>Non-U.S. Public Equity</b>	<b>20.4%</b>	<b>4.1%</b>	<b>9.8%</b>	<b>2.1%</b>
MSCI ACWI ex-USA Index	20.5%	0.8%	7.0%	1.3%
<b>Total Public Risk Assets</b>	<b>15.9%</b>	<b>6.1%</b>	<b>10.6%</b>	<b>4.4%</b>
Public Risk Assets Benchmark	14.6%	5.3%	9.7%	3.4%
<i>Benchmark consists of:</i>				
47.5%	Russell 3000 Index			
27.5%	MSCI ACWI ex-USA Index			
25.0%	Barclays U.S. Intermediate Credit Index			
<b>Safe Assets Program</b>				
<b>Total Safe Assets</b>	<b>-1.7%</b>	<b>1.4%</b>	<b>0.8%</b>	<b>3.5%</b>
Safe Assets Benchmark	-1.4%	1.7%	1.1%	3.5%
<i>Benchmark consists of:</i>				
80.0%	Barclays U.S. Treasury Index***			
20.0%	Barclays U.S. TIPS 1-10 Years Index			
<b>Private Risk Assets Program</b>				
<b>Private Equity</b>	<b>20.1%</b>	<b>12.6%</b>	<b>15.5%</b>	<b>10.7%</b>
Russell 3000 Index	18.5%	9.1%	14.6%	7.3%
<b>Private Real Estate</b>	<b>8.9%</b>	<b>11.1%</b>	<b>11.9%</b>	<b>4.0%</b>
NFI-ODCE Index	6.9%	10.0%	10.4%	4.6%
<b>Private Credit</b>	<b>23.6%</b>	<b>3.4%</b>	<b>7.5%</b>	<b>n/a</b>
Merrill Lynch High Yield Master II Index	12.8%	4.5%	6.9%	n/a
<b>Total Private Risk Assets</b>	<b>14.9%</b>	<b>11.5%</b>	<b>13.3%</b>	<b>7.3%</b>
Private Risk Assets Benchmark	13.5%	9.2%	12.4%	7.4%
<i>Benchmark consists of:</i>				
52.5%	Russell 3000 Index			
37.5%	NFI-ODCE Index			
10.0%	Merrill Lynch High Yield Master II Index			
<b>TOTAL FUND</b>				
<b>Total Fund</b>	<b>12.5%</b>	<b>6.2%</b>	<b>9.5%</b>	<b>5.5%</b>
Total Fund Benchmark	11.0%	5.4%	8.5%	5.0%
<i>Benchmark consists of:</i>				
39.0%	Russell 3000 Index			
16.5%	MSCI ACWI ex-USA Index			
16.0%	Barclays U.S. Treasury Index***			
4.0%	Barclays U.S. TIPS 1-10 Years Index			
15.0%	Barclays U.S. Intermediate Credit Index			
7.5%	NFI-ODCE Index			
2.0%	Merrill Lynch High Yield Master II Index			
<b>Actuarial Required Rate of Return ****</b>	<b>7.75%</b>	<b>8.0%</b>	<b>8.0%</b>	<b>8.0%</b>
<b>TUCS Universe Median</b>	<b>12.7%</b>	<b>5.7%</b>	<b>9.3%</b>	<b>5.6%</b>

\*Investment returns were prepared using a time-weighted rate of return based on market values.

\*\*Some programs have been established more recently and therefore 10-year returns are not available.

\*\*\*Effective January 1, 2017 the Barclays U.S. Treasury Index replaced the Barclays U.S. Treasury: Intermediate Index and the Barclays U.S. Treasury: Long Index components of the Policy Benchmark.

\*\*\*\*The Board of Trustees revised the long-term investment return objective from 8.0% to 7.75% effective for fiscal year 2017 investment performance. This reduction is included in the blended returns for the extended time periods.

## Investment Performance Relative to Benchmarks

The Board has established a long-term objective (actuarial required rate of return) to achieve a total investment return of at least 7.75% per year and a real rate of return of at least 5.5% per year. As discussed in the Investment Objective section, the long-term objective was revised to 7.75% effective for fiscal year 2017 and 7.60% effective for fiscal year 2018. The fiscal year 2017 total plan return of 12.5% was substantially higher than the long-term objective. Over long periods of time, PSRS and PEERS continue to produce investment returns that exceed the Systems' objective. The annualized investment return for the Systems is 8.4% over the last 30 years. The reductions in the long-term objective is based on capital market expectations and the belief that expected investment returns going forward will be lower than historical returns.

As previously discussed, in order to determine if the Systems' short-term and long-term objectives are being achieved, the Board utilizes three benchmarks by which the Systems' progress may be judged: (1) performance relative to a **policy benchmark** (defined set of broad market indices that reflects the Systems' long-term asset allocation, or market beta), (2) performance relative to a **strategic benchmark** which indicates value added by the internal staff, and, to a lesser extent, (3) performance relative to other public pension systems and their investment managers as a reference point of oversight.

The internal staff presents to the Board a detailed attribution of the total fund performance at the end of each fiscal year. Value is added over and above expected market returns if the strategic benchmark exceeds the policy benchmark (i.e., the internal staff made positive strategic decisions) and/or if the actual total fund return exceeds the strategic benchmark.

The fiscal year 2017 return was 12.5% which exceeded the policy benchmark by 150 basis points. The fiscal year investment return, net of **all** fees and expenses, was 12.3% which was also significantly above the policy benchmark. The total fund return has exceeded the policy benchmark in seven of the last ten fiscal years, an indication that internal staff and active investment management have added value to the Systems. Over the past five years, the total fund return has exceeded the policy benchmark by 100 basis points, on an annualized basis, resulting in over \$1.6 billion in excess performance (net of all investment expenses and fees) to the Systems.

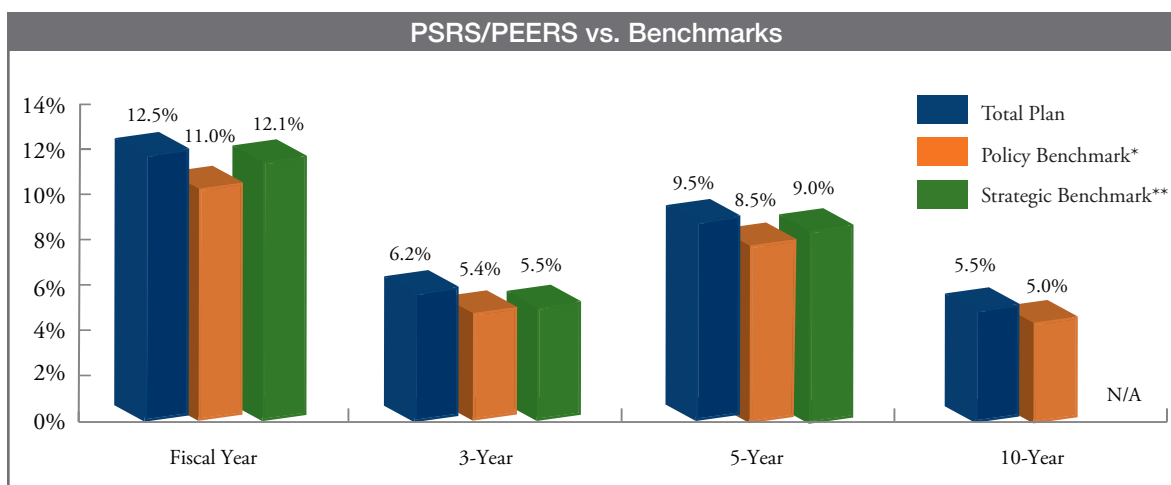
The Systems' utilize the Trust Universe Comparison Services (TUCS) to compare the total return and risk levels of the Systems relative to other public pension funds with assets in excess of \$1 billion. As the chart on page 64 indicates, the total return for the three-year and five-year time periods exceeded the median return of other large public funds. Total returns for the fiscal year and ten-year time periods were marginally below the public fund median return primarily due to asset allocation and risk tolerance differences. The systems have taken substantially less risk than comparable funds during all time periods yet have consistently provided higher investment returns.



## Statistical Performance

One of the primary investment objectives of the Systems is to achieve returns similar to the market but at lower risk or volatility levels. To that end, internal staff monitors a number of quantitative risk statistics related to the total investment portfolio as well as individual composites. The following table indicates that the Systems have taken less risk than the policy benchmark (as measured by standard deviation) over all time periods while achieving higher returns, thereby indicating strong risk-adjusted performance.

**Beta** measures the volatility, or systematic risk, of a security or portfolio in comparison to the market as a whole. If a portfolio has a beta of 1.0, it indicates that the portfolio moves in unison with the market. The Systems' portfolios have a beta of less than 1.0 relative to the policy benchmark, indicating less market volatility. The Systems' beta relative to the world stock index (MSCI World Index) is approximately 0.50. This signifies that the Systems' portfolio moves up or down approximately half as much as the world stock index.

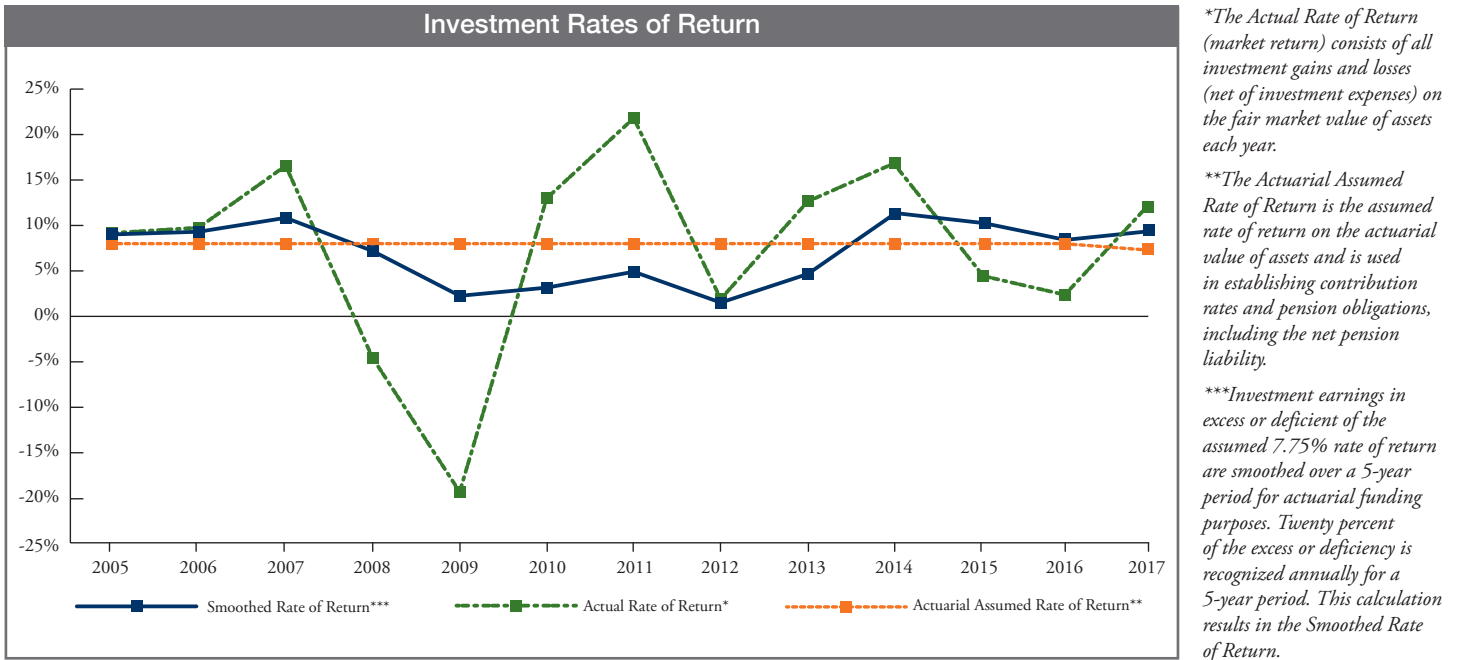


<b>Total Plan Statistical Performance</b>				
Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Total Plan Return	12.5%	6.2%	9.5%	5.5%
Annualized Policy Benchmark Return*	11.0%	5.4%	8.5%	5.0%
Annualized Strategic Benchmark Return**	12.1%	5.5%	9.0%	N/A
Excess return	1.5%	0.8%	1.0%	0.5%
Annualized Standard Deviation of Composite	2.7%	5.0%	4.9%	8.8%
Annualized Standard Deviation of Policy Benchmark*	3.4%	5.9%	5.6%	10.0%
Beta to Policy Benchmark*	0.78	0.83	0.87	0.87
Beta to MSCI World Index	0.47	0.45	0.48	0.53

\*As of June 30, 2017: 39.0% Russell 3000 Index, 16.5% MSCI ACWI ex-USA Index, 16% Barclays US Treasury Index, 15% Barclays U.S. Intermediate Credit Index, 7.5% NFI-ODCE, 4% Barclays U.S. TIPS 1-10 Years Index, and 2% Merrill Lynch High Yield Master II Index.

\*\*As of June 30, 2017: 41.3% Russell 3000 Index, 20.4% MSCI ACWI ex-USA Index, 13.1% Barclays US Treasury Index, 12.9% Barclays U.S. Intermediate Credit Index, 7.6% NFI-ODCE, 2.7% Merrill Lynch 3- Month U.S. Treasury Bill Index, 1.3% Barclays U.S. TIPS 1-10 Years Index, and 0.7% Merrill Lynch High Yield Master II Index. The Total Plan Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a 10-year return is not available.

The following chart shows the relationship between market value returns, the actuarially assumed rate of return and the utilization of an actuarial asset valuation method of smoothed assets. To reduce volatility in employer and employee contribution rates, a common actuarial practice of “asset smoothing” is utilized. The application of this practice results in full recognition of returns at the actuarial assumed rate and recognizes any annual excess or deficiency relative to the assumed rate over a period of five years.

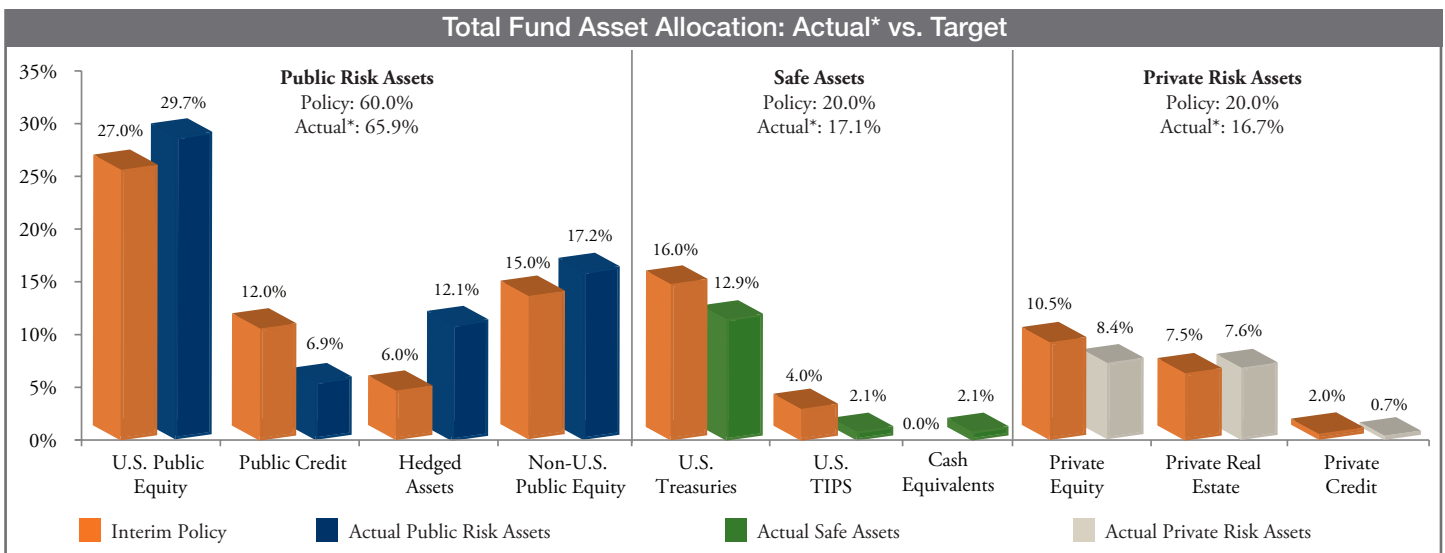


### Asset Allocation: Actual Versus Target

The interim policy allocations have been established to reflect meaningful progress towards the new long-term targets and for policy benchmark weights, as discussed in the Investment Policy Summary: Asset Allocation section. Until meaningful progress is made, the interim target will reflect the prior long-term policy allocations.

For fiscal year 2017 the interim policy allocation was 60% Public Risk Assets, 20% Safe Assets and 20% Private Risk Assets. Within each broad policy target, the Board has established sub-asset class targets. For example, as the chart below indicates, the target allocation to U.S. Public Equity was 27% as of June 30, 2017.

As illustrated in the chart, internal staff utilized the flexibility built into the investment policy to strategically overweight or underweight certain asset classes throughout the year. Strategic decisions within the Public Risk Assets program included an overweight to U.S. equities and Non-U.S. equities which provided meaningful returns to the Systems in fiscal year 2017.



\*Total Plan assets include 0.3% invested in an operating cash account that is not reflected in the chart above.

## Public Risk Assets Summary

As of June 30, 2017, Public Risk assets had a market value of approximately \$27.4 billion, representing 65.9% of total assets.

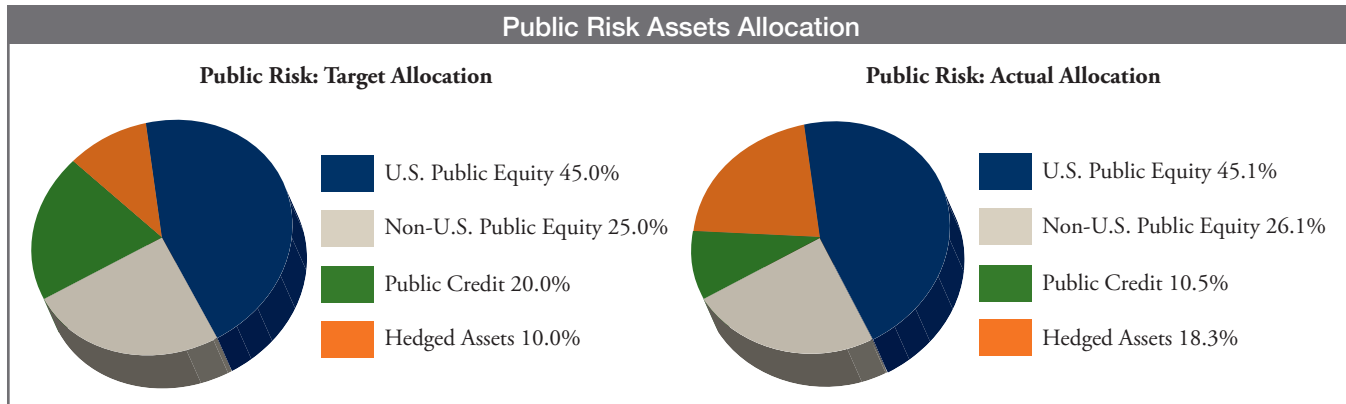
### Investment Program Description

The Board of Trustees has adopted an asset allocation policy that includes a significant allocation to Public Risk Assets. The four programs within the Public Risk Asset composite are U.S. Public Equity, Public Credit, Hedged Assets and Non-U.S. Public Equity. Each program within the Public Risk allocation is a separate multi-manager composite that is treated generally as a single portfolio. Each program serves a specific and distinct role within the overall Public Risk composite and also within the overall total plan allocation. Over time, the Public Risk composite and its sub-components serve as an effective and efficient vehicle to supply the underlying beta exposure to a portfolio of global risk assets required by the Systems' asset allocation policy, while providing the opportunity to achieve excess returns above that of a passive benchmark through the prudent combination of passive investment vehicles and a wide range of active investment strategies.

### Structure

As of June 30, 2017, 45.1% of the Systems' Public Risk assets were invested in the U.S. Public Equity program, 26.1% in the Non-U.S. Public Equity program, 10.5% in the Public Credit program and 18.3% in the Hedged Assets program. Each of these programs is discussed in more detail on the following pages.

The internal staff strategically over weighted the total plan to Public Risk assets during the year. The interim target allocation for Public Risk assets during fiscal year 2017 was 60.0% and the Systems' allocation at the end of the fiscal year was 65.9%. Within the Public Risk Assets composite, internal staff decreased its overweight to U.S. Public Equity and Hedged Assets while increasing an overweight to Non-U.S. Public Equity throughout the fiscal year. The Systems' continued to underweight Public Credit during the year.

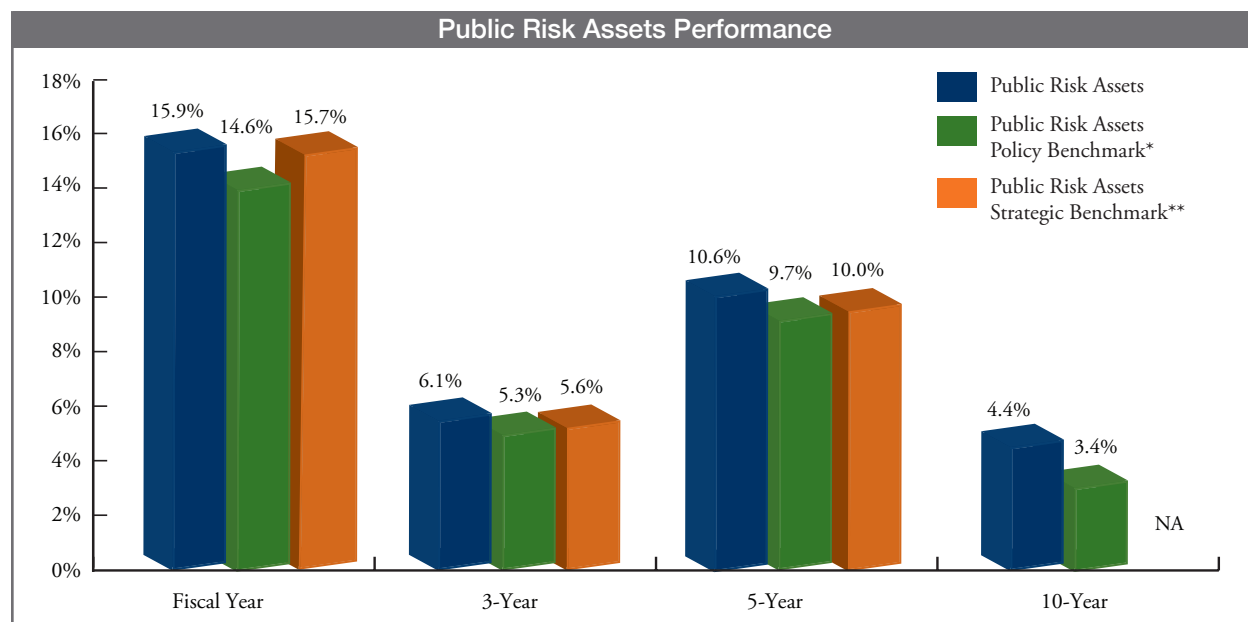


### Market Overview

Global equity markets performed very well in fiscal year 2017, driven in large part by a strengthening global economic outlook and strong corporate earnings. The Russell 3000 Index (broad measure of the U.S. stock market) was up 18.5% for the year and the MSCI ACWI ex-USA Index (broad measure of the international stock markets) increased 20.5%. Bond markets were mixed with Treasuries declining from rising rates while credit markets were positive from decreasing spreads, resulting in a modest gain for the Public Credit benchmark (Barclays U.S. Intermediate Credit Index) of 1.4%.

## Performance

The total return for the Systems' Public Risk portfolio was 15.9%, which outperformed the policy benchmark by 130 basis points. As shown in the table and graph below, the Systems' Public Risk composite returns significantly outperformed the benchmark in all reported time periods. The positive performance of the portfolio relative to the policy benchmark indicates substantial value added by the internal staff through both strategic asset allocation decisions and manager selection decisions.



**Public Risk Assets Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Return	15.9%	6.1%	10.6%	4.4%
Annualized Policy Benchmark Return*	14.6%	5.3%	9.7%	3.4%
Annualized Strategic Benchmark Return**	15.7%	5.6%	10.0%	N/A
Excess Return	1.3%	0.8%	0.9%	1.0%
Annualized Standard Deviation of Composite	3.9%	7.7%	7.3%	13.7%
Annualized Standard Deviation of Policy Benchmark*	4.3%	8.2%	7.6%	14.2%
Beta to Policy Benchmark*	0.90	0.94	0.96	0.96
Beta to MSCI World Index	0.71	0.71	0.73	0.82

\*The Public Risk Assets Policy Benchmark is composed as follows: 47.5% Russell 3000 Index, 27.5% MSCI ACWI ex-USA Index, 25.0% Barclays U.S. Intermediate Credit Index.

\*\* The Public Risk Assets Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a ten-year return is not available.

The table indicates that the Systems have taken slightly less risk relative to the policy benchmark (as measured by standard deviation) while achieving higher returns over the longer-term time periods, thereby indicating strong risk-adjusted performance. Additionally, the Systems' portfolios have a beta of less than 1.0 relative to the policy benchmark, indicating less market risk.

## U.S. Public Equity Program Summary

As of June 30, 2017, the U.S. Public Equity assets had a market value of approximately \$12.3 billion, representing 29.7% of total assets.

### Investment Program Description

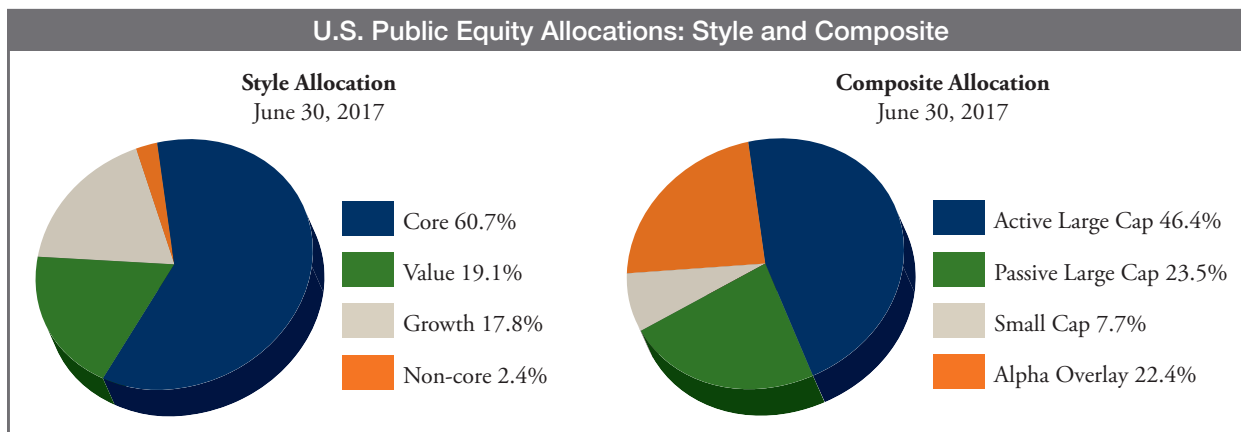
U.S. Public Equity is comprised of the Large-Cap, Small-Cap and Alpha Overlay programs which seek to provide long-term capital appreciation and dividend income in excess of inflation through the investment in domestic equity securities. Returns above a purely passive investment benchmark are targeted through the use of a wide variety of active investment strategies that may employ exposure to both equity securities and other types of investments. The primary *beta* exposure is achieved through investments in passive investment vehicles (including derivatives), traditional long-only active domestic equity management, and active long/short approaches. *Alpha* (or, excess returns above a passive alternative) is expected to be achieved through traditional long-only active domestic equity management, active long/short approaches and alpha overlay strategies (described in greater detail at the end of this section).

### Structure

As of June 30, 2017, 23.5% of the U.S. Public Equity composite was passively managed. The remainder of the portfolio was actively managed and diversified across a broad array of capitalization ranges and investment styles, including the Small-Cap and the Alpha Overlay program. Both programs represent multi-manager pools of assets managed within the overall U.S. Public Equity structure. The Small-Cap program encompasses all small capitalization assets. The Alpha Overlay composite focuses on the separation of returns into alpha and beta, and encompasses alternative equity mandates including hedge fund portfolios.

Exposure to the various segments of the domestic equity market (i.e., growth-oriented, value-oriented, and core) and to the approved investment strategy types are achieved through the identification, selection and on-going management of SEC-registered investment advisors qualified to serve as fiduciaries to the Systems.

The pie charts below depict the U.S. Public Equity portfolio by presenting the current style structure of the portfolio as well as the allocation by composite and market sector.



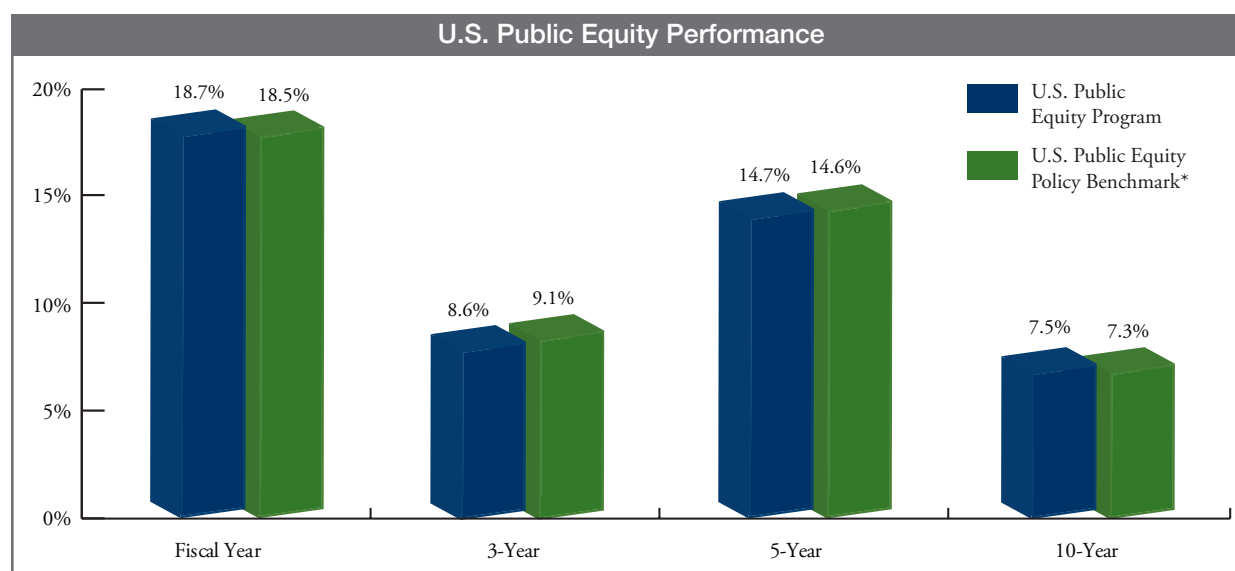
## Market Overview

The U.S. stock markets had a very strong year across both market capitalization and styles. The comprehensive measure of the U.S. stock market (Russell 3000 Index) increased 18.5% while small-cap stocks (Russell 2000 Index) increased 24.6% for the year. Large-cap growth stocks (Russell 1000 Growth Index) outperformed large-cap value stocks (Russell 1000 Value Index) with a return of 20.4% compared to 15.5% while small-cap growth stocks (Russell 2000 Growth Index) slightly underperformed small cap value stocks (Russell 2000 Value Index) with a return of 24.4% compared to 24.9%.

## Performance

The total return for the U.S. Public Equity program was 18.7% compared to the benchmark return of 18.5% for the fiscal year ended June 30, 2017. Within the U.S. Public Equity program, the Large-Cap pool returned 17.7%, Alpha Overlay returned 20.5% and the Small-Cap program returned 22.4% for the year.

As indicated in the table and graph, the U.S. Public Equity portfolio has produced strong returns for all reported time periods. Over longer periods of time, the Systems' U.S. Public Equity portfolio is designed to deliver approximately 50-100 basis points of excess return through a combination of active and passive investment strategies.



**U.S. Public Equity Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
U.S. Public Equity Return	18.7%	8.6%	14.7%	7.5%
Annualized Policy Benchmark Return*	18.5%	9.1%	14.6%	7.3%
Excess Return	0.2%	-0.5%	0.1%	0.2%

\*The U.S. Public Equity Policy Benchmark is the Russell 3000 Index.

## Statistics

The following table displays the statistical characteristics of the Systems' U.S. Public Equity program as of June 30, 2017 with comparisons shown to the portfolio's policy benchmark. In addition, the top ten U.S. stock holdings as of June 30, 2017 are shown in the table below the characteristics.

U.S. Public Equity Characteristics		
Characteristics	June 30, 2017 Combined Systems*	June 30, 2017 Russell 3000 Index
Number of Securities	1,889	3,000
Dividend Yield	1.8%	1.9%
Price-to-Earnings Ratio	19.2	22.2
Avg Market Capitalization	\$ 118.8 bil	\$140.2 bil
Price-to-Book Ratio	3.2	3.0

\* Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

U.S. Public Equity - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total U.S. Public Equity
Johnson & Johnson	\$ 112,386,573	0.9%
Alphabet, Inc.	90,797,772	0.7%
Amazon.com, Inc.	79,555,080	0.7%
JPMorgan Chase & Co.	78,271,213	0.6%
Merck & Co.	73,955,630	0.6%
PepsiCo, Inc.	72,053,518	0.6%
Bank of America Corp.	71,687,475	0.6%
Facebook, Inc.	68,051,215	0.6%
Wal-mart Stores, Inc.	65,684,564	0.5%
Apple, Inc.	62,958,199	0.5%
<b>TOTAL</b>	<b>\$ 775,401,239</b>	<b>6.3%</b>

## Investment Advisors

As of June 30, 2017, the Systems had contracts with 13 external investment advisors who managed 20 portfolios that comprised 77.5% of the U.S. Public Equity portfolio. The remaining 22.5% of the portfolio was in the Alpha Overlay program described in the next section. The Systems repositioned the Small-Cap program during the fiscal year by terminating four portfolios and adding a new passive Russell 2000 mandate with Blackrock.

U.S. Public Equity Investment Advisors			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
Analytic Investors	Structured Large Cap Value	\$ 265,938,547	0.6%
Analytic Investors	U.S. Low Volatility Equity	1,303,549,214	3.1%
AQR Capital Management	Large Cap 140/40 Core	744,060,895	1.8%
Aronson + Johnson + Ortiz	Active Large Cap 130/30 Value	426,046,072	1.0%
Aronson + Johnson + Ortiz	Active Large Cap Value	574,533,515	1.4%
Blackrock	Passive Russell 1000 Index	2,784,858,601	6.7%
Blackrock	Passive Russell 1000 Growth Index	110,561,201	0.3%
Columbia Management	Active Large Cap Growth	351,701,879	0.9%
Lazard Asset Management	Active US Equity Concentrated	342,822,444	0.8%
Martingale Asset Management	Active Large Cap 130/30 Growth	441,754,473	1.1%
Westwood Management	Active Large Cap Value	473,283,878	1.1%
Westwood Management	Master Limited Partnerships	228,179,404	0.6%
Zevenbergen Capital	Active All Cap Growth	577,736,053	1.4%
<b>Large-Cap Subtotal</b>		<b>8,625,026,176</b>	<b>20.8%</b>
Allianz	Active Micro Cap Growth	113,873,894	0.3%
Allianz	Active Ultra Micro Cap Growth	37,607,612	0.1%
AQR Capital Management	Active Small Cap Value	162,394,025	0.4%
Blackrock	Passive Russell 2000 Index	305,438,438	0.7%
Chartwell Investment Partners	Active Small Cap Value	89,017,243	0.2%
Columbus Circle	Active Small Cap Growth	74,325,509	0.2%
RBC Global Asset Management	Active Small Cap Core	162,226,631	0.4%
<b>Small-Cap Subtotal</b>		<b>944,883,352</b>	<b>2.3%</b>
<b>Total</b>		<b>\$ 9,569,909,528</b>	<b>23.1%</b>

\*Includes manager cash.

## Alpha Overlay Program Summary

As of June 30, 2017, the Alpha Overlay allocation had a market value of approximately \$2.8 billion, representing 6.6% of total assets.

### Investment Program Description

The Alpha Overlay portfolio resides within the U.S. Large-Cap Equity program. The Alpha Overlay portfolio has been constructed to assist in meeting the long-term goals established for the overall U.S. Large-Cap Equity allocation. Specifically, Alpha Overlay provides broad exposure to large-cap U.S. stocks using S&P 500 total return swaps, while the returns of a select portfolio of hedge fund strategies provides the opportunity to earn excess returns above the passive S&P 500 Index. By combining the market exposure obtained through the S&P 500 total return swaps with the diversified exposures to investment strategies focused on alpha generation, the combined portfolio is constructed and managed to produce a return stream with volatility and beta characteristics similar to the passive S&P 500 Index, while generating excess returns (or alpha) of approximately 200-250 basis points over longer periods of time.

### Structure

As of June 30, 2017, 27.0% of the Alpha Overlay composite assets were passively managed by NISA Investment Advisors using S&P 500 total return swaps to attain equitization. An additional 68.9% of the portfolio was actively managed across a diversified range of multi-strategy and market neutral hedge fund mandates. The remaining 4.1% of the portfolio was actively managed by Zevenbergen Capital in a long-only mandate. The chart below displays the specific investment advisor exposure within the composite as of June 30, 2017.

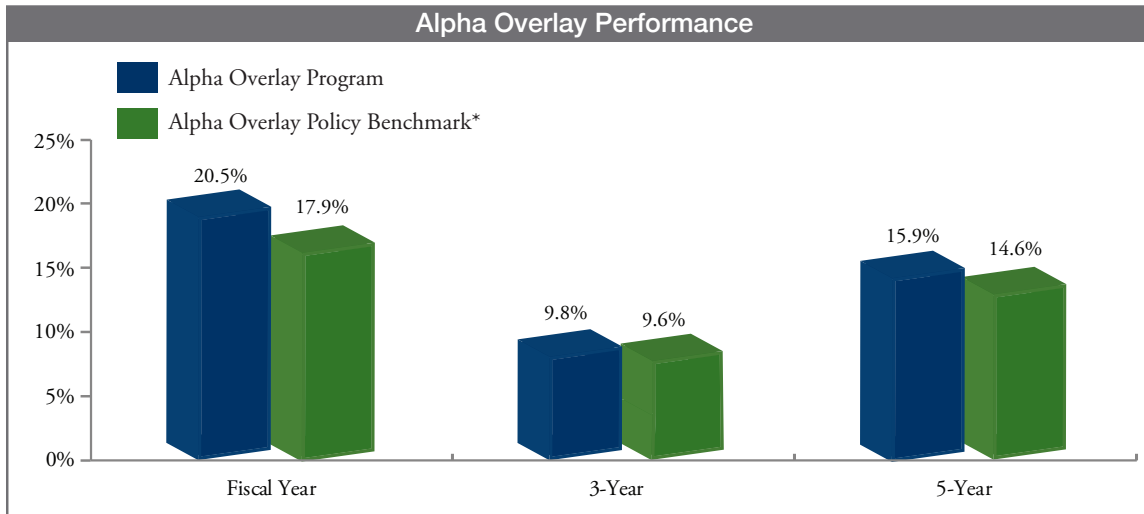
Alpha Overlay Investment Advisors				
Investment Advisor	Investment Style	Fair Value*	As of June 30, 2017	% of Total Fair Value
Analytic Investors	Relative Value	\$	31,855,512	0.1%
AQR Absolute Return Fund	Relative Value		165,566,347	0.4%
Bridgewater Pure Alpha II	Asset Allocation/Global Macro		320,474,650	0.8%
Carlson Black Diamond	Relative Value		258,174,852	0.6%
Davidson Kempner Institutional Partners	Event Driven		255,681,731	0.6%
HBK Capital Management	Relative Value		140,088,453	0.3%
NISA Investment Advisors	S&P 500 Exposure		748,242,414	1.8%
Och-Ziff Domestic Partners	Multi-Strategy		117,869,239	0.3%
Pershing Square	Activist Equity		66,430,073	0.1%
Renaissance Institutional Equities Fund	Low Volatility Equity		297,901,064	0.7%
Stark Investments Limited Partners	Equity Long/Short		2,042,244	0.0%
UBS O'Connor Multi-Strategy Alpha	Relative Value		233,502,668	0.6%
York Capital Management	Event Driven		19,342,428	0.0%
Zevenbergen Capital	Active All-Cap Growth		113,699,587	0.3%
<b>Total</b>			<b>\$ 2,770,871,262</b>	<b>6.6%</b>

\* Includes manager cash.



**Performance**

The fiscal year 2017 return for the Alpha Overlay program was 20.5% exceeding the benchmark return of 17.9% by 260 basis points. As shown in the table and graph below, the Alpha Overlay composite has produced significant absolute and relative returns over the last five years while maintaining a risk profile (standard deviation and beta) lower than the benchmark.



**Alpha Overlay Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Alpha Overlay Return	20.5%	9.8%	15.9%
Annualized Policy Benchmark Return*	17.9%	9.6%	14.6%
Excess Return	2.6%	0.2%	1.3%
Annualized Standard Deviation of Composite	4.7%	9.0%	8.9%
Annualized Standard Deviation of Policy Benchmark*	6.1%	10.4%	9.6%
Beta to Benchmark*	0.72	0.84	0.90

\*The Alpha Overlay Policy Benchmark is the S&P 500 Index.

The Alpha Overlay Program was established in January 2008, so ten-year returns are not available.

## Non-U.S. Public Equity Program Summary

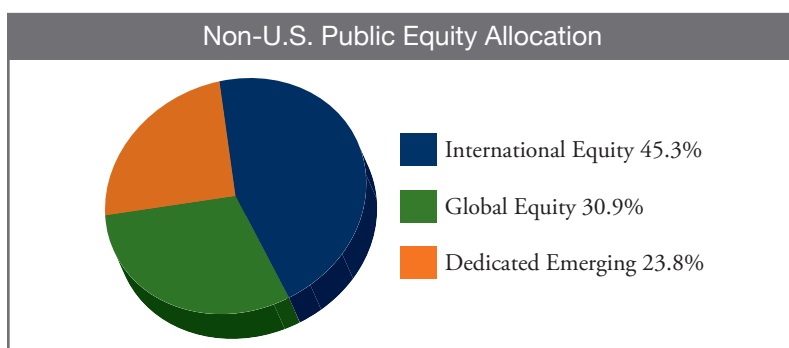
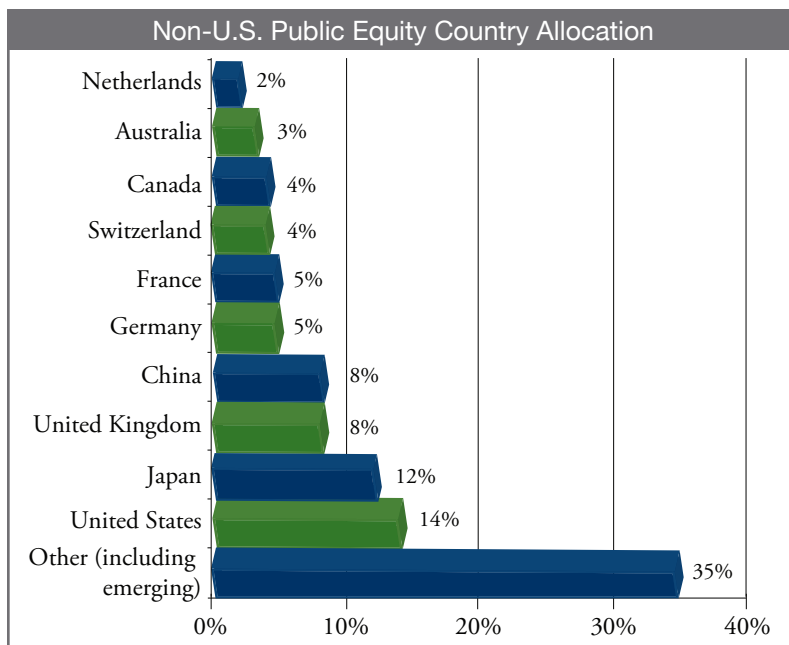
As of June 30, 2017, the Non-U.S. Public Equity assets had a market value of approximately \$7.1 billion, representing 17.2% of total assets.

### Investment Program Description

The Non-U.S. Public Equity program provides long-term capital appreciation and dividend income in excess of inflation through exposure to public equity securities on a global basis. Specific investment strategies approved for the Non-U.S. Public Equity program include passive investment vehicles, traditional long-only active equity management and active long/short approaches. Exposure to the various segments of the global equity market (i.e., U.S., developed non-U.S., emerging, growth-oriented, value-oriented, and core) and to the approved investment strategy types are achieved through the identification, selection and on-going management of SEC-registered investment advisors qualified to serve as fiduciaries to the Systems. The Non-U.S. Public Equity portfolios provide an element of diversification relative to the domestic equity portfolios. Currency is an aspect of international investing that can impact the performance and volatility of the asset class over the short-term. However, over the long-term, the effect from currency is expected to be neutral.

### Structure

As of June 30, 2017, 10.4% of the Non-U.S. Public Equity composite was passively managed. The remainder of the portfolio was actively managed and diversified across capitalization ranges, styles and a number of developed and emerging market countries. The bar graph displays the specific country exposure within the composite while the pie chart indicates broader exposure by investment mandate.

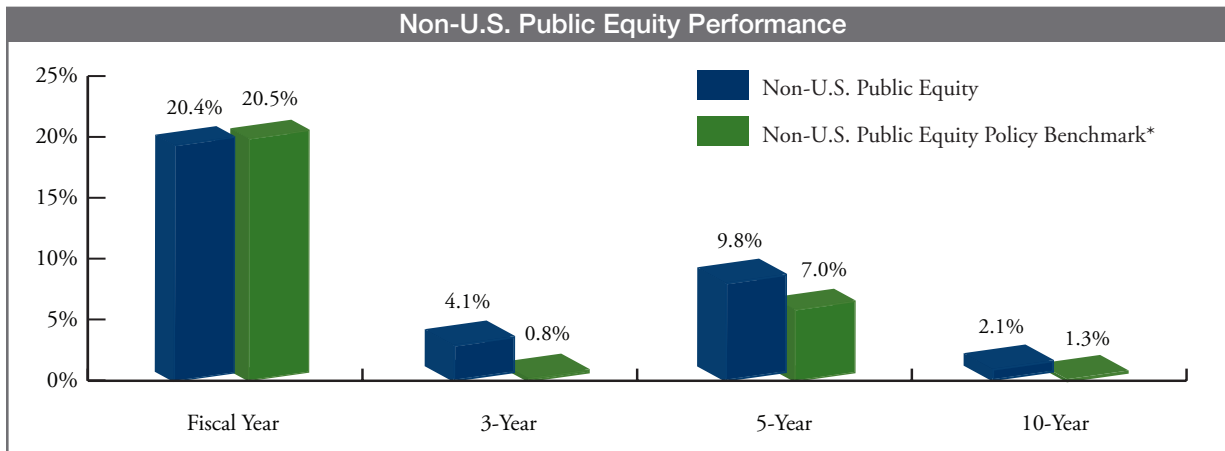


## Market Overview

Stock markets throughout the world increased substantially in fiscal year 2017 as result of strong economic growth, stable energy prices and accommodative monetary policies across the globe. The broad measure for developed international markets (MSCI EAFE Index) increased 20.3%, emerging markets (MSCI EM Index) increased 23.8% and global stocks (MSCI World) increased 18.2%.

## Performance

The total return for the Non-U.S. Public Equity program was 20.4% compared to the benchmark return of 20.5% for the fiscal year ended June 30, 2017. As shown in the table and graph below, the Systems' Non-U.S. Public Equity composite returns substantially outperformed the benchmark over the three- and five-year time periods. Over long periods of time, the Systems' Non-U.S. Public Equity program is designed to deliver approximately 100-150 basis points of excess returns through a combination of active and passive investment strategies. The ten-year excess returns are indicative of this expectation.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Non-U.S. Public Equity Return	20.4%	4.1%	9.8%	2.1%
Annualized Policy Benchmark Return*	20.5%	0.8%	7.0%	1.3%
Excess Return	-0.1%	3.3%	2.8%	0.8%

\*The Non-U.S. Public Equity Benchmark is the MSCI ACWI ex-USA Index.

## Statistics

The following table displays the top ten global stock holdings as of June 30, 2017.

Non-U.S. Public Equity - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total Non-U.S. Public Equity
Nestle SA	\$ 62,616,648	0.9%
Roche Holding AG	56,132,213	0.8%
ING	44,809,337	0.6%
Bayer AG	42,859,958	0.6%
Hoya Corp.	39,770,926	0.6%
AIA Group Ltd.	39,096,619	0.5%
Samsung Electronics Ltd.	37,414,144	0.5%
Compass Group	35,017,281	0.5%
Canadian National Railway Co.	34,148,441	0.5%
Taiwan Semiconductor Ltd.	33,010,176	0.5%
<b>Total</b>	<b>\$ 424,875,743</b>	<b>6.0%</b>

\* Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

## Investment Advisors

As of June 30, 2017, the Systems had contracts with 13 external investment advisors who managed 16 portfolios within the Non-U.S. Public Equity portfolio. In fiscal year 2017, a NISA ACWI swaps portfolio was terminated while two new investment portfolios were added: an active international low volatility mandate managed by Aronson + Johnson + Ortiz and an active international low volatility mandate managed by Invesco.

Non-U.S. Public Equity Investment Advisors			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
Acadian Asset Management	Active Emerging Markets	\$ 479,285,753	1.1%
Aronson + Johnson + Ortiz	Active Intl Low Volatility	103,990,493	0.2%
AllianceBernstein Institutional Mgmt.	Active Intl Value	454,480,094	1.1%
Analytic Investors	Active Global	749,542,508	1.8%
AQR Capital Management	Active Intl Core	745,697,004	1.8%
Arrowstreet Capital	Active Emerging Markets	236,724,862	0.6%
Arrowstreet Capital	Active Global	648,844,262	1.6%
Arrowstreet Capital	Global Long/Short	832,677,288	2.0%
Blackrock	Passive Intl Core	742,870,205	1.8%
Coronation Asset Management Limited	Active Emerging Markets	287,572,240	0.7%
Invesco	Active Intl Low Volatility	106,171,981	0.3%
MFS Investment Management	Active Intl Core	866,270,097	2.1%
MFS Investment Management	Active Intl Concentrated Core	217,313,340	0.5%
Neon Capital Management	Active Emerging Markets	120,653,440	0.3%
NISA Investment Advisors	Currency Hedge	(22,449,448)	-0.1%
Rock Creek Group	Active Emerging Markets	574,138,690	1.4%
Transition accounts	Transition accounts	174,584	0.0%
<b>Total</b>		<b>\$ 7,143,957,392</b>	<b>17.2%</b>

\* Includes manager cash.

## Public Credit Program Summary

As of June 30, 2017, the Public Credit assets had a market value of approximately \$2.9 billion, representing 6.9% of total assets.

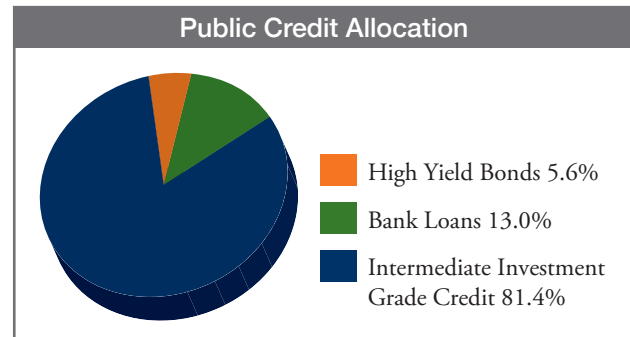
### Investment Program Description

The Public Credit Program is designed to provide a source of income and capital appreciation for the Systems while creating substantial diversification to the total plan with a low correlation to other asset classes. Most securities in this program exhibit high liquidity. Specific investments can include investment grade corporate securities, below investment grade debt instruments, distressed debt securities, convertible bonds, bank loans, agencies, mortgage-backed securities, asset-backed securities, and interest rate sensitive securities (including those issued or guaranteed by the United States government or its agencies). Investments in this program may include debt of both U.S. and non-U.S. issuers.

The performance objective for the Public Credit program is to exceed the returns of the investment grade credit markets through the use of a wide variety of active management approaches while incurring a level of risk that is generally consistent with the policy benchmark.

### Structure

As of June 30, 2017, the Public Credit composite was actively managed and diversified across high quality corporate bonds, bank loans and high yield bonds. The Systems' internal staff has built a diversified Public Credit portfolio with a base of high quality, shorter duration corporate bonds. The following pie chart presents the strategy allocation of the Systems' Public Credit assets as of June 30, 2017.

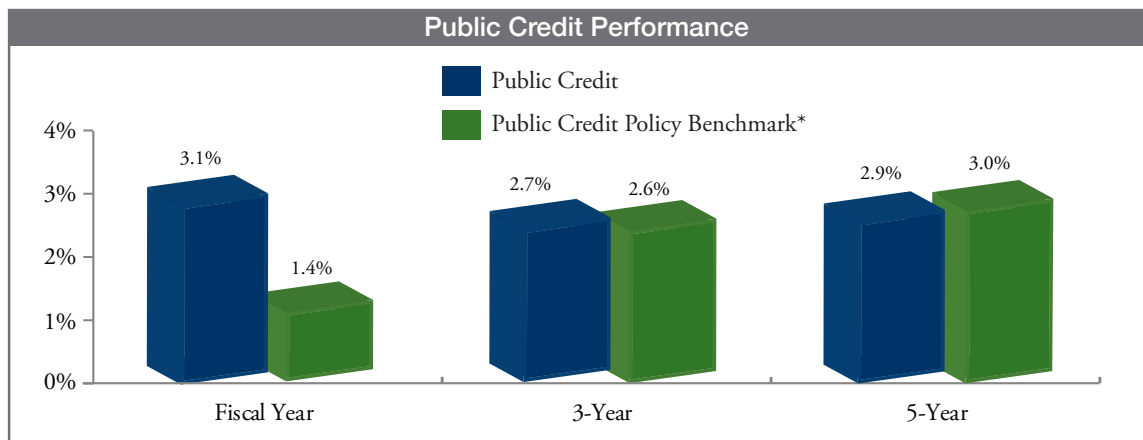


### Market Overview

High yield bonds strongly outperformed treasuries and investment grade credit during the year as the yield on the 10-year Treasury increased to 2.3% on June 30, 2017 from 1.5% on June 30, 2016. Investment grade credit corporate bonds (Barclays U.S. Intermediate Credit Index) increased 1.4% for the year while a broader measure of the U.S. bond market (Barclays U.S. Aggregate Index) decreased 0.3%. High yield, or lower quality bonds (Merrill Lynch High Yield Master II Index), increased 12.8% for the year and global bonds (Barclays Global Agg. Ex-US Index) decreased 3.8%.

### Performance

The Public Credit program produced solid absolute and relative returns for fiscal year 2017. The fiscal year return of 3.1% exceeded the benchmark return of 1.4% by 170 basis points. Over long periods of time, the Systems' Public Credit program is designed to deliver approximately 30-70 basis points of excess return through a combination of active and passive strategies. See charts on the following page.



Public Credit Statistical Performance			
Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Public Credit Return	3.1%	2.7%	2.9%
Annualized Policy Benchmark Return*	1.4%	2.6%	3.0%
Excess Return	1.7%	0.1%	-0.1%

\*The Public Credit Policy Benchmark is the Barclays U.S. Intermediate Credit Index.

The Public Credit Program was established in December 2008, so ten-year returns are not available.

## Statistics

The following table displays the top ten Public Credit holdings as of June 30, 2017.

Public Credit - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total Public Credit
Goldman Sachs Group, 2.91%, 6/05/2023	\$ 99,641,230	3.5%
J.P. Morgan Chase & Co., 3.22%, 03/01/2025	97,032,000	3.4%
AT&T, Inc., 0.00%, 11/27/2022	61,452,130	2.1%
Great Plains Energy, Inc., 3.9%, 04/01/2027	51,828,861	1.8%
Capital One Financial Corp., 2.5%, 05/12/2020	50,216,500	1.7%
Citigroup, Inc., 3.89%, 01/10/2028	49,750,223	1.7%
Transcontinental Gas Pipe Line Co., 7.85%, 02/01/2026	48,954,514	1.7%
Bank of America Corp., 2.88%, 04/24/2023	47,445,612	1.6%
Shire Acquisitions Investments, 2.88%, 9/23/2023	45,355,939	1.6%
Morgan Stanley, 1.98%, 02/14/2020	45,184,500	1.6%
<b>Total</b>	<b>\$ 596,861,509</b>	<b>20.7%</b>

\*Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

## Investment Advisors

As of June 30, 2017, the Systems had contracts with three external investment advisors who managed three portfolios in the Public Credit program.

Public Credit Investment Advisors			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
NISA Investment Advisors	Corporate Credit	\$ 2,342,086,702	5.6%
Oaktree Bank Loans	Senior Bank Loans	374,789,459	0.9%
Pacific Investment Management Co.	High Yield	161,633,902	0.4%
<b>Total</b>		<b>\$ 2,878,510,063</b>	<b>6.9%</b>

\*Includes manager cash.

## Hedged Assets Program Summary

As of June 30, 2017, the Hedged Assets portfolio had a market value of approximately \$5.0 billion, representing 12.1% of total assets.

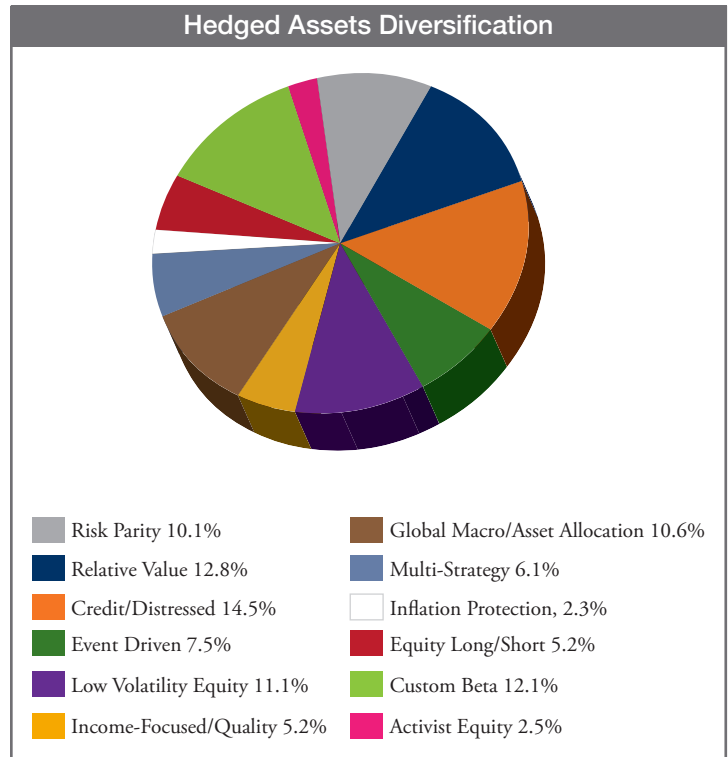
### Investment Program Description

The Hedged Assets program’s objective is to provide diversification to the total portfolio and reduce volatility within the Public Risk composite. The purpose of this program is to enhance the overall risk/return profile of the Public Risk composite through the inclusion of specialized investment strategies that typically generate returns in a different fashion (i.e., absent a high correlation to equities or bonds). These strategies may utilize leverage as allowed within their governing documents. The returns from these strategies have historically had a low-to-moderate correlation with the traditional equity markets, thus providing diversification benefits in addition to portfolio return enhancement. These strategies seek to control risks and maintain a focus on absolute returns. The inherent nature of these vehicles to serve as a “hedge” provides for the expectation that the program will lag the equity market during times when equities are performing above the long-term averages. However, when equities are performing below the long-term averages, the program would be expected to outperform the equity market. In addition, managers within this asset class have historically possessed significantly lower volatility relative to traditional equity managers.

### Structure

The Systems have retained Albourne America, LLC (Albourne) as its hedged asset consultant. Albourne is an independent global advisory firm with a significant focus on hedge funds. The Systems utilize direct investments into hedge funds as opposed to incorporating fund-of-funds. The Systems’ internal staff believes the benefits of direct investments, including lower fees, customized portfolio exposures, direct access to manager knowledge, and higher levels of transparency outweighed the benefit of quicker implementation offered by fund-of-funds.

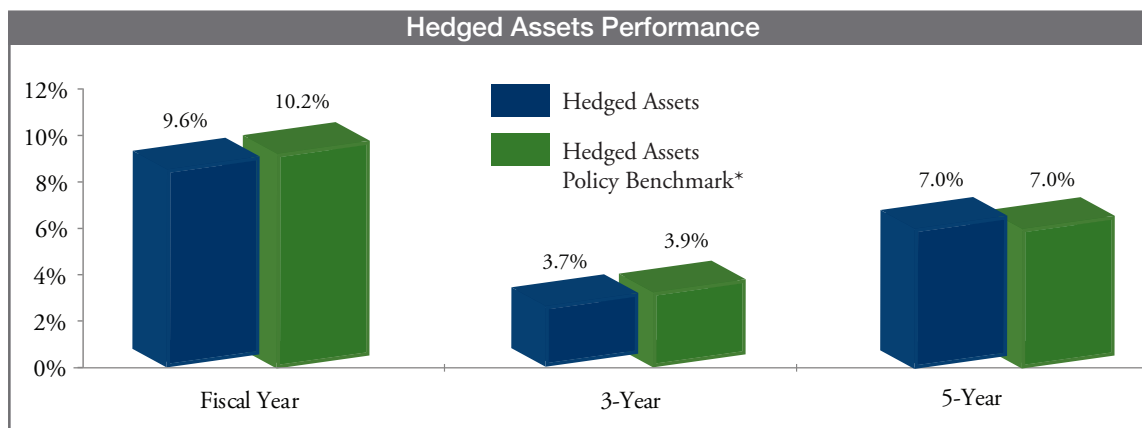
The following chart indicates the strategy diversification of the Hedged Assets program as of June 30, 2017. The Systems manage the Hedged Assets portfolio to a blended benchmark of 25% Russell 3000 Index, 25% MSCI ACWI ex-USA Index, and 50% Barclays U.S. Intermediate Credit Index.



### Performance

The total annualized return on the Systems’ Hedged Assets portfolio was 9.6%, compared to the benchmark return of 10.2% for the fiscal year ended June 30, 2017.

Over the past five years, the Hedged Assets program has performed equal to its policy benchmark of 7.0%. The performance relative to the policy benchmark is particularly significant given the strong performance of equities over the past five years. The Russell 3000 Index was up an annualized 14.6% over the past five years and the MSCI ACWI Index was up an annualized 10.5%. As discussed previously, the hedging characteristics of the Hedged Assets program provide for the expectation that its performance will lag equity markets and/or its policy benchmark during periods of higher-than-normal equity returns. The Hedged Assets program is expected to outperform in more normal and down markets. As the table indicates, the longer-term performance was accomplished by assuming less than one-half of the volatility of the world stock index and achieving a beta of approximately 0.40 to the index, signifying that the Systems’ portfolio moves up or down less than half as much as the world stock index.



### Hedged Assets Statistical Performance

Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Hedged Assets Return	9.6%	3.7%	7.0%
Annualized Policy Benchmark Return*	10.2%	3.9%	7.0%
Annualized S&P 500 Return	17.9%	9.6%	14.6%
Annualized MSCI ACWI Index	18.8%	4.8%	10.5%
Annualized Standard Deviation of Composite	2.0%	4.0%	4.5%
Annualized Standard Deviation of Policy Benchmark*	3.4%	5.9%	5.5%
Annualized Standard Deviation of S&P 500	6.1%	10.4%	9.6%
Annualized Standard Deviation of MSCI ACWI Index	5.3%	10.8%	10.0%
Beta to Policy Benchmark*	0.23	0.57	0.70
Beta to S&P 500	0.12	0.29	0.35
Beta to MSCI ACWI Index	0.15	0.30	0.37

\*The Hedged Assets Policy Benchmark is composed as follows: 50% Barclays U.S. Intermediate Credit Index, 25% MSCI ACWI ex-USA, 25% Russell 3000 Index.

The Hedged Assets Program was established in January 2008, so ten-year returns are not available.



## Investment Advisors

As of June 30, 2017, the Systems had contracts with 17 external investment advisors who managed 25 portfolios.

Hedged Assets Investment Advisors			
Investment Advisor	Investment Style	Fair Value*	% of Total
		As of June 30, 2017	Fair Value
AQR Absolute Return Fund	Relative Value	\$ 219,471,670	0.5%
AQR Diversified Beta Fund	Risk Parity	334,168,173	0.8%
AQR Real Asset Fund	Inflation Protection	44,284,149	0.1%
Bridgewater All Weather	Risk Parity	171,642,929	0.4%
Bridgewater Inflation Pool	Inflation Protection	69,360,037	0.2%
Bridgewater Pure Alpha II	Asset Allocation/Global Macro	522,879,676	1.3%
Bridgewater Pure Alpha Major Markets	Asset Allocation/Global Macro	6,222,612	0.0%
Carlson Black Diamond	Relative Value	172,116,568	0.4%
Davidson Kempner Institutional Partners	Event Driven	255,681,731	0.6%
Davidson Kempner Distressed Opportunities Fund	Distressed Debt/Credit	244,102,967	0.6%
GoldenTree Partners	Distressed Debt/Credit	482,735,063	1.2%
HBK Capital Management	Relative Value	93,392,302	0.2%
Indus Asia Pacific Fund	Equity Long/Short	109,589,266	0.3%
Maverick Fund USA	Equity Long/Short	149,191,893	0.4%
NISA Investment Advisors	Custom Beta	605,126,065	1.5%
Och-Ziff Domestic Partners	Multi-Strategy	156,245,270	0.4%
Och-Ziff Europe	Multi-Strategy	2,711,641	0.0%
Och-Ziff Asia	Multi-Strategy	147,505,391	0.3%
Owl Creek Overseas Fund	Event Driven	90,531,749	0.2%
Pershing Square	Activist Equity	123,370,135	0.3%
Renaissance Institutional Equities Fund	Low Volatility Equity	553,244,833	1.3%
Stark Investments Limited Partners	Equity Long/Short	3,792,739	0.0%
UBS O'Connor Multi-Strategy Alpha	Relative Value	155,668,445	0.4%
Westwood Management	Income Focused/Quality	259,645,969	0.6%
York Capital Management	Event Driven	29,013,642	0.1%
<b>Total</b>		<b>\$ 5,001,694,915</b>	<b>12.1%</b>

\*Includes manager cash.

## Safe Assets Summary

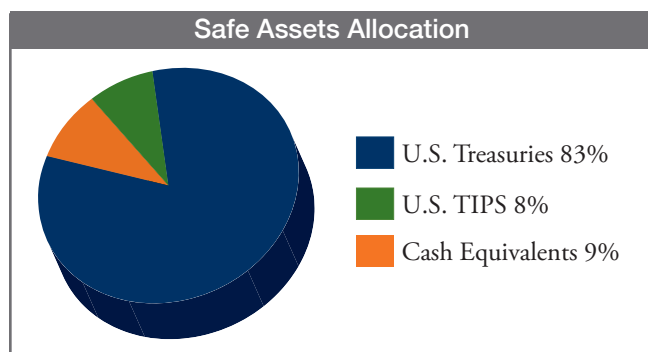
*As of June 30, 2017, the Safe Assets had a market value of approximately \$7.1 billion, representing 17.1% of total assets.*

### Investment Program Description

The Safe Assets program is intended to act as a source of safety and income for the Systems. The program is designed to create substantial diversification to the total portfolio and reduce volatility through low correlation to other asset classes. Specifically, the Safe Assets portfolio should provide asset protection at the total fund level in periods of economic stress.

### Structure

As of June 30, 2017, the Systems' entire Safe Assets program was managed by NISA Investment Advisors. The assets held within the program exhibit high liquidity and safety. The pie chart below depicts the Safe Assets Program by showing the sector and composite allocations as of June 30, 2017.



Internal staff continues to maintain a slight underweight to Safe Assets due in part to historically low yields and due to better expected risk/adjusted returns going forward within the Public Risk and Private Risk programs. The Systems' allocation to Safe Assets was 17.1% as of June, 30, 2017, as compared to the target weight of 20%.

### Market Overview

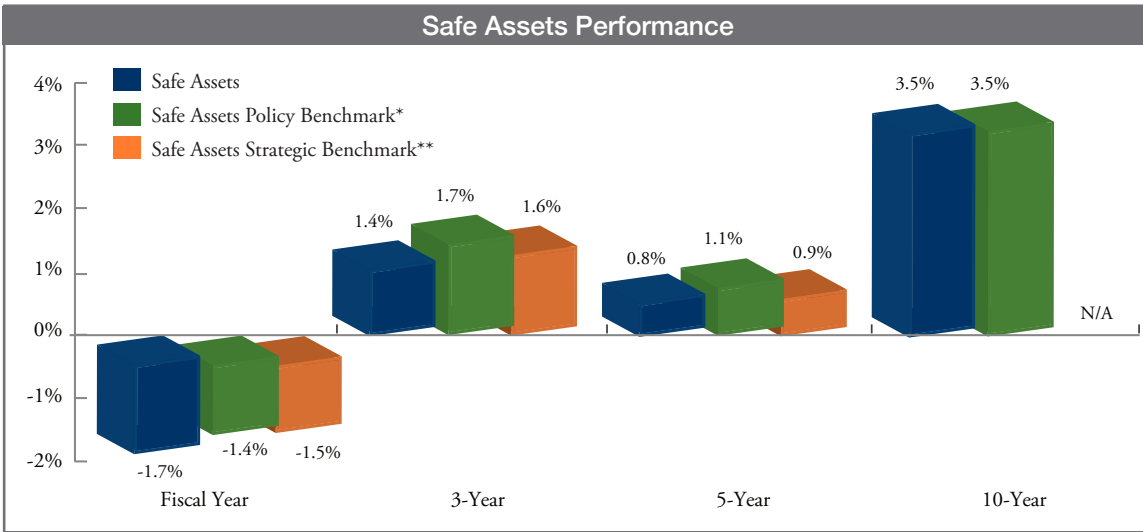
The yield on the 10-year Treasury increased to 2.3% on June 30, 2017 from 1.5% on June 30, 2016. The significant increase in interest rates throughout the year negatively impacted the price of bonds.

### Performance

The total return for Safe Assets portfolio was -1.7% for the fiscal year ended June 30, 2017. The portfolio underperformed the benchmark for the year by 30 basis points. For the three- and five-year time periods, the Systems' slightly underperformed the Safe Assets benchmark while the portfolio return was equal to benchmark for the ten-year time period.

The absolute return of the Safe Assets portfolio is relatively modest over longer time periods. However, the Safe Assets portfolio continues to provide asset protection at the total fund level in periods of economic stress and ultimate liquidity to the Systems. An allocation to Safe Assets allows the Systems to accept market risk in other portions of the total fund portfolio.

The Board of Trustees approved a new U.S. Treasuries benchmark effective January 1, 2017. The benchmark was modified from the Barclays U.S. Treasury Blended Index (a combination of 90% Barclays U.S. Treasury: Intermediate Index and 10% Barclays U.S. Treasury: Long Index) to the Barclays U.S. Treasury Index. The new Barclays Treasury Index is a better representation of the investable universe of U.S. Treasuries. The historical benchmark will reflect the Barclays U.S. Treasury Blended Index prior to 2017 with the Barclays U.S. Treasury Index returns being linked to this series following January 1, 2017.



**Safe Assets Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Safe Assets Return	-1.7%	1.4%	0.8%	3.5%
Annualized Policy Benchmark Return*	-1.4%	1.7%	1.1%	3.5%
Annualized Strategic Benchmark Return**	-1.5%	1.6%	0.9%	N/A
Excess Return	-0.3%	-0.3%	-0.3%	0.0%
Annualized Standard Deviation of Composite	2.6%	2.8%	2.6%	3.3%
Annualized Standard Deviation of Policy Benchmark*	2.6%	2.9%	2.8%	3.4%
Beta to Policy Benchmark*	0.97	0.93	0.92	0.95
Beta to MSCI World Index	0.23	-0.06	-0.03	-0.02

\*The Safe Assets Policy Benchmark is composed as follows: 80.0% Barclays U.S. Treasury Index and 20.0% Barclays U.S. TIPS 1-10 Yrs. Index. Effective January 1, 2017, the Barclays U.S. Treasury Index component replaced the Barclays U.S. Treasury: Intermediate Index and Barclays U.S. Treasury: Long Index components.

\*\*The Safe Assets Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a ten-year return is not available.

The Systems have specifically taken less risk compared to the Policy benchmark due to the inclusion of the cash equivalents portfolio. Additionally, the Systems’ portfolios have a beta slightly less than 1.0 relative to the Policy benchmark over all time periods, indicating less market volatility. Most importantly, the Safe Asset portfolio exhibits a beta of approximately zero relative to the world stock index (MSCI ACWI Index) over longer time periods, indicating no correlation to risk assets. These statistics support one of the primary objectives of Safe Assets: diversification from other risk assets in the total fund.

## Statistics

The following table displays the statistical characteristics of the Systems' Safe Assets Program as of June 30, 2017 with comparisons shown to the Barclays U.S. Treasury Index. Additionally, the top ten Safe Asset holdings as of June 30, 2017 are shown in the table below the characteristics.

Safe Assets Characteristics		
Characteristics	June 30, 2017 Combined Systems*	June 30, 2017 Barclays U.S. Treasury Index
Number of Securities	89	257
Average Coupon	1.6%	2.1%
Yield to Maturity	1.0%	1.9%
Average Maturity (Years)	6.6	7.6
Duration (Years)	4.9	6.2

Safe Assets - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total Safe Assets
United States Treasury Note, 1.25%, 04/30/2019	\$ 565,365,770	8.0%
United States Treasury Note, 0.75%, 08/31/2018	311,736,505	4.4%
United States Treasury Note, 2.50%, 05/15/2024	283,750,563	4.0%
United States Treasury Note, 0.875%, 03/31/2018	269,285,343	3.8%
United States Treasury Note, 1.125%, 07/31/2021	256,343,470	3.6%
United States Treasury Note, 3.50%, 05/15/2020	205,685,551	2.9%
United States Treasury Bond, 2.50%, 02/15/2045	194,020,596	2.8%
United States Treasury Note, 2.00%, 02/15/2025	185,772,653	2.6%
United States Treasury Note, 1.50%, 12/31/2018	182,468,733	2.6%
United States Treasury Note, 2.00%, 12/31/2021	179,256,723	2.5%
<b>TOTAL</b>	<b>\$ 2,633,685,907</b>	<b>37.2%</b>

\*Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

## Investment Advisors

NISA Investment Advisors managed the Safe Assets program as of June 30, 2017. The following table lists the firm's management by investment style.

Safe Assets Investment Advisor			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
NISA Investment Advisors	U.S. Treasuries	\$ 5,351,369,846	12.9%
NISA Investment Advisors	Cash Equivalents	861,503,557	2.1%
NISA Investment Advisors	U.S. TIPS	857,731,901	2.1%
<b>Total</b>		<b>\$ 7,070,605,304</b>	<b>17.1%</b>

\*Includes manager cash.

## Private Risk Assets Summary

*As of June 30, 2017, the Private Risk assets had a market value of approximately \$6.9 billion, representing 16.7% of total assets.*

### Investment Program Description

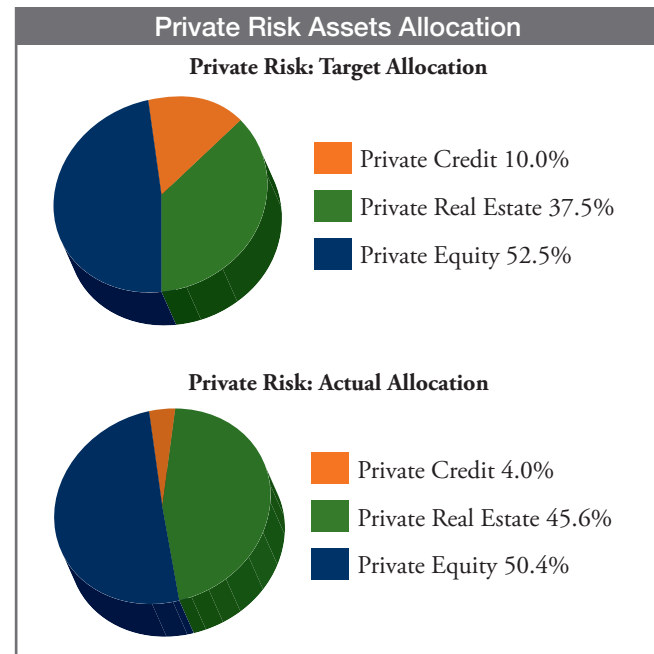
The allocation to Private Risk investments is viewed as a separate asset class for inclusion in the Systems' overall investment portfolios. The process of building the Systems' Private Risk program and fully funding the target allocation is expected to occur over a period of several years. Additional new investments will be necessary beyond the funding period in order to maintain the long-term target allocation. The three programs within the Private Risk Assets composite are Private Equity, Private Real Estate and Private Credit. Each program within the Private Risk allocation is a separate multi-manager composite that is treated generally as a single portfolio. Each program serves a specific and distinct role within the overall Private Risk Composite and also within the overall Total Plan allocation. Over time, the Private Risk Composite serves as a long-term vehicle to supply the underlying beta exposure to a portfolio of private assets.

Investments in Private Risk Assets differ substantially from the Systems' public markets asset classes (Public Risk Assets and Safe Assets) in part because they are typically very long-term in nature, not publicly traded, relatively illiquid, and offer the potential for substantially higher returns (along with a commensurate level of risk). The illiquid nature of Private Risk Assets can result from the form of the asset or security itself, or it can be a function of the investment structure being utilized (e.g., a limited partnership).

Due to the fact that Private Risk Assets are not publicly traded, pricing and performance measurements prior to realization of gains are less reliable than in the traditional publicly traded asset classes. The Systems continually monitor the valuation policies and procedures utilized for such investments.

### Structure

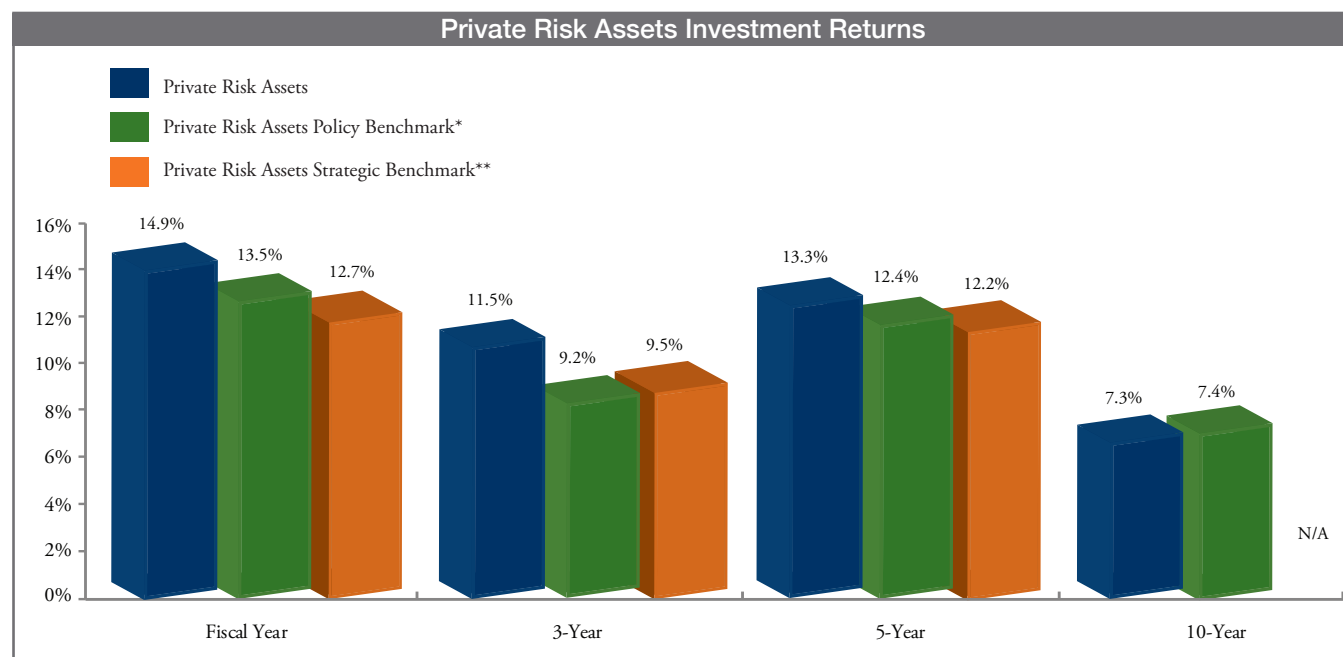
As of June 30, 2017, 50.4% of Private Risk assets were invested in the Private Equity program, 45.6% in the Private Real Estate program, and 4.0% in the Private Credit program. Each of these programs is discussed in more detail on the following pages.



## Performance

The total return for the Private Risk portfolio was 14.9%, compared to the policy benchmark return of 13.5% for the fiscal year ended June 30, 2017. For the three- and five-year time periods, the Systems also significantly outperformed the benchmark. The ten-year return was marginally below the benchmark due to the immaturity of the programs and the impacts of the financial crisis of 2008 and 2009.

The pricing and performance methodology utilized for private assets can provide for significant performance variances over short time periods. For instance, the Systems utilize a liquid benchmark (Russell 3000 Index) to measure an illiquid (private equity) asset class. Thus, there will be significant performance differences over short time periods in volatile markets. Due to the long term nature of Private Risk assets, the performance can be more appropriately judged over a longer timeframe. As the table below indicates, the Private Risk portfolios have produced excellent absolute returns over all time periods.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Private Risk Assets Return	14.9%	11.5%	13.3%	7.3%
Annualized Policy Benchmark Return*	13.5%	9.2%	12.4%	7.4%
Excess Return	1.4%	2.3%	0.9%	-0.1%
Annualized Strategic Benchmark Return**	12.7%	9.5%	12.2%	N/A

\* The Private Risk Assets Policy Benchmark is composed as follows: 52.5% Russell 3000 Index, 37.5% NFI-ODCE Index and 10.0% Merrill Lynch High Yield Master II Index.

\*\* The Private Risk Assets Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a 10-year return is not available.

## Private Equity Program Summary

*As of June 30, 2017, the Private Equity assets had a market value of approximately \$3.5 billion, representing 8.4% of total assets.*

### Investment Program Description

The Private Equity asset class is comprised of investment opportunities not typically included within the public equity and fixed income markets. Private Equity investments provide financing for start-up companies, private middle market companies, firms in financial distress and public and non-public firms seeking buyout financing. Private Equity investments can be classified into three basic sub-asset class categories:

- Venture Capital,
- Buyouts, and
- Debt-Related.

Investments in the sub-asset classes can be made in the U.S. or foreign countries. In total, the allocation to Non-U.S. Private Equity investments will not exceed 40.0% of the overall Private Equity target allocation. The risks associated with Private Equity will be viewed both in isolation and within the context of the entire fund.

In January 2014, the Board of Trustees approved the development and implementation of a Private Equity Co-Investment Program. The Co-Investment Program is expected to further advance the goals and objectives of the overall Private Equity Program by obtaining additional exposure to underlying portfolio company investments through direct equity investments made on a side-by-side basis with private equity funds where the Systems have an existing relationship. Co-investments serve to increase exposure to the Private Equity asset class with little or no additional fees and/or performance carry paid to the underlying private equity partnerships. The objective of the Co-Investment Program is to leverage existing, high-quality relationships with private equity managers in order to increase commitments to the asset class in a format that does not materially increase overall risk, while simultaneously helping to lower fees and performance carry.

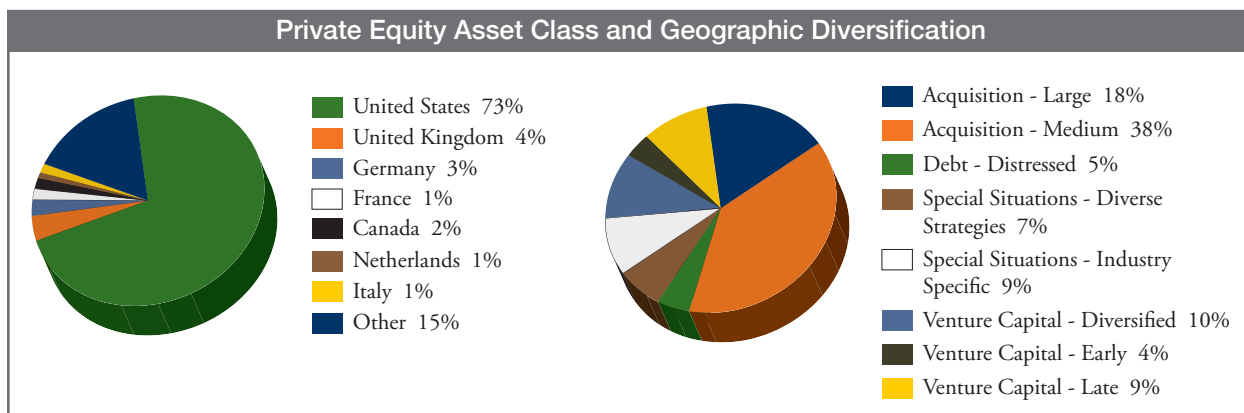
### Structure

As of June 30, 2017, Private Equity assets committed\* for investment were \$8.5 billion. The market value of funds that had been drawn down and actually invested as of June 30, 2017 was approximately \$3.5 billion, representing 8.4% of total assets. The Systems private equity investment commitments that have not yet been funded were approximately \$3.5 billion as of June 30, 2017.

The objective for the Systems' allocation to Private Equity is to achieve returns that are higher than those attainable in the public equity markets with the added benefit of diversification. The long-term target allocation to Private Equity is 12.0%. However, as of June 30, 2017, the actual allocation for the Systems was just 8.4% because the long-term and illiquid nature of the private equity asset class dictates that capital must be invested at a measured pace. In addition, private equity investments have made record distributions in recent years. Pathway Capital Management has been retained by the Systems to provide private equity investment management services through three structures; a discretionary fund-of-funds relationship, an advisory relationship and a co-investment program. Additionally, the Systems have invested in private equity secondary funds and also utilize Albourne America, LLC to provide private equity advisory services.

The pie charts on the following page show the diversification (utilizing the market value of the assets that have been invested) of the Systems' private equity holdings as of June 30, 2017 from both strategy and country perspectives.

*\* Committed capital reflects the total amount of capital that the Systems are legally obligated to supply to the partnerships and funds as the capital is needed to invest in underlying holdings. Market value reflects capital that has actually been drawn and invested by the partnerships and funds.*

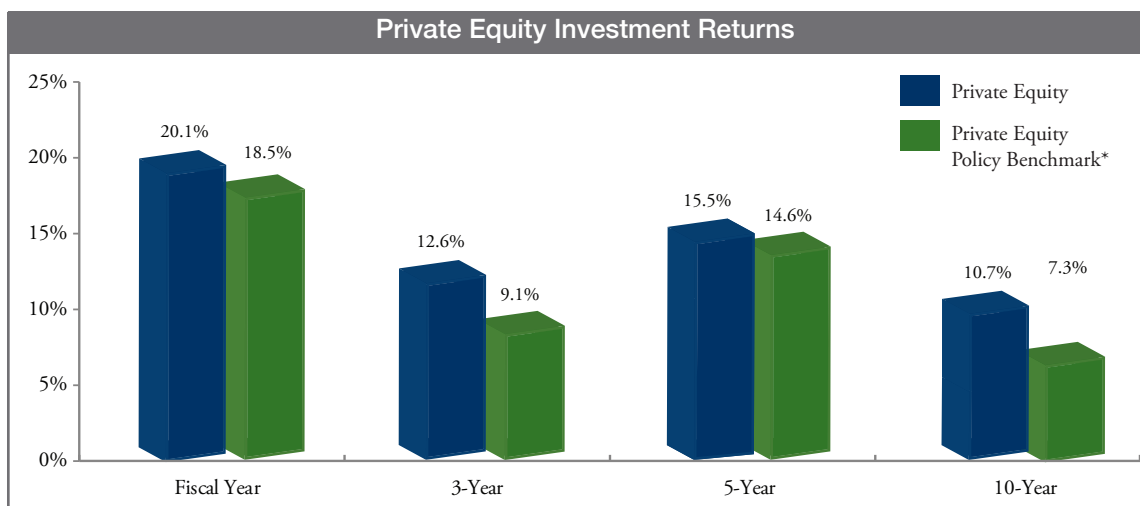


## Market Overview

The Private Equity Program continued to perform well in fiscal year 2017. Global IPO issuances and merger and acquisition activity for private equity companies was strong throughout the year. Private equity firms capitalized on the robust exist markets to sell their portfolio companies and return capital to limited partners.

## Performance

The total return for the Private Equity program was 20.1%, compared to the benchmark return of 18.5% for the fiscal year ended June 30, 2017. While short-term returns are not overly insightful for the Private Equity Program in comparison to its benchmark, the one-year return exceeded the benchmark by 160 basis points. The private equity benchmark utilizes a liquid public equity index (Russell 3000 Index) to measure an illiquid (private equity) asset class. As such, there could be significant performance differences over short time periods in volatile markets. Due to the long term nature of the asset class, the performance of a private equity portfolio can be more appropriately judged over a longer timeframe. As the table below indicates, the Private Equity portfolio has produced excellent absolute and relative returns over all time periods. The ten-year return exceeded the benchmark by 340 basis points. These excess returns are net of fees and expenses.



### Private Equity Statistical Performance

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Private Equity Return	20.1%	12.6%	15.5%	10.7%
Annualized Policy Benchmark Return*	18.5%	9.1%	14.6%	7.3%
Excess Return	1.6%	3.5%	0.9%	3.4%

\*The Private Equity Policy Benchmark is the Russell 3000 Index.



## Investment Advisors

As of June 30, 2017, the Systems had committed to 112 separate partnerships with 47 firms within the Private Equity asset class. In fiscal year 2017, the Systems committed to 21 new partnerships for \$1.5 billion. Additionally, the Systems received total distributions from the private equity partnerships of approximately \$880 million in fiscal year 2017.

Private Equity Investment Advisors				
Investment Advisor	Investment Style	Fair Value*	As of June 30, 2017	% of Total Fair Value
Advent International GPE VII-B and VIII	Acquisition - Medium	\$	61,181,992	0.1%
Baring Asia VI	Acquisition - Medium		16,632,254	0.0%
BC European IX	Acquisition - Medium		35,900,374	0.1%
Blackstone Capital Partners V and VI	Acquisition - Large		30,440,452	0.1%
Canaan Partners IX and X	Venture Capital		38,843,011	0.1%
Carlyle Europe Partners III	Acquisition - Medium		7,047,301	0.0%
Carlyle Partners IV, V and VI	Acquisition - Large		40,910,837	0.1%
Centerbridge Capital Partners I, II and III	Acquisition & Debt		50,253,443	0.1%
Centerbridge Capital Special Credit Partners II and III	Debt - Distressed		23,875,059	0.1%
Coller International Partners VII	Secondary Fund		11,346,816	0.0%
CVC Capital Partners VI	Acquisition - Large		34,016,285	0.1%
CVC European Equity Partners IV and V	Acquisition - Large		12,819,096	0.0%
CVC European Equity Tandem Fund	Acquisition - Large		301,066	0.0%
Encap VIII Co-Investors, IX, Flatrock III and Energy fund X	Acquisition - Energy		69,346,939	0.2%
Exponent Partners II	Acquisition - Medium		6,167,574	0.0%
First Reserve Fund XI and XII	Acquisition - Energy		11,042,486	0.0%
Genstar Capital Partners V and VIII	Acquisition - Medium		2,981,267	0.0%
Glendon Opportunities Fund	Debt - Distressed		23,393,005	0.1%
GTCR Fund IX, XI and X	Acquisition - Medium		60,401,983	0.1%
Hellman & Friedman Capital Partners VI, VII and VIII	Acquisition - Large		55,024,979	0.1%
Insight Venture Partners IX	Acquisition - Technology		23,278,756	0.1%
Institutional Investment Partners XV	Venture Capital		11,254,482	0.0%
Kelso Investment Associates VIII	Acquisition - Medium		19,901,663	0.1%
KKR 2006 Fund	Acquisition - Large		16,981,744	0.0%
KRG Fund IV	Acquisition - Medium		7,629,646	0.0%
Lexington Capital Partners VI-B, VII and VIII	Secondary Fund		140,640,725	0.3%
Madison Dearborn VI and VII	Acquisition - Large		31,149,547	0.1%
Montagu III and IV	Acquisition - Medium		28,069,437	0.1%
Nordic VII and VIII	Acquisition - Medium		54,788,062	0.1%
New Enterprise Associates 14, 15, 16 and XIII	Venture Capital		145,361,714	0.4%
Oak Investment Partners XIII	Venture Capital		26,467,726	0.1%
OCM Principal Opportunities Fund IV, VII, VIIb and IX	Debt - Distressed		31,030,310	0.0%
Odyssey Investment Partners IV and V	Acquisition - Medium		24,931,201	0.1%
Onex Partners II, III, IV and ONCAP IV	Acquisition - Medium		53,633,766	0.1%
Pantheon Global Secondary Fund III and IV	Secondary Fund		54,249,042	0.1%
Pathway Capital Management	Fund-of-Funds		1,642,735,087	3.9%
Paul Capital Partners IX	Secondary Fund		24,038,562	0.1%
Permira IV, V and VI	Acquisition - Large		40,828,555	0.1%
Providence Equity Partners VI	Acquisition - Medium		17,170,144	0.0%
Quad-C Partners IX and VIII	Acquisition - Medium		46,784,911	0.1%
Quantum Energy Partners V, V-C, VI, VII and VI-C	Acquisition - Energy		64,696,444	0.2%
The Resolute Fund II and III	Acquisition - Medium		32,915,262	0.1%
Silver Lake Partners III	Acquisition - Technology		18,100,235	0.1%
Spectrum Equity Investors VI and VII	Acquisition - Medium		27,034,812	0.1%
TA XI and XII	Acquisition - Large		33,552,607	0.1%
TCV IX, VI, VII and VIII	Venture Capital		85,383,271	0.2%
Thoma Bravo Discover Fund	Acquisition - Medium		5,426,496	0.0%
Thoma Bravo Fund XII	Acquisition - Large		16,217,734	0.0%
Thoma Bravo Special Opps Fund II	Acquisition - Medium		35,539,628	0.1%
Thoma Cressey Fund VIII	Acquisition - Medium		434,862	0.0%
TPG Partners V and VI	Acquisition - Large		24,157,811	0.1%
Vista Equity Partners V, VI and Foundation III	Acquisition - Medium		68,475,500	0.1%
Wayzata Opportunities Fund I, II and III	Debt - Distressed		19,322,148	0.1%
Wind Point Partners VI and VII	Acquisition - Medium		23,852,447	0.1%
Stock distribution account	Public Stocks		1,595,557	0.0%
<b>Total</b>		<b>\$</b>	<b>3,489,556,113</b>	<b>8.4%</b>

\*Market values are reported by the Systems' Private Equity advisors. Market values reflect the most current net asset values. In instances where the most current net asset values were not as of June 30, 2017, the net asset values utilized were cash flow adjusted through June 30, 2017.

## Private Credit Program Summary

As of June 30, 2017, the Private Credit assets had a market value of approximately \$280 million, representing 0.7% of total assets.

### Investment Program Description

Investments in Private Credit are similar to Private Equity investments in that they are typically very long-term in nature, not publicly traded, relatively illiquid, and offer the potential for substantially higher returns (along with a commensurate level of risk). The Private Credit portfolio also differs from the Private Equity portfolio, and is a separate and distinct composite within Private Risk Assets. The Private Credit asset class is comprised primarily of debt-related investments that provide a current yield along with equity participation (usually warrants) referred to as an 'equity kicker.' Primary strategies are distressed debt, bankruptcy restructurings, mezzanine debt, bank loans, and other credit-driven or debt-related investment strategies. Investments can be made in the U.S. or foreign countries. In total, the allocation to Non-U.S. Private Credit investments will not exceed 40% of the overall Private Credit target allocation. The risks associated with Private Credit will be viewed both in isolation and within the context of the entire fund.

### Structure

As of June 30, 2017, Private Credit assets committed\* for investment were \$1.2 billion. The market value of funds that have been drawn down and actually invested as of June 30, 2017 was approximately \$280 million, representing 0.7% of total assets. The Systems' private credit investment commitments that have not yet been funded were approximately \$363 million as of June 30, 2017.

The objective for the Systems' allocation to Private Credit is to achieve returns that are higher than those attainable in the public markets with the added benefit of diversification. The long-term and illiquid nature of the Private Credit asset class dictates that capital must be invested at a measured pace. Pathway Capital Management has been retained

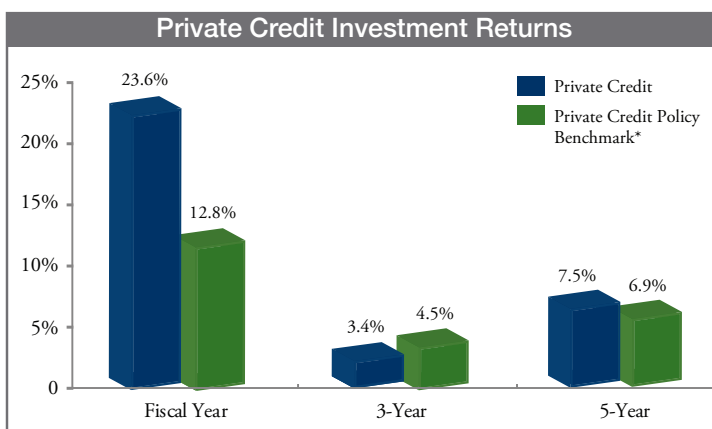
by the Systems to provide private credit investment management services through two structures; a discretionary fund-of-funds relationship and an advisory relationship. Albourne America, LLC has also been retained to provide private credit advisory services.

### Market Overview

Private Credit markets generated strong performance in fiscal year 2017, driven by narrowing credit spreads, a rebound in the energy sector and improving default rates. The recent volatility in financial markets has led to attractive investment opportunities in the private credit space this year.

### Performance

The total return for the Private Credit program was 23.6%, compared to the benchmark return of 12.8% for the fiscal year ended June 30, 2017. Short-term returns can be volatile for the Private Credit Program in comparison to a public benchmark, as discussed previously; private assets are more appropriately evaluated over longer time frames.



**Private Credit Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Private Credit Return	23.6%	3.4%	7.5%
Annualized Policy Benchmark Return*	12.8%	4.5%	6.9%
Excess Return	10.8%	-1.1%	0.6%

\*The Private Credit Policy Benchmark is the Merrill Lynch High Yield Master II Index. The Private Credit Program was established in December 2007, so ten-year returns are not available.

\* Committed capital reflects the total amount of capital that the Systems are legally obligated to supply to the partnerships and funds as the capital is needed to invest in underlying holdings. Market value reflects capital that has actually been drawn and invested by the partnerships and funds.

## Investment Advisors

As of June 30, 2017, the Systems had committed to 17 separate partnerships with 13 firms within the Private Credit asset class. Three new commitments were made to the Private Credit asset class during fiscal year 2017 for \$235 million. The Systems received total distributions from the private credit partnerships of approximately \$102 million in fiscal year 2017.

<b>Investment Advisor</b>	<b>Investment Style</b>	<b>Fair Value* As of June 30, 2017</b>	<b>% of Total Fair Value</b>
Avenue Capital Group Fund V	Debt - Distressed	\$ 115,033	0.0%
Bayview Opportunity Domestic V	Debt - Distressed	3,146,581	0.0%
Caltius IV	Debt - Mezzanine	2,025,486	0.0%
Centerbridge Special Capital Partners	Debt - Distressed	3,081,833	0.0%
EIG Energy Fund XVI	Debt - Energy	59,909,303	0.1%
Encap Fund VII	Acquisition - Energy	3,014,776	0.0%
Encap Fund VIII	Acquisition - Energy	17,707,883	0.1%
H.I.G Capital Whitehorse	Debt - Distressed	15,152,767	0.0%
H.I.G Capital Bayside IV	Debt - Distressed	8,683,201	0.0%
HPS Specialty Loan Fund 2016	Debt - Mezzanine	5,142,998	0.0%
Indigo Capital V	Debt - Mezzanine	2,028,320	0.0%
Lone Star Real Estate Fund II	Debt - Distressed	7,938,267	0.0%
OCM Opportunities Fund VIII	Debt - Distressed	7,769,239	0.0%
OCM Opportunities Fund VIII b	Debt - Distressed	19,445,585	0.1%
Pathway Capital Management	Funds-of-Funds	88,402,595	0.2%
TA Subordinated Debt Fund III	Debt - Mezzanine	18,519,167	0.1%
TA Subordinated Debt Fund IV	Debt - Mezzanine	17,823,535	0.1%
<b>Total</b>		<b>\$ 279,906,569</b>	<b>0.7%</b>

*\*Market values are reported by the Systems' Private Credit advisors. Market values reflect the most current net asset values. In instances where the most current net asset values were not as of June 30, 2017, the net asset values utilized were cash flow adjusted through June 30, 2017.*

## Private Real Estate Program Summary

As of June 30, 2017, the Private Real Estate assets had a market value of approximately \$3.2 billion, representing 7.6% of total assets.

### Investment Program Description

The Real Estate allocation is intended to provide exposure to a diversified portfolio of institutional quality private real estate investments that will provide meaningful, consistent returns, and act as a hedge against inflation and as a diversifier to the overall investment portfolio. The specific objectives of the real estate allocation will be to optimize yield and return, preserve capital and enhance portfolio value across market cycles. The risks associated with Private Real Estate will be viewed both in isolation and within the context of the entire fund.

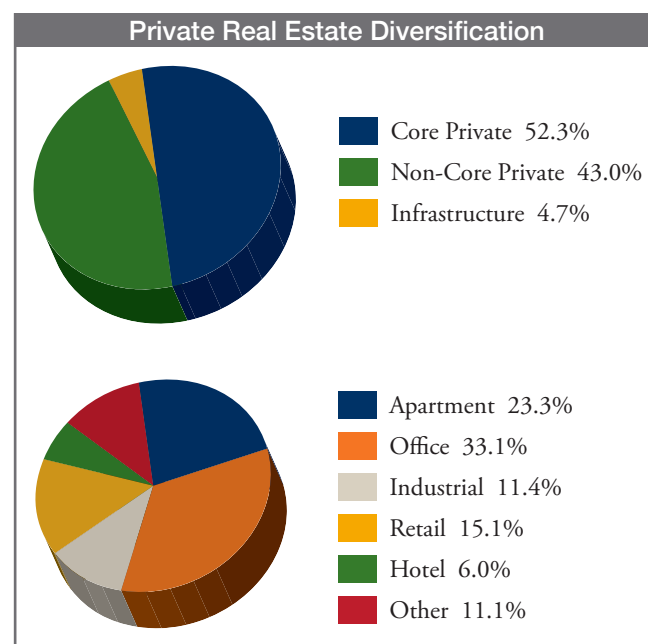
### Structure

As of June 30, 2017, the Systems' private real estate assets committed\* for investment were \$4.2 billion. The market value of funds that had been drawn down and actually invested as of June 30, 2017 was approximately \$3.2 billion, representing 7.6% of total assets. The Systems' private real estate investment commitments that had not yet been funded were approximately \$742 million as of June 30, 2017.

Within the overall Real Estate allocation, the Systems have established a 55% target allocation to non-core real estate and a 45% allocation to core private real estate. Non-Core investments represent those properties and/or investment strategies that require specialized acquisition and management expertise or skill to mitigate the business and leasing risk that may be associated with individual investments. Non-Core investments have greater associated risk compared to Core investments. Core investments include existing, substantially leased income-producing properties located mainly in metropolitan areas that exhibit reasonable economic diversification and growth.

\* Committed capital reflects the total amount of capital that the Systems are legally obligated to supply to the partnerships and funds as the capital is needed to invest in underlying holdings. Market value reflects capital that has actually been drawn and invested by the partnerships and funds.

The following pie charts indicate the current allocation to real estate investment strategies utilizing the market value of the Systems' invested real estate assets and the diversification within the real estate composite by property type.



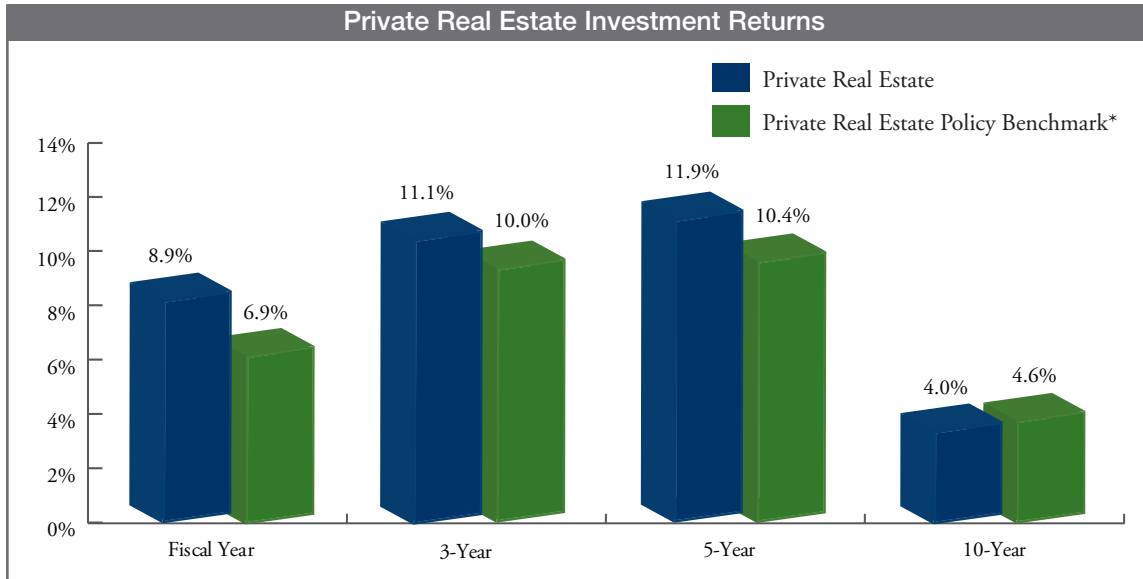
### Market Overview

Real estate fundamentals remained strong for most property types as the U.S. economy continued to expand at a modest pace in fiscal year 2017. Indications of moderating growth are emerging though as commercial real estate sales activity slowed over the last two quarters. Overall, it was a strong year for the real estate markets with the NCREIF Fund Index – Open Diversified Core Equity (NFI-ODCE) returning 6.9% for the fiscal year.

The Systems maintain a sizable allocation to high-quality, stabilized real estate assets (core) due to the secure income return. Additionally, the Systems have an allocation to non-core assets to enhance return to the overall real estate portfolio. The Systems will continue to focus real estate efforts going forward on investments that complement the existing portfolio.

## Performance

The total return for the Private Real Estate program was 8.9%, compared to the benchmark return of 6.9% for the fiscal year ended June 30, 2017. The Systems' Private Real Estate program has produced excellent absolute and relative returns for all time periods as noted below, with the exception of the 10-year time period. The underperformance for the 10-year time period was primarily due to the significant downward pressure on real estate valuations during the credit crisis of 2008 and 2009.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Private Real Estate Return	8.9%	11.1%	11.9%	4.0%
Annualized Policy Benchmark Return*	6.9%	10.0%	10.4%	4.6%
Excess Return	2.0%	1.1%	1.5%	-0.6%

\*Effective January 1, 2016 the Real Estate Policy Benchmark is the NCREIF Open End Diversified Core Equity Index (NFI-ODCE). The NCREIF Property Index is used for prior periods.

## Investment Advisors

As of June 30, 2017, the Systems had committed to 58 separate partnerships with 29 firms within the Private Real Estate asset class. In fiscal year 2017, the Systems committed to four new partnerships totaling \$290 million. Additionally, the Systems received total distributions from the real estate partnerships of approximately \$518 million in fiscal year 2017.

Private Real Estate Investment Advisors				
Investment Advisor	Investment Style	Fair Value*	As of June 30, 2017	% of Total Fair Value
Alinda Infrastructure Fund I	Infrastructure	\$	37,222,131	0.1%
Alterna Core Capital Assets Fund II	Infrastructure		58,307,702	0.1%
Asana Partners Fund I, L.P.	Non-Core - Private		20,798,968	0.1%
AMB Alliance III	Non-Core - Private		73,388,156	0.2%
AEW Core Property Fund	Core - Private		95,313,258	0.2%
Blackstone R.E. Partners V, VI, VII, VIII, and Real Estate Partners Asia	Non-Core - Private		206,042,563	0.5%
Brockton Capital II	Non-Core - Private		27,183,879	0.1%
Carlyle Europe Real Estate Partners III	Non-Core - Private		11,993,845	0.0%
Carlyle Property Investors	Core - Private		138,804,536	0.3%
Carlyle Realty V, VI and VII	Non-Core - Private		124,060,853	0.3%
CBRE Fund IV, US Value 5, US Value 6, US Value 7	Non-Core - Private		55,925,006	0.1%
CIM Fund III and VIII	Non-Core - Private		87,347,829	0.2%
CIM Urban REIT	Non-Core - Private		24,856,205	0.1%
Colony Investors VIII	Non-Core - Private		6,225,100	0.0%
CPI Capital Partners Europe	Non-Core - Private		1,800,956	0.0%
Dune Real Estate Fund I	Non-Core - Private		5,867,948	0.0%
Forum Asian Realty Income II	Non-Core - Private		1,864,964	0.0%
Heitman Value Partners II and III	Non-Core - Private		36,118,601	0.1%
JPMorgan Special Situation Property Fund	Non-Core - Private		154,514,077	0.4%
JPMorgan Strategic Property Fund	Core - Private		337,025,750	0.8%
KKR Real Estate Partners America	Non-Core - Private		38,553,096	0.1%
LaSalle Asia Opportunity Fund II and III	Non-Core - Private		2,896,755	0.0%
LaSalle Income & Growth V	Non-Core - Private		202,588	0.0%
LaSalle Japan Logistics Fund II	Non-Core - Private		142,002	0.0%
LaSalle Property Fund	Core - Private		211,739,621	0.5%
Lone Star V and VI	Non-Core - Private		15,618,503	0.0%
Lone Star Real Estate Fund	Non-Core - Private		2,273,798	0.0%
Lone Star V Co-Investment Fund, L.P.	Non-Core - Private		454,410	0.0%
Macquarie Infrastructure Partners	Infrastructure		48,148,292	0.1%
MSREF V International	Non-Core - Private		1,626,867	0.0%
Morgan Stanley Prime Property Fund	Core - Private		392,653,719	1.0%
Noble Hospitality Fund I and III	Non-Core - Private		34,606,153	0.1%
Principal Enhanced Property Fund	Core - Private		47,483,354	0.1%
Prudential PRISA Fund	Core - Private		178,866,149	0.4%
Prudential PRISA III	Non-Core - Private		86,254,390	0.2%
RREEF America REIT III	Non-Core - Private		479,155	0.0%
Standard Life European Real Estate Fund I, II and III	Non-Core - Private		152,343,493	0.4%
Starwood Hospitality Fund	Non-Core - Private		4,370,117	0.0%
UBS Trumbull Property Fund	Core - Private		341,835,305	0.8%
Westbrook R.E. Fund VII, VIII, IX and X	Non-Core - Private		92,480,203	0.3%
<b>Total</b>			<b>\$3,157,690,297</b>	<b>7.6%</b>

\*Market values are reported by the Systems' Private Real Estate advisors. Market values reflect the most current net asset values. In instances where the most current net asset values were not as of June 30, 2017, the net asset values utilized were cash flow adjusted through June 30, 2017.

**U.S. Public Equity Broker Commissions Report**

<b>Brokerage Firm</b>	<b>Shares Traded</b>	<b>Dollars Traded</b>	<b>Commissions Paid</b>	<b>Cost Per Share</b>
SG Cowen & Co	24,930,215	\$ 990,090,899	\$ 509,061	\$ 0.02
Merrill Lynch	32,209,441	1,249,192,819	444,781	0.01
Barclays Capital, Inc.	11,385,969	508,075,693	295,998	0.03
Weeden & Co	34,690,422	1,587,215,759	234,332	0.01
Instinet, LLC	32,711,562	1,186,109,292	228,432	0.01
Cap Institutional Services	5,113,989	264,669,747	171,246	0.03
Deutsche Bank	22,024,926	819,156,762	145,130	0.01
Investment Technology Group	18,803,834	793,602,462	133,405	0.01
Bank of New York	19,247,145	672,641,872	132,973	0.01
JP Morgan Chase	16,708,664	580,595,818	130,851	0.01
Other (<\$100,000)	130,271,396	4,336,338,243	1,705,517	0.01
<b>Total</b>	<b>348,097,563</b>	<b>\$12,987,689,366</b>	<b>\$ 4,131,726</b>	<b>\$ 0.01</b>

**Non-U.S. Public Equity Broker Commissions Report**

<b>Brokerage Firm</b>	<b>Shares Traded</b>	<b>Dollars Traded</b>	<b>Commissions Paid</b>	<b>Cost (Basis Points)</b>
Instinet, LLC	154,855,535	\$ 875,633,381	\$ 302,927	3.5
Merrill Lynch	132,554,708	480,972,663	225,887	4.7
Goldman Sachs and Company	85,659,285	427,919,767	204,354	4.8
Citigroup Global Markets, Inc.	35,350,511	232,954,216	186,450	8.0
Deutsche Bank	61,194,698	349,968,894	156,457	4.5
JP Morgan Chase	36,323,085	183,166,957	109,659	6.0
Morgan Stanley & Co Incorporated	44,912,793	259,683,557	106,879	4.1
Investment Technology Group	32,254,066	243,882,104	98,717	4.0
Credit Suisse Securities, LLC	491,125,202	105,650,084	90,154	8.5
HSBC Bank	340,059,989	129,177,679	82,241	6.4
Other (<\$75,000)	583,748,993	780,755,452	439,309	5.6
<b>Total</b>	<b>1,998,038,865</b>	<b>\$ 4,069,764,754</b>	<b>\$ 2,003,034</b>	<b>4.9</b>

Investment Summary as of June 30, 2017			
Asset Type	Fair Value	Percent of Total Fair Value	
		FY 2017	FY 2016
<i>Public Risk Assets</i>			
U.S. Public Equity	\$ 12,340,780,790	29.7%	30.7%
Non-U.S. Public Equity	7,143,957,392	17.2%	15.4%
Public Credit	2,878,510,063	6.9%	6.2%
Hedged Assets	5,001,694,915	12.1%	13.4%
<b>Total Public Risk Assets</b>	<b>27,364,943,160</b>	<b>65.9%</b>	<b>65.7%</b>
<i>Safe Assets</i>			
U.S. Treasuries	5,351,369,846	12.9%	14.6%
U.S. TIPS	857,731,901	2.1%	1.4%
Cash Equivalents	861,503,557	2.1%	1.5%
<b>Total Safe Assets</b>	<b>7,070,605,304</b>	<b>17.1%</b>	<b>17.5%</b>
<i>Private Risk Assets</i>			
Private Real Estate	3,157,690,297	7.6%	7.9%
Private Equity	3,489,556,113	8.4%	8.0%
Private Credit	279,906,569	0.7%	0.7%
<b>Total Private Risk Assets</b>	<b>6,927,152,979</b>	<b>16.7%</b>	<b>16.6%</b>
<b>Securities Lending Collateral</b>	<b>19,757</b>	<b>0.0%</b>	<b>0.0%</b>
<b>Cash &amp; Equivalents*</b>	<b>120,921,741</b>	<b>0.3%</b>	<b>0.2%</b>
<b>Total Investments**</b>	<b>\$ 41,483,642,941</b>	<b>100.0%</b>	<b>100.0%</b>
<i>Reconciliation with Financial Statements</i>			
Total from above	\$ 41,483,642,941		
Accrued payable for investments purchased	2,541,434,371		
Accrued income payable	570,135		
Accrued receivable for investments sold	(1,867,718,251)		
Accrued income receivable	(83,223,859)		
Securities lending collateral	(19,757)		
Short-term investments designated for benefits	(117,123,203)		
<b>Statements of Fiduciary Net Position</b>	<b>\$ 41,957,562,377</b>		

\*Managers may hold cash or cash equivalents as part of an active management strategy. Cash or cash equivalents held as part of an active management strategy are not separately listed.

\*\* Total Investments includes accrued income and securities lending collateral as of June 30, 2017.



**Investment Expenses for the Fiscal Year Ended June 30, 2017**
**Investment Managers**
**Investment Management Fees**

NISA Investment Advisors - Core	\$ 3,964,088
NISA Investment Advisors - TIPS	<u>351,415</u>

**Safe Assets Fees**

	4,315,503
NISA Investment Advisors - Corporate	1,269,236
Oaktree Bank Loans	1,830,806
Pacific Investment Management Company	<u>666,562</u>

**Public Credit Fees**

	3,766,604
Analytic Investors, LLC	2,103,611
AQR Capital Management -140/40	2,465,301
Aronson & Johnson & Ortiz	1,523,396
BlackRock Investment Management	180,189
Columbia Management	761,955
Lazard Asset Management	1,387,522
Martingale Asset Management	1,433,050
Westwood Management	2,529,507
Zevenbergen Capital	<u>1,374,019</u>

**U.S. Public Equity Fees**

	13,758,550
Acadian Asset Management	1,169,516
Alliance Bernstein Institutional Management	1,332,201
Analytic Investors, LLC - Global Low Vol	1,312,783
AQR Capital Management	2,047,886
Aronson & Johnson & Ortiz	118,228
Arrowstreet Capital	7,073,156
BlackRock - ACWI EX US	407,686
Coronation Asset Management (Proprietary) Limited	1,953,509
Invesco Advisers, Inc	159,095
MFS Institutional Advisors	3,180,430
Neon Capital Management	2,934,072
NISA Investment Advisors	217,259
The Rock Creek Group	<u>3,039,528</u>

**Non-U.S. Public Equity Fees**

	24,945,349
Allianz	1,449,886
AQR Capital Management	731,326
Blackrock, Inc	37,328
Chartwell Investment Partners	634,440
Columbus Circle	556,349
NISA Investment Advisors	62,517
Next Century Growth Investors	306,648
RBC Global Asset Management	<u>1,052,769</u>

**S-Cap Fees**

	4,831,263
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**Alpha Overlay Fees**

	51,351,920
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**Hedged Assets Fees**

	100,182,999
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**Private Real Estate Fees**

	46,575,280
--	------------

**Private Credit Fees**

	14,690,454
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**Private Equity Fees**

	213,300,397
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**Commission Recapture Income**

	(185,869)
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**Investment Management Expense**

	<u>477,532,450</u>
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**Custodial Services**

State Street Bank & Trust Co.	(204,759)
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JP Morgan Chase, NA	<u>634,569</u>
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**Custodial Fees**

	429,810
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**Investment Consultants**

Albourne America, LLC	750,000
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Pathway Consulting	3,537,800
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Institutional Shareholder Services, Inc.	74,500
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Towers Watson	439,533
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Townsend	<u>350,000</u>
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**Investment Consultant Fees**

	5,151,833
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**Legal Expenses**

	1,198,380
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**Staff Investment Expenses**

	<u>3,708,310</u>
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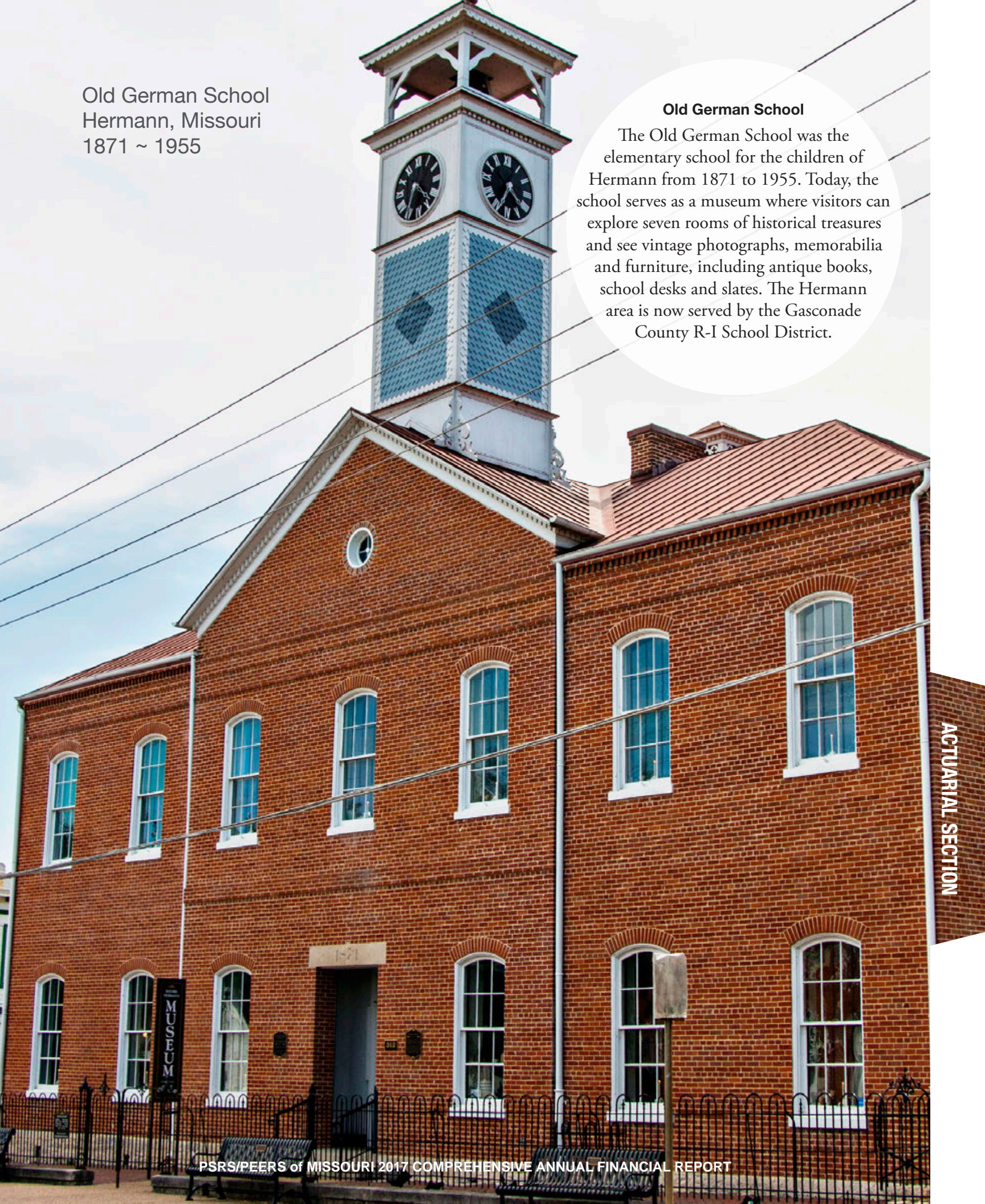
**Total Investment Expenses**

	<u>\$ 488,020,784</u>
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Old German School  
Hermann, Missouri  
1871 ~ 1955

**Old German School**

The Old German School was the elementary school for the children of Hermann from 1871 to 1955. Today, the school serves as a museum where visitors can explore seven rooms of historical treasures and see vintage photographs, memorabilia and furniture, including antique books, school desks and slates. The Hermann area is now served by the Gasconade County R-I School District.



## Actuarial Section

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# Certification of Actuarial Results



November 21, 2017

Board of Trustees  
Public School Retirement System of Missouri  
Public Education Employee Retirement System of Missouri  
3210 West Truman Boulevard  
Jefferson City, MO 65109

**Re: Certification of Actuarial Results as of June 30, 2017**

Dear Members of the Board:

At your request, we have performed actuarial valuations of the Public School Retirement System (“PSRS”) and the Public Education Employee Retirement System (“PEERS”) of Missouri as of June 30, 2017. An actuarial valuation of each System is performed annually for purposes of preparing the required accounting information under Governmental Accounting Standards and for purposes of determining the Actuarial Determined Contribution under the Plan’s funding policy. Our reports have been prepared pursuant to an engagement letter between PSRS and PEERS of Missouri and PwC, and are intended solely for the use and benefits of PSRS and PEERS of Missouri and not for reliance by any other person.

The actuarial valuation is based upon:

- a. *Benefit Provisions* – Our understanding of the benefit provisions in effect on the valuation date under Missouri Revised Statutes Chapter 169.
- b. *Data Relative to the Members of the Systems* - Data for all members of each System as of June 30, 2017 was provided by PSRS and PEERS of Missouri staff (“staff”). PwC relied on the data provided. PwC reviewed the data for reasonableness relative to the prior year’s data, but the data was not audited.
- c. *Assets of the Fund* - The values of the trust fund assets as of the valuation date for each System are also provided by the staff. An actuarial value of assets, with investment gains and losses relative to the assumed return recognized over five years, is used in the development of the contribution rates.
- d. *Actuarial Cost Method* - The actuarial cost method utilized by each System for accounting purposes is the Entry Age Normal, Level Percent method, as required by GASB Statement No. 67. The system has elected to use the same cost method in the determination of the contribution rates for pre-funding the benefits. The objective of this method is to allocate the cost of benefits as a level percentage of pay over the entire career of each member. On a funding basis, any Unfunded Actuarial Accrued Liability (“UAAL”) is separately financed as a level percentage of payroll over a fixed 30-year period, where a new 30-year amortization base is established for the gain or loss that occurred during the year prior to the valuation date.
- e. *Actuarial Assumptions* – For the June 30, 2017 valuation, the actuarial assumptions were adopted by the Board pursuant to an experience study completed in June 2016. The actuarial assumptions used in the June 30, 2017 valuations were the same as the assumptions used in the 2016 valuations, except for the investment return and COLA assumptions, which were updated based on changes to the Board’s funding policy adopted at the November 3, 2017 meeting.

For accounting purposes, the actuarial assumptions and methods used in this valuation were selected and approved by the Board and are in accordance with our understanding of GASB Statement No. 67.

For funding purposes, the actuarial assumption and methods were selected and approved by the Board and are consistent with the funding policy adopted by the Board and summarized below. In general, the methods provide orderly funding of all benefits being accrued, as well as funding of any Unfunded Actuarial Accrued Liability over a period of thirty years. The smoothing method employed in determining the Actuarial Value of Assets may accelerate or lengthen the effective funding period, depending on whether gains or losses are experienced. In our opinion, the actuarial assumptions and methods are reasonable for purposes of the actuarial valuations and meet the parameters set by the Actuarial Standards of Practice.

In order to establish long-term, consistent methods for pre-funding the benefits of each System, the Board of Trustees has adopted a funding policy. The objective is to achieve a funded ratio of 100% over a closed 30-year period. For this purpose, the funded ratio is

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## Certification of Actuarial Results, continued

defined as the Actuarial Value of Assets divided by the Actuarial Accrued Liability determined under the Entry Age Normal Level Percent cost method and the actuarial assumptions adopted by the Board.

The Board has identified the following principles to guide its funding policy:

1. Maintain adequate assets so that current plan assets plus future contributions and investment earnings should be sufficient to fund all benefits expected to be paid to members and their beneficiaries.
2. Maintain stability of contribution rates, consistent with other funding objectives.
3. Maintain public policy goals of accountability and transparency. Each policy element is clear in intent and effect, and each should allow an assessment of whether, how, and when the funding requirements of the plan will be met.
4. Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.
5. Provide a reasonable margin for adverse experience to help offset risks.
6. Review the investment earning assumption in conjunction with the periodic asset / liability study and in consideration of the Board's risk profile.
7. Review demographic and economic assumptions in conjunction with the periodic experience study performed by an actuary.
8. Continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL) while keeping the member and employer contribution rates at or near 14.5% of pay for PSRS and 6.86% of pay for PEERS, the contribution rate first paid during 2011-2012.

The actuarially determined contribution rates developed from the June 30, 2017 valuations reflect these principles.

Trend data in the Financial Section and the following schedules and other data in this Actuarial Section are prepared by the staff with our guidance.

- Schedules of Funding Progress
- Required Contribution Rate and Amortization of Unfunded Liability
- Reconciliation of Unfunded Actuarial Accrued Liability
- Solvency Test
- Schedules of Active Member Valuation Data
- Schedules of Retirees and Beneficiaries Added to and Removed from Retirement Rolls

A range of results, different from those presented in this report could be considered reasonable. Future actuarial measurements may differ significantly from the current measurement presented in this report due to a number of factors including but not limited to: plan experience differing from that anticipated by the economic and demographic assumptions; increases or decreases expected as part of the natural operation of the methods used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); rounding conventions; and changes in plan provisions or applicable law. Due to the limited scope of this report, an analysis of the potential range of such future measurements has not been performed.

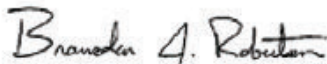
To the best of our knowledge, our actuarial reports are complete and accurate and have been prepared in accordance with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Our calculations also reflect our understanding of the requirements of Missouri state law. The undersigned actuaries are members of the Society of Actuaries and other professional organizations, including the American Academy of Actuaries, and meet the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States relating to pension plans. There is no relationship between the PwC practitioners involved in this engagement and PSRS and PEERS of Missouri that may impair our objectivity.

We certify that the information presented herein is accurate and fairly portrays the actuarial position of the Plans administered by PSRS and PEERS of Missouri as of June 30, 2017 based on the underlying census data, asset information and selected assumptions and methods.

Sincerely,



Cindy Fraterrigo, FSA, EA, MAAA, Principal



Brandon Robertson, ASA, EA, MAAA, Director



Kelly Stolyar, ASA, EA, MAAA, Manager

## Schedule of Funding Progress

## Public School Retirement System of Missouri

*(Dollar amounts in thousands)*

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)-Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
6/30/08	\$ 28,751,241	\$ 34,490,452 <sup>1</sup>	\$ 5,739,211	83.4%	\$ 4,209,417	136.3 %
6/30/09	28,826,075	36,060,121 <sup>1</sup>	7,234,046	79.9%	4,439,381	163.0%
6/30/10	28,931,331	37,233,602 <sup>1</sup>	8,302,271	77.7%	4,493,865	184.7%
6/30/11	29,387,486	34,383,430 <sup>3</sup>	4,995,944	85.5%	4,338,976	115.1%
6/30/12	29,013,002	35,588,030 <sup>1</sup>	6,575,028	81.5%	4,379,060	150.1%
6/30/13	29,443,147	36,758,165 <sup>2</sup>	7,315,018	80.1%	4,460,872	164.0%
6/30/14	31,846,599	38,483,184 <sup>1</sup>	6,636,585	82.8%	4,425,568	150.0%
6/30/15	34,073,415	40,610,540 <sup>1</sup>	6,537,125	83.9%	4,508,242	145.0%
6/30/16	35,419,278	41,744,619 <sup>3</sup>	6,325,341	84.8%	4,556,137	138.8%
6/30/17	37,373,740	44,501,771 <sup>3</sup>	7,128,031	84.0%	4,655,169	153.1%

<sup>1</sup> There were no legislative changes in fiscal years 2008, 2009, 2010, 2012, 2014 and 2015.<sup>2</sup> The extension of the 25-and-out and 2.55% provisions to 2014 are included in the AAL for 2013.<sup>3</sup> There were no legislative changes in fiscal years 2011, 2016 and 2017, however actuarial assumptions were revised.

## Schedule of Funding Progress

## Public Education Employee Retirement System of Missouri

*(Dollar amounts in thousands)*

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)-Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
6/30/08	\$ 2,703,762	\$ 3,278,602 <sup>1</sup>	\$ 574,840	82.5%	\$ 1,377,506	41.7%
6/30/09	2,792,182	3,458,044 <sup>1</sup>	665,862	80.7%	1,417,485	47.0%
6/30/10	2,892,411	3,658,713 <sup>1</sup>	766,302	79.1%	1,433,691	53.4%
6/30/11	3,028,757	3,549,348 <sup>3</sup>	520,591	85.3%	1,414,442	36.8%
6/30/12	3,090,880	3,746,347 <sup>1</sup>	655,467	82.5%	1,437,310	45.6%
6/30/13	3,237,200	3,967,619 <sup>2</sup>	730,419	81.6%	1,470,830	49.7%
6/30/14	3,584,719	4,211,489 <sup>1</sup>	626,770	85.1%	1,442,701	43.4%
6/30/15	3,915,199	4,512,317 <sup>1</sup>	597,118	86.8%	1,469,772	40.6%
6/30/16	4,157,427	4,809,666 <sup>3</sup>	652,239	86.4%	1,519,081	42.9%
6/30/17	4,470,270	5,209,369 <sup>3</sup>	739,099	85.8%	1,558,183	47.4%

<sup>1</sup> There were no legislative changes in fiscal years 2008, 2009, 2010, 2012, 2014 and 2015.<sup>2</sup> The extension of the 25-and-out provision is included in the AAL for 2013.<sup>3</sup> There were no legislative changes in fiscal years 2011, 2016 and 2017, however actuarial assumptions were revised.

**Required Contribution Rate & Amortization of Unfunded Liability**

**Public School Retirement System of Missouri**

*For the fiscal year ended June 30, 2017*

	<u>Percentage of Payroll</u>
(1) Normal cost rate	17.02%
(2) Rate needed to fund UAAL	<u>10.27%</u>
(3) Benchmark contribution rate - normal cost plus a rate to fund the UAAL over 24.2 years	27.29%
(4) Additional amount towards funding UAAL	<u>1.71%</u>
(5) Recommended rate for FY 2019	<u><u>29.00%</u></u>

**Required Contribution Rate & Amortization of Unfunded Liability**

**Public Education Employee Retirement System of Missouri**

*For the fiscal year ended June 30, 2017*

	<u>Percentage of Payroll</u>
(1) Normal cost rate	10.33%
(2) Rate needed to fund UAAL	<u>3.02%</u>
(3) Benchmark contribution rate - normal cost plus a rate to fund the UAAL over 24.4 years	13.35%
(4) Additional amount towards funding UAAL	<u>0.37%</u>
(5) Recommended rate for FY 2019	<u><u>13.72%</u></u>

## Reconciliation of Unfunded Actuarial Accrued Liability

**Public School Retirement System of Missouri***As of June 30, 2017*

(1) Unfunded actuarial liability as of July 1, 2016		\$ 6,325,341,383
(2) Changes in Unfunded Actuarial Accrued Liability		
a. Impact of Plan Changes	-	
b. Actuarial (Gains)/Losses		
i. From investment	(533,366,759)	
ii. From actuarial liabilities due to assumption changes	1,279,805,826	
iii. From actuarial liabilities due to actual vs. expected COLA	148,014,501	
iv. From actuarial liabilities due to actual vs. expected salary changes	(119,945,970)	
v. From actuarial liabilities due to other demographic experience	<u>(3,584,703)</u>	
vi. Total Unfunded Actuarial Accrued Liability (Gain)/Loss		<u>770,922,895</u>
c. Total New Amortization Bases: (2)(a) + (2)(b)(vi)		(293,682,853)
d. Net Change in Existing Bases Due to Prior Year Contributions, Net of Interest		<u>31,767,394</u>
e. Total changes in Unfunded Actuarial Accrued Liability		802,690,289
(3) Unfunded Actuarial Accrued Liability as of June 30, 2017		<u>\$ 7,128,031,672</u>

## Reconciliation of Unfunded Actuarial Accrued Liability

**Public Education Employee Retirement System of Missouri***As of June 30, 2017*

(1) Unfunded actuarial liability as of July 1, 2016		\$ 652,239,412
(2) Changes in Unfunded Actuarial Accrued Liability		
a. Impact of Plan Changes	-	
b. Actuarial (Gains)/Losses		
i. From investment	(54,777,703)	
ii. From actuarial liabilities due to assumption changes	140,420,925	
iii. From actuarial liabilities due to actual vs. expected COLA	10,487,387	
iv. From actuarial liabilities due to actual vs. expected salary changes	(17,247,753)	
v. From actuarial liabilities due to other demographic experience	<u>2,292,496</u>	
vi. Total Unfunded Actuarial Accrued Liability (Gain)/Loss		81,175,352
c. Total New Amortization Bases: (2)(a) + (2)(b)(vi)		81,175,352
d. Net Change in Existing Bases Due to Prior Year Contributions, Net of Interest		<u>5,684,188</u>
e. Total changes in Unfunded Actuarial Accrued Liability		86,859,540
(3) Unfunded Actuarial Accrued Liability as of June 30, 2017		<u>\$ 739,098,952</u>



**Schedule of Active Member Valuation Data**
**Public School Retirement System of Missouri**

Actuarial Valuation Date	Number of Employers	Number of Members	Covered Annual Payroll (000's)	Average Annual Salary	% Increase in Average Salary	Average Attained Age	Average Years of Service
6/30/08	542	78,436	\$ 4,209,417	\$ 53,667	4.0%	42.2	11.1
6/30/09	540	79,335	4,439,381	55,957	4.3%	42.2	11.1
6/30/10	538	79,256	4,493,865	56,701	1.3%	42.3	11.3
6/30/11	537	77,708	4,338,976	55,837	-1.5%	42.3	11.5
6/30/12	537	77,529	4,379,060	56,483	1.2%	42.2	11.4
6/30/13	535	78,076	4,460,872	57,135	1.2%	42.1	11.4
6/30/14	535	75,168	4,425,568	58,876	3.0%	42.2	11.8
6/30/15	535	78,138	4,508,242	58,582	-0.5%	42.0	11.5
6/30/16	534	78,129	4,556,137	59,005	0.7%	42.0	11.6
6/30/17	534	78,274	4,655,169	60,643	2.8%	42.0	11.7

**Schedule of Active Member Valuation Data**
**Public Education Employee Retirement System of Missouri**

Actuarial Valuation Date	Number of Employers	Number of Members	Covered Annual Payroll (000's)	Average Annual Salary	% Increase in Average Salary	Average Attained Age	Average Years of Service
6/30/08	536	50,865	\$ 1,377,506	\$ 27,082	4.7%	46.8	7.3
6/30/09	535	51,234	1,417,485	27,667	2.2%	47.1	7.7
6/30/10	535	50,363	1,433,691	28,467	2.9%	47.5	8.0
6/30/11	534	48,800	1,414,442	28,984	1.8%	47.9	8.3
6/30/12	534	48,605	1,437,310	29,571	2.0%	48.1	8.4
6/30/13	532	48,709	1,470,830	30,196	2.1%	48.1	8.5
6/30/14	532	45,589	1,442,701	31,646	4.8%	48.6	8.9
6/30/15	532	46,864	1,469,772	32,220	1.8%	48.4	8.6
6/30/16	530	47,851	1,519,081	32,887	2.1%	48.3	8.6
6/30/17	530	47,953	1,558,183	33,643	2.3%	48.3	8.5

Solvency Test							
Public School Retirement System of Missouri <i>(Dollar amounts in thousands)</i>							
Actuarial Accrued Liability for:							
Actuarial Valuation Date	Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members Employer Financed Portion	Actuarial Value of Assets	Percentage of Actuarial Liabilities Covered by Actuarial Value of Assets for:		
					(1)	(2)	(3)
6/30/08	\$ 6,174,718	\$ 18,548,552	\$ 9,767,182	\$ 28,751,241	100.0%	100.0%	41.2%
6/30/09	6,299,067	19,745,129	10,015,925	28,826,075	100.0%	100.0%	27.8%
6/30/10	6,506,803	20,532,011	10,194,788	28,931,331	100.0%	100.0%	18.6%
6/30/11	6,571,916	20,023,701	7,787,813	29,387,486	100.0%	100.0%	35.8%
6/30/12	6,687,358	21,191,032	7,709,641	29,013,002	100.0%	100.0%	14.7%
6/30/13	6,856,920	22,328,795	7,572,451	29,443,147	100.0%	100.0%	3.4%
6/30/14	6,985,665	23,579,998	7,917,522	31,846,599	100.0%	100.0%	16.2%
6/30/15	6,787,038	24,674,171	9,149,331	34,073,415	100.0%	100.0%	28.6%
6/30/16	6,994,370	25,895,012	8,855,237	35,419,278	100.0%	100.0%	28.6%
6/30/17	7,267,682	27,544,082	9,690,007	37,373,740	100.0%	100.0%	26.4%

Solvency Test							
Public Education Employee Retirement System of Missouri <i>(Dollar amounts in thousands)</i>							
Actuarial Accrued Liability for:							
Actuarial Valuation Date	Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members Employer Financed Portion	Actuarial Value of Assets	Percentage of Actuarial Liabilities Covered by Net Assets for:		
					(1)	(2)	(3)
6/30/08	\$ 650,970	\$ 1,215,036	\$ 1,412,596	\$ 2,703,762	100.0%	100.0%	59.3%
6/30/09	693,962	1,305,025	1,459,057	2,792,182	100.0%	100.0%	54.4%
6/30/10	743,146	1,392,753	1,522,813	2,892,411	100.0%	100.0%	49.7%
6/30/11	783,112	1,398,620	1,367,616	3,028,757	100.0%	100.0%	61.9%
6/30/12	822,485	1,541,541	1,382,321	3,090,880	100.0%	100.0%	52.6%
6/30/13	862,035	1,653,613	1,451,971	3,237,200	100.0%	100.0%	49.7%
6/30/14	894,650	1,861,575	1,455,264	3,584,719	100.0%	100.0%	56.9%
6/30/15	892,547	2,040,647	1,579,123	3,915,199	100.0%	100.0%	62.2%
6/30/16	926,274	2,205,328	1,678,064	4,157,427	100.0%	100.0%	61.1%
6/30/17	962,156	2,453,877	1,793,336	4,470,270	100.0%	100.0%	58.8%

**PSRS Schedule of Retirees and Beneficiaries Added to and Removed from Retirement Rolls**

	Added to Rolls		Removed from Rolls		Rolls End of Year		Average Annual Allowances	% Increase		
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		in Annual Allowance	in Average Annual Allowance	
<b>2016-2017</b>										
Service Retirees	2,601	\$ 97,816,017	1,042	\$ 36,450,990	54,629	\$ 2,276,325,975	\$ 41,669	2.73 %	-0.21 %	
Disability Retirees	56	1,525,607	30	585,716	981	26,584,277	27,099	2.83	0.31	
Beneficiaries	345	2,304,287	203	5,520,642	4,162	124,990,237	30,031	6.00	1.72	
<i>Note: As noted on page 124, other adjustments to 1 service retiree, 2 disability retirees and 26 beneficiaries occurred during the current year.</i>										
<b>2015-2016</b>										
Service Retirees	2,603	\$ 94,495,423	883	\$ 30,442,764	53,069	\$ 2,215,921,481	\$ 41,755	5.03 %	1.62 %	
Disability Retirees	83	2,292,574	23	524,458	957	25,852,085	27,014	9.35	1.92	
Beneficiaries	311	9,947,411	190	4,077,020	3,994	117,916,972	29,524	6.53	3.60	
<i>Note: Other adjustments to 4 service retirees, 5 disability retirees and 11 beneficiaries occurred during the 2015-2016 fiscal year.</i>										
<b>2014-2015</b>										
Service Retirees	2,571	\$ 92,740,440	933	\$ 30,965,898	51,345	\$ 2,109,756,890	\$ 41,090	5.07 %	1.61 %	
Disability Retirees	74	2,034,400	41	909,636	892	23,641,506	26,504	6.55	2.25	
Beneficiaries	351	10,810,471	387	4,706,760	3,884	110,685,031	28,498	7.82	7.48	
<i>Note: Effective June 30, 2015, retirees and beneficiaries with their benefits on hold are included in the payment rolls at year-end.</i>										
<b>2013-2014</b>										
Service Retirees	2,906	\$ 110,291,762	848	\$ 27,701,354	49,652	\$ 2,007,864,810	\$ 40,439	6.31 %	1.91 %	
Disability Retirees	59	1,461,178	45	827,024	856	22,188,843	25,922	3.82	2.12	
Beneficiaries	303	9,030,545	186	3,874,901	3,872	102,660,521	26,514	6.72	3.50	
<i>Note: 106 retirees and beneficiaries had their benefit on hold at June 30, 2014 and are not included in the payment rolls at the end of the year.</i>										
<b>2012-2013</b>										
Service Retirees	2,659	\$ 98,663,536	907	\$ 27,431,830	47,594	\$ 1,888,628,855	\$ 39,682	5.92 %	2.02 %	
Disability Retirees	69	1,808,376	28	627,785	842	21,372,682	25,383	7.58	2.33	
Beneficiaries	376	9,380,442	185	3,088,202	3,755	96,196,708	25,618	8.55	3.02	
<i>Note: 115 retirees and beneficiaries had their benefit on hold at June 30, 2013 and are not included in the payment rolls at the end of the year.</i>										
<b>2011-2012</b>										
Service Retirees	2,946	\$ 108,593,761	822	\$ 25,293,380	45,842	\$ 1,783,144,601	\$ 38,898	6.92 %	1.97 %	
Disability Retirees	70	1,628,482	30	618,063	801	19,867,641	24,804	7.17	1.82	
Beneficiaries	310	11,791,505	181	3,489,331	3,564	88,623,659	24,866	7.27	3.39	
<i>Note: 137 retirees and beneficiaries had their benefit on hold at June 30, 2012 and are not included in the payment rolls at the end of the year.</i>										

**PEERS Schedule of Retirees and Beneficiaries Added to and Removed from Retirement Rolls**

	Added to Rolls		Removed from Rolls		Rolls End of Year		Average Annual Allowances	% Increase		
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		in Annual Allowance	in Average Annual Allowance	
<b>2016-2017</b>										
Service Retirees	2,023	\$ 23,078,805	752	\$ 4,631,306	26,335	\$ 230,438,067	\$ 8,750	7.36 %	2.16 %	
Disability Retirees	46	313,598	23	109,268	804	4,388,588	5,458	4.54	1.68	
Beneficiaries	207	1,335,560	88	451,434	1,863	10,991,043	5,900	8.14	1.01	
<i>Note: As noted on page 125, other adjustments to 3 service retirees, 1 disability retiree and 4 beneficiaries occurred during the current year.</i>										
<b>2015-2016</b>										
Service Retirees	1,903	\$ 20,486,168	746	\$ 4,299,969	25,061	\$ 214,643,511	\$ 8,565	8.59 %	3.57 %	
Disability Retirees	53	333,484	31	149,572	782	4,198,147	5,368	5.38	3.35	
Beneficiaries	192	1,254,525	90	413,164	1,740	10,163,757	5,841	11.60	4.60	
<i>Note: Other adjustments to 4 service retirees, 7 disability retirees and 7 beneficiaries occurred during the 2015-2016 fiscal year.</i>										
<b>2014-2015</b>										
Service Retirees	1,886	\$ 20,303,553	742	\$ 4,999,606	23,900	\$ 197,661,001	\$ 8,270	9.23 %	3.62 %	
Disability Retirees	62	373,039	30	183,496	767	3,983,823	5,194	7.38	2.49	
Beneficiaries	171	1,199,171	78	371,236	1,631	9,107,407	5,584	11.51	5.08	
<i>Note: Effective June 30, 2015, retirees and beneficiaries with their benefits on hold are included in the payment rolls at year-end.</i>										
<b>2013-2014</b>										
Service Retirees	1,943	\$ 20,062,595	704	\$ 3,843,918	22,673	\$ 180,951,822	\$ 7,981	10.14 %	4.12 %	
Disability Retirees	66	360,139	39	195,300	732	3,710,104	5,068	6.19	2.26	
Beneficiaries	165	911,764	71	263,425	1,537	8,167,504	5,314	9.61	2.90	
<i>Note: 87 retirees and beneficiaries had their benefit on hold at June 30, 2014 and are not included in the payment rolls at the end of the year.</i>										
<b>2012-2013</b>										
Service Retirees	1,674	\$ 16,712,855	694	\$ 4,168,985	21,434	\$ 164,297,318	\$ 7,665	8.23 %	3.27 %	
Disability Retirees	69	408,169	29	158,081	705	3,493,840	4,956	9.21	3.01	
Beneficiaries	164	1,155,936	77	357,536	1,443	7,451,611	5,164	13.14	6.32	
<i>Note: 92 retirees and beneficiaries had their benefit on hold at June 30, 2013 and are not included in the payment rolls at the end of the year.</i>										
<b>2011-2012</b>										
Service Retirees	1,747	\$ 17,066,211	647	\$ 3,356,576	20,454	\$ 151,802,237	\$ 7,422	10.26 %	4.33 %	
Disability Retirees	69	405,024	21	86,830	665	3,199,134	4,811	12.69	4.56	
Beneficiaries	151	800,248	58	254,077	1,356	6,586,250	4,857	10.13	2.58	
<i>Note: 87 retirees and beneficiaries had their benefit on hold at June 30, 2012 and are not included in the payment rolls at the end of the year.</i>										

## PSRS Summary Plan Description

The Public School Retirement System of Missouri (PSRS) became operative July 1, 1946. It was established by an Act of the Missouri Legislature and is governed by Chapter 169 of the Revised Statutes of Missouri. Its purpose is to provide benefits to members and their dependents at retirement or in the event of death or disability prior to retirement.

PSRS is a defined benefit plan funded on an actuarial reserve basis, which establishes the availability of funds to pay benefits as prescribed by law. The System is established as an independent trust fund and is not subject to direction by any state agency. Administrative expenses are paid entirely out of investment earnings.

**Administration** – The administration of PSRS is vested in a seven-member Board of Trustees, composed of three elected PSRS members, one elected Public Education Employee Retirement System of Missouri (PEERS) member, and three appointed trustees. The four elected trustees are selected by vote of the members and retirees of both Systems. Two are elected each even-numbered calendar year to serve four-year terms. The three appointed trustees, one of whom must be a PSRS or a PEERS retiree, are named by the governor to serve four-year terms. The appointed trustees must be residents of school districts included in the System but not employees of such districts nor state employees nor state elected officials.

The Board appoints an executive director who is responsible for employment of the retirement office staff, routine operation of the System, and acts as an advisor to the Board on all matters pertaining to the System.

**Member Participation** – PSRS membership is automatic for certificated, full-time employees of public school districts in Missouri (except the St. Louis city and the Kansas City school districts), public two-year colleges in Missouri, PSRS and certain statewide non-profit educational associations that have previously elected to join. Non-profit educational associations are no longer allowed to join the System. Certificated, part-time employees whose services would qualify them for membership in PEERS are contributing members of PSRS unless PEERS membership is elected. The vast majority of PSRS members are not covered by Social Security. However, there are a few exceptions

due to specific guidance from the Social Security Administration. Those members who are also covered by Social Security contribute to PSRS at two-thirds the rate of other members and receive two-thirds benefits.

Members working in covered employment are considered active members. Such members contribute 14.5% of total retirement salary to PSRS. The contributions are deducted and remitted by the employer and are credited by PSRS to individual member accounts. Since July 1, 1989, member contributions have been tax-deferred for federal and state income tax purposes under IRS 414(h) (2). Contributions are not considered income for such purposes until they are paid as a lump-sum refund or monthly benefits.

Interest at a rate set each year by the Board of Trustees is credited to individual member accounts each June 30 on the previous June 30 balance. The interest rate set annually by the board, was 1% on June 30, 2017. Since PSRS is a defined benefit plan, benefits are based upon the member's final average salary and years of service. The amount of interest credited to a member's account has no bearing on the monthly benefit amount payable at retirement.

In addition to service earned for covered employment, members may purchase service in various categories including several types of leave, out-of-state school service, other public and private employment, active U.S. military duty, and service under the federal Uniformed Services Employment and Re-Employment Rights Act of 1994 (USERRA).

Members who have contributions on deposit with PSRS but are not working in covered employment are considered inactive members.

**Employer Participation** – The employers served by PSRS withhold members' contributions from salary payments and contribute an amount equal to those contributions at a current rate of 14.5% of payroll. Employer contributions and investment earnings on those funds are placed by PSRS in a general reserve account to pay monthly benefits to retirees and to beneficiaries of deceased members. Employers are responsible for remitting contributions promptly and for furnishing contribution information and new membership information to PSRS. Employers also provide needed data when members apply for monthly benefits or for refunds upon termination of employment.

**Survivor Benefits** – The designated beneficiary of a member who dies before retirement is eligible for a lump-sum refund of the member’s contributions and interest. If the beneficiary is an eligible dependent and the member dies while in covered employment with at least two years of service, or while eligible for disability retirement benefits, monthly survivor benefits based on a percentage of the member’s salary for the last full year of covered service can be elected instead of a lump-sum refund. Monthly survivor benefits may also be payable to qualified dependents of an inactive member who has at least five years of service.

In lieu of a lump-sum refund or monthly survivor benefits, survivors with an insurable interest and beneficiaries of disability retirees may elect to receive monthly benefits under the Joint-and-Survivor 100% benefit plan. Such benefits are payable when the member would have been eligible for early or normal service retirement.

**Refund of Contributions** – Member contributions and interest are fully refundable upon termination of covered employment or death. All service and benefit rights are forfeited upon voluntary refund or automatic termination of membership.

A member may, upon returning to covered employment, reinstate the service forfeited through termination of a previous membership by repaying the money refunded plus interest.

**Membership Termination** – Membership is terminated by death, retirement, refund of contributions or absence from covered employment by a non-vested member for five consecutive school years.

**Disability Retirement Benefits** – Disability retirement benefits are payable to eligible members who have met service and eligibility requirements and who, because of permanent disability, are unable to earn a livelihood in any occupation. In most instances, the disability retirement benefit is calculated at 50% of the member’s salary for the last full year of service.

**Service Retirement Benefits** – Service retirement benefits are payable to members who have terminated covered employment and have met certain eligibility requirements.

**Benefit Formula** – All service retirement benefits are based on a formula which multiplies final average salary by the applicable benefit factor, by the years of service and, in the case of early retirement, by an age-reduction factor. Final average salary is obtained by dividing the total salaries for the three highest consecutive years of service by 36 months to arrive at a monthly average; the applicable factor is determined by the type of retirement eligibility; total service is the amount accumulated at retirement for covered employment and purchased service; and the age-reduction factor, when applicable, is determined by the age at retirement.

**Normal Retirement** – A member may retire with benefits calculated under the standard (2.5%) benefit factor at age 60 with five years of service, at any age with 30 years of service, or when a combination of age and service equals 80 or more. Between July 1, 2001 and July 1, 2014, a member could retire with a 2.55% benefit factor with 31 or more years of service.

**Early Retirement** – A member may retire with benefits calculated under the standard (2.5%) formula with an age-reduction factor applied, at age 55 with five years of service or at any age with 25 years of service, as long as he or she does not qualify for Rule of 80.

A special provision allows members under age 55 with 25.0 to 29.9 years of service to retire with benefits calculated under a modified benefit factor ranging from 2.2% to 2.4% with no age-reduction factor applied.

**Payment Options** – A retiring member may choose to receive the maximum benefits payable under the Single Life benefit plan, or may elect to receive a reduced benefit under one of three Joint-and-Survivor benefit plans or under one of two Term-Certain benefit plans, to provide survivor benefit coverage in varying degrees after the retiree’s death.

Certain benefit minimums apply to normal or early retirement with 15 or more years of service. The minimums for 15 but fewer than 25 years of service are reduced if a Joint-and-Survivor or a Term-Certain benefit plan is elected and/or if an age-reduction factor is applicable because of early retirement. The minimums for 25 or more years of service are reduced only if a Joint-and-Survivor or a Term-Certain benefit plan is selected.

## PEERS Summary Plan Description

The Partial Lump Sum Option (PLSO) is available to qualified members. This option allows qualified members to choose to have their lifetime monthly benefits actuarially reduced in exchange for the right to also receive a one-time, lump-sum payment at retirement.

**Cost-of-Living Adjustments** – Cost-of-living adjustments (COLAs) are provided beginning the second January after retirement to service and disability retirees, and to Joint-and-Survivor and Term-Certain beneficiaries of deceased retirees. Lifetime COLAs are limited to 80% of the original retirement benefit.

The Department of Labor Consumer Price Index for Urban Consumers (CPI-U) for the previous fiscal year is used as a guideline for the annual COLA which is set by the Board. By law, if the change in CPI-U is 2% or more, the COLA must be at least 2%, but no more than 5%. If the change in CPI-U is between 0% and 2%, the Board may grant a COLA of 0% to 5%. If the change in CPI-U is less than 0%, no increase can be given. If it is more than 5%, the Board is required to give a 5% increase. Under the funding policies adopted by the Board in November 2017. The following applies:

- If the June to June change in the CPI-U is less than 2.00% for consecutive one-year periods, a cost-of-living increase of 2.00% will be granted when the cumulative increase is equal to or greater than 2.00%, at which point the cumulative increase in the CPI-U will be reset to be based on the June value immediately preceding the January 1 at which the 2.00% cost-of-living increase is granted.
- If the June to June change in the CPI-U is greater than or equal to 2.00%, but less than 5.00%, a cost-of-living increase of 2.00% will be granted.
- If the June to June change in the CPI-U is greater than or equal to 5.00%, a cost-of-living increase of 5.00% will be granted.

**Member Handbook** – A *Member Handbook* containing detailed information concerning the retirement program is available on our website or can be obtained from the retirement office upon request.

The Public Education Employee Retirement System of Missouri (PEERS) was established by an Act of the Missouri Legislature to begin operations on November 1, 1965, and is governed by Chapter 169 of the Revised Statutes of Missouri. Its purpose is to provide benefits to members and their dependents at retirement or in the event of death or disability prior to retirement.

PEERS is a defined benefit plan funded on an actuarial reserve basis, which establishes the availability of funds to pay benefits as prescribed by law. The System is established as an independent trust fund and is not subject to direction by any state agency. Administrative expenses are paid entirely out of investment earnings.

**Administration** – The law provides that the responsibility for the operation and administration of the retirement system is vested in the Public School Retirement System of Missouri (PSRS) Board of Trustees sitting as the Board of Trustees for PEERS. The Board is comprised of three elected PSRS members, one elected PEERS member and three appointed trustees. The four elected trustees are selected by vote of the members and retirees of both Systems. Two are elected each even-numbered calendar year to serve four-year terms. The three appointed trustees, one of whom must be a PSRS or a PEERS retiree, are named by the governor to serve four-year terms. The appointed trustees must be residents of school districts included in the System but not employees of such districts nor state employees nor state elected officials.

The Board appoints an executive director who is responsible for employment of the retirement office staff, routine operation of the System, and acts as an advisor to the Board on all matters pertaining to the System.

**Member Participation** – PEERS membership is automatic, regardless of position, for all persons not covered by PSRS who are employed for 20 or more hours a week on a regular basis in a position that normally requires at least 600 hours during the school term by the public school districts in Missouri (except the St. Louis city and the Kansas City school districts), public two-year colleges in Missouri (except St. Louis Community College), PSRS and statewide non-profit educational associations that have elected to join.

Members working in covered employment are considered active members. Such members contribute 6.86% of their total retirement salary to PEERS. The contributions are deducted by the employer and are credited by PEERS to individual member accounts. PEERS members are also covered by Social Security.

PEERS membership can be elected by employees with Missouri educator certificates who work in any position for 17 or more hours weekly but less than full time; however, PSRS membership is automatic if a PEERS election is not made. The election to join PEERS must be filed with the Board within 90 days after entering first time, part-time employment.

Since July 1, 1989, member contributions have been tax-deferred for federal and state income tax purposes under IRC 414(h)(2). Contributions are not considered as income for federal or state income tax purposes until they are paid in a lump-sum refund or in monthly benefits.

Individual accounts are maintained for all PEERS members. Interest is credited each June 30 on the previous June 30 balance. The interest rate, set annually by the Board, was 1% on June 30, 2017. Since PEERS is a defined benefit plan, benefits are based upon the member's final average salary and years of service. The amount of interest credited to a member's account has no bearing on the monthly benefit amount payable at retirement.

In addition to service earned for covered employment, members may purchase service in various categories including several types of leave, out-of-state school service, other public and private employment, active U.S. military duty, and service under the federal Uniformed Services Employment and Re-employment Rights Act of 1994 (USERRA).

Members who have contributions on deposit with PEERS but are not currently working in covered employment are considered inactive members.

**Employer Participation** – The employers served by PEERS withhold members' contributions from salary payments and contribute an amount equal to employee contributions at a current rate of 6.86% of payroll. Employer contributions and investment earnings on those funds are placed in a general reserve account to pay monthly benefits to retirees and to beneficiaries of deceased members. It is the responsibility of the employers to remit contributions promptly and for furnishing contribution information and new membership information to PEERS. Employers also

provide needed data when members apply for benefits or refund of contributions upon termination of employment.

**Survivor Benefits** – When a member dies before retirement, the designated beneficiary becomes eligible for a lump-sum refund of the employee's contributions and interest. In lieu of a lump-sum refund, survivors with an insurable interest and beneficiaries of disability retirees may elect to receive monthly benefits under the Joint-and-Survivor 100% benefit plan. Such benefits are payable when the member would have been eligible for early or normal service retirement.

**Refund of Contributions** – Member contributions and interest are fully refundable upon termination of covered employment or death. All service and benefit rights are forfeited upon voluntary refund or automatic termination of membership.

A member may, upon returning to covered employment, reinstate the service forfeited through termination of a previous membership by repaying the money refunded plus interest.

**Membership Termination** – Membership is terminated by death, retirement, refund of contributions or absence from covered employment by a non-vested member for five consecutive school years.

**Disability Retirement Benefits** – Disability retirement benefits are payable to members who have met service and eligibility requirements and who, because of permanent disability, are unable to earn a livelihood in any occupation. The disability retirement benefit is calculated at 90% of the normal service retirement benefit.

**Service Retirement Benefits** – Service retirement benefits are payable to members who have terminated covered employment and who have met certain eligibility requirements.

**Benefit Formula** – All service retirement benefits are based on a formula which multiplies final average salary by the applicable benefit factor, by the years of service and, in the case of early retirement, by an age-reduction factor. Final average salary is obtained by dividing the total salaries for the three highest consecutive years of service by 36 months to arrive at a monthly average; the applicable factor is determined by the type of retirement eligibility; total service is the amount accumulated at retirement for covered employment and purchased service; and the age-reduction factor, when applicable, is determined by the age at retirement.

Because of the conversion of the System from a formula integrated with Social Security to the present basis, a special “frozen benefit” is in effect for certain members for service prior to July 1, 1973.

**Normal Retirement** – A member may retire with benefits calculated under the standard (1.61%) formula at age 60 with five years of service, at any age with at least 30 years of service, and at the point where the member’s age plus service equals 80 or more (Rule of 80). A member may retire under the standard (1.61%) formula when the member qualifies for Rule of 80 or 30-and-Out and will receive an additional .8% multiplier until reaching minimum eligibility age for Social Security benefits (currently age 62).

**Early Retirement** – A member may retire with benefits calculated under the standard (1.61%) formula with an age-reduction factor applied at age 55 with five years of service, or at any age with 25 years of service, as long as he or she does not qualify for Rule of 80.

A special provision allows members under age 55 with 25.0 to 29.9 years of service to retire with benefits calculated under a modified benefit factor ranging from 1.51% to 1.59% with no age-reduction factor applied.

**Payment Options** – A retiring member may choose to receive the maximum benefits payable under the Single Life benefit plan, or may choose to receive a reduced benefit under one of three Joint-and-Survivor benefit plans or under one of two Term-Certain benefit plans, to provide survivor benefit coverage in varying degrees after the retiree’s death.

Another option, the Accelerated Payment Plan (APP), allows members to receive a higher PEERS benefit prior to minimum Social Security eligibility age (currently age 62). When the minimum Social Security eligibility age is attained, the member’s PEERS benefit is reduced and remains at a reduced level for the remainder of their retirement.

The Partial Lump Sum Option (PLSO) is available to qualified members. This option allows qualified members to choose to have their lifetime monthly benefits actuarially reduced in exchange for the right to also receive a one-time, lump-sum payment at retirement.

**Cost-of-Living Adjustments** – Cost-of-living adjustments (COLAs) are provided starting the fourth January after retirement to service and disability retirees, and to Joint-and-Survivor and Term-Certain beneficiaries of deceased retirees. Lifetime COLAs are limited to 80% of the original retirement benefit.

The Department of Labor Consumer Price Index for Urban Consumers (CPI-U) for the previous fiscal year is used as a guideline for the annual COLA which is set by the Board of Trustees. By law, if the change in CPI-U is 2% or more, the COLA must be at least 2%, but no more than 5%. If the change in CPI-U is between 0% and 2%, the Board may grant a COLA of 0% to 5%. If the change in CPI-U is less than 0%, no increase can be given. If it is more than 5%, the Board is required to give a 5% increase. Under the funding policies adopted by the Board in November 2017. The following applies:

- If the June to June change in the CPI-U is less than 2.00% for consecutive one-year periods, a cost-of-living increase of 2.00% will be granted when the cumulative increase is equal to or greater than 2.00%, at which point the cumulative increase in the CPI-U will be reset to be based on the June value immediately preceding the January 1 at which the 2.00% cost-of-living increase is granted.
- If the June to June change in the CPI-U is greater than or equal to 2.00%, but less than 5.00%, a cost-of-living increase of 2.00% will be granted.
- If the June to June change in the CPI-U is greater than or equal to 5.00%, a cost-of-living increase of 5.00% will be granted.

**Member Handbook** – A *Member Handbook* containing detailed information concerning the retirement program is available on our website or can be obtained from the retirement office upon request.



## PSRS and PEERS Summary of Actuarial Assumptions and Methods

The Board is responsible for the adoption of the Systems’ Funding Policies and assumptions. A summary of the current Funding Policy is included in the Certification of Actuarial Results.

The actuarial assumptions and methods utilized for funding and financial report purposes differ slightly. The primary difference between the two methods is the fact that financial reporting requires the recognition of investment gains at market with no smoothing.

### Inflation

Inflation is assumed to be 2.25% per annum. (effective 6/30/16).

### Payroll Growth

Total payroll growth for PSRS is assumed to be 2.75% per annum, consisting of 2.25% inflation, 0.25% real wage growth due to the inclusion of active health care costs in pension earnings, and 0.25% of real wage growth due to productivity (effective 6/30/16).

Total payroll growth for PEERS assumed to be 3.25% per annum, consisting of 2.25% inflation, 0.50% real wage growth due to the inclusion of active health care costs in pension earnings, and 0.50% of real wage growth due to productivity (effective 6/30/16).

### Individual Salary Growth

#### PSRS

Individual salaries for PSRS are assumed to increase each year with inflation of 2.25%, real wage growth generated by the cost of active health care of 0.25% (since health care costs are included in pension earnings), real wage growth due to productivity of 0.25%, and additional real salary growth for merit, promotion, and seniority (effective 6/30/16).

PSRS – Real Salary Growth						
Service	Inflation	Health Care Cost	Productivity	Merit, Promotion, Seniority	Total Individual Salary Growth	
0	2.25%	0.25%	0.25%	6.75%	9.50%	
1	2.25%	0.25%	0.25%	3.25%	6.00%	
2	2.25%	0.25%	0.25%	3.10%	5.85%	
3	2.25%	0.25%	0.25%	2.95%	5.70%	
4	2.25%	0.25%	0.25%	2.80%	5.55%	
5	2.25%	0.25%	0.25%	2.65%	5.40%	
6	2.25%	0.25%	0.25%	2.50%	5.25%	
7	2.25%	0.25%	0.25%	2.35%	5.10%	
8	2.25%	0.25%	0.25%	2.20%	4.95%	
9	2.25%	0.25%	0.25%	2.05%	4.80%	
10	2.25%	0.25%	0.25%	1.90%	4.65%	
11	2.25%	0.25%	0.25%	1.75%	4.50%	
12	2.25%	0.25%	0.25%	1.60%	4.35%	
13	2.25%	0.25%	0.25%	1.45%	4.20%	
14	2.25%	0.25%	0.25%	1.30%	4.05%	
15	2.25%	0.25%	0.25%	1.23%	3.98%	
16	2.25%	0.25%	0.25%	1.16%	3.91%	
17	2.25%	0.25%	0.25%	1.09%	3.84%	
18	2.25%	0.25%	0.25%	1.02%	3.77%	
19	2.25%	0.25%	0.25%	0.95%	3.70%	
20	2.25%	0.25%	0.25%	0.88%	3.63%	
21	2.25%	0.25%	0.25%	0.81%	3.56%	
22	2.25%	0.25%	0.25%	0.74%	3.49%	
23	2.25%	0.25%	0.25%	0.67%	3.42%	
24	2.25%	0.25%	0.25%	0.60%	3.35%	
25	2.25%	0.25%	0.25%	0.53%	3.28%	
26	2.25%	0.25%	0.25%	0.46%	3.21%	
27	2.25%	0.25%	0.25%	0.39%	3.14%	
28	2.25%	0.25%	0.25%	0.32%	3.07%	
29	2.25%	0.25%	0.25%	0.25%	3.00%	
30+	2.25%	0.25%	0.25%	0.25%	3.00%	

**PEERS**

Individual salaries for PEERS are assumed to increase each year with inflation of 2.25%, real wage growth generated by the cost of active health care of 0.50% (since health care costs are included in pension earnings), real wage growth due to productivity of 0.50%, and additional real salary growth for merit, promotion, and seniority (effective 6/30/16).

PEERS – Real Salary Growth						
Service	Inflation	Health Care Cost	Productivity	Merit, Promotion, Seniority	Total Individual Salary Growth	
0	2.25%	0.50%	0.50%	7.75%	11.00%	
1	2.25%	0.50%	0.50%	3.00%	6.25%	
2	2.25%	0.50%	0.50%	2.50%	5.75%	
3	2.25%	0.50%	0.50%	2.25%	5.50%	
4	2.25%	0.50%	0.50%	2.00%	5.25%	
5	2.25%	0.50%	0.50%	1.90%	5.15%	
6	2.25%	0.50%	0.50%	1.80%	5.05%	
7	2.25%	0.50%	0.50%	1.70%	4.95%	
8	2.25%	0.50%	0.50%	1.60%	4.85%	
9	2.25%	0.50%	0.50%	1.50%	4.75%	
10	2.25%	0.50%	0.50%	1.40%	4.65%	
11	2.25%	0.50%	0.50%	1.30%	4.55%	
12	2.25%	0.50%	0.50%	1.20%	4.45%	
13	2.25%	0.50%	0.50%	1.10%	4.35%	
14	2.25%	0.50%	0.50%	1.00%	4.25%	
15	2.25%	0.50%	0.50%	0.95%	4.20%	
16	2.25%	0.50%	0.50%	0.90%	4.15%	
17	2.25%	0.50%	0.50%	0.85%	4.10%	
18	2.25%	0.50%	0.50%	0.80%	4.05%	
19	2.25%	0.50%	0.50%	0.75%	4.00%	
20+	2.25%	0.50%	0.50%	0.75%	4.00%	

**Investment Return**

It is assumed that investments of the Systems will return a yield of 7.60% per annum, net of system expenses (investment and administrative). (effective 6/30/17).

**Cost-of-Living Adjustments**

The long-term cost-of-living adjustment assumed in the valuation is 1.65% per year, based on the current policy of the Board. The Board policy is as follows:

- If the June to June change in the CPI-U is less than 2.00% for consecutive one-year periods, a cost-of-living increase of 2.00% will be granted when the cumulative increase is equal to or greater than 2.00%, at which point the cumulative increase in the CPI-U will be reset to be based on the June value immediately preceding the January 1 at which the 2.00% cost-of-living increase is granted.
- If the June to June change in the CPI-U is greater than or equal to 2.00%, but less than 5.00%, a cost-of-living increase of 2.00% will be granted.
- If the June to June change in the CPI-U is greater than or equal to 5.00%, a cost-of-living increase of 5.00% will be granted.

The actuarial assumption increases from 1.20% to 1.65% over nine years (from fiscal year 2018 to fiscal year 2027). The COLA applies to service retirements and beneficiary annuities. The COLA does not apply to the benefits for in-service death payable to spouses (where the spouse is over age 60), and does not apply to the spouse with children pre-retirement death benefit, the dependent children pre-retirement death benefit, or the dependent parent death benefit. The total lifetime COLA cannot exceed 80% of the original benefit. Future COLAs for current benefit recipients reflect actual cumulative adjustments granted at the time of valuation. (effective 6/30/17)

**Mortality Rates**

*Active Member Mortality*

**PSRS**

Mortality rates for PSRS active members are based on RP 2006 White Collar Employee Mortality Table, multiplied by an adjustment factor of 0.75 at all ages for both males and females, with static projection using the 2014 SSA Improvement Scale to 2028 (i.e. a 12-year projection from the date first implemented, the approximate duration of the total actuarial accrued liability). Illustrative rates per 1,000 members at various ages are as follows (effective 6/30/16):

PSRS Active Member Mortality		
Age	Male	Female
20	0.196	0.097
30	0.228	0.123
40	0.280	0.224
50	0.851	0.666
60	1.929	1.205
70	6.434	3.579

**PEERS**

Mortality rates for PEERS active members are based on the RP 2006 Total Dataset Employee Mortality Table, multiplied by an adjustment factor of 0.75 at all ages for both males and females, with static projection using the 2014 SSA Improvement Scale to 2028 (i.e. a 12-year projection from the date first implemented, the approximate duration of the total actuarial accrued liability). Illustrative rates per 1,000 members at various ages are as follows (effective 6/30/16):

PEERS Active Member Mortality		
Age	Male	Female
20	0.279	0.114
30	0.325	0.146
40	0.399	0.265
50	1.214	0.789
60	2.751	1.429
70	8.672	4.156

*Service Retiree, Beneficiary and Survivor Mortality*

**PSRS**

Mortality rates for PSRS non-disabled retirees and beneficiaries are based on the RP 2006 White Collar Mortality Table multiplied by the plan specific adjustment factors shown in the table below, with static projections using the 2014 SSA Improvement Scale to 2028 (i.e. a 12-year projection from the date first implemented, the approximate duration of the total actuarial accrued liability). (effective 6/30/16).

PSRS Non-Disabled Retiree and Beneficiary Plan Specific Mortality Adjustment Factors		
Age	Male	Female
<60	1.00	1.00
60-74	0.89	0.66
75-89	1.05	0.91
>=90	1.05	1.16

Illustrative rates per 1,000 members at various ages are as follows (effective 6/30/16):

PSRS Service Retiree, Beneficiary and Survivor Mortality		
Age	Male	Female
40	0.373	0.298
50	2.655	1.982
60	3.639	2.034
70	9.212	6.211
80	34.813	25.742
90	126.672	118.203
100	314.507	310.679
110	465.57	493.661

**PEERS**

Mortality rates for PEERS non-disabled retirees and beneficiaries are based on the RP 2006 Total Dataset Mortality Table multiplied by the plan specific adjustment factors shown in the table below, with static projections using the 2014 SSA Improvement Scale to 2028 (i.e. a 12-year projection from the date first implemented, the approximate duration of the total actuarial accrued liability). (effective 6/30/16).

PEERS Non-Disabled Retiree and Beneficiary Plan Specific Mortality Adjustment Factors		
Age	Male	Female
<60	1.00	1.00
60-74	1.49	0.77
75-89	1.27	1.03
>=90	1.16	1.04

Illustrative rates per 1,000 members at various ages are as follows: (effective 6/30/16):

PEERS Service Retiree, Beneficiary and Survivor Mortality		
Age	Male	Female
40	0.532	0.353
50	3.904	2.642
60	9.060	3.119
70	20.854	8.702
80	50.476	33.375
90	153.099	113.293
100	347.456	278.540
110	514.345	442.593

**Disability Retiree Mortality**

Mortality rates for PSRS and PEERS disabled retirees are based on the RP 2006 Disabled Retiree Mortality Table, with static projections using the 2014 SSA Improvement Scale to 2028 (i.e. a 12-year projection from the date first implemented, the approximate duration of the total actuarial accrued liability).

(effective 6/30/16):

Illustrative rates per 1,000 members at various ages are as follows: (effective 6/30/16).

PSRS and PEERS Disability Retiree Mortality		
Age	Male	Female
40	9.317	4.862
50	19.588	11.367
60	20.817	13.263
70	33.674	24.771
80	68.090	56.760
90	168.008	134.892
100	311.674	275.075
110	443.401	425.570

**Retirement Rates**

Retirement is assumed in accordance with the following rates per 1,000 eligible members (effective 6/30/16):

<b>PSRS Active Member Retirement</b>											
<b>Age</b>	<b>Years of Service</b>										
	<b>&lt;=20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>&gt;=30</b>
<50	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	3.00%	3.00%	3.00%	3.00%	45.00%
50	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	3.00%	3.00%	3.00%	3.00%	45.00%
51	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	3.00%	3.00%	3.00%	20.00%	45.00%
52	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	3.00%	3.00%	20.00%	20.00%	45.00%
53	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	3.00%	30.00%	20.00%	20.00%	45.00%
54	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	30.00%	20.00%	20.00%	20.00%	45.00%
55	5.00%	5.00%	5.00%	5.00%	5.00%	40.00%	20.00%	20.00%	20.00%	20.00%	45.00%
56	3.00%	3.00%	3.00%	3.00%	40.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
57	3.00%	3.00%	3.00%	40.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
58	3.00%	3.00%	40.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
59	3.00%	40.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
60	15.00%	15.00%	15.00%	15.00%	15.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
61	15.00%	15.00%	15.00%	15.00%	15.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
62	15.00%	15.00%	15.00%	15.00%	15.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
63	15.00%	15.00%	15.00%	15.00%	15.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
64	15.00%	15.00%	15.00%	15.00%	15.00%	20.00%	20.00%	20.00%	20.00%	20.00%	45.00%
65	25.00%	25.00%	25.00%	25.00%	25.00%	40.00%	40.00%	40.00%	40.00%	40.00%	45.00%
66	25.00%	25.00%	25.00%	25.00%	25.00%	30.00%	30.00%	30.00%	30.00%	30.00%	45.00%
67	25.00%	25.00%	25.00%	25.00%	25.00%	30.00%	30.00%	30.00%	30.00%	30.00%	45.00%
68	25.00%	25.00%	25.00%	25.00%	25.00%	30.00%	30.00%	30.00%	30.00%	30.00%	45.00%
69	25.00%	25.00%	25.00%	25.00%	25.00%	30.00%	30.00%	30.00%	30.00%	30.00%	45.00%
>=70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

<b>PEERS Active Member Retirement</b>											
<b>Age</b>	<b>Years of Service</b>										
	<b>&lt;=20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>&gt;=30</b>
<50	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	5.00%	5.00%	5.00%	5.00%	30.00%
50	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	5.00%	5.00%	5.00%	5.00%	20.00%
51	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	5.00%	5.00%	5.00%	30.00%	20.00%
52	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	5.00%	5.00%	30.00%	20.00%	20.00%
53	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	5.00%	30.00%	20.00%	20.00%	20.00%
54	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	30.00%	20.00%	20.00%	20.00%	20.00%
55	5.00%	5.00%	5.00%	5.00%	5.00%	30.00%	20.00%	20.00%	20.00%	20.00%	20.00%
56	5.00%	5.00%	5.00%	5.00%	30.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
57	5.00%	5.00%	5.00%	30.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
58	5.00%	5.00%	30.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
59	5.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
60	10.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%
61	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
62	24.00%	24.00%	24.00%	24.00%	24.00%	24.00%	24.00%	24.00%	24.00%	24.00%	24.00%
63	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
64	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
65	26.00%	26.00%	26.00%	26.00%	26.00%	26.00%	26.00%	26.00%	26.00%	26.00%	26.00%
66	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
67	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
68	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
69	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
70	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
71	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
72	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
73	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
74	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
>=75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

### Withdrawal Rates

Termination of membership prior to eligibility for retirement from all causes other than death, disability or retirement is assumed in accordance with the following illustrative rates per 1,000 members: (effective 6/30/16):

PSRS Active Member Withdrawal		PEERS Active Member Withdrawal	
Years of Service	Rate	Years of Service	Rate
0	240.0	0	350.0
1	115.0	1	230.0
2	100.0	2	180.0
3	80.0	3	150.0
4	70.0	4	125.0
5	60.0	5	100.0
10	27.5	10	55.0
15	15.0	15	33.0
20	10.0	20	18.0
25+	0.0	25+	0.0

### Refund of Contributions

Active members who terminate employment with less than five years of service and inactive members with less than five years of service are assumed to take an immediate refund of their contributions.

Active members who terminate employment with five or more years of service, but prior to satisfying the age and service requirements for service retirement, and inactive members with five or more years of service are assumed to select the option that has the greater present value between an immediate refund of their contributions and a life annuity deferred to their earliest retirement age. (effective 6/30/2016).

Active members who terminate employment with five or more years of service and satisfy the age and service requirements for service retirement upon termination, and inactive members with five or more years of service and currently eligible for service retirement are assumed to select an immediate life annuity. (effective 6/30/2016).

### Disability Rates

Retirement for disability prior to age 60 is assumed in accordance with the following illustrative rates per 1,000 eligible members (effective 6/30/16):

PSRS Active Member Disability		PEERS Active Member Disability	
Age	Rates	Age	Rates
25	0.0017%	25	0.0017%
30	0.0080%	30	0.0080%
35	0.0220%	35	0.0016%
40	0.0480%	40	0.0320%
45	0.0780%	45	0.0640%
50	0.1110%	50	0.1220%
55	0.1460%	55	0.2100%

### Interest on Member Accounts

1.00% per annum (effective 6/30/10)

### Service Purchases

A 1.00% load for PSRS and a 1.50% load for PEERS is added to the Normal Cost to account for anticipated losses resulting from service purchases and reinstatements. (effective 6/30/16).

### Provisions for Expenses

There is no specific provision for expenses. The implicit assumption is that administrative expenses are paid from investment income in excess of 7.6% per annum. (effective 6/30/17).

### Dependent Assumptions

(effective 6/30/16)

- **Marriage Assumptions (Pre-retirement)** 70% of male and female members are assumed to be married. Beneficiaries are assumed to be of the opposite sex from the member. Male spouses are assumed to be two years older than that of female spouses.
- **Beneficiary Assumptions (Post-retirement)** Retired members, regardless of gender, are assumed to be three years older than their joint annuitant.

### Survivor Benefits (Pre-retirement PSRS Only)

All active members under age 50 are assumed to have two dependent children. Each child is assumed to receive payments of \$860 per month for 18 years if the member is under age 32, and grading down to zero years if the member is age 50. (effective 6/30/16).

### Return of Unused Member Account Balance

A cash refund feature is included in the valuation of annuity benefits to reflect that cumulative annuity payments to members may not be less than the amount of contributions paid by the member. (effective 6/30/16).

### Actuarial Cost Method

The actuarial cost method is Entry Age Normal - Level Percent of Payroll.

The normal cost is calculated separately for each active member and is equal to the level percentage of payroll needed as an annual contribution from entry age to retirement age to fund projected benefits. The actuarial accrued liability on any valuation date is the accumulated value of such normal costs from entry age to the valuation date (effective 1947).

### Asset Valuation Method

The Actuarial Value of Assets is a smoothed value of assets. The actuarial value at June 30 of the prior year is projected by increasing the amount by 7.75% interest, adding contributions with 7.75% interest for half the year, and subtracting benefit payments for half the year. Twenty percent of the difference between the actual returns at market value for the year and expected return from the projection of the prior year actuarial value, along with corresponding amounts from each of the prior four years is added to the actuarial value. The Actuarial Value of Assets was reset to market value at June 30, 2003. The assumed rate of return was changed to 7.60% effective June 30, 2017, therefore future years will utilize 7.60% in the projections. The methodology remains unchanged. (1994).


### Amortization of Unfunded Actuarial Accrued Liability

Gains and losses occurring from census experience different than assumed and assumption changes are amortized over a 30-year period as a level percent of payroll. A new gain or loss base is established each year based on the additional gain or loss during that year and that base is amortized over a new 30-year period. The purpose of the method is to give a smooth progression of the costs from year to year and, at the same time, provide for an orderly funding of the unfunded liabilities. Increases or decrease in the Actuarial Accrued Liability caused by changes in the benefit provisions are amortized over 20 years, as determined in the 2007 session of the Legislature.

The method for amortizing the unfunded Actuarial Accrued Liability was changed from a rolling 30-year method to the closed 30-year method described above effective June 30, 2011.

For accounting, gains and losses occurring from census experience different than assumed and assumption changes are amortized into expense over the average expected future service of all plan participants (active and inactive). Gains and losses occurring from investment experience different than assumed are amortized into expense over a five year period. The effect of plan changes on the plan liability are fully recognized in expense in the year in which they occur.

*Note: Dates reflect the effective date as adopted by the Board of Trustees. The most recent assumption revisions were approved by the Board of Trustees at their November 2017 meeting. The revised assumptions were used for the June 30, 2017 valuation.*

A photograph of the Historic Mt. Gilead School, a white, single-story building with a gabled roof and a covered porch supported by white columns. The building is surrounded by green trees and a lawn. A circular callout box is overlaid on the left side of the image, containing text about the school's history. The text in the callout box is: 

**Historic Mt. Gilead School**  
First built of logs in 1835, Mt. Gilead School has been rebuilt twice, once in 1844 after it was destroyed by fire, and again in 1879. For decades the school served as an academy offering courses such as Greek, Latin and music, and was the only school west of the Mississippi that continuously held classes throughout the Civil War. It now serves as a historic site. Students in the area today attend the Kearney school district.

Historic Mt. Gilead School  
Kearney, Missouri  
1879 ~ 1946

**Historic Mt. Gilead School**

First built of logs in 1835, Mt. Gilead School has been rebuilt twice, once in 1844 after it was destroyed by fire, and again in 1879. For decades the school served as an academy offering courses such as Greek, Latin and music, and was the only school west of the Mississippi that continuously held classes throughout the Civil War. It now serves as a historic site. Students in the area today attend the Kearney school district.



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## Statistical Summary

### Benefit Recipients

The largest percentage of the Systems' benefit recipients are service retirees. Service retirement benefits are payable to members who have met age and service requirements. The number of PSRS service retirees on the payment rolls increased by 1,560 from 53,069 at June 30, 2016 to 54,629 at June 30, 2017. The number of PEERS service retirees on the payment rolls increased by 1,274 from 25,061 at June 30, 2016 to 26,335 at June 30, 2017.

Disability benefits in PSRS and PEERS are paid to members who are unable to earn a livelihood due to permanent disability and who have met certain eligibility requirements. The number of PSRS disability retirees on the payment rolls increased by 24 from 957 at June 30, 2016 to 981 at June 30, 2017. The number of PEERS disability retirees on the payment rolls increased by 22 from 782 at June 30, 2016 to 804 at June 30, 2017.

In both PSRS and PEERS, beneficiary payments are available to survivors if the retiree elected this option. Three Joint-and-Survivor benefit plans and two Term-Certain benefit plans are available. In PSRS, survivor benefits are also available to designated beneficiaries of members who die before retirement.

The charts on page 120 detail the number of benefit recipients by type and monthly benefit amount for each System.

### Pension Funding

An unfunded actuarial accrued liability (UAAL) for pension benefits generally represents the difference between the present value of all benefits estimated to be payable to plan members as a result of their age, salary, and service through the valuation date and the

actuarial value of plan assets available to pay those benefits. This amount changes over time as a result of changes in accrued benefits, pay levels, rates of return on investments, changes in actuarial assumptions, and changes in the demographics of the employee base. Each year an outside actuary performs a valuation to determine the present value of the benefits payable (actuarial accrued liability) and compares this to the assets available to arrive at the pre-funded status of the Systems.

The charts on page 128 show a comparison of the assets and liabilities of the Systems over time. At June 30, 2017, PSRS was 84.0% pre-funded and PEERS was 85.8% pre-funded. At June 30, 2016, PSRS was 84.8% pre-funded and PEERS was 86.4% pre-funded. The decrease in pre-funded status from the prior year is a result of a reduction in the assumed rate of return and a revision to the cost-of-living assumption. Detailed information on actuarial assumptions, can be found in the Actuarial Section of this report.

### Changes in Fiduciary Net Position

The charts on page 121 detail a 10-year history of the additions (revenue) and deductions (expenses) of the Systems.

Other charts in this section detail demographic information concerning our members and employers.

The data in this section was derived from internal sources and the annual actuarial valuation reports.

**PSRS Summary of Benefit Recipients By Type As of June 30, 2017**

Amount of Monthly Benefit	Service Retirement	Disability Retirement	Beneficiary Recipients				Total
			Disability	Survivors	Beneficiary	Term-Certain	
<\$1,000	4,742	29	211	397	295	6	5,680
\$1,000 - \$1,999	6,321	371	96	166	685	6	7,645
\$2,000 - \$2,999	10,601	421	26	96	748	8	11,900
\$3,000 - \$3,999	13,219	141	3	70	572	1	14,006
\$4,000 - \$4,999	10,239	17	2	41	385	2	10,686
\$5,000 - \$5,999	5,719	1	-	12	194	1	5,927
\$6,000+	3,788	1	-	22	117	-	3,928
<b>Total</b>	<b>54,629</b>	<b>981</b>	<b>338</b>	<b>804</b>	<b>2,996</b>	<b>24</b>	<b>59,772</b>

**PEERS Summary of Benefit Recipients By Type As of June 30, 2017**

Amount of Monthly Benefit	Service Retirement	Disability Retirement	Beneficiary Recipients				Total
			Disability	Survivors*	Beneficiary	Term-Certain	
<\$500	13,699	531	212	-	998	31	15,471
\$500 - \$999	6,444	224	31	-	377	10	7,086
\$1,000 - \$1,999	4,546	49	2	-	167	1	4,765
\$2,000 - \$2,999	1,101	-	-	-	20	2	1,123
\$3,000 - \$3,999	351	-	-	-	10	-	361
\$4,000+	194	-	-	-	2	-	196
<b>Total</b>	<b>26,335</b>	<b>804</b>	<b>245</b>	<b>-</b>	<b>1,574</b>	<b>44</b>	<b>29,002</b>

\* Benefit not available in PEERS.

PSRS Schedule of Changes in Fiduciary Net Position, Last 10 Fiscal Years

(Dollar amounts in thousands)

	Fiscal Year									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Additions by source</b>										
Member contributions	\$ 572,810	\$ 599,582	\$ 636,633	\$ 638,357	\$ 620,214	\$ 665,926	\$ 679,618	\$ 689,187	\$ 704,786	\$ 719,625
Employer contributions	521,242	563,454	594,326	594,732	658,936	634,040	643,763	656,925	670,794	684,858
Investment income	(1,385,701)	(5,301,374)	2,723,032	5,018,519	449,822	3,378,531	4,927,193	1,447,144	533,174	4,104,110
Other income	370	627	867	930	441	20	6	26	6	13
<b>Total additions by source</b>	<b>(291,279)</b>	<b>(4,137,711)</b>	<b>3,954,858</b>	<b>6,252,538</b>	<b>1,729,413</b>	<b>4,678,517</b>	<b>6,250,580</b>	<b>2,793,282</b>	<b>1,908,760</b>	<b>5,508,606</b>
<b>Deductions by type</b>										
<i>Monthly benefits</i>										
Service retirement	1,363,571	1,490,693	1,584,382	1,674,931	1,775,305	1,880,783	1,999,520	2,102,511	2,203,773	2,288,945
Service retirement -PLSO	59,793	74,042	52,117	69,956	69,392	61,062	58,849	37,191	32,365	34,721
Disability	15,599	16,355	17,284	18,406	19,640	21,120	22,138	23,447	25,309	26,379
Beneficiary	64,011	70,518	75,922	82,327	85,894	92,799	100,040	107,109	114,829	121,170
<i>Lump-sum refunds</i>										
Death	7,058	7,274	7,075	7,763	9,295	8,344	7,123	7,712	9,078	8,504
Withdrawal/transfers	39,243	39,134	41,084	45,876	45,161	47,051	48,799	48,226	45,553	42,114
Administrative expenses/other	8,074	10,135	10,430	8,839	8,135	8,714	8,919	10,015	11,563	10,497
<b>Total deductions by type</b>	<b>1,557,349</b>	<b>1,708,151</b>	<b>1,788,294</b>	<b>1,908,098</b>	<b>2,012,822</b>	<b>2,119,873</b>	<b>2,245,388</b>	<b>2,336,211</b>	<b>2,442,470</b>	<b>2,532,330</b>
<b>Changes in plan net position</b>	<b>\$(1,848,628)</b>	<b>\$(5,845,862)</b>	<b>\$ 2,166,564</b>	<b>\$ 4,344,440</b>	<b>\$ (283,409)</b>	<b>\$ 2,558,644</b>	<b>\$ 4,005,192</b>	<b>\$ 457,071</b>	<b>\$(533,710)</b>	<b>\$ 2,976,276</b>

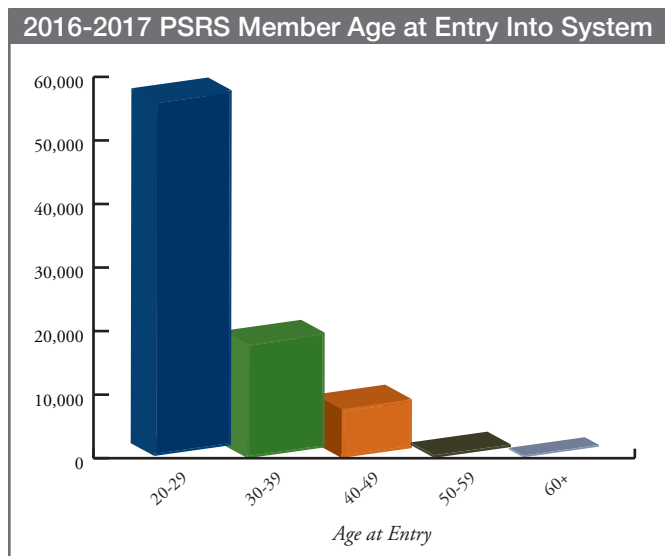
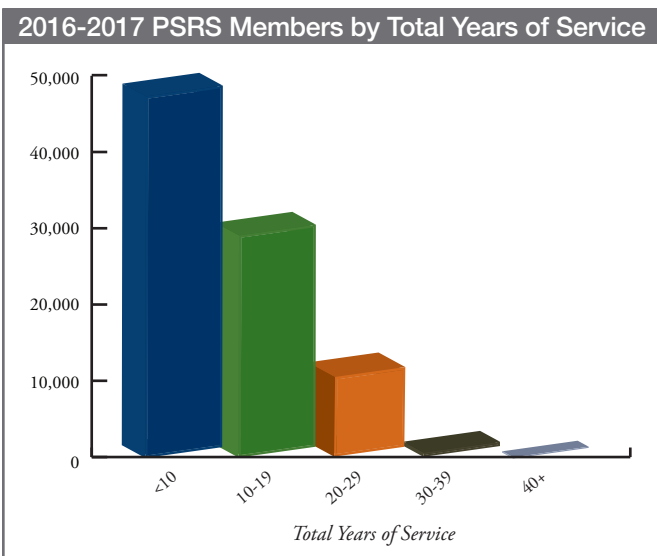
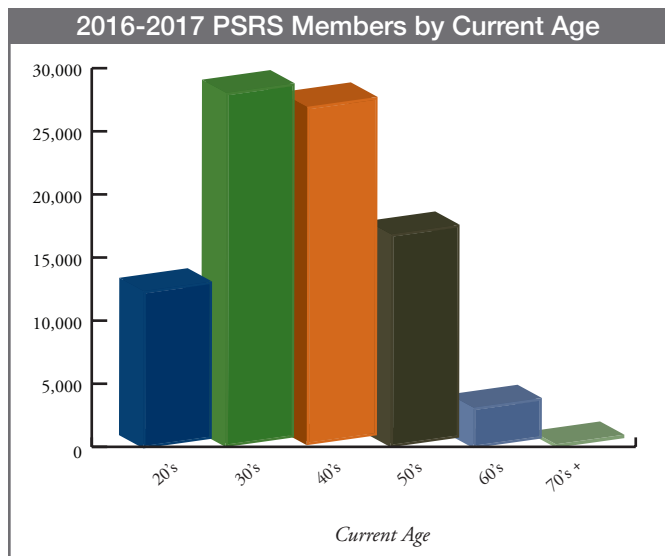
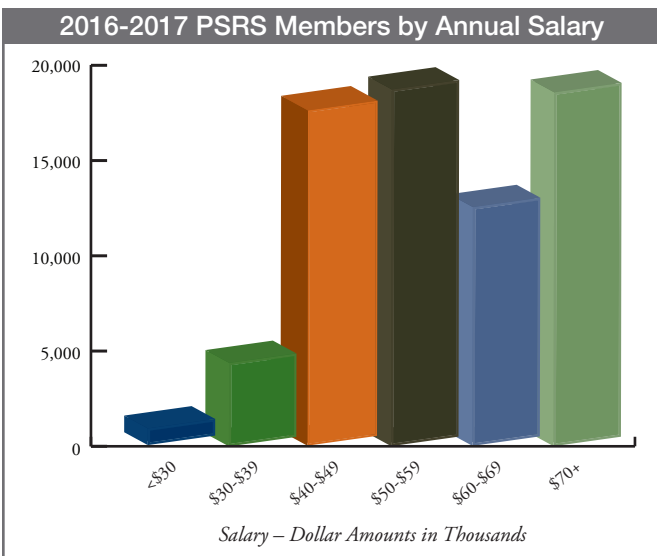
PEERS Schedule of Changes in Fiduciary Net Position, Last 10 Fiscal Years

(Dollar amounts in thousands)

	Fiscal Year									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Additions by source</b>										
Member contributions	\$ 81,370	\$ 89,427	\$ 95,924	\$ 95,792	\$ 95,095	\$ 103,271	\$ 106,430	\$ 110,444	\$ 114,258	\$ 118,447
Employer contributions	77,989	85,916	91,479	90,816	101,930	97,059	100,690	103,624	106,717	111,240
Investment income	(130,619)	(489,552)	261,135	502,934	39,774	353,729	544,154	163,718	60,317	485,047
Other income	-	1	-	-	-	-	1	2	-	-
<b>Total additions by source</b>	<b>28,740</b>	<b>(314,208)</b>	<b>448,538</b>	<b>689,542</b>	<b>236,799</b>	<b>554,059</b>	<b>751,275</b>	<b>377,788</b>	<b>281,292</b>	<b>714,734</b>
<b>Deductions by type</b>										
<i>Monthly benefits</i>										
Service retirement	104,352	115,757	124,928	136,912	150,334	163,134	179,262	195,980	212,327	229,599
Service retirement -PLSO	3,133	3,676	2,972	5,178	7,191	5,006	5,971	6,576	4,410	6,585
Disability	2,125	2,353	2,514	2,798	3,057	3,430	3,665	3,917	4,158	4,313
Beneficiary	4,454	4,881	5,382	5,881	6,363	7,094	7,847	8,769	9,791	10,581
<i>Lump-sum refunds</i>										
Death	675	765	790	1,047	1,113	1,202	1,063	1,418	1,159	1,266
Withdrawal/transfers	14,833	14,908	15,921	17,776	17,357	17,434	18,817	18,410	18,546	16,925
Administrative expenses/other	4,682	5,440	5,280	5,611	5,591	4,803	4,840	5,629	6,981	6,377
<b>Total deductions by type</b>	<b>134,254</b>	<b>147,780</b>	<b>157,787</b>	<b>175,203</b>	<b>191,006</b>	<b>202,103</b>	<b>221,465</b>	<b>240,699</b>	<b>257,372</b>	<b>275,646</b>
<b>Changes in plan net position</b>	<b>\$(105,514)</b>	<b>\$(461,988)</b>	<b>\$ 290,751</b>	<b>\$ 514,339</b>	<b>\$ 45,793</b>	<b>\$ 351,956</b>	<b>\$ 529,810</b>	<b>\$ 137,089</b>	<b>\$ 23,920</b>	<b>\$ 439,088</b>

**PSRS Summary of Changes in Membership During 2016-2017**

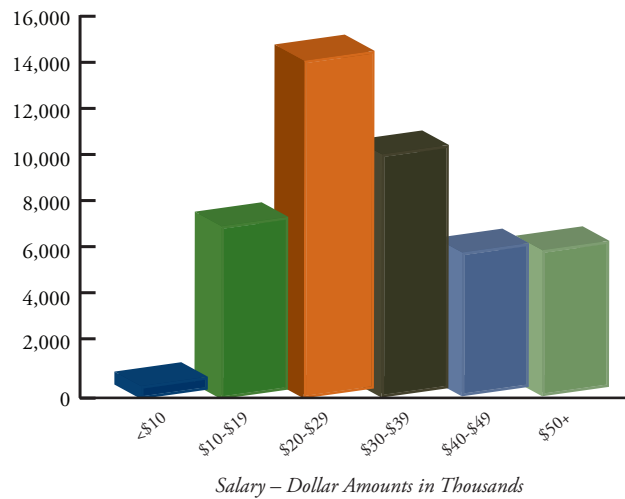
	<b>Male</b>	<b>Female</b>	<b>Total</b>
Membership July 1, 2016	21,191	73,314	94,505
New members added	1,250	4,052	5,302
Less:			
Service retirements	539	2,062	2,601
Disability retirements	8	48	56
Withdrawals	494	1,513	2,007
Deaths	26	50	76
Other	11	26	37
	<u>1,078</u>	<u>3,699</u>	<u>4,777</u>
Net change in membership 2016-2017	172	353	525
Membership June 30, 2017	<u>21,363</u>	<u>73,667</u>	<u>95,030</u>



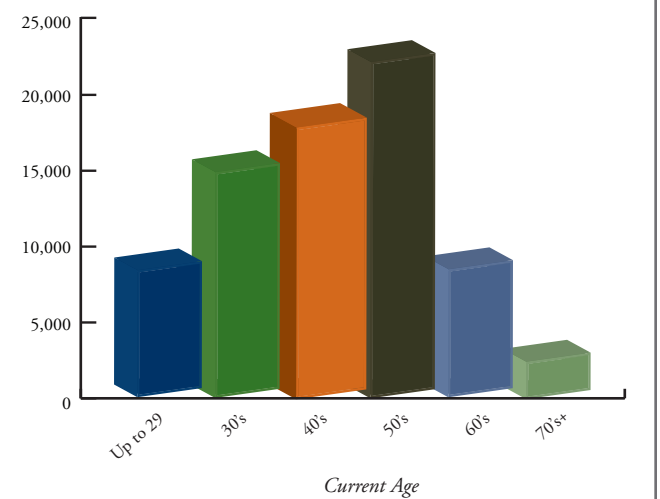
PEERS Summary of Changes in Membership During 2016-2017

	Male	Female	Total
Membership July 1, 2016	21,781	57,647	79,428
New members added	2,262	6,000	8,262
Less:			
Service retirements	550	1,473	2,023
Disability retirements	15	31	46
Withdrawals	1,257	3,080	4,337
Deaths	63	89	152
Other	3	24	27
	1,888	4,697	6,585
Net change in membership 2016-2017	374	1,303	1,677
Membership June 30, 2017	22,155	58,950	81,105

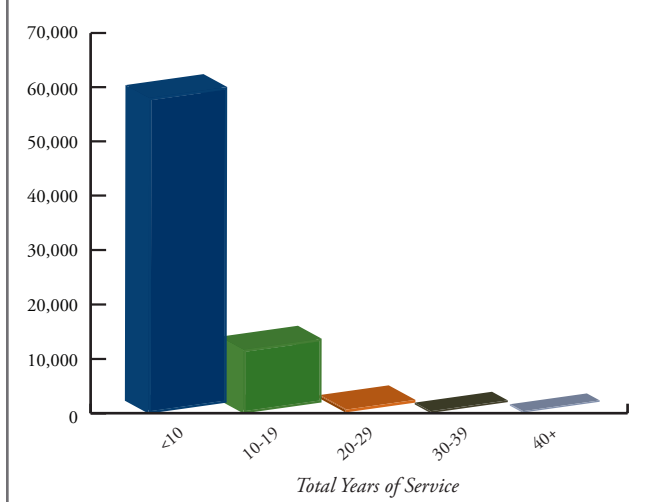
2016-2017 PEERS Members by Annual Salary



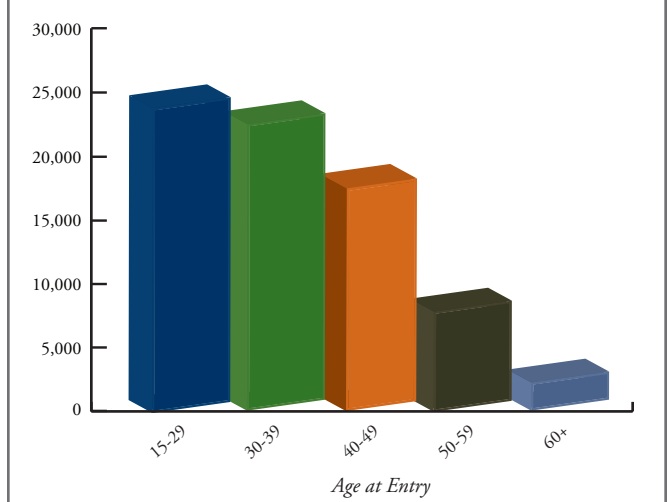
2016-2017 PEERS Members by Current Age



2016-2017 PEERS Members by Total Years of Service



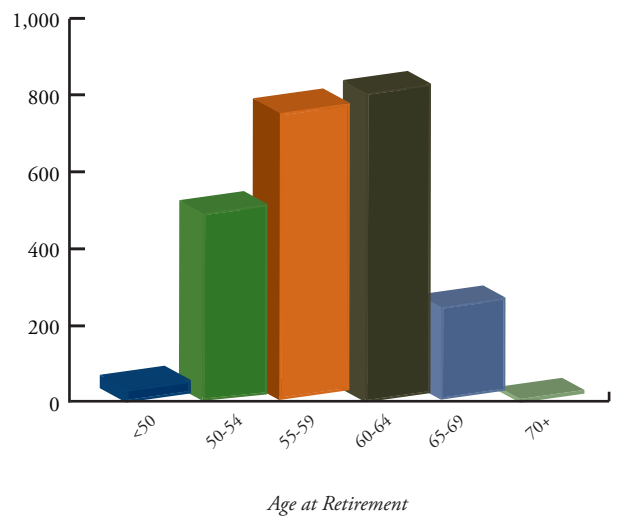
2016-2017 PEERS Member Age at Entry Into System



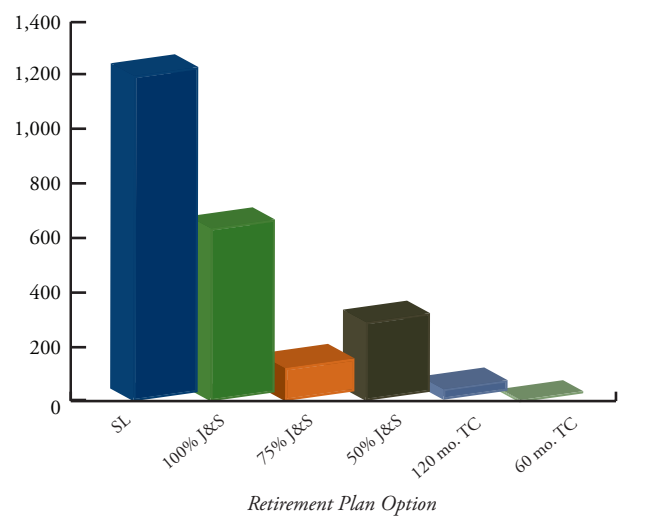
**PSRS 2016-2017 New Service Retirees**

	<b>Service Retirees</b>	<b>Disability Retirees</b>	<b>Beneficiaries</b>
Retirees July 1, 2016	53,069	957	3,994
Added during the year	2,601	56	345
Died during the Year	-1,042	-30	-203
Other	1	-2	26
Retirees June 30, 2017	54,629	981	4,162

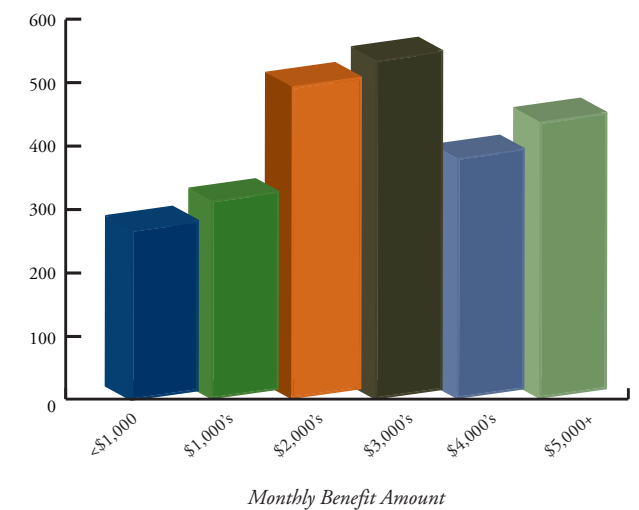
**2016-2017 PSRS New Service Retirees by Age at Retirement**



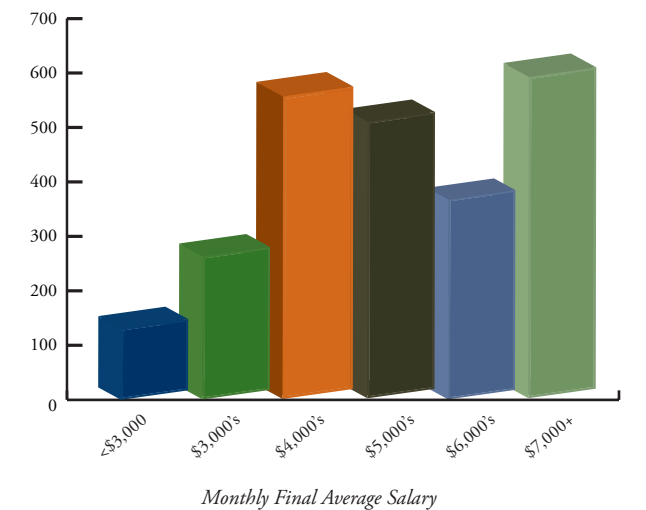
**2016-2017 PSRS New Service Retirees by Retirement Plan Option**



**2016-2017 PSRS New Service Retirees by Single Life Monthly Benefit Amount**

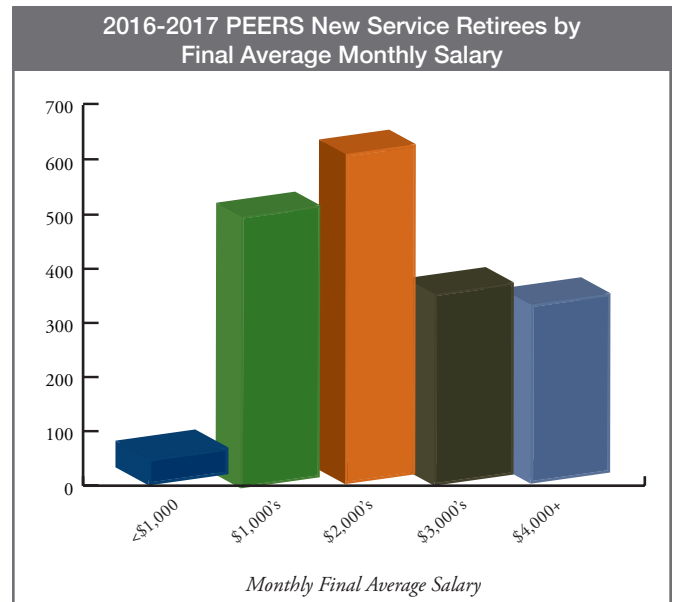
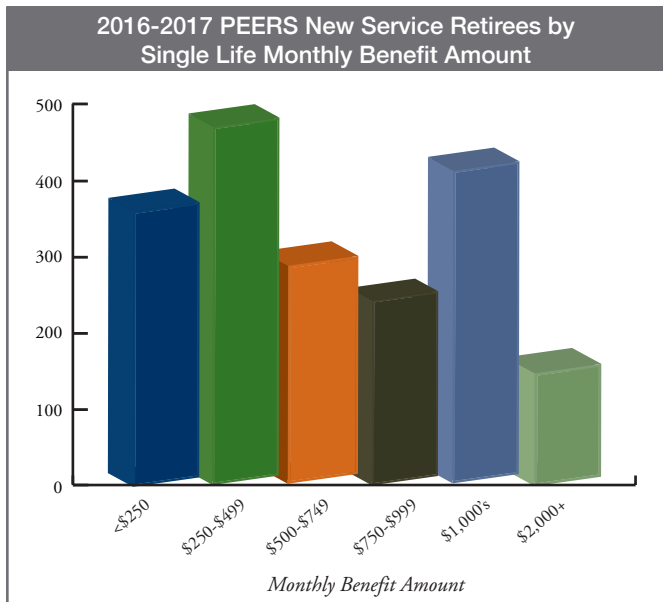
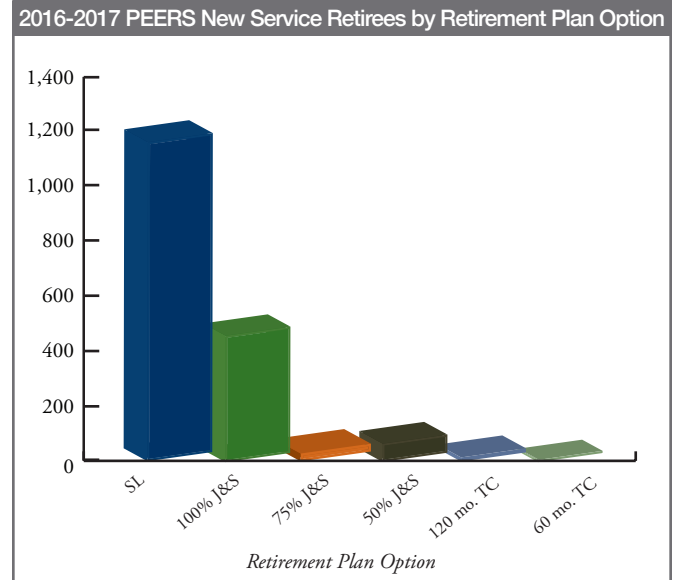
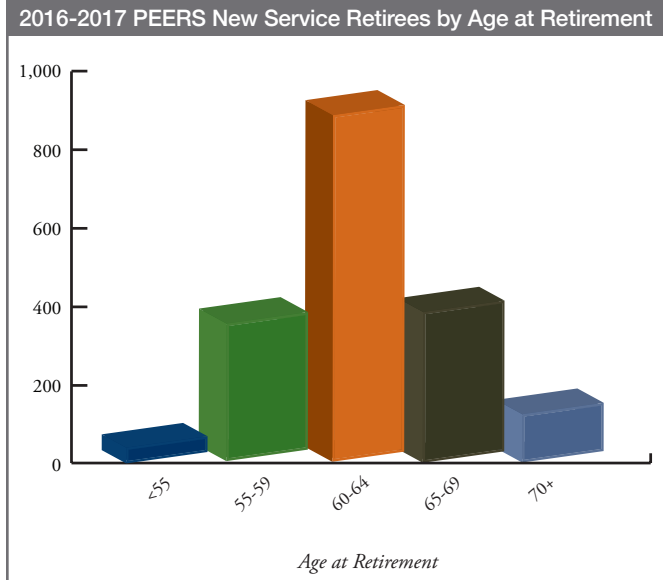


**2016-2017 PSRS New Service Retirees by Final Average Monthly Salary**



PEERS 2016-2017 New Service Retirees

	Service Retirees	Disability Retirees	Beneficiaries
Retirees July 1, 2016	25,061	782	1,740
Added during the Year	2,023	46	207
Died during the Year	-752	-23	-88
Other	3	-1	4
Retirees June 30, 2017	26,335	804	1,863





**PSRS Schedule of Average Benefit Payments to New Service Retirees**

	Years of Service							
	5 - 9.9	10 - 14.9	15 - 19.9	20 - 24.9	25 - 29.9	30 - 34.9	35 - 39.9	40+
<b>2016-2017</b>								
Average monthly benefit	\$ 639	\$ 1,296	\$ 2,228	\$ 3,213	\$ 4,289	\$ 5,135	\$ 6,427	\$ 6,881
Average final average salary	3,806	4,476	5,320	5,737	6,395	6,574	7,056	6,881
Number of retirees	249	243	339	531	756	427	44	12
<b>2015-2016</b>								
Average monthly benefit	\$ 671	\$ 1,322	\$ 2,179	\$ 3,127	\$ 4,152	\$ 4,942	\$ 5,627	\$ 6,686
Average final average salary	4,141	4,515	5,192	5,628	6,193	6,389	6,195	6,686
Number of retirees	251	265	328	530	745	430	37	17
<b>2014-2015</b>								
Average monthly benefit	\$ 729	\$ 1,351	\$ 2,102	\$ 3,083	\$ 4,120	\$ 5,064	\$ 6,130	\$ 6,418
Average final average salary	4,342	4,581	5,004	5,562	6,091	6,324	6,521	6,418
Number of retirees	255	308	313	487	677	469	46	15
<b>2013-2014</b>								
Average monthly benefit	\$ 697	\$ 1,299	\$ 2,135	\$ 3,108	\$ 3,955	\$ 5,147	\$ 6,319	\$ 6,601
Average final average salary	4,257	4,385	5,024	5,557	5,930	6,396	6,730	6,601
Number of retirees	274	260	317	483	746	696	101	11
<b>2012-2013</b>								
Average monthly benefit	\$ 695	\$ 1,327	\$ 2,035	\$ 3,143	\$ 3,927	\$ 4,998	\$ 6,739	\$ 6,033
Average final average salary	4,067	4,554	4,818	5,609	5,896	6,212	7,218	6,033
Number of retirees	233	263	286	483	692	583	79	13
<b>2011-2012</b>								
Average monthly benefit	\$ 607	\$ 1,261	\$ 1,995	\$ 2,980	\$ 3,824	\$ 4,893	\$ 6,071	\$ 5,262
Average final average salary	3,946	4,305	4,795	5,317	5,713	6,070	6,506	5,262
Number of retirees	248	265	293	531	723	767	81	18
<b>2010-2011</b>								
Average monthly benefit	\$ 661	\$ 1,262	\$ 1,969	\$ 3,010	\$ 3,792	\$ 4,815	\$ 6,231	\$ 6,595
Average final average salary	4,074	4,298	4,754	5,366	5,642	5,974	6,662	6,595
Number of retirees	267	322	289	540	733	832	126	13
<b>2009-2010</b>								
Average monthly benefit	\$ 556	\$ 1,123	\$ 1,915	\$ 2,865	\$ 3,660	\$ 4,836	\$ 6,133	\$ 5,678
Average final average salary	3,396	3,840	4,566	5,110	5,469	6,007	6,559	5,678
Number of retirees	271	243	207	412	477	653	97	19
<b>2008-2009</b>								
Average monthly benefit	\$ 627	\$ 1,178	\$ 2,035	\$ 2,861	\$ 3,590	\$ 4,598	\$ 6,028	\$ 5,749
Average final average salary	3,901	4,057	4,801	5,136	5,343	5,697	6,436	5,749
Number of retirees	198	186	198	411	617	892	116	11
<b>2007-2008</b>								
Average monthly benefit	\$ 612	\$ 1,079	\$ 1,876	\$ 2,765	\$ 3,453	\$ 4,410	\$ 6,124	\$ 6,515
Average final average salary	3,741	3,792	4,548	4,935	5,159	5,494	6,607	6,515
Number of retirees	226	197	200	406	646	798	105	12

PEERS Schedule of Average Benefit Payments to New Service Retirees

	Years of Service					
	5 - 9.9	10 - 14.9	15 - 19.9	20 - 24.9	25 - 29.9	30+
<b>2016-2017</b>						
Average monthly benefit	\$ 255	\$ 483	\$ 802	\$ 1,157	\$ 1,690	\$ 2,441
Average final average salary	2,209	2,523	2,919	3,225	3,874	4,505
Number of retirees	558	425	339	363	209	129
<b>2015-2016</b>						
Average monthly benefit	\$ 238	\$ 493	\$ 785	\$ 1,160	\$ 1,630	\$ 2,235
Average final average salary	2,078	2,520	2,807	3,231	3,703	4,128
Number of retirees	520	410	328	289	235	121
<b>2014-2015</b>						
Average monthly benefit	\$ 237	\$ 490	\$ 766	\$ 1,162	\$ 1,665	\$ 2,212
Average final average salary	2,054	2,500	2,802	3,229	3,824	4,073
Number of retirees	529	419	303	309	197	127
<b>2013-2014</b>						
Average monthly benefit	\$ 228	\$ 461	\$ 796	\$ 1,178	\$ 1,588	\$ 2,233
Average final average salary	2,042	2,406	2,884	3,257	3,632	4,110
Number of retirees	568	429	301	283	206	132
<b>2012-2013</b>						
Average monthly benefit	\$ 219	\$ 467	\$ 735	\$ 1,104	\$ 1,512	\$ 1,995
Average final average salary	1,958	2,439	2,734	3,054	3,491	3,672
Number of retirees	475	362	250	275	173	121
<b>2011-2012</b>						
Average monthly benefit	\$ 227	\$ 433	\$ 705	\$ 1,063	\$ 1,508	\$ 1,957
Average final average salary	2,010	2,257	2,597	2,954	3,502	3,637
Number of retirees	516	371	246	250	184	147
<b>2010-2011</b>						
Average monthly benefit	\$ 221	\$ 410	\$ 707	\$ 1,052	\$ 1,389	\$ 1,947
Average final average salary	1,965	2,176	2,628	2,920	3,195	3,611
Number of retirees	487	345	231	244	185	164
<b>2009-2010</b>						
Average monthly benefit	\$ 196	\$ 384	\$ 635	\$ 979	\$ 1,330	\$ 1,885
Average final average salary	1,769	2,034	2,339	2,723	3,060	3,582
Number of retirees	503	316	162	180	122	117
<b>2008-2009</b>						
Average monthly benefit	\$ 206	\$ 374	\$ 637	\$ 1,021	\$ 1,365	\$ 1,727
Average final average salary	1,821	2,011	2,349	2,847	3,104	3,240
Number of retirees	417	264	152	216	164	112
<b>2007-2008</b>						
Average monthly benefit	\$ 187	\$ 382	\$ 655	\$ 966	\$ 1,274	\$ 1,605
Average final average salary	1,741	2,070	2,451	2,724	2,930	2,969
Number of retirees	363	262	142	229	155	94

Comparisons of Actuarial Assets and Total Actuarial Liabilities

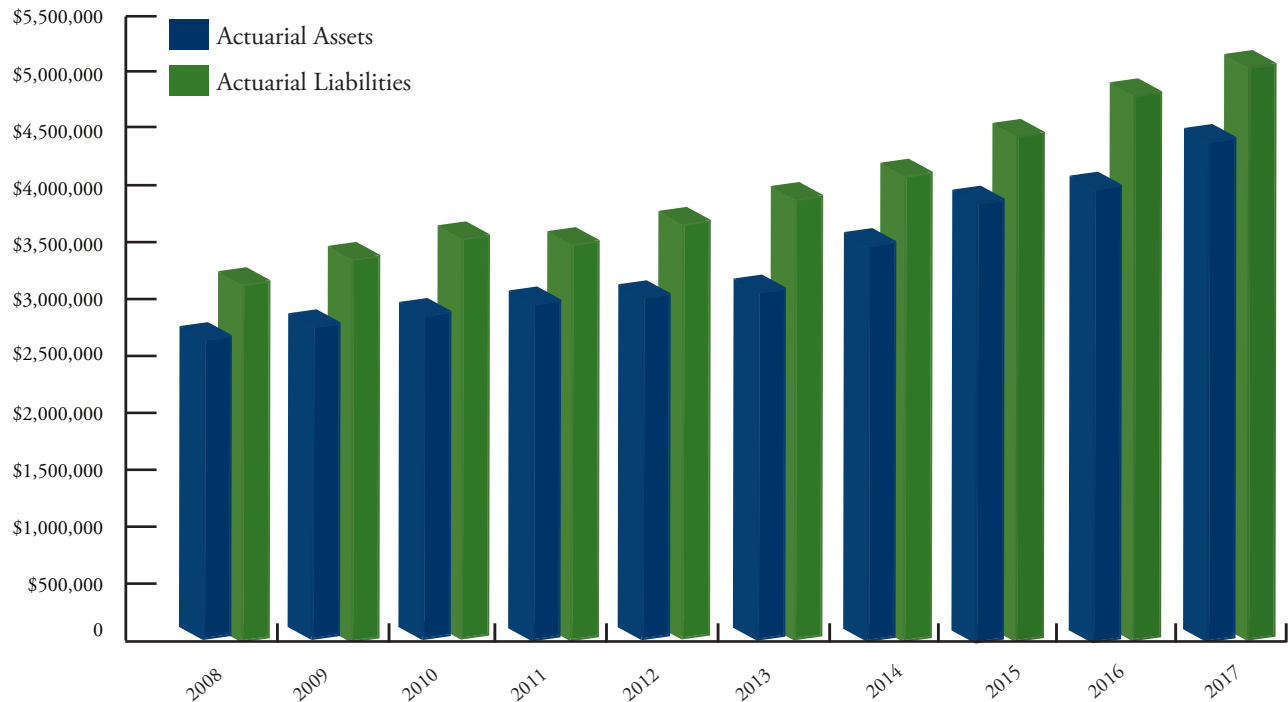
**Public School Retirement System of Missouri**

*Dollar Amounts in Thousands*



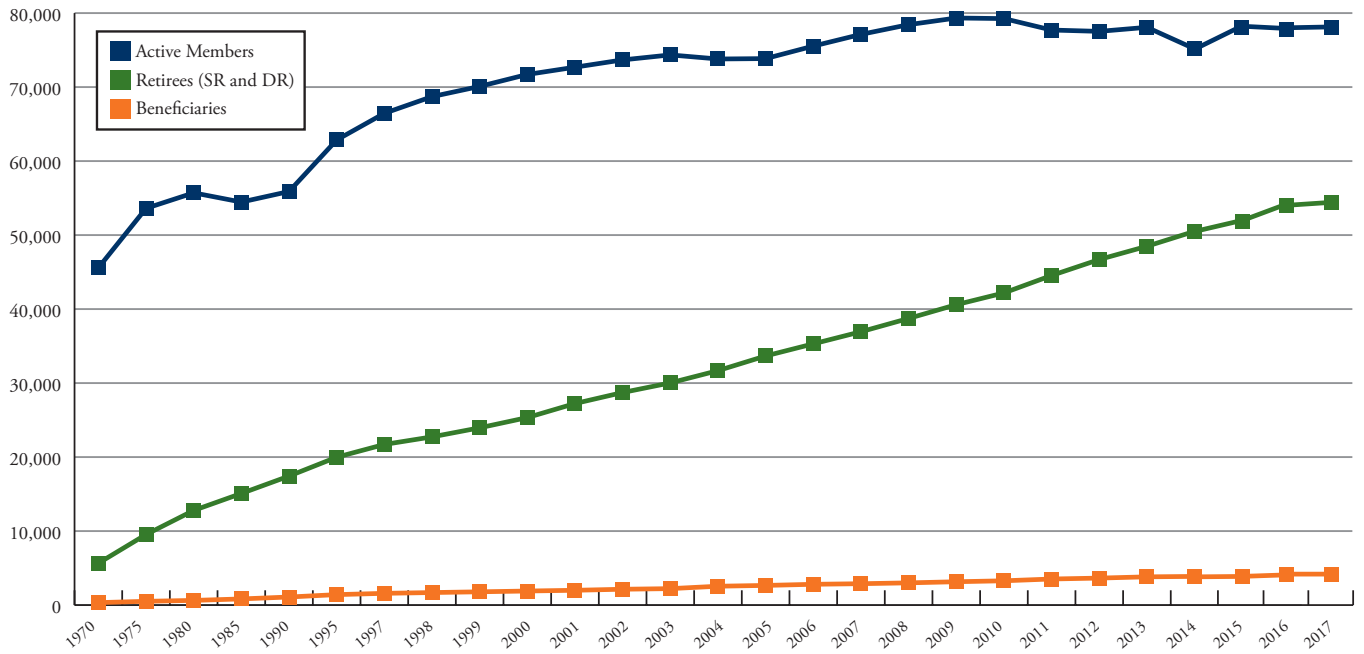
**Public Education Employee Retirement System of Missouri**

*Dollar Amounts in Thousands*

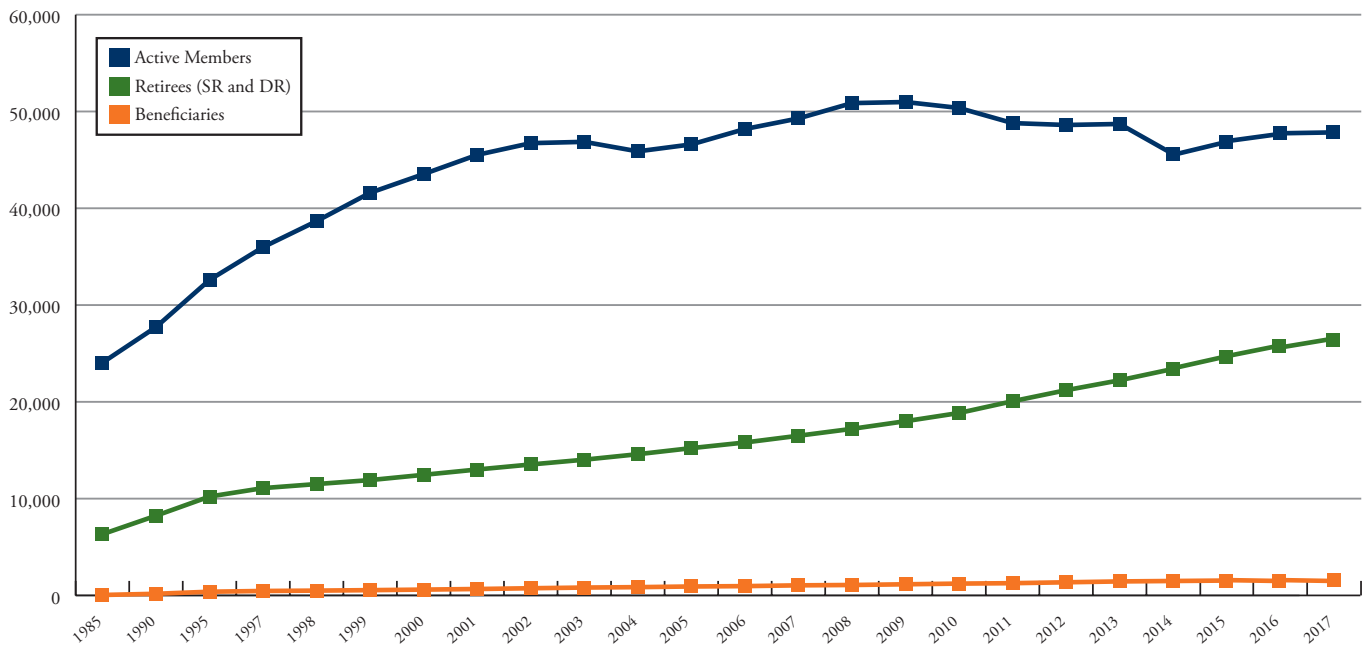


Growth in Membership

Public School Retirement System of Missouri



Public Education Employee Retirement System of Missouri



**PSRS Schedule of Covered Employees in the Top 10 Employers**

<b>Employer</b>	<b>2017</b>		<b>2016</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	2,914	4%	2,956	4%
Springfield R-XII Schools	2,208	3%	2,208	3%
Rockwood R-VI Schools	1,926	2%	2,036	2%
North Kansas City Schools	1,735	2%	1,723	2%
Columbia Public Schools	1,726	2%	1,844	2%
Parkway C-2 Schools	1,703	2%	1,804	2%
Francis Howell R-III Schools	1,510	2%	1,549	2%
Ft. Zumwalt R-II Schools	1,670	2%	1,611	2%
Hazelwood R-I Schools	1,488	2%	1,559	2%
Lee's Summit R-VII Schools	1,459	2%	1,443	2%
All Others	63,886	77%	64,842	77%
<b>Total - 534 Employers</b>	<b>82,225</b>	<b>100%</b>	<b>83,575</b>	<b>100%</b>

<b>Employer</b>	<b>2015</b>		<b>2014</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	2,995	4%	3,082	4%
Springfield R-XII Schools	2,189	3%	2,159	3%
Rockwood R-VI Schools	2,003	2%	1,912	2%
North Kansas City Schools	1,713	2%	1,740	2%
Columbia Public Schools	1,779	2%	1,690	2%
Parkway C-2 Schools	1,769	2%	1,672	2%
Francis Howell R-III Schools	1,610	2%	1,575	2%
Ft. Zumwalt R-II Schools	1,611	2%	1,568	2%
Hazelwood R-I Schools	1,577	2%	1,566	2%
Lee's Summit R-VII Schools	1,415	2%	1,390	2%
All Others	65,940	77%	64,335	77%
<b>Total - 535 Employers</b>	<b>84,601</b>	<b>100%</b>	<b>82,689</b>	<b>100%</b>

<b>Employer</b>	<b>2013</b>		<b>2012</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	3,080	4%	3,039	4%
Springfield R-XII Schools	2,096	3%	2,096	3%
Rockwood R-VI Schools	1,888	2%	1,910	2%
North Kansas City Schools	1,763	2%	1,699	2%
Parkway C-2 Schools	1,714	2%	1,794	2%
Columbia Public Schools	1,649	2%	1,640	2%
Hazelwood R-I Schools	1,600	2%	1,589	2%
Ft. Zumwalt R-II Schools	1,549	2%	1,508	2%
Francis Howell R-III Schools	1,538	2%	1,494	2%
Lee's Summit R-VII Schools	1,360	2%	1,341	2%
All Others	63,377	77%	62,775	77%
<b>Total - 535 Employers during 2013 and 537 during 2012</b>	<b>81,614</b>	<b>100%</b>	<b>80,885</b>	<b>100%</b>

**PSRS Schedule of Covered Employees in the Top 10 Employers (continued)**

<b>Employer</b>	<b>2011</b>		<b>2010</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	3,020	4%	3,021	4%
Springfield R-XII Schools	2,116	3%	2,132	3%
Rockwood R-VI Schools	1,936	2%	1,990	2%
Parkway C-2 Schools	1,789	2%	1,745	2%
North Kansas City Schools	1,663	2%	1,630	2%
Columbia Public Schools	1,592	2%	1,612	2%
Francis Howell R-III Schools	1,559	2%	1,573	2%
Ft. Zumwalt R-II Schools	1,525	2%	1,493	2%
Hazelwood R-I Schools	1,510	2%	1,549	2%
Lee's Summit R-VII Schools	1,412	2%	1,435	2%
All Others	62,525	77%	63,994	77%
Total - 537 Employers during 2011 and 538 during 2010	<u>80,647</u>	<u>100%</u>	<u>82,174</u>	<u>100%</u>
<b>Employer</b>	<b>2009</b>		<b>2008</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	2,931	4%	2,913	4%
Springfield R-XII Schools	2,089	3%	2,037	3%
Rockwood R-VI Schools	1,893	2%	1,773	2%
Parkway C-2 Schools	1,656	2%	1,589	2%
Columbia Public Schools	1,594	2%	1,626	2%
Hazelwood R-I Schools	1,578	2%	1,639	2%
North Kansas City Schools	1,497	2%	1,517	2%
Francis Howell R-III Schools	1,462	2%	1,468	2%
Ft. Zumwalt R-II Schools	1,441	2%	1,395	2%
Lee's Summit R-VII Schools	1,358	2%	1,337	2%
All Others	63,490	77%	62,964	77%
Total - 540 Employers during 2009 and 542 during 2008	<u>80,989</u>	<u>100%</u>	<u>80,258</u>	<u>100%</u>

*Note: Schedules reflect total members reported at any time during the fiscal year.*

**PEERS Schedule of Covered Employees in the Top 10 Employers**

<b>Employer</b>	<b>2017</b>		<b>2016</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	2,504	5%	2,501	5%
Springfield R-XII Schools	1,499	3%	1,540	3%
North Kansas City Schools	1,406	3%	1,397	3%
Rockwood R-VI Schools	1,503	3%	1,319	2%
Lee's Summit R-VII Schools	1,291	2%	1,294	2%
Ft. Zumwalt R-II Schools	1,278	2%	1,228	2%
Columbia Public Schools	1,160	2%	1,126	2%
Independence Public Schools	1,083	2%	1,111	2%
Parkway C-2 Schools	1,054	2%	1,060	2%
Hazelwood R-I Schools	959	2%	964	2%
All Others	40,305	74%	40,351	75%
<b>Total - 530 Employers</b>	<b>54,042</b>	<b>100%</b>	<b>53,891</b>	<b>100%</b>

<b>Employer</b>	<b>2015</b>		<b>2014</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	2,496	5%	2,405	5%
Springfield R-XII Schools	1,540	3%	1,480	3%
North Kansas City Schools	1,369	3%	1,296	2%
Lee's Summit R-VII Schools	1,283	2%	1,207	2%
Ft. Zumwalt R-II Schools	1,232	2%	1,180	2%
Rockwood R-VI Schools	1,230	2%	1,186	2%
Independence Public Schools	1,135	2%	1,143	2%
Columbia Public Schools	1,081	2%	1,043	2%
Parkway C-2 Schools	1,054	2%	1,031	2%
Hazelwood R-I Schools	1,004	2%	960	2%
All Others	40,627	75%	39,568	76%
<b>Total - 532 Employers</b>	<b>54,051</b>	<b>100%</b>	<b>52,499</b>	<b>100%</b>

<b>Employer</b>	<b>2013</b>		<b>2012</b>	
	<b>Covered Employees</b>	<b>Percentage of Total</b>	<b>Covered Employees</b>	<b>Percentage of Total</b>
Special School District - St. Louis	2,386	5%	2,481	5%
Springfield R-XII Schools	1,488	3%	1,478	3%
Rockwood R-VI Schools	1,179	2%	1,222	2%
North Kansas City Schools	1,246	2%	1,216	2%
Lee's Summit R-VII Schools	1,164	2%	1,171	2%
Ft. Zumwalt R-II Schools	1,141	2%	1,131	2%
Parkway C-2 Schools	1,041	2%	1,085	2%
Independence Public Schools	1,065	2%	1,071	2%
Hazelwood R-I Schools	961	2%	964	2%
Columbia Public Schools	982	2%	945	2%
All Others	38,464	76%	38,222	76%
<b>Total - 532 Employers during 2013 and 534 during 2012</b>	<b>51,117</b>	<b>100%</b>	<b>50,986</b>	<b>100%</b>

PEERS Schedule of Covered Employees in the Top 10 Employers (continued)

Employer	2011		2010	
	Covered Employees	Percentage of Total	Covered Employees	Percentage of Total
Special School District - St. Louis	2,532	5%	2,584	5%
Springfield R-XII Schools	1,502	3%	1,473	3%
Rockwood R-VI Schools	1,206	2%	1,251	2%
North Kansas City Schools	1,203	2%	1,229	2%
Lee's Summit R-VII Schools	1,174	2%	1,198	2%
Independence Public Schools	1,082	2%	1,149	2%
Ft. Zumwalt R-II Schools	1,128	2%	1,131	2%
Parkway C-2 Schools	1,106	2%	1,091	2%
Hazelwood R-I Schools	977	2%	1,015	2%
Columbia Public Schools	906	2%	932	2%
All Others	38,146	76%	39,295	76%
Total - 534 Employers during 2011 and 535 during 2010	50,962	100%	52,348	100%

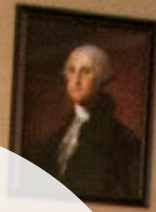
Employer	2009		2008	
	Covered Employees	Percentage of Total	Covered Employees	Percentage of Total
Special School District - St. Louis	2,685	5%	2,619	5%
Springfield R-XII Schools	1,463	3%	1,464	3%
North Kansas City Schools	1,266	2%	1,213	2%
Rockwood R-VI Schools	1,248	2%	1,241	2%
Lee's Summit R-VII Schools	1,203	2%	1,203	2%
Independence Public Schools	1,167	2%	1,058	2%
Ft. Zumwalt R-II Schools	1,129	2%	1,131	2%
Parkway C-2 Schools	1,102	2%	1,106	2%
Hazelwood R-I Schools	995	2%	1,017	2%
Columbia Public Schools	950	2%	1,026	2%
All Others	39,754	76%	39,715	76%
Total - 535 Employers during 2009 and 536 during 2008	52,962	100%	52,793	100%

Note: Schedules reflect total members reported at any time during the fiscal year.





Just do your best



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MISSOURI  
CAPITAL



Mt. Sterling Schoolhouse  
 Mt. Sterling, Missouri  
 1896 ~ 1963

Disclaimer:

*Historical information contained in this Comprehensive Annual Financial Report was obtained from the Missouri State Historical Society and the Missouri Directory of Historic and One-Room Schools, by David L Burton and Jennifer Kervian, 2014.*

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