2016 Comprehensive Annual Financial Report for the year ended December 31, 2016


# Dedicated

OPERS

Ohio Public Employees Retirement System

Prepared by OPERS Finance Division staff

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# Table of Contents

## Employer composition and membership information

For actuarial purposes, participating employers are divided into State, Local, Law Enforcement and Public Safety divisions. A complete description of the OPERS membership is contained in the Plan Statement Section of this document, beginning on page 227.

## Annual report organization

This annual report is divided into six sections, listed as each appears in this document:

1. **Introductory Section**—with the Letter of Transmittal, organizational chart, and recognition awards garnered in 2016
2. **Financial Section**—with the Independent Auditors' Report, Management's Discussion and Analysis, the financial statements of the System, and Required Supplementary and Additional Information
3. **Investment Section**—with the Chief Investment Officer's report on investment activity, Independent Investment Consultant's Report, investment policies, investment results, and various investment schedules
4. **Actuarial Section**—with the Actuary's Certification Letter and the most recent results of the annual actuarial valuation
5. **Statistical Section**—with significant data pertaining to the System
6. **Plan Statement**—with complete membership information and details about the retirement plans offered through OPERS

# Introductory Section

## *Dedicated to:* Transparent Communication

We know that only through ongoing, easy-to-understand outreach can our members be confident about their financial security in retirement. Our plain-language commitment allows us to present information in a manner that provides all individuals with a high level of comprehension. Our ongoing goal is to ensure our communications illuminate the important financial information all stakeholders require.

We know most stakeholders are not pension experts. Throughout 2016, we worked to segment our many audiences and provide just the right information for each audience. Take a look:

- Multiple specialized newsletters were created and provided to just the right target audience—the member audience was segmented by plan choice and by timeline to retirement decision.
- We know some members prefer video formats. Approximately 51 video presentations were created on multiple topics resulting in 104,750 views.
- More than 16 topic-specific leaflets and two handbooks were generated.

Targeted outreach is the single most important element we have to assure all stakeholders that OPERS has traditionally and will continue to deliver on our promise of a secure retirement.

*Note: This section is unaudited.*

## Board of Trustees members as of January 2017

***Front row (left to right):*** Cinthia Sledz, Representative for Miscellaneous Employees; Charles Latsa, Representative for Non-teaching College/University Employees; Robert C. Smith, Treasurer-Appointed Investment Expert

***Standing:*** Sean Loftus, Representative for County Employees; Patrick Smith, Designee for Robert Blair, Director of the Ohio Department of Administrative Services (Statutory Member); James Tilling, General Assembly Appointed Investment Expert; Ken Thomas, Representative for Municipal Employees and Board Chair; John W. Maurer, Representative for Retirees; Christopher Mabe, Representative for State Employees and Board Vice Chair; Steve Toth, Representative for Retirees

***Not Shown in Photo:*** Governor's Appointee—Vacant

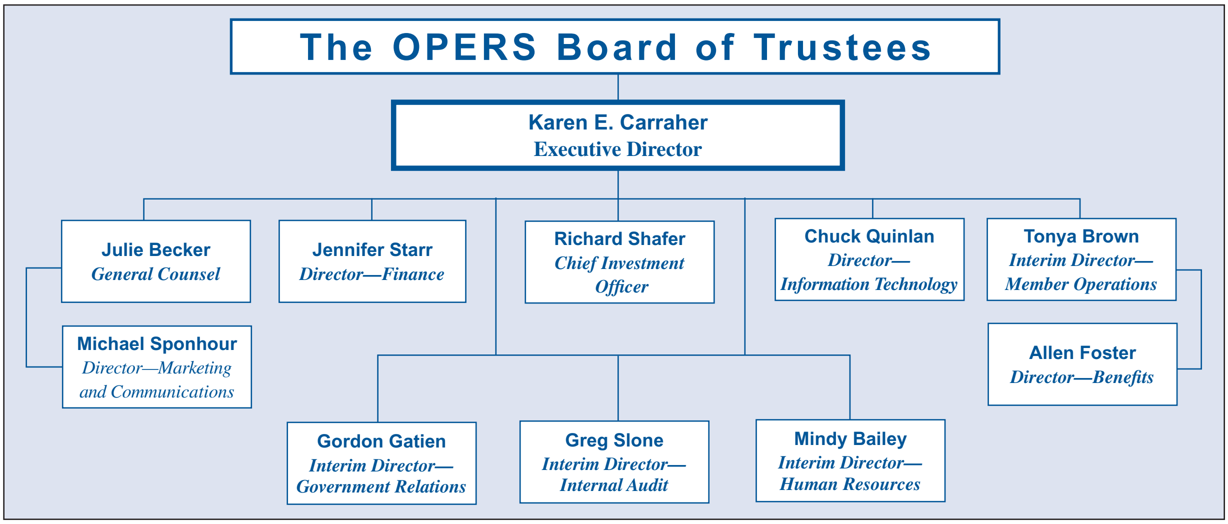
The 11-member Board of Trustees (Board) is the governing body of the Ohio Public Employees Retirement System (referred to as OPERS, System or Fund). The Board is ultimately responsible for the administration and management of all OPERS activities including oversight of investment activities.

The Board is comprised of seven individuals who are elected by the specific stakeholder group each represents: college/university employees, state employees, miscellaneous employees, county employees, municipal employees, and two retiree representatives. Three individuals with investment expertise are appointed by Ohio's Governor, Treasurer, and jointly by the Ohio Legislature. The Board is completed by the Director of the Ohio Department of Administrative Services who serves on the Board by virtue of office.

The Board appoints the Executive Director, an actuary, and other advisors necessary for the transaction of business. By law, the Treasurer of the state of Ohio is custodian of the OPERS funds.

The Board meets monthly and receives no compensation, but is reimbursed for necessary expenses.

## Organizational Structure




## Leadership Team

***Front, center:*** Karen Carraher, Executive Director

***Second row:*** Tonya Brown, Interim Director—Member Operations; Jennifer Starr, Director—Finance; Chuck Quinlan, Director—Information Technology

***Third row:*** Richard Shafer, Chief Investment Officer; Gordon Gatien, Interim Director—Government Relations; Allen Foster, Director—Benefits

***Fourth row:*** Greg Slone, Interim Director—Internal Audit; Michael Sponhour, Director—Marketing and Communications; Mindy Bailey, Interim Director—Human Resources

***Not Shown in Photo:*** Julie Becker, General Counsel

## Auditors

**CliftonLarsonAllen LLP**
Toledo, Ohio
(under contract with the Auditor of State)

## Advisors

**Actuary—**
**Gabriel, Roeder, Smith & Company**
Southfield, Michigan

**Investment Policy Advisors to the Board of Trustees—**

**AON Hewitt Investment Consulting, Inc.**
Chicago, Illinois

**NEPC, LLC**
Cambridge, Massachusetts

See pages 106-109 for a list of investment fees and external asset managers.

OPERS Ohio Public Employees Retirement System

277 East Town Street Columbus, Ohio 43215-4642 1-800-222-7377 www.opers.org

June 14, 2017

Dear Chair and Members of the Board of Trustees:

It's a pleasure to present to you the *2016 Comprehensive Annual Financial Report* (CAFR or annual report) of the Ohio Public Employees Retirement System (OPERS or System) for the fiscal year ended December 31, 2016. Our theme of *Dedication* captures the attitude, efforts and diligence displayed by our Board of Trustees (Board) and staff in 2016—qualities displayed every year. We believe the cumulative results for 2016 illustrate this dedication.

Because we live—and work—in eventful times, dedication is required for OPERS to be in the position of delivering on our stated mission of providing a secure financial retirement for our members. To achieve our mission, we have five tenets upon which we focus daily: We are dedicated to continue building financial stability, streamlining operations, investing responsibly but with a long-term view, providing transparent communication and strong education for members and stakeholders, and continuing to anticipate and prepare for the future—all so that we can keep our promise of delivering pension benefits.

## Overview of OPERS—a Tradition of Dedication

OPERS was established and exists solely for the purpose of providing retirement, disability and survivor benefits to Ohio's public employees. Created by legislation in 1933, OPERS began operations January 1, 1935, prior to the Social Security Administration. Since then, the ongoing commitment and dedication of the Board, management and staff have guided OPERS through more than 80 years—through all economic environments, the System has consistently provided benefits delivered with the highest standards for member service.

In 1974, OPERS added access to health care—an important element for retirees—yet one that is neither mandated nor guaranteed. In 2003, OPERS increased the pension options offered from one plan to three plans. More information on current benefits can be found in the Plan Statement starting on page 227.

As of year-end 2016, OPERS served more than 1,090,000 members, including 208,381 retirees and beneficiaries. In addition, the System works with approximately 3,700 public employers. With an asset base of $90.6 billion, OPERS is the largest public pension system in Ohio and the 12th largest public pension system in the nation. OPERS serves as an economic engine for Ohio.

OPERS remains strong; 2016 was a good year for the System with positive results and, more importantly, continued progress toward our long-term goals. The OPERS team—staff, management and Board—remains dedicated to keeping this System strong today and well into the future. Reflected here, the 2016 accomplishments and activities clearly demonstrated the commitment, focus, and dedication of all OPERS associates. Throughout 2016, we worked to implement approved changes and diligently monitored the cumulative impact of those changes—all while keeping our sight directed toward the future. As always, we worked to ensure members received quality service and a good experience by seeking every possible channel to engage, educate, and communicate.

As with all years, we had successes and challenges—throughout all, we remained dedicated and delivered solid results.

## The Key Activities and Accomplishments

### Investments

Our dedication to providing members with a secure retirement remains the cornerstone of our attitude toward issues, initiatives, projects and activities. This dedication is especially important as investment markets have become increasingly complex and market volatility, even within a single year, can be remarkable. Because investment returns provide approximately two-thirds of the pension funding, the inconsistent markets mean we must be diligent in our adherence to the proven principles of asset allocation and diversification to produce solid results.

Eventful certainly describes the 2016 investment market. The market had a very slow start—in fact, 2016 saw the worst-ever five-day start. However, by year-end, the market was well over the 19,000 mark. The OPERS long-term investment goal is to achieve sustained performance to help secure retirement benefits for our members. This sustained performance goal means we focus on the long-term market view—but understanding that year-to-year market fluctuations and corrections will occur.

For the past decade, OPERS has been repositioning the investment portfolio to protect against volatility. Specifically, this involved a reduction in the allocation to public global equities (a very traditional asset class that previously represented more than 60% of the portfolio) to a more diversified portfolio with improved risk balance. The departure from the portfolio that was heavy in global equities reduced some of the high results that we might have earned when the equity market was favorable. However, more importantly, the rebalancing reduced portfolio risk since this asset class also tends to be a key contributor to market volatility. Annually, the asset allocation is reviewed in detail with a view to find opportunities to add value throughout dynamic adjustments to the Board's long-term strategic allocation. Over the past several years, changes to the asset allocation have been minor.

Periodically, the System engages in a more comprehensive study that examines the nature of the pension liabilities we will ultimately pay and the characteristics of the asset allocation projections, including the associated level of risk. This comprehensive study is referred to as an asset liability study. OPERS, in conjunction with its investment consultants, completed such a study in 2016 and, as a result, modified the asset allocation slightly, but not substantively. The study was a good reinforcement that our current strategy remains the most appropriate for the long-term results we want to achieve.

The 2016 investment results were favorable and showed consistent, steady growth. The OPERS total pension return for 2016 was 8.23%, better than the anticipated 7.5% return projected for our funding plan, but lower than the benchmark return of 8.53%. OPERS' total portfolio is made up of underlying portfolios that fund pension benefits and the health care program. Because of a structural change in 2016, the underlying portfolios differ slightly by year. For 2015, the underlying investment portfolios consisted of: the Defined Benefit portfolio, the Defined Contribution portfolio, the 401(h) Health Care Trust portfolio and the 115 Health Care Trust portfolio. In 2016, the underlying portfolios consisted of: the Defined Benefit portfolio, the Defined Contribution portfolio, the 115 Health Care Trust portfolio and six months of activity in the 401(h) Health Care Trust portfolio. By portfolio, the 2016 returns were:

- Defined Benefit portfolio returned 8.31%, compared to the benchmark return of 8.64%. The actuarial rate anticipated as part of the funding plan was 7.5%. The Voluntary Employees' Beneficiary Association (VEBA) Trust was closed as of June 30, 2016, with the VEBA assets transferring from the Defined Benefit portfolio to the 115 Health Care Trust effective July 1, 2016. Thus, the investment results related to these assets were previously included in the investment return results of the Defined Benefit portfolio and are for first six months of the year. However, with the transfer, the last six months of the year and all future investment results will be included with the investment returns of the 115 Health Care Trust portfolio.
- The 401(h) Health Care Trust portfolio returned 4.73%, compared to the benchmark return of 4.72%, for the six months ended June 30, 2016. This compares to the actuarial rate anticipated for funding of 5.0% for the full year. The 401(h) Health Care Trust was closed as of June 30, 2016, with the assets transferring to the 115 Health Care Trust effective July 1, 2016. Thus, the results for the 401(h) Health Care Trust reflect only six months of investment results and the remainder of the investment results for the year are included in the 115 Health Care Trust portfolio.
- The 115 Health Care Trust portfolio returned 5.11%, compared to the benchmark return of 5.14%. The total health care assets return, combining the 401(h) and 115 health care trust portfolios for the year, was 7.55%, compared to a combined benchmark return of 7.75% and the actuarial rate anticipated for funding of 5.0%.
- The Defined Contribution portfolio returned 9.51%, compared to the benchmark return of 9.31%.

For additional information on the trust closures, see the discussion on page 10. A complete discussion of investment returns, activities, asset allocation strategy, and policies governing those activities can be found in the Investment Section, beginning on page 93. Additionally, information on investment fees and commissions can be found beginning on page 106.

## Experience Study—Updated Assumptions

The OPERS funding plan is based on actuarial valuation assumptions that represent projected long-term expectations of demographic and economic activity impacting the System. Both statute and best practices indicate pension systems should review their assumptions used in actuarial valuations every five years. In 2016, the Board's actuarial consultants conducted an experience study for the period 2011 through 2015, comparing assumptions to actual results. The experience study incorporates both a historical review and forward-looking projections to determine the appropriate set of assumptions to keep the plan on a path toward full funding.

As is typical from these studies, OPERS modified some of the assumptions used in pension plan funding. Specifically, one of the most significant changes was to the assumptions used to estimate how much investment earnings would be earned over the long term in the future. Previously, OPERS used an assumption of 8.0%, which means that over the long period of 30 years or more, OPERS expected to be able to earn an average return of 8.0%. While historical returns have supported that assumption, forward projections were more pessimistic. Thus, the approved recommendation was to reduce this assumption from 8.0% to 7.5%. Other key pension assumption modifications included a reduction in the wage inflation assumption and the price inflation assumption and an increase in the mortality assumptions to reflect the longer life expectancies of our members.

The changes in pension assumptions from the study resulted in an increase to the actuarial liability of approximately $5.3 billion (restated 2015 amounts). This also resulted in a decrease in the funded ratio from 85.0% to 80.0%, and a slight increase in the amortization period from 19 years to 20 years (restated 2015 amounts). While the funded ratio declined, the overall funded ratio remains strong. The funded ratio illustrates the assets that have been set aside to fund the liability that will come due in future years. It is important to note that the liability associated with those members who are already retired and have commenced their benefit is 100% funded—the remaining unfunded liability is associated only with those who are still actively working and will retire in the future. The amortization period reflects how long it will take to fund remaining liabilities. The OPERS amortization period of 20 years remains both strong and well within the statutorily required 30-year period of time.

OPERS also conducted an experience study for health care funding. For health care, the assumption regarding future investment earnings remained unchanged at 5.0%. However, similar changes were made to the mortality assumptions.

The changes in the assumptions are described further in the Actuarial Section, beginning on page 147. Additionally, the schedules of funding progress for pension reflect results including the changes in assumptions approved by the Board in 2016.

## Health Care—Connector Fully Deployed

Health care is neither mandated nor guaranteed—and can never be allowed to dilute the stability of the System. That said, the Board, management and staff, recognize the importance to our members of providing access to meaningful health care. Maintaining access to meaningful health care has become increasingly expensive as OPERS retirees, similar to national trends, have increased in number, have longer life expectancies, and the costs of health care continue to increase significantly faster than inflation. We are dedicated to the principle of intergenerational equity and work to maintain a viable health care program for both current retirees and future retirees. We know the health care program must balance long-term sustainability with consistent access to coverage between generations.

To continue to offer viable access to health care, in 2012, OPERS adopted significant changes to the health care program. These changes were designed to be phased in, with complete implementation by 2018. In January 2016, after extensive outreach, one significant component of the changes, the OPERS Medicare Connector (Connector), was fully deployed. The Connector provided more than 143,000 Medicare-eligible OPERS retirees and dependents with access to an individual Medicare Advantage or Medigap plan and a prescription drug plan. This was the first time OPERS did not sponsor a plan for the Medicare-eligible retirees who instead were able to select a plan from the open market with the assistance of a specialist provided through an OPERS vendor. In conjunction with the Connector, OPERS provided financial assistance to eligible members in the form of a health reimbursement arrangement (HRA). OPERS retains a vendor to administer the HRA.

As with any significant change, OPERS carefully planned and communicated to all stakeholders to assist in preparation for the change. However, we recognize that such a fundamental shift from sponsoring a plan to assisting our retirees in selecting a plan is a substantial change for our retirees. We appreciate the diligence of our members in working through these changes with us. In 2016, all necessary members of OPERS staff—call centers, health care, benefits, communications, finance, government relations, legal and IT—were committed to resolving outstanding member conversion issues and to implementing processes that helped improve the member experience.

The results from the health care changes, and especially the implementation of the Connector, are evident in our financial results for 2016. Overall, health care costs significantly reduced from approximately $1.8 billion to approximately $1.2 billion.

## Health Care Trust Transfer

The 115 Health Care Trust was established in 2014 to provide an allowable vehicle to pay the HRA. Prior to the establishment of the 115 Health Care Trust, OPERS had two other health care-related trusts. The 401(h) Health Care Trust had been in existence since OPERS began funding health care in the mid-1970s. This trust, established under Internal Revenue Service (IRS) rules, had limitations that necessitated the establishment of the 115 Health Care Trust. OPERS also had the VEBA Trust that provided health care funding for members of the Member-Directed Plan. With the establishment of the 115 Health Care Trust, OPERS sought IRS approval to consolidate the 401(h) Health Care Trust and the VEBA Trust into the new 115 Health Care Trust. As a result, effective July 1, 2016, OPERS closed the two health care trust funds and transferred the assets to the 115 Health Care Trust. All financial results reflect the year-end consolidated balances of the three health care trusts and any performance results or activity for the closed trusts reflects six months of activity.

The Plan Statement, found on page 227 of this CAFR, includes more information on current benefits and requirements.

## Governmental Accounting Standards Board (GASB)

Continuing on established efforts, throughout 2016, OPERS provided employers with the information needed to comply with the GASB pension standards (Statements No. 67 and 68). These standards require pension systems to allocate the net pension liability, or unfunded liability, to all contributing employers. In 2015, GASB approved additional reporting standards to require similar reporting requirements for other post-employment benefits (OPEB), such as health care (Statements No. 74 and 75). These new standards for health care require systems to allocate the unfunded health care liability, or net OPEB liability, to all contributing employers. OPERS will continue to work proactively with employers going forward to ensure smooth implementation of these new GASB standards. The statements require OPERS to implement the new standards in 2017 and employers to implement, generally, in 2018. Similar to the pension liability reporting, the new OPEB standards have no impact on funding and are a reporting requirement only.

## Internal Processes

The internal Our Way Forward initiative, our technology and business process redesign project, continued in 2016 with two major deployments designed to improve internal systems and provide for faster, more responsive features for members. The Our Way Forward project is targeted for completion by 2019. However, we know that we must constantly evolve to keep pace with technology and the service levels our members require and expect. We will continue to invest in and advance our technology to provide the best possible customer service at the lowest possible cost. As a by-product of the investment in technology, OPERS has recognized savings through reduced staffing levels as more processes are automated to support our growing membership.

## Outreach to Legislators, Members and the Public

We recognize and embrace our responsibility to assist members in understanding the business of pensions. Our members make important life decisions based on the information we provide. Therefore, we are dedicated to providing transparent, accurate and timely information to all members—starting with information on retirement plans at the start of a public career, continuing throughout that career with updates and account data and, when retirement is chosen, retirement options and health care access provided by OPERS is detailed fully and completely.

We know our ongoing focus on outreach is both appropriate and of immense importance—not only for our members and retirees, but also for multiple stakeholders who are affected by the economic impact provided by OPERS. Here's an overview of our outreach efforts for 2016:

- Meetings with state legislators and presentations to the Ohio Retirement Study Council relative to legislation including House Bill 520.
- Extensive outreach and advocacy efforts with state and federal legislators on a variety of issues including the Cadillac tax provision of the Affordable Care Act and the impact of improving accessibility to biosimilar drugs.
- Members received accurate, personalized, account information via an annual account statement to help ensure each understands the status of benefits earned.
- More than 389 educational seminars were conducted throughout the state.
- The OPERS website attracted more than 1,053,919 individual hits, while the Member Services Call Center fielded 410,973 calls.

## Report Contents and Structure

This CAFR is designed to comply with the reporting requirements of the GASB and in accordance with Governmental Accounting Standards Best Practices. The responsibility for the accuracy of the data presented here, as well as the completeness and fairness of the presentation, rests with OPERS management.

The management of OPERS is responsible for internal accounting controls designed to provide reasonable assurance for the safeguarding of assets and the reliability of financial records. The concept of reasonable assurance recognizes the relationship between the cost of a control and the benefit likely to be derived, based on the judgment of management. We believe the established internal accounting controls are adequate to meet the purpose for which they were intended.

We also believe the financial statements presented in this report, supporting schedules, and statistical tables are presented fairly in all material aspects. These assertions can be made because OPERS has established a comprehensive internal control framework designed to protect the assets from loss and to compile sufficient reliable information for the preparation of the OPERS financial statements in conformity with generally accepted accounting principles. Even effective internal controls may not prevent or detect misstatements and can provide only a reasonable assurance with respect to financial statement preparation.

The System's external auditors, CliftonLarsonAllen LLP, conducted an independent audit of the financial statements in accordance with U.S. generally accepted government auditing standards. This audit and the financial statements are described in the Financial Section, beginning on page 19.

## 2016 Financial Highlights

**Funded Status:** Funded status measures the progress of accumulating the funds necessary to meet future obligations. Historically, periods of diminished funded status were made up as market conditions improved. Similarly, years of enhanced funded status are eroded when market conditions are poor. We are dedicated to maintaining and enhancing the stability of this System. As a result, OPERS has remained in compliance within the 30-year funding window required by law.

The December 31, 2016 valuation funded status is 80.1%, with the unfunded liability expected to be funded within 19 years on a funding basis. These results reflect the changes in assumptions from the experience study completed in 2016 which reduced the assumed rate of return or discount rate from 8.0% to 7.5%. For more information on assumption changes as a result of the experience study, refer to the Actuarial Section beginning on page 147.

OPERS is not required by statute or GASB to pre-fund health care. However, as responsible administrators, we have historically pre-funded this expense. Our commitment to the conservative approach of pre-funding and the refining of our health care options continues to yield favorable results. As of the December 31, 2015 health care actuarial valuation (the most recent), OPERS was 64.5% funded (pre-experience study results) with funds expected to be sufficient to fund future health care needs.

**Retirement Contributions:** Employee contributions, employer contributions, and income from investments provide the funds necessary to finance retirement benefits. Approximately two-thirds of OPERS revenue, from which benefits are paid, is generated from investment returns. The remaining funding comes from employee and employer contributions. The System reports a total net position of $90.6 billion at the end of 2016.

**Expenses:** Expenses (including pension benefit payments, health care coverage payments and refunds) for fiscal year 2016 were $7.3 billion. In 2016, OPERS paid $5.6 billion in pension benefits and $1.2 billion in health care to more than 208,000 retired Ohioans and their beneficiaries. These numbers clearly demonstrate the importance of OPERS as an important economic driver for the Ohio economy—especially in light of the fact that approximately 90% of OPERS retirees remain in Ohio.

**Administrative Costs:** OPERS management remains diligent in monitoring and, where possible, reducing or containing expenses. We know expenses matter. At OPERS, administrative costs are paid through investment returns generated; we are thoughtful and practical with public funds and are always mindful of keeping administrative costs low. Administrative costs in 2016 were $119.5 million, including investment expenses.

Complete details of all administrative expenses are included in the Financial Section, on page 91. In addition, the Management's Discussion and Analysis, beginning on page 22, has a more detailed discussion of the OPERS funded status and also provides a complete analysis of the additions and deductions to Plan Net Position.

## Professional Services

Professional services are provided to OPERS by consultants appointed by the Board. Actuarial services are provided by Gabriel, Roeder, Smith & Company; Southfield, Michigan. The investment advisors to the Board for all the plans are NEPC, LLC, Cambridge, Massachusetts; and AON Hewett Investment Consulting, Inc., Chicago, Illinois. The financial records of the System are audited by CliftonLarsonAllen, LLP, Certified Public Accountants, Toledo, Ohio, under contract with the Ohio Auditor of State.

## Acknowledgments

This CAFR is the result of the combined teamwork of the System's staff under the direction of the Board. Our sincere appreciation is extended to all who assisted in and contributed toward the completion of this document.

As always, the purpose of this report is to provide complete and reliable information so that it serves as a basis for making management decisions, as a method for determining legal compliance and as a resource that details our responsible stewardship over the assets held in trust for members of this System. This document is educational in that it provides information so that all stakeholders can clearly understand the work of OPERS throughout the past years, our results for 2016, and the expectations for the future.

Overall, as with all years, the year 2016 provided challenges and opportunities. The OPERS management and staff, with the advice and counsel of our dedicated Board, met each challenge and each opportunity with professionalism, innovation and dedication. As a result, OPERS continues to be a strong pension system, well-positioned to continue to keep our promise to members—the promise of a secure financial retirement. We are honored to be associated with, appreciate and acknowledge the efforts of all involved.

Respectfully submitted,

Karen E. Carraher

Karen E. Carraher, CPA
Executive Director

Jennifer H. Starr

Jennifer H. Starr, CPA
Chief Financial Officer


Karen Carraher and Jennifer Starr

## Fiduciary Responsibilities

The Board and executive management of OPERS are fiduciaries of the pension trust funds. Fiduciaries are charged with the responsibility of assuring that the assets of OPERS are used exclusively for the benefit of plan participants and their beneficiaries.

## Request for Information

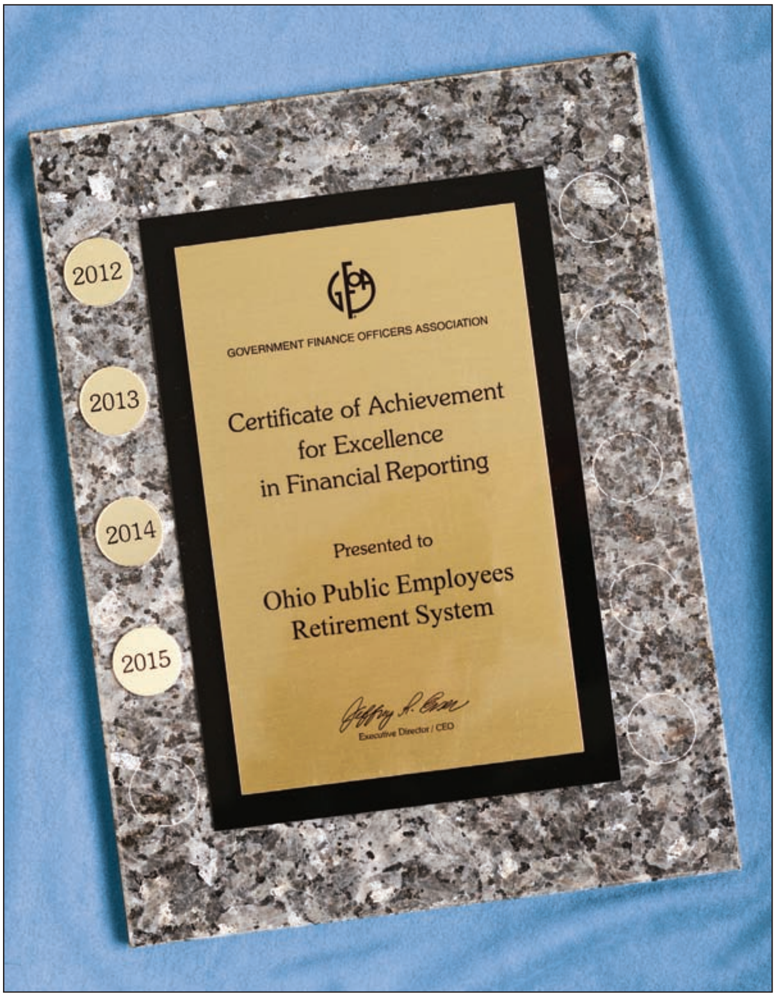
This financial report is designed to provide the Board, our membership, taxpayers, investment managers, and creditors with an overview of OPERS finances and accountability for the money received. Questions concerning any of the information provided in this report or requests for additional information should be addressed to:

Ohio Public Employees Retirement System
Director—Finance
277 East Town Street
Columbus, Ohio 43215-4642

OPERS has been recognized by national financial experts and organizations for commitment to the highest possible fiscal standards. We are honored to have been recognized with the following awards:

- ***2015 Certificate of Achievement***—For the 33rd consecutive year, the Government Finance Officers Association of the United States and Canada (GFOA) awarded OPERS a Certificate of Achievement for Excellence in Financial Reporting for its *Comprehensive Annual Financial Report* for the fiscal year ended December 31, 2015. In order to be awarded a certificate of achievement, a government must publish an easily readable and efficiently organized comprehensive annual financial report that satisfies both generally accepted accounting principles and applicable legal requirements.

## Certificate of Achievement for Excellence in Financial Reporting



- ***2015 Award for Outstanding Achievement***—For the sixth consecutive year, OPERS has received the GFOA award for Outstanding Achievement in Popular Annual Financial Reporting for the OPERS *Popular Annual Financial Report* for the fiscal year ended December 31, 2015. This award is a prestigious national award recognizing conformance with the highest standards of creativity, presentation, understandability, and reader appeal for preparation of governmental popular reports.

### Award for Outstanding Achievement in Popular Annual Financial Reporting

- ***2016 Public Pension Standards Award***—Issued by the Public Pension Coordinating Council, this award recognizes OPERS for demonstrating a high level of plan design, funding, member communications and administrative practices. The standards serve as a benchmark by which all public defined benefit plans are managed.

### 2016 Public Pension Standards Award

PPCC

Public Pension Coordinating Council

**_Public Pension Standards Award_**
**_For Funding and Administration_**
**_2016_**

Presented to

**_Ohio Public Employees Retirement System_**

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

*Presented by the Public Pension Coordinating Council, a confederation of*

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

Alan H. Winkle
Program Administrator

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# Financial Section

## *Dedicated to:* Streamlined Operations

OPERS is a responsible steward of employer and employee contributions. Our ability to deliver accurate financial information and required financial reporting is provided at the lowest possible cost. We understand that costs really do matter. However, so does customer service. Our ongoing focus is to maintain strong customer service standards and accurate, timely financial information so that each of our more than one million members is in the position to make important retirement decisions with confidence.

Throughout 2016, as has been our tradition, OPERS delivered accurate financial information with outstanding customer service—without adding to operational costs. How has this been possible? By consistently investing in the power of technology to enhance controls and streamline operations—even as the number of members and retirees requiring OPERS services continues to grow. In fact, OPERS maintains a low cost-to-member ratio, provides appropriate safeguards for finances, and maintains a strong customer service standard—all because of the ability to target and acquire the technology necessary to enable us to streamline some operational functions—while freeing up important staff time to work directly with members.

This dedication to streamlined operations and accurate accounting information at an individual level has been noticed: For more than 30 years, OPERS has been recognized with awards for financial reporting transparency and accounting measures—and, most importantly, we consistently have high customer satisfaction rankings.

*Note: Portions of this section are unaudited, including the Management's Discussion and Analysis, the Required Supplementary Information and Notes to Required Supplementary Information.*

CliftonLarsonAllen

CliftonLarsonAllen LLP
CLAconnect.com

## INDEPENDENT AUDITORS' REPORT

Board of Trustees
The Ohio Public Employees Retirement System, and
The Honorable Dave Yost, Auditor of State

### Report on the Financial Statements

We have audited the accompanying financial statements of the Ohio Public Employees Retirement System (OPERS), which comprise the combining statement of fiduciary net position as of December 31, 2016, and the related combining statement of changes in fiduciary net position for the year then ended and the related notes to the financial statements, which collectively comprise OPERS' basic financial statements, as listed in the table of contents.

### Management's Responsibility for the Financial Statements

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

### Auditors' Responsibility

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

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the 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 opinion.

### Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of OPERS as of December 31, 2016, and the respective changes in its fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

A member of Nexia International

Board of Trustees
The Ohio Public Employees Retirement System, and
The Honorable Dave Yost, Auditor of State

**Other Matters**

*Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, the schedules of changes in net pension liability, member and employer contributions, investment returns, funding progress, contributions from employers and other contributing entities, and notes to required supplementary information, as listed in the table of contents, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

*Other Information*

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise OPERS' basic financial statements. The additional information, including the administrative expenses and schedule of investment expenses, as listed in the table of contents, is presented for purposes of additional analysis and are not a required part of the basic financial statements.

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

The introductory, investment, actuarial and statistical sections, as listed in the table of contents, 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 it.

**Other Reporting Required by *Government Auditing Standards***

In accordance with *Government Auditing Standards*, we have also issued our report dated June 14, 2017 on our consideration of OPERS' internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering OPERS' internal control over financial reporting and compliance.

CliftonLarsonAllen LLP

**CliftonLarsonAllen LLP**

Toledo, Ohio
June 14, 2017

The management of the Ohio Public Employees Retirement System (OPERS or System or Fund) offers readers of the System's financial statements this narrative overview of the financial activities of OPERS for the year ended December 31, 2016. This narrative is intended to supplement the System's financial statements. Readers are encouraged to consider the information presented here in conjunction with the financial statements that begin on page 38.

The OPERS *Comprehensive Annual Financial Report* (CAFR or annual report) presents financial statements for the most recent year end. Users of this CAFR can refer to the Statistical Section, beginning on page 173, for historical financial information.

## Overview of the Financial Statements

The following discussion and analysis are intended to serve as an introduction to the OPERS financial statements. The basic financial statements include:

1. Combining Statements of Fiduciary Net Position
2. Combining Statements of Changes in Fiduciary Net Position
3. Notes to Combining Financial Statements

As mandated, this CAFR also contains the following schedules, referred to as Required Supplementary Information:

1. Schedules of Changes in Net Pension Liability—Traditional Pension Plan, Combined Plan and Member-Directed Plan
2. Schedule of Member and Employer Contributions—Traditional Pension Plan
3. Schedules of Employer Contributions—Traditional Pension Plan, Combined Plan and Member-Directed Plan
4. Schedule of Investment Returns—Defined Benefit Portfolio
5. Schedule of Funding Progress—Health Care
6. Schedule of Contributions from Employers and Other Contributing Entities—Health Care
7. Notes to Required Supplementary Information

Expenses associated with administering the System are presented immediately following the Notes to Required Supplementary Information in the following Additional Information schedules:

1. Administrative Expenses
2. Schedule of Investment Expenses

The financial statements contained in this annual report disclose financial data for each of the benefit plans and health care trusts described beginning below and on the next two pages. Please refer to the Plan Statement Section beginning on page 227 for a comprehensive description of the plan structures and benefits. These plans and trusts are established as separate legal entities in accordance with Internal Revenue Service (IRS) regulations and Ohio law and are summarized beginning below.

### The Traditional Pension Plan

The Traditional Pension Plan is a defined benefit plan in which a member's retirement benefits are calculated on a formula that considers years of service and final average salary (FAS). The pension benefits are funded by both member and employer contributions, and investment earnings on those contributions.

### The Combined Plan

The Combined Plan is a defined benefit plan with elements of a defined contribution plan. Under the Combined Plan, members earn a formula benefit similar to, but at a factor less than, the Traditional Pension Plan benefit. This defined benefit is funded by employer contributions and associated investment earnings. Additionally, member contributions are deposited into a defined contribution account in which the member self-directs the investment. Upon retirement or termination, the member may choose a defined contribution retirement distribution that is equal in amount to the member's contributions to the plan and investment earnings (or losses) on those contributions. Members may also elect to use their defined contribution account balances to purchase a defined benefit annuity administered by OPERS.

### The Member-Directed Plan

The Member-Directed Plan is a defined contribution plan in which members self-direct the investment of both member and employer contributions. The retirement distribution under this plan is equal to the sum of member and vested employer contributions, plus investment earnings (or losses) on those contributions. Employer contributions and associated investment earnings vest over a five-year period at a rate of 20% per year.

Upon retirement or termination, the member may choose a defined contribution retirement distribution, or may elect to use his/her defined contribution account balance to purchase a defined benefit annuity administered by OPERS.

### 401(h) Health Care Trust

The 401(h) Health Care Trust (401(h) Trust) was established under Section 401(h) of the Internal Revenue Code (IRC). This trust was pre-funded and held the portion of employer contributions of the Traditional Pension Plan and Combined Plan that were set aside for funding retiree health care. The health care portion of the employer contribution rate for the Traditional Pension Plan and Combined Plan is comparable, as the same coverage options are provided to participants in both plans.

Employer contributions to this trust ceased in September 2014 upon the establishment of the 115 Health Care Trust (115 Trust). Health care coverage previously funded through the 401(h) Trust terminated as of December 31, 2015 and the 115 Trust began funding all health care coverage previously funded through the 401(h) Trust. In March 2016, OPERS received two favorable rulings from the IRS allowing OPERS to consolidate all health care assets into the 115 Trust. Transition to the new health care trust structure was completed as of July 1, 2016. The Combining Statements of Changes in Fiduciary Net Position for the year ended December 31, 2016 reflects a partial year of activity in the 401(h) Trust prior to the termination of the trust as of June 30, 2016 and the transfer of the net position to the 115 Trust on July 1, 2016. Since health care coverage was funded through the 115 Trust in 2016, the 401(h) Trust has no deductions reported in the Combining Statements of Changes in Fiduciary Net Position.

### 115 Health Care Trust

As OPERS prepared to change the manner of funding health care for Medicare-eligible retirees, it needed a permissible trust that could fund a health reimbursement arrangement (HRA). In 2014, OPERS established the 115 Trust under Section 115 of the IRC to support an HRA plan. This trust, similar to the 401(h) Trust, provides reimbursement for eligible health care expenses of retirees in the Traditional Pension Plan and Combined Plan.

Effective October 1, 2015, the HRA was launched in conjunction with the OPERS Medicare Connector (Connector) for coverage periods beginning January 1, 2016. The Connector is a program whereby eligible Medicare-enrolled retirees may have an allowance deposited to an HRA account to be used toward the health care program of their choice selected with the assistance of an OPERS vendor. Employer contributions to this trust began in September 2014 with the initial health care disbursements from this trust commencing with January 2016 premium reimbursements. As previously mentioned, favorable rulings from the IRS received in 2016 allowed OPERS to consolidate all health care assets into the 115 Trust. The 401(h) Trust and Voluntary Employees' Beneficiary Association (VEBA) Trust closed as of June 30, 2016 and the net positions were transferred to the 115 Trust on July 1, 2016.

### Voluntary Employees' Beneficiary Association Trust

Member-Directed Plan participants are provided with a retiree medical account (RMA). The funding vehicle of the RMA Plan, prior to July 1, 2016, was the VEBA Trust established under Section 501(c)(9) of the IRC. The VEBA Trust held the portion of employer contributions of the Member-Directed Plan that were set aside for funding retiree health care. Beginning July 1, 2016, the funding vehicle of the Member-Directed RMA Plan is the 115 Trust.

Upon separation or retirement, the participant may use the vested funds in his/her RMA for qualified health care expenses. Vesting requirements for the RMA have changed over the life of the plan. The RMA originally required 10 years of participation to fully vest in the contributions and interest earned on the account. Effective January 1, 2009, contributions and interest vested with the participant over a five-year period. Effective July 1, 2015, new participants to the RMA are required to participate for 15 years to become fully vested. Additional information on the new vesting schedule can be found in the Plan Statement on page 240.

Financial activity for each of the pension plans and health care trusts is reported in the basic combining financial statements described below:

### Combining Statements of Fiduciary Net Position

The Combining Statements of Fiduciary Net Position is a point-in-time snapshot of fund balances at fiscal year-end for pension and health care. It reports the assets available to pay future benefits to retirees, and any liabilities owed as of the statement date. The resulting Net Position (Assets less Liabilities = Net Position) represents the value of assets held in trust for pension benefits and health care. As previously noted, the net positions of the 401(h) Trust and the VEBA Trust were transferred to the 115 Trust on July 1, 2016. Therefore, this statement reflects all health care assets within the 115 Trust as of December 31, 2016. (See Combining Statements of Fiduciary Net Position as of December 31, 2016 on pages 38-39 of this report.)

### Combining Statements of Changes in Fiduciary Net Position

The Combining Statements of Changes in Fiduciary Net Position displays the effect of financial transactions that occurred during the fiscal year, where Additions less Deductions = Net Increase (or Net Decrease) in Net Position. This Net Increase (or Net Decrease) in Net Position reflects the change in the value of Fiduciary Net Position that occurred between the current and prior year. As previously noted, this statement presents a partial year of activity for the 401(h) Trust and the VEBA Trust for the six-month period ended June 30, 2016, the date the trusts were closed. (See Combining Statements of Changes in Fiduciary Net Position for the year ended December 31, 2016 on pages 40-41 of this report.)

### Notes to Combining Financial Statements

The Notes to Combining Financial Statements is an integral part of the financial statements and provide additional information that is essential for a comprehensive understanding of the data provided in the financial statements. These notes describe the accounting and administrative policies under which OPERS operates, and provide additional levels of detail for selected financial statement items. The most significant changes to this section this year are found in Note 3 and include additional information to comply with Governmental Accounting Standards Board (GASB) Statement No. 72 (GASB 72), *Fair Value Measurement and Application*, as 2016 is the initial year of implementation of this standard for OPERS. This statement requires investments to be measured at fair value. Since most investments have been measured at fair value in prior years, there was no impact to the combining statements. However, the disclosures in this section were expanded to include detailed information on the fair value of investments, and other requirements, as defined in GASB 72. (See Notes to Combining Financial Statements, December 31, 2016 on pages 42-78 of this report.)

The financial statements described are prepared in accordance with GASB pronouncements. Information on the significant accounting policies and recent GASB standards reviewed and adopted in the preparation of the financial statements can be found in Note 2 in the Notes to Combining Financial Statements beginning on page 50.

Because of the long-term nature of most pension plans, financial statements alone cannot provide sufficient information to properly reflect the ongoing plan perspective. Therefore, in addition to the financial statements explained previously, this report includes six additional Required Supplementary Information (RSI) schedules and required notes. The RSI section includes schedules of changes in net pension liability and investment returns for the defined-benefit portion of the pension plans, schedules of employer contributions for both defined-benefit pension plans and health care and a schedule of funding progress for all health care plans. The schedules of funding progress for defined-benefit pension plans have been included in the Actuarial Section of this document. Each of the following schedules includes historical trend information when required by standards, except when it was the initial year of implementation and historical information is unavailable as with GASB Statement No. 67 (GASB 67), *Financial Reporting for Pension Plans:*

### Schedules of Changes in Net Pension Liability—Traditional Pension Plan, Combined Plan and Member-Directed Plan

The Schedules of Changes in Net Pension Liability (pages 79-82) includes actuarial information regarding the increase (or decrease) of each element of the net pension liability between the beginning and ending of the year for the OPERS defined benefit pension plans. The values included in these schedules were calculated using the assumptions and requirements defined in GASB 67 (also referred to as the Accounting Basis throughout this document). The calculation method defined in GASB 67 requires different assumptions than are used to calculate the funded status of a plan (also referred to as the Funding Basis throughout this document). For example, the Accounting Basis requires the use of fair value of assets versus the smoothed value of assets used for the Funding Basis (refer to page 30 for additional information on actuarial smoothing techniques). Therefore, the GASB 67 Accounting Basis net pension liability results differ from the Funding Basis unfunded actuarial accrued liability results provided in the Schedule of Funding Progress included on page 29 of this section and in the Actuarial Section of this document beginning on page 147. GASB 67 breaks the link between accounting and funding. While these changes affect the accounting information disclosed in the Notes to Combining Financial Statements and RSI, they do not have an effect on the actuarial methods and assumptions used by OPERS to determine the employer contributions needed to fund the plans.

Historical information is not available prior to the GASB 67 implementation in 2014. The schedules will be expanded each subsequent year until they contain the required 10-year presentation.

### Schedule of Member and Employer Contributions—Traditional Pension Plan

The Schedule of Member and Employer Contributions (page 83) presents historical trend information regarding the value of total annual contributions required to be paid by the members and employers participating in the Traditional Pension Plan, and the actual amounts remitted. The information contained in this schedule reflects the required contributions based on the contribution rates approved by the OPERS Board of Trustees (Board). This schedule includes both member and employer contributions that are used to calculate the proportionate share by employer for the Traditional Pension Plan.

GASB Statement No. 68 (GASB 68), *Accounting and Financial Reporting for Pensions*, was issued by GASB in conjunction with GASB 67. GASB 68 applies to employers that participate in OPERS as well as other governmental employers that sponsor or contribute to pension plans. GASB 68 requires employers to recognize a proportionate share of the net pension liability in their financial statements, and includes other reporting changes. GASB 68 specifies that when different contribution rates are assessed for different classes of employees, the determination of the employer’s proportionate share must reflect those relationships. The Traditional Pension Plan proportionate share calculation includes both member and employer contributions to recognize the differing benefits of members in the State, Local, Public Safety and Law divisions. Members in the Public Safety and Law divisions are prohibited from participating in the Combined Plan or Member-Directed Plan. The defined benefit pension portion of the Combined Plan is funded with employer contributions only. Annuitized defined contribution accounts for Member-Directed Plan retirees are funded with member contributions, vested employer contributions (if applicable) and investment gains/(losses) related to those contributions. Separate schedules showing employer-only contributions for the Traditional Pension Plan, Combined Plan and Member-Directed Plan are also included in RSI and described below.

### Schedules of Employer Contributions—Traditional Pension Plan, Combined Plan and Member-Directed Plan

The Schedules of Employer Contributions (pages 84-85) presents historical trend information regarding the value of total annual contributions required to be paid by employers only for the employees participating in each plan, and the actual amounts remitted. The information contained in these schedules also reflects the required contributions based on the contribution rates approved by the Board. The Member-Directed Plan is a defined contribution plan with the option for retirees to purchase a defined benefit annuity administered through OPERS. Defined benefit annuities purchased by eligible Member-Directed retirees are funded with the accumulated member contributions, vested employer contributions, and gains or losses resulting from the member-selected investment options. All employer contributions deposited to the Member-Directed Plan are included in these schedules.

### Schedule of Investment Returns—Defined Benefit Portfolio

The Schedule of Investment Returns (page 86) provides information regarding the annual money-weighted rates of return on pension plan investments in the Defined Benefit portfolio, calculated and presented as required by GASB 67. Historical information is not available prior to the GASB 67 implementation in 2014. The schedule will be expanded each subsequent year until it contains the required 10-year presentation.

### Schedule of Funding Progress—Health Care

The Schedule of Funding Progress for Health Care (page 87) includes actuarial information about the status of health care from an ongoing, long-term perspective, and the progress made in accumulating sufficient assets to pay future health care coverage costs. The results presented relate to the plans for the non-Medicare population as well as the Connector (Medicare-eligible population). The Schedule of Funding Progress for health care is reported on the Funding Basis, as the new GASB Accounting Basis for health care will not be effective for OPERS until the 2017 annual report. Therefore, Accounting Basis information for health care is currently not available. Health care coverage is not statutorily guaranteed and may be changed to ensure the long-term solvency of the plans and OPERS' ability to provide future coverage for all eligible retirees. Actuarial accrued liabilities are determined based on the current plan design, and do not reflect potential changes until approved by the Board.

### Schedule of Contributions from Employers and Other Contributing Entities—Health Care

The Schedule of Contributions from Employers and Other Contributing Entities for health care (page 87) presents historical trend information regarding the value of total annual contributions required to fund health care coverage and the total portion of the employers' contributions applied toward this funding. The information contained in this schedule reflects the required contributions based on the contribution rates approved by the Board. In addition, OPERS participates in federal programs such as Medicare Part D reimbursements and prescription drug plans that provide rebates of some health care expenses. These reimbursement/rebates programs contribute to the funded status of health care and are included in this schedule.

As noted previously, the VEBA Trust was a separate legal entity that was the funding vehicle for the Member-Directed RMA Plan. The contributions deposited to the VEBA were historically not included in the Schedule of Contributions from Employers and Other Contributing Entities. Recent guidance issued in the Proposed Implementation Guide for GASB Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*, indicates that the Member-Directed RMA benefits should be treated as a defined benefit (rather than defined contribution) other postemployment benefit (OPEB) plan. Due to this new guidance and the consolidation of health care assets into the 115 Trust in 2016, the current year Member-Directed RMA Plan contributions are reported in this schedule.

### Notes to Required Supplementary Information

The Notes to Required Supplementary Information (pages 88-90) provides background information, a summary of the actuarial assumptions used for valuation of the pension plans and health care, and explanatory detail to help in understanding the required supplementary schedules.

The following schedules are provided as Additional Information regarding the expenses associated with administering the System:

### Administrative Expenses

The Administrative Expenses schedule displays the total operating costs of managing the System, by major categories of expense (page 91). This schedule also includes payments made to outside professionals by the type of service providers used by the System (such as actuarial or legal).

### Schedule of Investment Expenses

The Schedule of Investment Expenses summarizes the costs incurred in managing the investment assets of the System (page 91). These costs are reported as Investment Administrative Expenses in the Combining Statements of Changes in Fiduciary Net Position, and are reflected as a reduction in Net Investment Income.

## Financial Highlights

- The investment portfolio reported total returns of 8.2%, for the year ended December 31, 2016, compared to a loss of less than 0.1% in 2015. The total portfolio, as of the year end, is divided into three sub-portfolios: the Defined Benefit portfolio, the 115 Health Care Trust portfolio, and the Defined Contribution portfolio. The 401(h) Health Care Trust portfolio was closed as of June 30, 2016 and the net position transferred to the 115 Health Care Trust portfolio on July 1, 2016. The Defined Benefit portfolio earned an investment return of 8.3% in 2016 compared to a return of 0.3% in 2015. The 401(h) Health Care Trust portfolio earned an investment return of 4.7% for the six months ended June 30, 2016 compared to losses of 2.2%, or (2.2%), for the year 2015. The 115 Health Care Trust portfolio earned an investment return of 5.1% in 2016 compared to losses of 3.2%, or (3.2%), in 2015. The combined return on total health care assets for the year ended December 31, 2016 is 7.6%. The Defined Contribution portfolio earned an investment return of 9.5% in 2016 compared to losses of 1.7%, or (1.7%), in 2015.
- Net position increased by $3.3 billion to $90.6 billion as of December 31, 2016 compared to $87.3 billion in 2015. Net income from investing activities totaled $6.9 billion in 2016 compared to income of $9.4 million in 2015. Table 1 presents a two-year comparative history of Changes in Fiduciary Net Position.

**Changes to Fiduciary Net Position** (for the years ended December 31, 2016 and 2015) **Table 1**

| | 2016 | 2015 | Amount Increase/ (Decrease) from 2015 to 2016 | Percent Increase/ (Decrease) from 2015 to 2016 |
|---|---|---|---|---|
| Member and Employer Contributions | $3,328,847,544 | $3,197,132,735 | $131,714,809 | 4.1% |
| Contract Receipts and Other Income | 191,064,863 | 362,870,526 | (171,805,663) | (47.3) |
| Retiree-Paid Health Care Premiums | 184,368,783 | 248,601,375 | (64,232,592) | (25.8) |
| Net Income from Investing Activity | 6,926,572,065 | 9,415,961 | 6,917,156,104 | >1,000.0 |
| **Total Additions** | **10,630,853,255** | **3,818,020,597** | **6,812,832,658** | **178.4** |
| Benefits, Health Care and Account Refunds | 7,215,166,451 | 7,673,717,830 | (458,551,379) | (6.0) |
| Administrative and Other Expenses | 96,264,397 | 96,796,057 | (531,660) | (0.5) |
| **Total Deductions** | **7,311,430,848** | **7,770,513,887** | **(459,083,039)** | **(5.9)** |
| **Net Increase in Net Position** | **3,319,422,407** | **(3,952,493,290)** | **7,271,915,697** | **184.0** |
| Net Position, Beginning of Year | 87,291,401,818 | 91,243,895,108 | (3,952,493,290) | (4.3) |
| **Net Position, End of Year** | **$90,610,824,225** | **$87,291,401,818** | **$3,319,422,407** | **3.8%** |

- OPERS continues its goal of ensuring financial stability of both the pension and health care funds. In 2016, the Board's actuarial consultants conducted an experience study for the period 2011 through 2015, comparing assumptions to actual results. The experience study incorporates both a historical review and forward-looking projections to determine the appropriate set of assumptions to keep the plan on a path toward full funding. Information from this study led to changes in both demographic assumptions and economic assumptions, with the most notable being a reduction in the expected rate of investment return from an 8.0% actuarially assumed rate of return down to 7.5%, for the defined benefit investments. The information in Table 2 reflects the preliminary 2015 valuation results prior to the experience study assumption changes and 2015 valuation results revised to reflect the change in assumptions approved by the Board based on the experience study results. (Refer to the Actuarial Section, beginning on page 147, for more information on actuarial assumption changes based on the 2016 experience study.)

- OPERS presents current pension funding information, in Table 2, that aligns with the year-end of the financial statements presented in this document. As a result, the pension funding discussion includes information updated as of December 31, 2016, also reflecting the assumption changes from the 2016 experience study. The health care funding presented in this document (refer to Table 3 on page 31) remains a year in arrears as the most recent health care funding information is as of December 31, 2015. OPERS presents 2015 health care funding information with pre-experience study assumptions.

**Schedule of Funding Progress—Funding Basis** ($ in millions) **Defined Benefit Plans*—Table 2**

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities (UAAL) | Ratio of Assets to AAL | Funding Years |
|---|---|---|---|---|---|
| 2016 | $100,166 | $80,280 | $19,886 | 80.1% | 19 |
| 2015*** | 97,177 | 78,061 | 19,116 | 80.3 | 20 |
| 2015** | 91,832 | 78,061 | 13,771 | 85.0 | 19 |
| 2014 | 89,285 | 74,865 | 14,420 | 83.8 | 21 |
| 2013 | 86,645 | 71,411 | 15,234 | 82.4 | 24 |
| 2012***** | 83,878 | 67,855 | 16,023 | 80.9 | 26 |
| 2012**** | 87,105 | 67,855 | 19,250 | 77.9 | 30 |
| 2011 | 84,530 | 65,436 | 19,094 | 77.4 | 30 |
| 2010*** | 80,485 | 63,649 | 16,836 | 79.1 | 24 |
| 2010** | 79,630 | 60,600 | 19,030 | 76.1 | 29 |
| 2009 | 76,555 | 57,629 | 18,926 | 75.3 | 30 |
| 2008 | 73,466 | 55,315 | 18,151 | 75.3 | 30 |
| 2007 | 69,734 | 67,151 | 2,583 | 96.3 | 14 |

* Defined Benefit Plans include the Traditional Pension Plan, the defined benefit portion of the Combined Plan and purchased annuities in the Member-Directed Plan.
** Results from original valuation prior to re-statement after completion of experience study.
*** Revised actuarial assumptions based on experience study.
**** Results prior to the provisions of Senate Bill 343.
***** Results reflecting the provisions of Senate Bill 343.

- As previously noted, the OPERS net investment income for the year ended December 31, 2016 totaled $6.9 billion, including an investment return of 8.2% on the total OPERS portfolio. Net investment income for the defined benefit plans comprised $6.0 billion of this total, with a return of 8.3%. The 401(h) Health Care Trust portfolio, for the six months ended June 30, 2016, realized investment income of $490.2 million, with an investment return of 4.7%. The net investment income for the 115 Health Care Trust portfolio was $352.6 million, with an investment return of 5.1%, and the Defined Contribution portfolio earned an increase of $100.1 million in investment income with a return of 9.5%. The combined return on total health care assets for the year ended December 31, 2016 is 7.6%. As with all mature retirement systems, OPERS' primary means of funding benefit payments in the future will be through investment income. Ultimately, the goal is for investment income to provide more than 60%

of the funds necessary to pay retirement benefits. Therefore, the long-term rate of investment return is critical to the funding status of the System.

- To fully understand the funding status of a retirement system, it is often advisable to view actuarial data in conjunction with financial data. Both Tables 2 and 3 are presented on the Funding Basis. Under the Funding Basis, the actuarial value of assets used to calculate funded status is not based on year-end fair value, known as the Accounting Basis (or GASB 67 basis), as of the valuation date. Under the Funding Basis, market gains and losses for actuarial funding purposes are smoothed over a rolling four-year period, subject to a 12% market corridor. This smoothing of actuarial gains and losses mitigates the need to constantly increase or decrease contribution rate allocations because volatile market conditions can be recognized (smoothed in) over several years.
- The reality of actuarial smoothing techniques is that the fair value of assets may be significantly different from the funding value (actuarial value) of assets at a given point in time. This means that in periods of extended market decline the fair value of assets will usually be less than the funding, or actuarial value, of assets. This was the case with OPERS during the extended down market of 2000 to 2002, and in 2008. Conversely, during periods of extended market gains, the value of assets will usually be greater than the funding, or actuarial value, of assets.
- To ensure that the funding value of assets and the market value of assets remain within a reasonable proximity of each other under the Funding Basis, OPERS uses a 12% market corridor in conjunction with its four-year smoothing. This policy, instituted by the Board in 2001, ensures that the funding value of assets is neither lower than 88% nor higher than 112% of the market value of the assets. At the end of 2015, the market value of assets was lower than the funding value due to smoothing of losses from 2014 and 2015. At the end of 2016, the market value of assets remained lower than the funding value as the 2016 investment return recognized gain did not offset the prior net unrealized losses.
- At December 31, 2016, the date of the latest actuarial evaluation, the funding value of assets set aside to pay defined benefit pension benefits (non-health care assets) was $80.3 billion. The market value of these defined benefit assets at December 31, 2016, included in the pension plans on OPERS financial statements, was $77.5 billion. As of December 31, 2016, the fair value of assets was lower than the funding value of assets by $2.8 billion, indicating that these losses will be recognized in future years.
- As of December 31, 2016, the date of the most recent actuarial valuation, the unfunded actuarial accrued liability for the defined benefit pension plans was $19.9 billion. While the defined benefit investment return of 8.3% was more than the new 7.5% actuarially assumed rate of return in 2016, the funding return was 6.9%. The lower funding return reflects the realization of a portion of prior year losses smoothed in over a four-year period, the reduction in the assumed rate of return and the impact of other changes to actuarial assumptions adopted based on the experience study. As a result, the unfunded actuarial liability increased from $19.1 billion (post-experience study) as of December 31, 2015 to $19.9 billion as of December 31, 2016. Refer to Table 2 on page 29 for a comparative history of actuarial liabilities and funding years for pension benefits.
- As of December 31, 2016, OPERS had accumulated sufficient assets to fund 100% of the benefits for retirees and their beneficiaries, and had also provided nearly 46.7% of the reserves necessary to fund pensions for active and inactive members based on service credit earned through 2016.
- As of December 31, 2016, the date of the latest actuarial valuation, the funded ratio for defined benefit pensions was 80.1%. In general, this means that for each dollar of future pension liability, OPERS had accumulated approximately $0.80 to meet that obligation. The funded ratio remained flat between 2016 and 2015 post-experience study. However, the 2015 pre- and post-experience study funded ratio decreased due to the change in assumptions, most notably the reduction in the investment rate of return from 8.0% to 7.5%. The December 31, 2016 actuarial report indicates that if future activity

proceeded according to assumptions, OPERS would accumulate sufficient assets to pay all pension liabilities for active members and retirees within 19 years on a Funding Basis. The funding years as of December 31, 2015 were 20 years on a Funding Basis (post-experience study).

**Schedule of Funding Progress—Funding Basis** ($ in millions) **Health Care—Table 3**

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities (UAAL) | Ratio of Assets to AAL | Solvency Years* |
|---|---|---|---|---|---|
| 2015** | $18,515 | $11,933 | $6,582 | 64.5% | Indefinite |
| 2014 | 19,405 | 12,062 | 7,343 | 62.2 | Indefinite |
| 2013 | 19,784 | 12,031 | 7,753 | 60.8 | Indefinite |
| 2012 | 19,182 | 12,193 | 6,989 | 63.6 | Indefinite |
| 2011 | 31,020 | 12,115 | 18,905 | 39.1 | 10 |
| 2010*** | 30,531 | 12,320 | 18,211 | 40.4 | 11 |
| 2010** | 26,929 | 11,267 | 15,662 | 41.8 | 11 |
| 2009 | 31,558 | 10,936 | 20,622 | 34.7 | 11 |
| 2008 | 29,623 | 10,748 | 18,875 | 36.3 | 11 |
| 2007 | 29,825 | 12,801 | 17,024 | 42.9 | 31 |
| 2006 | 30,748 | 12,025 | 18,723 | 39.1 | 27 |

* Solvency years represent an estimate of the number of years the fund will be able to provide health care under the intermediate actuarial assumptions. Indefinite indicates funds are expected to be sufficient to fund future health care needs.
** Results from original valuation prior to re-statement after completion of experience study.
*** Revised actuarial assumptions based on experience study.

- The funding objective is to meet long-term pension benefit obligations and, to the extent possible, fund post-employment health care. As of December 31, 2015, the date of the latest health care actuarial valuation, the actuarial liability for health care was $18.5 billion (before experience study) and the System had accumulated assets of $11.9 billion for that obligation. OPERS had an unfunded actuarial accrued liability of $6.6 billion (before experience study), which is a decrease from the 2014 valuation amount of $7.3 billion. The funded ratio increased to 64.5% (before experience study) compared to 62.2% in 2014. The decrease in the unfunded liability and increase in funded ratio are a result of the continued phase-in of 2012 and 2013 calendar-year gains in the funding value (actuarial value) of assets, in conjunction with the four-year smoothing technique previously noted.

  Health care coverage is not statutorily guaranteed, and is subordinate to pension funding. Accordingly, OPERS reduced the allocation to heath care and correspondingly increased the allocation to pension. For 2016, the employer contribution rate allocation to pension funding was 12% and to health care funding was 2%. Beginning in 2017, that allocation will shift again with 13% allocated to pension funding and 1% allocated to health care funding. The 2018 allocation is expected to shift again with the full 14% employer contribution allocated to pension funding and 0% allocated to health care funding. The 2018 allocation is expected to continue thereafter, but all future decisions are subject to annual review and approval by the Board and thus may be adjusted based on actual results. Current projections indicate the changes to the allocation will reduce the health care fund solvency, but will still allow for sufficient funding for health care at this time.

  The funding progress of health care is measured in terms of solvency years, or the number of years that funds are projected to be available to pay health care expenses under the current plan design before health care would be reduced to a pay-as-you-go basis. The implementation of plan design changes approved by the Board in 2012, changes in assumptions and strong investment returns between 2012 and 2014, resulted in health care remaining solvent for an indefinite period under actuarial terms as of the December 31, 2014 and 2015 (before experience study) valuations. An indefinite solvency period indicates that health care assets are projected to be sufficient to fund expected liabilities. Refer to Table 3, on the previous page, for a comparative history of actuarial liabilities and solvency years for health care.

## Analysis of Financial Activities

The OPERS funding objective is to meet long-term benefit obligations with investment income and contributions. Accordingly, the collection of employer and member contributions and the income generated from investment activities provide the reserves needed to finance future pension benefits and health care. The following discussion provides an analysis of the current year's financial activities. Comparative data is presented, where appropriate.

## Additions to Fiduciary Net Position (Revenues)

As previously noted, the reserves needed to finance retirement benefits are accumulated primarily through the collection of member and employer contributions, and through investment income (net of investment expense). Revenues (Additions to Fiduciary Net Position) for the year 2016 were $10.6 billion, and include member and employer contributions of $3.3 billion, net income from investment activities of $6.9 billion, and other income totaling approximately $0.4 billion. Other income line items are comprised of purchased service agreements, Retiree-Paid Health Care Premiums, employer interest and penalty charges, vendor performance guarantees and rebates, federal subsidies, settlements, Interplan Activity, and miscellaneous other income or expense. Interplan Activity in Table 4 represents transactions between plans that are additions to plan assets. Additions to plan net position for the year 2015 were $3.8 billion, comprised of $3.2 billion in contribution revenues, $9.4 million in net income from investment activities, and other income totaling approximately $0.6 billion. Refer to Table 4 for a comparative history of Additions to Fiduciary Net Position.

**Additions to Fiduciary Net Position (Revenues)** (for the years ended December 31, 2016 and 2015) **Table 4**

| | 2016 | 2015 | Amount Increase/ (Decrease) from 2015 to 2016 | Percent Increase/ (Decrease) from 2015 to 2016 |
|---|---|---|---|---|
| Member Contributions | $1,387,215,220 | $1,332,308,994 | $54,906,226 | 4.1% |
| Employer Contributions | 1,941,632,324 | 1,864,823,741 | 76,808,583 | 4.1 |
| Contract and Other Receipts | 172,338,832 | 172,067,637 | 271,195 | 0.2 |
| Retiree-Paid Health Care Premiums | 184,368,783 | 248,601,375 | (64,232,592) | (25.8) |
| Federal Subsidy | 4,065,058 | 175,930,875 | (171,865,817) | (97.7) |
| Other Income/(Expense), net | (2,544,366) | (4,887,359) | 2,342,993 | 47.9 |
| Interplan Activity | 17,205,339 | 19,759,373 | (2,554,034) | (12.9) |
| Net Income from Investing Activity | 6,926,572,065 | 9,415,961 | 6,917,156,104 | >1,000.0 |
| **Total Additions** | **$10,630,853,255** | **$3,818,020,597** | **$6,812,832,658** | **178.4%** |

Member and employer contributions for 2016, compared to 2015, increased by $131.7 million, or 4.1%. Member and employer contributions include amounts paid by active members and their employers for future retirement benefits. In general, as wages start to rise, the retirement contributions from active members, and their employers, also increase. These contributions can also be influenced by the number of active members that move to retirement. In 2016, approximately 7,300 active members retired and will generally be replaced with less-tenured or entry-level staff. This is the second-lowest number of new retirees in the past 10 years. Additionally, OPERS total active population increased by approximately 1,300 employees, the first increase in the active population since 2007. Finally, the national average wage increase given to government employees for 2016 was 2.4%.

Contracts and Other Receipts represents funds received for member purchase of service contracts, employer early retirement incentive programs, vendor rebates, and funds received from other Ohio retirement systems for members with service credit under more than one retirement system. These receipts totaled $172.3 million in 2016, a slight change compared to the $172.1 million received in 2015. The increase is directly related to rebates from health care vendors of $91.7 million in 2016 compared to $91.4 million in 2015. The rebates are related to gain-sharing revenues received in conjunction with the Medicare Advantage program. The Medicare Advantage premiums were estimated at the beginning of the year, and adjusted at year end based on actual claims experience. These gain-sharing revenues represented a premium adjustment based on actual experience that results in receiving a vendor rebate. OPERS did not offer the Medicare Advantage program after December 31, 2015 when the OPERS Connector program started on January 1, 2016. The activity recorded in 2016 represents the final vendor rebates received on the Medicare Advantage program based on the 2015 actual experience.

Additions to Fiduciary Net Position also includes amounts paid by retirees toward the cost of OPERS-provided health care in the Retiree-Paid Health Care Premiums line item. Retirees have historically shared in the cost of providing health care coverage for themselves, spouses and dependents. In 2016, these contributions totaled $184.4 million, compared to $248.6 million in 2015. This decrease is primarily related to the implementation of the OPERS Connector as Medicare-eligible retirees, more than half of OPERS retirees, moved from OPERS-sponsored health care coverage to the Medicare market under the Connector effective January 1, 2016. Also contributing to the decrease in this line item is the reduction of spousal health care allowances as health care program changes continued to be phased in during 2016. This change resulted in a decline of almost 10,000 covered lives in 2016.

Federal Subsidy revenue is mostly comprised of reimbursements and direct subsidies OPERS received from the federal government for participation in the Medicare Prescription Drug Program (PDP). In 2016, the PDP subsidy totaled $3.9 million compared to $175.2 million in 2015, making up the majority of this line item in both years. OPERS did not offer the program after December 31, 2015 when OPERS self-insured plan was terminated and the OPERS Connector started January 1, 2016. Medicare-eligible retirees now select pharmacy coverage through the Medicare market.

Other Income/(Expense), net, is comprised of miscellaneous proceeds, gains or losses on the disposal of fixed assets and litigation settlements activity. Other income/(expense) for 2016 was a net expense of $2.5 million compared to a net expense of $4.9 million in 2015. This activity typically fluctuates from year-to-year and, in 2016, the net expense balance in this line item is primarily comprised of an estimated $3.5 million litigation settlement related to an investment holding. Similarly, in 2015, the net expense balance reflected an estimated $6.0 million litigation settlement related to the same investment holding. Favorable class action settlements, miscellaneous proceeds, and losses on the disposal of fixed assets comprise the remainder of the balance.

Interplan Activity represents transfers between the plans to record activity occurring between the plans. This activity includes members changing from one plan to another, and repayment of initial plan start-up and administrative costs. Interplan Activity in 2016 resulted in a net inflow of $17.2 million, compared to $19.8 million in 2015. Since this activity represents one plan paying another plan, there is a corresponding interplan expense activity of the same amount in each year. (Refer also to the Deductions from Fiduciary Net Position discussion beginning on the next page.) In 2014, the Board approved changes to the Member-Directed Plan, Combined Plan and Member-Directed RMA Plan to provide funding sources for these plans to pay for initial plan start-up and administrative costs due to the Traditional Pension Plan, and on-going administrative expenses. These plan changes enabled each plan to completely repay the start-up and administrative costs due the Traditional Pension Plan as of December 31, 2016, and fund on-going administrative expenses of the plans.

Net Income from Investing Activity represents total investment income net of external management fees and administrative expenses. Investment income includes dividends, interest, and gains or losses on the sale of investments. OPERS reflects both income and management fees from external managers in this line item.

In 2016, OPERS continued transparency efforts related to the compilation of external management fees incurred during the year and continued to make a good faith attempt to account for fees that are not readily separable. The results of our efforts to obtain additional non-required information from fund managers identified management fees impacting the net asset value that were historically netted against the net increase/decrease in fair value. External Asset Management Fees within the Combining Statements of Changes in Fiduciary Net Position were $513.6 million in 2016, or an increase of $85.3 million from 2015. The 2016 investment manager fees reported to OPERS, whether directly invoiced or subtracted from the fund on a net basis, are reported as External Asset Management Fees. These fees include investment management fees, incentive fees and other expenses, such as audit expenses, in limited partnership structures, as well as fee offsets that may have the effect of reducing the total amount of fees. Incentive fees represent the investment managers' share of the net profits realized by the fund during the period.

Investment Administrative Expenses includes investment-specific expenses such as staff wages, professional services contracted by the Board, legal services and a share of the OPERS facility and operational costs. For a discussion on the current year activity within Net Income from Investing Activity, refer to the Financial Highlights section on page 28.

## Deductions from Fiduciary Net Position (Expenses)

OPERS was created to provide retirement, survivor, and disability benefits to qualified members and their beneficiaries. The cost of such programs includes recurring benefit payments, elective refunds of contributions to members who terminate employment with a participating employer, and the cost of administering the System.

Expenses (Deductions from Fiduciary Net Position) for 2016 were $7.3 billion, a decrease of $0.5 billion compared to 2015, or 5.9%. Pension benefits and health care expenses comprise $6.8 billion of the 2016 expenditures and $7.2 billion for 2015. Refunds of member contributions, including interest and additional payments on withdrawal where required by statute, fluctuate each year, but were $429.8 million in 2016. Non-investment related administrative expenses increased by $2.0 million to $79.1 million and represent 1.1% of the total expenses. Pension benefits and health care expenses paid on behalf of current retirees and their beneficiaries comprise approximately 93% of the total expenses reported. The remaining expenses are comprised of interplan activity transactions representing the expense side of the repayment of initial start-up and administrative costs. Refer to Table 5 for a comparative history of Deductions from Fiduciary Net Position.

### Deductions from Fiduciary Net Position (Expenses)

(for the years ended December 31, 2016 and 2015)

**Table 5**

| | 2016 | 2015 | Amount Increase/ (Decrease) from 2015 to 2016 | Percent Increase/ (Decrease) from 2015 to 2016 |
|---|---|---|---|---|
| Benefits—Pension | $5,588,000,966 | $5,401,880,992 | $186,119,974 | 3.4% |
| Benefits—Health Care Expenses | 1,197,374,344 | 1,822,571,428 | (625,197,084) | (34.3) |
| Refunds | 429,791,141 | 449,265,410 | (19,474,269) | (4.3) |
| Administrative Expenses | 79,059,058 | 77,036,684 | 2,022,374 | 2.6 |
| Interplan Activity | 17,205,339 | 19,759,373 | (2,554,034) | (12.9) |
| **Total Deductions** | **$7,311,430,848** | **$7,770,513,887** | **($459,083,039)** | **(5.9%)** |

Pension benefits totaled $5.6 billion in 2016, an increase of $186.1 million, or 3.4%, over 2015 benefits. The increase in 2016 reflects the combination of a net growth of 1.4% in the total number of retirees and beneficiaries receiving benefits, an annual simple cost-of-living adjustment (COLA) granted on the retirees benefit anniversary, and demographic changes in the retiree population. As expected, with the majority of changes to both pension and health care fully implemented, members are opting to work longer and the growth in new retirees is declining. The 8,459 new retirees in 2016 is less than the most recent 10-year average of 10,787. In addition to the increasing number of retirees, the increase in pension benefits represents the net effect of new retirees being added to the rolls, less terminated benefits related to retiree deaths and disabled recipients returning to service. The cost of retirements will continue to increase as newer retirees with higher FAS replace terminated long-time retirees with lower FAS. Refer to the Schedule of Average Benefits on page 213 of the Statistical Section for details related to the new retiree populations by year. Also refer to the Plan Statement on page 227 for details on pension benefits.

Total health care expenses decreased by 34.3% to $1.2 billion in 2016, compared to 2015. This decrease was expected with the implementation of the Connector with Medicare-eligible retirees selecting plans available on the market, versus OPERS-sponsored plans. The majority of health care expenses are comprised of medical, dental, vision, and prescription drug costs, as well as reimbursements to retirees for Medicare Parts A and B premiums. Medical, dental, vision and disease-management costs represent approximately 56% of the total health care expenses for 2016, an increase from 2015, which approximated 55% of total health care expenses. Prescription drug costs comprised 14% of total health care expenses in 2016, a decrease over the 37% reported for 2015, again, related to the shift in Medicare-eligible retirees selecting plans on the open market versus OPERS providing a self-insured plan. Medicare Part A and B premium reimbursements were approximately 4% of the total for both 2016 and 2015. As part of plan changes approved by the Board in 2012, the Medicare Part B reimbursement is being phased-out over a three-year period with the final reduction in 2016, resulting in no reimbursements beginning January 1, 2017. In 2016, retirees that did not contribute to Medicare during their career, and to a lesser extent their spouses, began receiving reimbursement of their Medicare Part A premium, which allowed this population to participate in the Connector.

The OPERS health care plans for non-Medicare eligible recipients are self-insured. OPERS also self-insures prescription drug coverage for non-Medicare eligible retirees and dependents. Medicare-eligible retirees, prior to January 1, 2016, had medical coverage provided through a premium-based Medicare Advantage plan. Beginning January 1, 2016, Medicare-eligible retirees have the opportunity to select supplemental coverage through the Connector and may receive a deposit into an HRA account to be used for reimbursement of qualified health care expenses. Costs in self-insured plans will fluctuate based on the timing of claims incurrence and the magnitude of catastrophic claims, in addition to overall increases in costs occurring in the market. Medical, dental, vision and disease-management expenses for 2016 decreased by 33% to $0.7 billion, compared to $1.0 billion in 2015. Prescription drug costs decreased 75% to $170.6 million in 2016, compared to $672.7 million in 2015. As with medical claims, prescription costs were also expected to decrease in 2016 with the conversion to the Connector and elimination of the Medicare Prescription Drug Plan.

Refunds of member accounts are at the discretion of the member, and vary from year to year. In 2016, member-elected refunds totaled $429.8 million, compared to $449.3 million in 2015. Members may only refund their account if they have been separated from OPERS-covered employment for at least three months. House Bill 520 became effective April 5, 2017 and will reduce the refund separation period from three months to two months. Accordingly, refunds represent disbursements of inactive member accounts. The number of refunded accounts and the refund values decreased in 2016 by 17.6% and 4.3%, respectively. In 2015, an initiative to contact inactive members with small balances to confirm their intent to maintain an account at OPERS occurred and resulted in 2015 having the highest number of refunded accounts in the last 10 years. The average member balance refunded in 2016 was approximately $17,000 compared to the 2015 average of approximately $14,600.

OPERS has consistently managed its administrative expense budget with no material variances experienced between planned and actual expenditures in either 2016 or 2015. Administrative Expenses shown in Table 5 on the previous page do not include investment administrative expenses. Administrative Expenses, not including investment expenses, totaled $79.1 million in 2016 compared to $77.0 million in 2015. The increase in 2016 Administrative Expenses includes an increase in financial statement audit services and legal services relating to the closure of the 401(h) and VEBA health care trusts and consolidation of health care assets into the 115 Trust, and an increase in the number of catastrophic claims for the self-insured OPERS employee insurance plan.

## Net Position Summary

Net position may serve over time as a useful indicator of OPERS' financial status (please refer to Table 6). At the close of calendar years 2016 and 2015, the net positions of OPERS totaled $90.6 billion and $87.3 billion, respectively. These plan net positions are available to meet OPERS ongoing obligations to plan participants and their beneficiaries, and to the extent possible, OPERS post-employment health care.

**Net Position** (as of December 31, 2016 and 2015) **Table 6**

| | 2016 | 2015 | Amount Increase/ (Decrease) from 2015 to 2016 | Percent Increase/ (Decrease) from 2015 to 2016 |
|---|---|---|---|---|
| Current and Other Assets | $1,112,848,213 | $956,197,651 | $156,650,562 | 16.4% |
| Cash and Investments at Fair Value | 98,324,311,631 | 95,154,353,476 | 3,169,958,155 | 3.3 |
| Capital Assets | 132,961,073 | 132,811,651 | 149,422 | 0.1 |
| **Total Assets** | **99,570,120,917** | **96,243,362,778** | **3,326,758,139** | **3.5** |
| **Total Liabilities** | **8,959,296,692** | **8,951,960,960** | **7,335,732** | **0.1** |
| **Net Position, End of Year** | **90,610,824,225** | **87,291,401,818** | **3,319,422,407** | **3.8** |
| Net Position, Beginning of Year | 87,291,401,818 | 91,243,895,108 | (3,952,493,290) | (4.3) |
| **Net Increase/(Decrease) in Net Position** | **$3,319,422,407** | **($3,952,493,290)** | **$7,271,915,697** | **184.0%** |

## Summary

OPERS remains a strong pension system with sound funding. OPERS continues to proactively manage the Fund in a manner that addresses issues and trends timely contributing to the strength of the Fund. The funding levels and 2016 results of operations are found, in detail, and by category, in this annual report.

## Combining Statements of Fiduciary Net Position (as of December 31, 2016)

| | Pension | | |
|---|---|---|---|
| | Traditional Pension Plan | Combined Plan | Member-Directed Plan |
| **Assets** | | | |
| **Cash and Short-Term Investments** | **$3,695,255,724** | **$15,750,245** | **$666,696** |
| **Receivables** | | | |
| Members and Employers | 287,523,078 | 8,949,632 | 11,413,818 |
| Vendor and Other | 123,766 | | |
| Investment Sales Proceeds | 387,126,011 | 2,009,919 | 142,620 |
| Accrued Interest and Dividends | 205,817,151 | 1,045,992 | 33,806 |
| **Total Receivables** | **880,590,006** | **12,005,543** | **11,590,244** |
| **Investments, at fair value** | | | |
| Fixed Income | 17,583,806,963 | 190,714,010 | 195,418,872 |
| Domestic Equities | 13,473,433,693 | 278,319,290 | 392,541,550 |
| Real Estate | 7,975,063,506 | 40,530,414 | 1,309,906 |
| Private Equity | 8,809,033,057 | 44,768,767 | 1,446,886 |
| International Equities | 13,765,550,971 | 175,237,321 | 198,087,702 |
| Other Investments | 11,306,176,941 | 57,459,609 | 1,857,043 |
| **Total Investments** | **72,913,065,131** | **787,029,411** | **790,661,959** |
| **Collateral on Loaned Securities** | **8,247,367,947** | **39,693,971** | **1,293,605** |
| **Capital Assets** | | | |
| Land | 2,626,888 | 82,647 | 82,550 |
| Building and Building Improvements | 78,032,713 | 2,455,058 | 2,452,185 |
| Furniture and Equipment | 101,414,496 | 4,132,610 | 3,374,744 |
| Total Capital Assets | 182,074,097 | 6,670,315 | 5,909,479 |
| Accumulated Depreciation | (83,988,708) | (2,784,818) | (2,947,404) |
| **Net Capital Assets** | **98,085,389** | **3,885,497** | **2,962,075** |
| **Prepaid Expenses and Other Assets** | **764,515** | | |
| **TOTAL ASSETS** | **85,835,128,712** | **858,364,667** | **807,174,579** |
| **Liabilities** | | | |
| Undistributed Deposits | 5,039,178 | | |
| Benefits Payable | 1,253,982 | | |
| Investment Commitments Payable | 456,426,672 | 2,833,383 | 1,030,593 |
| Accounts Payable and Other Liabilities | 18,462,607 | | |
| Obligations Under Securities Lending | 8,244,312,788 | 39,679,267 | 1,293,126 |
| **TOTAL LIABILITIES** | **8,725,495,227** | **42,512,650** | **2,323,719** |
| **Net Positions Held in Trust for Pension Benefits and Post-employment Health Care** | **$77,109,633,485** | **$815,852,017** | **$804,850,860** |

* During 2016, OPERS consolidated health care assets from the 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust into the 115 Health Care Trust. For more information, see Note 1 in the Notes to Combining Financial Statements.

See Notes to Combining Financial Statements, beginning on page 42.

(continued from page 38)

| 115 Health Care Trust* | Total Pension and Health Care |
|---|---|
| **$874,632,840** | **$4,586,305,505** |
| 28,954,270 | 336,840,798 |
| 67,090,996 | 67,214,762 |
| 70,760,106 | 460,038,656 |
| 41,092,533 | 247,989,482 |
| **207,897,905** | **1,112,083,698** |
| 4,087,785,698 | 22,057,725,543 |
| 3,071,759,733 | 17,216,054,266 |
| | 8,016,903,826 |
| | 8,855,248,710 |
| 2,265,107,975 | 16,403,983,969 |
| 1,534,240,696 | 12,899,734,289 |
| **10,958,894,102** | **85,449,650,603** |
| | **8,288,355,523** |
| 942,728 | 3,734,813 |
| 28,004,098 | 110,944,054 |
| 32,759,796 | 141,681,646 |
| 61,706,622 | 256,360,513 |
| (33,678,510) | (123,399,440) |
| **28,028,112** | **132,961,073** |
| | **764,515** |
| **12,069,452,959** | **99,570,120,917** |
| 287,413 | 5,326,591 |
| 109,142,271 | 110,396,253 |
| 79,535,412 | 539,826,060 |
| | 18,462,607 |
| | 8,285,285,181 |
| **188,965,096** | **8,959,296,692** |
| **$11,880,487,863** | **$90,610,824,225** |

## Combining Statements of Changes in Fiduciary Net Position (for the year ended December 31, 2016)

| | Pension | | |
|---|---|---|---|
| | Traditional Pension Plan | Combined Plan | Member-Directed Plan |
| **Additions** | | | |
| Member Contributions | $1,294,853,664 | $39,232,690 | $53,128,866 |
| Employer Contributions | 1,556,529,162 | 47,079,023 | 53,120,880 |
| Contract and Other Receipts | 77,862,156 | 620,078 | 527,291 |
| Retiree-Paid Health Care Premiums | | | |
| Federal Subsidy | | | |
| Other Income/(Expense), net | (2,560,081) | | |
| Interplan Activity | 11,168,557 | | |
| **Total Non-investment Income** | **2,937,853,458** | **86,931,791** | **106,777,037** |
| **Income From Investing Activities** | | | |
| Net Increase in the Fair Value of Investments | 2,178,299,353 | 45,514,750 | 65,278,201 |
| Bond Interest | 910,211,981 | 4,912,361 | 1,125,729 |
| Dividends | 1,493,402,186 | 7,234,241 | 319,228 |
| Real Estate Operating Income, net | 987,269,311 | 4,751,570 | 154,856 |
| International Income/(Loss) | 23,036 | 111 | 4 |
| Other Investment Income | 835,289,710 | 4,018,433 | 130,963 |
| External Asset Management Fees | (475,626,560) | (2,563,388) | (590,455) |
| **Net Investment Income** | **5,928,869,017** | **63,868,078** | **66,418,526** |
| From Securities Lending Activity | | | |
| Security Lending Income | 88,288,814 | 424,925 | 13,848 |
| Security Lending Expenses | (39,305,929) | (189,174) | (6,165) |
| Net Security Lending Income | 48,982,885 | 235,751 | 7,683 |
| Unrealized Gains | 3,056,008 | 9,860 | 321 |
| **Net Income from Securities Lending** | **52,038,893** | **245,611** | **8,004** |
| Investment Administrative Expenses | (33,674,584) | (418,978) | (327,144) |
| **Net Income from Investing Activity** | **5,947,233,326** | **63,694,711** | **66,099,386** |
| **TOTAL ADDITIONS** | **8,885,086,784** | **150,626,502** | **172,876,423** |
| **Deductions** | | | |
| Benefits | 5,584,517,896 | 1,981,664 | 1,501,406 |
| Refunds of Contributions | 352,362,641 | 21,857,512 | 55,570,988 |
| Administrative Expenses | 51,871,700 | 2,559,387 | 2,305,383 |
| Interplan Activity | | 9,290,331 | 7,187,816 |
| **TOTAL DEDUCTIONS** | **5,988,752,237** | **35,688,894** | **66,565,593** |
| **Special Item** | | | |
| **Interplan Activity-Trust Closures** | **(21,414)** | | |
| Net Increase/(Decrease) | 2,896,313,133 | 114,937,608 | 106,310,830 |
| Net Positions Held in Trust for Pension Benefits and Post-employment Health Care | | | |
| Balance, Beginning of Year | 74,213,320,352 | 700,914,409 | 698,540,030 |
| **Balance, End of Year** | **$77,109,633,485** | **$815,852,017** | **$804,850,860** |

* Health care coverage provided through the OPERS 401(h) Health Care Trust (401(h) Trust) was terminated as of December 31, 2015. Therefore, there are no deductions in the 401(h) Trust for 2016 as health care was funded through the 115 Health Care Trust (115 Trust) in 2016. The 401(h) Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust were closed as of June 30, 2016 and the net positions transferred to the 115 Trust on July 1, 2016. Activity included in this statement for the 401(h) Trust and VEBA Trust is for the six-month period ended June 30, 2016. The Special Item Interplan Activity-Trust Closures line represents the interplan activity as a result of these closures and transfer of net positions to the 115 Trust. For more information, see Note 1 in the Notes to Combining Financial Statements.

See Notes to Combining Financial Statements, beginning on page 42.

(continued from page 40)

| Health Care | | | |
|---|---|---|---|
| 401(h) Health Care Trust* | 115 Health Care Trust* | Voluntary Employees' Beneficiary Association Trust* | Total Pension and Health Care |
| | | | $1,387,215,220 |
| | $274,419,455 | $10,483,804 | 1,941,632,324 |
| | 93,306,585 | 22,722 | 172,338,832 |
| | 184,368,783 | | 184,368,783 |
| | 4,065,058 | | 4,065,058 |
| | 15,715 | | (2,544,366) |
| | 6,036,782 | | 17,205,339 |
| | **562,212,378** | **10,506,526** | **3,704,281,190** |
| $428,632,525 | 160,473,865 | 2,277,759 | 2,880,476,453 |
| (60,085,563) | 92,284,043 | 1,222,858 | 949,671,409 |
| 131,736,664 | 130,678,719 | 1,738,911 | 1,765,109,949 |
| | | 1,026,057 | 993,201,794 |
| 3,751 | (1,998) | 79 | 24,983 |
| 14,158 | (282,340) | 517,933 | 839,688,857 |
| (7,012,448) | (27,669,191) | (92,819) | (513,554,861) |
| **493,289,087** | **355,483,098** | **6,690,778** | **6,914,618,584** |
| | | 92,902 | 88,820,489 |
| | | (41,106) | (39,542,374) |
| | | 51,796 | 49,278,115 |
| | | 4,152 | 3,070,341 |
| | | **55,948** | **52,348,456** |
| (3,080,517) | (2,853,560) | (40,192) | (40,394,975) |
| **490,208,570** | **352,629,538** | **6,706,534** | **6,926,572,065** |
| **490,208,570** | **914,841,916** | **17,213,060** | **10,630,853,255** |
| | 1,195,956,899 | 1,417,445 | 6,785,375,310 |
| | | | 429,791,141 |
| | 21,693,387 | 629,201 | 79,059,058 |
| | | 727,192 | 17,205,339 |
| | **1,217,650,286** | **2,773,838** | **7,311,430,848** |
| **(11,161,276,751)** | **11,342,184,193** | **(180,886,028)** | **0** |
| (10,671,068,181) | 11,039,375,823 | (166,446,806) | 3,319,422,407 |
| 10,671,068,181 | 841,112,040 | 166,446,806 | 87,291,401,818 |
| **$0** | **$11,880,487,863** | **$0** | **$90,610,824,225** |

## 1. Description of OPERS

a. **Organization—**The Ohio Public Employees Retirement System (OPERS, System or Fund) is a cost-sharing, multiple-employer public employee retirement system comprised of three separate pension plans: the Traditional Pension Plan, a defined benefit plan; the Combined Plan, a combination defined benefit/defined contribution plan; and the Member-Directed Plan, a defined contribution plan. OPERS is a qualified governmental plan under Section 401(a) of the Internal Revenue Code (IRC). OPERS is administered in accordance with Chapter 145 of the Ohio Revised Code (ORC). All state and local governmental employees in Ohio, except those covered by one of the other state or local retirement systems in Ohio, are members of OPERS. New public employees (those who establish membership in OPERS on or after January 1, 2003) have 180 days from the commencement of employment to select membership in one of the three pension plans. Contributions to OPERS are effective with the first day of the member's employment. Contributions made prior to the member's plan selection are maintained in the Traditional Pension Plan and later transferred to the plan elected by the member, as appropriate.

**Special Item—**As of December 31, 2016, OPERS maintains one health care trust, the 115 Health Care Trust (115 Trust), which was established in 2014 to initially provide a funding mechanism for a health reimbursement arrangement (HRA). In March 2016, OPERS received two favorable rulings from the Internal Revenue Service (IRS) allowing OPERS to consolidate health care assets into the 115 Trust. The 401(h) Health Care Trust (401(h) Trust) was a pre-funded trust that provided health care funding for eligible members of the Traditional Pension Plan and the Combined Plan through December 31, 2015, when plans funded through the 401(h) Trust were terminated. The Voluntary Employees' Beneficiary Association Trust (VEBA Trust) accumulated funding for retiree medical accounts (RMA) for participants of the Member-Directed Plan through June 30, 2016. The 401(h) Trust and the VEBA Trust were closed as of June 30, 2016 and the net positions transferred to the 115 Trust on July 1, 2016. Beginning in 2016, the 115 Trust is the funding vehicle for all health care plans. Therefore, the Combining Statements of Changes in Fiduciary Net Position displays a partial year of activity for both the 401(h) Trust and the VEBA Trust for the six-month period ended June 30, 2016. The transfer of the net positions of the 401(h) Trust and VEBA Trust were $11,161,276,751 and $180,886,028, respectively, and are reflected on a Special Item Interplan Activity—Trust Closures line in the Combining Statements of Changes in Fiduciary Net Position. The Combining Statements of Fiduciary Net Position displays all health care assets and net position in the 115 Trust as of December 31, 2016.

Beginning 2016, Traditional Pension Plan and Combined Plan retirees enrolled in Medicare A and B were eligible to participate in the OPERS Medicare Connector (Connector). The Connector, a vendor selected by OPERS, assists eligible retirees in the selection and purchase of Medicare supplemental coverage through the Medicare market. Retirees that purchase supplemental coverage through the Connector may receive a monthly allowance in an HRA that can be used to reimburse eligible health care expenses, beginning with January 2016 premiums.

The health care plans funded through the 115 Trust are reported as other post-employment benefit plans (OPEB) based on the criteria established by the Governmental Accounting Standards Board (GASB). Periodically, OPERS modifies the health care program design to improve the ongoing solvency of the plans. Eligibility requirements for access to the OPERS health care options has changed over the history of the program for Traditional Pension Plan and Combined Plan members. Prior to January 1, 2015, 10 or more years of service were required to qualify for health care coverage. Beginning January 1, 2015, generally, members must be at least age 60 with 20 years of qualifying service credit to qualify for health care coverage or 30 years of qualifying service at any age. Upon termination or retirement, Member-Directed Plan participants can use vested RMA funds for reimbursement of qualified medical expenses. Members who elect the Member-Directed Plan after July 1, 2015 will vest over 15 years at a rate of 10% each year starting with the sixth year of participation. Members who elected the Member-Directed Plan prior to July 1, 2015, vest over a five-year period at a rate of 20% per year. Please see the Plan Statement beginning on page 227 for additional details. Health care coverage is neither guaranteed nor statutorily required.

The accompanying financial statements comply with the provisions of GASB Statement No. 14, *The Financial Reporting Entity,* and with the provisions of GASB Statement No. 39, *Determining Whether Certain Organizations Are Component Units—an amendment of GASB Statement No. 14*. These statements require that financial statements of the reporting entity include all the organizations, activities, functions and component units for which the reporting entity is financially accountable. Financial accountability is defined as the appointment of a voting majority of the component unit's board of directors and either (1) the reporting entity's ability to impose its will over the component unit, or (2) the possibility that the component unit will provide a financial benefit to, or impose a financial burden on, the reporting entity. OPERS does not have financial accountability over any entities.

Individual audited financial statements, as of and for the six-month period ended June 30, 2016 or the year ended December 31, 2016 (as noted below), for each of the following plans and trusts as presented in the Combining Statements of Fiduciary Net Position and Changes in Fiduciary Net Position, were issued:

- Combined Plan (December 31, 2016)
- Member-Directed Plan (December 31, 2016)
- 115 Health Care Trust (December 31, 2016)
- 401(h) Health Care Trust (June 30, 2016)
- Voluntary Employees' Beneficiary Association Trust (June 30, 2016)

OPERS is not part of the state of Ohio financial-reporting entity, nor is OPERS a component unit of the state of Ohio. Responsibility for the organization is vested in the OPERS Board of Trustees (Board); there is no financial interdependency with the state of Ohio. The Board is the governing body of OPERS, with responsibility for administration and management. Of the Board, seven members are elected by the group they represent: the retirees (two representatives), employees of the state, employees of counties, employees of municipalities, non-teaching employees of state colleges and universities and miscellaneous employees. The remaining four members are appointed or designated by position. The Governor, General Assembly and the Treasurer of the state of Ohio each appoint a representative. The Director of the Ohio Department of Administrative Services completes the Board.

The Board appoints the Executive Director, an actuary, investment consultants and other consultants necessary for the transaction of business. The Board meets monthly and receives no compensation, but is reimbursed for necessary expenses.

**Plan membership**—All state and local governmental employees, except those covered by another state retirement system in Ohio or the Cincinnati Retirement System, are required to become contributing members of OPERS when they begin public employment unless they are exempted or excluded as defined by the ORC. For actuarial purposes, employees who have earned sufficient service credit (60 contributing months) are entitled to a future retirement benefit from OPERS. Employer, employee and retiree data as of December 31, 2016 is found on the next page.

## Plan Membership

| As of December 31, 2016 | Traditional Pension Plan | Combined Plan* | Member-Directed Plan | 115 Health Care Trust** Traditional Pension and Combined Plans Retiree Sponsored Programs | 115 Health Care Trust** Member-Directed Retiree Medical Accounts | 2016 Total |
|---|---|---|---|---|---|---|
| **Employer Units** | | | | | | **3,678** |
| State Division | | | | | | 250 |
| Local Division | | | | | | 3,193 |
| Law Enforcement and Public Safety Divisions | | | | | | 235 |
| **Retirees and Inactive Members—Defined Benefit Pension** | | | | | | **748,843** |
| Retirees and Primary Beneficiaries currently receiving benefits | 207,917 | 238 | 219 | | | 208,374 |
| Dependents and Other Beneficiaries currently receiving benefits | 7,106 | 158 | 1 | | | 7,265 |
| Inactive Members eligible for, but not yet receiving, benefits*** | 8,222 | 70 | | | | 8,292 |
| Inactive Members not yet age-eligible for benefits*** | 25,298 | 595 | | | | 25,893 |
| Inactive Members eligible for refund value of account only*** | 497,930 | 1,089 | | | | 499,019 |
| **Retirees and Inactive Members—Defined Contribution Accounts** | | | | | | **4,035** |
| Retirees currently receiving benefits | | 6 | 7 | | | 13 |
| Inactive Members | | | 4,022 | | | 4,022 |
| **Retirees and Inactive Members—Health Care** | | | | | | **221,111** |
| Retirees and Primary Beneficiaries currently receiving benefits | | | | 170,590 | 5,605 | 176,195 |
| Dependent and Other Beneficiaries currently receiving benefits | | | | 42,938 | | 42,938 |
| Inactive Members eligible for, but not yet receiving, benefits | | | | 1,978 | | 1,978 |
| **Active Employees** | | | | | | **346,959** |
| State Division | 117,625 | 2,832 | 4,088 | | | 124,545 |
| Local Division | 202,084 | 4,945 | 7,389 | | | 214,418 |
| Law Enforcement Division | 7,919 | | | | | 7,919 |
| Public Safety Division | 77 | | | | | 77 |

* Combined Plan members receiving a defined formula benefit may also be receiving a distribution of their defined contribution account, so may be counted more than once in this table.

** In March 2016, OPERS received two favorable rulings from the Internal Revenue Service allowing OPERS to consolidate health care assets into the 115 Health Care Trust (115 Trust). The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust were closed as of June 30, 2016 and the net positions transferred to the 115 Trust. As of July 1, 2016, all health care coverage is funded through the 115 Trust. This table reflects the breakout of health care programs between those supporting membership in the Traditional Pension Plan and Combined Plan, and a separate column for the Member-Directed Retiree Medical Account Plan.

*** Inactive members with at least five years of service are eligible for a retirement benefit at the age of 60. Inactive members with less than five years of service are eligible for a refund of account. Inactive members with five or more years of service are displayed based on their age eligibility for a retirement benefit as of the end of the year.

b. **Benefits**—All benefits of the System, and any benefit increases are established by the legislature pursuant to ORC Chapter 145. The Board, pursuant to ORC Chapter 145, has elected to maintain funds to provide health care coverage to eligible Traditional Pension Plan and Combined Plan retirees and survivors of members. Health care coverage does not vest and is not required under ORC Chapter 145. As a result, coverage may be reduced or eliminated at the discretion of the Board.

- ***Age-and-Service Defined Benefits***—Effective January 7, 2013, Senate Bill (SB) 343 modified components of the Traditional Pension Plan and Combined Plan. Members were impacted (to varying degrees) by the changes based on their transition group. Three transition groups (A, B and C) were designed to ease the transition for key components of the pension plan changes. Members who were eligible to retire under law in effect prior to SB 343, or will be eligible to retire no later than five years after January 7, 2013, comprise transition Group A. Members who have 20 years of service credit prior to January 7, 2013, or will be eligible to retire no later than 10 years after January 7, 2013, are included in transition Group B. Group C included those members who are not in either of the other groups and members who were hired on or after January 7, 2013. Please see the Plan Statement for additional details.

Benefits in the Traditional Pension Plan for State and Local members are calculated on the basis of age, final average salary (FAS), and service credit. State and Local members in transition Groups A and B are eligible for retirement benefits at age 60 with 60 contributing months of service credit or at age 55 with 25 or more years of service credit. Group C for State and Local is eligible for retirement benefits at age 57 with 25 years of service or at age 62 with five years of service. For Groups A and B, the annual benefit is based on 2.2% of FAS multiplied by the actual years of service for the first 30 years of service credit and 2.5% for years of service in excess of 30 years. For Group C, the annual benefit applies a factor of 2.2% for the first 35 years and a factor of 2.5% for the years of service in excess of 35. FAS represents the average of the three highest years of earnings over a member's career for Groups A and B. Group C is based on the average of the five highest years of earnings over a member's career. Refer to the age-and-service tables located in the Plan Statement beginning on page 227 for additional information regarding the requirements for reduced and unreduced benefits. Members who retire before meeting the age and years of service credit requirement for unreduced benefits, receive a percentage reduction in the benefit amount. The base amount of a member's pension benefit is locked in upon receipt of the initial benefit payment for calculation of annual cost-of-living adjustment.

Effective January 1, 2001, House Bill 416 divided the OPERS Law Enforcement Program into two separate divisions: Law Enforcement and Public Safety. Both groups of members, as defined in ORC Chapter 145, and recently updated in House Bill 520, are eligible for special retirement options under the Traditional Pension Plan and are not eligible to participate in the Member-Directed Plan or Combined Plan. Public Safety members may file an application for full retirement benefits at age 48 or older with 25 or more years of credited service or 52 or older with 15 or more years of credited service for Groups A and B. Public Safety Group C is eligible for benefits at age 52 or older with 25 years or at age 56 or older with 15 years. Those members classified as Law Enforcement officers are eligible for full retirement at age 52 or older with 15 or more years of credited service for Group A. Law Enforcement Group B is eligible at age 48 or older with 25 years or at age 52 or older with 15 years of service. Law Enforcement Group C is eligible at age 48 or older with 25 years of service or at age 56 with 15 years of service. Annual benefits under both divisions are calculated by multiplying 2.5% of FAS by the actual years of service for the first 25 years of service credit, and 2.1% of FAS for each year of service over 25 years. These options also permit early retirement under qualifying circumstances as early as age 48 with a reduced benefit.

Prior to 2000, payments to OPERS benefit recipients were limited under Section 415(b) of the IRC. OPERS entered into a Qualified Excess Benefit Arrangement (QEBA) with the IRS to allow OPERS benefit recipients to receive their full statutory benefit even when the benefit exceeds IRC 415(b) limitations. Monthly QEBA payments start when the total amount of benefits received by the recipients exceeds the IRC limit each year. The portion of the benefit in excess of the IRC 415(b) limit is paid out of the QEBA and taxed as employee payroll in accordance with IRS regulations.

Benefits in the Combined Plan consist of both an age-and-service formula benefit (defined benefit) and a defined contribution element. The defined benefit element is calculated on the basis of age, FAS, and years of service. Eligibility regarding age and years of service in the Combined Plan is the same as the Traditional Pension Plan. The benefit formula for the defined benefit component of the plan for State and Local members in transition Groups A and B applies a factor of 1.0% to the member's FAS for the first 30 years of service. A factor of 1.25% is applied to years of service in excess of 30. The benefit formula for transition Group C applies a factor of 1.0% to the member's FAS for the first 35 years of service and a factor of 1.25% is applied to years in excess of 35. Persons retiring before age 65 with less than 30 years of service credit receive a percentage reduction in benefit. The defined contribution portion of the benefit is based on accumulated member contributions plus or minus any investment gains or losses on those contributions.

- ***Defined Contribution Benefits***—Defined contribution plan benefits are established in the plan documents, which may be amended by the Board. Member-Directed Plan and Combined Plan members who have met the retirement eligibility requirements may apply for retirement benefits. The amount available for defined contribution benefits in the Combined Plan consists of the member's contributions plus or minus the investment gains or losses resulting from the member's investment selections. Combined Plan members wishing to receive benefits must meet the requirements for both the defined benefit and defined contribution plans. Member-Directed participants must have attained the age of 55, have money on deposit in the defined contribution plan and have terminated public service to apply for retirement benefits. The amount available for defined contribution benefits in the Member-Directed Plan consists of the members' contributions, vested employer contributions and investment gains or losses resulting from the members' investment selections. Employer contributions and associated investment earnings vest over a five-year period, at a rate of 20% each year. At retirement, members may select one of several distribution options for payment of the vested balance in their individual OPERS accounts. Options include the purchase of a monthly defined benefit annuity from OPERS (which includes joint and survivor options), partial lump-sum payments (subject to limitations), a rollover of the vested account balance to another financial institution, receipt of entire account balance, net of taxes withheld, or a combination of these options.

- ***Early Retirement Incentive Plan (ERIP)***—Employers under OPERS may establish an early retirement incentive plan by purchasing service credit for eligible employees. To be eligible, employees must be able to retire under existing plan provisions after the purchase of the additional credit. Electing employers must contribute all such additional costs as are actuarially determined to fund the benefit. Such a plan, if adopted by an employer, must be offered to a minimum of 5% of covered employees, and may provide for the purchase of up to five years of service credit, limited to a maximum of 20% of the member's total service credit. Members electing to participate in the employer's plan must retire within 90 days of receiving notice of the purchased service or the service is withdrawn and refunded to the employer.

  Employers offering an ERIP may choose to pay the full cost of the additional benefits at the time the plan is adopted, or elect an installment payment plan. The required contributions are recognized in full by OPERS in the year in which the payment plan becomes effective. In addition, interest is charged annually on the unpaid balance.

- ***Disability Benefits***—OPERS administers two disability plans for participants in either the Traditional Pension Plan or Combined Plan. Members in the plan as of July 29, 1992, could elect, by April 7, 1993, coverage under either the original plan or the revised plan. All members who entered the System after July 29, 1992, are automatically covered under the revised plan. Under the original plan, a member who becomes disabled before age 60 and has completed 60 contributing months is eligible for a disability benefit. Benefits are funded by the employee and employer contributions and terminate if the member is able to return to work. The revised plan differs in that a member who becomes disabled at any age with 60 contributing months will be eligible for disability benefits until a determined age. The benefit is funded by reserves accumulated from employer contributions. After the disability benefit ends, the member may apply for a service retirement benefit or a refund of contributions, which are not reduced by the amount of disability benefits received. Law Enforcement officers are immediately eligible for disability benefits if disabled by an on-duty illness or injury. Members participating in the Member-Directed Plan are not eligible for disability benefits.

- ***Survivor Benefits***—Dependents of deceased members who participated in either the Traditional Pension Plan or the Combined Plan may qualify for survivor benefits if the deceased employee had at least one and a half years of service credit with the plan, and at least one quarter year of credit within the two and one-half years prior to the date of death. ORC Chapter 145, recently updated by House Bill 520, specifies the dependents and the conditions under which they qualify for survivor benefits. Qualified survivors of Law Enforcement and Public Safety officers are eligible for survivor benefits immediately upon employment.
- ***Health Care Coverage***—The ORC permits, but does not require, OPERS to offer post-employment health care coverage (OPEB). The ORC allows a portion of the employers' contributions to be used to fund health care coverage. The health care portion of the employer contribution rate for the Traditional Pension Plan and Combined Plan is comparable, as the same coverage options are provided to participants in both plans. As previously noted, OPERS received favorable IRS rulings allowing the consolidation of health care assets into the 115 Trust. The 115 Trust was established in 2014 under Internal Revenue Code (IRC) Section 115, initially to fund HRA accounts for Medicare-eligible retirees. Beginning in 2016, the 115 Trust is the funding vehicle for all health care plans. The 401(h) Trust, established under Section 401(h) of the IRC, was pre-funded and held the portion of employer contributions of the Traditional Pension Plan and Combined Plan that were set aside for funding retiree health care through December 31, 2015, when plans funded through the 401(h) Trust were terminated. Employer contributions to the 401(h) Trust ceased in September 2014 upon the establishment of the 115 Trust, and the 401(h) Trust was closed as of June 30, 2016 and the net position transferred to the 115 Trust on July 1, 2016.

  Prior to January 1, 2015, the System provided comprehensive health care coverage to retirees with 10 or more years of qualifying service credit and offered coverage to their dependents on a premium deduction or direct bill basis. Beginning January 1, 2015, the service eligibility criteria for health care coverage increased from 10 years to 20 years with a minimum age of 60, or 30 years of qualifying service at any age. Beginning with January 2016 premiums, Medicare-eligible retirees could select supplemental coverage through the Connector, and may be eligible for monthly allowances deposited to an HRA to be used for reimbursement of eligible health care expenses. Coverage for non-Medicare retirees includes hospitalization, medical expenses and prescription drugs. The System determines the amount, if any, of the associated health care costs that will be absorbed by the System and attempts to control costs by using managed care, case management, disease management, and other programs. Additional details on health care coverage can be found in the Plan Statement beginning on page 227.

  Participants in the Member-Directed Plan are not eligible for the health care coverage offered to benefit recipients in the Traditional Pension Plan and Combined Plan. A portion of employer contributions for these participants is allocated to a RMA, previously funded through the VEBA Trust established under IRC 501(c)(9). As previously noted, the VEBA Trust was closed as of June 30, 2016 and the net position transferred to the 115 Trust on July 1, 2016. Upon separation or retirement, participants may be reimbursed for qualified medical expenses from their RMA funds, now funded through the 115 Trust.

  An additional RMA was also established within the 401(h) Trust several years ago when three coverage levels were available to retirees. Monthly allowance amounts in excess of the cost of the retiree's selected coverage were notionally credited to the retiree's RMA. Retirees and their dependents could seek reimbursement from the RMA balances for qualified medical expenses. In 2013, the number of health care options available to retirees was reduced from three to one, eliminating the majority of deposits to the RMA.

Wellness incentive payments were the only remaining deposits made to the RMA funded through the 401(h) Trust through December 31, 2015, then funded through the 115 Trust beginning in 2016. Wellness incentives are no longer awarded starting with the 2017 plan year.

- ***Other Benefits***—Once a benefit recipient retiring under the Traditional Pension Plan has received benefits for 12 months, an annual cost-of-living adjustment is provided on the member's base benefit. Members retiring under the Combined Plan receive a cost-of-living adjustment on the defined benefit portion of their benefit. The cost-of-living increase varies somewhat, but is generally defined as the Consumer Price Index (CPI) not to exceed 3%. A death benefit of $500-$2,500, determined by the number of years of service credit of the retiree, is paid to the beneficiary of a deceased retiree or disability benefit recipient under the Traditional Pension Plan and Combined Plan. Death benefits are not available to beneficiaries of Member-Directed Plan participants.

- ***Money Purchase Annuity***—Age-and-service retirees who become re-employed in an OPERS-covered position must contribute the regular contribution rates, which are applied towards a money purchase annuity. The money purchase annuity calculation is based on the accumulated contributions of the retiree for the period of re-employment, and an amount of the employer contributions determined by the Board. Upon termination of service, members over the age of 65 can elect to receive a lump-sum payout or a monthly annuity. Members under age 65 may leave the funds on deposit with OPERS to receive an annuity benefit at age 65, or may elect to receive a refund of their employee contributions made during the period of re-employment, plus interest.

- ***Refunds***—Members who have terminated service in OPERS-covered employment may file an application for refund of their account. The ORC used to require a three-month waiting period after service termination before the refund may be paid. Effective April 6, 2017, House Bill 520 reduced the waiting period from three months to two months. The acceptance of a refund payment cancels the individual's rights and benefits in OPERS.

  Refunds processed for Traditional Pension Plan members include the member's accumulated contributions, interest and any qualifying employer funds. A Combined Plan member's refund may consist of member contributions for the purchase of service plus interest, qualifying employer funds, and the value of their account in the defined contribution plan consisting of member contributions adjusted by the gains or losses incurred based on their investment selections. Refunds paid to participants in the Member-Directed Plan include member contributions and vested employer contributions adjusted by the gains or losses incurred based on their investment selections.

**c. Contributions**—The OPERS funding policy provides for periodic member and employer contributions to all three plans (Traditional Pension, Combined and Member-Directed) at rates established by the Board, subject to limits set in statute. The rates established for member and employer contributions were approved based upon the recommendations of the System's actuary. All contribution rates were within the limits authorized by the ORC.

Member and employer contribution rates, as a percent of covered payroll, were the same for each covered group across all three plans for the year ended December 31, 2016. Within the Traditional Pension Plan and Combined Plan, member and employer contributions (employer contributions only for the Combined Plan) and an actuarially determined rate of return are adequate to accumulate sufficient assets to pay defined benefits when due. Member contributions within the Combined Plan are not used to fund the defined benefit retirement allowance. Employer contribution rates as a level percent of payroll dollars are determined using the entry age actuarial funding method. This formula determines the amount of contributions necessary to fund: (1) the current service cost, representing the estimated amount necessary to pay for defined benefits earned by the members during the current service year; and (2) the prior service cost for service earned prior to the current year and subsequent benefit increases. These contributions represent the amount necessary to fund accrued liabilities for retirement allowances and survivor benefits over a period of time. The annual employer contributions reported for the Traditional Pension Plan for 2016 were $1,556,529,162. Employer contributions for the Combined Plan for 2016 were $47,079,023. Employers satisfied 100% of the contribution requirements.

The following table displays the member and employer contribution rates as a percent of covered payroll for each division for 2016. With the assistance of the System's actuary and Board approval, a portion of each employer's contribution to OPERS may be set aside for the funding of post-employment health care coverage. The portion of Traditional Pension Plan and Combined Plan employer contributions allocated to health care was 2.0% for 2016. The employer contribution as a percent of covered payroll deposited for RMA participants in the Member-Directed Plan for 2016 was 4.0%.

**Board of Trustees—Approved Contribution Rates—All Plans**

| | 2016 Employee Rate | 2016 Employer Rate |
|---|---|---|
| State Division | 10.00% | 14.00% |
| Local Division | 10.00 | 14.00 |
| Law Enforcement Division | 13.00 | 18.10 |
| Public Safety Division | 12.00 | 18.10 |

The member and employer contribution rates for the State and Local divisions are currently set at the maximums authorized by the ORC of 10% and 14%, respectively. The Public Safety and Law Enforcement employer rates are also set at the maximum authorized rate of 18.1%. The member Public Safety rate is determined by the Board and has no maximum rate established by the ORC. The member rate for Law Enforcement is also determined by the Board, but is limited by the ORC to not more than 2% greater than the Public Safety rate.

ORC Chapter 145 assigns authority to the Board to amend the funding policy. As of December 31, 2016, the Board adopted the contribution rates that were recommended by the actuary. The contribution rates were included in a funding policy adopted by the Board in October 2013, and are certified periodically by the Board as required by the ORC.

As of December 31, 2016, the date of the last pension actuarial study, the funding period for all defined benefits of the System was 19 years.

d. **Federal Subsidies**—OPERS participated in several federal programs that subsidized or provided reimbursements to the 115 Trust. Medicare Part D is a federal program that reimburses 28% of the cost of prescription drugs for Medicare beneficiaries in the United States. During 2011, OPERS implemented a prescription drug plan (PDP) in which the System received a direct subsidy from the Centers for Medicare & Medicaid Services based on the risk score of each eligible retiree. The PDP was terminated December 31, 2015 as OPERS transitioned the Medicare-eligible retirees to the Connector and the program was no longer needed.

The following table summarizes the various federal subsidies received by OPERS for the year ended December 31, 2016:

| Federal Subsidy Received (for the year ended December 31, 2016) | |
|---|---|
| | 115 Health Care Trust |
| Medicare Part D Retiree Drug Subsidy | $122,044 |
| Medicare Prescription Drug Plan | 3,943,014 |
| **Total Federal Subsidy** | **$4,065,058** |

e. **Commitments and Contingencies**—OPERS has committed to fund various private equity and closed-end real estate investments totaling approximately $8.6 billion at December 31, 2016. The expected funding dates for these commitments extend through 2022. OPERS is a party in various lawsuits relating to plan benefits and investments. While the final outcome cannot be determined at this time, management is of the opinion that the liability, if any, for these legal actions will not have a material adverse effect on OPERS financial position.

## 2. Summary of Significant Accounting Policies

The following are the significant accounting policies followed by OPERS for all pension and health care plans:

a. **Basis of Accounting**—The financial statements are prepared using the accrual basis of accounting under which deductions are recorded when the liability is incurred and revenues are recognized when earned. Pension benefit payments are due the first day of the month following the retirement of a member, and the first of each month thereafter. Health care payments are considered a liability and recognized in the Combining Statements of Fiduciary Net Position when a present obligation exists and a condition that requires that the event creating the liability has taken place. Therefore, OPEB plan liabilities are recognized when the benefits are currently due and payable in accordance with the benefit terms, as clarified in GASB Statement No. 74 (GASB 74), *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*. Health care liabilities contain estimates on incurred but not reported amounts for the current year. OPERS notionally funds and tracks member balances in the HRAs, Member-Directed RMAs and wellness RMAs. As of December 31, 2016, the notional member balances in the HRAs is $236.6 million and the amount recognized as being currently due for 2016 claims based on estimates is $17.4 million. As of December 31, 2016, the notional member balances in the Member-Directed RMAs and wellness RMAs are $189.7 million and $18.2 million, respectively, and the amounts currently due are estimated at $0.4 million and $1.8 million, respectively. As previously noted, the Member-Directed RMAs were originally funded through the VEBA Trust, prior to the 115 Trust, and the VEBA Trust was historically reported separately in the combining financial statements. Although all health care activity is now reported under the 115 Trust as of the end of 2016, OPERS internally accounts for health care activity separately. Total net position reported for the 115 Trust as of December 31, 2016 is $11.9 billion, this includes a net position of $195.3 million in the Member-Directed RMA Plan. Refunds, for any member who makes a written application to withdraw his/her contributions, are payable three months after termination of the member's OPERS-covered employment (updated in law in 2017 to two months). Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

Additions to the plans consist of contributions (member and employer), health care reimbursements, federal health care subsidies, other contracts and receipts, interplan activities, net investment income, and other miscellaneous income. Contributions are recorded in the period the related salaries are earned and become measurable pursuant to formal commitments, statutory or contractual requirements. Accordingly, both member and employer contributions for the year ended December 31, 2016 include year-end accruals based upon estimates derived from subsequent payment activity and historical payment patterns. Member and employer contributions are due 30 days after the month in which salaries are earned based on pay period end date. Health care reimbursements are recognized when they become measurable and due to OPERS based on contractual requirements. Therefore, health care reimbursements contain estimates based on information received from health care vendors and other sources. Plan changes, settlement activity and other interplan activity are recorded as an addition or deduction based on the nature of the transaction, when the transaction occurs. Investment purchases and sales are recorded as of the trade date.

The accounting and reporting policies of OPERS conform to accounting principles generally accepted in the United States of America (referred to as GAAP) as applicable to government organizations. The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and to disclose contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

In 2015, the GASB issued Statement No. 72 (GASB 72), *Fair Value Measurement and Application*, effective in financial statements for periods beginning after June 15, 2015. GASB 72 addresses accounting and financial reporting related to fair value measurements of assets and liabilities. Guidance is provided around valuation techniques to measure fair value and extensive disclosures are required around the hierarchy of inputs to valuation techniques used to measure fair value as established by the statement. Since the statement generally requires investments to be measured at fair value, the impact to OPERS financial statements was minimal. However, the investment-related notes to the combining financial statements were significantly enhanced to comply with this new standard. OPERS implemented the provisions of GASB 72 in the current year annual report for the year ended December 31, 2016, see Note 3 for additional information.

In 2015, the GASB issued Statement No. 73 (GASB 73), *Accounting and Financial Reporting for Pensions and Related Assets That Are Not within the Scope of GASB Statement 68, and Amendments to Certain Provisions of GASB Statements 67 and 68*, effective in financial statements for periods beginning after June 15, 2015. Among other requirements not applicable to OPERS, this statement clarifies the application of certain provisions of GASB Statement No. 67 (GASB 67), *Financial Reporting for Pension Plans-an amendment of GASB Statement No. 25,* and GASB Statement No. 68 (GASB 68), *Accounting and Financial Reporting for Pensions-an amendment of GASB Statement No. 27.* GASB 73 clarifies information required to be presented as notes to the 10-year schedules of required supplementary information about investment-related factors that significantly affect trends in the amounts reported over which the pension plan has influence (for example, changes in investment policies). OPERS implemented this standard in this annual report and includes a section in the Notes to Required Supplementary Information on factors significantly affecting trends in reported amounts.

GASB also issued GASB 74, and in conjunction with GASB 74, the GASB issued Statement No. 75 (GASB 75), *Accounting and Financial Reporting for Postemployment Benefits Other than Pensions.* GASB 74 and 75 result from a comprehensive review of the standards of accounting and financial reporting for all postemployment benefits (pensions and OPEB).

While GASB 67 and 68 address fundamental changes to accounting and financial reporting of pensions by both the pension systems and participating employers, GASB 74 and 75 address very similar changes in requirements for these same parties in regard to OPEB, or health care, provided by OPERS to qualifying retirees and beneficiaries. These requirements involve changes in presentation of the financial statements, notes to the financial statements, and required supplementary information of state and local health care plans established as trusts.

GASB 74 replaces GASB Statement No. 43 (GASB 43), *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*, and Statement No. 57 (GASB 57), *OPEB Measurements by Agent Employers and Agent Multiple-Employer Plans*. It also includes requirements for defined contribution OPEB plans that replace the requirements for those OPEB plans in GASB 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, GASB 43, and GASB Statement No. 50, *Pension Disclosures—an amendment of GASB Statements No. 25 and No. 27*. GASB 75 replaces Statements No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, as amended, and GASB 57.

GASB 74 is effective for OPEB systems for fiscal years beginning after June 15, 2016, resulting in initial implementation in the OPERS 2017 CAFR. GASB 75 is effective for OPERS participating employers for fiscal years beginning after June 15, 2017, resulting in initial implementation for employers generally in 2018 annual reports. These new accounting and reporting standards also break the link between accounting and funding, similar to GASB 67 and 68. While these changes will affect the accounting measures, they do not have an effect on the actuarial methods and assumptions used by OPERS to determine the employer contributions needed to fund health care. However, the new standards will impact the financial statement presentation for health care accounting and related disclosures for OPERS and participating employers.

GASB Statement No. 76, *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments*, is effective for reporting periods beginning after June 15, 2015. This statement supersedes Statement No. 55, *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments.* The requirements in this statement raise the category of GASB Implementation Guides in the GAAP hierarchy, emphasize the use of analogies to authoritative literature when accounting treatment for an event is not specified in GAAP, and require the consideration of consistency with the GASB Concept Statements when evaluating accounting treatments specified in nonauthoritative literature. This statement did not have an impact on the OPERS financial statements as OPERS is consistently using GASB implementation guides and did not encounter any events in 2016 not specified in GAAP or where treatment is specified in nonauthoritative literature.

In 2015, the GASB issued Statement No. 77, *Tax Abatement Disclosures*. This statement is effective for reporting periods beginning after December 15, 2015. This statement is not applicable to OPERS as the System does not have any tax revenues or abatement activity.

The GASB issued Statement 78 (GASB 78), *Pensions Provided through Certain Multiple-Employer Defined Benefit Plans*, in December 2015. This statement amends the scope and applicability of GASB 68 to exclude certain pensions that are not solely associated with state or local government plans and employees of state or local government employers. The statement does not apply to OPERS.

The GASB issued GASB Statement No. 79, *Certain External Investment Pools and Pool Participants*, in December 2015. This statement addresses accounting and financial reporting for certain external investment pools and pool participants, specifically establishing criteria for these pools to qualify for measurement at amortized cost. This statement is effective for reporting periods beginning after December 15, 2015. OPERS did not hold or participate in these types of investments in 2016. Therefore, this statement does not apply.

GASB Statement No. 80, *Blending Requirements for Certain Component Units—an amendment of GASB Statement No. 14*, was issued in January 2016. This statement is not applicable to OPERS as the System is not a component unit of a state or local government, or part of a primary government that reports component units.

GASB Statement No. 81, *Irrevocable Split-Interest Agreements*, was issued in March 2016. This statement is not applicable to OPERS as the System does not have these types of agreements.

GASB Statement No. 82, *Pension Issues—an amendment of GASB Statements No. 67, No. 68 and No. 73*, was issued March 2016. This statement addresses issues regarding: 1) the presentation of payroll-related measures in required supplementary information; 2) the selection of assumptions and the treatment of deviations from the guidance in an actuarial standard of practice for financial reporting purposes; and 3) the classification of payments made by employers to satisfy employee (member) contribution requirements. This statement does not have an impact on the OPERS financial statements, notes, or required supplementary information in this document, as OPERS is currently presenting, selecting and classifying this information in accordance with the requirements of the statement.

In November 2016, GASB issued Statement No. 83, *Certain Asset Retirement Obligations*. This statement establishes criteria for determining the timing and recognition of a liability and a corresponding deferred outflow of resources for asset retirement obligations, or legally enforceable liabilities associated with the retirement of a tangible capital asset. OPERS has no asset retirement obligations, therefore, this statement does not apply.

GASB Statement No. 84, *Fiduciary Activities*, was issued January 2017. This statement addresses financial reporting requirements of specific fiduciary funds in primary government financial statements. OPERS is not a primary government that reports component units, therefore, this statement does not apply.

Finally, GASB Statement No. 85, *Omnibus 2017*, was issued March 2017. This statement addresses practice issues that have been identified during implementation and application of certain GASB statements. Topics include issues related to blending component units, goodwill, fair value measurement and application, and postemployment benefits (pensions and OPEB). The effective date for this standard is reporting periods beginning after June 15, 2017. OPERS is currently evaluating this statement with initial implementation planned for the 2018 annual report.

b. **Investments**—OPERS is authorized by ORC Section 145.11 to invest under a prudent person standard and does so through an investment policy established by the Board. ORC 145.11 states:

> The Board and other fiduciaries shall discharge their duties with respect to the funds solely in the interest of the participants and beneficiaries; for the exclusive purpose of providing benefits to participants and their beneficiaries and defraying reasonable expenses of administering the public employees retirement system; with care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims; and by diversifying the investments of the system so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so.

Member-Directed Plan participants self-direct the investment of both member and employer contributions. Contributions must be invested with an investment manager approved by the Board. Similarly, participants in the Combined Plan self-direct the investment of member contributions. The investment assets for all other plans and the trust are invested under the direction of the OPERS Investment staff in conformance with policies approved by the Board.

All investments are reported at fair value. Fair value is the amount that a plan can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller, that is, other than in a forced or liquidation sale. All investments, with the exception of real estate, private equity, and hedge funds, are valued based on closing market prices or broker quotes. Securities not having a quoted market price have been valued based on yields currently available on comparable securities of issuers with similar credit ratings. The fair value of real estate investments is based on estimated current values and independent appraisals. The fair value of private equity is based on management's valuation of estimates and assumptions from information and representations provided by the respective general partners, in the absence of readily ascertainable market values. The fair value of hedge funds is based on a net asset value, which is established by the fund or by the fund's third-party administrator.

Net increase (decrease) in the fair value of investments is determined by calculating the change in the fair value of investments between the end of the year and the beginning of the year, less purchases of investments at cost, plus sales of investments at fair value. Interest income is recorded on the accrual basis and dividends are recorded on the ex-dividend date. Commissions paid to brokers are considered a part of the investment asset cost and are, therefore, not reported as expenses of the System. Brokerage commissions for 2016 were $8,616,922. Investment administrative expenses consist of custodial banking fees and those expenses directly related to OPERS internal investment operations, and include a proportional amount of allocated overhead.

c. **Capital Assets**—Capital assets are recorded at cost and do not meet the definition of an investment under GASB 72. OPERS has adopted a capitalization threshold used to identify whether assets purchased by the System are classified as capital assets or operating expenses. Building enhancements, furniture and equipment with a cost equal to or greater than $5,000 and computer software purchases of $25,000 or more are recorded as capital assets and depreciated based on the useful life of the asset. OPERS implemented GASB Statement No. 51 (GASB 51), *Accounting and Financial Reporting for Intangible Assets*, in 2008 for internally developed software and capitalizes software projects in accordance with this standard.

Depreciation is computed using the straight-line method over the estimated useful lives of the related assets according to the following schedule:

**Useful Lives of Capital Assets**

| | Years |
|---|---|
| Buildings and Building Improvements | 50 |
| Furniture and Equipment | 3-10 |
| Computer Software | 3-8 |

The table below is a schedule of the capital asset account balances as of December 31, 2015 and 2016, with changes to those account balances during the year ended December 31, 2016:

**Capital Asset Account Balances**

| | Land | Building and Building Improvements | Furniture and Equipment | Total Capital Assets |
|---|---|---|---|---|
| **Cost** | | | | |
| Balances December 31, 2015 | $3,734,813 | $111,104,859 | $138,502,671 | $253,342,343 |
| Additions | | | 11,875,209 | 11,875,209 |
| Write-offs | | (160,805) | (8,696,234) | (8,857,039) |
| Balances December 31, 2016 | 3,734,813 | 110,944,054 | 141,681,646 | 256,360,513 |
| **Accumulated Depreciation** | | | | |
| Balances December 31, 2015 | | 31,862,241 | 88,668,451 | 120,530,692 |
| Depreciation Expense | | 2,333,360 | 8,885,081 | 11,218,441 |
| Write-offs | | (58,724) | (8,290,969) | (8,349,693) |
| Balances December 31, 2016 | | 34,136,877 | 89,262,563 | 123,399,440 |
| **Net Capital Assets December 31, 2016** | **$3,734,813** | **$76,807,177** | **$52,419,083** | **$132,961,073** |

d. **Undistributed Deposits**—Cash receipts are recorded as undistributed deposits until they are allocated to employer receivables, member contributions, miscellaneous or investment income.

e. **Federal Income Tax Status**—OPERS is a qualified plan under Section 401(a) of the IRC and is exempt from federal income taxes under Section 501(a).

f. **Funds—**In accordance with the ORC and IRS regulations, various funds have been established to account for the reserves held for future and current payments. Statutory and IRS-mandated funds within each of the three pension plans are described starting below:

**Traditional Pension Plan**

- ***The Employees' Savings Fund***—represents member contributions held in trust pending their refund or transfer to a benefit disbursement fund. Upon a member's refund or retirement, such member's account is credited with an amount of interest (statutory interest) on the member's contributions based on a Board-approved rate, which currently ranges from 1% to 4%. Members eligible for a refund also receive additional funds from the Employers' Accumulation Fund, if qualified. The ORC Chapter 145 requires statutory interest to be compounded annually.
- ***The Employers' Accumulation Fund***—is used to accumulate employer contributions to be used in providing the reserves required for transfer to the Annuity and Pension Reserve Fund as members retire or become eligible for disability benefits, and to the Survivors' Benefit Fund for benefits due dependents of deceased members.
- ***The Employers' Accumulation Health Care Fund (IRC 401(h))***—was used to accumulate employer contributions to be used in providing the reserves required for transfer to the Annuity and Pension Reserve and Survivors' Benefit funds for health care coverage paid for retirees and eligible dependents of deceased members. The balance in this statutory and IRS-mandated fund was $11,161,276,751 as of June 30, 2016, and restricted for future health care expenses. The 401(h) Trust was closed as of June 30, 2016 and the net position transferred to the 115 Trust on July 1, 2016. This transfer is reflected on a Special Item Interplan Activity—Trust Closures line in the Combining Statements of Changes in Fiduciary Net Position.

- ***The Employers' Accumulation Health Care Fund (IRC 115)***—is used to accumulate employer contributions to be used in providing the reserves required for transfer to the Annuity and Pension Reserve and Survivors' Benefit funds for health care coverage paid for non-Medicare eligible retirees and eligible dependents of deceased members, monthly deposits to an HRA for Medicare-eligible retirees and eligible dependents of deceased members under the Connector program, and Member-Directed RMAs. Beginning in 2016, the 115 Trust is the funding vehicle for all health care plans, including plans that used to be funded through the 401(h) Trust and VEBA Trust. The transfer of the net positions of the 401(h) Trust and VEBA Trust into the 115 Trust is reflected on a Special Item Interplan Activity—Trust Closures line in the Combining Statements of Changes in Fiduciary Net Position.
- ***The Annuity and Pension Reserve Fund***—is the fund from which retirement allowances that do not exceed the IRC 415(b) limitations, and health care coverage are paid. This reserve was fully funded for pension benefits according to the latest actuarial study dated December 31, 2016. Accordingly, sufficient assets are available in this fund to pay the vested pension benefits of all retirees and beneficiaries as of the valuation date.
- ***The Survivors' Benefit Fund***—is the fund from which benefits due dependents of deceased members of the System that do not exceed the IRC 415(b) limitations are paid. This fund also was fully funded in relation to vested pension benefits as of December 31, 2016.
- ***Qualified Excess Benefit Arrangement (QEBA) Fund***—is the fund from which annuity, disability and survivors' benefits are paid when the recipient exceeds the IRC 415(b) limits. This reserve is funded by employer contributions; therefore, it is fully funded.
- ***The Income Fund***—is the fund credited with all investment earnings and miscellaneous income. Annually, the balance in this fund is transferred to other funds to aid in the funding of future benefit payments and administrative expenses.
- ***The Expense Fund***—provides for the payment of administrative expenses with the necessary monies allocated to it from the Income Fund.

**Member-Directed Plan**

- ***The Defined Contribution Fund***—represents member and employer contributions held in trust pending their refund or commencement of benefit payments. Members self-direct the investment of these funds. The member vests in employer contributions over a five-year period at a rate of 20% per year.
- ***The Annuity and Pension Reserve Fund***—is the fund from which purchased annuity benefits are paid. Upon retirement, Member-Directed participants may elect to liquidate their defined contribution accounts to purchase a defined benefit annuity. The value of the annuity is based on the value of the defined contribution account at the time of liquidation.
- ***The Income Fund***—is the fund credited with all investment earnings, account fees, and miscellaneous income. The balance in this fund is used to fund the gains or losses incurred by participants and to fund the administrative expenses of the Member-Directed Plan.
- ***The Expense Fund***—provides for the payment of administrative expenses with the necessary monies allocated to it from the Income Fund.
- ***The Voluntary Employees' Beneficiary Association Trust***—was the fund used to accumulate employer contributions in Member-Directed participants' RMAs. The effective date of the VEBA Trust coincided with the effective date of the Member-Directed Plan. Accordingly, since January 1, 2003, a portion of employer contributions made on behalf of

members electing to participate in the Member-Directed Plan has been deposited to the VEBA Trust. Employer contributions were allocated to this trust through June 30, 2016, when the trust was closed and the net position of $180,886,028 was transferred to the 115 Trust on July 1, 2016. This transfer is reflected on a Special Item Interplan Activity—Trust Closures line in the Combining Statements of Changes in Fiduciary Net Position. For additional information, refer to page 42 of Note 1.

- ***The Employers' Accumulation Health Care Fund (IRC 115)***—beginning July 1, 2016, this fund is used to accumulate employer contributions in the Member-Directed participants' RMAs. For additional information, refer to the previous note on the VEBA Trust.

**Combined Plan**

- ***The Defined Contribution Fund***—represents member contributions held in trust pending their refund or commencement of benefit payments. Members self-direct the investment of these funds.
- ***The Employees' Savings Fund***—represents member deposits for the purchase of service credit held in trust pending their refund or transfer to the plan's Annuity and Pension Reserve Fund. Upon a member's refund or retirement, such member's accounts are credited with an amount of interest (statutory interest) on the member's deposits based on a Board-approved rate. The interest rate has been 1% since January 1, 2003.
- ***The Employers' Accumulation Fund***—is used to accumulate employer contributions to be used in providing the reserves required for transfer to the Annuity and Pension Reserve Fund as members retire. Disability and survivor benefits are funded by transfers to Traditional Pension Plan funds, which pay such benefits.
- ***The Employers' Accumulation Health Care Fund (IRC 401(h))***—was used to accumulate employer contributions to be used in providing the reserves required for transfer to the Annuity and Pension Reserve and Survivors' Benefit funds for health care coverage paid for retirees and eligible dependents of deceased members. This trust was closed as of June 30, 2016 and the net position transferred to the 115 Trust. For additional information, refer to the description of this fund under the Traditional Pension Plan on page 55.
- ***The Employers' Accumulation Health Care Fund (IRC 115)***—is used to accumulate employer contributions to be used in providing the reserves required for transfer to the Annuity and Pension Reserve and Survivors' Benefit funds, for health care coverage paid for non-Medicare eligible retirees and eligible dependents of deceased members, monthly deposits to an HRA for Medicare-eligible retirees and eligible dependents of deceased members under the Connector program, and Member-Directed RMAs. For additional information, refer to the description of this fund under the Traditional Pension Plan on page 56.
- ***The Annuity and Pension Reserve Fund***—is the fund from which retirement allowances and health care coverage are paid. This reserve was fully funded according to the latest actuarial study dated December 31, 2016.
- ***The Income Fund***—is the fund credited with all investment earnings, account fees and miscellaneous income. The balance in this fund is transferred to other funds, to the credit of member accounts and to aid in the funding of future benefit payments and administrative expenses.
- ***The Expense Fund***—provides for the payment of administrative expenses with the necessary monies allocated to it from the Income Fund.

The statutory funds defined by ORC 145 and the IRC-required funds are not mutually exclusive. The Combining Statements of Fiduciary Net Position and the Combining Statements of Changes in Fiduciary Net Position (pages 38-41) are presented based on IRC requirements. The following schedule provides the values of the statutory funds and how they are distributed among the various retirement plans and the health care trust administered by the System. The rows represent the statutory funds required by the ORC. In total, these funds will equal the fiduciary net position of the System. To support the fiduciary net position for each plan and trust included in the statements, the schedule has been expanded to include the value of the statutory funds as they relate to each plan and trust.

Statutory and IRC Fund balances at December 31, 2016 are as follows:

**Statutory and IRC Fund Balances** (as of December 31, 2016)

| | Traditional Pension Plan | Combined Plan | Member-Directed Plan | 115 Health Care Trust | Total |
|---|---|---|---|---|---|
| Employees' Savings Fund | $13,912,277,541 | $2,629,485 | $52,511 | | $13,914,959,537 |
| Employers' Accumulation Fund | 6,965,583,478 | 372,135,835 | 703,037 | $11,880,487,863 | 19,218,910,213 |
| Annuity and Pension Reserve Fund | 54,433,695,575 | 17,116,877 | 11,909,731 | | 54,462,722,183 |
| Survivors' Benefit Fund | 1,669,466,891 | | | | 1,669,466,891 |
| Defined Contribution Fund | | 423,969,820 | 792,185,581 | | 1,216,155,401 |
| Income Fund | 123,776,306 | | | | 123,776,306 |
| Expense Fund | 4,833,694 | | | | 4,833,694 |
| **Total** | **$77,109,633,485** | **$815,852,017** | **$804,850,860** | **$11,880,487,863** | **$90,610,824,225** |

**g. Risk Management**—OPERS is exposed to various risks of loss related to theft of, damage to, and destruction of assets; injuries to employees; and court challenges to fiduciary decisions. To cover these risks, OPERS maintains commercial insurance and holds fidelity bonds on employees. There were no reductions in coverage nor have there been any settlements exceeding insurance coverage for the past three years. As required by state law, OPERS is registered and insured through the state of Ohio Bureau of Workers’ Compensation for injuries to employees. OPERS is self-insured for employee health care coverage. The only outstanding liabilities at the end of 2016 were related to the employee health care coverage (see Note 7).

## 3. Cash and Investments

A summary of cash and short-term securities and investments held at December 31, 2016 is as follows:

**Summary of Cash and Short-Term Securities and Investments** (as of December 31, 2016)

| | 2016 Fair Value |
|---|---|
| **Cash and Short-Term Investments** | |
| Cash | $40,260,841 |
| Short-Term Securities | |
| Commercial Paper | 1,105,725,807 |
| U.S. Treasury Obligations | 256,716,347 |
| Repurchase Agreements | 1,480,000,000 |
| Interest-Bearing Short-Term Certificates | 339,976,257 |
| Short-Term Investment Funds (STIF) | 1,363,626,253 |
| Subtotal Short-Term Securities | 4,546,044,664 |
| **Total Cash and Short-Term Investments** | **$4,586,305,505** |
| **Investments** | |
| Fixed Income | |
| U.S. Corporate Bonds | $6,130,248,901 |
| Non-U.S. Notes and Bonds | 6,407,706,767 |
| U.S. Government and Agencies | 6,603,998,122 |
| U.S. Mortgage Backed | 2,915,771,753 |
| Subtotal Fixed Income | 22,057,725,543 |
| Domestic Equities | 17,216,054,266 |
| Real Estate | 8,016,903,826 |
| Private Equity | 8,855,248,710 |
| International Equities | 16,403,983,969 |
| Hedge Funds and Derivatives* | 12,899,734,289 |
| **Total Investments Before Collateral on Loaned Securities** | **85,449,650,603** |
| Collateral on Loaned Securities | |
| Reinvested Cash Collateral for Loaned Securities | 8,288,355,523 |
| **Total Collateral on Loaned Securities** | **8,288,355,523** |
| **Total Investments Including Collateral on Loaned Securities** | **$93,738,006,126** |
| **Total Cash and Investments** | **$98,324,311,631** |

* Hedge Funds and Derivatives includes risk parity and global tactical asset allocation.

a. **Custodial Credit Risk, Deposits**—Custodial credit risk for deposits is risk that, in the event of the failure of a depository financial institution, OPERS will not be able to recover its deposits or will not be able to recover collateral securities that are in the possession of an outside party. Balances on deposit are insured by the Federal Deposit Insurance Corporation (FDIC) up to specified limits. Balances in excess of FDIC limits are uninsured. The total amount of cash and cash equivalent balances held by the bank was $41,706,228 at December 31, 2016. OPERS has not experienced any losses in its accounts and believes it is not exposed to a significant credit risk on its cash. OPERS has no formal policy specific to custodial credit risk. These assets are under the custody of the Treasurer of the state of Ohio.

b. **Custodial Credit Risk, Investments**—Custodial credit risk for investments is the risk that, in the event of the failure of the custodian, OPERS will not be able to recover the value of its investment or collateral securities that are in the possession of the custodian. The Treasurer of the state of Ohio, as custodian, selects the custodian in the name of OPERS or its nominee; thus, OPERS investments are not exposed to custodial credit risk.

c. **Credit Risk**—Generally, credit risk is the risk that an issuer of an investment will not fulfill its obligation to the holder of the investment. This risk is measured by ratings assigned by a nationally recognized statistical rating organization.

The OPERS Public Fixed Income Policy includes limiting non-investment grade securities to within 15 percentage points of the market value percentage of non-investment grade securities in the Fixed Income Aggregate Benchmark within the Defined Benefit portfolio, the 401(h) Health Care Trust portfolio (closed June 30, 2016), the 115 Health Care Trust portfolio, fixed income components of any target date funds and fixed income funds offered directly to OPERS members. Limitations on holdings of non-investment grade securities are included in portfolio guidelines.

d. **Interest Rate Risk**—Interest rate risk is the risk that changes in market interest rates will adversely affect the fair value of an investment. Generally, the longer the maturity of an investment, the greater the sensitivity of its fair value to changes in market interest rates. OPERS monitors the interest rate risk inherent in its portfolio by measuring the weighted-average duration of its portfolio. Duration is a measure of a debt investment's exposure to fair value changes arising from changing interest rates. It uses the present value of cash flows, weighted for those cash flows as a percentage of the investment's full price. The effective duration measures the sensitivity of the market price to parallel shifts in the yield curve. The OPERS Fixed Income Policy states the average effective duration of all defined benefit, 401(h) Health Care Trust (closed June 30, 2016) and 115 Health Care Trust assets must be within 20% of the average effective duration of the benchmark.

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The following table presents the credit quality ratings and effective durations of OPERS fixed income assets, including short-term investments, as of December 31, 2016:

### 2016 Average Credit Quality and Exposure Levels of Guaranteed Securities

| Fixed Income Security Type | Fair Value | Percent of All Fixed Income Assets | Weighted Average Duration to Maturity (years) | AAA | AA |
|---|---|---|---|---|---|
| Commercial Paper | $1,105,725,807 | 4.2% | 0.01 | $805,755,130 | $234,975,374 |
| Short-Term Investment Funds (STIF) | 1,363,626,253 | 5.1 | 0.08 | 1,363,626,253 | |
| Repurchase Agreements | 1,480,000,000 | 5.6 | 0.01 | 1,080,000,000 | 100,000,000 |
| Interest-Bearing Short-Term Certificates & Other | 339,976,257 | 1.3 | 0.35 | 337,921,000 | |
| Corporate Bonds | 4,122,299,257 | 15.5 | 5.70 | 39,339,220 | 252,613,764 |
| Municipal Bonds | 133,146,409 | 0.5 | 13.64 | 20,547,476 | 79,461,637 |
| Asset-Backed Securities | 936,658,452 | 3.5 | 1.22 | 552,791,427 | 125,774,158 |
| Mortgages | 783,509,033 | 2.9 | 4.15 | 148,675,344 | 132,822,785 |
| Agency Mortgages | 2,032,186,506 | 7.6 | 5.20 | | 2,032,186,506 |
| Non-U.S. Corporate Bonds | 2,126,503,636 | 8.0 | 5.27 | 73,021,413 | 199,462,425 |
| Non-U.S. Mortgage & Asset-Backed Securities | 180,048,697 | 0.7 | 4.20 | 68,200,000 | |
| Non-U.S. Government | 4,096,764,250 | 15.4 | 6.09 | | 14,937,525 |
| Agency Bonds | 772,569,993 | 2.9 | 1.25 | | 772,569,993 |
| Commingled Long-Term Global Funds | 1,068,847,567 | 4.0 | 4.28 | 26,236,386 | 260,825,271 |
| **Total Non-Government Guaranteed** | **20,541,862,117** | **77.2** | | **4,516,113,649** | **4,205,629,438** |
| U.S. Treasury Notes | 3,743,006,109 | 14.1 | 3.61 | | 3,743,006,109 |
| U.S. Treasury Bonds | 509,599,881 | 1.9 | 18.73 | | 509,599,881 |
| U.S. Treasury Inflation Protected | 1,332,577,347 | 5.0 | 7.61 | | 1,332,577,347 |
| U.S. Treasury Floating Rate Notes | 220,008,406 | 0.8 | 0.77 | | 220,008,406 |
| U.S. Treasury Discount Notes | 256,716,347 | 1.0 | 0.18 | | 256,716,347 |
| **Total Fixed Income and Short-Term Securities** | **$26,603,770,207** | **100.0%** | **4.38** | **$4,516,113,649** | **$10,267,537,528** |

## 2016 Average Credit Quality and Exposure Levels of Guaranteed Securities (continued from page 62)

| A | BBB | BB | B | CCC | CC | C | D | Not Rated |
|---|---|---|---|---|---|---|---|---|
| $64,995,303 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | $300,000,000 |
| | | | | | | | | 2,055,257 |
| 616,017,596 | $1,141,011,533 | $919,942,652 | $871,711,583 | $245,514,600 | $1,075,568 | $2,421,725 | $7,346,860 | 25,304,156 |
| 30,292,316 | 2,844,980 | | | | | | | |
| 71,175,404 | 17,915,829 | 53,557,809 | 6,322,637 | 28,756,880 | 41,067,219 | | 12,320,662 | 26,976,427 |
| 47,673,848 | 96,477,109 | 106,497,104 | 122,298,125 | 73,545,895 | 22,139,373 | | 25,354,546 | 8,024,904 |
| | | | | | | | | |
| 150,724,520 | 494,788,628 | 518,975,969 | 494,334,024 | 126,214,014 | | | 7,698,983 | 61,283,660 |
| | 3,998,797 | 38,552,031 | 9,848,430 | 56,731,224 | 2,658,000 | 59,293 | | 922 |
| 754,032,462 | 1,369,474,873 | 933,947,762 | 875,624,565 | 80,273,665 | 13,441,500 | | | 55,031,898 |
| | | | | | | | | |
| 30,351,813 | | 502,129,141 | | | | | | 249,304,956 |
| **1,765,263,262** | **3,126,511,749** | **3,073,602,468** | **2,380,139,364** | **611,036,278** | **80,381,660** | **2,481,018** | **52,721,051** | **727,982,180** |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **$1,765,263,262** | **$3,126,511,749** | **$3,073,602,468** | **$2,380,139,364** | **$611,036,278** | **$80,381,660** | **$2,481,018** | **$52,721,051** | **$727,982,180** |

e. **Concentration of Credit Risk**—Concentration of credit risk is the risk of loss that may be attributed to the magnitude of an investment in a single issuer. As of December 31, 2016, the portfolio has no single-issuer exposure that comprises 5% or more of the overall portfolio, excluding investments issued or explicitly guaranteed by the U.S. government and investments in mutual funds, external investment pools, and other pooled investments. Therefore, no concentration of credit risk exists.

f. **Foreign Currency Risk**—Foreign currency risk is the risk that changes in exchange rates will adversely impact the local currency value of an investment. The OPERS foreign currency exposures primarily reside within non-U.S. investment holdings. The OPERS implementation policy is to allow external managers to decide what action to take within approved portfolio guidelines for their respective portfolios' foreign currency exposures using forward-currency contracts. See chart on next page for foreign currency detail.

## Exposure to Foreign Currency Risk in U.S. Dollars (as of December 31, 2016)

| Currency | Cash | Forwards | Fixed Income | International Equities | Real Estate | Private Equity |
|---|---|---|---|---|---|---|
| Argentine Peso | | | $41,290,837 | | | |
| Australian Dollar | $1,663,297 | | | $464,356,586 | | |
| Brazilian Real | 579,632 | ($9,019,343) | 312,896,211 | 298,133,833 | | |
| British Pound Sterling | 1,939,801 | 3,188,764 | 18,600,087 | 1,622,319,122 | | $436,157,691 |
| Canadian Dollar | 524,318 | | | 574,098,979 | | |
| Chilean Peso | | | 290,598 | 14,001,308 | | |
| Chinese Yuan Renminbi | 7,184 | | | | | |
| Colombian Peso | 606,102 | (7,308,484) | 151,086,060 | 3,242,125 | | |
| Czech Koruna | 152 | | | 2,114,360 | | |
| Danish Krone | 122,411 | | | 133,641,570 | | |
| Dominican Peso | | | 11,729,026 | | | |
| Egyptian Pound | 127,079 | | 4,675,829 | 3,022,667 | | |
| Euro Currency | 6,322,709 | 29,456,120 | 100,429,991 | 2,609,995,080 | $86,993,220 | 974,536,522 |
| Ghanaian Cedi | 20 | | 38,699,928 | | | |
| Hong Kong Dollar | 1,288,489 | | | 993,467,090 | | |
| Hungarian Forint | 430,327 | 6,908,023 | 39,550,697 | 3,227,756 | | |
| Indian Rupee | 6,778,720 | (21,647,956) | 75,846,235 | 418,871,578 | | |
| Indonesian Rupiah | 530,810 | (6,818,695) | 221,509,415 | 137,972,833 | | |
| Israeli Shekel | 154,231 | (2,801,005) | 2,917,817 | 35,798,117 | | |
| Japanese Yen | 773,556 | (4,214,499) | | 1,962,337,002 | | |
| Kenyan Shilling | | | 11,865,547 | | | |
| Malaysian Ringgit | 330,767 | | 161,921,980 | 61,664,144 | | |
| Mexican Peso | 1,913,783 | 6,699,574 | 267,877,896 | 104,438,528 | | |
| New Zealand Dollar | 173,266 | | | 40,803,634 | | |
| Nigerian Naira | 6,190 | | | | | |
| Norwegian Krone | 1,046,217 | | | 100,617,278 | | |
| Peruvian Nuevo Sol | 37,297 | 1,405,587 | 26,292,495 | 373,803 | | |
| Philippine Peso | 47,046 | | 9,080,456 | 38,123,686 | | |
| Polish Zloty | 774,789 | 4,466,385 | 202,776,351 | 33,776,947 | | |
| Qatari Rial | 2,879 | | | 14,305,246 | | |
| Romanian New Leu | 1,140,917 | 10,478,648 | 18,582,722 | | | |
| Russian Ruble | 97,318 | 5,033,041 | 179,567,736 | | | |
| Singapore Dollar | 231,967 | | | 96,854,217 | | |
| South African Rand | 2,598,113 | (19,113,367) | 247,579,511 | 263,896,662 | | |
| South Korean Won | 430,305 | | 58,120 | 593,406,596 | | |
| Swedish Krona | 143,576 | 364,662 | | 200,774,566 | | |
| Swiss Franc | 700,841 | 637,737 | | 667,429,820 | | |
| Taiwan Dollar | 368,367 | | | 254,908,914 | | |
| Thailand Baht | 501,255 | 17,506,479 | 60,183,855 | 131,368,587 | | |
| Turkish Lira | 391,316 | (3,657,494) | 190,613,362 | 56,714,646 | | |
| UAE Dirham | (35) | | | 27,651,676 | | |
| Uganda Shilling | | | 8,632,633 | | | |
| Uruguay Peso | 239,564 | | 32,591,961 | | | |
| **Total** | **$33,024,576** | **$11,564,177** | **$2,437,147,356** | **$11,963,708,956** | **$86,993,220** | **$1,410,694,213** |

g. **Securities Lending**—OPERS maintains a securities lending program. OPERS uses its discretion to determine the type and amount of securities lent under the program. Under this program, securities are loaned to brokers. In return, OPERS receives cash collateral and agrees to return the collateral for the same securities in the future. Cash collateral from securities loaned is, simultaneous to the loan, reinvested in repurchase agreements and short-term securities. Securities loaned are collateralized at a minimum of 102% of the fair value of loaned U.S. securities and 105% of the fair value of loaned international securities. Collateral is marked-to-market daily. OPERS does not have the ability to pledge or sell collateral securities absent a broker default. If the fair value of the collateral held falls below the required levels, additional collateral is provided.

As of December 31, 2016, the fair value of securities on loan was $8,052,519,460. Associated collateral totaling $8,285,285,181 was received. The fair market value of reinvested collateral was $8,288,355,523 at December 31, 2016, which includes an unrealized gain on securities lending income totaling $3,070,342.

Net security lending income/(loss) is composed of four components: gross income, broker rebates, agent fees and unrealized gains/(losses) on collateral. Gross income is equal to earnings on cash collateral received in a security lending transaction. A broker rebate is the cost of using that cash collateral. Agent fees represent the fees paid to the agent for administering the lending program. Unrealized gains/(losses) result from the change in fair value of the reinvested cash collateral. Net security lending income is equal to gross income less broker rebates, agent fees, and unrealized losses on collateral. Security lending income for 2016 was recorded on an accrual basis.

h. **Derivatives**—Derivatives are generally defined as contracts whose values depend on, or are derived from, the value of an underlying asset, reference rate or index. OPERS has classified the following as derivatives:

- ***Forward-Currency Contracts***—OPERS enters into various forward-currency contracts to manage exposure to changes in foreign currency exchange rates on its foreign portfolio holdings. The System may also enter into forward-currency exchange contracts to provide a quantity of foreign currency needed at a future time at the current exchange rates, if rates are expected to change dramatically. A forward-exchange contract is a commitment to purchase or sell a foreign currency at a future date at a negotiated forward rate. Risk associated with such contracts includes movement in the value of foreign currency relative to the U.S. dollar and the ability of the counterparty to perform. The contracts are valued at forward-exchange rates, and the changes in value of open contracts are recognized as net increase/decrease in the fair value of investments in the Combining Statements of Changes in Fiduciary Net Position. The forward-currency purchases are recognized in Investment Commitments Payable on the Combining Statements of Fiduciary Net Position and the forward-currency sales are recognized in Investment Sales Proceeds. The realized gains or losses on forward-currency contracts represent the difference between the value of the original contracts and the closing value of such contracts and is included as net increase/decrease in the fair value of investments in the Combining Statements of Changes in Fiduciary Net Position. The net realized and unrealized loss on forward-currency contracts for the year 2016 was $19,875,948, or ($19,875,948).

  The fair values of forward-currency contracts and contracts hedged were as follows:

**Fair Value of Forward-Currency and Hedged Contracts** (as of December 31, 2016)

| | |
|---|---|
| Forward-currency purchases | $177,052,985 |
| Forward-currency sales | $162,600,004 |
| Unrealized loss | ($2,888,804) |

- ***Futures Contracts***—OPERS enters into various futures contracts to manage exposure to changes in equity, fixed income and currency markets and to take advantage of movements on an opportunistic basis. A stock index future is a futures contract that uses a stock index as its base, and which is settled by cash or delivery of the underlying stocks in the index. Financial futures represent an off balance sheet obligation, as there are no balance sheet assets or liabilities associated with those contracts; however, the realized and unrealized gains and losses on futures are recorded in the Combining Statements of Changes in Fiduciary Net Position. Futures contracts differ from forward-currency contracts by their standardization, exchange trading, margin requirements, and daily settlement (marking-to-market). Risk associated with stock index futures contracts includes adverse movements in the underlying stock index. The following table shows the futures positions held by OPERS as of December 31, 2016. The net realized and unrealized gain on futures contracts for the year 2016 was $431,948,151.

**Futures Positions Held** (as of December 31, 2016)

| Futures Contracts | Number of Contracts | Contract Principal |
|---|---|---|
| U.S. Equity Index Futures purchased long | 20,743 | $2,298,499,765 |
| U.S. Treasury Futures purchased long | 6,591 | $949,663,228 |
| Currency Futures purchased long | 27 | $3,568,725 |
| Currency Futures purchased short | 5 | ($386,188) |
| Non-U.S. Equity Index Futures purchased long | 14,892 | $892,347,068 |

- ***Total Return Swaps***—OPERS may manage market exposure through the use of total return swaps. A total return swap is an agreement in which one party commits to pay a fee in exchange for a return linked to the market performance of an underlying security, group of securities, index or other asset (reference obligation). Risks may arise if the value of the swap acquired decreases because of an unfavorable change in price of the reference obligation or the counterparty's ability to meet the terms of the contract. OPERS held total return swaps with a notional value of $1,475,280,693 as of December 31, 2016. The unrealized loss at December 31, 2016 was $5,458,451, or ($5,458,451). The net realized and unrealized gain in total return swaps for the year 2016 was $215,923,130.
- ***Credit Default Swaps***—OPERS may manage credit exposure through the use of credit default swaps or credit default swap indices. 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 credit default swap allows for exposure to credit risk while limiting exposure to other risks, such as interest rate and currency risk. OPERS held a credit default swap index with a notional value of $1,000,000 at December 31, 2016. The net realized and unrealized loss in credit default swaps for the year 2016 was $21,200, or ($21,200).
- ***Options***—Options give buyers the right, but not the obligation, to buy or sell an asset at a predetermined strike price over a specified period. The option premium is usually a small percentage of the underlying asset value. When writing an option, OPERS receives a premium initially and bears the risk of an unfavorable change in the price of the underlying asset during the option life. When OPERS purchases an option, it pays a premium to a counterparty that bears the risk of an unfavorable change in the price of the underlying asset during the option life. While OPERS invested in options during 2016, there were no outstanding options at December 31, 2016. The net realized loss in options for 2016 was $115,323, or ($115,323).

i. **Fair Value Leveling**—Generally accepted accounting principles specify a hierarchy of valuation classifications based on whether the inputs to the valuation techniques used in each valuation classification are observable or unobservable. These classifications are summarized in the three broad levels listed below:

- 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 and significant value drivers are observable.
- Level 3—Valuations derived from valuation techniques in which significant inputs or significant value drivers are unobservable.

Inputs used to measure fair value might fall in different levels of the fair value hierarchy, in which case OPERS defaults to the lowest level input that is significant to the fair value measurement in its entirety. These levels are not necessarily an indication of the risk or liquidity associated with the investments.

The following tables present fair value as of December 31, 2016:

### Investments and Short-Term Holdings Measured At Fair Value (as of December 31, 2016)

| | Fair Value | Fair Value Measurements Using: Quoted Prices in Active Markets for Identical Assets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
|---|---|---|---|---|
| **Investments by Fair Value Level** | | | | |
| **Fixed Income** | | | | |
| U.S. Corporate Bonds | $5,187,713,934 | | $5,023,513,476 | $164,200,458 |
| Non-U.S. Notes and Bonds | 6,407,706,767 | $15,058,120 | 6,163,402,045 | 229,246,602 |
| U.S. Government and Agencies | 6,577,761,736 | | 6,577,761,736 | |
| U.S. Mortgage Backed | 2,915,771,753 | | 2,724,429,475 | 191,342,278 |
| Total Fixed Income | 21,088,954,190 | 15,058,120 | 20,489,106,732 | 584,789,338 |
| **Equities** | | | | |
| Domestic Equities | 16,615,880,360 | 16,613,359,844 | 1,244,369 | 1,276,147 |
| International Equities | 14,438,836,220 | 14,397,880,154 | 35,347,970 | 5,608,096 |
| Total Equities | 31,054,716,580 | 31,011,239,998 | 36,592,339 | 6,884,243 |
| **Total Investments by Fair Value Level** | **$52,143,670,770** | **$31,026,298,118** | **$20,525,699,071** | **$591,673,581** |
| | | | | |
| **Investments Measured at the Net Asset Value (NAV)** | | | | |
| Real Estate | $8,016,903,826 | | | |
| Private Equity | 8,855,248,710 | | | |
| Hedge Funds* | 12,908,081,545 | | | |
| Commingled Mutual Funds | | | | |
| U.S. Corporate Bonds | 502,129,141 | | | |
| International Equities | 1,664,042,223 | | | |
| **Defined Contribution Commingled Mutual Funds** | | | | |
| Domestic Equities | 600,173,906 | | | |
| U.S. Corporate Bonds | 440,405,826 | | | |
| U.S. Government and Agencies | 26,236,386 | | | |
| International Equities | 301,105,526 | | | |
| **Total Investments Measured at the NAV** | **$33,314,327,089** | | | |
| | | | | |
| **Investment Derivative Instruments** | | | | |
| Foreign Exchange Contracts | ($2,888,804) | | ($2,888,804) | |
| Swaps (Total Return and Credit Default) | (5,458,452) | | (5,458,452) | |
| **Total Investment Derivative Instruments** | **($8,347,256)** | | **($8,347,256)** | |
| | | | | |
| **Investments Not Subject to Fair Value Leveling** (at cost or amortized cost) | | | | |
| Cash | $40,260,841 | | | |
| Commercial Paper | 1,105,725,807 | | | |
| Interest Bearing Short-Term Investments | 339,976,257 | | | |
| Repurchase Agreements | 1,480,000,000 | | | |
| Short-Term Investment Funds (STIF) | 1,363,626,253 | | | |
| U.S. Treasury Obligations | 256,716,347 | | | |
| **Total Investments Not Subject to Fair Value Leveling** | **$4,586,305,505** | | | |
| **Total Cash and Investments Before Collateral on Loaned Securities** | **$90,035,956,108** | | | |

* Hedge Funds includes risk parity and global tactical asset allocation.

## Other Investment Derivative Instruments (as of December 31, 2016)

| | Fair Value | Fair Value Measurements Using: Quoted Prices in Active Markets for Identical Assets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
|---|---|---|---|---|
| Investment Commitments Payable—Forward-Currency Purchases | $177,052,985 | | $177,052,985 | |
| Investment Sales Proceeds—Forward-Currency Sales | 162,600,004 | | 162,600,004 | |

## Reinvested Cash Collateral for Securities on Loan (as of December 31, 2016)

| | Fair Value | Fair Value Measurements Using: Quoted Prices in Active Markets for Identical Assets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
|---|---|---|---|---|
| **Investments by Fair Value Level** | | | | |
| **Fixed Income** | | | | |
| U.S. Government and Agencies | $1,776,059,489 | $545,216,404 | $1,230,843,085 | |
| U.S. Corporate Bonds | 1,712,716,841 | | 1,712,716,841 | |
| U.S. Mortgage Backed | 21,955,162 | | 21,955,162 | |
| **Total Investments by Fair Value Level** | **3,510,731,492** | **545,216,404** | **2,965,515,088** | |
| **Investments Not Subject to Fair Value Leveling** (at cost or amortized cost) | | | | |
| Cash | 135,300,044 | | | |
| Certificates of Deposit | 1,000,000,000 | | | |
| Commercial Paper | 1,566,481,541 | | | |
| Commingled Funds | 364,265,267 | | | |
| Receivables/Payables | (26,712,911) | | | |
| Repurchase Agreements | 1,154,561,005 | | | |
| Short-Term Debt | | | | |
| Short-Term Investment Funds | 478,845,000 | | | |
| U.S. Treasury Obligations Less than One Year | 104,884,085 | | | |
| **Total Reinvested Cash Collateral for Loaned Securities** | **$8,288,355,523** | **$545,216,404** | **$2,965,515,088** | |

Investments classified as Level 1 in the previous tables are comprised of common stock, international equity and international debt.

Investments classified as Level 2 are primarily comprised of investments in U.S. corporate notes and bonds, international debt, U.S. mortgage-backed securities and U.S. government and agency securities, including Federal Home Loan Mortgage Corporation (Freddie Mac) securities, Federal National Mortgage Association (Fannie Mae) securities, Government National Mortgage Association (Ginnie Mae) securities, U.S. Treasury notes and bonds, U.S. Treasury floating rate notes, U.S. and commercial mortgage trusts, and derivatives, including foreign exchange contracts and swaps.

Investments classified as Level 3 are comprised of common stock, U.S. corporate notes and bonds, international debt and equities, and U.S. mortgage-backed securities.

Changes in the significant unobservable inputs in the table on page 68 may result in a materially higher or lower fair value measurement.

In certain instances, debt and equity securities are valued on the basis of prices from an orderly transaction between market participants provided by brokers/dealers or pricing services (Level 1 in the tables). In determining the value of a particular investment, pricing services may use information with respect to transactions in such investments, broker quotes, pricing matrices, market transactions in comparable investments and various relationships between investments. As part of its independent price verification process, OPERS selectively performs detailed reviews of valuations provided by brokers/dealers or pricing services.

Foreign exchange contracts are valued by interpolating a value using the spot foreign exchange rate and forward points (based on the spot rate and currency interest rate differentials), which are all inputs that are observable in active markets (Level 2 in the tables).

In the absence of observable market prices, OPERS values its investments using valuation methodologies applied on a consistent basis (Levels 2 or 3 in the tables). For some investments, little market activity may exist; management's determination of fair value is then based on the best information available in the circumstances, and may incorporate management's own assumptions and involves a significant degree of judgement, taking into consideration a combination of internal and external factors. Such investments are evaluated on a quarterly basis, taking into consideration any changes in key inputs and changes in economic and other relevant conditions, and valuation models are updated accordingly. The valuation process also includes a review by the OPERS internal valuation committee, comprised of senior members from various departments within OPERS, including investment management. The valuation committee provides independent oversight of the valuation policies and procedures.

The fair values in certain investments are based on the net asset value (NAV) per share (or its equivalent) provided by the investee or third party administrator, as applicable, and are considered to be alternative investments. Investments categorized according to NAV include hedge funds, real estate, and private equity limited partnership interests. These represent OPERS' collective ownership interests in limited partnership vehicles that invest in non-registered funds which are valued based on the net asset values of the underlying investments.

Unlike more traditional investments, alternative investments generally do not have readily obtainable market values and take the form of limited partnerships. OPERS values these investments based on the partnerships' audited financial statements, typically calendar year-end. If December 31 statements are available, those values are preferentially used for these statements. However, some partnerships have fiscal years ending on dates other than December 31. If December 31 valuations are not available, the value is progressed from the most recently available valuation on the financial statements, taking into account subsequent calls and distributions.

Hedge funds are most often established as private investment limited partnerships open to a limited number of accredited investors. Investments in hedge funds may be illiquid as investors in certain funds may be required to keep their investment in the fund for a year or longer, and withdrawals may be limited to intervals such as monthly, quarterly, annually or bi-annually. OPERS monitors liquidity provisions of each individual hedge fund investment and reports characteristics of the asset class quarterly.

Real estate investments typically do not trade on organized exchanges, but rather through privately negotiated transactions between a buyer and a seller, and transactions are predicated on the availability of capital, and a willing buyer and seller.

The nature of the private equity investments is that distributions are received through the liquidation of the underlying assets of the fund, rather than through redemptions, and these assets are not sold in the secondary market.

The expected liquidation period for alternative investments is as follows:

| | |
|---|---|
| Private Equity | 3 to 7 years |
| Closed-End Real Estate | 10 to 12 years |
| Open-End Real Estate | 10+ years |
| Separately Managed Real Estate | 3 to 10 years |
| Hedge Funds | Monthly, Quarterly, Annually, Bi-Annually |

As of December 31, 2016, the alternative investments are not expected to be sold at an amount different from the NAV per share (or its equivalent) of the System's ownership interest in partners' capital.

The following table presents the unfunded commitments, redemption frequency (if currently eligible), and the redemption notice period for OPERS' alternative investments measured at NAV as of December 31, 2016:

## Investments Measured at the Net Asset Value (NAV) (as of December 31, 2016)

| | Net Asset Value | Unfunded Commitments | Redemption Frequency (If Currently Eligible) | Redemption Notice Period |
|---|---|---|---|---|
| **Real Estate** | | | | |
| Closed-End Private Real Estate[1] | $1,414,692,586 | $1,292,350,372 | N/A | N/A |
| Open-End Private Real Estate[2] | 1,809,281,958 | 0 | Quarterly | 90 Days |
| Separate Account Private Real Estate[3] | 4,792,929,282 | 1,037,215,602 | N/A | N/A |
| **Private Equity[4]** | 8,855,248,710 | 6,272,261,958 | N/A | N/A |
| **Hedge Funds** | | | | |
| Event-Driven[5] | 2,033,964,576 | N/A | Quarterly, Annual | 45-90 Days |
| Long/Short Equity[6] | 1,378,814,432 | N/A | Monthly, Quarterly | 15-65 Days |
| Multi-Strategy/Risk Focus[7] | 7,327,681,308 | N/A | Monthly, Quarterly, Annual | 30-95 Days |
| Relative Value[8] | 872,394,275 | N/A | Monthly, Quarterly, | 30-60 Days |
| Tactical Trading[9] | 1,295,226,954 | N/A | Monthly, Quarterly, Bi-Annual | 2-65 Days |
| **Commingled Mutual Funds[10]** | | | | |
| U.S. Corporate Bonds | 502,129,141 | N/A | Monthly | 3 Days |
| International Equities | 1,664,042,223 | N/A | Monthly | 10 Days |
| **Defined Contribution Commingled Mutual Funds[11]** | | | | |
| Domestic Equities | 600,173,906 | N/A | Daily | Daily |
| U.S. Corporate Bonds | 440,405,826 | N/A | Daily | Daily |
| U.S. Government and Agencies | 26,236,386 | N/A | Daily | Daily |
| International Equities | 301,105,526 | N/A | Daily | Daily |
| **Total Investments Measured at the NAV** | **$33,314,327,089** | | | |

1 **Closed-End Private Real Estate**—Closed-end private real estate includes finite-life pooled private market investment vehicles that are typically structured as limited partnerships, where the investors are limited partners (LPs) and the fund sponsor/manager is the general partner (GP). The LPs have limited control and limited liability. Real estate closed-end funds typically invest in value-add and opportunistic private market real estate assets.

2 **Open-End Private Real Estate**—Open-end private real estate holds infinite-life pooled private market investment vehicles that typically invest in stabilized properties in major metropolitan areas. Open-end commingled funds provide liquidity to investors quarterly, subject to each fund's ability to honor investment and redemption requests.

3 **Separate Account Private Real Estate**—Separate account real estate includes separately managed investment accounts where OPERS is the sole investor. The account is governed by the investment management agreement between OPERS and the manager. The OPERS separate accounts may invest in stabilized, value-add and opportunistic private market real estate assets.

4 **Private Equity**—The fair value of investments in certain private equity funds have been determined using recent observable transaction information for similar investments and non-binding bids received from potential buyers of the investments.

5 **Event-Driven Hedge Funds**—Event-driven managers maintain positions in companies currently or prospectively involved in various corporate transactions including, but not limited to, mergers, restructurings, financial distress, tender offers, shareholder buybacks, debt exchanges, security issuance or other capital structure adjustments. Security types can range from most senior in the capital structure to most junior or subordinated, and frequently involve additional derivative securities. Event-driven exposure includes a combination of sensitivities to equity markets, credit markets and company-specific developments.

[6] **Long/Short Equity Hedge Funds**—Equity hedge strategies maintain positions both long and short in primarily equity and equity derivative securities. A wide variety of investment processes can be employed to arrive at an investment decision, including both quantitative and fundamental techniques. Strategies can be broadly diversified or narrowly focused on specific sectors and can range broadly in terms of levels of net exposure, leverage employed, holding period, concentrations of market capitalizations and valuation ranges of typical portfolios.

[7] **Multi-Strategy/Risk Focus Hedge Funds**—Multi-strategy managers combine several strategies within the same fund in order to provide diversification benefits to reduce return volatility and decrease asset-class and single-strategy risks. These funds typically add incremental returns through active allocation adjustments based on market opportunities. Risk is managed through a combination of quantitative and qualitative constraints including, but not limited to, active risk, liquidity risk, currency risk, manager risk, derivatives risk, and leverage risk.

[8] **Relative Value Hedge Funds**—Relative value managers maintain positions in which the investment thesis is predicated on the realization of a valuation discrepancy in the relationship between multiple securities. Managers employ a variety of fundamental and quantitative techniques to establish investment insights, and security types range broadly across equity, fixed income, derivative or other security types. Fixed Income strategies are typically quantitatively driven to measure the existing relationship between instruments and, in some cases, identify attractive positions in which the risk-adjusted spread between these instruments represents an attractive opportunity.

[9] **Tactical Trading Hedge Funds**—Tactical managers execute a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency, and commodity markets. Managers employ a variety of techniques, both discretionary and systematic analyses, combinations of top down and bottom up disciplines, quantitative and fundamental approaches, and long and short-term holding periods.

[10] **Commingled Mutual Funds**—The commingled mutual funds seek to outperform the Bloomberg Barclays U.S. Corporate High Yield Index and the MSCI All Country World Free x U.S. Index.

[11] **Defined Contribution Commingled Mutual Funds**—The defined contribution funds, other than the Stable Value Fund, are index-managed, meaning they seek to mirror investment results of broadly based and publicly quoted market indices. They are not intended to outperform such indices. The Stable Value Fund is a custom index whose primary objective is to preserve value of principal. Its secondary objective is to exceed the long-term return of a custom index.

## 4. Vacation and Sick Leave

As of December 31, 2016, $7,715,076 was accrued for unused vacation and sick leave for employees of OPERS. Employees who resign or retire are entitled to full compensation for all earned but unused vacation leave for balances up to three times their annual accrual rate at the time of separation. Unused sick leave is forfeited upon termination. However, employees who retire with more than 10 years of service with OPERS are entitled to receive payment for 50% of their unused sick leave up to a maximum of 2,000 hours, or payment of 1,000 hours.

## 5. Deferred Compensation Plan

OPERS does not sponsor a deferred compensation program. OPERS employees are eligible to participate in the deferred compensation plan sponsored by the state of Ohio. The state-sponsored plan was created in accordance with IRC Section 457. The plan is available to all OPERS employees and permits them to defer a portion of their salary until future years. Deferred compensation assets are not available to employees until termination, retirement, death, or unforeseeable emergency.

IRC Section 457 requires that the amount of compensation assets deferred under a plan, all property and rights, and all income attributable to those amounts, property or rights, be held in trust for the benefit of the participants. This insulates IRC Section 457 benefits from the claims of an employer's general creditors. Accordingly, OPERS does not include the deferred compensation assets or liabilities of the Ohio Deferred Compensation Plan in its financial statements.

## 6. Schedule of Required Contributions

All employees of OPERS are eligible for membership in the benefit plans of the System. The employer contributions paid on behalf of these employees are funded by revenues in the Income Fund, arising from investment activity and other income. The annual required pension and health care contributions for employees for the year ended December 31, 2016 are as follows:

**Annual Required Pension and Health Care Contributions**

| | Pension | | Health Care | |
|---|---|---|---|---|
| Year Ended | Annual Required Contributions | Percent Contributed | Annual Required Contributions | Percent Contributed |
| 2016 | $5,585,842 | 100% | $1,276,129 | 100% |

Under GASB 51, internal payroll related to the implementation of capital projects is capitalized as part of the fixed asset cost. OPERS implemented GASB 51 at the end of 2008, and began capitalizing internal labor costs effective January 1, 2009. The capitalized cost includes salary and wages as well as the corresponding employer paid Medicare and retirement contribution expenses. The portion of the 2016 annual required contribution included in fixed assets was $283,838 for pension and $63,617 for health care.

## 7. Self-insured Employee Health Care

Under a professionally administered plan, OPERS self-insures for general health, hospitalization, and prescription drug employee benefits. OPERS maintained specific stop-loss coverage per employee for medical benefits in the amount of $250,000 for 2016. Employees share in the cost of their coverage by payroll deductions, which are netted against the claims cost. Employee deductions and vendor rebates totaled $2,303,190 in 2016. The summary of changes in incurred but not reported claims for the year ended December 31, 2016 follows:

**Employee Health Insurance**

| | 2016 |
|---|---|
| Balance January 1 | $112,310 |
| Claims Incurred | 8,264,664 |
| Claims Paid | (8,222,224) |
| **Balance December 31** | **$154,750** |

The liability for self-insured employee health care is included in Accounts Payable and Other Liabilities on the Combining Statements of Fiduciary Net Position.

## 8. Net Pension Liability

The components of the net pension liability of the defined benefit portion of the pension plans as of December 31, 2016 are as follows:

**Net Pension Liability/(Asset)** ($ in millions)

| As of December 31, 2016 | All Plans | Traditional Pension Plan | Combined Plan* | Member-Directed Plan* |
|---|---|---|---|---|
| Total Pension Liability | $100,166 | $99,818 | $336 | $12 |
| Plan Fiduciary Net Position | 77,514 | 77,110 | 392 | 12 |
| Employers' Net Pension Liability/(Asset) | $22,652 | $22,708 | ($56) | $0 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability/(Asset) | 77.39% | 77.25% | 116.55% | 103.40% |

* The Combined Plan and Member-Directed Plan information in the Net Pension Liability includes only the defined benefit portion of these plans to comply with GASB-reporting standards and does not include the defined contribution portion. The Combining Statements of Fiduciary Net Position and Changes in Fiduciary Net Position present the combined defined benefit and defined contribution portions of the Combined Plan and Member-Directed Plan.

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 cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time of each valuation. The total pension liability was determined by an actuarial valuation as of December 31, 2016, using the following actuarial assumptions applied to all prior periods included in the measurement in accordance with the requirements of GASB 67. In 2016, the Board's actuarial consultants conducted an experience study for the period 2011 through 2015, comparing assumptions to actual results. The experience study incorporates both a historical review and forward-looking projections to determine the appropriate set of assumptions to keep the plan on a path toward full funding. Information from this study led to changes in both demographic and economic assumptions, with the most notable being a reduction in the actuarially assumed rate of return from 8.0% down to 7.5%, for the defined benefit investments. Key methods and assumptions used in the latest actuarial valuation, reflecting experience study results, are presented below.

**Key Methods and Assumptions Used in Valuation of Total Pension Liability**

| Actuarial Information | Traditional Pension Plan | Combined Plan | Member-Directed Plan |
|---|---|---|---|
| Valuation Date | December 31, 2016 | December 31, 2016 | December 31, 2016 |
| Experience Study | 5 Year Period Ended December 31, 2015 | 5 Year Period Ended December 31, 2015 | 5 Year Period Ended December 31, 2015 |
| Actuarial Cost Method | Individual entry age | Individual entry age | Individual entry age |
| Actuarial Assumptions | | | |
| Investment Rate of Return | 7.50% | 7.50% | 7.50% |
| Wage Inflation | 3.25% | 3.25% | 3.25% |
| Projected Salary Increases | 3.25%-10.75% (includes wage inflation at 3.25%) | 3.25%-8.25% (includes wage inflation at 3.25%) | 3.25%-8.25% (includes wage inflation at 3.25%) |
| Cost-of-living Adjustments | Pre-1/7/2013 Retirees: 3.00% Simple<br>Post-1/7/2013 Retirees: 3.00% Simple through 2018, then 2.15% Simple | Pre-1/7/2013 Retirees: 3.00% Simple<br>Post-1/7/2013 Retirees: 3.00% Simple through 2018, then 2.15% Simple | Pre-1/7/2013 Retirees: 3.00% Simple<br>Post-1/7/2013 Retirees: 3.00% Simple through 2018, then 2.15% Simple |

Mortality rates are based on the RP-2014 Healthy Annuitant mortality table. For males, Healthy Annuitant Mortality tables were used, adjusted for mortality improvement back to the observation period base of 2006 and then established the base year as 2015. For females, Healthy Annuitant Mortality tables were used, adjusted for mortality improvements back to the observation period base year of 2006 and then established the base year as 2010. The mortality rates used in evaluating disability allowances were based on the RP-2014 Disabled mortality tables, adjusted for mortality improvement back to the observation base year of 2006 and then established the base year as 2015 for males and 2010 for females. Mortality rates for a particular calendar year for both healthy and disabled retiree mortality tables are determined by applying the MP-2015 mortality improvement scale to the above described tables.

The discount rate used to measure the total pension liability was 7.5%, post-experience study results, for the Traditional Pension Plan, Combined Plan and Member-Directed Plan. The projection of cash flows used to determine the discount rate assumed that contributions from plan members and those of the contributing employers are made at the contractually required rates, as actuarially determined. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments for the Traditional Pension Plan, Combined Plan and Member-Directed Plan was applied to all periods of projected benefit payments to determine the total pension liability.

The allocation of investment assets within the Defined Benefit portfolio is approved by the Board as outlined in the annual investment plan. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit pension plans. The table below displays the Board-approved asset allocation policy for 2016 and the long-term expected real rates of return.

| Asset Class | Target Allocation for 2016 | Weighted Average Long-Term Expected Real Rate of Return (Arithmetic) |
|---|---|---|
| Fixed Income | 23.00% | 2.75% |
| Domestic Equities | 20.70 | 6.34 |
| Real Estate | 10.00 | 4.75 |
| Private Equity | 10.00 | 8.97 |
| International Equities | 18.30 | 7.95 |
| Other Investments | 18.00 | 4.92 |
| **TOTAL** | **100.00%** | **5.66%** |

The long-term expected rate of return on defined benefit investment assets was determined using a building-block method in which best-estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected real rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation.

During 2016, OPERS managed investments in four investment portfolios: the Defined Benefit portfolio, the 401(h) Health Care Trust portfolio, the 115 Health Care Trust portfolio and the Defined Contribution portfolio. The 401(h) Health Care Trust portfolio was closed as of June 30, 2016 and the net position transferred to the 115 Health Care Trust portfolio on July 1, 2016. The Defined Benefit portfolio contains the investment assets of the Traditional Pension Plan, the defined benefit component of the Combined Plan and the annuitized accounts of the Member-Directed Plan. The Defined Benefit portfolio historically included the assets of the Member-Directed retiree medical accounts funded through the VEBA Trust. However, the VEBA Trust was closed as of June 30, 2016 and the net position transferred to the 115 Health Care Trust portfolio on July 1, 2016. Within the Defined Benefit portfolio, contributions into the plans are all recorded at the same time, and benefit payments all occur on the first of the month. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Defined Benefit portfolio is 8.3% for 2016.

The following table presents the net pension liability calculated using the discount rate of 7.5%, and the expected net pension liability if it were calculated using a discount rate that is 1.0% lower or 1.0% higher than the current rate.

**Sensitivity of Net Pension Liability/(Asset) to Changes in the Discount Rate** ($ in millions)

| Employers' Net Pension Liability/(Asset) As of December 31, 2016 | 1% Decrease 6.5% | Current Discount Rate 7.5% | 1% Increase 8.5% |
|---|---|---|---|
| All Plans | $34,697 | $22,652 | $12,619 |
| Traditional Pension Plan | $34,692 | $22,708 | $12,722 |
| Combined Plan | $4 | ($56) | ($102) |
| Member-Directed Plan | $1 | $0 | ($1) |

The funding status of the three pension plans and their Schedules of Funding Progress may be found in the Actuarial Section of this document on pages 165-166. The Member-Directed Plan is a defined contribution plan allowing members at retirement to have the option to convert their defined contribution account to a defined benefit annuity. The purchased defined benefit annuities under this plan were included in this annual report from a GASB 67 perspective.

## 9. Post-employment Health Care Plans

In March 2016, OPERS received two favorable rulings from the IRS allowing OPERS to consolidate all health care assets into the 115 Health Care Trust. The 401(h) Trust and the VEBA Trust were closed as of June 30, 2016 and the net positions transferred to the 115 Trust on July 1, 2016. Health care coverage previously funded through the 401(h) Trust terminated as of December 31, 2015 and the 115 Trust began funding all health care coverage previously funded through the 401(h) Trust on January 1, 2016. The covered lives included in the actuarial valuation as of December 31, 2015, the most recent actuarial valuation date, under the 401(h) Trust are included in the covered lives under the 115 Trust in 2016. Therefore, no actuarial accrued liability exists for the 115 Trust as of December 31, 2015. The funded status of health care as of December 31, 2015 (before experience study) is as follows:

**Funded Status of Health Care** ($ in millions)

| As of December 31, 2015* | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities (UAAL) | Ratio of Assets to AAL | Active Member Payroll | UAAL as a Percent of Active Member Payroll |
|---|---|---|---|---|---|---|
| Health Care | $18,515 | $11,933 | $6,582 | 64.5% | $13,186 | 49.9% |

* Results from original valuation prior to completion of experience study.

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 cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future. The Schedule of Funding Progress presents multi-year trend information about whether the actuarial values of plan assets are increasing or decreasing over time, relative to the actuarial accrued liabilities for health care coverage. The Schedule of Funding Progress for health care is presented on page 87 of the Required Supplementary Information section of this document.

The accompanying Schedule of Contributions from Employers and Other Contributing Entities (refer to page 87) presents trend information about the amounts contributed to the plan in comparison to the Annual Required Contributions. The Annual Required Contributions column represents a level of funding that, if paid on an ongoing basis, is projected to cover estimated health care costs for each year and amortize any unfunded actuarial liabilities (or funding excess) over a period not to exceed 30 years.

Projections of health care costs for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of coverage provided at the time of each valuation and the historical pattern of sharing of costs between the employers 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 actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations. Key methods and assumptions used in the actuarial valuation before the experience study are presented below:

### Key Methods and Assumptions Used in Valuation of Health Care Liability

| Actuarial Information | Health Care |
|---|---|
| Valuation Date | December 31, 2015 |
| Actuarial Cost Method | Individual entry age normal |
| Amortization Method | Level percentage of pay, open |
| Amortization Period | 30 years |
| Assets Valuation Method | 4-year, smoothed market-12% corridor |
| Actuarial Assumptions | |
| Investment Rate of Return | 5.0% |
| Projected Salary Increases | 4.25%-10.05%<br>(includes wage inflation at 3.75%) |
| Health Care Cost Trend Rate | 9.5% initial, 3.75% ultimate in 2026 |

## Defined Benefit Pension Plans

The Schedules of Changes in Net Pension Liability displays the components of the total pension liability and plan fiduciary net position for each pension plan with a defined benefit component, calculated in conformity with the requirements of GASB 67. Covered employee payroll represents the collective total of the OPERS eligible wages of all OPERS employers within each plan.

### Schedules of Changes in Net Pension Liability ($ in millions) — All Plans*

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| **Net Change in Total Pension Liability** | | | |
| Service Cost | $1,763.4 | $1,710.7 | $1,685.3 |
| Interest on Total Pension Liability | 7,131.5 | 6,978.9 | 6,778.9 |
| Changes of Benefit Terms | - | - | - |
| Difference Between Expected and Actual Experience | 37.5 | (334.0) | (321.4) |
| Changes in Assumptions | 5,344.6 | - | - |
| Benefit Payments, Including Refunds of Employee Contributions | (5,942.8) | (5,808.6) | (5,502.2) |
| **Net Change in Total Pension Liability** | **8,334.2** | **2,547.0** | **2,640.6** |
| Total Pension Liability—Beginning | 91,832.2 | 89,285.2 | 86,644.6 |
| **Total Pension Liability—Ending** | **$100,166.4** | **$91,832.2** | **$89,285.2** |
| **Net Change in Plan Fiduciary Net Position** | | | |
| Employer Contributions | $1,606.0 | $1,564.7 | $1,520.3 |
| Member Contributions | 1,294.8 | 1,246.7 | 1,228.1 |
| Net Investment Income | 5,976.9 | 276.3 | 5,074.7 |
| Benefit Payments, Including Refunds of Employee Contributions | (5,942.8) | (5,808.6) | (5,502.2) |
| Non-Investment Administrative Expenses | (51.9) | (49.1) | (49.8) |
| Other** | 71.1 | 66.9 | 125.5 |
| **Net Change in Plan Fiduciary Net Position** | **2,954.1** | **(2,703.1)** | **2,396.6** |
| Plan Fiduciary Net Position—Beginning | 74,560.1 | 77,263.2 | 74,866.6 |
| **Plan Fiduciary Net Position—Ending** | **$77,514.2** | **$74,560.1** | **$77,263.2** |
| **Net Pension Liability/(Asset)** | **$22,652.2** | **$17,272.1** | **$12,022.0** |
| Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset) | 77.39% | 81.19% | 86.54% |
| Covered Employee Payroll | $13,717.6 | $13,177.0 | $12,932.5 |
| Net Pension Liability/(Asset) as a Percentage of Covered Employee Payroll | 165.13% | 131.08% | 92.96% |

* Includes Traditional Pension Plan and defined benefit portions of Combined Plan and Member-Directed Plan.
** Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

## Schedules of Changes in Net Pension Liability ($ in millions) — Traditional Pension Plan*

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| **Net Change in Total Pension Liability** | | | |
| Service Cost | $1,738.6 | $1,687.0 | $1,659.6 |
| Interest on Total Pension Liability | 7,107.3 | 6,956.7 | 6,759.0 |
| Changes of Benefit Terms | - | - | - |
| Difference Between Expected and Actual Experience | 45.5 | (322.3) | (309.7) |
| Changes in Assumptions | 5,328.8 | - | - |
| Benefit Payments, Including Refunds of Employee Contributions | (5,936.9) | (5,804.1) | (5,498.8) |
| **Net Change in Total Pension Liability** | **8,283.3** | **2,517.3** | **2,610.1** |
| Total Pension Liability—Beginning | 91,534.6 | 89,017.3 | 86,407.2 |
| **Total Pension Liability—Ending** | **$99,817.9** | **$91,534.6** | **$89,017.3** |
| **Net Change in Plan Fiduciary Net Position** | | | |
| Employer Contributions | $1,556.5 | $1,498.7 | $1,476.1 |
| Member Contributions | 1,294.8 | 1,246.7 | 1,228.1 |
| Net Investment Income | 5,947.2 | 274.9 | 5,056.3 |
| Benefit Payments, Including Refunds of Employee Contributions | (5,936.9) | (5,804.1) | (5,498.8) |
| Non-Investment Administrative Expenses | (51.9) | (49.1) | (49.8) |
| Other** | 86.6 | 90.0 | 125.8 |
| **Net Change in Plan Fiduciary Net Position** | **2,896.3** | **(2,742.9)** | **2,337.7** |
| Plan Fiduciary Net Position—Beginning | 74,213.3 | 76,956.2 | 74,618.5 |
| **Plan Fiduciary Net Position—Ending** | **$77,109.6** | **$74,213.3** | **$76,956.2** |
| **Net Pension Liability/(Asset)** | **$22,708.3** | **$17,321.3** | **$12,061.1** |
| Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset) | 77.25% | 81.08% | 86.45% |
| Covered Employee Payroll | $12,794.0 | $12,321.2 | $12,139.7 |
| Net Pension Liability/(Asset) as a Percentage of Covered Employee Payroll | 177.49% | 140.58% | 99.35% |

* Includes money purchase annuities for re-employed retirees and additional annuities.
** Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

## Schedules of Changes in Net Pension Liability ($ in millions) — Combined Plan*

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| **Net Change in Total Pension Liability** | | | |
| Service Cost | $24.8 | $23.7 | $25.7 |
| Interest on Total Pension Liability | 23.5 | 21.6 | 19.4 |
| Changes of Benefit Terms | - | - | - |
| Difference Between Expected and Actual Experience | (10.2) | (13.3) | (13.2) |
| Changes in Assumptions | 15.2 | - | - |
| Benefit Payments, Including Refunds of Employee Contributions | (5.0) | (3.7) | (2.8) |
| **Net Change in Total Pension Liability** | **48.3** | **28.3** | **29.1** |
| Total Pension Liability—Beginning | 287.9 | 259.6 | 230.5 |
| **Total Pension Liability—Ending** | **$336.2** | **$287.9** | **$259.6** |
| **Net Change in Plan Fiduciary Net Position** | | | |
| Employer Contributions | $47.1 | $44.0 | $44.2 |
| Member Contributions | - | - | - |
| Net Investment Income | 28.8 | 1.3 | 17.9 |
| Benefit Payments, Including Refunds of Employee Contributions | (5.0) | (3.7) | (2.8) |
| Non-Investment Administrative Expenses | - | - | - |
| Other** | (15.6) | (3.1) | (2.2) |
| **Net Change in Plan Fiduciary Net Position** | **55.3** | **38.5** | **57.1** |
| Plan Fiduciary Net Position—Beginning | 336.6 | 298.1 | 241.0 |
| **Plan Fiduciary Net Position—Ending** | **$391.9** | **$336.6** | **$298.1** |
| **Net Pension Liability/(Asset)** | **($55.7)** | **($48.7)** | **($38.5)** |
| Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset) | 116.55% | 116.90% | 114.83% |
| Covered Employee Payroll | $392.3 | $366.9 | $346.0 |
| Net Pension Liability/(Asset) as a Percentage of Covered Employee Payroll | (14.19%) | (13.26%) | (11.13%) |

* Includes annuitized defined contribution accounts. The Combined Plan information in the Net Pension Liability includes only the defined benefit portion of this plan to comply with GASB-reporting standards and does not include the defined contribution portion. The Combining Statements of Fiduciary Net Position and Changes in Fiduciary Net Position present the combined defined benefit and defined contribution portions of the Combined Plan.

** Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

## Schedules of Changes in Net Pension Liability ($ in millions) — Member-Directed Plan*

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| **Net Change in Total Pension Liability** | | | |
| Service Cost | - | - | - |
| Interest on Total Pension Liability | $0.7 | $0.6 | $0.5 |
| Changes of Benefit Terms | - | - | - |
| Difference Between Expected and Actual Experience | 2.2 | 1.6 | 1.5 |
| Changes in Assumptions | 0.6 | - | - |
| Benefit Payments, Including Refunds of Employee Contributions | (0.9) | (0.8) | (0.6) |
| **Net Change in Total Pension Liability** | **2.6** | **1.4** | **1.4** |
| Total Pension Liability—Beginning | 9.7 | 8.3 | 6.9 |
| **Total Pension Liability—Ending** | **$12.3** | **$9.7** | **$8.3** |
| **Net Change in Plan Fiduciary Net Position** | | | |
| Employer Contributions | $2.4 | $22.0 | - |
| Member Contributions | - | - | - |
| Net Investment Income | 0.9 | 0.1 | $0.5 |
| Benefit Payments, Including Refunds of Employee Contributions | (0.9) | (0.8) | (0.6) |
| Non-Investment Administrative Expenses | - | - | - |
| Other** | 0.1 | (20.0) | 1.9 |
| **Net Change in Plan Fiduciary Net Position** | **2.5** | **1.3** | **1.8** |
| Plan Fiduciary Net Position—Beginning | 10.2 | 8.9 | 7.1 |
| **Plan Fiduciary Net Position—Ending** | **$12.7** | **$10.2** | **$8.9** |
| **Net Pension Liability/(Asset)** | **($0.4)** | **($0.5)** | **($0.6)** |
| Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset) | 103.40% | 103.91% | 107.10% |
| Covered Employee Payroll | $531.3 | $488.9 | $446.8 |
| Net Pension Liability/(Asset) as a Percentage of Covered Employee Payroll | (0.08%) | (0.08%) | (0.13%) |

* Includes annuitized defined contribution accounts. The Member-Directed Plan information in the Net Pension Liability includes only the defined benefit annuities purchased in this plan to comply with GASB-reporting standards and does not include the defined contribution portion. The Combining Statements of Fiduciary Net Position and Changes in Fiduciary Net Position present the combined defined benefit and defined contribution portions of the Member-Directed Plan.

** Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

Within the Traditional Pension Plan, OPERS classifies employees into four divisions: State, Local, Law Enforcement and Public Safety. The Public Safety and Law Enforcement divisions have different contribution rates, benefit formulas, and retirement eligibility requirements than those of the State and Local members. The member and employer contribution rates are actuarially determined within the constraints of statutory limits for each division. Both the member and employer contribution rates for Public Safety and Law Enforcement members are higher than those of the State and Local members to recognize the higher cost of these benefits. Accordingly, both member and employer contributions are used to calculate the proportionate shares of employers.

## Schedule of Member and Employer Contributions — Traditional Pension Plan*

| Year Ended December 31 | Actuarially Determined Contributions** | Contributions Paid | Contribution Deficiency/ (Excess) | Covered Employee Payroll | Contributions as a Percent of Covered Payroll |
|---|---|---|---|---|---|
| 2016 | $2,851,382,826 | $2,851,382,826 | - | $12,793,976,661 | 22.3% |
| 2015 | 2,745,411,751 | 2,745,411,751 | - | 12,321,236,358 | 22.3 |
| 2014 | 2,704,218,157 | 2,704,218,157 | - | 12,139,692,990 | 22.3 |
| 2013 | 2,778,566,900 | 2,778,566,900 | - | 11,999,928,351 | 23.2 |
| 2012 | 2,407,224,107 | 2,407,224,107 | - | 11,883,831,019 | 20.3 |
| 2011 | 2,454,599,959 | 2,454,599,959 | - | 12,103,258,896 | 20.3 |
| 2010 | 2,315,100,186 | 2,315,100,186 | - | 12,165,415,760 | 19.0 |
| 2009 | 2,256,548,622 | 2,256,548,622 | - | 12,289,885,494 | 18.4 |
| 2008 | 2,145,747,568 | 2,145,747,568 | - | 12,546,006,885 | 17.1 |
| 2007 | 2,235,767,340 | 2,235,767,340 | - | 12,347,230,140 | 18.1 |

* The actuarially determined contribution to fund the cost of pensions includes member and employer contributions. The contributions reported in this schedule are consistent with the presentation of the employers' proportionate shares.

** The Board has approved all contribution rates as recommended by the actuary.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

The Combined Plan defined benefit pension is funded only from the employer contributions, with the member contributions deposited to a defined contribution account. Both member and employer contributions for the Member-Directed Plan are deposited into the participants' defined contribution accounts. However, the Member-Directed Plan defined benefit annuities purchased by eligible Member-Directed Plan retirees are funded with accumulated member contributions, vested employer contributions and gains or losses resulting from the member-selected investment options. As a result, the Member-Directed Plan table on page 85 shows all employer contributions to the plan since there are no separate actuarially determined contributions calculated for purchased annuities and employer contributions are used to determine the employer proportionate share of this activity. The tables below display the actuarially determined contributions for employers of the defined benefit pension plans based on the actuarially determined rate, and the amount of these contributions paid by the employers each year.

## Schedule of Employer Contributions* — All Plans

| Year Ended December 31 | Actuarially Determined Contributions | Contributions Paid | Contribution Deficiency/ (Excess) | Covered Employee Payroll | Contributions as a Percent of Covered Payroll |
|---|---|---|---|---|---|
| 2016 | $1,656,729,065 | $1,656,729,065 | - | $13,717,592,219 | 12.1% |
| 2015 | 1,611,150,408 | 1,611,150,408 | - | 13,177,006,156 | 12.2 |
| 2014 | 1,568,121,657 | 1,568,121,657 | - | 12,932,540,544 | 12.1 |
| 2013 | 1,655,726,521 | 1,655,726,521 | - | 12,331,162,054 | 13.4 |
| 2012 | 1,267,795,786 | 1,267,795,786 | - | 12,193,467,217 | 10.4 |
| 2011 | 1,290,029,652 | 1,290,029,652 | - | 12,399,464,698 | 10.4 |
| 2010 | 1,153,671,398 | 1,153,671,398 | - | 12,449,782,144 | 9.3 |
| 2009 | 1,069,336,423 | 1,069,336,423 | - | 12,548,337,499 | 8.5 |
| 2008 | 937,458,579 | 937,458,579 | - | 12,801,062,526 | 7.3 |
| 2007 | 1,092,097,882 | 1,092,097,882 | - | 12,583,371,444 | 8.7 |

## Schedule of Employer Contributions* — Traditional Pension Plan

| Year Ended December 31 | Actuarially Determined Contributions | Contributions Paid | Contribution Deficiency/ (Excess) | Covered Employee Payroll | Contributions as a Percent of Covered Payroll |
|---|---|---|---|---|---|
| 2016 | $1,556,529,162 | $1,556,529,162 | - | $12,793,976,661 | 12.2% |
| 2015 | 1,498,679,737 | 1,498,679,737 | - | 12,321,236,358 | 12.2 |
| 2014 | 1,476,074,083 | 1,476,074,083 | - | 12,139,692,990 | 12.2 |
| 2013 | 1,571,758,150 | 1,571,758,150 | - | 11,999,928,351 | 13.1 |
| 2012 | 1,208,150,727 | 1,208,150,727 | - | 11,883,831,019 | 10.2 |
| 2011 | 1,233,002,841 | 1,233,002,841 | - | 12,103,258,896 | 10.2 |
| 2010 | 1,097,711,440 | 1,097,711,440 | - | 12,165,415,760 | 9.0 |
| 2009 | 1,019,582,360 | 1,019,582,360 | - | 12,289,885,494 | 8.3 |
| 2008 | 892,693,746 | 892,693,746 | - | 12,546,006,885 | 7.1 |
| 2007 | 1,051,808,289 | 1,051,808,289 | - | 12,347,230,140 | 8.5 |

* The Board has approved all contribution rates recommended by the actuary. Actuarially determined contributions exclude funds deposited for purchase of service, employer-paid retirement incentive programs, interest and penalties. These deposits are included in Contract and Other Receipts in the Combining Statements of Changes in Fiduciary Net Position.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

## Schedule of Employer Contributions* — Combined Plan

| Year Ended December 31 | Actuarially Determined Contributions | Contributions Paid | Contribution Deficiency/ (Excess) | Covered Employee Payroll | Contributions as a Percent of Covered Payroll |
|---|---|---|---|---|---|
| 2016 | $47,079,023 | $47,079,023 | - | $392,326,896 | 12.0% |
| 2015 | 44,022,120 | 44,022,120 | - | 366,851,607 | 12.0 |
| 2014 | 44,196,044 | 44,196,044 | - | 346,043,977 | 12.8 |
| 2013 | 45,427,520 | 45,427,520 | - | 331,233,703 | 13.7 |
| 2012 | 23,998,486 | 23,998,486 | - | 309,636,198 | 7.8 |
| 2011 | 23,280,520 | 23,280,520 | - | 296,205,802 | 7.9 |
| 2010 | 26,432,761 | 26,432,761 | - | 284,366,384 | 9.3 |
| 2009 | 23,397,299 | 23,397,299 | - | 258,452,005 | 9.1 |
| 2008 | 20,352,999 | 20,352,999 | - | 255,055,641 | 8.0 |
| 2007 | 19,241,579 | 19,241,579 | - | 236,141,304 | 8.1 |

## Schedule of Employer Contributions* — Member-Directed Plan

| Year Ended December 31 | Actuarially Determined Contributions | Contributions Paid | Contribution Deficiency/ (Excess) | Covered Employee Payroll** | Contributions as a Percent of Covered Payroll** |
|---|---|---|---|---|---|
| 2016 | $53,120,880 | $53,120,880 | - | $531,288,662 | 10.0% |
| 2015 | 68,448,551 | 68,448,551 | - | 488,918,191 | 14.0 |
| 2014 | 47,851,530 | 47,851,530 | - | 446,803,577 | 10.7 |
| 2013 | 38,540,851 | 38,540,851 | - | | |
| 2012 | 35,646,573 | 35,646,573 | - | | |
| 2011 | 33,746,291 | 33,746,291 | - | | |
| 2010 | 29,527,197 | 29,527,197 | - | | |
| 2009 | 26,356,764 | 26,356,764 | - | | |
| 2008 | 24,411,834 | 24,411,834 | - | | |
| 2007 | 21,048,014 | 21,048,014 | - | | |

* The Board has approved all contribution rates recommended by the actuary. Actuarially determined contributions exclude funds deposited for purchase of service, employer-paid retirement incentive programs, interest and penalties. These deposits are included in Contract and Other Receipts in the Combining Statements of Changes in Fiduciary Net Position.

** Covered payroll calculated in conjunction with GASB 67 implementation in 2014.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

During 2016, OPERS managed its investments in four investment portfolios: the Defined Benefit portfolio, the 401(h) Health Care Trust portfolio, the 115 Health Care Trust portfolio and the Defined Contribution portfolio. On June 30, 2016, OPERS closed the 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust, included within the Defined Benefit portfolio, and the net positions were transferred to the 115 Health Care Trust on July 1, 2016. Beginning July 1, 2016, all health care assets were consolidated in the 115 Health Care Trust portfolio. The Defined Benefit portfolio contains the investment assets of the Traditional Pension Plan, the defined benefit component of the Combined Plan, and the annuitized accounts of the Member-Directed Plan. Within the Defined Benefit portfolio, with the exception of Member-Directed annuitized accounts, contributions into the plans are all recorded at the same time, and benefit payments all occur on the first of the month. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio.

**Schedule of Investment Returns** Defined Benefit Portfolio

| Year | Annual Money-Weighted Rate of Return Net of Investment Expense |
|---|---|
| 2016 | 8.3% |
| 2015 | 0.4% |
| 2014 | 6.9% |

## Post-employment Health Care Coverage

As previously noted, OPERS received approval in 2016 from the Internal Revenue Service to consolidate health care assets into the 115 Health Care Trust. The 401(h) Health Care Trust and VEBA Trust were closed as of June 30, 2016, and the net positions transferred to the 115 Health Care Trust on July 1, 2016. As of July 1, 2016, the 115 Health Care Trust holds all health care assets and provides funding for a group of cost-sharing, multiple-employer health care plans that provide health care coverage for eligible benefit recipients in the Traditional Pension Plan and Combined Plan.
The 115 Health Care Trust also holds the assets for the Member-Directed Retiree Medical Account Plan (previously funded through the VEBA Trust). The covered lives included in the actuarial valuation as of December 31, 2015, the most recent actuarial valuation date, under the 401(h) Health Care Trust are included in the covered lives under the 115 Health Care Trust in 2016. Therefore, no actuarial accrued liability exists for the 115 Health Care Trust as of December 31, 2015. The schedule on the next page displays the funding status for all health care plans.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

## Schedule of Funding Progress ($ in millions) — Health Care

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities (UAAL) | Ratio of Assets of AAL | Active Member Payroll | UAAL as a Percent of Active Member Payroll |
|---|---|---|---|---|---|---|
| 2015* | $18,515 | $11,933 | $6,582 | 64.5% | $13,186 | 49.9% |
| 2014 | 19,405 | 12,062 | 7,343 | 62.2 | 12,654 | 58.0 |
| 2013 | 19,784 | 12,031 | 7,753 | 60.8 | 12,331 | 62.9 |
| 2012 | 19,182 | 12,193 | 6,989 | 63.6 | 12,194 | 57.3 |
| 2011 | 31,020 | 12,115 | 18,905 | 39.1 | 12,399 | 152.5 |
| 2010** | 30,531 | 12,320 | 18,211 | 40.4 | 12,449 | 146.3 |
| 2010* | 26,929 | 11,267 | 15,662 | 41.8 | 12,449 | 125.8 |
| 2009 | 31,558 | 10,936 | 20,622 | 34.7 | 12,548 | 164.3 |
| 2008 | 29,623 | 10,748 | 18,875 | 36.3 | 12,801 | 147.4 |
| 2007 | 29,825 | 12,801 | 17,024 | 42.9 | 12,584 | 135.3 |
| 2006 | 30,748 | 12,025 | 18,723 | 39.1 | 12,175 | 153.8 |

* Results from original valuation prior to re-statement after completion of experience study.
** Revised actuarial assumptions based on the experience study.

The table below displays the Annual Required Contributions based on the actuarially determined rate, and the percentage of these contributions billed (and paid) by the employers each year. Federal subsidies are comprised of direct subsidies for the Medicare Prescription Drug Plan and Medicare Part D reimbursements.

## Schedule of Contributions from Employers and Other Contributing Entities — Health Care**

| Year Ended December 31 | Traditional Pension and Combined plans Annual Required Contributions | Percent Contributed by Employers* | Member-Directed Retiree Medical Account Annual Required Contributions*** | Percent Contributed by Employers* | Prescription Drug Plan | Medicare Part D | Total Medicare Subsidies | Total Percent Contributed |
|---|---|---|---|---|---|---|---|---|
| 2016 | $732,922,373 | 35.97% | $21,262,117 | 100.00% | $3,943,014 | $122,044 | $4,065,058 | 36.53% |
| 2015 | 731,847,564 | 34.66 | | | 175,187,530 | 743,345 | 175,930,875 | 58.70 |
| 2014 | 684,421,764 | 36.10 | | | 176,225,797 | 394,094 | 176,619,891 | 61.91 |
| 2013 | 1,555,931,467 | 7.72 | | | 105,719,623 | 246,139 | 105,965,762 | 14.53 |
| 2012 | 1,422,859,434 | 34.72 | | | 181,652,987 | 926,931 | 182,579,918 | 47.55 |
| 2011 | 1,831,329,260 | 27.49 | | | 81,802,880 | 788,419 | 82,591,299 | 32.00 |
| 2010 | 1,650,917,533 | 38.08 | | | | 72,100,529 | 72,100,529 | 42.45 |
| 2009 | 1,698,928,499 | 43.61 | | | | 69,132,772 | 69,132,772 | 47.67 |
| 2008 | 1,855,720,690 | 48.04 | | | | 63,310,194 | 63,310,194 | 51.46 |
| 2007 | 2,068,922,571 | 33.64 | | | | 59,075,120 | 59,075,120 | 36.49 |

* The Percent Contributed by Employers displays the percentage of the annual required contribution that was billed to employers and paid each year.
** Contributions to the 401(h) Health Care Trust ceased September 2014. The 401(h) Health Care Trust was subsequently closed as of June 30, 2016 and the net position transferred to the 115 Health Care Trust.
*** The Voluntary Employees' Beneficiary Association (VEBA) Trust was a separate legal entity that was the funding vehicle for the Member-Directed Retiree Medical Account (RMA) Plan. The VEBA Trust was closed as of June 30, 2016 and the net position transferred to the 115 Health Care Trust on July 1, 2016. The contributions deposited to the VEBA were historically not included in this table. Recent guidance issued in the GASB Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*, Proposed Implementation Guide indicates that the Member-Directed RMA Plan expenses should be treated as a defined benefit (rather than defined contribution) other post-employment benefit plan. Due to this new guidance and the consolidation of health care assets into the 115 Health Care Trust in 2016, the Member-Directed RMA Plan contributions are reported in this schedule beginning in 2016.

See Notes to Required Supplementary Information, beginning on page 88.

See accompanying Independent Auditors' Report, beginning on page 20.

## Defined Benefit Pension Plans

### Actuarial Assumptions and Methods Used in Determining Contribution Rates

Actuarially determined contributions are constrained by contribution limits established by statute. Contribution rates are calculated as of December 31, three years prior to the end of the fiscal year in which contributions are reported. In 2016, the Board's actuarial consultants conducted an experience study for the period 2011 through 2015, comparing assumptions to actual results. The experience study incorporates both a historical review and forward-looking projections to determine the appropriate set of assumptions to keep the plan on a path toward full funding. Information from this study led to changes in both demographic and economic assumptions, with the most notable being a reduction in the expected rate of investment return from an 8.0% actuarially assumed rate of return down to 7.5%, for the defined benefit investments. The actuarial assumptions and methods used to determine contribution rates are described below based on the actuarial valuation study for the year ended December 31, 2016, reflecting the experience study results.

- ***Valuation Method***—Individual entry age actuarial cost method of valuation is used in determining benefit liabilities and normal cost. Differences between assumed and actual experience (the actuarial gains and losses) become part of the total pension liability. This method was not changed in the experience study.
- ***Asset Valuation Method***—For actuarial purposes, assets are valued utilizing a method that recognizes assumed investment returns fully each year. Difference between actual and assumed investment returns are phased in over a closed four-year period. This funding value is not permitted to deviate from fair value by a corridor of plus or minus 12.00%. This method was not changed in the experience study.
- ***Amortization Method***—Level percent of payroll, closed amortization period, 19 years from December 31, 2018. This method was not changed in the experience study.
- ***Investment Return***—An investment rate of return of 7.50% compounded annually was assumed for all members, retirees, and beneficiaries; a decrease of 0.50% from 8.00% after the experience study.
- ***Wage Inflation***—The active member payroll was assumed to increase 3.25% annually, which is the portion of the individual pay increase assumption attributable to inflation and overall productivity; a decrease of 0.50% from 3.75% after the experience study.
- ***Salary Scale***—Wage inflation plus additional projected salary increases ranging from 0.00% to 7.50% per year depending on age, attributable to seniority and merit; a slight change from the 0.50% to 6.30% pre-experience study assumptions.
- **Multiple Decrement Tables**
    - **Mortality—**The rates used for retiree allowances were updated as a result of the experience study and now based on the RP-2014 Healthy Annuitant mortality table. For males, the Healthy Annuitant Mortality tables were used, adjusted for mortality improvement back to the observation period base of 2006, and then established the base year as 2015. For females, the Healthy Annuitant Mortality tables were used, adjusted for mortality improvements back to the observation period base year of 2006, and then established the base year as 2010.

      The rates used for disability allowances were based on the RP-2014 Disabled mortality tables, adjusted for mortality improvement back to the observation base year of 2006, and then established the base year as 2015 for males and 2010 for females. Mortality rates for a particular calendar year for both healthy and disabled retiree mortality tables were determined by applying the MP-2015 mortality improvement scale to the previously noted tables.

## Factors Significantly Affecting Trends in Reported Amounts

There were no recent significant changes of benefit terms, investment policies, the size or composition of the population covered by the benefit terms impacting the actuarial valuation study for the year ended December 31, 2016.

As previously noted, in 2016, a five-year experience study was completed on the period January 1, 2011 through December 31, 2015. The Board adopted changes to the demographic and economic assumptions as a result of the study, refer to the significant economic changes noted on the previous page. The most notable change in demographic assumptions is an increased life expectancy of our members. The new assumptions included in the 2016 actuarial valuation are further disclosed in the Actuary Section beginning on page 147.

In 2016, OPERS, in conjunction with the Board's investment consultants, also completed an asset liability study. Periodically, the System engages in a more comprehensive study that examines the nature of the pension liabilities we will ultimately pay and the characteristics of the asset allocation projections and the associated level of risk. As a result of this study, OPERS modified the asset allocation slightly, but not substantively.

# Post-employment Health Care Coverage

## Description of Schedule of Funding Progress

OPERS-provided health care coverage is neither a guaranteed nor statutorily required benefit. OPERS primary funding responsibility is to pensions. Health care plans are funded from a portion of the employer contribution as approved by the Board each year, after consideration of the funding needs of the defined benefit pension plans.

Each time a health care plan enhancement is made that applies to service already rendered, an unfunded actuarial accrued liability is created. These additional liabilities are financed systematically over a period of future years. In addition, if actual financial experiences are less favorable than assumed financial experiences, the difference is added to the unfunded actuarial accrued liability.

In an inflationary economy, the value of the dollar is decreasing. This environment typically results in employee pay increasing in dollar amount, with a corresponding increase in the employer contributions to valuation assets. During recessionary periods, employee pay may decrease or remain constant, resulting in a potential reduction in the corresponding employer contributions to health care while the employee's eligibility for health care continues to grow. Unfunded actuarial accrued liabilities divided by active employee payroll provides an index that adjusts for the effects of inflation or recession. The smaller the ratio of unfunded actuarial accrued liabilities to active member payroll, the more secure retiree health care coverage is considered to be. Observation of this relative index over a period of years will give an indication of whether the health care trust funding is becoming financially stronger or weaker.

## Actuarial Assumptions and Methods

The actuarial assumptions and methods described below are based on the most recent actuarial valuation study for the year ended December 31, 2015, before the experience study results.

- **Funding Method—**An individual entry-age normal actuarial-cost method of valuation is used in determining liabilities and normal cost. Differences between assumed and actual experience (the actuarial gains and losses) become part of unfunded actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized over a period of time to produce payments that are a level percent of payroll contributions based on an open amortization period.
- **Asset Valuation Method—**For actuarial purposes, assets are valued utilizing a method which recognizes assumed investment returns fully each year. Differences between actual and assumed investment returns are phased in over a closed four-year period. This funding value is not permitted to deviate from fair value by a corridor of plus or minus 12.00%.
- **Significant Actuarial Assumptions—**Assumptions employed by the actuary for funding purposes as of December 31, 2015, the date of the latest actuarial study, before the experience study include:
  - **Investment Return—**An investment return rate of 5.00% compounded annually.
  - **Salary Scale—**The active member payroll was assumed to increase 3.75% annually for 2015, which is the portion of the individual pay increase assumption attributable to inflation and overall productivity. Also assumed were additional projected salary increases ranging from 0.50% to 6.30% per year depending on age, attributable to seniority and merit for 2015.
  - **Benefit Payment—**For the 2015 valuation, health care expenses are assumed to increase initially at 9.50%, before leveling off to 3.75% in 2026.
- **Multiple Decrement Tables**
  - **Mortality—**The rates used for retiree allowances were the RP-2000 Mortality table projected 20 years using Projection Scale AA. For males, 105% of the combined healthy male mortality rates were used. For females, 100% of the combined healthy female mortality rates were used.

    The rates used for disability allowances were the RP-2000 Mortality table with no projection. For males, 120% of the disabled female mortality rates were used, set forward two years. For females, 100% of the disabled female mortality rates were used.

## Administrative Expenses (for the year ended December 31, 2016)

| | |
|---|---|
| **Personnel Expenses** | |
| Wages and Salaries | $49,315,599 |
| Retirement Contributions—OPERS | 6,514,556 |
| Retirement Contributions—Medicare | 686,976 |
| Employee Insurance | 9,692,897 |
| Other Personnel Expense | 337,182 |
| **Purchased Services and Supplies** | |
| Professional Expenses | |
| Audit Services | 548,638 |
| Actuarial Services | 652,185 |
| Consulting Services | 592,963 |
| Investment and Financial Services | 14,819,039 |
| Legal and Investigation Services | 2,439,541 |
| Medical Examinations | 1,127,946 |
| Retirement Study Council | 266,611 |
| Custodial and Banking Fees | 4,627,319 |
| Information Technology | 8,226,358 |
| Communications | 2,097,841 |
| Office Supplies, Equipment and Other Miscellaneous | 759,559 |
| Education—Member and Staff | 1,355,875 |
| Facility Expenses | 4,174,506 |
| **Subtotal Operating Expenses** | **108,235,591** |
| **Depreciation Expense** | |
| Building | 2,333,361 |
| Furniture and Equipment | 8,885,081 |
| **Subtotal Depreciation** | **11,218,442** |
| **Total Administrative Expenses** | **119,454,033** |
| Investment Expenses | (40,394,975) |
| **Net Administrative Expenses** | **$79,059,058** |

## Schedule of Investment Expenses* (for the year ended December 31, 2016)

| | |
|---|---|
| Investment Staff Expense | $17,458,375 |
| Investment Services | 19,374,027 |
| Investment Legal Services | 1,435,864 |
| Allocation of Administrative Expenses (See Note 2b to Financial Statements) | 2,126,709 |
| **Total Investment Expenses** | **$40,394,975** |

*Excludes fees and commissions, please see Schedules of Brokerage Commissions Paid beginning on page 106.

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# Investment Section

## *Dedicated to:* Investing Responsibly

OPERS investments traditionally generate between 50-75 percent of the pension benefit. That's an important responsibility—one that has been achieved for more than 80 years. At OPERS, the idea of investing responsibly has many facets:

- We work to generate strong, long-term returns with adherence to our asset allocation policy so that the overall risk inherent in the investment market is mitigated.
- We recognize the need for agility to maximizing some opportunities—yet we never allow market pressures to force a decision.

Although no organization can accurately predict the market, we understand and anticipate the various market cycles—from robust to stagnant to volatile—and work to responsibly position and diligently fund OPERS to meet its obligation.

This responsibility results in sustainable, long-term growth—meaning our highs will never be as high as the top investors every year—but our lows will never be as low. Quality growth means sustainable growth—that's our goal each and every year.

*Note: This section is unaudited.*

OPERS Ohio Public Employees Retirement System
277 East Town Street Columbus, Ohio 43215-4642 1-800-222-7377 www.opers.org

Dear Members and Beneficiaries:

As an investment professional, my focus tends to be ever forward. It's a privilege to have the opportunity to review any given year and position the actions and results within the framework of what occurred during the year. It's also a compelling responsibility.

### Market overview

I would characterize the 2016 markets as eventful—with Brexit, the U.S. presidential election, and a rate increase from the Federal Reserve all taking center stage. Major market events, by quarter, included:

- In the first quarter, U.S. stocks had an extremely rocky start—yet, by year end, the Dow, S&P 500 and Nasdaq Composite had set records.
- The markets had just stabilized when the United Kingdom voted to exit the European Union (Brexit) in June 2016—yet, surprisingly, the market turmoil Brexit created was quickly recouped.
- Third quarter was fairly uneventful, but all investors were considering what would be happening with the U.S. election and how the anticipated rate hike would impact the markets.
- The election results created an unprecedented stock futures sell off—that, equally unprecedented, lasted only a few hours as stocks soared to record highs.

Traditionally, markets do not like surprises. Therefore, the real surprise for 2016 was, despite the momentous events of the marketplace, that stock markets managed to settle into much lower-than-expected volatility and still produce strong returns by year end. The S&P 500 large capitalization U.S. stock index closed up 12 percent for the year (dividends included). Exceptional performances were also recorded by emerging markets equity, up 11.6 percent, and emerging markets bonds posted a more than 10 percent increase—mostly due to the recovering currencies within those markets.

### 2016 Investment results

Against the event-driven 2016 marketplace, how did OPERS investments perform? On behalf of the entire Investment Division team, I'm pleased to report OPERS finished 2016 with strong results:

- The OPERS Defined Benefit portfolio produced, net of fees, investment returns of 8.3 percent;

- The health care trust portfolios, net of fees, returned 7.5 percent (see the Executive Director's Letter of Transmittal for a complete description of the actions taken for the individual health care portfolios in 2016).

These returns only slightly trailed the policy benchmark returns of 8.6 percent for the Defined Benefit portfolio and 7.8 percent for the Health Care portfolio. It should be noted that, in most previous years, the active management returns absorbed the cost of the investment program and provided returns in excess of costs. In 2016, active returns were able to absorb costs but without producing excess returns. Also in 2016, combined net returns generated by both portfolios exceeded the 7.5 percent actuarial-assumed rate of return on defined benefit assets and 5.0 percent on health care assets, as defined by this year's experience study and accepted by the Board of Trustees. (More detailed information on the experience study can be found in the Executive Director's Letter of Transmittal, pages 6-13 of this annual report.) Readers of this year's report will also note we have provided more transparency into investment costs, which, by industry practice, are typically netted against returns. All past-year returns have reflected all costs and fees, but without as much detailed reporting.

### Significant actions and activities

These investment results did not occur in a vacuum. The OPERS Investment team was able to ensure OPERS could, as always, maximize the opportunities the year presented and minimize the risks inherent in any investment program. OPERS continues to be well-positioned to meet its obligations. We never lose sight of our overarching responsibility over the long horizon—investment returns should be positioned to provide more than half of the total amount of benefit payments.

Working closely with the OPERS Board of Trustees to ensure alignment with Board directives and policies, many functions and actions were completed in 2016:

- As prudent institutional investors, we know the need for external consultants. Recognizing the ever-changing marketplace, and our unchanging need to produce strong returns, the Board periodically evaluates the market to ensure it has selected the right investment consultants—those who embraced our values and augment the considerable internal talent found here. After an extensive process, the decision was made to re-appoint the existing consultants, NEPC, LLC, as general consultant, and Aon Hewitt for strategic alternatives.
- After the selection of the consultants, OPERS immediately began an asset liability study. As a result of this study and in conjunction with the actuarial experience study, the decision was made to reduce the defined benefit actuarial rate assumption from 8.0 percent to 7.5 percent.
- Next, after extensive study, the Board affirmed the general consultant's recommendation to maintain the existing asset allocation plans for both the Defined Benefit and Health Care portfolios.

### The importance of asset allocation

The importance of asset allocation as a long-term success strategy cannot be overstated. Please understand, a decision to keep an asset allocation plan is every bit as rigorous and momentous as a decision to make changes. Any decision regarding the OPERS asset allocation plan requires, at a minimum, extensive review and testing of the liability profile—as well as a comprehensive study of expected capital market outcomes, an assessment of likely risks and challenges presented by the prevailing market conditions, complete liquidity analyses, and a thorough vetting of recommendations. Simply put, to remain in or to move away from an asset class—and at what level—is regarded from all facets before a decision is made.

Does this diligence work? Yes. The table below provides an at-a-glance overview of the evolution of the OPERS asset allocation for the Defined Benefit portfolio from 2007 through 2016:

| Allocation | Assets 12/31/2007 | Assets 12/31/2016 | Change | Net Change ($ in billions) |
|---|---|---|---|---|
| Global Equity | 64.6% | 35.5% | (29.1%) | ($17.5) |
| Private Equity | 3.4 | 11.5 | 8.1 | 6.5 |
| REITs | 0.9 | 0.0 | (0.9) | ( 0.7) |
| **Total Equity** | **68.9** | **47.0** | **(21.9)** | **(11.7)** |
| Global Bonds | 25.3 | 27.8 | 2.5 | 3.8 |
| Private Real Estate | 5.8 | 10.4 | 4.6 | 4.0 |
| Hedge Funds | 0.0 | 7.9 | 7.9 | 6.1 |
| Multi-Asset Class* | 0.0 | 5.9 | 5.9 | 4.5 |
| Commodities | 0.0 | 1.0 | 1.0 | 0.7 |
| **Totals** | **100.0%** | **100.0%** | | **$7.4** |

* Multi-Asset Class consists of managers who pursue an investment strategy across multiple asset classes simultaneously (risk parity and global tactical asset allocation).

In the simplest terms, alternative investments (possibly excepting real estate) can be considered strategies involving otherwise traditional assets. For example, private equity is a different way to own corporate stocks or other forms of equity. The importance of pursuing alternatives to traditional assets is to better manage outcomes by mitigating risks through portfolio diversification versus reward outcomes presented by “take it as they come” public securities markets.

These investment portfolio changes were made to reduce the volatility of assets while continuing to earn better risk-adjusted returns on the total portfolio. This was accomplished principally by moving toward a peer group weighting in alternative asset classes such as private equity, but also by adopting multi-asset class strategies such as risk parity (that broadly owns the same asset classes found elsewhere in the asset allocation plan, but adjusts portfolio weightings to better balance risks between them).

The majority of these changes to OPERS asset allocation plan were adopted in 2010 and have been implemented over the last five years. Since 2010, change has been minimal—appropriate for a large institutional investor such as OPERS with a significant time horizon. Because of our asset allocation strategy, we do not need to react to market dynamics that change every year. History has shown that investors who react to past events, rather than plan for the future, rarely succeed.

For any year, and 2016 was not an exception, the OPERS Investment team considers two questions when assessing our asset allocation strategy:

- How did the portfolio perform against expected outcomes given the market environment that ensued?
- Is the allocation demonstrating an appropriate balance between risk and return, in general?

Regarding targeted results, as stated previously, the OPERS Defined Benefit portfolio only very narrowly missed the policy return benchmark of 8.6 percent. Importantly, the returns nonetheless exceeded the median of a consultant-defined peer group of 8.0 percent. OPERS was able to achieve this result despite having a peer-group underweight to U.S. stocks—which were the single best-performing asset class within our peer-group allocations of stocks, bonds, real estate and private equity.

How was this possible? To reduce risk, OPERS had diversified from significant equity exposure into less-traditional asset types including risk parity, emerging market debt, high-yield bonds and commodities. All of these asset types performed nearly as well as U.S equities in 2016—yet rather than being concentrated in U.S. stocks, risk was spread throughout multiple asset types.

OPERS investment returns are often above average—most recently above average in the past four out of five years versus our peers. This level of investment achievement can only be accomplished by diligently adhering to asset allocation strategies. A well-designed and well-diversified asset allocation strategy reduces risk and provides consistent returns through most market cycles. Notably, this consistent, low cost, and diligent implementation is applied to all OPERS portfolios (defined benefit, health care and target date funds).

## Final thoughts on 2016

The year 2016 was a good year and it’s always a pleasure to report on a strong year—personally and professionally. Working closely with the Board of Trustees, significant decisions were made in 2016—decisions that, I am confident, have positioned this System positively for the future. It is an honor to work with this Board whose members continue to have the courage and foresight to make and adhere to strong investment policies and Board governance.

It’s important to note that, under all the work, the reporting of billions and the constant regulation of risk-and-reward, the really impressive fact is: Investment returns have generated—and are expected to continue to generate—enough revenue so that OPERS can keep its 81-year tradition of delivering on the promise of a secure retirement for our members. We never lose sight of the fact that all the big data, through every market cycle and across every year, boils down to one goal—securing each and every member’s financial security.

Respectfully submitted,

Richard Shafer
Chief Investment Officer

**Board Investment and Fiduciary Duties**

(A) The members of the public employees retirement board shall be the trustees of the funds created by section 145.23 of the Revised Code. The board shall have full power to invest the funds. The board and other fiduciaries shall discharge their duties with respect to the funds solely in the interest of the participants and beneficiaries; for the exclusive purpose of providing benefits to participants and their beneficiaries and defraying reasonable expenses of administering the public employees retirement system; with care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims; and by diversifying the investments of the system so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so.

(B) In exercising its fiduciary responsibility with respect to the investment of the funds, it shall be the intent of the board to give consideration to investments that enhance the general welfare of the state and its citizens where the investments offer quality, return, and safety comparable to other investments currently available to the board. In fulfilling this intent, equal consideration shall also be given to investments otherwise qualifying under this section that involve minority owned and controlled firms and firms owned and controlled by women either alone or in joint venture with other firms.

OPERS

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April 20, 2017

Board of Trustees
Ohio Public Employees Retirement System
277 East Town Street
Columbus, OH 43215-4642

As an independent investment advisor to the Ohio Public Employees Retirement System ('OPERS') and the Board of Trustees (the 'Board'), NEPC, LLC is providing an opinion on the reporting of OPERS investment results, investment policies, internal compliance procedures and the Board's oversight of the Retirement System's investments.

**Investment Results**

To the best of NEPC's knowledge and belief, OPERS investment results, as presented in this Comprehensive Annual Financial Report (CAFR), accurately represent the performance of the Retirement System's Defined Benefit, Health Care and Defined Contribution assets. All measurements shown have been calculated using standard performance evaluation methods and are presented in a manner that is consistent with investment industry standards.

**Investment Policies**

OPERS investment policies can be accessed online at https://www.opers.org/investments/inv-policies.shtml and are organized as follows: Part I: Investment Objectives and Asset Allocation Policies; Part II: Asset Class and Sub-Asset Class Policies; Part III: Investment-Wide Policies; and Part IV: Corporate Governance and Proxy Voting Policies.

In NEPC's opinion, OPERS assets are managed under a set of transparent investment policies and guidelines. These policies and guidelines adequately highlight the strategic performance objectives of the Ohio Public Employees Retirement System and emphasize the dual importance of maintaining robust risk controls and program diversification.

**Internal Compliance**

The constant testing of Fund portfolios and the continuous review of the compliance function itself is considered to be best practice within the investment industry. While serving as OPERS generalist investment consultant, NEPC has witnessed Staff's consistent and ongoing efforts to improve the effectiveness of their internal compliance procedures. NEPC also believes that the Investment Division's support of the CFA® Institute's Code of

Page 2

Ethics and Standards of Professional Conduct, as well as the guidelines and procedures that are set forth in the OPERS Code of Ethics and OPERS Personal Trading Policies, are consistent with industry best practice for investment professionals.

**Prudent Oversight**

The daily management of the OPERS assets has been clearly delegated to the Retirement System's investment Staff. In NEPC's opinion, this clear delegation of accountability helps the Board maintain effective oversight of the OPERS Defined Benefit, Health Care and Defined Contribution Funds through quarterly performance reviews, regular oversight of Staff's activities and monthly meetings with Staff, the investment consultants and other independent service providers.

Craig Svendsen

Craig Svendsen, CFA
Partner

NEPC, LLC

## Introduction

The total OPERS investment portfolio, as reflected in the Combining Statements of Fiduciary Net Position, pages 38-39, is comprised of the Defined Benefit, the 115 Health Care Trust, and the Defined Contribution portfolio assets. The 401(h) Health Care Trust was closed as of June 30, 2016, and the assets transferred to the 115 Health Care Trust on July 1, 2016. The Defined Benefit portfolio assets originate from Traditional Pension Plan member and employer contributions, employer contributions to the Combined Plan, Member-Directed Retiree Medical Accounts funded through the Voluntary Employees' Beneficiary Association (VEBA) Trust, and funds transferred from defined contribution accounts for defined benefit annuities. The VEBA Trust was also closed as of June 30, 2016, and the assets transferred to the 115 Health Care Trust on July 1, 2016. The management of these assets is the responsibility of the Investment staff, adhering to the policies approved by the OPERS Board of Trustees (Board).

In 2005, the 401(h) Health Care Trust portfolio assets were segregated from the pension portfolio and invested with a more conservative, and shorter term, asset-allocation strategy. The 401(h) Health Care Trust portfolio was comprised of assets set aside to provide post-employment health care for the retirees in the Traditional Pension Plan and Combined Plan. In 2014, the 115 Health Care Trust portfolio was created as another funding vehicle for post-employment health care for members in the Traditional Pension Plan and Combined Plan. Assets were segregated into the 115 Health Care Trust beginning September 2014, with the initial health care disbursements from this trust commencing late 2015 for January 2016 premium reimbursements. Favorable rulings from the Internal Revenue Service received March 2016 allowed OPERS to consolidate health care assets from the VEBA Trust and the 401(h) Health Care Trust into the 115 Health Care Trust.

Defined Contribution portfolio assets originate from member contributions to the Combined Plan and both member and employer contributions to the Member-Directed Plan. The investment of Defined Contribution portfolio assets is self-directed by members in the Combined and Member-Directed plans, but is limited to investment options approved by the Board and the self-directed brokerage account window.

## Investment summary

The Total Investment Summary (starting on page 101) relates to the System-wide investments and includes the assets of all three portfolios as of December 31, 2016. The balance of information in this Investment Section is organized as follows: Defined Benefit portfolio investments (pages 111-115) relating exclusively to the Defined Benefit assets (including the VEBA Trust through June 30, 2016, mentioned above); 401(h) Health Care Trust portfolio investments (pages 117-121) relating exclusively to the health care assets in the 401(h) Health Care Trust through June 30, 2016; 115 Health Care Trust portfolio investments (pages 123-127) relating exclusively to the 115 Health Care Trust assets (including VEBA and 401(h) Health Care Trust assets beginning July 1, 2016); and Defined Contribution portfolio investments (pages 129-131) relating exclusively to the Defined Contribution assets. The Investment Objectives and Policies and Asset Class Policies (pages 133-146) provide information on System-wide investment policies and performance objectives.

A complete listing of assets held at December 31, 2016, is available from OPERS upon request. All returns presented throughout the Investment Section are net of external manager fees, overdraft charges, debit interest, registration expenses, stamp duties and taxes spent on foreign securities. In addition, the securities lending money market returns are net of custodial fees, transfer agent expenses and professional fees.

The following table reflects the total investment portfolio, which includes all three remaining component portfolios as of December 31, 2016: the Defined Benefit portfolio, the 115 Health Care Trust portfolio and the Defined Contribution portfolio.

Investments are reported at fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on a national or international exchange are valued at the last-reported sales price at current exchange rates. Performance results and fair values for the real estate and private equity asset classes are typically reported on a quarter lag basis, adjusted for cash flow activity during the fourth quarter. If any significant market gains or losses occur in the fourth quarter, these asset classes are adjusted for financial reporting purposes to reflect the estimated fair value at year end. The investment results reported for these asset classes in the Investment Section reflect this practice. The table below displays the fair values of investment assets consistent with the presentation in the financial statements on pages 38-39.

**Total Investment Summary** (as of December 31, 2016)

| | Fair Value | Percent of Total Fair Value |
|---|---|---|
| **Cash and Short-Term Investments** | | |
| Cash | $40,260,841 | 0.04% |
| Short-Term Securities | | |
| Commercial Paper | 1,105,725,807 | 1.23 |
| U.S. Treasury Obligations | 256,716,347 | 0.29 |
| Repurchase Agreements | 1,480,000,000 | 1.64 |
| Interest-Bearing Short-Term Certificates | 339,976,257 | 0.38 |
| Short-Term Investment Funds (STIF) | 1,363,626,253 | 1.51 |
| **Total Cash and Short-Term Investments** | **4,586,305,505** | **5.09** |
| **Investments** | | |
| Fixed Income | | |
| U.S. Corporate Bonds | 6,130,248,901 | 6.81 |
| Non-U.S. Notes and Bonds | 6,407,706,767 | 7.12 |
| U.S. Government and Agencies | 6,603,998,122 | 7.33 |
| U.S. Mortgage Backed | 2,915,771,753 | 3.24 |
| Subtotal Fixed Income | 22,057,725,543 | 24.50 |
| Domestic Equities | 17,216,054,266 | 19.12 |
| Real Estate | 8,016,903,826 | 8.90 |
| Private Equity | 8,855,248,710 | 9.84 |
| International Equities | 16,403,983,969 | 18.22 |
| Hedge Funds and Derivatives* | 12,899,734,289 | 14.33 |
| **Total Long-Term Investments** | **85,449,650,603** | **94.91** |
| **Total Cash and Investments** | **$90,035,956,108** | **100.00%** |

*Hedge Funds and Derivatives includes risk parity and global tactical asset allocation.

# Total Investment Summary

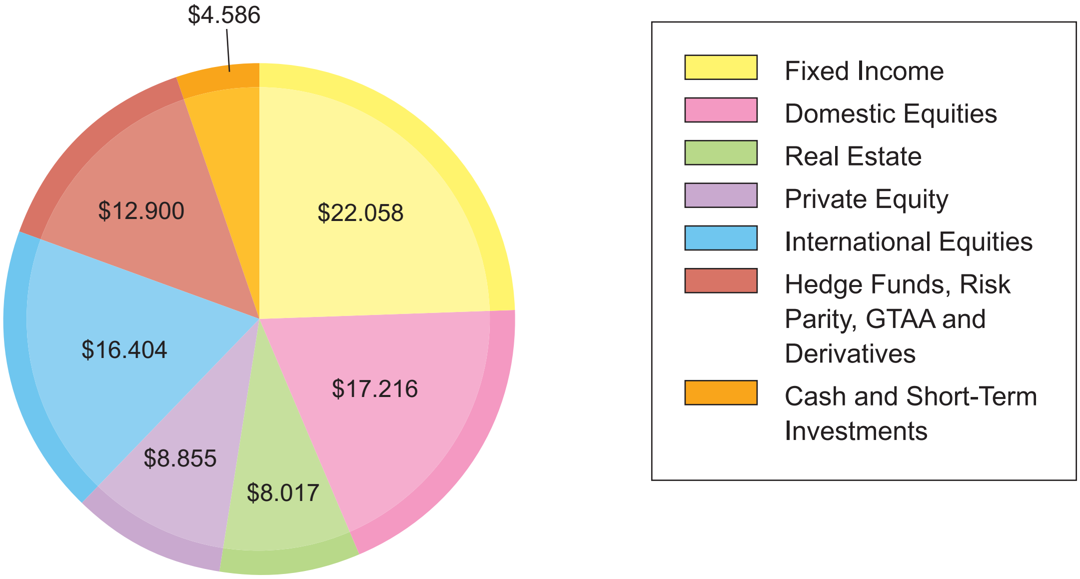
The following table reflects the breakdown of the total investment portfolio into the three component portfolios—the Defined Benefit, the 115 Health Care Trust and the Defined Contribution portfolios.

## Total Investment Summary by Portfolio* (as of December 31, 2016)

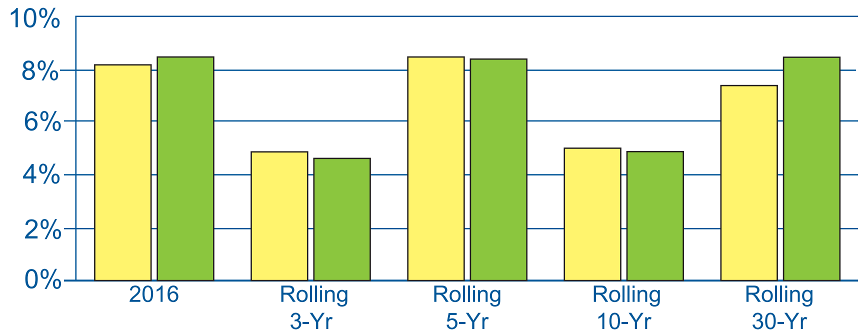
| | Defined Benefit | 115 Health Care Trust | Defined Contribution | Total |
|---|---|---|---|---|
| Fixed Income | $17,676,048,547 | $4,087,785,698 | $293,891,298 | $22,057,725,543 |
| Domestic Equities | 13,544,120,627 | 3,071,759,733 | 600,173,906 | 17,216,054,266 |
| Real Estate | 8,016,903,826 | | | 8,016,903,826 |
| Private Equity | 8,855,248,710 | | | 8,855,248,710 |
| International Equities | 13,837,770,468 | 2,265,107,975 | 301,105,526 | 16,403,983,969 |
| Hedge Funds and Derivatives** | 11,365,493,593 | 1,534,240,696 | | 12,899,734,289 |
| Cash and Short-Term Investments | 3,711,672,665 | 874,632,840 | | 4,586,305,505 |
| **Total** | **$77,007,258,436** | **$11,833,526,942** | **$1,195,170,730** | **$90,035,956,108** |

* Assets summarized on performance basis.
** Hedge Funds includes risk parity and global tactical asset allocation.

## Total Investment Summary (as of December 31, 2016, $ in billions)




## Total Investment Returns—Annual Rates of Return*




| | 2016 | Rolling 3-Yr | Rolling 5-Yr | Rolling 10-Yr | Rolling 30-Yr |
|---|---|---|---|---|---|
| Total Investment Returns | 8.23% | 4.91% | 8.53% | 5.05% | 7.44% |
| Policy Benchmark Returns | 8.53% | 4.66% | 8.45% | 4.92% | 8.52%** |

* Annual rates of return—The returns are the result of the returns generated by Defined Benefit, 401(h) Health Care Trust, 115 Health Care Trust and Defined Contribution portfolio investments, based on a combination of time-weighted calculations and market value-weighted calculations. The policy benchmark is derived by a market value-weighted calculation of the Defined Benefit, 401(h) Health Care Trust, 115 Health Care Trust, and Defined Contribution investment policy benchmarks while all other returns throughout the remainder of this section are derived from a time-weighted calculation. All returns presented throughout the Investment Section are net of external manager fees, overdraft charges, debit interest, registration expenses, stamp duties and taxes spent on foreign securities. In addition, the securities lending money market returns are net of custodial fees, transfer agent expenses and professional fees.

** The benchmark returns for 1996 and prior years were estimated.

## Historical Investment Returns

| Year | Total Portfolio Return | Total Defined Benefit Return* | Total 401(h) Health Care Trust Return* | Total 115 Health Care Trust Return | Total Defined Contribution Return*** |
|---|---|---|---|---|---|
| 2016 | 8.23% | 8.31%**** | 4.73%**** | 5.11%**** | 9.51% |
| 2015 | (0.03) | 0.33 | (2.18) | (3.23) | (1.71) |
| 2014 | 6.70 | 6.96 | 5.28 | (0.03)** | 4.83 |
| 2013 | 14.00 | 14.38 | 11.36 | | 20.45 |
| 2012 | 14.40 | 14.54 | 13.72 | | 13.37 |
| 2011 | 0.20 | 0.36 | (0.38) | | (2.59) |
| 2010 | 13.90 | 13.98 | 13.93 | | 13.74 |
| 2009 | 20.06 | 19.09 | 24.80 | | 26.44 |
| 2008 | (26.92) | (27.15) | (25.77) | | (28.00) |
| 2007 | 8.52 | 8.89 | 6.87 | | 5.80 |
| 2006 | 14.66 | 15.05 | 12.78 | | 12.96 |
| 2005 | 9.03 | 9.25 | 8.00 | | 6.88 |
| 2004 | 12.49 | 12.50 | | | 9.73 |
| 2003 | 25.39 | 25.39 | | | |
| 2002 | (10.73) | (10.73) | | | |
| 2001 | (4.58) | (4.58) | | | |
| 2000 | (0.71) | (0.71) | | | |
| 1999 | 12.10 | 12.10 | | | |
| 1998 | 14.45 | 14.45 | | | |
| 1997 | 13.37 | 13.37 | | | |
| 1996 | 7.85 | 7.85 | | | |
| 1995 | 20.47 | 20.47 | | | |
| 1994 | (0.02) | (0.02) | | | |
| 1993 | 9.72 | 9.72 | | | |
| 1992 | 5.66 | 5.66 | | | |
| 1991 | 15.68 | 15.68 | | | |
| 1990 | 6.30 | 6.30 | | | |
| 1989 | 18.38 | 18.38 | | | |
| 1988 | 9.25 | 9.25 | | | |
| 1987 | 1.29 | 1.29 | | | |

* Prior to 2005, the 401(h) Health Care Trust assets were included in the Defined Benefit portfolio. In 2005, the 401(h) Health Care Trust assets were segregated from the Defined Benefit portfolio into a separate portfolio with portfolio-specific asset allocation and investment policies. Accordingly, Defined Benefit returns for 2004 and prior represent a composite of the Defined Benefit and 401(h) Health Care Trust assets.

** The 115 Health Care Trust was established September 2014. Returns are two-month cumulative returns in 2014 since funding of the 115 Health Care Trust portfolio began November 2014.

*** Defined Contribution plans commenced January 1, 2003, with a separate portfolio established in 2004.

**** Returns are six-month cumulative returns as of June 30, 2016 in the 401(h) Health Care Trust. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust were closed as of June 30, 2016. Prior to July 1, 2016, the VEBA Trust assets were included in the Defined Benefit portfolio. On July 1, 2016, the 401(h) Health Care Trust and VEBA Trust assets were transferred to the 115 Health Care Trust portfolio. The combined return on total health care assets for the year ended December 31, 2016 is 7.55%. The number disclosed in the 115 Health Care Trust Return column, 5.11%, represents the return for the 115 Trust portfolio assets.

## Largest Equity Holdings (by fair value)* (as of December 31, 2016)

| Description | Shares | Fair Value |
|---|---|---|
| Apple Inc. | 4,075,161 | $471,985,147 |
| Microsoft Corp. | 5,572,201 | 346,256,570 |
| Exxon Mobil Corp. | 2,958,134 | 267,001,175 |
| JPMorgan Chase & Co. | 2,613,802 | 225,544,975 |
| Johnson & Johnson Co. | 1,940,800 | 223,599,568 |
| Berkshire Hathaway Inc. | 1,337,031 | 217,909,312 |
| General Electric Co. | 6,560,359 | 207,307,344 |
| Amazon.com Inc. | 275,354 | 206,479,704 |
| Samsung Electronics Co. Ltd | 132,929 | 198,326,014 |
| Facebook Inc. | 1,592,263 | 183,189,858 |
| **Total** | **27,058,034** | **$2,547,599,667** |

## Largest Bond Holdings (by fair value)* (as of December 31, 2016)

| Description | Coupon | Maturity | Rating | Par Value | Fair Value |
|---|---|---|---|---|---|
| U.S. Treasury Note | 1.125% | 9/30/2021 | AAA | $211,279,000 | $203,797,611 |
| U.S. Treasury Note | 0.750 | 10/31/2018 | AAA | 186,758,000 | 185,407,740 |
| U.S. Treasury Note | 1.125 | 8/31/2021 | AAA | 181,366,000 | 175,250,335 |
| U.S. Treasury Note | 1.000 | 10/15/2019 | AAA | 175,839,000 | 173,962,796 |
| U.S. Treasury Note | 0.875 | 9/15/2019 | AAA | 172,144,000 | 169,899,241 |
| U.S. Treasury Note | 1.250 | 10/31/2021 | AAA | 172,271,000 | 167,059,799 |
| U.S. Treasury Note | 0.750 | 9/30/2018 | AAA | 160,000,000 | 158,932,800 |
| U.S. Treasury Note | 1.375 | 12/15/2019 | AAA | 153,976,000 | 153,071,909 |
| U.S. Treasury Bond | 2.875 | 5/15/2043 | AAA | 153,458,000 | 148,318,693 |
| U.S. Treasury Bond | 2.500 | 2/15/2045 | AAA | 154,925,000 | 138,058,314 |
| **Total** | | | | **$1,722,016,000** | **$1,673,759,238** |

*A complete list of assets held at December 31, 2016 is available from OPERS upon request.

## U.S. Equity Commissions (for the year ended December 31, 2016)

| Brokerage Firm | U.S. Equity Commissions Paid | Shares Traded | Average Commission Per Share |
|---|---|---|---|
| UBS Securities LLC | $456,341 | 39,331,827 | $0.012 |
| Credit Suisse Securities (USA) LLC | 426,723 | 28,231,347 | 0.015 |
| Morgan Stanley & Co. | 171,706 | 10,301,732 | 0.017 |
| J.P. Morgan Securities LLC | 168,994 | 11,244,499 | 0.015 |
| Merrill Lynch & Co. Inc. | 124,412 | 12,038,205 | 0.010 |
| Liquidnet Inc. | 119,484 | 5,973,735 | 0.020 |
| RBC Capital Markets Corp. | 114,717 | 7,586,464 | 0.015 |
| Citigroup Global Markets Inc. | 107,709 | 7,180,498 | 0.015 |
| Weeden & Co. | 105,664 | 12,836,278 | 0.008 |
| Barclays Capital Inc. | 68,837 | 7,247,591 | 0.009 |
| Deutsche Bank Securities Inc. | 37,195 | 1,808,695 | 0.021 |
| ISI Group Inc. | 28,131 | 1,403,491 | 0.020 |
| Sanford C. Bernstein & Co. | 28,046 | 1,869,653 | 0.015 |
| Oppenheimer & Co. | 27,503 | 1,375,139 | 0.020 |
| Investment Technology Group Inc. | 26,287 | 1,743,043 | 0.015 |
| KeyBanc Capital Markets Inc. | 23,896 | 1,047,194 | 0.023 |
| Cowen and Company LLC | 22,015 | 1,100,732 | 0.020 |
| Other Commissions less than $20,000 | 83,413 | 4,593,631 | 0.018 |
| **Total U.S. Equity Commissions** | **$2,141,073** | **156,913,754** | **$0.014** |

## Non-U.S. Equity Commissions (for the year ended December 31, 2016)

| Brokerage Firm | Non-U.S. Equity Commissions Paid | Shares Traded | Average Commission Per Share |
|---|---|---|---|
| Merrill Lynch & Co. Inc. | $472,258 | 217,117,867 | $0.002 |
| UBS Securities LLC | 441,008 | 292,127,301 | 0.002 |
| Instinet LLC | 420,901 | 159,379,723 | 0.003 |
| Deutsche Bank Securities Inc. | 377,473 | 200,097,741 | 0.002 |
| J.P. Morgan Securities LLC | 368,541 | 98,531,197 | 0.004 |
| Citigroup Global Markets Inc. | 328,799 | 91,910,294 | 0.004 |
| Goldman Sachs & Co. | 288,587 | 103,070,261 | 0.003 |
| Morgan Stanley & Co. | 267,883 | 145,183,391 | 0.002 |
| Credit Suisse Securities LLC | 238,968 | 95,208,541 | 0.003 |
| Sanford C. Bernstein & Co. | 216,316 | 66,038,535 | 0.003 |
| Investment Technology Group Inc. | 202,300 | 57,451,828 | 0.004 |
| S.G. Securities | 200,724 | 260,757,934 | 0.001 |
| HSBC Securities Inc. | 192,248 | 75,187,268 | 0.003 |
| Bank of New York Mellon Corp. | 141,581 | 28,086,358 | 0.005 |
| Macquarie Bank Ltd. | 119,195 | 47,954,015 | 0.002 |
| Credit Lyonnais Bank | 96,990 | 54,936,165 | 0.002 |
| Barclays Capital Inc. | 93,684 | 8,408,875 | 0.011 |
| Jefferies & Co. | 84,507 | 8,685,342 | 0.010 |
| Banque BNP Paribas | 80,388 | 19,973,774 | 0.004 |
| Daiwa Capital Markets Inc. | 52,845 | 19,633,950 | 0.003 |
| Pershing Securities Ltd. | 37,992 | 4,526,004 | 0.008 |
| RBC Capital Markets Corp. | 35,290 | 3,851,427 | 0.009 |
| SMBC Nikko Securities Inc. | 33,396 | 1,272,449 | 0.026 |
| Cantor Fitzgerald & Co. | 32,103 | 2,674,578 | 0.012 |
| Mizuho International PLC | 32,091 | 2,572,757 | 0.012 |
| Societe Generale Securities Services | 29,569 | 5,306,872 | 0.006 |
| CLSA Global Markets Pte Ltd. | 28,046 | 14,716,360 | 0.002 |
| Banco Santander SA | 25,051 | 2,175,900 | 0.012 |
| Den Norske Bank ASA | 23,151 | 699,784 | 0.033 |
| Other Commissions less than $20,000 | 644,410 | 92,207,083 | 0.007 |
| **Total Non-U.S. Equity Commissions** | **$5,606,295** | **2,179,743,574** | **$0.003** |

## Futures Commissions (for the year ended December 31, 2016)

| Brokerage Firm | Futures Commissions Paid | Contracts Traded | Average Commission Per Contract |
|---|---|---|---|
| Goldman Sachs & Co. | $727,943 | 366,394 | $1.99 |
| Credit Suisse Securities LLC | 141,611 | 71,281 | 1.99 |
| **Total Futures Commissions** | **$869,554** | **437,675** | **$1.99** |
| **Total U.S. Equity, Non-U.S. Equity and Futures Commissions** | **$8,616,922** | **N/A** | **N/A** |

The brokerage commissions do not include commissions paid by external investment managers using commingled fund structures. OPERS maintains a commission recapture program with several of its non-U.S. Equity managers. Capital Institutional Services Inc. and Frank Russell Securities Inc. perform record-keeping services for the commission recapture program.

The total commissions schedule includes $833,886 in commissions paid that were part of a commission sharing agreement (CSA). CSA funds are held by the participating brokers and may be used to purchase qualifying investment research services. During 2016, $1,250,523 in investment research services were purchased using CSA funds.

## Schedule of Fees to External Asset Managers by Portfolio (for the year ended December 31, 2016)

| | Defined Benefit | 401(h) Health Care Trust** | 115 Health Care Trust | Defined Contribution | Total |
|---|---|---|---|---|---|
| Fixed Income | $29,874,302 | $2,199,972 | $2,276,299 | $194,572 | $34,545,145 |
| Domestic Equities | 10,809,578 | 1,063,475 | 1,043,734 | 308,406 | 13,225,193 |
| International Equities | 41,898,685 | 3,208,460 | 4,023,952 | 289,324 | 49,420,421 |
| Private Equity* | 175,270,526 | | | | 175,270,526 |
| Hedge Funds and Other* | 154,803,171 | 540,540 | 20,325,206 | | 175,668,917 |
| Real Estate* | 65,424,659 | | | | 65,424,659 |
| **Total Fees** | **$478,080,921** | **$7,012,447** | **$27,669,191** | **$792,302** | **$513,554,861** |

* All investment manager fees reported to OPERS, whether directly invoiced or subtracted from the fund on a net basis, are reported as External Asset Management Fees. These fees include investment management fees, incentive fees and other expenses, such as audit expenses, in limited partnership structures, as well as fee offsets that may have the effect of reducing the total amount of fees. See the following table for a breakdown of fees by category.

** The 401(h) Health Care Trust was closed as of June 30, 2016, and assets transferred to the 115 Health Care Trust on July 1, 2016.

## Schedule of Fees to External Asset Managers by Category (for the year ended December 31, 2016)

| | Net Management Fees | Partnership Expenses | Subtotal | Incentive Fees | Total |
|---|---|---|---|---|---|
| Fixed Income | $34,545,145 | | $34,545,145 | | $34,545,145 |
| Domestic Equities | 13,225,193 | | 13,225,193 | | 13,225,193 |
| International Equities | 49,420,421 | | 49,420,421 | | 49,420,421 |
| Private Equity* | 90,253,210 | $22,084,630 | 112,337,840 | $62,932,686 | 175,270,526 |
| Hedge Funds and Other* | 113,882,392 | | 113,882,392 | 61,786,525 | 175,668,917 |
| Real Estate* | 31,628,561 | 11,884,095 | 43,512,656 | 21,912,003 | 65,424,659 |
| **Total Fees** | **$332,954,922** | **$33,968,725** | **$366,923,647** | **$146,631,214** | **$513,554,861** |

* All investment manager fees reported to OPERS, whether directly invoiced or subtracted from the fund on a net basis, are reported as External Asset Management Fees. OPERS makes a good faith attempt to account for fees that are not readily separable. Net Management Fees are net of management fee offsets. Incentive Fees represent the investment managers' share of the net profits realized by the fund during the period.

## Schedule of External Asset Managers (for the year ended December 31, 2016)

**U.S. Equity Managers**

| | | |
|---|---|---|
| Affinity Investment Advisors | GW Capital Inc. | Redwood Investments LLC |
| Atlanta Capital Management, Company LLC | Hahn Capital Management LLC | Wasatch Advisors |
| Bowling Portfolio Management LLC | Mason Capital | Winslow Asset Management |
| CT Mason Inc. (aka Grace Capital) | Matarin Capital | |
| Dean Investment Associates | New South Capital Management | |
| Decatur Capital Management | Nicholas Investment Partners | |
| Disciplined Growth Investors | Oberweis Asset Management Inc. | |
| First Fiduciary Investment Counsel Inc. | Opus Capital Management | |
| Geneva Capital Management Ltd. | Penn Capital Management | |

**Non-U.S. Equity Managers**

| | | |
|---|---|---|
| Acadian | Franklin Templeton Institutional LLC | Strategic Global Advisors |
| AQR Capital Management LLC | J.P. Morgan | Trilogy Global Advisors LP |
| Arrowstreet | J O Hambro Capital Management Ltd. | T. Rowe Price International Ltd. |
| Ballie Gifford | Lazard | Vontobel Asset Management |
| BlackRock Financial Management Inc. | LSV | Walter Scott & Partners |
| Copper Rock Capital Partners LLC | Manning and Napier | Wasatch Advisors Inc. |
| Dimensional Fund Advisors | Oldfield Partners LLP | |
| Fisher Investments | Schroder Investment Management NA Inc. | |

**Bond Managers**

| | | |
|---|---|---|
| Aberdeen Asset Management | Franklin Templeton Institutional LLC | Neuberger Berman |
| AFL-CIO Housing Investment Trust | J.P. Morgan | Nomura Group |
| BlueBay Asset Management | Lazard | Post Advisory Group |
| Capital Guardian | Logan Circle Partners LP | Shenkman Capital Management |
| CIFC | Loomis, Sayles & Company LP | Stone Harbor |
| Fort Washington Investment Advisors Inc. | MacKay Shields | Wellington Management |

**Hedge Fund Managers**

| | | |
|---|---|---|
| AQR Capital Management | Discovery Capital Management | Och Ziff Capital Management |
| Aristeia Capital LLC | Egerton Capital | Panagora Asset Management |
| Arrowgrass Partnership | First Quadrant | Prisma Capital Partners LP |
| Ascend Partners | GMO | Putnam Investments |
| Beach Point Capital Management | Graham Capital | Schroders |
| BHR Capital | Highline Capital Partners | Scopia Capital |
| BlackRock Financial Management Inc. | Jana Partners | Taconic Investment Partners |
| BlueCrest Capital LP | K2 Advisors | Third Point Partners |
| Bridgewater Associates | Kepos Capital | Visium Asset Management |
| Brigade Capital Management LP | KLS Diversified Asset Management | Wellington Management |
| Canyon Capital Advisors LLC | Kynikos Associates | Winton Capital |
| Chatham Asset Partners | Lakewood Capital Partners | York Capital Management |
| CQS Management | Lynx Asset Management AB | |
| Davidson Kempner Institutional Partners LP | Oceanwood Capital Management LLP | |

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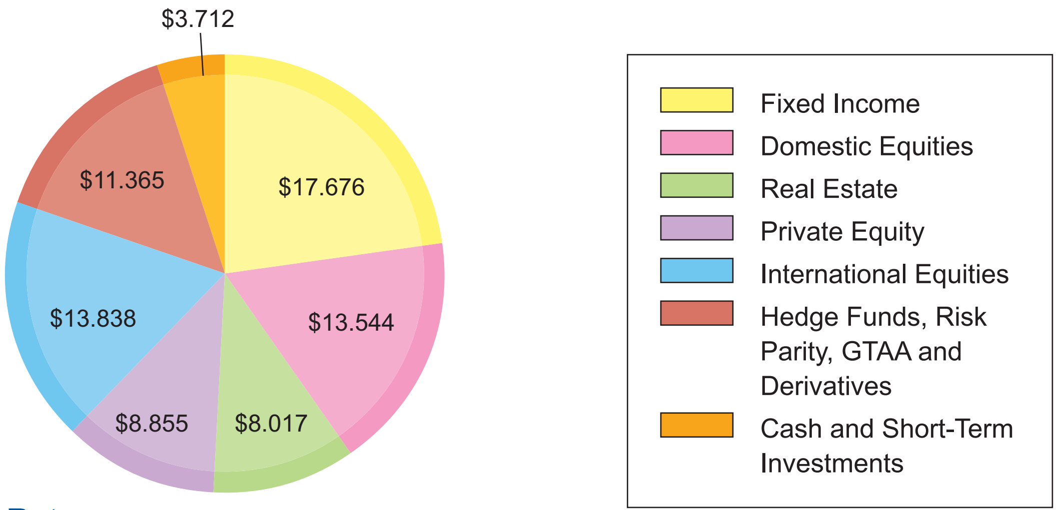
As noted previously, the Investment Division manages the total investment portfolio by dividing it into sub-portfolios. As of December 31, 2016, these portfolios are: the Defined Benefit portfolio, the 115 Health Care Trust portfolio, and the Defined Contribution portfolio. The 401(h) Health Care Trust portfolio assets were transferred to the 115 Health Care Trust portfolio on July 1, 2016. Information through June 30, 2016 is presented for the 401(h) Health Care Trust portfolio. All information prior to this point has been reported on the OPERS total investment portfolio; however, all the following information will be presented at the specific portfolio level.

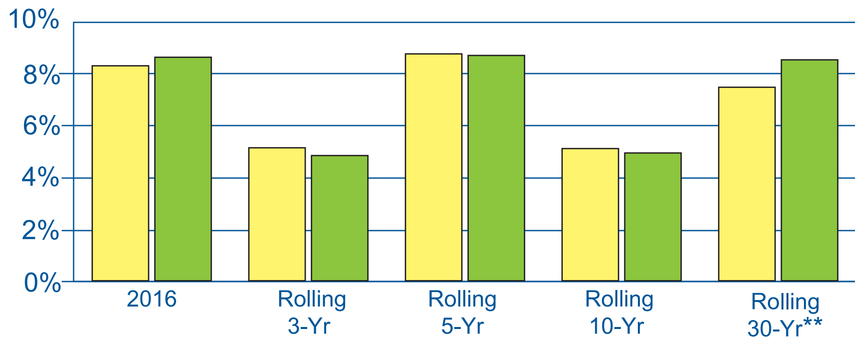
**Defined Benefit Portfolio Asset Allocation** (as of December 31, 2016, $ in billions)




## Investment Returns

The Defined Benefit portfolio returned 8.31% in 2016. The overall portfolio return is compared to a composite benchmark return that could be achieved by a portfolio that is passively invested in the broad market, with percentage weights allocated to each asset class as specified in the *OPERS Statement of Investment Objectives and Policies*. The return of the policy benchmark for 2016 was 8.64%.

**Investment Returns—Annual Rates of Return** **Defined Benefit Portfolio***




| | 2016 | Rolling 3-Yr | Rolling 5-Yr | Rolling 10-Yr | Rolling 30-Yr** |
|---|---|---|---|---|---|
| Defined Benefit Portfolio Returns | 8.31% | 5.14% | 8.77% | 5.11% | 7.48% |
| Policy Benchmark Returns | 8.64% | 4.84% | 8.71% | 4.94% | 8.54%*** |

* Annual rates of return--The Defined Benefit portfolio return is based on a time-weighted calculation. The policy benchmark is derived by a market value-weighted calculation of the Defined Benefit investment policy benchmarks. All returns are net of external manager fees, overdraft charges, debit interest, registration expenses, stamp duties and taxes spent on foreign securities.

** The 401(h) Health Care Trust portfolio was segregated from the Defined Benefit portfolio in 2005; thus, the 30-year rolling return information reflects both the Defined Benefit and 401(h) Health Care Trust portfolios.

*** The benchmark returns for 1996 and prior years were estimated.

Investment returns for the Defined Benefit portfolio underlying asset class composites and their respective benchmarks are shown below:

**Schedule of Investment Results** (for the year ended December 31, 2016) **Defined Benefit Portfolio**

| | 2016 | Rolling 3-Year | Rolling 5-Year |
|---|---|---|---|
| **Total Defined Benefit Portfolio** | **8.31%** | **5.14%** | **8.77%** |
| **Total Defined Benefit Portfolio Benchmark**[1] | **8.64** | **4.84** | **8.71** |
| U.S. Equity Composite | 12.00 | 7.80 | 14.30 |
| U.S. Equity Composite Benchmark | 12.74 | 8.43 | 14.67 |
| Non-U.S. Equity Composite | 5.41 | (0.35) | 6.09 |
| Non-U.S. Equity Composite Benchmark | 5.54 | (1.44) | 4.84 |
| Core Fixed Composite | 2.66 | 3.34 | 2.77 |
| Core Fixed Composite Benchmark | 2.65 | 3.03 | 2.23 |
| TIPS Composite | 4.69 | 2.27 | N/A |
| TIPS Composite Benchmark | 4.68 | 2.26 | N/A |
| High Yield Composite | 14.09 | 4.19 | 7.06 |
| High Yield Composite Benchmark | 17.13 | 4.66 | 7.36 |
| Emerging Markets Debt Composite | 10.50 | 0.15 | 2.13 |
| Emerging Markets Debt Composite Benchmark | 10.18 | 0.70 | 2.09 |
| Securitized Debt Composite | (0.80) | 7.09 | 13.14 |
| Securitized Debt Composite Benchmark | 5.87 | 4.73 | 5.57 |
| Floating Rate Debt Composite | 0.16 | 2.30 | N/A |
| Floating Rate Debt Composite Benchmark | 9.88 | 3.76 | N/A |
| Global High Yield Debt Composite | 12.74 | 2.35 | N/A |
| Global High Yield Debt Composite Benchmark | 14.27 | 3.60 | N/A |
| Private Equity Composite | 6.72 | 10.12 | 12.98 |
| Private Equity Composite Benchmark | 8.48 | 9.91 | 16.78 |
| Real Estate Composite | 11.61 | 15.61 | 14.90 |
| Real Estate Composite Benchmark | 9.93 | 12.27 | 12.12 |
| Hedge Funds Composite | 3.38 | 2.01 | 4.34 |
| Hedge Funds Composite Benchmark | 6.51 | 2.41 | 4.22 |
| Opportunistic Composite | 0.89 | 1.48 | 1.09 |
| Opportunistic Composite Benchmark | 1.04 | 2.34 | 2.20 |
| Commodities Composite | 11.92 | (19.93) | N/A |
| Commodities Composite Benchmark | 11.37 | (20.60) | N/A |
| Cash Composite | 0.67 | 0.44 | 0.42 |
| Cash Composite Benchmark | 0.33 | 0.14 | 0.12 |
| Additional Annuity Composite | 1.81 | 1.62 | 1.64 |
| Additional Annuity Composite Benchmark | 0.33 | 0.14 | 0.12 |
| Risk Parity Composite | 15.51 | 4.32 | N/A |
| Risk Parity Composite Benchmark | 7.00 | 5.97 | N/A |
| GTAA Composite | 6.58 | 3.96 | N/A |
| GTAA Composite Benchmark | 5.77 | 2.86 | N/A |
| U.S. Treasury Composite | 0.99 | N/A | N/A |
| U.S. Treasury Composite Benchmark | 1.04 | N/A | N/A |

[1] **Defined Benefit Portfolio Benchmark**—The returns for this benchmark are derived from the asset class composite benchmark returns summarized in the table above, the historical asset class target allocations listed on the next page, and the asset class composite benchmark indices listed in the table on page 114.

Footnotes continue on page 115.

## Historical Asset Class Target Allocations — Defined Benefit Portfolio

| Asset Class | 2016 | 2015 | 2014 | 2013 | 2012 |
|---|---|---|---|---|---|
| U.S. Equity | 22.4% | 22.3% | 21.4% | 22.0% | 23.6% |
| Opportunistic | 0.1 | 0.1 | 0.1 | 0.5 | 0.7 |
| Core Bonds | 9.8 | 9.5 | 10.3 | 10.0 | 13.3 |
| Corporate Credit | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Floating Rate Debt | 0.2 | 0.5 | 0.7 | 1.0 | 0.7 |
| Global High Yield | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 |
| Securitized Debt | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Non-U.S. Equity | 18.5 | 18.6 | 19.5 | 22.0 | 24.0 |
| Private Real Estate/REITs | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Private Equity | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Cash Equivalents | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 |
| High Yield | 3.0 | 3.0 | 3.0 | 5.0 | 5.0 |
| Emerging Markets Debt | 6.0 | 6.0 | 6.0 | 3.0 | 3.0 |
| Hedge Funds | 8.0 | 8.0 | 8.0 | 6.0 | 4.7 |
| Commodities | 1.0 | 1.0 | 1.0 | 1.0 | N/A |
| Risk Parity | 5.0 | 5.0 | 5.0 | 2.0 | N/A |
| GTAA | 2.0 | 2.0 | 2.0 | 2.0 | N/A |
| TIPS | 1.0 | 1.0 | 1.0 | 1.0 | N/A |
| U.S. Treasury | 1.0 | 1.0 | N/A | N/A | N/A |
| **Total** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

To arrive at customized benchmark performance, the asset allocation targets are multiplied by the performance of the corresponding asset class reference indices. The asset class reference indices are specified by the Investment Policy, and are displayed below:

## Historical Asset Class Composite Benchmark Indices — Defined Benefit Portfolio

| Asset Class Composite Benchmarks | As of December 31 | | | | |
|---|---|---|---|---|---|
| | 2016 | 2015 | 2014 | 2013 | 2012 |
| U.S. Equity | Russell 3000 Stock Index[2] | Russell 3000 Stock Index | Russell 3000 Stock Index | Russell 3000 Stock Index | Russell 3000 Stock Index |
| Opportunistic | Custom Opportunistic Benchmark[3] | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark |
| Core Bonds | Bloomberg Barclays U.S. Aggregate Index[4] | Custom Core Fixed | Custom Core Fixed | Custom Core Fixed | Barclays U.S. Aggregate Bond Index |
| Corporate Credit | N/A | N/A | N/A | N/A | Barclays U.S. Corporate Investment Grade |
| Floating Rate Debt | Credit Suisse Leveraged Loan Index[5] | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index |
| Global High Yield | Bloomberg Barclays Global High Yield Index[6] | Barclays Global High Yield | Barclays Global High Yield | Barclays Global High Yield | Barclays Global High Yield |
| Securitized Debt | Bloomberg Barclays CMBS Index + 2%[7] | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% |
| Non-U.S. Equity | Custom Non-U.S. Equity Benchmark (net)[8] | Custom Non-U.S. Equity Benchmark (net) | Custom Non-U.S. Equity Benchmark (net) | Custom Non-U.S. Equity Benchmark (net) | Custom Non-U.S. Equity Benchmark (net) |
| Private Real Estate | Custom Private Real Estate[9] | Custom Private Real Estate | Custom Private Real Estate | Custom Private Real Estate | NCREIF Property Index (quarter lag) |
| Private Equity | SSPEI Index[10] | SSPEI Index | Custom Private Equity | Custom Private Equity | Russell 3000 (quarter lag) + 3% |
| Cash Equivalents | 90-day U.S. Treasury Bill Index[11] | 90-day U.S. Treasury Bill Index | 90-day U.S. Treasury Bill Index | 90-day U.S. Treasury Bill Index | 90-day U.S. Treasury Bill Index |
| High Yield | Bloomberg Barclays Capital U.S. Corporate High Yield[12] | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield |
| Emerging Markets Debt | Custom Emerging Markets Debt Benchmark[13] | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark |
| Hedge Funds | Custom Hedge Funds Benchmark[14] | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark |
| Commodities | S&P Goldman Sachs Commodity Index[15] | S&P Goldman Sachs Commodity Index | S&P Goldman Sachs Commodity Index | S&P Goldman Sachs Commodity Index | N/A |
| Risk Parity | Custom Risk Parity Benchmark[16] | Custom Risk Parity Benchmark | Custom Risk Parity Benchmark | Custom Risk Parity Benchmark | N/A |
| GTAA | Custom GTAA Benchmark[17] | Custom GTAA Benchmark | Custom GTAA Benchmark | Custom GTAA Benchmark | N/A |
| TIPS | Bloomberg Barclays U.S. TIPS Index[18] | Barclays U.S. TIPS Index | Barclays U.S. TIPS Index | Barclays U.S. TIPS Index | N/A |
| U.S. Treasury | Bloomberg Barclays U.S. Treasury Index[19] | Barclays U.S. Treasury Index | N/A | N/A | N/A |

## Footnotes for Schedule of Investment Results—Defined Benefit Portfolio

The footnotes below provide definitions for the asset class composite benchmark indices as of December 31, 2016:

2 **Russell 3000 Stock Index**—A capitalization-weighted stock index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.

3 **Custom Opportunistic Benchmark**—Market value weight of the underlying portfolio benchmarks.

4 **Bloomberg Barclays U.S. Aggregate Index**—A market capitalization-weighted index covering the universe of most U.S. traded investment grade bonds, excluding municipal bonds and TIPS.

5 **Credit Suisse Leveraged Loan Index**—Is designed to mirror the investible universe of the U.S.-denominated leveraged loan market.

6 **Bloomberg Barclays Global High Yield**—The Global High Yield Index represents the union of the U.S. High Yield, Pan-European High Yield, U.S. Emerging Markets High-Yield, and Pan-European Emerging Markets High Yield Indices.

7 **Bloomberg Barclays Commercial Mortgage Backed Securities (CMBS) Index +2%**—The Barclays CMBS ERISA-Eligible Index is the ERISA-Eligible component of the Bloomberg Barclays CMBS Index. This index, which includes investment grade securities that are ERISA-Eligible under the underwriter's exemption, is the only CMBS sector that is included in the U.S. Aggregate Index. .

8 **Custom Non-U.S. Equity Benchmark (net)**—As of December 31, 2016, blend was 55% MSCI World x U.S. (net), 31% MSCI Emerging Markets (net), 10% MSCI World x U.S. Small Cap (net), and 4% MSCI Emerging Markets Small Cap (net).

9 **Custom Private Real Estate**—NCREIF Fund Index Open-End Diversified Core Equity (NFI-ODCE) net of fees plus an annual premium of 85 bps is a capitalization-weighted index consisting of 24 open-end commingled funds pursuing a core investment strategy.

10 **State Street Private Equity Index (SSPEI)**—Evaluates the performance of actively managed private equity portfolios. SSPEI includes venture capital, buyout, and distressed debt funds within the U.S.

11 **90-day U.S. Treasury Bill Index**—The 90-day Treasury Bill return as measured by Bank of America Merrill Lynch.

12 **Bloomberg Barclays Capital U.S. Corporate High Yield**—Covers the universe of fixed rate, non-investment grade debt.

13 **Custom Emerging Markets Debt Benchmark**—As of December 31, 2016, blend was 50% J.P. Morgan EMBI Global Index, 50% J.P. Morgan GBI-Emerging Markets Global Diversified USD Index.

14 **Custom Hedge Funds Benchmark**—As of December 31, 2016, blend was 20% HFRI Equity Hedge (Total) Index, 20% HFRI Macro (Total) Index, 15% HFRI Relative Value (Total) Index,15% HFRI Fund Weighted Composite Index, 30% HFRI Event-Driven (Total) Index.

15 **S&P Goldman Sachs Commodity Index**—Tracks general price movements and inflation in the world economy. The index is calculated primarily on a world-production weighted basis and is comprised of the principal physical commodities that are the subject of active, liquid futures markets.

16 **Custom Risk Parity Benchmark**—Market value weight of the underlying portfolio benchmarks.

17 **Custom Global Tactical Asset Allocation (GTAA) Benchmark**—Market value weight of the underlying portfolio benchmarks.

18 **Bloomberg Barclays U.S. TIPS Index**—This index consists of inflation-protected securities issued by the U.S. Treasury.

19 **Bloomberg Barclays U.S. Treasury Index**—Is designed to measure U.S. dollar-denominated, fixed-rate, nominal debt issued by the U.S. Treasury. Treasury bills are excluded, but are part of a separate Short Treasury index. Separate Trading of Registered Interest and Principal of Securities (STRIPS) are excluded from the index. The U.S. Treasury index is a component of the U.S. Aggregate, U.S. Universal, Global Aggregate and Global Treasury indices.

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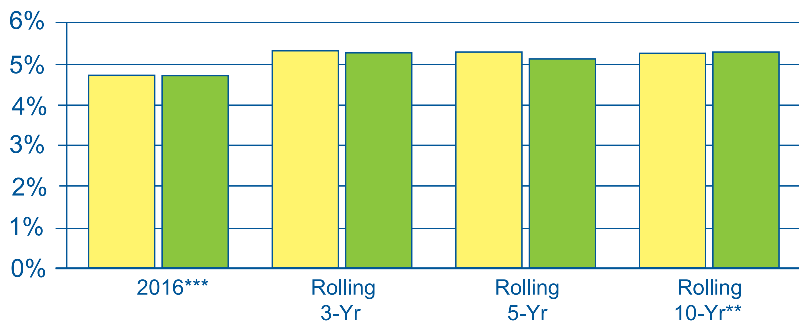
## 401(h) Health Care Trust Portfolio Asset Allocation

Favorable rulings from the Internal Revenue Service (IRS) received March 2016 allowed OPERS to consolidate health care assets from the Voluntary Employees' Beneficiary Association (VEBA) Trust and the 401(h) Health Care Trust into the 115 Health Care Trust. The VEBA Trust assets were historically included in the Defined Benefit portfolio. OPERS closed the 401(h) Health Care Trust and VEBA Trust as of June 30, 2016. Assets from these trusts transferred into the 115 Health Care Trust on July 1, 2016. For 2016, the 401(h) Health Care Trust portfolio reflects a cumulative six-month return for the period January 1, 2016 through June 30, 2016, and asset class allocations and composite benchmark indices represent the same period.

## Investment Returns

The 401(h) Health Care Trust portfolio returned 4.73% for the six months ended June 30, 2016. The overall portfolio return is compared to a composite benchmark return that could be achieved by a portfolio that is passively invested in the broad market, with percentage weights allocated to each asset class as specified in the *OPERS Statement of Investment Objectives and Policies*. The return of the policy benchmark for the six months ended June 30, 2016 was 4.72%.

## Investment Returns—Annual Rates of Return*** 401(h) Health Care Trust Portfolio*




| | 2016*** | Rolling 3-Yr | Rolling 5-Yr | Rolling 10-Yr** |
|---|---|---|---|---|
| 401(h) Health Care Trust Portfolio Returns | 4.73% | 5.33% | 5.30% | 5.27% |
| Policy Benchmark Returns | 4.72% | 5.28% | 5.13% | 5.30% |

* Annual rates of return—The 401(h) Health Care Trust portfolio return is based on a time-weighted calculation and market value-weighted calculation. The policy benchmark is derived by a market value-weighted calculation of the 401(h) Health Care Trust investments policy benchmarks. All returns are net of external manager fees, overdraft charges, debit interest, registration expenses, stamp duties and taxes spent on foreign securities.

** The 401(h) Health Care Trust portfolio was segregated from the Defined Benefit portfolio in 2005; thus, the 30-year rolling return information does not exist.

*** Returns are based on six-month cumulative returns as of June 30, 2016. The 401(h) Health Care Trust was closed as of June 30, 2016, with the assets transferring to the 115 Health Care Trust on July 1, 2016.

Investment returns for the 401(h) Health Care Trust portfolio underlying asset class composites and their respective benchmarks are shown below:

| Schedule of Investment Results (for the period ended June 30, 2016) | 401(h) Health Care Trust Portfolio | | |
|---|---|---|---|
| | 2016* | Rolling 3-Year | Rolling 5-Year |
| **Total 401(h) Health Care Trust Portfolio** | **4.73%** | **5.33%** | **5.30%** |
| **Total 401(h) Health Care Trust Portfolio Benchmark[1]** | **4.72** | **5.28** | **5.13** |
| U.S. Equity Composite | 3.31 | 10.73 | 11.33 |
| U.S. Equity Composite Benchmark | 3.62 | 11.13 | 11.60 |
| Non-U.S. Equity Composite | 0.79 | 2.63 | 1.37 |
| Non-U.S. Equity Composite Benchmark | 0.30 | 1.31 | (0.05) |
| Core Fixed Composite | 5.03 | 4.44 | 4.15 |
| Core Fixed Composite Benchmark | 5.31 | 4.06 | 3.76 |
| TIPS Composite | 6.24 | 2.34 | 2.66 |
| TIPS Composite Benchmark | 6.24 | 2.31 | 2.63 |
| High Yield Composite | 7.61 | 4.08 | 5.80 |
| High Yield Composite Benchmark | 9.06 | 4.18 | 5.84 |
| Emerging Markets Debt Composite | 10.95 | 0.34 | 1.38 |
| Emerging Markets Debt Composite Benchmark | 12.54 | 1.38 | 2.00 |
| Securitized Debt Composite | 0.16 | 10.82 | 13.48 |
| Securitized Debt Composite Benchmark | 7.09 | 6.08 | 6.52 |
| Floating Rate Debt Composite | (0.44) | 3.31 | N/A |
| Floating Rate Debt Composite Benchmark | 4.23 | 3.04 | N/A |
| Global High Yield Debt Composite | 7.46 | 3.08 | N/A |
| Global High Yield Debt Composite Benchmark | 8.73 | 4.35 | N/A |
| REITs Composite | 10.75 | 13.50 | 12.32 |
| REITs Composite Benchmark | 10.79 | 13.52 | 12.18 |
| Hedge Funds Composite | (0.96) | 2.33 | 2.75 |
| Hedge Funds Composite Benchmark | 1.74 | 2.01 | 3.98 |
| Opportunistic Composite | 5.22 | 3.26 | 1.50 |
| Opportunistic Composite Benchmark | 5.37 | 4.20 | 3.07 |
| Commodities Composite | 10.05 | (19.13) | (13.48) |
| Commodities Composite Benchmark | 9.86 | (19.81) | (14.03) |
| Cash Composite | 0.31 | 0.39 | 0.40 |
| Cash Composite Benchmark | 0.15 | 0.09 | 0.09 |
| Risk Parity Composite | 14.97 | 6.54 | N/A |
| Risk Parity Composite Benchmark | 3.86 | 6.90 | N/A |
| GTAA Composite | 0.78 | 4.25 | N/A |
| GTAA Composite Benchmark | 3.43 | 5.45 | N/A |
| U.S. Treasury Composite | 5.29 | N/A | N/A |
| U.S. Treasury Composite Benchmark | 5.37 | N/A | N/A |

*Returns are based on six-month cumulative returns as of June 30, 2016. The 401(h) Health Care Trust was closed as of June 30, 2016, with the assets transferring to the 115 Health Care Trust on July 1, 2016.

[1] **401(h) Health Care Trust Portfolio Benchmark**—The returns for this benchmark are derived from the asset class composite benchmark returns summarized in the table above, the historical asset class target allocations listed in the table on the next page, and the asset class composite benchmark indices listed in the table on page 120.

Footnotes continue on page 121.

| Historical Asset Class Target Allocations | | | | 401(h) Health Care Trust Portfolio | |
|---|---|---|---|---|---|
| Asset Class | 2016* | 2015 | 2014 | 2013 | 2012 |
| U.S. Equity | 24.7% | 24.4% | 23.4% | 23.5% | 24.6% |
| Commodities | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 |
| Opportunistic | 0.1 | 0.1 | 0.1 | 0.5 | 0.7 |
| Core Bonds | 16.6 | 16.5 | 17.3 | 17.0 | 18.8 |
| Corporate Credit | N/A | N/A | N/A | N/A | 1.0 |
| Floating Rate Debt | 0.4 | 0.5 | 0.7 | 1.0 | 0.7 |
| Global High Yield | 1.5 | 1.5 | 1.5 | 2.0 | 2.0 |
| Securitized Debt | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| TIPS | 5.0 | 5.0 | 5.0 | 3.5 | 3.5 |
| High Yield | 2.5 | 2.5 | 2.5 | 2.0 | 2.0 |
| Non-U.S. Equity | 20.2 | 20.5 | 21.5 | 24.6 | 27.0 |
| Emerging Markets Debt | 6.0 | 6.0 | 6.0 | 5.0 | 5.0 |
| REITs | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Cash Equivalents | N/A | N/A | N/A | 2.0 | 2.0 |
| Private Equity | N/A | N/A | N/A | 0.5 | 0.5 |
| Hedge Funds | 6.0 | 6.0 | 6.0 | 5.4 | 4.2 |
| Risk Parity | 5.0 | 5.0 | 5.0 | 2.0 | N/A |
| GTAA | 2.0 | 2.0 | 2.0 | 2.0 | N/A |
| U.S. Treasury | 1.0 | 1.0 | N/A | N/A | N/A |
| **Total** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

*Asset class target allocations are as of June 30, 2016.

To arrive at customized benchmark performance, the asset allocation targets are multiplied by the performance of the corresponding asset class reference indices. The asset class reference indices are specified by the Investment Policy, and are displayed below:

## Historical Asset Class Composite Benchmark Indices — 401(h) Health Care Trust Portfolio

| Asset Class Composite Benchmarks | As of December 31 | | | | |
|---|---|---|---|---|---|
| | 2016* | 2015 | 2014 | 2013 | 2012 |
| U.S. Equity | Russell 3000 Stock Index[2] | Russell 3000 Stock Index | Russell 3000 Stock Index | Russell 3000 Stock Index | Russell 3000 Stock Index |
| Commodities | S&P Goldman Sachs Commodity Index[3] | S&P Goldman Sachs Commodity Index | S&P Goldman Sachs Commodity Index | S&P Goldman Sachs Commodity Index | S&P Goldman Sachs Commodity Index |
| Opportunistic | Custom Opportunistic Benchmark[4] | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark |
| Core Bonds | Bloomberg Barclays U.S. Aggregate Index[5] | Custom Core Fixed | Custom Core Fixed | Custom Core Fixed | Barclays U.S. Aggregate Bond Index |
| Corporate Credit | N/A | N/A | N/A | N/A | Barclays U.S. Corporate Investment Grade |
| Floating Rate Debt | Credit Suisse Leveraged Loan Index[6] | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index |
| Global High Yield | Bloomberg Barclays Global High Yield[7] | Barclays Global High Yield | Barclays Global High Yield | Barclays Global High Yield | Barclays Global High Yield |
| Securitized Debt | Bloomberg Barclays CMBS Index + 2%[8] | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% |
| TIPS | Bloomberg Barclays U.S. TIPS Index[9] | Barclays U.S. TIPS Index | Barclays U.S. TIPS Index | Barclays U.S. TIPS Index | Barclays U.S. TIPS Index |
| High Yield | Bloomberg Barclays Capital U.S. Corporate High Yield[10] | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield |
| Non-U.S. Equity | Custom Non-U.S. Equity Benchmark (net)[11] | Custom Non-U.S. Equity Benchmark (net) | Custom Non-U.S. Equity Benchmark (net) | Custom Non-U.S. Equity Benchmark (net) | Custom Non-U.S. Equity Benchmark (net) |
| Emerging Markets Debt | Custom Emerging Markets Debt Benchmark[12] | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark |
| REITs | DJ U.S. Select RESI[13] | DJ U.S. Select RESI | DJ U.S. Select RESI | DJ U.S. Select RESI | DJ U.S. Select RESI |
| Cash Equivalents | 90-day U.S. Treasury Bill Index[14] | 90-day U.S. Treasury Bill Index | 90-day U.S. Treasury Bill Index | 90-day U.S. Treasury Bill Index | 90-day U.S. Treasury Bill Index |
| Private Equity | N/A | N/A | Custom Private Equity | Custom Private Equity | Russell 3000 (quarter lag) + 3% |
| Hedge Funds | Custom Hedge Funds Benchmark[15] | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark |
| Risk Parity | Custom Risk Parity Benchmark[16] | Custom Risk Parity Benchmark | Custom Risk Parity Benchmark | Custom Risk Parity Benchmark | N/A |
| GTAA | Custom GTAA Benchmark[17] | Custom GTAA Benchmark | Custom GTAA Benchmark | Custom GTAA Benchmark | N/A |
| U.S. Treasury | Bloomberg Barclays U.S. Treasury Index[18] | Barclays U.S. Treasury Index | N/A | N/A | N/A |

*Benchmarks are as of June 30, 2016.

## Footnotes for Schedule of Investment Results—401(h) Health Care Trust Portfolio

The footnotes below provide definitions for the asset class composite benchmark indices as of June 30, 2016:

[2] **Russell 3000 Stock Index**—A capitalization-weighted stock index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.

[3] **S&P Goldman Sachs Commodity Index**—Tracks general price movements and inflation in the world economy. The index is calculated primarily on a world-production weighted basis and is comprised of the principal physical commodities that are the subject of active, liquid futures markets.

[4] **Custom Opportunistic Benchmark**—Market value weight of the underlying portfolio benchmarks.

[5] **Bloomberg Barclays U.S. Aggregate Index**—A market capitalization-weighted index covering the universe of most U.S. traded investment grade bonds, excluding municipal bonds and TIPS.

[6] **Credit Suisse Leveraged Loan Index**—This Index is designed to mirror the investible universe of the U.S.-denominated leveraged loan market.

[7] **Bloomberg Barclays Global High Yield**—The Global High Yield Index represents the union of the U.S. High Yield, Pan-European High Yield, U.S. Emerging Markets High-Yield, and Pan-European Emerging Markets High Yield Indices.

[8] **Bloomberg Barclays Commercial Mortgage Backed Securities (CMBS) Index +2%**—The Barclays CMBS ERISA-Eligible Index is the ERISA-Eligible component of the Bloomberg Barclays CMBS Index. This index, which includes investment grade securities that are ERISA-Eligible under the underwriter's exemption, is the only CMBS sector that is included in the U.S. Aggregate Index.

[9] **Bloomberg Barclays U.S. TIPS Index**—This index consists of Inflation-Protection securities issued by the U.S. Treasury.

[10] **Bloomberg Barclays Capital U.S. Corporate High Yield**—Covers the universe of fixed rate, non-investment grade debt.

[11] **Custom Non-U.S. Equity Benchmark (net)**—As of June 30, 2016, blend was 55% MSCI World x U.S. (net), 31% MSCI Emerging Markets (net), 10% MSCI World x U.S. Small Cap (net), and 4% MSCI Emerging Markets Small Cap (net).

[12] **Custom Emerging Markets Debt Benchmark**—As of June 30, 2016, blend was 50% J.P. Morgan EMBI Global Index, 50% J.P. Morgan GBI-Emerging Markets Global Diversified USD Index.

[13] **DJ U.S. Select RESI**—The Dow Jones U.S. Select RESI represents equity REITs and REOCs traded in the U.S.

[14] **90-day U.S. Treasury Bill Index**—The 90-day Treasury Bill return as measured by Bank of America Merrill Lynch.

[15] **Custom Hedge Funds Benchmark**—As of June 30, 2016, blend was 20% HFRI Equity Hedge (Total) Index, 20% HFRI Macro (Total) Index, 15% HFRI Relative Value (Total) Index, 15% HFRI Fund-Weighted Composite Index, 30% HFRI Event-Driven (Total) Index.

[16] **Custom Risk Parity Benchmark**—Market value weight of the underlying portfolio benchmarks.

[17] **Custom Global Tactical Asset Allocation (GTAA) Benchmark**—Market value weight of the underlying portfolio benchmarks.

[18] **Bloomberg Barclays U.S. Treasury Index**—Is designed to measure U.S. dollar-denominated, fixed-rate, nominal debt issued by the U.S. Treasury. Treasury bills are excluded, but are part of a separate Short Treasury index. Separate Trading of Registered Interest and Principal of Securities (STRIPS) are excluded from the index. The U.S. Treasury index is a component of the U.S. Aggregate, U.S. Universal, Global Aggregate and Global Treasury indices.

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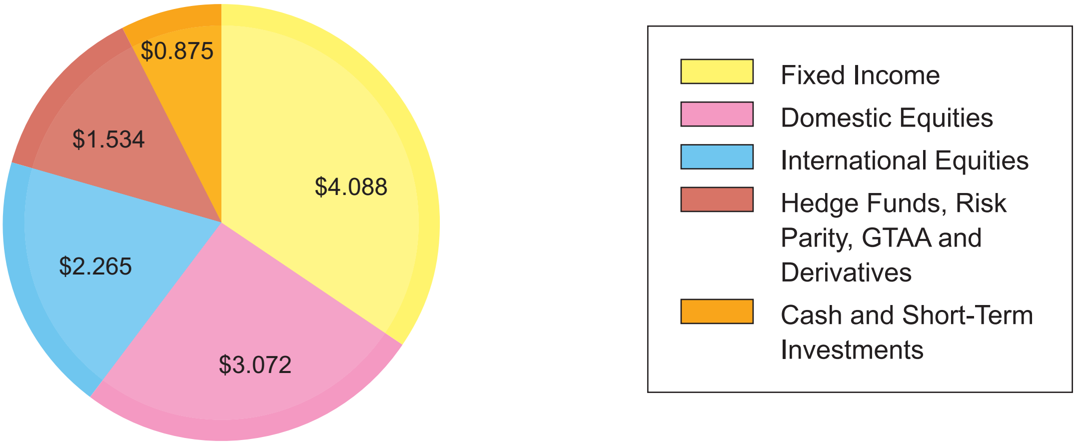
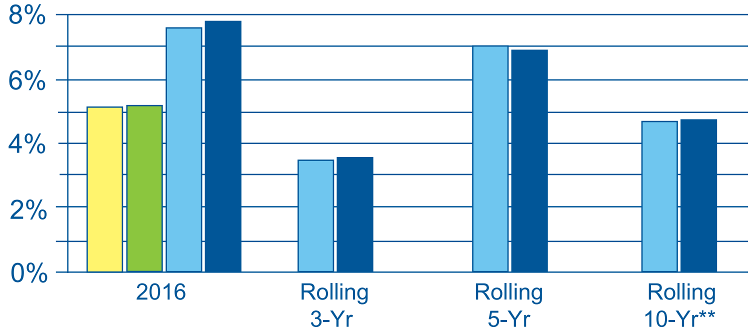
## 115 Health Care Trust Portfolio Asset Allocation (as of December 31, 2016, $ in billions)




## Investment Returns

The 401(h) Health Care Trust portfolio was transferred to the 115 Health Care Trust portfolio on July 1, 2016. Consequently, the returns reflected below include a combined December 31, 2016 return for the full-year return on the 115 Health Care Trust assets, combined with the six-month return of the 401(h) Health Care Trust assets. The 115 Health Care Trust portfolio returned 5.11% in 2016, and the combined 115 Health Care Trust and 401(h) Health Care Trust, for the full year, returned 7.55% in 2016. The overall returns are compared to a composite benchmark return that could be achieved by a portfolio that is passively invested in the broad market, with percentage weights allocated to each asset class as specified in the *OPERS Statement of Investment Objectives and Policies*. The return of the policy benchmark for the 115 Health Care Trust portfolio for 2016 was 5.14%, and the combined 115 Health Care Trust and 401(h) Health Care Trust for the full year 2016 was 7.75%.

## Investment Returns—Annual Rates of Return — 115 Health Care Trust Portfolio*




| | 2016 | Rolling 3-Yr | Rolling 5-Yr | Rolling 10-Yr** |
|---|---|---|---|---|
| 115 Health Care Trust Portfolio Return*** | 5.11% | N/A | N/A | N/A |
| 115 Policy Benchmark Return*** | 5.14% | N/A | N/A | N/A |
| Combined 401(h) and 115 Trust Portfolio Returns**** | 7.55% | 3.45% | 6.99% | 4.65% |
| Combined Policy Benchmark Returns**** | 7.75% | 3.53% | 6.88% | 4.70% |

* Annual rates of return—The 115 Health Care Trust portfolio return is based on a time-weighted calculation and market value-weighted calculation. The policy benchmark is derived by a market value-weighted calculation of the 115 Health Care Trust investment policy benchmarks. All returns are net of external manager fees, overdraft charges, debit interest, registration expenses, stamp duties and taxes spent on foreign securities.

** The 401(h) Health Care Trust portfolio was segregated from the Defined Benefit portfolio in 2005; thus, the 30-year rolling return information does not exist.

*** The 115 Health Care Trust portfolio was established September 2014; thus, the 3-year, 5-year, 10-year, and 30-year rolling returns information does not exist.

**** The combined portfolio returns are combined returns of the 401(h) Health Care Trust portfolio (through June 30, 2016) and the 115 Health Care Trust portfolio for 2016.

Investment returns for the 115 Health Care Trust portfolio underlying asset class composites and their respective benchmarks are shown below:

| Schedule of Investment Results (for the year ended December 31, 2016) | 115 Health Care Trust Portfolio* | | |
|---|---|---|---|
| | 2016 | Rolling 3-Year | Rolling 5-Year |
| **Total 115 Health Care Trust Portfolio** | **5.11%** | **N/A** | **N/A** |
| **Total 115 Health Care Trust Portfolio Benchmark[1]** | **5.14** | **N/A** | **N/A** |
| U.S. Equity Composite | 12.00 | N/A | N/A |
| U.S. Equity Composite Benchmark | 12.74 | N/A | N/A |
| Non-U.S. Equity Composite | 5.41 | N/A | N/A |
| Non-U.S. Equity Composite Benchmark | 5.54 | N/A | N/A |
| Core Fixed Composite | 2.66 | N/A | N/A |
| Core Fixed Composite Benchmark | 2.65 | N/A | N/A |
| TIPS Composite | 4.69 | N/A | N/A |
| TIPS Composite Benchmark | 4.68 | N/A | N/A |
| High Yield Composite | 14.09 | N/A | N/A |
| High Yield Composite Benchmark | 17.13 | N/A | N/A |
| Emerging Markets Debt Composite | 10.50 | N/A | N/A |
| Emerging Markets Debt Composite Benchmark | 10.18 | N/A | N/A |
| Securitized Debt Composite*** | (0.97) | N/A | N/A |
| Securitized Debt Composite Benchmark*** | (1.14) | N/A | N/A |
| Floating Rate Debt Composite*** | 0.60 | N/A | N/A |
| Floating Rate Debt Composite Benchmark*** | 5.42 | N/A | N/A |
| Global High Yield Debt Composite*** | 4.91 | N/A | N/A |
| Global High Yield Debt Composite Benchmark*** | 5.10 | N/A | N/A |
| REITs Composite | 6.70 | N/A | N/A |
| REITs Composite Benchmark | 6.65 | N/A | N/A |
| Hedge Funds Composite | 3.38 | N/A | N/A |
| Hedge Funds Composite Benchmark | 6.49 | N/A | N/A |
| Opportunistic Composite | 0.89 | N/A | N/A |
| Opportunistic Composite Benchmark | 1.04 | N/A | N/A |
| Commodities Composite | 11.92 | N/A | N/A |
| Commodities Composite Benchmark | 11.37 | N/A | N/A |
| Cash Composite** | 0.74 | N/A | N/A |
| Cash Composite Benchmark** | 0.33 | N/A | N/A |
| Risk Parity Composite | 15.51 | N/A | N/A |
| Risk Parity Composite Benchmark | 7.00 | N/A | N/A |
| GTAA Composite | 6.58 | N/A | N/A |
| GTAA Composite Benchmark | 5.77 | N/A | N/A |
| U.S. Treasury Composite*** | (4.08) | N/A | N/A |
| U.S. Treasury Composite Benchmark*** | (4.11) | N/A | N/A |
| Short-Term Liquidity Composite** | (4.23) | N/A | N/A |
| Short-Term Liquidity Composite Benchmark** | 0.33 | N/A | N/A |

* The 115 Health Care Trust portfolio was established in September 2014; thus, the 3-year and 5-year rolling returns information does not exist.

** Cash and Short-Term Liquidity composites have a zero allocation but can hold residual cash balances of the 115 Health Care Trust portfolio. This can result in residual performance that does not affect the overall 115 Health Care Trust portfolio.

*** Returns are six-month cumulative returns (July 2016—December 2016), post transfer of 401(h) Health Care Trust assets into the 115 Health Care Trust on July 1, 2016.

[1] **115 Health Care Trust Portfolio Benchmark**—The returns for this benchmark are derived from the asset class composite benchmark returns summarized in the table above, the historical asset class target allocations listed in the table on the next page, and the asset class composite benchmark indicies listed in the table on page 126.

Footnotes continue on page 127.

| Historical Asset Class Target Allocations | | | 115 Health Care Trust Portfolio |
|---|---|---|---|
| Asset Class | 2016*** | 2015** | 2014* |
| U.S. Equity | 24.5% | 9.8% | 23.4% |
| Commodities | 2.0 | 1.0 | 2.0 |
| Opportunistic | 0.1 | 0.1 | 0.1 |
| Core Bonds | 16.8 | 7.0 | 17.3 |
| Floating Rate Debt | 0.2 | N/A | 0.7 |
| Global High Yield | 1.5 | N/A | 1.5 |
| Securitized Debt | 1.0 | N/A | 1.0 |
| TIPS | 5.0 | 2.0 | 5.0 |
| High Yield | 2.5 | 1.0 | 2.5 |
| Non-U.S. Equity | 20.4 | 8.1 | 21.5 |
| Emerging Markets Debt | 6.0 | 2.0 | 6.0 |
| REITs | 6.0 | 3.0 | 6.0 |
| Hedge Funds | 6.0 | 3.0 | 6.0 |
| Risk Parity | 5.0 | 3.0 | 5.0 |
| GTAA | 2.0 | 1.0 | 2.0 |
| U.S. Treasury | 1.0 | N/A | N/A |
| Short-Term Liquidity | N/A | 59.0 | N/A |
| **Total** | **100.0%** | **100.0%** | **100.0%** |

* Since the 115 Health Care Trust portfolio was established in 2014, this column represents average target allocations that reflect adjustments during implementation of the 115 Health Care Trust portfolio. Information prior to 2014 does not exist.

** The target allocation for 2015 reflects a change approved by the Board effective October 1, 2015. For the first nine months of 2015, the target allocation was the same as the 401(h) Health Care Trust portfolio.

*** With the transfer of the 401(h) Health Care Trust assets to the 115 Health Care Trust on July 1, 2016, the Board approved changing the target allocation for the 115 Health Care Trust to be the same as the target allocation for the 401(h) Health Care Trust prior to June 30, 2016.

To arrive at customized benchmark performance, the asset allocation targets are multiplied by the performance of the corresponding asset class reference indices. The asset class reference indices are specified by the Investment Policy, and are displayed below:

## Historical Asset Class Composite Benchmark Indices — 115 Health Care Trust Portfolio*

| Asset Class Composite Benchmarks | As of December 31 | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| U.S. Equity | Russell 3000 Stock Index[2] | Russell 3000 Stock Index | Russell 3000 Stock Index |
| Commodities | S&P Goldman Sachs Commodity Index[3] | S&P Goldman Sachs Commodity Index | S&P Goldman Sachs Commodity Index |
| Opportunistic | Custom Opportunistic Benchmark[4] | Custom Opportunistic Benchmark | Custom Opportunistic Benchmark |
| Core Bonds | Bloomberg Barclays U.S. Aggregate Index[5] | Custom Core Fixed | Custom Core Fixed |
| Floating Rate Debt | Credit Suisse Leveraged Loan Index[6] | Credit Suisse Leveraged Loan Index | Credit Suisse Leveraged Loan Index |
| Global High Yield | Bloomberg Barclays Global High Yield[7] | Barclays Global High Yield | Barclays Global High Yield |
| Securitized Debt | Bloomberg Barclays CMBS Index + 2%[8] | Barclays CMBS Index + 2% | Barclays CMBS Index + 2% |
| TIPS | Bloomberg Barclays U.S. TIPS Index[9] | Barclays U.S. TIPS Index | Barclays U.S. TIPS Index |
| High Yield | Bloomberg Barclays Capital U.S. Corporate High Yield[10] | Barclays Capital U.S. Corporate High Yield | Barclays Capital U.S. Corporate High Yield |
| Non-U.S. Equity | Custom Non-U.S. Equity Benchmark (net)[11] | Custom Non-U.S. Equity Bench-mark (net) | Custom Non-U.S. Equity Bench-mark (net) |
| Emerging Markets Debt | Custom Emerging Markets Debt Benchmark[12] | Custom Emerging Markets Debt Benchmark | Custom Emerging Markets Debt Benchmark |
| REITs | DJ U.S. Select RESI[13] | DJ U.S. Select RESI | DJ U.S. Select RESI |
| Hedge Funds | Custom Hedge Funds Benchmark[14] | Custom Hedge Funds Benchmark | Custom Hedge Funds Benchmark |
| Risk Parity | Custom Risk Parity Benchmark[15] | Custom Risk Parity Benchmark | Custom Risk Parity Benchmark |
| GTAA | Custom GTAA Benchmark[16] | Custom GTAA Benchmark | Custom GTAA Benchmark |
| U.S. Treasury | Bloomberg Barclays U.S. Treasury Index[17] | Barclays U.S. Treasury Index | N/A |
| Short-Term Liquidity | 90-day U.S. Treasury Bill Index[18] | 90-day U.S. Treasury Bill Index | N/A |

*Since the 115 Health Care Trust portfolio was established in 2014, information prior to 2014 does not exist.

### Footnotes for Schedule of Investment Results—115 Health Care Trust Portfolio

The footnotes below provide definitions for the asset class composite benchmark indices as of December 31, 2016:

[2] **Russell 3000 Stock Index**—A capitalization-weighted stock index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.

[3] **S&P Goldman Sachs Commodity Index**—Tracks general price movements and inflation in the world economy. The index is calculated primarily on a world-production weighted basis and is comprised of the principal physical commodities that are the subject of active, liquid futures markets.

[4] **Custom Opportunistic Benchmark**—Market value weight of the underlying portfolio benchmarks.

[5] **Bloomberg Barclays U.S. Aggregate Index**—A market capitalization-weighted index covering the universe of most U.S. traded investment grade bonds, excluding municipal bonds and TIPS.

[6] **Credit Suisse Leveraged Loan Index**—This index is designed to mirror the investible universe of the U.S.-denominated leveraged loan market.

[7] **Bloomberg Barclays Global High Yield**—The Global High Yield Index represents the union of the U.S. High Yield, Pan-European High Yield, U.S. Emerging Markets High-Yield, and Pan-European Emerging Markets High Yield Indices.

[8] **Bloomberg Barclays Commercial Mortgage Backed Securities (CMBS) Index +2%**—The Barclays CMBS ERISA-Eligible Index is the ERISA-Eligible component of the Bloomberg Barclays CMBS Index. This index, which includes investment grade securities that are ERISA-Eligible under the underwriter's exemption, is the only CMBS sector that is included in the U.S. Aggregate Index.

[9] **Bloomberg Barclays U.S. TIPS Index**—This index consists of Inflation-Protection securities issued by the U.S. Treasury.

[10] **Bloomberg Barclays Capital U.S. Corporate High Yield**—Covers the universe of fixed rate, non-investment grade debt.

[11] **Custom Non-U.S. Equity Benchmark (net)**—As of December 31, 2016, blend was 55% MSCI World x U.S. (net), 31% MSCI Emerging Markets (net), 10% MSCI World x U.S. Small Cap (net), and 4% MSCI Emerging Markets Small Cap (net).

[12] **Custom Emerging Markets Debt Benchmark**—As of December 31, 2016, blend was 50% J.P. Morgan EMBI Global Index, 50% J.P. Morgan GBI-Emerging Markets Global Diversified USD Index.

[13] **DJ U.S. Select RESI**—The Dow Jones U.S. Select RESI represents equity REITs and REOCs traded in the U.S.

[14] **Custom Hedge Funds Benchmark**—As of December 31, 2016, blend was 20% HFRI Equity Hedge (Total) Index, 20% HFRI Macro (Total) Index, 15% HFRI Relative Value (Total) Index, 15% HFRI Fund Weighted Composite Index, 30% HFRI Event-Driven (Total) Index.

[15] **Custom Risk Parity Benchmark**—Market value weight of the underlying portfolio benchmarks.

[16] **Custom Global Tactical Asset Allocation (GTAA) Benchmark**—Market value weight of the underlying portfolio benchmarks.

[17] **Bloomberg Barclays U.S. Treasury Index**—Is designed to measure U.S. dollar-denominated, fixed-rate, nominal debt issued by the U.S. Treasury. Treasury bills are excluded, but are part of a separate Short Treasury index. Separate Trading of Registered Interest and Principal of Securities (STRIPS) are excluded from the index. The U.S. Treasury index is a component of the U.S. Aggregate, U.S. Universal, Global Aggregate and Global Treasury indices.

[18] **90-day U.S. Treasury Bill Index**—The 90-day Treasury Bill return as measured by Bank of America Merrill Lynch.

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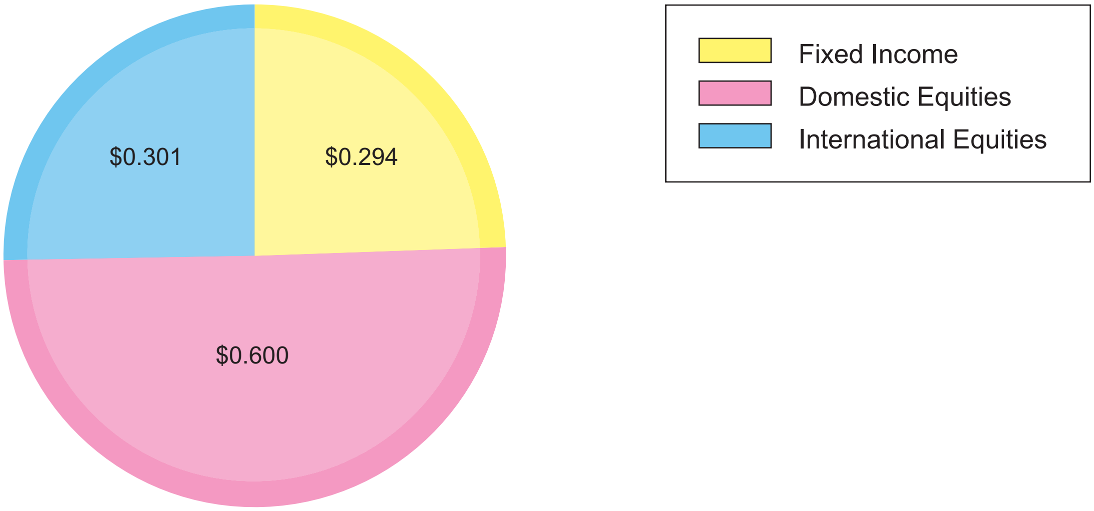
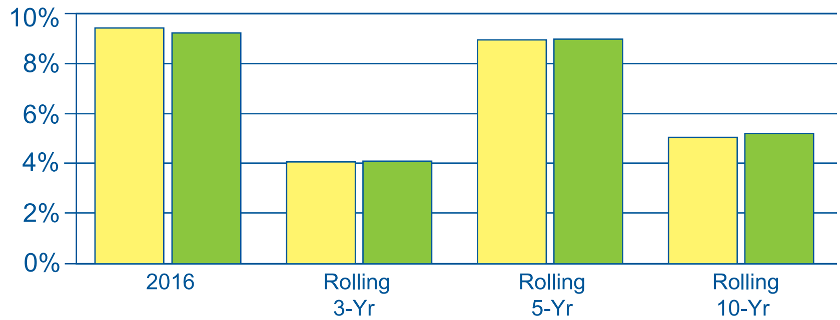
## Defined Contribution Portfolio Asset Allocation (as of December 31, 2016, $ in billions)




## Investment Returns

The Defined Contribution portfolio returned 9.51% in 2016. The portfolio composite is derived from the individual investment option returns and their actual year-end fair values. Members may not invest in this portfolio composite, but may invest in the individual investment options as they choose. The returns for the investment options, and their respective indices, are shown on the following page.

## Investment Returns—Annual Rates of Return — Defined Contribution Portfolio*




| | 2016 | Rolling 3-Yr | Rolling 5-Yr | Rolling 10-Yr |
|---|---|---|---|---|
| Defined Contribution Portfolio Returns | 9.51% | 4.11% | 9.03% | 5.10% |
| Policy Benchmark Returns | 9.31% | 4.14% | 9.06% | 5.40% |

* Annual rates of return—The Defined Contribution portfolio return is the result of the returns generated by defined contribution investments based on a combination of time-weighted and market value-weighted calculations. The defined contribution plans began in 2003; thus, 30-year return information does not exist.

Investment returns for the Defined Contribution portfolio underlying asset class composites and their respective benchmarks are shown below:

**Schedule of Investment Results** (for the year ended December 31, 2016) **Defined Contribution Portfolio**

| | 2016 | Rolling 3-Year | Rolling 5-Year |
|---|---|---|---|
| Target Payout Fund | 4.76% | 2.44% | 4.07% |
| Target Payout Fund Index[1] | 4.74 | 2.52 | 4.22 |
| Target 2020 Fund | 6.55 | 2.95 | 6.57 |
| Target 2020 Fund Index[2] | 6.06 | 2.91 | 6.41 |
| Target 2025 Fund | 7.50 | 2.93 | 7.78 |
| Target 2025 Fund Index[3] | 7.36 | 3.02 | 7.73 |
| Target 2030 Fund | 9.17 | 3.15 | 8.53 |
| Target 2030 Fund Index[4] | 8.55 | 3.07 | 8.40 |
| Target 2035 Fund | 9.46 | 3.09 | 8.72 |
| Target 2035 Fund Index[5] | 9.15 | 3.13 | 8.63 |
| Target 2040 Fund | 9.50 | 3.04 | 8.85 |
| Target 2040 Fund Index[6] | 9.26 | 3.12 | 8.86 |
| Target 2045 Fund | 9.98 | 3.18 | 9.25 |
| Target 2045 Fund Index[7] | 9.54 | 3.18 | 9.14 |
| Target 2050 Fund | 9.96 | 3.12 | 9.25 |
| Target 2050 Fund Index[8] | 9.65 | 3.12 | 9.14 |
| Target 2055 Fund | 9.99 | 3.12 | 9.21 |
| Target 2055 Fund Index[9] | 9.65 | 3.12 | 9.14 |
| Target 2060 Fund | 10.24 | N/A* | N/A* |
| Target 2060 Fund Index[10] | 9.65 | N/A* | N/A* |
| Stable Value Index Portfolio | 1.81 | 1.62 | 1.64 |
| Stable Value Index Benchmark[11] | 1.89 | 1.81 | 2.56 |
| Bond Index Portfolio | 2.63 | 3.05 | 2.24 |
| Bloomberg Barclays U.S. Aggregate Index Benchmark[12] | 2.65 | 3.03 | 2.23 |
| U.S. Stock Index Portfolio | 12.73 | 8.42 | 14.63 |
| Russell 3000 Stock Index Benchmark[13] | 12.73 | 8.43 | 14.67 |
| Large Cap Index Portfolio | 11.99 | 8.53 | 14.62 |
| Russell 1000 Stock Index Benchmark[14] | 12.05 | 8.59 | 14.69 |
| Small Cap Index Portfolio | 21.22 | 6.69 | 14.41 |
| Russell 2000 Index Benchmark[15] | 21.31 | 6.74 | 14.46 |
| Non-U.S. Stock Index Portfolio | 5.28 | (1.65) | 5.14 |
| MSCI ACWI x U.S. Index Benchmark[16] | 4.49 | (1.78) | 5.00 |

* Target 2060 Fund was launched in December 2015; thus, the 3-year and 5-year rolling returns information does not exist.

Footnotes continue on page 131.

## Footnotes for Schedule of Investment Results—Defined Contribution Portfolio

The footnotes below provide definitions for the asset class composite benchmark indices as of December 31, 2016:

[1] **Target Payout Fund Index**—Blend was 25% Bloomberg Barclays Government 1-3 Year Index, 32% Bloomberg Barclays U.S. Aggregate, 10% Russell 1000, 5% Russell 2000, 15% MSCI ACWI x U.S., 13% Bloomberg Barclays U.S. TIPS.

[2] **Target 2020 Fund Index**—Blend was 9% Bloomberg Barclays Government 1-3 Year Index, 38% Bloomberg Barclays U.S. Aggregate, 12% Russell 1000, 9% Russell 2000, 21% MSCI ACWI x U.S., 11% Bloomberg Barclays U.S. TIPS.

[3] **Target 2025 Fund Index**—Blend was 1% Bloomberg Barclays Government 1-3 Year Index, 36% Bloomberg Barclays U.S. Aggregate, 16% Russell 1000, 13% Russell 2000, 30% MSCI ACWI x U.S., 4% Bloomberg Barclays U.S. TIPS.

[4] **Target 2030 Fund Index**—Blend was 21% Bloomberg Barclays U.S. Aggregate, 20% Russell 1000, 17% Russell 2000, 38% MSCI ACWI x U.S., 4% Bloomberg Barclays U.S. Government/Credit.

[5] **Target 2035 Fund Index**—Blend was 11% Bloomberg Barclays U.S. Aggregate, 22% Russell 1000, 19% Russell 2000, 41% MSCI ACWI x U.S., 7% Bloomberg Barclays U.S. Government/Credit.

[6] **Target 2040 Fund Index**—Blend was 8% Bloomberg Barclays U.S. Aggregate, 23% Russell 1000, 19% Russell 2000, 42% MSCI ACWI x U.S., 8% Bloomberg Barclays U.S. Government/Credit.

[7] **Target 2045 Fund Index**—Blend was 7% Bloomberg Barclays U.S. Aggregate, 24% Russell 1000, 20% Russell 2000, 43% MSCI ACWI x U.S., 6% Bloomberg Barclays U.S. Government/Credit.

[8] **Target 2050 Fund Index**—Blend was 5% Bloomberg Barclays U.S. Aggregate, 25% Russell 1000, 20% Russell 2000, 45% MSCI ACWI x U.S., 5% Bloomberg Barclays U.S. Government/Credit.

[9] **Target 2055 Fund Index**—Blend was 5% Bloomberg Barclays U.S. Aggregate, 25% Russell 1000, 20% Russell 2000, 45% MSCI ACWI x U.S., 5% Bloomberg Barclays U.S. Government/Credit.

[10] **Target 2060 Fund Index**—Blend was 5% Bloomberg Barclays U.S. Aggregate, 25% Russell 1000, 20% Russell 2000, 45% MSCI ACWI x U.S., 5% Bloomberg Barclays U.S. Government/Credit.

[11] **Stable Value Index Benchmark**—Blend was 15% Bloomberg Barclays Aggregate Index, 45% Bloomberg Barclays 1-5 Year Government/Credit Bond, 35% Bloomberg Barclays Intermediate Government/Credit, 5% Bank of America Merrill Lynch 3-Month U.S. Treasury Bill.

[12] **Bloomberg Barclays U.S. Aggregate Index Benchmark**—A market value-weighted index consisting of Bloomberg Barclays Corporate, Government and Mortgage-Backed Indices. This index is the broadest available measure of the aggregate U.S. fixed income market.

[13] **Russell 3000 Stock Index Benchmark**—A capitalization-weighted stock index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.

[14] **Russell 1000 Stock Index Benchmark**—A capitalization-weighted stock index consisting of the 1,000 largest companies in the Russell 3000 Index, which represents approximately 92% of the total market capitalization of the Russell 3000 Index.

[15] **Russell 2000 Stock Index Benchmark**—A capitalization-weighted stock index consisting of the 2,000 smallest companies in the Russell 3000 Index, which represents approximately 8% of the total market capitalization of the Russell 3000 Index.

[16] **MSCI All Country World x U.S. Index (MSCI ACWI x U.S. Benchmark)**—A capitalization-weighted index of stocks representing 45 developed and emerging country markets, excluding the U.S. market.

# Top 10 Ohio Companies

The 10 largest direct investments in the state of Ohio, measured at the fair value of our investment in the securities of firms headquartered in Ohio, totaled approximately $0.3 billion at the end of the year.

The 10 largest indirect investments, measured at the fair value of our investment in the securities of 10 companies with the largest employment presence in the state, totaled approximately $0.9 billion. Employment presence is measured by the number of persons employed at a business located in Ohio, as defined by the Office of Strategic Research, Ohio Department of Development. Firms with the largest employment presence in Ohio employed approximately 200,000 people in Ohio.

## Top Ohio Holdings (for the year ended December 31, 2016)

| Direct | | Indirect | | |
|---|---|---|---|---|
| Largest Firms Headquartered In Ohio | Fair Value | Firms with Largest Employment Presence | Ohio Employment Estimated Headcount | Fair Value |
| Procter & Gamble Co. | $151,669,053 | Wal-Mart Stores Inc. | 46,600 | $74,785,974 |
| Welltower Inc. | 37,932,444 | Kroger Co. | 41,900 | 33,992,523 |
| Kroger Co. | 33,992,523 | JPMorgan Chase & Co. | 21,000 | 225,544,975 |
| American Electric Power Co. Inc. | 21,373,976 | General Electric Co. | 16,000 | 207,307,344 |
| Eaton Corp. Plc. | 21,098,329 | Honda Motor Co. Ltd. | 14,300 | 12,478,051 |
| Cardinal Health Inc. | 17,350,456 | United Parcel Service Inc. | 13,500 | 56,037,637 |
| L Brands Inc. | 16,790,517 | Home Depot Inc. | 12,000 | 119,836,682 |
| Sherwin Williams Co. | 14,937,107 | Lowe's Companies Inc. | 11,760 | 45,843,027 |
| Marathon Petroleum Corp. | 12,117,030 | Bob Evans Farm Inc. | 11,400 | 204,699 |
| JM Smucker Co. | 11,676,639 | Procter & Gamble Co. | 10,700 | 151,669,053 |
| **Total** | **$338,938,074** | **Total** | **199,160** | **$927,699,965** |

The investment and fiduciary responsibilities of the Board are governed by ORC 145.11 and the requirements of the *OPERS Code of Ethics and Personal Trading Policy*, and applicable state statutes. The Board discharges its duties solely in the interest of participants and beneficiaries, for the exclusive purpose of providing benefits and defraying reasonable expenses of administering OPERS, with the care, skill and diligence of a prudent person, by diversifying the investments.

The Board reviews all policies and approves changes or additions as appropriate. The Investment staff fulfills the mandates and obligations described in the policies and recommends changes to the Board, as appropriate. The following policies reflect those in place for the 2016 fiscal year.

The Board manages the assets in a fashion that reflects the OPERS unique liabilities, funding resources and portfolio size, by incorporating accepted investment theory and reliable, empirical evidence. The Board ensures adequate risk control of the Defined Benefit, 401(h) Health Care Trust (prior to July 1, 2016), 115 Health Care Trust and Defined Contribution portfolios through diversification, portfolio guidelines, risk budgeting, compliance and monitoring.

The purpose of the OPERS policies is to provide a broad strategic framework for managing portfolios. Approved Board asset class policies are summarized beginning on page 141 and are posted on the OPERS website, www.OPERS.org, where they can be viewed in their entirety.

## Rebalancing

Markets are dynamic and portfolios must be reviewed regularly to ensure holdings remain within their strategic asset allocations. To ensure conformance with the asset allocation policies, the Defined Benefit, Defined Contribution, 401(h) Health Care Trust (prior to July 1, 2016) and 115 Health Care Trust portfolios are reviewed daily for compliance within the target asset allocation percentages, specified by portfolio, reasonable costs and best interest of OPERS.

The Board establishes and reviews asset allocation targets, ranges and investment policies against capital market expectations, the investment landscape and an annual actuarial assessment by the actuarial consultant of each portfolio. A comprehensive strategic asset allocation review is completed approximately every five years. The review helps to assess the continuing appropriateness of the asset allocation policy and could include an asset/liability study, required funding, actuarial interest rate assumption and funded status of liabilities. Additionally, the review may also include a study of portfolio design and comparisons with peers. A review was just completed in 2016, in conjunction with an actuarial five-year experience study, that resulted in no changes to the strategic asset allocation of the portfolios. As part of the experience study, the Board approved a decrease in the actuarial interest rate, from 8.0% to 7.5%, in 2016.

## Defined Benefit Investment Policies

### Investment Objective

The primary objective of the Defined Benefit portfolio is to secure statutory benefits provided by OPERS and to keep OPERS costs reasonable for employees and employers.

### Asset Allocation and Performance Objectives

The Board asset allocation policy establishes a framework that has a high likelihood of realizing the OPERS long-term investment objectives. The Defined Benefit portfolio performance objectives are to exceed the OPERS performance benchmark, net of investment expenses over five-year periods; and exceed the actuarial interest rate, recently lowered to 7.5% from 8.0%, over a reasonably longer time horizon.

The Board sets target allocations (targets) to various asset classes that are designed to meet the OPERS long-term investment objectives. Targets for the Public Equity and Fixed Income asset classes are 39% and 23%, respectively, with the remaining 31%, 5% and 2% allocated to Alternatives (Private Equity, Real Estate, Commodities, Hedge Funds, and Opportunistic), Risk Parity and Global Tactical Asset Allocation (GTAA), respectively. The Board also establishes a band of minimum and maximum allowable allocations, or ranges, surrounding each asset class target. The purpose of ranges is to appropriately and cost-effectively balance the Board's investment policy with the investment strategies pursued over shorter time periods. The following table lists the Defined Benefit portfolio target allocations, ranges and performance benchmarks for each asset class:

## Defined Benefit Asset Allocation

| Asset Class | Target Allocation | Range | Benchmark Index |
|---|---|---|---|
| **Public Equity** | **39.0%** | **31 to 47%** | |
| U.S. Equity | Custom Allocation* | +/- 5% | Russell 3000 Stock Index |
| Non-U.S. Equity | Custom Allocation* | +/- 5 | Custom benchmark of the following indices:<br>55% MSCI World Index x U.S. Standard<br>10% MSCI World Index x U.S. Small Cap<br>31% MSCI Emerging Markets Standard<br>4% MSCI Emerging Markets Small Cap |
| **Fixed Income** | **23.0%** | **16 to 30%** | |
| Core Fixed | 10.0 | 7 to 13 | Bloomberg Barclays U.S. Aggregate Index |
| Emerging Markets Debt | 6.0 | 2 to 8 | Custom benchmark of the following indices:<br>50% J.P. Morgan Emerging Markets Bond Index (EMBI) Global<br>50% J.P. Morgan Government Bond Index (GBI)—Emerging Markets Global Diversified |
| Floating Rate Debt | 0.0 | 0 to 2 | Credit Suisse Leveraged Loan Index |
| Securitized Debt | 1.0 | 0 to 2 | Non-Agency CMBS component of Bloomberg Barclays U.S. Aggregate Index plus 200 bps |
| TIPS | 1.0 | 0 to 2 | Bloomberg Barclays U.S. TIPS Index |
| High Yield | 3.0 | 0 to 5 | Bloomberg Barclays U.S. High Yield Index |
| Global High Yield | 1.0 | 0 to 2 | Bloomberg Barclays Global High Yield Index |
| U.S. Treasury | 1.0 | 0 to 2 | Bloomberg Barclays U.S. Treasury Index |
| **Alternatives** | **31.0%** | **22 to 40%** | |
| Private Equity | 10.0 | 5 to 15 | State Street Private Equity Index (SSPEI) |
| Real Estate | 10.0 | 5 to 15 | Net NFI-ODCE plus 85 basis points |
| Hedge Funds | 8.0 | 4 to 12 | Custom benchmark using the HFRI Single Strategy Indices weighted by the target allocations listed in the Annual Investment Plan |
| Opportunistic | 2.0 | 0 to 4 | Market value weight of underlying portfolio benchmarks |
| Commodities | 1.0 | 0 to 2 | S&P GSCI Total Return Index |
| **Risk Parity** | **5.0%** | **2 to 8%** | Market value weight of underlying portfolio benchmarks |
| **GTAA** | **2.0%** | **0 to 4%** | Market value weight of underlying portfolio benchmarks |
| **Operating Cash** | **0.0%** | **0 to 3%** | N/A |
| **Total** | **100.0%** | | |

* The custom allocation is reset quarterly based on the U.S. to Non-U.S. equity ratio as measured by the market capitalization of the MSCI ACWI-Investible Market Index.

## 401(h) Health Care Trust Investment Policies

The 401(h) Health Care Trust closed as of June 30, 2016. Assets transferred to the 115 Health Care Trust on July 1, 2016, due to favorable IRS rulings in March 2016 that allowed the 401(h) Health Care Trust assets to be consolidated into the 115 Health Care Trust. The return for the 401(h) Health Care Trust portfolio for the six-month period ended June 30, 2016 is reported in this Investment section.

### Investment Objective

The primary objective of the 401(h) Health Care Trust portfolio was to provide funding for discretionary health care for eligible members over a solvency period as defined by the Board. The assets of the 401(h) Health Care Trust portfolio were invested with the objectives of: a) preservation of capital, and b) earning a reasonable return.

### Asset Allocation and Performance Objectives

The approved asset allocation policy established a framework that had a high likelihood of realizing the long-term investment objective. The 401(h) Health Care Trust portfolio performance objective was to exceed the established performance benchmark, net of investment expenses. The table below sets forth targets, ranges and performance benchmarks for each asset class as of June 30, 2016:

**401(h) Health Care Trust Asset Allocation***

| Asset Class | Target Allocation | Range | Benchmark Index |
|---|---|---|---|
| **Public Equity** | **43.0%** | **34 to 52%** | |
| U.S. Equity | Custom Allocation* | +/- 5% | Russell 3000 Stock Index |
| Non-U.S. Equity | Custom Allocation* | +/- 5% | Custom benchmark of the following indices:<br>55% MSCI World Index x U.S. Standard<br>10% MSCI World Index x U.S. Small Cap<br>31% MSCI Emerging Markets Standard<br>4% MSCI Emerging Markets Small Cap |
| **Fixed Income** | **34.0%** | **24 to 44%** | |
| Core Fixed | 17.0 | 12 to 22 | Bloomberg Barclays U.S. Aggregate Index |
| Emerging Markets Debt | 6.0 | 2 to 8 | Custom benchmark of the following indices:<br>50% J.P. Morgan Emerging Markets Bond Index Global<br>50% J.P. Morgan Government Bond Index-Emerging Markets Global Diversified |
| Floating Rate Debt | 0.0 | 0 to 2 | Credit Suisse Leveraged Loan Index |
| Securitized Debt | 1.0 | 0 to 2 | Non-Agency CMBS component of Bloomberg Barclays U.S. Aggregate Index plus 200 bps |
| TIPS | 5.0 | 2 to 8 | Bloomberg Barclays U.S. TIPS Index |
| High Yield | 2.5 | 0 to 5 | Bloomberg Barclays U.S. High Yield Index |
| Global High Yield | 1.5 | 0 to 4 | Bloomberg Barclays Global High Yield Index |
| U.S. Treasury | 1.0 | 0 to 2 | Bloomberg Barclays U.S. Treasury Index |
| **Alternatives** | **16.0%** | **11 to 21%** | |
| REITs | 6.0 | 3 to 9 | Dow Jones U.S. Select RESI Total Return |
| Hedge Funds | 6.0 | 3 to 9 | Custom benchmark using the HFRI single strategy indices weighted by the target allocations listed in the Annual Investment Plan |
| Opportunistic | 2.0 | 0 to 4 | Market value weight of underlying portfolio benchmarks |
| Commodities | 2.0 | 0 to 4 | S&P GSCI Total Return Index |
| **Risk Parity** | **5.0%** | **2 to 8%** | Market value weight of underlying portfolio benchmarks |
| **GTAA** | **5.0%** | **0 to 4%** | Market value weight of underlying portfolio benchmarks |
| **Operating Cash** | **0.0%** | **0 to 3%** | N/A |
| **Total** | **100.0%** | | |

* Asset class target allocations as of June 30, 2016.

** The custom allocation is reset quarterly based on the U.S. to Non-U.S. equity ratio as measured by the market capitalization of the MSCI ACWI-Investible Market Index.

## 115 Health Care Trust Investment Policies

The 401(h) Health Care Trust assets were transferred to the 115 Health Care Trust portfolio on July 1, 2016. Consequently, the 115 Health Care Trust investment policy now covers all health care assets of OPERS and mirrors the policy that was in effect for the 401(h) Health Care Trust portfolio.

### Investment Objective

The primary objective of the 115 Health Care Trust portfolio is to provide discretionary health care coverage for eligible members over a solvency period as defined by the Board. The assets of the 115 Health Care Trust portfolio are invested with the objectives of: a) preservation of capital, and b) earning a reasonable return.

### Asset Allocation and Performance Objectives

The approved asset allocation policy establishes a framework that has a high likelihood of realizing the long-term investment objective. The 115 Health Care Trust portfolio performance objective is to exceed the performance benchmark net of investment expenses. The table on the next page sets forth targets, ranges and performance benchmarks for each asset class:

### 115 Health Care Trust Asset Allocation

| | January 1, 2016 - June 30, 2016 | | July 1, 2016 - December 31, 2016 | | |
|---|---|---|---|---|---|
| Asset Class | Target Allocation | Range | Target Allocation | Range | Benchmark Index |
| **Public Equity** | **17.0%** | **0 to 21%** | **43.0%** | **34 to 52%** | |
| U.S. Equity | Custom Allocation* | +/- 5% | Custom Allocation* | +/- 5% | Russell 3000 Stock Index |
| Non-U.S. Equity | Custom Allocation* | +/- 5 | Custom Allocation* | +/- 5% | Custom benchmark of the following indices:<br>55% MSCI World Index x U.S. Standard<br>10% MSCI World Index x U.S. Small Cap<br>31% MSCI Emerging Markets Standard<br>4% MSCI Emerging Markets Small Cap |
| **Fixed Income** | **12.0%** | **0 to 16%** | **34.0%** | **24 to 44%** | |
| Core Fixed | 7.0 | 0 to 11 | 17.0 | 12 to 22 | Bloomberg Barclays U.S. Aggregate Index |
| Emerging Markets Debt | 2.0 | 0 to 4 | 6.0 | 2 to 8 | Custom benchmark of the following indices:<br>50% J.P. Morgan Emerging Markets Bond Index Global<br>50% J.P. Morgan Government Bond Index-Emerging Markets Global Diversified |
| Floating Rate Debt | N/A | N/A | 0.0 | 0 to 2 | Credit Suisse Leveraged Loan Index |
| Securitized Debt | N/A | N/A | 1.0 | 0 to 2 | Non-Agency CMBS component of Bloomberg Barclays U.S. Aggregate Index plus 200 bps |
| TIPS | 2.0 | 0 to 4 | 5.0 | 2 to 8 | Bloomberg Barclays U.S. TIPS Index |
| High Yield | 1.0 | 0 to 2 | 2.5 | 0 to 5 | Bloomberg Barclays U.S. High Yield Index |
| Global High Yield | N/A | N/A | 1.5 | 0 to 4 | Bloomberg Barclays Global High Yield Index |
| U.S. Treasury | N/A | N/A | 1.0 | 0 to 2 | Bloomberg Barclays U.S. Treasury Index |
| **Alternatives** | **8.0%** | **0 to 12%** | **16.0%** | **11 to 21%** | |
| REITs | 3.0 | 0 to 6 | 6.0 | 3 to 9 | Dow Jones U.S. Select RESI Total Return |
| Hedge Funds | 3.0 | 0 to 6 | 6.0 | 3 to 9 | Custom benchmark using the HFRI single strategy indices weighted by the target allocations listed in the Annual Investment Plan |
| Opportunistic | 1.0 | 0 to 2 | 2.0 | 0 to 4 | Market value weight of underlying portfolio benchmarks |
| Commodities | 1.0 | 0 to 2 | 2.0 | 0 to 4 | S&P GSCI Total Return Index |
| **Risk Parity** | **3.0%** | **0 to 6%** | **5.0%** | **2 to 8%** | Market value weight of underlying portfolio benchmarks |
| **GTAA** | **1.0%** | **0 to 2%** | **2.0%** | **0 to 4%** | Market value weight of underlying portfolio benchmarks |
| **Short-Term Liquidity** | **59.0%** | **0 to 65%** | **N/A** | **N/A** | Bank of America Merrill Lynch 3-Month U.S. Treasury Bill Index |
| **Operating Cash** | **0.0%** | **0 to 3%** | **0.0%** | **0 to 3%** | N/A |
| **Total** | **100.0%** | | **100.0%** | | |

*The custom allocation is reset quarterly based on the U.S. to Non-U.S. equity ratio as measured by the market capitalization of the MSCI ACWI-Investible Market Index.

## Defined Contribution Investment Policies

### Investment Objective

The Defined Contribution portfolio investment options are intended to be primary retirement savings vehicles for members. The long-term objectives of the Defined Contribution portfolios are to support defined contribution plan members in having independent control over their OPERS retirement assets, while providing a suitable framework to invest their assets over the long-term.

### Asset Allocation

The asset allocation and diversification objective is based on three components: Target Date Funds, OPERS Funds and the self-directed brokerage account that offers members in the defined contribution plans (the Member-Directed Plan and the Combined Plan) diversified investment options. The default investment option for defined contribution plan members who fail to make a selection is to place their contributions into the Target Date Fund that most closely corresponds to their current age assuming a payout at age 65.

- **Target Date Funds**

  Target Date Funds is a passive program that links a defined contribution member's investment portfolio to a particular time horizon, typically an expected retirement date. A target date fund with a corresponding target date in the distant future will have an allocation tilted more toward equities and other higher risk/higher reward asset classes to enhance the opportunity to accumulate capital. As target date funds move toward their target payout dates, they reduce their allocation to such assets to better preserve accumulated capital while simultaneously increasing their allocation to fixed income and cash. These transitions, called glide paths, are accomplished by assigning each target date fund an asset class investment allocation and an asset class range surrounding such targets. The asset class ranges for each Target Date Fund, for the period December 1, 2016 through November 30, 2017, are on the next page.

## Defined Contribution Asset Allocation

| OPERS Investment Fund | Payout Target | Payout Range | 2020 Target | 2020 Range | 2025 Target | 2025 Range | 2030 Target | 2030 Range | 2035 Target | 2035 Range |
|---|---|---|---|---|---|---|---|---|---|---|
| Large Cap Index Fund | 10.0% | +/-2.0% | 12.0% | +/-2.0% | 16.0% | +/-3.0% | 20.0% | +/-3.0% | 22.0% | +/-3.0% |
| Small Cap Index Fund | 5.0 | +/-2.0 | 9.0 | +/-2.0 | 13.0 | +/-2.0 | 17.0 | +/-3.0 | 19.0 | +/-3.0 |
| Non-U.S. Stock Index Fund | 15.0 | +/-3.0 | 21.0 | +/-3.0 | 30.0 | +/-4.0 | 38.0 | +/-5.0 | 41.0 | +/-5.0 |
| Bond Index Fund | 32.0 | +/-4.0 | 38.0 | +/-5.0 | 36.0 | +/-5.0 | 21.0 | +/-3.0 | 11.0 | +/-2.0 |
| Short-Term Bond Fund | 25.0 | +/-4.0 | 9.0 | +/-2.0 | 1.0 | +/-1.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 |
| Long-Duration Bond Fund | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 4.0 | +/-1.0 | 7.0 | +/-2.0 |
| TIPS Fund | 13.0 | +/-2.0 | 11.0 | +/-2.0 | 4.0 | +/-1.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 |

OPERS Target Date Funds

## Defined Contribution Asset Allocation (continued)

| OPERS Investment Fund | 2040 Target | 2040 Range | 2045 Target | 2045 Range | 2050 Target | 2050 Range | 2055 Target | 2055 Range | 2060 Target | 2060 Range |
|---|---|---|---|---|---|---|---|---|---|---|
| Large Cap Index Fund | 23.0% | +/-3.0% | 24.0% | +/-3.0% | 25.0% | +/-4.0% | 25.0% | +/-4.0% | 25.0% | +/-4.0% |
| Small Cap Index Fund | 19.0 | +/-3.0 | 20.0 | +/-3.0 | 20.0 | +/-3.0 | 20.0 | +/-3.0 | 20.0 | +/-3.0 |
| Non-U.S. Stock Index Fund | 42.0 | +/-5.0 | 43.0 | +/-5.0 | 45.0 | +/-5.0 | 45.0 | +/-5.0 | 45.0 | +/-5.0 |
| Bond Index Fund | 8.0 | +/-2.0 | 7.0 | +/-2.0 | 5.0 | +/-2.0 | 5.0 | +/-2.0 | 5.0 | +/-2.0 |
| Short-Term Bond Fund | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 |
| Long-Duration Bond Fund | 8.0 | +/-2.0 | 6.0 | +/-2.0 | 5.0 | +/-2.0 | 5.0 | +/-2.0 | 5.0 | +/-2.0 |
| TIPS Fund | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 | 0.0 | +/-0.0 |

- **OPERS Funds**

OPERS offers members in the defined contribution plans low cost, primarily passive, asset class specific investment funds. Those funds, and their respective indices, are as follows:

| OPERS Fund | Market Index |
|---|---|
| Stable Value | Custom Index* |
| Bond Index | Bloomberg Barclays U.S. Aggregate |
| Stock Index | Russell 3000 |
| Large Cap | Russell 1000 |
| Small Cap | Russell 2000 |
| Non-U.S. Stock Index | MSCI ACWI Dividend Return x U.S. Index |

* The Stable Value Fund (SVF) is managed actively. Its primary objective is to preserve the value of principal. Its secondary objective is to exceed the long-term return of a custom index comprised of 45% of the Bloomberg Barclays 1-5 Year Government/Corporate Bond Index, 35% of the Bloomberg Barclays Intermediate Government/Corporate Bond Index, 15% of the Bloomberg Barclays Aggregate Bond Index and 5% of the Bank of America Merrill Lynch 3-Month U.S. Treasury Bills Index. A typical stable value fund return fluctuates less than one percent a year; therefore, neither the short-term returns nor volatility of the SVF is consistent with market value instruments such as those in the custom index.

- **Self-Directed Brokerage Account**

The self-directed brokerage account option provides defined contribution members more flexibility in choosing their retirement savings investments by allowing them to invest in a variety of active and passive mutual funds. The program parameters are the following:

- Only designated mutual funds can be purchased through the window.
- Maximum of 50% of a member's portfolio is allowed to be invested through the brokerage window, though the Plan will not rebalance the brokerage investments should they grow to exceed 50% of participant's assets.
- Account minimum of $5,000 is required before a participant can use the window.
- The annual cost of the window is borne by the participant using the window.

### Rebalancing

The ranges specified for the target date funds are a function of the expected volatility of each asset class and the proportion of the total fund allocated to the asset class. The staff shall ensure target date funds conform to the asset allocation policy through quarterly review and rebalancing.

### Performance Objectives and Risk Management

The performance objectives for the target date funds are to meet the return of the respective performance benchmarks primarily through the use of passive index funds. The performance benchmarks are a custom index comprised of market indices for the component funds weighted in accordance with the target date fund target allocations as specified in the Defined Contribution Fund policy. The performance objectives for the OPERS funds are to meet the return of their respective performance benchmarks, gross of investment manager fees. There is no plan-level performance objective for the self-directed brokerage account because the mutual funds purchased through it are selected by members.

Defined contribution fund investment options offer diversification to minimize the impact of loss from individual positions. In addition to diversification, the program is passively managed for the target date funds and OPERS funds. The self-directed brokerage account offers participants a broad range of mutual fund choices that are self-selected and subject to the program parameters.

## Fixed Income

OPERS seeks to obtain broad exposure to fixed income assets in order to diversify assets and provide a return and a hedge for long-term liabilities in the defined benefit plans and rising health care costs in the 401(h), prior to July 1, 2016, and 115 Health Care Trusts. The Fixed Income program may utilize active and passive management strategies as well as internal and external portfolio managers.

The Fixed Income policies provide for investments in fixed income sub-asset classes of core fixed, emerging markets debt, floating rate debt, securitized debt, Treasury inflation-protected securities (TIPS), high yield, global high yield and U.S. Treasuries.

The internal core portfolio uses a risk-controlled active strategy focusing on investment grade securities. Currently, external managers are used for the high yield, emerging debt, global high yield, and floating rate debt, which require specialized expertise. The TIPS and U.S. Treasury allocations are managed internally as index strategies. The securitized debt, liquidity, and the majority of the core fixed portfolios are internally managed using risk-controlled active strategies.

## Public Equities (Domestic and International)

The Public Equities program seeks to diversify assets by obtaining broad exposure to global publicly-traded equity markets. Considering that security, sector and market return opportunities occur, the Public Equity asset class is structured to include managers who seek to exploit those opportunities with the expectation the overall asset class produces a risk-adjusted return, net of fees, that will exceed the benchmark.

The Public Equities program contains both actively traded and passive or indexed components. The Investment staff's decision to allocate across passive and active styles is designed, in aggregate, to outperform the respective U.S. Equity and Non-U.S. Equity benchmarks while operating within established risk parameters.

Tracking error is a statistical measure of the potential variability of portfolio returns, relative to that of the assigned benchmark. The benchmark and tracking error range for the Defined Benefit, 401(h) Health Care Trust, prior to July 1, 2016, and 115 Health Care Trust portfolios are displayed in the following table:

| Asset Class | Benchmark | Tracking Error Range |
|---|---|---|
| U.S. Equity | Russell 3000 Stock Index | 0-100 basis points |
| Non-U.S. Equity | Custom benchmark of the following indices:<br>55% MSCI World Index x U.S. Standard<br>10% MSCI World Index x U.S. Small Cap<br>31% MSCI Emerging Markets Standard<br>4% MSCI Emerging Markets Small Cap | 0-300 basis points |

## Real Estate

The Private Market Real Estate program uses active management strategies implemented through external managers. The public market real estate portfolio may engage in active and passive management strategies through internal and external managers. Both strategies may use a component of Non-U.S. Real Estate investments.

The performance benchmark for the Defined Benefit Real Estate sub-asset class is the National Council of Real Estate Investment Fiduciaries (NCREIF) Fund Index—Open End Diversified Core Equity (ODCE), net of fees plus 85 basis points (bps) to reflect long-term portfolio weightings to core and non-core Real Estate. The Defined Benefit Portfolio Real Estate sub-asset class is expected to meet or exceed the net ODCE plus 85 bps over rolling five-year periods. The performance benchmark for the Health Care portfolios REITs sub-asset class is the Dow Jones U.S. Select RESI Total Return Index.

The Private Market Real Estate program has a single-manager exposure limited to 20% of the Private Market Real Estate program. The long-term goal is to have at least 80% of the Private Market Real Estate portfolio invested in apartment, industrial, office and retail assets. Investments outside the U.S. will be limited to no more than 25% of the Private Market Real Estate portfolio. OPERS limits the amount of equity in any single direct investment to 15% of the Private Market Real Estate target allocation. Single closed-end commingled funds are limited to the greater of $400 million or 5% of the Private Market Real Estate target allocation. Single open-end commingled funds are limited to 10% of the Private Market Real Estate target allocation.

## Private Equity

The Private Equity sub-asset class seeks superior equity returns plus a liquidity premium by investing with managers who have a consistent record of producing top-quartile returns. Private Equity investments also allow the opportunity to invest in the very significant portion of the global economy that is not publicly traded, as well as to access strategies that benefit from longer-holding or workout periods. Accessing these strategies leads to superior returns and to additional diversification of assets and strategies within the Defined Benefit portfolio.

The Private Equity program exclusively uses active management strategies and is 100% externally managed with single fund exposure limited to the lesser of 25% of total commitment or $400 million. Risk is also managed beyond manager and firm exposure through a combination of quantitative and qualitative constraints for liquidity, vintage, currency, industry, leverage and geography.

Private Equity performance is benchmarked against the State Street Private Equity Index (SSPEI) and is calculated using the time-weighted total return method. In addition, computed internal rate of return (IRR) results are compared to peer rankings using the SSPEI data whose performance is also based on the IRR methodology.

## Cash Management

Cash management actively seeks to preserve principal, provide adequate liquidity and achieve market returns in excess of the benchmark, net of fees. Cash management involves actively investing cash and securities and lending cash collateral relative to the respective benchmarks of each portfolio within established risk parameters. Interest rate and credit and liquidity risk are managed through a combination of quantitative and qualitative constraints with the objective being to preserve principal, maintain liquidity, and provide a market rate of return.

## Derivatives

Derivatives may be used to facilitate cost-effective and timely investments, for risk-management purposes, to provide for trading efficiency, and to enhance or manage the risk/return profile of individual securities or portfolios. Derivatives may also be used to assist in achieving investment goals within a particular investment strategy such as managing the overall asset allocation of a fund or portfolio, including rebalancing activities, transitioning assets between managers, and equitizing or bondizing cash balances. In addition, derivatives may be used to hedge or manage exposure to equity markets, commodities, currencies, duration, total return, yield or credit, interest rates, sectors, sub-sectors and/or countries, and risk/return profiles of individual securities or portfolios.

Derivatives are grouped into three categories: Category I derivatives are securities-based and are traded either on an exchange or over-the-counter. Category II derivatives are non-securities-based exchange-traded instruments such as futures, options on futures and options. Category III derivatives are non-securities-based over-the-counter transactions.

In order to manage overall fund liquidity (Category III) and to balance the fund-level usage of derivatives versus physical securities (Category II), the following limits apply to public market assets held in separate accounts:

- The gross notional exposure of Category III derivatives will not exceed 10% of the total net asset value of public market assets held in separate accounts, excluding foreign exchange derivatives used for hedging purposes. Additional portfolio level restrictions may apply.
- The combined gross notional exposure of Category II and Category III derivatives will not exceed 20% of the total net asset value of public market assets held in separate accounts, excluding foreign exchange derivatives used for hedging purposes. Additional portfolio level restrictions may apply.
- Currency forwards are one year or less to maturity, unless approved by the Chief Investment Officer.

## Hedge Funds

Hedge fund investments are structured to preserve capital and provide competitive returns with a low correlation to traditional asset classes, providing diversification, reduced volatility of returns and long-term return enhancement.

The performance objective for the Hedge Funds sub-asset class is a custom benchmark using the HFRI single-strategy indices weighted by the target allocation. Risk is managed through a combination of quantitative and qualitative measures. The requirements for establishing appropriate risk metrics for each hedge fund include: (1) providing risk parameter and performance reporting on a monthly basis; (2) seeking advice from legal counsel, the due diligence consultant and/or investment advisor to determine if audited financial statements are required based on the specific structure of each investment; and, (3) establishing position-level transparency targets for the Hedge Funds asset class. Hedge fund allocations are limited to $400 million, or 10%, of the sub-asset class fair value, whichever is greater for hedge fund managers; and, direct hedge fund managers are limited to $200 million, or 7%, of the sub-asset class fair value, whichever is greater.

## Securities Lending

The Securities Lending program actively lends securities through various programs to qualified borrowers in order to provide incremental income to the respective asset classes. Staff will assess the performance of the securities lending program on no less than an annual basis.

Cash reinvestment risk and counterparty risk are managed through a combination of quantitative and qualitative constraints. Excess collateral, marked-to-market daily, is held for each loan in the amount of 102% for domestic securities and 105% for international securities. The maximum percentage of assets that may be on loan is 50% of the eligible assets while the maximum amount that may be on loan with any one borrower is 15% of the eligible assets.

## Commodities

Commodity investments are to provide exposure to global commodities and to achieve returns comparable to or in excess of the benchmark return, net of fees. Commodity portfolios shall be governed by manager portfolio guidelines that establish management parameters to achieve commodity-based returns. Commodity investments may be in any of the commodities that comprise the Standard and Poor's-Goldman Sachs Commodity Index and/or the Bloomberg Commodity Index at the time of purchase. Risk is managed through a combination of quantitative and qualitative constraints.

## Opportunistic

Investments in the Opportunistic sub-asset class include investment strategies or assets that are not currently used in the respective Defined Benefit, 401(h) Health Care Trust, prior to July 1, 2016, or 115 Health Care Trust portfolios, but which have the potential to improve investment results over time. Assets and strategies used in the Opportunistic program must have the potential to be mainstreamed into the investment program over time, or be opportunistic based on either valuation or circumstances.

Every strategy within the Opportunistic sub-asset class will have a specific performance benchmark. The overall benchmark for the Opportunistic sub-asset class is the market value weight of the underlying benchmarks. Long-term returns from the Opportunistic sub-asset class should match or exceed the OPERS total fund benchmark, which is a measure of the opportunity cost of investing in this category.

The primary risk control mechanisms are the limited size of the opportunistic allocation and the limits on the size of single assets and strategies. No single investment strategy or portfolio assigned to the same benchmark within the Opportunistic sub-asset class may exceed 0.5% of the sum of the Defined Benefit, 401(h) Health Care Trust, prior to July 1, 2016, or 115 Health Care Trust portfolio assets at the time of funding.

## Global Tactical Asset Allocation (GTAA)

GTAA seeks to capitalize on short-term opportunities among global capital market assets. The strategy focuses on general movements in the market rather than on performance of individual securities. This requires investing in multiple asset types and may employ leverage to obtain the desired mix. GTAA investments are expected to provide fund level diversification and an additional source of excess return.

GTAA assets may be invested in all types of instruments intended to obtain exposure to a wide variety of asset types including equities, fixed income (both sovereign and credit-based exposures), inflation-linked bonds, commodities and other asset types. Instruments used may be exchange-traded or non-exchange traded and may be physical securities or derivatives, and some degree of leverage may be employed.

The overall benchmark for GTAA is the market value weight of the underlying managers' benchmarks. Risk is managed through a combination of quantitative and qualitative constraints. By allocating to multiple GTAA managers, concentration to any one manager is limited. Investment Advisors will help identify managers, using a process approved by the Chief Investment Officer. In addition to the investment due-diligence process, each manager will undergo an operational due-diligence review prior to funding to evaluate non-investment related risk factors.

## Risk Parity

Risk parity seeks to diversify assets by obtaining exposure to global capital market assets in a risk-aware manner. This requires investing in multiple asset types and leveraging exposures to global markets in order to obtain the desired risk-aware mix. The risk parity allocation is structured to achieve roughly balanced risk exposure across equities, nominal fixed income, and inflation sensitive assets, targeting a total volatility level comparable to that of the Defined Benefit portfolio, the 401(h) Health Care Trust portfolio, prior to July 1, 2016, and the 115 Health Care Trust portfolio.

The overall benchmark for risk parity is the market value weight of the underlying managers' benchmarks. The Board will set performance expectation for risk parity through its approval of the Annual Investment Plan. Risk is managed through a combination of quantitative and qualitative constraints. By allocating to multiple risk parity managers, concentration to any one manager is limited.

## Investment Rates by Portfolio—Defined Benefit and Health Care

OPERS uses several rates to evaluate the results of the investment portfolios. Actual and benchmark returns for the years listed can be found in the Investment Section. The portfolio target return is based on the asset allocation in place during the year presented and the actuarial assumed rate of return, or discount rate, is the assumption used by our actuaries for the annual actuarial valuations, described further in the Actuarial Section.

Rates are presented for four years in the following table:

### Investment Rates by Portfolio

| | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Defined Benefit Portfolio** | | | | |
| Actual Rate of Return | 8.31% | 0.33% | 6.96% | 14.38% |
| Benchmark Return | 8.64% | 0.25% | 5.81% | 14.24% |
| Portfolio Target Rate of Return | 8.00% | 8.00% | 8.00% | 8.00% |
| Actuarial Assumed Rate of Return | 7.50% | 8.00% | 8.00% | 8.00% |
| **Health Care Portfolio*** | | | | |
| Actual Rate of Return | 7.55% | (2.18%) | 5.28% | 11.36% |
| Benchmark Return | 7.75% | (1.88%) | 5.01% | 10.70% |
| Portfolio Target Rate of Return | 6.50% | 6.50% | 6.50% | 6.50% |
| Actuarial Assumed Rate of Return | 5.00% | 5.00% | 5.00% | 5.00% |

* In 2016, the 401(h) Health Care Trust closed and assets were transferred to the 115 Health Care Trust. The 2016 partial year results for both of these portfolios can be found in the Investment Section, reflecting six month returns for the 401(h) Health Care Trust. For 2016, this chart displays the combined health care rates as disclosed in the Investment Section. For previous years, the rates represent the 401(h) Health Care Trust, as the majority of the health care assets resided in this trust until transferred to the 115 Health Care Trust.

The following exhibit illustrates the structure and relationship of the 28 investment policies within the total System and its four investment portfolios in 2016.

**OPERS FUNDS**

**POLICIES**

**Pension**

- Defined Benefit Portfolio Summary of Investment Objectives & Policies
- Defined Contribution Portfolio Summary of Investment Objectives & Policies

**Health Care**

- 401(h) Health Care Trust Portfolio (closed June 30, 2016) Summary of Investment Objectives & Policies
- 115 Health Care Trust Portfolio Summary of Investment Objectives & Policies

**ASSET/SUB-ASSET CLASS POLICIES**

Cash Policy
Commodities Policy
Fixed Income Policy
Global Tactical Asset Allocation Policy
Hedge Funds Policy
Opportunistic Policy
Private Equity Policy
Public Equity Policy
Real Estate Policy
Risk Parity Policy

**INVESTMENT-WIDE POLICIES**

Broker-Dealer Policy
Corporate Governance Policy
Derivatives Policy
External Investment Managers' Insurance Policy
Iran and Sudan Divestment Policy
Leverage Policy
Material Nonpublic Information Policy
Office of Foreign Assets Control Compliance
Ohio-Qualified and Minority-Owned Manager Policy
Personal Trading Policy
Proxy Voting Guidelines
Responsible Contractor Policy
Securities Lending Policy
Soft Dollar Policy

# Actuarial Section

## *Dedicated to:* Building Stability

Building stability means building an organization that can withstand anticipated and unforeseen pressures. Although change can feel unsettling, it is commonly understood that an organization must anticipate and adapt to change in order to ensure stability, to survive, and, ultimately, to thrive.

OPERS does not make changes lightly or without extensive study.  When change is determined to be necessary, we work closely with those who can help OPERS make the very best decisions.

OPERS anticipated the major shifts in member demographics—longer lives in retirement, the baby-boomer generation facing retirement and rapidly escalating health care costs commensurate with an aging population. These parameters needed to be addressed through proactive solutions to ensure all future generations of retirees had access to the same strong benefits as past generations. To address this issue, OPERS management worked closely with all stakeholders to develop appropriate changes.

Our members responded positively to OPERS-sponsored information—information built on well-vetted assumptions and experience studies—and supported the changes necessary to help ensure the stability of this organization—throughout 2016 and well into the future.

*Note: This section is unaudited.*

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May 24, 2017

The Retirement Board
Ohio Public Employees Retirement System
277 East Town Street
Columbus, Ohio 43215

Dear Board Members:

The basic financial objective of the defined benefit pension portion of the Ohio Public Employees Retirement System (OPERS) is to establish and receive contributions which:

- When expressed in terms of percents of active member payroll will remain approximately level from generation to generation, and
- When combined with present assets and future investment return will be sufficient to meet the financial obligations of OPERS to present and future retirees and beneficiaries.

This financial objective is addressed within the annual actuarial funding valuation of the defined benefit pension portion of OPERS. The purposes of the funding valuation are as follows:

- Measure the financial position of OPERS,
- Assist the Board in establishing employer and employee contribution rates necessary to fund the pension defined benefits provided by OPERS, and
- Determine the number of years required to amortize the unfunded actuarial accrued liabilities based upon established contribution rates.

The most recent funding valuation was completed based upon population data, asset data, and plan provisions as of December 31, 2016. A report containing the results of the funding valuation is produced annually, in some cases due to timing issues after the publication of the Comprehensive Annual Financial Report (CAFR).

In addition to the funding valuation report for the defined benefit pension plan, separate reports are issued to provide financial reporting information for OPERS in accordance with Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 (pension benefits) and 43 (retiree health benefits). Reports containing the actuarial results of the financial reporting valuations are produced annually, in some cases after the publication of the CAFR. Financial reporting information has been produced based upon a measurement date of December 31, 2016 for GASB Statement Nos. 67 and 68 and December 31, 2015 for GASB Statement Nos. 43 and 45.

The Retirement Board
May 24, 2017
Page 2

The following schedules in the Actuarial Section and Financial Section of the CAFR were prepared based upon certain information presented in the previously mentioned funding and financial reporting valuation reports:

**Actuarial Section**

Summary of Assumptions
Schedules of Average Benefits Paid
Actuarial Valuation Data
Schedules of Funding Progress
Short-Term Solvency Test
Analysis of Financial Experience

**Financial Section**

Net Pension Liability/(Asset)
Key Methods and Assumptions Used in Valuation of Total Pension Liability
Sensitivity of Net Pension Liability/(Asset) to Changes in the Discount Rate
Funded Status of Health Care
Key Methods and Assumptions Used in Valuation of Health Care Liability
Schedules of Changes in Net Pension Liability/(Asset)
Schedules of Member and Employer Contributions
Schedule of Funding Progress for Health Care

The individual member statistical data required for the valuations was furnished by OPERS, together with pertinent data on financial operations. The cooperation of OPERS in furnishing these materials is acknowledged with appreciation. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the data. Assets are valued on a market related basis that recognizes each year's difference between actual and assumed investment return over a closed four-year period. For determining the Net Pension Liability (NPL) under GASB Statement No. 67, assets are valued on a market basis. The long term assumed rate of investment return on pension fund assets is 7.5%. Based upon the results of a projection performed in accordance with GASB Statement No. 67 parameters, the Single Discount Rate for purposes of discounting pension liabilities for pension financial reporting purposes is also 7.5%.

Actuarial valuations are based upon assumptions regarding future activity in specific risk areas including the rates of investment return and payroll growth, eligibility for the various classes of benefits, and longevity among retired lives. The Board adopted the actuarial assumptions after considering the advice of the actuary and other professionals. The assumptions and methods used for funding and financial reporting purposes are in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. They are also in conformity with the Board's funding policy. The December 31, 2016 valuations were based upon assumptions that were recommended in connection with an Experience Study covering the 2011-2015 period.

Gabriel Roeder Smith & Company

The Retirement Board
May 24, 2017
Page 3

The computed pension amortization period as of the December 31, 2016 annual valuation is 19 years and the System is 80% funded with respect to pension benefits, based upon the actuarial accrued liability and the funding value of assets.

Based upon the results of the December 31, 2016 valuations, we are pleased to report to the Board that the Public Employees Retirement System of Ohio is meeting its basic financial objective and continues to operate in accordance with the actuarial principles of level percent of payroll financing.

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

Readers desiring a more complete understanding of the actuarial condition of OPERS are encouraged to obtain and read the complete valuation reports. The Actuarial and Financial Sections of this CAFR contain some, but not all of, the information in the valuation reports.

Brian B. Murphy and Mita D. Drazilov are Members of the American Academy of Actuaries (MAAA), are independent of the plan sponsor and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Brian B. Murphy, FSA, EA, FCA, MAAA

Mita D. Drazilov, ASA, FCA, MAAA

BBM/MDD:mdd

Gabriel Roeder Smith & Company

The defined benefit pension actuarial information presented in this *2016 Comprehensive Annual Financial Report* (CAFR) is based on the System's most current actuarial valuation data as of December 31, 2016. In conjunction with Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67), *Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25*, OPERS is reporting actuarial results of pensions as of the current year. The Financial Section of the CAFR presents additional actuarial valuation information on a financial reporting basis, or Accounting Basis, as required by GASB 67. This section presents actuarial valuation information on a Funding Basis, and has been updated to reflect pension funding results as of December 31, 2016. The actuarial assumptions in this section are applicable to 2016, unless otherwise noted.

The Accounting Basis calculation methodology defined in GASB 67 requires different methods and may require different assumptions than are used to calculate the funded status of a plan. For example, GASB 67 requires the use of the fair value of assets versus the smoothed value of assets used for the Funding Basis, as reflected in the Financial Section on page 75. However, the information included in this section is reflected on a Funding Basis rather than Accounting Basis. Therefore, the GASB 67 net pension liability results will differ from the unfunded actuarial accrued liability results provided in the Schedules of Funding Progress included in this section, beginning on page 165. GASB 67 breaks the link between accounting and funding. These changes affect the accounting information disclosed in the Notes to Combining Financial Statements and Required Supplementary Information, both included in the Financial Section. However, the changes do not impact the actuarial methods and assumptions used by OPERS to determine the employer contributions needed to fund the plan. The assumptions disclosed in this section were used for both funding and financial reporting valuations, unless otherwise noted and reported in this section.

OPERS conducts an experience study every five years in accordance with Ohio Revised Code Section 145.22. The OPERS Board of Trustees (Board)-appointed actuary conducted an experience study for the five-year period ended December 31, 2015. Following this experience study, in consultation with the actuary, the Board approved and adopted the methods and assumptions in 2016, as disclosed in this section. These methods and assumptions apply to both the Traditional Pension Plan and the Combined Plan. As in previous studies, the results are divided into two areas—demographic assumptions and economic assumptions.

The demographic assumptions studied include expected rates of withdrawal, disability, retirement and mortality. Development of the assumptions related to demographic risk are primarily the responsibility of the actuary, taking into consideration any factors or trends known by the Board or OPERS staff. One key trend noted in the demographic portion of the study is the improved life expectancy for members, especially for males. To reflect the expectation of increased longevity, the actuary recommended a change to a generational mortality assumption that incorporates the improvement in expected mortality by means of a two-dimensional mortality table. Another significant change is a reduction in disability rates—driven by the recent changes in the disability program. The changes encourage disabled participants to seek rehabilitation and return to work—and, thus, to a more fulfilling life. We are pleased that the experience study demonstrates the effectiveness of the disability changes. Adopted demographic changes are summarized on page 152.

The economic portion of the experience study analyzes three key rate assumptions: investment return, wage inflation and price inflation. Rates of pay increases in excess of wage inflation (for example, pay increases due to merit and seniority) were also analyzed. Based on recent investment and economic experience, and a review of projected intermediate-term forecasts, the actuary recommended, and the Board approved, reductions to all three key economic rates (investment returns, pay increases and inflation). These three rates typically move together to preserve internal consistency. The actuary provided, and the Board evaluated, alternatives for the investment return, wage-growth and price-growth assumptions, including considering historical experience and examining forward-looking forecasts from multiple independent sources. After extensive study, the Board adopted the experience study with economic changes, which are summarized on page 153.

Pension plan details can be found in the Plan Statement beginning on page 227.

## Funding Method

An individual entry-age actuarial cost method of valuation is used in determining benefit liabilities and normal cost under both the funding valuations included in this section and the financial reporting valuation done under GASB 67 included in the Financial Section. Differences between assumed and actual experience (actuarial gains and losses) become part of actuarial accrued liabilities. For funding valuation purposes, unfunded actuarial accrued liabilities are amortized to produce payments (principal and interest), which are a level percent of payroll contributions.

## Demographic Assumptions

The demographic changes adopted by the Board, as a result of the experience study, are summarized in the following tables. Additional details on these assumptions are found throughout this section.

**Impact of Updated Demographic Assumptions on Expected Annual Number of Future Decrements**

**Experience Study** (five-year period ended December 31, 2015)

| Division | State | Local | Public Safety | Law Enforcement |
|---|---|---|---|---|
| **Males** | | | | |
| Normal (unreduced) retirements | No change | No change | No change | No change |
| Early (reduced) retirements | No change | No change | No change | N/A |
| Withdrawals (before 5 years of service) | Increase | Increase | Increase | No change |
| Withdrawals (after 5 years of service) | Increase | Increase | No change | No change |
| Disability retirements | Decrease | Decrease | Decrease | Decrease |
| Post-retirement mortality (non-disabled) | Increase | Increase | Increase | Increase |
| Post-retirement mortality (disabled) | Increase | Increase | Increase | Increase |
| **Females** | | | | |
| Normal (unreduced) retirements | No change | No change | No change | No change |
| Early (reduced) retirements | No change | No change | No change | N/A |
| Withdrawals (before 5 years of service) | Increase | Increase | Increase | Increase |
| Withdrawals (after 5 years of service) | Increase | Increase | No change | No change |
| Disability retirements | Decrease | Decrease | Decrease | Decrease |
| Post-retirement mortality (non-disabled) | Increase | Increase | Increase | Increase |
| Post-retirement mortality (disabled) | Decrease | Decrease | Decrease | Decrease |

## Economic Assumptions

The economic assumptions approved by the Board as a result of the 2016 experience study and used in the 2016 actuarial valuation, as well as the prior assumptions, are shown below:

- ***Investment Return***—7.50% compounded annually, net of administrative expenses, a decrease of 0.50% from 8.00%.
- ***Wage Inflation Rate***—3.25% per year, a decrease of 0.50% from 3.75%. Wage inflation is defined to be the portion of total pay increases for an individual due to macroeconomic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes related to individual merit and seniority effects.
- ***Price Inflation***—2.50% of the investment return rate and wage inflation rate is assumed to be price inflation, a decrease of 0.50% from 3.00%.
- ***Assumed Real Rate of Return***—4.25% per year (no change). The assumed real rate of return is defined as the portion of the 7.50% investment return greater than the assumed total wage growth rate of 3.25%.
- ***Active Member Population***—The sum of active members in the Traditional Pension Plan and Combined Plan, assumed to remain constant. For purposes of financing the unfunded actuarial accrued liabilities, total payroll is assumed to grow at the wage inflation rate of 3.25% per year.
- ***Individual Employee Pay Increases***—An active employee's pay is assumed to increase each year, in accordance with an age-based table. Part of the assumed increase is for merit and/or seniority increases, and the balance recognizes the wage inflation rate. The following table, below, describes annual increase percentages for sample ages.

### Individual Employee Pay Increases

| | Merit and Seniority | | | | | Total Increase Next Year | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | State | Local | Public Safety | Law | Wage Inflation | State | Local | Public Safety | Law |
| 30 | 3.38% | 3.38% | 3.70% | 3.70% | 3.25% | 6.63% | 6.63% | 6.95% | 6.95% |
| 40 | 1.90 | 1.77 | 1.46 | 1.46 | 3.25 | 5.15 | 5.02 | 4.71 | 4.71 |
| 50 | 0.92 | 0.92 | 0.94 | 0.94 | 3.25 | 4.17 | 4.17 | 4.19 | 4.19 |
| 60 | 0.42 | 0.42 | 0.40 | 0.40 | 3.25 | 3.67 | 3.67 | 3.65 | 3.65 |

- ***Turnover***—Represents the probabilities of separation from OPERS-covered employment before age-and-service retirement because of employment termination (withdrawal from service), death, or disability. The separation probabilities are based on historical trends of OPERS actual experience, without consideration of the manner in which the members' accounts are distributed.

## Percent Separating Within Next Year–Withdrawal from Employment

| Sample Ages | Years of Service | Withdrawal | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | State | | Local | | Public Safety | | Law Enforcement | |
| | | Men | Women | Men | Women | Men | Women | Men | Women |
| | 0 | 50.00% | 50.00% | 40.00% | 40.00% | 20.00% | 20.00% | 16.00% | 20.00% |
| | 1 | 35.00 | 35.00 | 27.00 | 27.00 | 19.00 | 19.00 | 10.00 | 12.00 |
| | 2 | 20.00 | 20.00 | 18.00 | 18.00 | 15.00 | 15.00 | 8.00 | 9.00 |
| | 3 | 15.00 | 15.00 | 13.00 | 13.00 | 15.00 | 15.00 | 6.00 | 6.00 |
| | 4 | 12.00 | 12.00 | 11.00 | 11.00 | 10.00 | 10.00 | 5.00 | 6.00 |
| 30 | 5 & over | 5.80 | 7.30 | 5.34 | 6.94 | 8.80 | 8.80 | 2.66 | 2.90 |
| 40 | 5 & over | 3.14 | 3.46 | 2.82 | 3.52 | 3.50 | 3.50 | 1.48 | 1.50 |
| 50 | 5 & over | 1.84 | 2.10 | 2.04 | 2.50 | 2.00 | 2.00 | 1.20 | 1.20 |
| 60 | 5 & over | 1.80 | 2.10 | 2.00 | 2.50 | 2.00 | 2.00 | 1.20 | 1.20 |

## Percent Separating Within Next Year–Death or Disability

| Sample Ages | Years of Service | Death | | Disability | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | All Divisions | | State | | Local | | Public Safety & Law Enforcement | |
| | | Men | Women | Men | Women | Men | Women | Men | Women |
| 25 | 5 & over | 0.05% | 0.02% | 0.10% | 0.10% | 0.10% | 0.10% | 0.20% | 0.60% |
| 35 | 5 & over | 0.05 | 0.03 | 0.16 | 0.16 | 0.13 | 0.10 | 0.34 | 0.60 |
| 45 | 5 & over | 0.12 | 0.07 | 0.47 | 0.47 | 0.37 | 0.26 | 0.78 | 1.38 |
| 55 | 5 & over | 0.29 | 0.17 | 1.05 | 1.05 | 0.90 | 0.71 | 2.32 | 2.65 |
| 60 | 5 & over | 0.49 | 0.27 | 1.25 | 1.25 | 1.00 | 0.85 | 2.60 | 2.75 |

The turnover probabilities in the tables above estimate the number of active members who will separate from employment based on the criteria of age, gender, and years of service. These members may be eligible for a refund of their account or an annuity benefit depending on the nature of the separation. The method of distribution and the resulting liabilities are calculated for this population based on the following assumptions:

- ***Withdrawal from Service*—**Assumes that members terminating before age 35, members terminating with less than five years of service, and a percentage of all other members will withdraw their contributions and forfeit their entitlement to an employer-financed benefit. The percentage withdrawing their contributions is 100% at age 35 and is reduced for each year of age after 35, becoming 0% at age 55 (age 45 for Public Safety and Law Enforcement Division members).
- ***Death-in-service and Disability Benefits*—**Assumes that members with at least five years of service will elect to receive an annuity benefit. It is assumed that Combined Plan members will transfer to, and take a benefit from, the Traditional Pension Plan, unless a lump-sum distribution from the Combined Plan would have a greater value.

## Asset Valuation Method

For actuarial purposes, and under the Funding Basis, the funding value of defined benefit assets recognizes assumed investment returns fully each year. Differences between actual and assumed investment returns are phased in over a closed four-year period. The funding value is not permitted to deviate from fair value by more than 12%. Both the Traditional Pension Plan and Combined Plan retiree health care funding value of assets are developed independently beginning with the December 31, 2004 valuation.

## Valuation Data

The demographic and financial data used in the actuarial valuations were provided to the actuary by the OPERS staff. The actuary examined the data for general reasonableness and year-to-year consistency, but did not audit the information.

## Decrement Assumptions

The probabilities used by the actuary related to specific risk areas are displayed in the tables starting on the next page:

- ***Mortality*—**The tables used in evaluating age-and-service and survivor benefit allowances to be paid were updated as a result of the experience study and are now based on the RP-2014 Healthy Annuitant mortality tables. The Healthy Annuitant mortality tables were used, adjusted for mortality improvement back to the observation period base of 2006, and then established the base year as 2015 for males and 2010 for females. The mortality rates used in evaluating disability allowances were also updated as a result of the experience study and are now based upon the RP-2014 Disabled mortality tables, adjusted for mortality improvement back to the observation period base year of 2006, and then established the base year as 2015 for males and 2010 for females. Mortality rates for a particular calendar year for both healthy and disabled retiree mortality tables are determined by applying the MP-2015 mortality improvement scale to the previously noted tables.
- ***Retirement*—**Probabilities of age-and-service retirement applicable to members eligible to retire are as shown in the schedules on pages 156 -160.

Senate Bill (SB) 343 was enacted into law with an effective date of January 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the law applicable to each group. Members who were eligible to retire under law in effect prior to SB 343, or who will be eligible to retire no later than five years after January 7, 2013 comprise transition group A. Members who have 20 years of service credit prior to January 7, 2013 or who will be eligible to retire no later than 10 years after January 7, 2013 are included in transition group B. Group C includes those members who are not in either of the other groups and members who were hired on or after January 7, 2013. See pages 230-232 of the Plan Statement for additional information.

## Percent of Eligible Active Members Retiring Within Next Year

### With Unreduced Age-and-Service Retirement Benefits

Members may retire with no reduction in benefits if they have the following total years of service credit and have attained division specific minimum ages:

**Transition Group A**

- ***State and Local*****—**30 years of service at any age; five years of service at age 65:
  - > A service-based probability is used for members who attain 30 years of service prior to age 65;
  - > An age-based probability is used for members who attain 30 years of service on or after age 65.
- ***Public Safety*****—**25 years of service and attained the age of 52; 15 years of service at age 62.
- ***Law Enforcement*****—**25 years of service and attained the age of 48; 15 years of service at age 62.

| | State | | Local | |
|---|---|---|---|---|
| Service | Men | Women | Men | Women |
| 30 | 37% | 40% | 35% | 35% |
| 31 | 28 | 33 | 26 | 30 |
| 32-39 | 24 | 26 | 23 | 24 |
| 40-42 | 35 | 33 | 32 | 24 |
| 43-44 | 35 | 33 | 32 | 20 |
| 45 | 25 | 25 | 32 | 20 |
| 46-49 | 25 | 25 | 25 | 20 |
| 50 & Over | 100 | 100 | 100 | 100 |

| Retirement Age | State | | Local | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 65-66 | 22% | 22% | 20% | 20% |
| 67 | 20 | 20 | 15 | 20 |
| 68-71 | 20 | 20 | 15 | 17 |
| 72-76 | 15 | 20 | 15 | 17 |
| 77-78 | 15 | 25 | 15 | 17 |
| 79 | 15 | 25 | 15 | 22 |
| 80-84 | 25 | 25 | 20 | 22 |
| 85 & Over | 100 | 100 | 100 | 100 |

| Retirement Age | Public Safety | Law Enforcement |
|---|---|---|
| 48-51 | N/A | 20% |
| 52-53 | 30% | 20 |
| 54-55 | 25 | 20 |
| 56-57 | 25 | 23 |
| 58-59 | 20 | 25 |
| 60 | 35 | 30 |
| 61-69 | 35 | 25 |
| 70 & Over | 100 | 100 |

### Transition Group B

- ***State and Local***—31 years of service at age 52; 32 years of service at any age; or five years of service at age 66:
  - > A service-based probability is used for members who attain 32 years of service at any age;
  - > An age-based probability is used for members who attain 32 years of service on or after age 66.
- ***Public Safety***—25 years of service and attained the age of 54; 15 years of service and attained the age of 64.
- ***Law Enforcement***—25 years of service and attained the age of 50; 15 years of service and attained the age of 64.

| Service | State | | Local | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 31 | 37% | 40% | 35% | 35% |
| 32 | 28 | 33 | 26 | 30 |
| 33-40 | 24 | 26 | 23 | 24 |
| 41-43 | 35 | 33 | 32 | 24 |
| 44-45 | 35 | 33 | 32 | 20 |
| 46 | 25 | 25 | 32 | 20 |
| 47-50 | 25 | 25 | 25 | 20 |
| 51 & Over | 100 | 100 | 100 | 100 |

| Retirement Age | State | | Local | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 66-67 | 22% | 22% | 20% | 20% |
| 68 | 20 | 20 | 15 | 20 |
| 69-72 | 20 | 20 | 15 | 17 |
| 73-77 | 15 | 20 | 15 | 17 |
| 78-79 | 15 | 25 | 15 | 17 |
| 80 | 15 | 25 | 15 | 22 |
| 81-84 | 25 | 25 | 20 | 22 |
| 85 & Over | 100 | 100 | 100 | 100 |

| Retirement Age | Public Safety | Law Enforcement |
|---|---|---|
| 50-53 | N/A | 20% |
| 54-57 | 25% | 20 |
| 58-59 | 20 | 23 |
| 60-61 | 35 | 25 |
| 62 | 35 | 30 |
| 63-69 | 35 | 25 |
| 70-71 | 100 | 25 |
| 72 & Over | 100 | 100 |

### Transition Group C

- ***State and Local—***32 years of service at age 55 (55 & 32 Condition); or five years of service at age 67 (67 & 5 Condition):
  - > A service-based probability is used for members who attain 32 years of service at or after age 55;
  - > An age-based probability is used for members who attain 32 years of service on or after age 67.
- ***Public Safety—***25 years of service and attained the age of 56; or 15 years of service and attained the age of 64.
- ***Law Enforcement—***25 years of service and attained the age of 52; or 15 years of service and attained the age of 64.

| 55 & 32 Condition Year of Eligibility | State | | Local | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 1 | 37% | 40% | 35% | 35% |
| 2 | 28 | 33 | 26 | 30 |
| 3-10 | 24 | 26 | 23 | 24 |
| 11-13 | 35 | 33 | 32 | 24 |
| 14-15 | 35 | 33 | 32 | 20 |
| 16 | 25 | 25 | 32 | 20 |
| 17-20 | 25 | 25 | 25 | 20 |
| 21 & Over | 100 | 100 | 100 | 100 |

| 67 & 5 Condition Retirement Age | State | | Local | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 67-68 | 22% | 22% | 20% | 20% |
| 69 | 20 | 20 | 15 | 20 |
| 70-73 | 20 | 20 | 15 | 17 |
| 74-78 | 15 | 20 | 15 | 17 |
| 79-80 | 15 | 25 | 15 | 17 |
| 81 | 15 | 25 | 15 | 22 |
| 82-84 | 25 | 25 | 20 | 22 |
| 85 & Over | 100 | 100 | 100 | 100 |

| Retirement Age | Public Safety | Law Enforcement |
|---|---|---|
| 52-55 | N/A | 20% |
| 56-57 | 25% | 20 |
| 58-59 | 20 | 20 |
| 60-61 | 35 | 23 |
| 62-63 | 35 | 25 |
| 64 | 35 | 30 |
| 65-69 | 35 | 25 |
| 70-73 | 100 | 25 |
| 74 & Over | 100 | 100 |

## Percent of Eligible Active Members Retiring Within Next Year

## With Reduced Age-and-Service Retirement Benefits

### Transition Group A

Members in the State and Local divisions who have a minimum of 25 years of total service credit and who have attained the age of 55 and members with five years of service who have attained age 60 may retire with a reduced benefit. Members in the Public Safety and Law Enforcement divisions who have a minimum of 25 years of service and who have attained age 48 and members with 15 years of service and who have attained age 52 may also retire with a reduced benefit.

| Retirement Age | State | | Local | | Public Safety |
|---|---|---|---|---|---|
| | Men | Women | Men | Women | |
| 48-51 | N/A | N/A | N/A | N/A | 8% |
| 52-54 | N/A | N/A | N/A | N/A | N/A |
| 55-58 | 10% | 10% | 9% | 11% | N/A |
| 59 | 10 | 11 | 9 | 11 | N/A |
| 60 | 10 | 12 | 9 | 11 | N/A |
| 61 | 10 | 13 | 9 | 12 | N/A |
| 62 | 15 | 15 | 13 | 13 | N/A |
| 63 | 15 | 15 | 14 | 14 | N/A |
| 64 | 15 | 15 | 12 | 15 | N/A |

### Transition Group B

Members in the State and Local divisions who have a minimum of 25 years of total service credit and who have attained the age of 55 and members with five years of service who have attained age 60 may retire with a reduced benefit. Members in the Public Safety and Law Enforcement divisions who have a minimum of 25 years of service and who have attained age 48 and members with 15 years of service and who have attained age 52 may also retire with a reduced benefit.

| Retirement Age | State | | Local | | Public Safety | Law Enforcement |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | | |
| 48-49 | N/A | N/A | N/A | N/A | 8% | 8% |
| 50-53 | N/A | N/A | N/A | N/A | 8 | N/A |
| 54 | N/A | N/A | N/A | N/A | N/A | N/A |
| 55-58 | 10% | 10% | 9% | 11% | N/A | N/A |
| 59 | 10 | 11 | 9 | 11 | N/A | N/A |
| 60 | 10 | 12 | 9 | 11 | N/A | N/A |
| 61 | 10 | 13 | 9 | 12 | N/A | N/A |
| 62 | 15 | 15 | 13 | 13 | N/A | N/A |
| 63 | 15 | 15 | 14 | 14 | N/A | N/A |
| 64-65 | 15 | 15 | 12 | 15 | N/A | N/A |

### Transition Group C

Members in the State and Local divisions who have a minimum of 25 years of total service credit and who have attained the age of 57 and members with five years of service who have attained age 62 may retire with a reduced benefit. Members in the Public Safety division who have a minimum of 25 years of service and who have attained age 52 and members with 15 years of service who have attained age 56 may retire with a reduced benefit. Members in the Law Enforcement division who have a minimum of 25 years of service and who have attained age 48 and members with 15 years of service who have attained age 56 may also retire with a reduced benefit.

| Retirement Age | State | | Local | | Public Safety | Law Enforcement |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | | |
| 48-51 | N/A | N/A | N/A | N/A | N/A | 8% |
| 52-55 | N/A | N/A | N/A | N/A | 8% | N/A |
| 56 | N/A | N/A | N/A | N/A | N/A | N/A |
| 57-60 | 10% | 10% | 9% | 11% | N/A | N/A |
| 61 | 10 | 11 | 9 | 11 | N/A | N/A |
| 62 | 10 | 12 | 9 | 11 | N/A | N/A |
| 63 | 10 | 13 | 9 | 12 | N/A | N/A |
| 64 | 15 | 15 | 13 | 13 | N/A | N/A |
| 65 | 15 | 15 | 14 | 14 | N/A | N/A |
| 66 | 15 | 15 | 12 | 15 | N/A | N/A |

## Schedules of Average Defined Benefits Paid

The tables below display statistical information regarding the average defined benefits paid to retirees receiving an age-and-service, disability, or survivor benefit. Additional benefits paid through the additional annuity and re-employed retiree programs, and annuities purchased from defined contribution accounts are excluded, as these benefits are not calculated under the defined benefit formula.

### Average Defined Benefits Paid OPERS Retirees — Traditional Pension Plan

| Year | Average Age at Retirement | Average Service at Retirement | Average Final Average Salary | Average Pension at Retirement | Average Age on Valuation Date | Average Pension on Valuation Date |
|---|---|---|---|---|---|---|
| 2016 | 57.6 | 23.0 | $41,519 | $20,545 | 70.2 | $26,396 |
| 2015 | 57.6 | 22.9 | 40,600 | 20,092 | 69.9 | 25,600 |
| 2014 | 57.6 | 22.8 | 39,749 | 19,686 | 69.7 | 24,849 |
| 2013 | 57.4 | 22.8 | 38,760 | 19,299 | 69.5 | 24,220 |
| 2012 | 57.4 | 22.7 | 37,741 | 18,832 | 69.3 | 23,468 |
| 2011 | 57.3 | 22.6 | 36,549 | 18,221 | 69.3 | 22,614 |
| 2010 | 57.2 | 22.4 | 35,025 | 17,380 | 69.3 | 21,600 |
| 2009 | 57.2 | 22.2 | 33,808 | 16,725 | 69.3 | 20,731 |
| 2008 | 57.2 | 22.0 | 32,401 | 15,942 | 69.4 | 19,751 |
| 2007 | 57.2 | 21.9 | 31,214 | 15,318 | 69.4 | 18,917 |

### Average Defined Benefits Paid OPERS Retirees — Combined Plan

| Year | Average Age at Retirement | Average Service at Retirement | Average Final Average Salary | Average Pension at Retirement | Average Age on Valuation Date | Average Pension on Valuation Date |
|---|---|---|---|---|---|---|
| 2016 | 64.8 | 10.0 | $46,614 | $3,709 | 67.9 | $3,956 |
| 2015 | 64.6 | 9.8 | 45,141 | 3,401 | 67.3 | 3,596 |
| 2014 | 64.7 | 9.7 | 44,349 | 3,284 | 66.8 | 3,421 |
| 2013 | 64.9 | 8.7 | 43,403 | 2,839 | 67.0 | 2,962 |
| 2012 | 64.2 | 8.5 | 45,218 | 2,785 | 66.2 | 2,891 |
| 2011 | 64.2 | 7.9 | 49,751 | 2,757 | 66.0 | 2,828 |
| 2010 | 64.3 | 7.9 | 40,548 | 2,158 | 65.9 | 2,219 |
| 2009 | 65.0 | 7.6 | 35,139 | 1,590 | 66.6 | 1,635 |
| 2008 | 64.0 | 7.4 | 29,454 | 1,239 | 64.8 | 1,260 |
| 2007 | 61.1 | 4.8 | 43,743 | 1,620 | 62.0 | 1,644 |

The following tables display the actuarial valuation data for the active and retired members of the Traditional Pension Plan, and the defined benefit component of the Combined Plan:

## Actuarial Valuation Data — Traditional Pension Plan

| | | | Active Members | | | | Retired Lives | | |
|---|---|---|---|---|---|---|---|---|---|
| Valuation Year | Participating Employers** | Employer Units** | Number | Annual Payroll ($ millions) | Average Pay | Percent Increase in Average Pay | Number* | Annual Allowance ($ millions) | Average Allowance |
| 2016 | 3,232 | 3,678 | 323,179 | $12,794 | $39,588 | 3.26% | 213,550 | $5,527 | $25,882 |
| 2015 | 3,247 | 3,683 | 321,383 | 12,321 | 38,337 | 1.78 | 210,792 | 5,296 | 25,124 |
| 2014 | 3,251 | 3,692 | 322,318 | 12,140 | 37,665 | 2.06 | 208,395 | 5,085 | 24,401 |
| 2013 | 3,260 | 3,718 | 325,181 | 12,000 | 36,903 | 1.29 | 201,841 | 4,803 | 23,796 |
| 2012 | 3,264 | 3,702 | 326,227 | 11,885 | 36,432 | (1.08) | 195,622 | 4,523 | 23,121 |
| 2011 | 3,248 | 3,695 | 328,640 | 12,103 | 36,828 | 1.27 | 189,753 | 4,232 | 22,303 |
| 2010 | 3,245 | 3,699 | 334,507 | 12,165 | 36,367 | 1.15 | 181,433 | 3,868 | 21,319 |
| 2009 | 3,264 | 3,714 | 341,777 | 12,290 | 35,953 | 0.29 | 174,637 | 3,576 | 20,477 |
| 2008 | 3,275 | 3,724 | 349,969 | 12,546 | 35,849 | 3.87 | 169,000 | 3,300 | 19,525 |
| 2007 | 3,270 | 3,714 | 357,743 | 12,347 | 34,514 | 2.76 | 163,505 | 3,063 | 18,731 |

* The number of Retired Lives represents an individual count of retirees and beneficiaries.
** The number of employer units exceeds the number of reporting or participating employers as some employers report multiple divisions or agencies. The employer unit count also includes private-sector employers that have assumed privatized functions from public employers for indeterminate periods. The number of participating employers is included to comply with GASB 67 requirements for presentation of a primary government and its component units as one employer.

## Actuarial Valuation Data — Combined Plan

| | | | Active Members | | | | Retired Lives | | |
|---|---|---|---|---|---|---|---|---|---|
| Valuation Year | Participating Employers** | Employer Units** | Number | Annual Payroll ($ millions) | Average Pay | Percent Increase in Average Pay | Number* | Annual Allowance ($ millions) | Average Allowance |
| 2016 | 3,232 | 3,678 | 7,803 | $392 | $50,237 | 4.39% | 239 | $1 | $3,956 |
| 2015 | 3,247 | 3,683 | 7,626 | 367 | 48,125 | 3.69 | 196 | 1 | 3,596 |
| 2014 | 3,251 | 3,692 | 7,455 | 346 | 46,412 | 1.50 | 158 | 1 | 3,421 |
| 2013 | 3,260 | 3,718 | 7,239 | 331 | 45,725 | 2.82 | 100 | 0 | 2,962 |
| 2012 | 3,264 | 3,702 | 6,948 | 309 | 44,473 | 0.88 | 57 | 0 | 2,891 |
| 2011 | 3,248 | 3,695 | 6,714 | 296 | 44,087 | 3.13 | 36 | 0 | 2,828 |
| 2010 | 3,245 | 3,699 | 6,667 | 284 | 42,748 | 4.56 | 20 | 0 | 2,219 |
| 2009 | 3,264 | 3,714 | 6,335 | 258 | 40,884 | 2.91 | 8 | 0 | 1,635 |
| 2008 | 3,275 | 3,724 | 6,419 | 255 | 39,726 | 6.60 | 7 | 0 | 1,260 |
| 2007 | 3,270 | 3,714 | 6,333 | 236 | 37,265 | 4.12 | 2 | 0 | 1,693 |

* The number of Retired Lives represents an individual count of retirees and beneficiaries receiving an age-and-service benefit. Plan inception January 1, 2003; first eligible retiree in 2006.
** The number of employer units exceeds the number of reporting or participating employers as some employers report multiple divisions or agencies. The employer unit count also includes private-sector employers that have assumed privatized functions from public employers for indeterminate periods. The number of participating employers is included to comply with GASB 67 requirements for presentation of a primary government and its component units as one employer.

Members of the Combined Plan and Member-Directed Plan may purchase a defined benefit annuity with the funds available in their defined contribution accounts. The following table displays the actuarial valuation data for these annuitized accounts:

**Actuarial Valuation Data** **Purchased Annuities**

| Valuation Year | Member-Directed Plan* | | | Combined Plan* | | |
|---|---|---|---|---|---|---|
| | Number** | Annual Allowance ($ millions) | Average Allowance | Number** | Annual Allowance ($ millions) | Average Allowance |
| 2016 | 219 | $1 | $4,593 | 159 | $1 | $3,618 |
| 2015 | 185 | 1 | 4,480 | 128 | 0 | 3,303 |
| 2014 | 155 | 1 | 4,305 | 101 | 0 | 3,257 |
| 2013 | 131 | 1 | 4,146 | 64 | 0 | 3,248 |
| 2012 | 62 | 0 | 3,516 | 38 | 0 | 2,922 |
| 2011 | 38 | 0 | 2,652 | 22 | 0 | 2,286 |
| 2010 | 18 | 0 | 2,275 | 12 | 0 | 1,920 |
| 2009 | 10 | 0 | 2,158 | 4 | 0 | 1,770 |
| 2008 | 4 | 0 | 3,468 | 5 | 0 | 1,778 |
| 2007 | 2 | 0 | 1,932 | 2 | 0 | 1,702 |

* Plan inception January 1, 2003; first eligible retiree in 2006 in Combined Plan and 2007 for Member-Directed Plan.
** Number represents an individual count of retirees and beneficiaries.

The tables below display the changes in the retiree population that occurred each year within the Traditional Pension Plan and the Combined Plan. The Annual Allowances in the Rolls at End of the Year and the Average Annual Allowances represent the value of pension payments for the retiree population on the rolls at December 31, 2016.

The statistics presented below represent the number of retired members' accounts under which either the member or the members' beneficiaries are receiving defined formula benefits for age-and-service retirements, disability or survivor benefits. Annual Allowances include annual cost-of-living adjustments, but exclude other annuities such as money purchase or additional annuities (refer to the Plan Statement beginning on page 227 for a description of these benefits). Prior to 2011, the statistics excluded retired members with less than five years of service credit. Restated data for years prior to 2011 is not available.

**Schedule of Retirees and Beneficiaries Added to and Removed from Rolls — Traditional Pension Plan**

| Year Ended | Added to Rolls | | Removed from Rolls | | Rolls at End of Year | | Percentage Increase in Annual Allowances | Average Annual Allowances |
|---|---|---|---|---|---|---|---|---|
| | Number | Annual Allowances | Number | Annual Allowances | Number | Annual Allowances | | |
| 2016 | 8,394 | $222,425,424 | 5,724 | $101,173,388 | 206,380 | $5,510,557,484 | 4.4% | $26,701 |
| 2015 | 8,235 | 202,901,884 | 5,849 | 101,124,098 | 203,710 | 5,277,086,404 | 4.2 | 25,905 |
| 2014 | 12,001 | 270,725,495 | 5,609 | 93,114,033 | 201,324 | 5,065,543,814 | 5.9 | 25,161 |
| 2013 | 10,946 | 265,957,588 | 5,371 | 83,764,472 | 194,932 | 4,784,927,394 | 6.3 | 24,547 |
| 2012 | 11,263 | 281,185,485 | 5,772 | 87,465,474 | 189,357 | 4,501,952,331 | 6.8 | 23,775 |
| 2011* | 12,235 | 321,228,243 | 5,402 | 80,530,077 | 183,866 | 4,215,359,130 | 10.2 | 22,926 |
| 2010 | 10,607 | 278,758,820 | 4,041 | 59,271,884 | 173,235 | 3,824,710,874 | 8.0 | 22,078 |
| 2009 | 10,839 | 289,793,503 | 5,542 | 78,808,830 | 166,669 | 3,541,886,599 | 8.6 | 21,251 |
| 2008 | 9,240 | 225,548,983 | 4,124 | 56,416,940 | 161,372 | 3,261,996,219 | 7.4 | 20,214 |
| 2007 | 9,733 | 230,401,061 | 5,576 | 82,605,482 | 156,256 | 3,035,847,045 | 7.9 | 19,429 |

**Schedule of Retirees and Beneficiaries Added to and Removed from Rolls — Combined Plan—Defined Benefit****

| Year Ended | Added to Rolls | | Removed from Rolls | | Rolls at End of Year | | Percentage Increase in Annual Allowances | Average Annual Allowances |
|---|---|---|---|---|---|---|---|---|
| | Number | Annual Allowances | Number | Annual Allowances | Number | Annual Allowances | | |
| 2016 | 43 | $209,341 | 1 | $5,304 | 238 | $929,456 | 31.9% | $3,905 |
| 2015 | 41 | 162,966 | 1 | 3,333 | 196 | 704,864 | 33.4 | 3,596 |
| 2014 | 56 | 223,294 | 0 | 0 | 156 | 528,211 | 78.3 | 3,386 |
| 2013 | 45 | 133,159 | 0 | 0 | 100 | 296,172 | 87.2 | 2,962 |
| 2012 | 19 | 59,135 | 0 | 0 | 55 | 158,191 | 68.4 | 2,876 |
| 2011* | 15 | 50,537 | 0 | 0 | 36 | 93,925 | 119.2 | 2,609 |
| 2010 | 11 | 29,695 | 0 | 0 | 19 | 42,849 | 228.7 | 2,255 |
| 2009 | 4 | 7,545 | 3 | 3,702 | 8 | 13,035 | 46.8 | 1,629 |
| 2008 | 5 | 5,492 | 0 | 0 | 7 | 8,879 | 162.2 | 1,268 |
| 2007*** | 1 | 1,881 | 0 | 0 | 2 | 3,386 | 125.0 | 1,693 |

* Data aggregation methodology modified from values reported in the *2011 Comprehensive Annual Financial Report*.
** Plan inception January 1, 2003; first eligible retiree in 2006.
*** Restated to remove annuitized defined contribution accounts previously included in values.

# Schedules of Funding Progress

The Schedules of Funding Progress below include the Traditional Pension Plan, the defined benefit component of the Combined Plan and the actuarial impact of the annuitized defined contribution accounts for the Combined Plan and Member-Directed Plan. Members in the Combined Plan and Member-Directed Plan have the option of converting their defined contribution accounts to a defined benefit annuity at retirement. Separate schedules are displayed for each plan reflecting the funding status of the plans on a valuation, or funding, basis. See page 204 in the Statistical Section for the schedules of funding progress on an accounting, or financial, basis. Separate schedules are included in the Required Supplementary Information of the Financial Section disclosing the 10-year schedule of actuarially determined and actual contributions paid.

### Schedule of Funding Progress—Funding Basis* ($ in millions) — All Pension Plans

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities (UAAL) | Ratio of Assets to AAL | Active Member Payroll | UAAL as Percent of Active Member Payroll | Amortization Years |
|---|---|---|---|---|---|---|---|
| 2016 | $100,166 | $80,280 | $19,886 | 80% | $13,718 | 145% | 19 |
| 2015*** | 97,177 | 78,061 | 19,116 | 80 | 13,177 | 145 | 20 |
| 2015** | 91,832 | 78,061 | 13,771 | 85 | 13,177 | 105 | 19 |
| 2014 | 89,285 | 74,865 | 14,420 | 84 | 12,933 | 111 | 21 |
| 2013 | 86,645 | 71,411 | 15,234 | 82 | 12,331 | 124 | 24 |
| 2012 | 83,878 | 67,855 | 16,023 | 81 | 12,194 | 131 | 26 |
| 2011 | 84,530 | 65,436 | 19,094 | 77 | 12,399 | 154 | 30 |
| 2010*** | 80,485 | 63,649 | 16,836 | 79 | 12,449 | 135 | 24 |
| 2010** | 79,630 | 60,600 | 19,030 | 76 | 12,449 | 153 | 29 |
| 2009 | 76,555 | 57,629 | 18,926 | 75 | 12,548 | 151 | 30 |
| 2008 | 73,466 | 55,315 | 18,151 | 75 | 12,801 | 142 | 30 |
| 2007 | 69,734 | 67,151 | 2,583 | 96 | 12,583 | 21 | 14 |

### Schedule of Funding Progress—Funding Basis* ($ in millions) — Traditional Pension Plan

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities (UAAL) | Ratio of Assets to AAL | Active Member Payroll | UAAL as Percent of Active Member Payroll | Amortization Years |
|---|---|---|---|---|---|---|---|
| 2016 | $99,818 | $79,865 | $19,953 | 80% | $12,794 | 156% | 20 |
| 2015*** | 96,863 | 77,700 | 19,163 | 80 | 12,321 | 156 | 20 |
| 2015** | 91,535 | 77,700 | 13,835 | 85 | 12,321 | 112 | 19 |
| 2014 | 89,017 | 74,567 | 14,450 | 84 | 12,140 | 119 | 21 |
| 2013 | 86,407 | 71,175 | 15,232 | 82 | 12,000 | 127 | 25 |
| 2012 | 83,664 | 67,670 | 15,994 | 81 | 11,885 | 135 | 26 |
| 2011 | 84,325 | 65,274 | 19,051 | 77 | 12,103 | 157 | 30 |
| 2010*** | 80,307 | 63,515 | 16,792 | 79 | 12,165 | 138 | 25 |
| 2010** | 79,459 | 60,461 | 18,998 | 76 | 12,165 | 156 | 30 |
| 2009 | 76,407 | 57,519 | 18,888 | 75 | 12,290 | 154 | 30 |
| 2008 | 73,346 | 55,230 | 18,116 | 75 | 12,546 | 144 | 30 |
| 2007 | 69,639 | 67,067 | 2,572 | 96 | 12,347 | 21 | 14 |

* The amounts reported on this schedule do not include assets or liabilities for health care.
** Results from original valuation prior to re-statement after completion of experience study.
*** Revised actuarial assumptions based on experience study.

The Combined Plan is a retirement plan with both a defined benefit and a defined contribution component. At retirement, members have the option to convert their defined contribution account to a defined benefit annuity. The schedule below includes the funding status for both defined formula benefits and the purchased annuities, when applicable.

### Schedule of Funding Progress—Funding Basis* ($ in millions) Combined Plan

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities/(Assets) (UAAL) | Ratio of Assets to AAL | Active Member Payroll | UAAL as Percent of Active Member Payroll | Amortization Years |
|---|---|---|---|---|---|---|---|
| 2016 | $336 | $402 | ($66) | 120% | $392 | 0% | 0 |
| 2015*** | 303 | 350 | (47) | 116 | 367 | 0 | 0 |
| 2015** | 288 | 350 | (62) | 122 | 367 | 0 | 0 |
| 2014 | 260 | 289 | (29) | 111 | 346 | 0 | 0 |
| 2013 | 230 | 229 | 1 | 100 | 331 | 0 | 0 |
| 2012 | 212 | 183 | 29 | 86 | 309 | 9 | 1 |
| 2011 | 203 | 161 | 42 | 79 | 296 | 14 | 2 |
| 2010*** | 177 | 134 | 43 | 76 | 284 | 15 | 3 |
| 2010** | 171 | 138 | 33 | 81 | 284 | 12 | 2 |
| 2009 | 148 | 110 | 38 | 74 | 258 | 15 | 3 |
| 2008 | 120 | 85 | 35 | 71 | 255 | 14 | 4 |
| 2007 | 95 | 84 | 11 | 88 | 236 | 5 | N/A |

* The amounts reported on this schedule do not include assets or liabilities for health care.
** Results from original valuation prior to re-statement after completion of experience study.
*** Revised actuarial assumptions based on experience study.

The Member-Directed Plan is a defined contribution plan. At retirement, members have the option to convert their defined contribution account to a defined benefit annuity. The schedule below displays the funding status of the purchased defined benefit annuities.

### Schedule of Funding Progress—Funding Basis* ($ in thousands) Member-Directed Annuities#

| Valuation Year | Actuarial Accrued Liabilities (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liabilities/(Assets) (UAAL) | Ratio of Assets to AAL | Active Member Payroll | UAAL as Percent of Active Member Payroll |
|---|---|---|---|---|---|---|
| 2016 | $12,249 | $12,961 | ($712) | 106% | N/A | N/A |
| 2015*** | 10,291 | 10,622 | (331) | 103 | N/A | N/A |
| 2015** | 9,767 | 10,622 | (855) | 109 | N/A | N/A |
| 2014 | 8,291 | 8,772 | (481) | 106 | N/A | N/A |
| 2013 | 6,884 | 6,826 | 58 | 99 | N/A | N/A |
| 2012 | 2,666 | 2,524 | 142 | 95 | N/A | N/A |
| 2011 | 1,173 | 1,156 | 17 | 99 | N/A | N/A |
| 2010*** | 496 | 454 | 42 | 92 | N/A | N/A |
| 2010** | 490 | 439 | 51 | 90 | N/A | N/A |
| 2009 | 253 | 206 | 47 | 81 | N/A | N/A |
| 2008 | 166 | 148 | 18 | 89 | N/A | N/A |

* Participants in the Member-Directed Plan do not have access to health care under the Traditional Pension Plan or Combined Plan. Instead, a portion of the employer contributions are deposited into a retiree medical account (RMA). The RMA can reimburse qualified medical expenses when a Member-Directed Plan participant terminates service or retires.
** Results from original valuation prior to re-statement after completion of experience study.
*** Revised actuarial assumptions based on experience study.
\# Plan inception January 1, 2003. Actuarial data for annuitized accounts is not available prior to 2008.

The OPERS funding objective is to pay for retirement benefits through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will pay all promised benefits when due–the ultimate test of financial soundness.

A short-term solvency test is one means of checking a plan's progress under its funding program. In a short-term solvency test, the plan's present assets (cash and investments) are compared to: 1) active and inactive member contributions on deposit; 2) the liabilities for future benefits payable to present retired lives; and 3) the liabilities for service already rendered by active/inactive members.

In a plan that has been following the discipline of level percent of payroll financing, the liabilities for member contributions on deposit (Columns (1)) and the liabilities for future benefits payable to present retired lives (Columns (2)) will be fully covered by existing assets (except in rare circumstances). In addition, the liabilities for service already rendered by active/inactive members (Columns (3)) will be partially covered by the remaining value of actuarial assets at year end. Generally, if the plan has been using level cost financing, the funded portion of (Columns (3)) will increase over time. Columns (3) are rarely fully funded.

The following tables display the results of the Short-Term Solvency Test for asset values in the defined benefit Traditional Pension Plan and Combined Plan, based on the actuarial value of assets at year end.

**Accrued Pension Liabilities** ($ in millions) — **Traditional Pension Plan**

| Valuation Year | Aggregate Accrued Liabilities for: (1) Active Member Contributions | (2) Retirees and Beneficiaries | (3) Active/Inactive Members (Employer-Financed Portion) | Valuation Assets* | Portions of Accrued Liabilities Covered by Reported Assets: (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2016 | $13,912 | $62,798 | $23,108 | $79,865 | 100% | 100% | 14% |
| 2015*** | 13,469 | 56,376 | 27,018 | 77,700 | 100 | 100 | 29 |
| 2015** | 13,469 | 56,815 | 21,250 | 77,700 | 100 | 100 | 35 |
| 2014 | 13,191 | 55,102 | 20,724 | 74,567 | 100 | 100 | 30 |
| 2013 | 12,826 | 52,404 | 21,177 | 71,175 | 100 | 100 | 28 |
| 2012 | 12,640 | 49,667 | 21,357 | 67,670 | 100 | 100 | 25 |
| 2011 | 12,299 | 46,588 | 25,439 | 65,274 | 100 | 100 | 25 |
| 2010*** | 12,134 | 42,362 | 25,811 | 63,515 | 100 | 100 | 35 |
| 2010** | 12,134 | 41,715 | 25,609 | 60,461 | 100 | 100 | 26 |
| 2009 | 11,933 | 38,577 | 25,897 | 57,519 | 100 | 100 | 27 |
| 2008 | 11,546 | 35,485 | 26,315 | 55,230 | 100 | 100 | 31 |
| 2007 | 10,785 | 32,923 | 25,930 | 67,067 | 100 | 100 | 90 |

* Does not include assets set aside for health care.
** Results from original valuation prior to completion of experience study.
*** Results restated based on experience study.

## Accrued Pension Liabilities ($ in millions) — Combined Plan

| Valuation Year | Aggregate Accrued Liabilities for: (1) Active Member Contributions | (2) Retirees and Beneficiaries | (3) Active/Inactive Members (Employer-Financed Portion) | Valuation Assets* | Portions of Accrued Liabilities Covered by Reported Assets: (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2016 | $3 | $18 | $315 | $402 | 100% | 100% | 121% |
| 2015*** | 2 | 14 | 287 | 350 | 100 | 100 | 116 |
| 2015** | 3 | 13 | 272 | 350 | 100 | 100 | 123 |
| 2014 | 3 | 10 | 246 | 289 | 100 | 100 | 112 |
| 2013 | 2 | 6 | 223 | 229 | 100 | 100 | 100 |
| 2012 | 2 | 3 | 207 | 183 | 100 | 100 | 86 |
| 2011 | 1 | 2 | 200 | 161 | 100 | 100 | 79 |
| 2010*** | 1 | 1 | 175 | 134 | 100 | 100 | 75 |
| 2010** | 1 | 1 | 169 | 138 | 100 | 100 | 80 |
| 2009 | 1 | 0 | 147 | 110 | 100 | 100 | 74 |
| 2008 | 1 | 0 | 119 | 85 | 100 | 100 | 71 |
| 2007 | 0 | 0 | 95 | 84 | 100 | 100 | 89 |

* Does not include assets set aside for health care.
** Results from original valuation prior to completion of experience study.
*** Results restated based on experience study.

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The following tables display the actual financial experience in relation to the actuarially assumed experience for each of the defined benefit plans. Actuarial gains and losses in accrued liabilities result from differences between the assumed experience and actual experience.

### Analysis of Financial Experience (continued on next page)

| Type of Activity | Gains (or Losses) for Year ($ in millions) | | | |
|---|---|---|---|---|
| | 2016 | 2015 | 2014 | 2013 |
| **Age-and-Service Retirements** When members retire at older ages than assumed, a gain results. If members retire at ages younger than assumed, a loss occurs. | $55.5 | $71.6 | ($91.9) | ($77.2) |
| **Disability Retirements** When disability claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs. | 61.2 | 83.1 | 95.0 | 64.0 |
| **Death-In-Service Annuities** When survivor claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs. | 41.3 | 41.0 | 40.4 | 29.5 |
| **Other Separations** When liabilities released by other separations are greater than assumed, a gain results. If liabilities released are less than assumed, a loss occurs. | 5.2 | 22.1 | 4.7 | (13.0) |
| **Pay Increases** When pay increases are less than assumed, a gain results. If pay increases are greater than assumed, a loss occurs. | (48.1) | 367.1 | 461.8 | 551.7 |
| **Investment Return** When investment returns are greater than assumed, a gain results. If investment returns are less than assumed, a loss occurs. | (467.8) | 261.6 | 471.3 | 617.1 |
| **Retiree Mortality** When liabilities released due to death of members are greater than assumed, a gain results. If liabilities released are less than assumed, a loss occurs. | 31.9 | 74.4 | 95.8 | 140.4 |
| **Gains (or Losses) During Year From Financial Experience** | **($320.8)** | **$920.9** | **$1,077.1** | **$1,312.5** |

### Analysis of Financial Experience (continued on next page)

| Type of Activity | Gains (or Losses) for Year ($ in millions) | | | |
|---|---|---|---|---|
| | 2016 | 2015 | 2014 | 2013 |
| **Age-and-Service Retirements** When members retire at older ages than assumed, a gain results. If members retire at ages younger than assumed, a loss occurs. | $0.06 | $0.07 | ($0.16) | ($0.09) |
| **Disability Retirements** When disability claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs. | 3.82 | 3.93 | 4.66 | 4.34 |
| **Death-In-Service Annuities** When survivor claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs. | 0.94 | 0.42 | 1.04 | 0.66 |
| **Other Separations** When liabilities released by other separations are greater than assumed, a gain results. If liabilities released are less than assumed, a loss occurs. | (0.44) | 0.23 | (0.74) | (0.09) |
| **Pay Increases** When pay increases are less than assumed, a gain results. If pay increases are greater than assumed, a loss occurs. | 4.09 | 5.92 | 4.92 | 5.53 |
| **Investment Return** When investment returns are greater than assumed, a gain results. If investment returns are less than assumed, a loss occurs. | (2.02) | (0.08) | 3.05 | 2.84 |
| **Retiree Mortality** When liabilities released due to death of members are greater than assumed, a gain results. If liabilities released are less than assumed, a loss occurs. | (0.03) | 0.29 | 0.04 | 0.10 |
| **Gains (or Losses) During Year From Financial Experience** | **$6.42** | **$10.78** | **$12.81** | **$13.29** |

## Actual vs. Recommended Contribution Rates

The Board adopted all contribution rates as recommended by the actuary.

| Traditional Pension Plan | | | | | |
|---|---|---|---|---|---|
| Gains (or Losses) for Year ($ in millions) | | | | | |
| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
| ($113.2) | ($179.0) | ($20.5) | ($27.5) | $10.1 | ($30.6) |
| 71.6 | 88.1 | 59.2 | 74.0 | 39.1 | 36.7 |
| 42.0 | 36.1 | 32.0 | 34.6 | 31.7 | 29.5 |
| 8.9 | 15.9 | 99.8 | (58.9) | (27.9) | (129.0) |
| 1,261.7 | 359.5 | 773.7 | 1,141.8 | 220.2 | 202.4 |
| (398.4) | (1,193.8) | 153.5 | (620.5) | (15,813.5) | 1,979.3 |
| | | | | | |
| **$872.6** | **($873.2)** | **$1,097.7** | **$543.5** | **($15,540.3)** | **$2,088.3** |

| Combined Plan | | | | | |
|---|---|---|---|---|---|
| Gains (or Losses) for Year ($ in millions) | | | | | |
| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
| ($0.11) | ($0.09) | ($0.12) | ($0.12) | ($0.06) | ($0.03) |
| 4.86 | 4.52 | 2.78 | 2.07 | 1.94 | 1.12 |
| 0.59 | (0.02) | 0.04 | 0.53 | 0.05 | 0.21 |
| 0.44 | 0.55 | (1.67) | 7.56 | 1.98 | 1.08 |
| 7.55 | 3.00 | 2.29 | (3.35) | (0.21) | 0.22 |
| (0.38) | (2.69) | (3.44) | (3.25) | (23.83) | (0.10) |
| | | | | | |
| **$12.95** | **$5.27** | **($0.12)** | **$3.44** | **($20.13)** | **$2.50** |

The actuarial assumptions and methods described below are based on the most recent health care actuarial valuation study for the year ended December 31, 2015, before the experience study results.

➢ **Funding Method—**An individual entry-age normal actuarial-cost method of valuation is used in determining liabilities and normal cost. Differences between assumed and actual experience (the actuarial gains and losses) become part of unfunded actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized over a period of time to produce payments that are a level percent of payroll contributions based on an open amortization period.

➢ **Asset Valuation Method—**For actuarial purposes, assets are valued utilizing a method which recognizes assumed investment returns fully each year. Differences between actual and assumed investment returns are phased in over a closed four-year period. This funding value is not permitted to deviate from fair value by a corridor of plus or minus 12.00%.

➢ **Significant Actuarial Assumptions—**Assumptions employed by the actuary for funding purposes as of December 31, 2015, the date of the latest actuarial study, before the experience study include:

- **Investment Return—**An investment return rate of 5.00% compounded annually.
- **Salary Scale—**The active member payroll was assumed to increase 3.75% annually for 2015, which is the portion of the individual pay increase assumption attributable to inflation and overall productivity. Also assumed were additional projected salary increases ranging from 0.50% to 6.30% per year depending on age, attributable to seniority and merit for 2015.
- **Benefit Payment—**For the 2015 valuation, health care expenses are assumed to increase initially at 9.50%, before leveling off to 3.75% in 2026.

➢ **Multiple Decrement Tables**

- **Mortality—**The rates used for retiree allowances were the RP-2000 Mortality table projected 20 years using Projection Scale AA. For males, 105% of the combined healthy male mortality rates were used. For females, 100% of the combined healthy female mortality rates were used.

  The rates used for disability allowances were the RP-2000 Mortality table with no projection. For males, 120% of the disabled female mortality rates were used, set forward two years. For females, 100% of the disabled female mortality rates were used.


# Statistical Section

## *Dedicated to:* Going the Distance

The concept of statistics has been defined as the scientific investigation of numbers that enables an organization to perform any endeavor better and more reliably. Study of statistics helps OPERS understand where we've been and helps us navigate critical decisions that shape our future. With statistics, we can identify trends that can help us make important decisions based on data. For example, we know:

- Almost 90 percent of all OPERS retirees reside in the state of Ohio—providing a significant economic impact to the economy.
- Our funded status has consistently put this organization within the required 30-year window—meaning we are and will be able to go the distance and pay pension benefits.

We agree with the adage: If you don't know where you've been, you'll never know where you're going. So, we work to scientifically define the past and present so that we will be in the position of going the distance—providing financial security for all members—past, present and future.

*Note: This section is unaudited.*

# Overview

The Statistical Section provides pertinent information to assist readers when viewing the Financial Statements, Notes to the Financial Statements and Required Supplementary Information to help in understanding and assessing the System's overall financial condition. The information reported here is in compliance with Governmental Accounting Standards Board (GASB) Statement No. 44, *Economic Condition Reporting: The Statistical Section.* This statement establishes standardized reporting requirements for the supplementary information provided in this section.

The schedules and graphs beginning on the next page show financial trend information about the growth of assets for the past 10 years (where available). These schedules provide detailed information about the trends of key sources of additions and deductions to the System's assets and assist in providing a context framing how the OPERS financial position has changed over time. The financial-trend schedules presented are:

- Net Position by Plan,
- Statutory Fund Balance by Plan,
- Fiduciary Net Position by Year,
- Changes in Fiduciary Net Position,
- Additions by Source,
- Deductions by Type,
- Benefits by Type,
- Pension Benefits by Type and
- Refunds by Type.

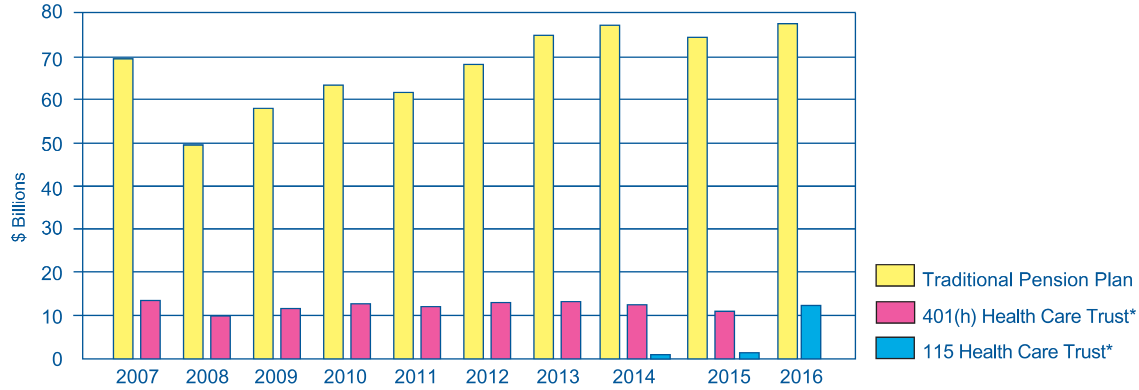
The schedules on page 204 through 205 compare the pension assets accumulated to cover the projected pension liabilities that are ultimately due at retirement for each of the defined benefit plans and the corresponding funded ratio under both the accounting basis (GASB Statement No. 67) and the funding basis. The schedule on page 206 displays similar information for health care assets and projected liabilities. The Health Care Solvency schedule shows the estimated number of years for which assets are available to cover the projected liabilities. The overall objective is to maintain a funding level that will meet all future health care obligations. Refer to the schedules of pension and health care assets vs. liabilities.

The schedules beginning on page 202 show demographic and economic information and operating information. The demographic and economic information is designed to assist in understanding the environment in which OPERS operates. The operating information is intended to provide contextual information about operations to assist in assessing the System's economic condition. The demographic and economic information, and the operating information presented includes:

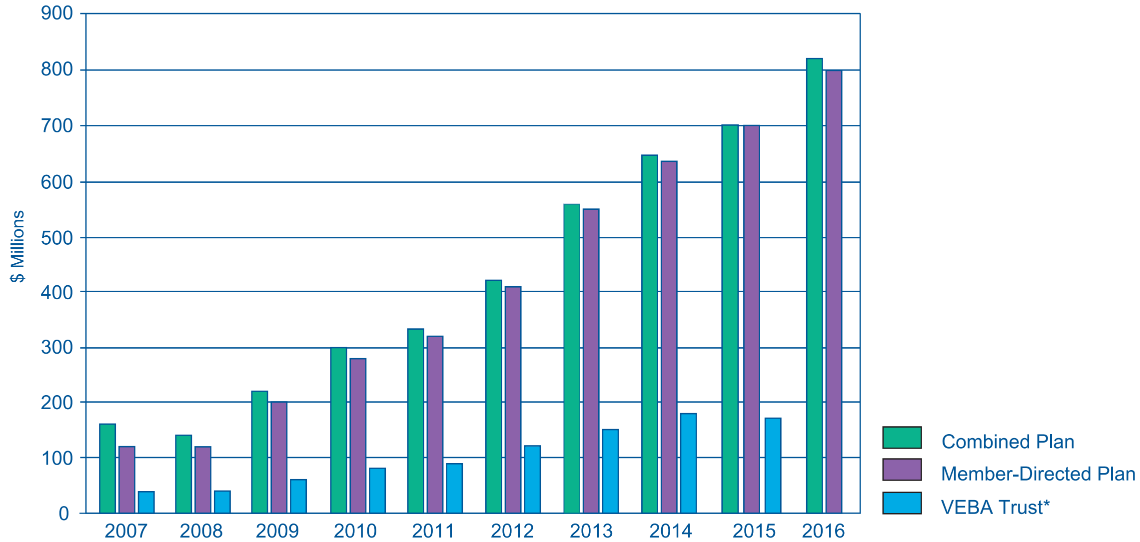
- Number of Refund Payments by Plan,
- Pension Assets vs. Pension Liabilities,
- Health Care Assets vs. Liabilities,
- Number of Retirees/Benefit Recipients by Category,
- Number of Covered Lives by Category,
- Schedule of Retirees by Benefit Type and Amount,
- Number of New Pension Retirees,
- Schedule of Average Benefits (Traditional Pension Plan and Combined Plan),
- Member Counts by Plan,
- 2016 Pension Benefits and Retirees by Ohio County,
- Retirees by Geographic Location,
- Contribution Rates,
- Number of Employer Units, and
- Principal Participating Employers.
- Investment Rates by Portfolio—Defined Benefit and Health Care

All non-accounting data is derived from OPERS internal sources.

## Net Position by Plan — Traditional Pension Plan, 401(h) Health Care Trust, 115 Health Care Trust




## Net Position by Plan — Combined Plan, Member-Directed Plan, VEBA Trust




## Net Position by Plan (last 10 fiscal years)

| Year | Traditional Pension Plan | Combined Plan | Member-Directed Plan | 401(h) Health Care Trust | 115 Health Care Trust** | Voluntary Employees' Beneficiary Association Trust | Total Net Position |
|---|---|---|---|---|---|---|---|
| 2016* | $77,109,633,485 | $815,852,017 | $804,850,860 | | $11,880,487,863 | | $90,610,824,225 |
| 2015 | 74,213,320,352 | 700,914,409 | 698,540,030 | $10,671,068,181 | 841,112,040 | $166,446,806 | 87,291,401,818 |
| 2014 | 76,956,230,642 | 650,249,727 | 635,272,613 | 12,440,522,790 | 386,080,172 | 175,539,164 | 91,243,895,108 |
| 2013 | 74,618,532,269 | 559,612,889 | 547,022,037 | 13,111,684,807 | | 153,084,296 | 88,989,936,298 |
| 2012 | 67,668,091,799 | 420,197,546 | 410,662,967 | 12,828,625,322 | | 119,615,875 | 81,447,193,509 |
| 2011*** | 61,330,891,370 | 333,095,015 | 317,193,338 | 11,959,000,311 | | 90,696,132 | 74,030,876,166 |
| 2010*** | 63,153,243,166 | 300,437,631 | 279,096,442 | 12,682,612,422 | | 76,231,029 | 76,491,620,690 |
| 2009 | 57,630,423,957 | 223,384,797 | 200,588,070 | 11,415,195,274 | | 55,784,131 | 69,525,376,229 |
| 2008 | 49,312,811,154 | 138,950,485 | 117,342,021 | 9,596,082,077 | | 36,333,066 | 59,201,518,803 |
| 2007 | 69,959,641,078 | 156,864,566 | 123,946,918 | 13,282,947,482 | | 37,227,685 | 83,560,627,729 |

* The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.
** The 115 Health Care Trust was established in 2014.
*** Net Position by Plan was restated to correct allocation of investment income as of December 31, 2010, with the restatement rolled forward through 2011 and 2012. The restatement by plan does not impact the total net position of the System.

## Statutory Fund Balance by Plan (last 10 fiscal years)

(continued on next page)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans** | | | | |
| Employees' Savings Fund | $13,914,959,537 | $13,471,062,846 | $13,194,306,671 | $12,828,423,536 |
| Employers' Accumulation Fund—Pension/Health Care | 19,218,910,213 | 16,076,648,809 | 22,768,644,951 | 22,852,975,720 |
| Annuity and Pension Reserve Fund | 54,462,722,183 | 54,705,647,821 | 52,331,183,968 | 50,525,254,541 |
| Survivors' Benefit Fund | 1,669,466,891 | 1,694,085,497 | 1,675,926,615 | 1,654,787,855 |
| Defined Contribution Fund—Retirement/Health Care | 1,216,155,401 | 1,219,165,845 | 1,154,079,903 | 1,011,655,646 |
| Income Fund | 123,776,306 | 122,714,098 | 114,494,235 | 113,671,739 |
| Expense Fund | 4,833,694 | 2,076,902 | 5,258,765 | 3,167,261 |
| **Total Fund Balance** | **$90,610,824,225** | **$87,291,401,818** | **$91,243,895,108** | **$88,989,936,298** |
| **Traditional Pension Plan** | | | | |
| Employees' Savings Fund | $13,912,277,541 | $13,468,694,332 | $13,191,067,352 | $12,826,142,567 |
| Employers' Accumulation Fund—Pension | 6,965,583,478 | 4,243,982,790 | 9,655,043,969 | 9,507,406,396 |
| Annuity and Pension Reserve Fund | 54,433,695,575 | 54,681,766,733 | 52,314,439,706 | 50,513,356,451 |
| Survivors' Benefit Fund | 1,669,466,891 | 1,694,085,497 | 1,675,926,615 | 1,654,787,855 |
| Income Fund | 123,776,306 | 122,714,098 | 114,494,235 | 113,671,739 |
| Expense Fund | 4,833,694 | 2,076,902 | 5,258,765 | 3,167,261 |
| **Total Fund Balance** | **$77,109,633,485** | **$74,213,320,352** | **$76,956,230,642** | **$74,618,532,269** |
| **Combined Plan** | | | | |
| Employees' Savings Fund | $2,629,485 | $2,343,149 | $2,994,501 | $1,894,549 |
| Employers' Accumulation Fund—Pension | 372,135,835 | 320,876,515 | 286,747,478 | 233,588,347 |
| Annuity and Pension Reserve Fund | 17,116,877 | 13,366,406 | 8,359,792 | 5,481,510 |
| Defined Contribution Fund—Retirement | 423,969,820 | 364,328,339 | 352,147,956 | 318,648,483 |
| **Total Fund Balance** | **$815,852,017** | **$700,914,409** | **$650,249,727** | **$559,612,889** |
| **Member-Directed Plan** | | | | |
| Employees' Savings Fund | $52,511 | $25,365 | $244,818 | $386,420 |
| Employers' Accumulation Fund—Pension | 703,037 | (390,717) | 250,542 | 296,170 |
| Annuity and Pension Reserve Fund | 11,909,731 | 10,514,682 | 8,384,470 | 6,416,580 |
| Defined Contribution Fund—Retirement | 792,185,581 | 688,390,700 | 626,392,783 | 539,922,867 |
| **Total Fund Balance** | **$804,850,860** | **$698,540,030** | **$635,272,613** | **$547,022,037** |
| **401(h) Health Care Trust**** | | | | |
| Employers' Accumulation Fund—Health Care | | $10,671,068,181 | $12,440,522,790 | $13,111,684,807 |
| **Total Fund Balance** | | **$10,671,068,181** | **$12,440,522,790** | **$13,111,684,807** |
| **115 Health Care Trust**** | | | | |
| Employers' Accumulation Fund—Health Care | $11,880,487,863 | $841,112,040 | $386,080,172 | |
| **Total Fund Balance** | **$11,880,487,863** | **$841,112,040** | **$386,080,172** | |
| **Voluntary Employees' Beneficiary Association Trust**** | | | | |
| Defined Contribution Fund—Health Care | | $166,446,806 | $175,539,164 | $153,084,296 |
| **Total Fund Balance** | | **$166,446,806** | **$175,539,164** | **$153,084,296** |

* Net Position by Plan was restated to correct the allocation of investment income as of December 31, 2010, with restatement rolled forward through 2011 and 2012. The restatement by plan does not impact the total net position of the System.

** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

## Statutory Fund Balance by Plan

| 2012 | 2011* | 2010* | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $12,641,655,468 | $12,300,117,438 | $12,134,839,989 | $11,933,642,333 | $11,546,208,967 | $10,815,159,012 |
| 19,074,270,351 | 15,959,261,830 | 22,278,219,189 | 20,026,006,552 | 13,503,733,507 | 40,336,757,059 |
| 47,232,908,883 | 43,513,048,458 | 39,927,499,750 | 35,616,195,176 | 32,410,382,036 | 30,699,027,425 |
| 1,627,212,197 | 1,568,050,108 | 1,527,374,797 | 1,472,264,995 | 1,418,388,692 | 1,373,512,884 |
| 763,702,610 | 587,622,632 | 522,426,170 | 376,419,373 | 216,885,601 | 234,047,349 |
| 107,444,000 | 99,016,985 | 99,070,651 | 95,184,666 | 100,226,117 | 99,627,634 |
| | 3,758,715 | 2,190,144 | 5,663,134 | 5,693,883 | 2,496,366 |
| **$81,447,193,509** | **$74,030,876,166** | **$76,491,620,690** | **$69,525,376,229** | **$59,201,518,803** | **$83,560,627,729** |
| | | | | | |
| $12,639,906,042 | $12,298,673,251 | $12,133,856,642 | $11,932,873,455 | $11,545,651,011 | $10,814,646,533 |
| 6,066,140,290 | 3,850,924,715 | 9,464,360,661 | 8,508,596,858 | 3,832,714,973 | 26,970,418,583 |
| 47,227,389,270 | 43,510,467,596 | 39,926,390,271 | 35,615,840,849 | 32,410,136,478 | 30,698,939,078 |
| 1,627,212,197 | 1,568,050,108 | 1,527,374,797 | 1,472,264,995 | 1,418,388,692 | 1,373,512,884 |
| 107,444,000 | 99,016,985 | 99,070,651 | 95,184,666 | 100,226,117 | 99,627,634 |
| | 3,758,715 | 2,190,144 | 5,663,134 | 5,693,883 | 2,496,366 |
| **$67,668,091,799** | **$61,330,891,370** | **$63,153,243,166** | **$57,630,423,957** | **$49,312,811,154** | **$69,959,641,078** |
| | | | | | |
| $1,606,472 | $1,362,904 | $975,589 | $768,977 | $557,956 | $512,479 |
| 179,466,995 | 149,374,928 | 131,266,975 | 102,108,811 | 74,976,136 | 83,391,067 |
| 3,114,881 | 1,514,253 | 644,239 | 251,905 | 73,758 | 60,804 |
| 236,009,198 | 180,842,930 | 167,550,828 | 120,255,104 | 63,342,635 | 72,900,216 |
| **$420,197,546** | **$333,095,015** | **$300,437,631** | **$223,384,797** | **$138,950,485** | **$156,864,566** |
| | | | | | |
| $142,954 | $81,283 | $7,758 | ($99) | | |
| 37,744 | (38,124) | (20,869) | 105,609 | ($39,679) | ($73) |
| 2,404,732 | 1,066,609 | 465,240 | 102,422 | 171,800 | 27,543 |
| 408,077,537 | 316,083,570 | 278,644,313 | 200,380,138 | 117,209,900 | 123,919,448 |
| **$410,662,967** | **$317,193,338** | **$279,096,442** | **$200,588,070** | **$117,342,021** | **$123,946,918** |
| | | | | | |
| $12,828,625,322 | $11,959,000,311 | $12,682,612,422 | $11,415,195,274 | $9,596,082,077 | $13,282,947,482 |
| **$12,828,625,322** | **$11,959,000,311** | **$12,682,612,422** | **$11,415,195,274** | **$9,596,082,077** | **$13,282,947,482** |
| | | | | | |
| | | | | | |
| | | | | | |
| $119,615,875 | $90,696,132 | $76,231,029 | $55,784,131 | $36,333,066 | $37,227,685 |
| **$119,615,875** | **$90,696,132** | **$76,231,029** | **$55,784,131** | **$36,333,066** | **$37,227,685** |

## Fiduciary Net Position by Year (last 10 fiscal years)

(continued through page 181)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | $4,586,305,505 | $3,064,065,686 | $2,882,858,353 | $3,333,382,605 |
| Receivables | 1,112,083,698 | 954,980,282 | 1,088,837,041 | 1,092,845,990 |
| Investments | 85,449,650,603 | 83,819,475,118 | 87,891,142,075 | 85,137,610,781 |
| Collateral on Loaned Securities | 8,288,355,523 | 8,270,812,672 | 7,854,368,780 | 6,958,964,420 |
| Net Capital Assets | 132,961,073 | 132,811,651 | 133,629,210 | 131,389,851 |
| Prepaid Expenses and Other Assets | 764,515 | 1,217,369 | 2,261,461 | 2,912,709 |
| **Total Assets** | **99,570,120,917** | **96,243,362,778** | **99,853,096,920** | **96,657,106,356** |
| **Liabilities and Net Position** | | | | |
| Benefits Payable | 110,396,253 | 93,550,718 | 99,844,976 | 90,115,030 |
| Investment Commitments Payable | 539,826,060 | 475,568,951 | 593,164,943 | 554,398,461 |
| Obligations Under Securities Lending | 8,285,285,181 | 8,271,338,789 | 7,852,803,699 | 6,953,717,885 |
| Other Liabilities | 23,789,198 | 111,502,502 | 63,388,194 | 68,938,682 |
| Net Position (Fund Balance) | 90,610,824,225 | 87,291,401,818 | 91,243,895,108 | 88,989,936,298 |
| **Total Liabilities and Net Position** | **$99,570,120,917** | **$96,243,362,778** | **$99,853,096,920** | **$96,657,106,356** |
| **Traditional Pension Plan** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | $3,695,255,724 | $2,381,670,021 | $2,357,796,670 | $2,826,596,339 |
| Receivables | 880,590,006 | 637,347,978 | 709,932,322 | 760,735,070 |
| Investments | 72,913,065,131 | 71,514,345,166 | 74,279,082,505 | 71,393,042,048 |
| Collateral on Loaned Securities | 8,247,367,947 | 8,215,428,672 | 7,809,036,934 | 6,924,316,299 |
| Net Capital Assets | 98,085,389 | 96,541,605 | 96,963,543 | 98,948,820 |
| Prepaid Expenses and Other Assets | 764,515 | 1,217,369 | 2,261,461 | 2,912,709 |
| **Total Assets** | **85,835,128,712** | **82,846,550,811** | **85,255,073,435** | **82,006,551,285** |
| **Liabilities and Net Position** | | | | |
| Benefits Payable | 1,253,982 | 255,699 | 311,575 | 78,477 |
| Investment Commitments Payable | 456,426,672 | 393,965,905 | 475,297,939 | 451,977,660 |
| Obligations Under Securities Lending | 8,244,312,788 | 8,215,951,266 | 7,807,480,885 | 6,919,095,886 |
| Other Liabilities | 23,501,785 | 23,057,589 | 15,752,394 | 16,866,993 |
| Net Position (Fund Balance) | 77,109,633,485 | 74,213,320,352 | 76,956,230,642 | 74,618,532,269 |
| **Total Liabilities and Net Position** | **$85,835,128,712** | **$82,846,550,811** | **$85,255,073,435** | **$82,006,551,285** |
| **Combined Plan** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | $15,750,245 | $10,566,328 | $8,947,770 | $9,425,463 |
| Receivables | 12,005,543 | 22,378,455 | 21,472,538 | 17,071,301 |
| Investments | 787,029,411 | 674,801,893 | 623,991,406 | 534,668,467 |
| Collateral on Loaned Securities | 39,693,971 | 34,258,885 | 27,497,528 | 20,966,014 |
| Net Capital Assets | 3,885,497 | 3,950,559 | 3,998,438 | 3,921,730 |
| **Total Assets** | **858,364,667** | **745,956,120** | **685,907,680** | **586,052,975** |
| **Liabilities and Net Position** | | | | |
| Investment Commitments Payable | 2,833,383 | 1,801,004 | 1,787,256 | 1,549,789 |
| Obligations Under Securities Lending | 39,679,267 | 34,261,065 | 27,492,049 | 20,950,208 |
| Other Liabilities | | 8,979,642 | 6,378,648 | 3,940,089 |
| Net Position (Fund Balance) | 815,852,017 | 700,914,409 | 650,249,727 | 559,612,889 |
| **Total Liabilities and Net Position** | **$858,364,667** | **$745,956,120** | **$685,907,680** | **$586,052,975** |
| **Member-Directed Plan** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | $666,696 | $334,220 | $274,295 | $282,346 |
| Receivables | 11,590,244 | 23,237,455 | 21,577,499 | 15,586,438 |
| Investments | 790,661,959 | 677,842,112 | 638,145,075 | 560,933,809 |
| Collateral on Loaned Securities | 1,293,605 | 2,237,421 | 767,134 | 482,373 |
| Net Capital Assets | 2,962,075 | 3,025,179 | 3,150,369 | 2,856,649 |
| **Total Assets** | **807,174,579** | **706,676,387** | **663,914,372** | **580,141,615** |
| **Liabilities and Net Position** | | | | |
| Investment Commitments Payable | 1,030,593 | 245,260 | 137,585 | 196,803 |
| Obligations Under Securities Lending | 1,293,126 | 2,237,563 | 766,982 | 482,009 |
| Other Liabilities | | 5,653,534 | 27,737,192 | 32,440,766 |
| Net Position (Fund Balance) | 804,850,860 | 698,540,030 | 635,272,613 | 547,022,037 |
| **Total Liabilities and Net Position** | **$807,174,579** | **$706,676,387** | **$663,914,372** | **$580,141,615** |

*Net Position by Plan was restated to correct the allocation of investment income as of December 31, 2010, with the restatement rolled forward through 2011 and 2012. The adjustment is reflected in the Cash and Short-Term Investments line and has no impact on the total net position of the System.

## Fiduciary Net Position by Year

| 2012 | 2011* | 2010* | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $2,780,697,535 | $2,847,839,851 | $3,654,805,279 | $1,742,538,072 | $1,429,632,493 | $1,030,943,608 |
| 2,212,003,770 | 1,554,352,796 | 1,437,458,798 | 1,976,201,742 | 1,016,153,104 | 1,029,220,765 |
| 77,617,850,120 | 71,149,016,095 | 72,661,379,153 | 66,819,524,257 | 57,289,210,006 | 82,001,128,270 |
| 6,827,172,458 | 10,401,223,945 | 9,250,107,607 | 9,978,449,975 | 7,665,906,536 | 13,159,403,768 |
| 121,172,935 | 112,092,861 | 112,130,055 | 113,508,936 | 117,521,350 | 120,859,724 |
| 3,841,978 | 779,630 | 471,611 | 236,290 | 284,846 | 387,169 |
| **89,562,738,796** | **86,065,305,178** | **87,116,352,503** | **80,630,459,272** | **67,518,708,335** | **97,341,943,304** |
| 101,188,640 | 119,591,363 | 142,993,825 | 140,959,867 | 131,922,479 | 142,701,327 |
| 1,116,869,935 | 1,423,836,318 | 1,155,469,120 | 916,348,545 | 437,680,710 | 415,429,392 |
| 6,816,672,766 | 10,410,130,422 | 9,250,107,607 | 9,978,449,975 | 7,665,906,536 | 13,159,403,768 |
| 80,813,946 | 80,870,909 | 76,161,261 | 69,324,656 | 81,679,807 | 63,781,088 |
| 81,447,193,509 | 74,030,876,166 | 76,491,620,690 | 69,525,376,229 | 59,201,518,803 | 83,560,627,729 |
| **$89,562,738,796** | **$86,065,305,178** | **$87,116,352,503** | **$80,630,459,272** | **$67,518,708,335** | **$97,341,943,304** |
| $2,324,824,614 | $2,321,930,951 | $2,969,362,112 | $1,652,107,085 | $1,208,848,813 | $858,481,646 |
| 1,690,953,615 | 1,181,127,055 | 1,039,459,387 | 915,977,579 | 741,420,763 | 774,558,734 |
| 64,487,332,183 | 58,890,460,789 | 59,973,039,802 | 55,741,813,567 | 47,649,655,710 | 68,602,804,295 |
| 6,797,920,566 | 10,363,838,801 | 7,708,958,738 | 9,653,891,069 | 5,357,710,312 | 11,069,869,796 |
| 85,661,140 | 84,923,332 | 85,155,975 | 86,063,353 | 91,213,500 | 93,969,101 |
| 3,841,978 | 779,630 | 471,611 | 236,290 | 284,846 | 387,169 |
| **75,390,534,096** | **72,843,060,558** | **71,776,447,625** | **68,050,088,943** | **55,049,133,944** | **81,400,070,741** |
| 682,136 | 1,061,656 | 31,862 | 6,950,608 | 130,259 | |
| 918,234,060 | 1,124,645,829 | 899,118,485 | 749,608,796 | 364,423,724 | 355,806,425 |
| 6,787,465,861 | 10,372,713,265 | 7,708,958,738 | 9,653,891,069 | 5,357,710,312 | 11,069,869,796 |
| 16,060,240 | 13,748,438 | 15,095,374 | 9,214,513 | 14,058,495 | 14,753,442 |
| 67,668,091,799 | 61,330,891,370 | 63,153,243,166 | 57,630,423,957 | 49,312,811,154 | 69,959,641,078 |
| **$75,390,534,096** | **$72,843,060,558** | **$71,776,447,625** | **$68,050,088,943** | **$55,049,133,944** | **$81,400,070,741** |
| $6,574,926 | $6,248,674 | $7,127,776 | $3,716,643 | $2,982,361 | $2,725,143 |
| 9,350,843 | 7,707,808 | 6,892,606 | 6,259,012 | 5,788,861 | 5,264,533 |
| 416,161,716 | 339,986,995 | 303,637,263 | 233,771,271 | 157,027,020 | 172,094,212 |
| 18,059,949 | 23,506,898 | 15,196,825 | 16,765,205 | 7,044,675 | 11,788,022 |
| 4,357,765 | 65,084 | 34,750 | 1,932 | 118 | 68,975 |
| **454,505,199** | **377,515,459** | **332,889,220** | **260,514,063** | **172,843,035** | **191,940,885** |
| 2,690,744 | 2,823,632 | 1,950,989 | 1,942,496 | 1,527,796 | 1,205,858 |
| 18,032,174 | 23,527,027 | 15,196,825 | 16,765,205 | 7,044,675 | 11,788,022 |
| 13,584,735 | 18,069,785 | 15,303,775 | 18,421,565 | 25,320,079 | 22,082,439 |
| 420,197,546 | 333,095,015 | 300,437,631 | 223,384,797 | 138,950,485 | 156,864,566 |
| **$454,505,199** | **$377,515,459** | **$332,889,220** | **$260,514,063** | **$172,843,035** | **$191,940,885** |
| $91,299 | $980,013 | $1,349,705 | $2,322,907 | $2,194,785 | $3,064,085 |
| 6,821,748 | 7,353,279 | 5,657,850 | 5,901,916 | 5,995,977 | 5,397,814 |
| 432,851,458 | 338,695,474 | 301,502,301 | 221,224,028 | 137,235,988 | 140,594,070 |
| 205,837 | 111,647 | 40,463 | 30,222 | 9,177 | 171,375 |
| 3,667,974 | 94,933 | 38,662 | 2,294 | 137 | 55,124 |
| **443,638,316** | **347,235,346** | **308,588,981** | **229,481,367** | **145,436,064** | **149,282,468** |
| 155,855 | 123,669 | 6,707 | 787,160 | 1,585,226 | 1,216,779 |
| 205,521 | 111,743 | 40,463 | 30,222 | 9,177 | 171,375 |
| 32,613,973 | 29,806,596 | 29,445,369 | 28,075,915 | 26,499,640 | 23,947,396 |
| 410,662,967 | 317,193,338 | 279,096,442 | 200,588,070 | 117,342,021 | 123,946,918 |
| **$443,638,316** | **$347,235,346** | **$308,588,981** | **$229,481,367** | **$145,436,064** | **$149,282,468** |

continued on page 180

continued from page 179

## Fiduciary Net Position by Year (last 10 fiscal years)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **401(h) Health Care Trust**** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | | $437,888,805 | $503,893,407 | $491,371,340 |
| Receivables | | 83,230,392 | 125,472,731 | 290,484,285 |
| Investments | | 10,314,427,768 | 12,008,141,647 | 12,510,470,437 |
| Collateral on Loaned Securities | | | | |
| Net Capital Assets | | 27,020,679 | 28,631,421 | 24,866,659 |
| **Total Assets** | | **10,862,567,644** | **12,666,139,206** | **13,317,192,721** |
| **Liabilities and Net Position** | | | | |
| Benefits Payable | | 91,451,759 | 99,279,185 | 90,019,865 |
| Investment Commitments Payable | | 76,923,764 | 113,120,724 | 99,797,215 |
| Obligations Under Securities Lending | | | | |
| Other Liabilities | | 23,123,940 | 13,216,507 | 15,690,834 |
| Net Position (Fund Balance) | | 10,671,068,181 | 12,440,522,790 | 13,111,684,807 |
| **Total Liabilities and Net Position** | | **$10,862,567,644** | **$12,666,139,206** | **$13,317,192,721** |
| **115 Health Care Trust**** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | $874,632,840 | $228,930,728 | $7,797,254 | |
| Receivables | 207,897,905 | 173,883,586 | 197,641,190 | |
| Investments | 10,958,894,102 | 484,975,264 | 182,748,955 | |
| Net Capital Assets | 28,028,112 | 1,441,984 | | |
| **Total Assets** | **12,069,452,959** | **889,231,562** | **388,187,399** | |
| **Liabilities and Net Position** | | | | |
| Benefits Payable | 109,142,271 | 1,634,811 | | |
| Investment Commitments Payable | 79,535,412 | 1,789,658 | 1,803,774 | |
| Other Liabilities | 287,413 | 44,695,053 | 303,453 | |
| Net Position (Fund Balance) | 11,880,487,863 | 841,112,040 | 386,080,172 | |
| **Total Liabilities and Net Position** | **$12,069,452,959** | **$889,231,562** | **$388,187,399** | |
| **Voluntary Employees' Beneficiary Association Trust**** | | | | |
| **Assets** | | | | |
| Cash and Short-Term Investments | | $4,675,584 | $4,148,957 | $5,707,117 |
| Receivables | | 14,902,416 | 12,740,761 | 8,968,896 |
| Investments | | 153,082,915 | 159,032,487 | 138,496,020 |
| Collateral on Loaned Securities | | 18,887,694 | 17,067,184 | 13,199,734 |
| Net Capital Assets | | 831,645 | 885,439 | 795,993 |
| **Total Assets** | | **192,380,254** | **193,874,828** | **167,167,760** |
| **Liabilities and Net Position** | | | | |
| Benefits Payable | | 208,449 | 254,216 | 16,688 |
| Investment Commitments Payable | | 843,360 | 1,017,665 | 876,994 |
| Obligations Under Securities Lending | | 18,888,895 | 17,063,783 | 13,189,782 |
| Other Liabilities | | 5,992,744 | | |
| Net Position (Fund Balance) | | 166,446,806 | 175,539,164 | 153,084,296 |
| **Total Liabilities and Net Position** | | **$192,380,254** | **$193,874,828** | **$167,167,760** |

* Net Position by Plan was restated to correct the allocation of investment income as of December 31, 2010, with the restatement rolled forward through 2011 and 2012. The adjustment is reflected in the Cash and Short-Term Investments line and has no impact on the total net position of the System.

** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

## Fiduciary Net Position by Year

| 2012 | 2011* | 2010* | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $446,851,345 | $516,841,401 | $673,728,399 | $82,384,335 | $214,267,049 | $166,407,166 |
| 500,838,389 | 355,160,439 | 383,127,242 | 1,046,106,655 | 261,187,030 | 242,221,858 |
| 12,167,526,143 | 11,492,400,597 | 12,011,299,168 | 10,567,015,643 | 9,301,814,794 | 13,050,429,116 |
| | | 1,517,578,594 | 299,502,780 | 2,297,927,070 | 2,072,493,713 |
| 26,625,770 | 26,945,871 | 26,862,896 | 27,377,310 | 26,203,570 | 26,606,207 |
| **13,141,841,647** | **12,391,348,308** | **14,612,596,299** | **12,022,386,723** | **12,101,399,513** | **15,558,158,060** |
| 100,495,333 | 118,529,285 | 142,952,643 | 134,007,772 | 131,776,992 | 142,701,327 |
| 194,165,994 | 294,572,622 | 253,257,695 | 163,153,464 | 69,811,443 | 57,017,727 |
| | | 1,517,578,594 | 299,502,780 | 2,297,927,070 | 2,072,493,713 |
| 18,554,998 | 19,246,090 | 16,194,945 | 10,527,433 | 5,801,931 | 2,997,811 |
| 12,828,625,322 | 11,959,000,311 | 12,682,612,422 | 11,415,195,274 | 9,596,082,077 | 13,282,947,482 |
| **$13,141,841,647** | **$12,391,348,308** | **$14,612,596,299** | **$12,022,386,723** | **$12,101,399,513** | **$15,558,158,060** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| $2,355,351 | $1,838,812 | $3,237,287 | $2,007,102 | $1,339,485 | $265,568 |
| 4,039,175 | 3,004,215 | 2,321,713 | 1,956,580 | 1,760,473 | 1,777,826 |
| 113,978,620 | 87,472,240 | 71,900,619 | 55,699,748 | 43,476,494 | 35,206,577 |
| 10,986,106 | 13,766,599 | 8,332,987 | 8,260,699 | 3,215,302 | 5,080,862 |
| 860,286 | 63,641 | 37,772 | 64,047 | 104,025 | 160,317 |
| **132,219,538** | **106,145,507** | **85,830,378** | **67,988,176** | **49,895,779** | **42,491,150** |
| 11,171 | 422 | 9,320 | 1,487 | 15,228 | |
| 1,623,282 | 1,670,566 | 1,135,244 | 856,629 | 332,521 | 182,603 |
| 10,969,210 | 13,778,387 | 8,332,987 | 8,260,699 | 3,215,302 | 5,080,862 |
| | | 121,798 | 3,085,230 | 9,999,662 | |
| 119,615,875 | 90,696,132 | 76,231,029 | 55,784,131 | 36,333,066 | 37,227,685 |
| **$132,219,538** | **$106,145,507** | **$85,830,378** | **$67,988,176** | **$49,895,779** | **$42,491,150** |

## Changes in Fiduciary Net Position (last 10 fiscal years)

(continued through page 189)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans** | | | | |
| **Additions** | | | | |
| Member Contributions | $1,387,215,220 | $1,332,308,994 | $1,307,428,830 | $1,279,945,223 |
| Employer Contributions | 1,941,632,324 | 1,864,823,741 | 1,829,907,525 | 1,794,039,132 |
| Contracts and Other Receipts | 172,338,832 | 172,067,637 | 270,728,202 | 250,228,379 |
| Retiree-Paid Health Care Premiums† | 184,368,783 | 248,601,375 | 238,406,380 | 178,140,822 |
| Federal Subsidy | 4,065,058 | 175,930,875 | 176,619,891 | 105,965,762 |
| Net Income/(Loss) from Investing Activity | 6,926,572,065 | 9,415,961 | 5,775,317,835 | 11,006,164,375 |
| Other Income/(Expense), net | (2,544,366) | (4,887,359) | 8,304,360 | 13,898,739 |
| Interplan Activity | 17,205,339 | 19,759,373 | 10,357,663 | 13,034,171 |
| Total Additions | 10,630,853,255 | 3,818,020,597 | 9,617,070,686 | 14,641,416,603 |
| **Deductions** | | | | |
| Pension Benefits | 5,588,000,966 | 5,401,880,992 | 5,112,123,787 | 4,931,491,707 |
| Health Care Expenses | 1,197,374,344 | 1,822,571,428 | 1,740,814,106 | 1,644,244,641 |
| Refunds of Contributions | 429,791,141 | 449,265,410 | 425,701,829 | 441,284,204 |
| Administrative Expenses | 79,059,058 | 77,036,684 | 74,114,491 | 68,619,091 |
| Interplan Activity | 17,205,339 | 19,759,373 | 10,357,663 | 13,034,171 |
| Total Deductions | 7,311,430,848 | 7,770,513,887 | 7,363,111,876 | 7,098,673,814 |
| Net Increase/(Decrease) | 3,319,422,407 | (3,952,493,290) | 2,253,958,810 | 7,542,742,789 |
| Net Position Held in Trust, Beginning of Year | 87,291,401,818 | 91,243,895,108 | 88,989,936,298 | 81,447,193,509 |
| **Net Position Held in Trust, End of Year** | **$90,610,824,225** | **$87,291,401,818** | **$91,243,895,108** | **$88,989,936,298** |
| **Traditional Pension Plan*** ** | | | | |
| **Additions** | | | | |
| Member Contributions | $1,294,853,664 | $1,246,732,014 | $1,228,144,074 | $1,206,808,750 |
| Employer Contributions | 1,556,529,162 | 1,498,679,737 | 1,476,074,083 | 1,571,758,150 |
| Contracts and Other Receipts | 77,862,156 | 75,209,820 | 114,830,564 | 121,818,099 |
| Net Income/(Loss) from Investing Activity | 5,947,233,326 | 274,898,652 | 5,056,307,357 | 9,423,847,940 |
| Other Income/(Expense), net | (2,560,081) | (4,887,369) | 625,549 | 414,878 |
| Interplan Activity | 11,168,557 | 19,759,373 | 10,357,663 | 13,034,171 |
| Total Additions | 8,885,086,784 | 3,110,392,227 | 7,886,339,290 | 12,337,681,988 |
| **Deductions** | | | | |
| Pension Benefits | 5,584,517,896 | 5,398,844,664 | 5,109,100,939 | 4,928,972,847 |
| Refunds of Contributions | 352,362,641 | 405,320,800 | 389,707,612 | 411,321,700 |
| Administrative Expenses | 51,871,700 | 49,137,053 | 49,832,366 | 46,946,971 |
| Interplan Activity | | | | |
| Total Deductions | 5,988,752,237 | 5,853,302,517 | 5,548,640,917 | 5,387,241,518 |
| **Special Item**** | (21,414) | | | |
| Net Increase/(Decrease) | 2,896,313,133 | (2,742,910,290) | 2,337,698,373 | 6,950,440,470 |
| Net Position Held in Trust, Beginning of Year | 74,213,320,352 | 76,956,230,642 | 74,618,532,269 | 67,668,091,799 |
| **Net Position Held in Trust, End of Year** | **$77,109,633,485** | **$74,213,320,352** | **$76,956,230,642** | **$74,618,532,269** |

* Net Position by Plan was restated to adjust the allocation of investment income as of December 31, 2010, with the restatement shown in the beginning net position of 2011. The restatement by plan does not impact the total net position of the System.

** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016. The Special Item represents this interplan activity and nets to zero in consolidation.

*** The year 2009 was restated for reclassification of Alternative Retirement Plan contribution accrual from Employer Contributions to Contract and Other Receipts.

† Beginning in 2015, Retiree-Paid Health Care Premiums was reported separately and not included in the Member Contributions line item. For comparability, this activity has been reclassified from Member Contributions to Retiree–Paid Health Care Premiums for all prior years presented.

## Changes in Fiduciary Net Position

| 2012 | 2011* | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $1,266,800,236 | $1,286,385,298 | $1,275,688,737 | $1,290,805,214 | $1,303,865,947 | $1,227,345,099 |
| 1,778,728,069 | 1,809,470,716 | 1,796,343,429 | 1,822,639,448 | 1,840,585,266 | 1,798,305,461 |
| 218,259,489 | 211,847,098 | 197,507,372 | 219,182,666 | 180,763,502 | 151,494,844 |
| 159,614,898 | 148,370,246 | 111,638,313 | 94,370,543 | 82,695,255 | 79,198,959 |
| 182,579,917 | 192,118,407 | 142,658,293 | 69,132,772 | 63,310,194 | 59,075,120 |
| 10,375,431,044 | 179,956,702 | 9,268,181,189 | 12,274,797,785 | (22,770,412,901) | 6,594,053,702 |
| 12,103,692 | 11,255,503 | 7,930,265 | 794,525 | 1,635,996 | 110,559 |
| 16,981,683 | 10,077,664 | 10,528,250 | 7,879,768 | 7,470,205 | 5,730,846 |
| 14,010,499,028 | 3,849,481,634 | 12,810,475,848 | 15,779,602,721 | (19,290,086,536) | 9,915,314,590 |
| 4,590,938,871 | 4,329,918,267 | 3,961,552,022 | 3,661,174,109 | 3,388,953,861 | 3,136,995,197 |
| 1,609,157,697 | 1,576,457,152 | 1,568,065,943 | 1,488,266,219 | 1,377,274,519 | 1,282,829,856 |
| 307,486,279 | 323,672,042 | 233,054,714 | 222,580,254 | 221,300,825 | 221,092,748 |
| 69,617,155 | 70,101,033 | 71,030,458 | 75,844,945 | 74,022,980 | 69,305,991 |
| 16,981,683 | 10,077,664 | 10,528,250 | 7,879,768 | 7,470,205 | 5,730,846 |
| 6,594,181,685 | 6,310,226,158 | 5,844,231,387 | 5,455,745,295 | 5,069,022,390 | 4,715,954,638 |
| 7,416,317,343 | (2,460,744,524) | 6,966,244,461 | 10,323,857,426 | (24,359,108,926) | 5,199,359,952 |
| 74,030,876,166 | 76,491,620,690 | 69,525,376,229 | 59,201,518,803 | 83,560,627,729 | 78,361,267,777 |
| **$81,447,193,509** | **$74,030,876,166** | **$76,491,620,690** | **$69,525,376,229** | **$59,201,518,803** | **$83,560,627,729** |

| | | | | | |
|---|---|---|---|---|---|
| $1,199,073,380 | $1,221,597,118 | $1,217,388,746 | $1,236,966,262 | $1,253,053,822 | $1,183,959,051 |
| 1,208,150,727 | 1,233,002,841 | 1,097,711,440 | 1,019,582,360 | 892,693,746 | 1,051,808,289 |
| 122,281,629 | 121,560,871 | 113,080,115 | 160,232,136 | 113,351,117 | 105,157,859 |
| 8,713,817,411 | 274,530,266 | 7,678,536,712 | 9,822,978,753 | (19,258,540,437) | 5,717,111,026 |
| 329,493 | 340,460 | 763,943 | 140,494 | 1,021,007 | 40,061 |
| 16,918,042 | 10,077,664 | 10,501,974 | 7,839,790 | 7,289,779 | 4,969,740 |
| 11,260,570,682 | 2,861,109,220 | 10,117,982,930 | 12,247,739,795 | (16,991,130,966) | 8,063,046,026 |
| 4,589,973,216 | 4,329,452,581 | 3,961,217,461 | 3,661,076,709 | 3,388,862,796 | 3,136,978,910 |
| 284,217,216 | 302,812,289 | 219,808,143 | 212,209,227 | 212,802,651 | 213,007,451 |
| 49,179,821 | 51,196,146 | 52,375,762 | 56,805,048 | 53,853,085 | 50,053,260 |
| | | | 36,008 | 180,426 | 718,220 |
| 4,923,370,253 | 4,683,461,016 | 4,233,401,366 | 3,930,126,992 | 3,655,698,958 | 3,400,757,841 |
| | | | | | |
| 6,337,200,429 | (1,822,351,796) | 5,884,581,564 | 8,317,612,803 | (20,646,829,924) | 4,662,288,185 |
| 61,330,891,370 | 63,153,243,166 | 57,630,423,957 | 49,312,811,154 | 69,959,641,078 | 65,297,352,893 |
| **$67,668,091,799** | **$61,330,891,370** | **$63,515,005,521** | **$57,630,423,957** | **$49,312,811,154** | **$69,959,641,078** |

continued on page 184

continued from page 183

## Changes in Fiduciary Net Position (last 10 fiscal years)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Combined Plan** | | | | |
| **Additions** | | | | |
| Member Contributions | $39,232,690 | $36,685,161 | $34,604,398 | $32,535,565 |
| Employer Contributions | 47,079,023 | 44,022,120 | 44,196,044 | 45,427,520 |
| Contracts and Other Receipts | 620,078 | 492,260 | 412,808 | 680,258 |
| Net Income/(Loss) from Investing Activity | 63,694,711 | (6,501,919) | 32,379,863 | 78,379,140 |
| Other Income, net | | | | |
| Interplan Activity | | | | |
| Total Additions | 150,626,502 | 74,697,622 | 111,593,113 | 157,022,483 |
| **Deductions** | | | | |
| Pension Benefits | 1,981,664 | 1,791,115 | 2,230,987 | 1,526,005 |
| Refunds of Contributions | 21,857,512 | 12,577,944 | 10,974,442 | 7,731,155 |
| Administrative Expenses | 2,559,387 | 2,522,610 | 2,375,278 | 2,264,293 |
| Interplan Activity | 9,290,331 | 7,141,271 | 5,375,568 | 6,085,687 |
| Total Deductions | 35,688,894 | 24,032,940 | 20,956,275 | 17,607,140 |
| Net Increase/(Decrease) | 114,937,608 | 50,664,682 | 90,636,838 | 139,415,343 |
| Net Position Held in Trust, Beginning of Year | 700,914,409 | 650,249,727 | 559,612,889 | 420,197,546 |
| **Net Position Held in Trust, End of Year** | **$815,852,017** | **$700,914,409** | **$650,249,727** | **$559,612,889** |

| | | | | |
|---|---|---|---|---|
| **Member-Directed Plan** | | | | |
| **Additions** | | | | |
| Member Contributions | $53,128,866 | $48,891,819 | $44,680,358 | $40,600,908 |
| Employer Contributions | 53,120,880 | 68,448,551 | 47,851,530 | 38,540,851 |
| Contracts and Other Receipts | 527,291 | 495,540 | 700,770 | 785,072 |
| Net Income/(Loss) from Investing Activity | 66,099,386 | (13,070,950) | 28,212,549 | 88,633,791 |
| Other Income, net | | | | |
| Interplan Activity | | | | |
| Total Additions | 172,876,423 | 104,764,960 | 121,445,207 | 168,560,622 |
| **Deductions** | | | | |
| Pension Benefits | 1,501,406 | 1,245,213 | 791,861 | 992,855 |
| Refunds of Contributions | 55,570,988 | 31,366,666 | 25,019,775 | 22,231,349 |
| Administrative Expenses | 2,305,383 | 2,260,306 | 2,400,900 | 2,028,864 |
| Interplan Activity | 7,187,816 | 6,625,358 | 4,982,095 | 6,948,484 |
| Total Deductions | 66,565,593 | 41,497,543 | 33,194,631 | 32,201,552 |
| Net Increase/(Decrease) | 106,310,830 | 63,267,417 | 88,250,576 | 136,359,070 |
| Net Position Held in Trust, Beginning of Year | 698,540,030 | 635,272,613 | 547,022,037 | 410,662,967 |
| **Net Position Held in Trust, End of Year** | **$804,850,860** | **$698,540,030** | **$635,272,613** | **$547,022,037** |

* Net Position by Plan was restated to adjust the allocation of investment income as of December 31, 2010, with the restatement shown in the beginning net position of 2011. The restatement by plan does not impact the total net position of the System.

## Changes in Fiduciary Net Position

| 2012 | 2011* | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $30,193,165 | $29,256,952 | $27,272,707 | $26,096,068 | $25,123,220 | $21,907,704 |
| 23,998,486 | 23,280,520 | 26,432,761 | 23,397,299 | 20,352,999 | 19,241,579 |
| 745,347 | 386,879 | 384,947 | 124,823 | 844,005 | 347,280 |
| 50,732,608 | (5,810,229) | 35,971,101 | 44,034,607 | (53,571,566) | 9,866,238 |
| | | 1,267 | | | |
| | | | | 68,857 | 411,764 |
| 105,669,606 | 47,114,122 | 90,062,783 | 93,652,797 | (7,182,485) | 51,774,565 |
| 610,545 | 305,215 | 128,366 | 35,566 | 11,911 | 5,451 |
| 6,173,714 | 6,462,849 | 3,540,043 | 2,905,883 | 3,623,723 | 2,707,630 |
| 2,295,688 | 2,559,312 | 2,584,673 | 2,638,279 | 2,990,092 | 3,890,828 |
| 9,487,128 | 5,129,362 | 6,043,719 | 3,638,757 | 4,105,870 | 2,305,124 |
| 18,567,075 | 14,456,738 | 12,296,801 | 9,218,485 | 10,731,596 | 8,909,033 |
| 87,102,531 | 32,657,384 | 77,765,982 | 84,434,312 | (17,914,081) | 42,865,532 |
| 333,095,015 | 300,437,631 | 223,384,797 | 138,950,485 | 156,864,566 | 113,999,034 |
| **$420,197,546** | **$333,095,015** | **$301,150,779** | **$223,384,797** | **$138,950,485** | **$156,864,566** |

| | | | | | |
|---|---|---|---|---|---|
| $37,533,691 | $35,531,228 | $31,027,284 | $27,742,884 | $25,688,905 | $21,478,344 |
| 35,646,573 | 33,746,291 | 29,527,197 | 26,356,764 | 24,411,834 | 21,048,014 |
| 492,890 | 802,270 | 462,075 | 173,832 | 223,485 | 453,716 |
| 46,860,344 | (10,151,205) | 34,223,485 | 42,835,328 | (46,084,400) | 5,860,816 |
| | | 1,108 | | | |
| | | | | 55,277 | 278,478 |
| 120,533,498 | 59,928,584 | 95,241,149 | 97,108,808 | 4,295,101 | 49,119,368 |
| 355,110 | 160,471 | 206,195 | 61,834 | 79,154 | 10,836 |
| 17,095,349 | 14,396,904 | 9,706,528 | 7,465,144 | 4,874,451 | 5,377,667 |
| 2,118,855 | 2,354,183 | 2,435,285 | 2,514,665 | 2,762,484 | 3,601,327 |
| 7,494,555 | 4,920,130 | 4,382,873 | 3,821,116 | 3,183,909 | 2,707,502 |
| 27,063,869 | 21,831,688 | 16,730,881 | 13,862,759 | 10,899,998 | 11,697,332 |
| 93,469,629 | 38,096,896 | 78,510,268 | 83,246,049 | (6,604,897) | 37,422,036 |
| 317,193,338 | 279,096,442 | 200,588,070 | 117,342,021 | 123,946,918 | 86,524,882 |
| **$410,662,967** | **$317,193,338** | **$279,098,338** | **$200,588,070** | **$117,342,021** | **$123,946,918** |

continued on page 186

continued from page 185

## Changes in Fiduciary Net Position (last 10 fiscal years)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **401(h) Health Care Trust*** ** | | | | |
| **Additions** | | | | |
| Employer Contributions | | | $135,522,351 | $120,056,440 |
| Contracts and Other Receipts | | $9,435 | 10,950,386 | 126,941,889 |
| Retiree-Paid Health Care Premiums† | | 248,601,375 | 238,406,380 | 178,140,822 |
| Federal Subsidy | | | 44,715,641 | 105,965,762 |
| Net Income/(Loss) from Investing Activity | $490,208,570 | (223,464,384) | 648,566,894 | 1,397,348,823 |
| Other Income/(Expense), net | | | 7,601,841 | 13,483,861 |
| Total Additions | 490,208,570 | 25,146,426 | 1,085,763,493 | 1,941,937,597 |
| **Deductions** | | | | |
| Health Care Expenses | | 1,774,989,836 | 1,738,596,173 | 1,642,525,598 |
| Administrative Expenses | | 19,611,199 | 18,329,337 | 16,352,514 |
| Total Deductions | | 1,794,601,035 | 1,756,925,510 | 1,658,878,112 |
| **Special Item**** | (11,161,276,751) | | | |
| Net Increase/(Decrease) | (10,671,068,181) | (1,769,454,609) | (671,162,017) | 283,059,485 |
| Net Position Held in Trust, Beginning of Year | 10,671,068,181 | 12,440,522,790 | 13,111,684,807 | 12,828,625,322 |
| **Net Position Held in Trust, End of Year** | **$0** | **$10,671,068,181** | **$12,440,522,790** | **$13,111,684,807** |
| **115 Health Care Trust**** | | | | |
| **Additions** | | | | |
| Employer Contributions | $274,419,455 | $253,673,333 | $111,561,319 | |
| Contracts and Other Receipts | 93,306,585 | 95,860,582 | 143,813,190 | |
| Retiree-Paid Health Care Premiums† | 184,368,783 | | | |
| Federal Subsidy | 4,065,058 | 175,930,875 | 131,904,250 | |
| Net Income/(Loss) from Investing Activity | 352,629,538 | (23,073,355) | (1,193,356) | |
| Other Income, net | 15,715 | 10 | 76,970 | |
| Interplan Activity | 6,036,782 | | | |
| Total Additions | 914,841,916 | 502,391,445 | 386,162,373 | |
| **Deductions** | | | | |
| Health Care Expenses | 1,195,956,899 | 45,184,620 | | |
| Administrative Expenses | 21,693,387 | 2,174,957 | 82,201 | |
| Total Deductions | 1,217,650,286 | 47,359,577 | 82,201 | |
| **Special Item**** | 11,342,184,193 | | | |
| Net Increase/(Decrease) | 11,039,375,823 | 455,031,868 | 386,080,172 | |
| Net Position Held in Trust, Beginning of Year | 841,112,040 | 386,080,172 | | |
| **Net Position Held in Trust, End of Year** | **$11,880,487,863** | **$841,112,040** | **$386,080,172** | |

* Net Position by Plan was restated to adjust the allocation of investment income as of December 31, 2010, with the restatement shown in the beginning net position of 2011. The restatement by plan does not impact the total net position of the System.

** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016. The Special Item represents this interplan activity and nets to zero in consolidation.

*** The year 2010 was restated for reclassification of Early Retirement Reinsurance Program from Contracts and Other Receipts to Federal Subsidy, and the reclassification of the Pending Medical Claims adjustment from Health Care Expenses to Other Income. Pending Medical Claims consists of the annual adjustment made to the incurred but not reported liability included in Benefits Payable. This liability fluctuates from year to year based on changes in the claims experience.

† Beginning in 2015, Retiree-Paid Health Care Premiums was reported separately and not included in the Member Contributions line item. For comparability, this activity has been reclassified from Member Contributions to Retiree-Paid Health Care Premiums for all prior years presented.

## Changes in Fiduciary Net Position

| 2012 | 2011* | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $494,048,415 | $503,458,216 | $628,685,237 | $740,817,891 | $891,561,073 | $695,967,837 |
| 94,730,390 | 89,087,996 | 83,572,868 | 58,649,547 | 66,343,542 | 45,534,017 |
| 159,614,898 | 148,370,246 | 111,638,313 | 94,370,543 | 82,695,255 | 79,198,959 |
| 182,579,917 | 192,118,407 | 142,658,293 | 69,132,772 | 63,310,194 | 59,075,120 |
| 1,549,970,894 | (78,923,627) | 1,511,164,964 | 2,356,554,863 | (3,400,647,342) | 858,614,433 |
| 11,774,199 | 10,915,043 | 7,163,609 | 654,031 | 614,989 | 70,498 |
| 2,492,718,713 | 865,026,281 | 2,484,883,284 | 3,320,179,647 | (2,296,122,289) | 1,738,460,864 |
| 1,607,921,528 | 1,575,561,578 | 1,567,551,611 | 1,488,032,855 | 1,377,146,173 | 1,282,776,044 |
| 15,172,174 | 13,076,814 | 12,782,968 | 13,033,595 | 13,596,943 | 10,796,417 |
| 1,623,093,702 | 1,588,638,392 | 1,580,334,579 | 1,501,066,450 | 1,390,743,116 | 1,293,572,461 |
| | | | | | |
| 869,625,011 | (723,612,111) | 904,548,705 | 1,819,113,197 | (3,686,865,405) | 444,888,403 |
| 11,959,000,311 | 12,682,612,422 | 11,415,195,274 | 9,596,082,077 | 13,282,947,482 | 12,838,059,079 |
| **$12,828,625,322** | **$11,959,000,311** | **$12,319,743,979** | **$11,415,195,274** | **$9,596,082,077** | **$13,282,947,482** |

continued on page 188

continued from page 187

## Changes in Fiduciary Net Position (last 10 fiscal years)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Voluntary Employees' Beneficiary Association Trust** | | | | |
| **Additions** | | | | |
| Employer Contributions*** | $10,483,804 | | $14,702,198 | $18,256,171 |
| Contracts and Other Receipts | 22,722 | | 20,484 | 3,061 |
| Net Income/(Loss) from Investing Activity | 6,706,534 | $627,917 | 11,044,528 | 17,954,681 |
| Other Income, net | | | | |
| Interplan Activity | | | | |
| Total Additions | 17,213,060 | 627,917 | 25,767,210 | 36,213,913 |
| **Deductions** | | | | |
| Health Care Expenses | 1,417,445 | 2,396,972 | 2,217,933 | 1,719,043 |
| Administrative Expenses | 629,201 | 1,330,559 | 1,094,409 | 1,026,449 |
| Interplan Activity | 727,192 | 5,992,744 | | |
| Total Deductions | 2,773,838 | 9,720,275 | 3,312,342 | 2,745,492 |
| **Special Item**** | (180,886,028) | | | |
| Net Increase/(Decrease) | (166,446,806) | (9,092,358) | 22,454,868 | 33,468,421 |
| Net Position Held in Trust, Beginning of Year | 166,446,806 | 175,539,164 | 153,084,296 | 119,615,875 |
| **Net Position Held in Trust, End of Year** | **$0** | **$166,446,806** | **$175,539,164** | **$153,084,296** |

* Net Position by Plan was restated to adjust the allocation of investment income as of December 31, 2010, with the restatement shown in the beginning net position of 2011. The restatement by plan does not impact the total net position of the System.

** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016. The Special Item represents this interplan activity and nets to zero in consolidation.

*** Beginning October 2014, the Board approved the funding of the VEBA Trust participant accounts using the reserves in the VEBA Trust rather than the allocation of employer contributions. Instead, employer contributions were allocated to the Member-Directed Plan to repay the original plan start-up and administrative costs.

## Changes in Fiduciary Net Position

| 2012 | 2011* | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| | | | | | |
| $16,883,868 | $15,982,848 | $13,986,794 | $12,485,134 | $11,565,614 | $10,239,742 |
| 9,233 | 9,082 | 7,367 | 2,328 | 1,353 | 1,972 |
| 14,049,787 | 311,497 | 8,284,927 | 8,394,234 | (11,569,156) | 2,601,189 |
| | | 338 | | | |
| 63,641 | | 26,276 | 39,978 | 56,292 | 70,864 |
| 31,006,529 | 16,303,427 | 22,305,702 | 20,921,674 | 54,103 | 12,913,767 |
| 1,236,169 | 895,574 | 514,332 | 233,364 | 128,346 | 53,812 |
| 850,617 | 914,578 | 851,770 | 853,358 | 820,376 | 964,159 |
| | 28,172 | 101,658 | 383,887 | | |
| 2,086,786 | 1,838,324 | 1,467,760 | 1,470,609 | 948,722 | 1,017,971 |
| | | | | | |
| 28,919,743 | 14,465,103 | 20,837,942 | 19,451,065 | (894,619) | 11,895,796 |
| 90,696,132 | 76,231,029 | 55,784,131 | 36,333,066 | 37,227,685 | 25,331,889 |
| **$119,615,875** | **$90,696,132** | **$76,622,073** | **$55,784,131** | **$36,333,066** | **$37,227,685** |

## Additions by Source (last 10 fiscal years)

(continued through page 193)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans*** | | | | |
| Member Contributions | $1,387,215,220 | $1,332,308,994 | $1,307,428,830 | $1,279,945,223 |
| Employer Contributions | 1,941,632,324 | 1,864,823,741 | 1,829,907,525 | 1,794,039,132 |
| Purchase of Service | 18,073,121 | 22,850,005 | 26,521,581 | 60,100,714 |
| Retiree-Paid Health Care Premiums† | 184,368,783 | 248,601,375 | 238,406,380 | 178,140,822 |
| Early Retirement Incentive Payments | | 2,636,885 | 15,180,991 | 7,294,662 |
| Transfers from Other Retirement Systems | 44,266,370 | 47,270,349 | 69,328,737 | 46,370,923 |
| Vendor Rebates and Other Receipts | 91,735,221 | 91,372,473 | 150,377,554 | 121,660,735 |
| Additional Annuity/Voluntary Contributions | 2,074,383 | 1,668,697 | 1,693,612 | 5,786,692 |
| Other Employer Payments | 16,189,737 | 6,269,228 | 7,625,727 | 9,014,653 |
| Federal Subsidy | 4,065,058 | 175,930,875 | 176,619,891 | 105,965,762 |
| Net Income/(Loss) from Investing Activity | 6,926,572,065 | 9,415,961 | 5,775,317,835 | 11,006,164,375 |
| Other Income/(Expense), net | (2,544,366) | (4,887,359) | 8,304,360 | 13,898,739 |
| Interplan Activity | 17,205,339 | 19,759,373 | 10,357,663 | 13,034,171 |
| **Total Additions** | **$10,630,853,255** | **$3,818,020,597** | **$9,617,070,686** | **$14,641,416,603** |

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Traditional Pension Plan** | | | | |
| Member Contributions | $1,294,853,664 | $1,246,732,014 | $1,228,144,074 | $1,206,808,750 |
| Employer Contributions | 1,556,529,162 | 1,498,679,737 | 1,476,074,083 | 1,571,758,150 |
| Purchase of Service | 17,926,008 | 22,718,488 | 26,297,267 | 59,756,708 |
| Early Retirement Incentive Payments | | 2,649,968 | 14,427,760 | 6,943,575 |
| Transfers from Other Retirement Systems | 44,199,326 | 43,081,440 | 66,309,930 | 42,242,610 |
| Additional Annuity Contributions | 1,235,194 | 830,196 | 945,803 | 4,744,751 |
| Other Employer Payments | 14,501,628 | 5,929,728 | 6,849,804 | 8,130,455 |
| Net Income/(Loss) from Investing Activity | 5,947,233,326 | 274,898,652 | 5,056,307,357 | 9,423,847,940 |
| Other Income/(Expense), net | (2,560,081) | (4,887,369) | 625,549 | 414,878 |
| Interplan Activity | 11,168,557 | 19,759,373 | 10,357,663 | 13,034,171 |
| **Total Additions** | **$8,885,086,784** | **$3,110,392,227** | **$7,886,339,290** | **$12,337,681,988** |

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Combined Plan** | | | | |
| Member Contributions | $39,232,690 | $36,685,161 | $34,604,398 | $32,535,565 |
| Employer Contributions | 47,079,023 | 44,022,120 | 44,196,044 | 45,427,520 |
| Purchase of Service | 136,029 | 131,373 | 218,582 | 343,752 |
| Transfers from Other Retirement Systems | | | | |
| Voluntary Contributions | 336,536 | 353,335 | 153,014 | 270,861 |
| Other Employer Payments | 147,513 | 7,552 | 41,212 | 65,645 |
| Net Income/(Loss) from Investing Activity | 63,694,711 | (6,501,919) | 32,379,863 | 78,379,140 |
| Other Income, net | | | | |
| Interplan Activity | | | | |
| **Total Additions** | **$150,626,502** | **$74,697,622** | **$111,593,113** | **$157,022,483** |

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Member-Directed Plan** | | | | |
| Member Contributions | $53,128,866 | $48,891,819 | $44,680,358 | $40,600,908 |
| Employer Contributions | 53,120,880 | 68,448,551 | 47,851,530 | 38,540,851 |
| Purchase of Service | 11,084 | 144 | 5,732 | 254 |
| Voluntary Contributions | 502,653 | 485,166 | 594,795 | 771,080 |
| Other Employer Payments | 13,554 | 10,230 | 100,243 | 13,738 |
| Net Income/(Loss) from Investing Activity | 66,099,386 | (13,070,950) | 28,212,549 | 88,633,791 |
| Other Income, net | | | | |
| Interplan Activity | | | | |
| **Total Additions** | **$172,876,423** | **$104,764,960** | **$121,445,207** | **$168,560,622** |

* The year 2010 401(h) Health Care Trust expenses were restated for reclassification of Pending Medical Claims adjustment from Health Care Medical Expense to Other Income. Pending Medical Claims consists of the annual adjustment made to the incurred but not reported liability included in Benefits Payable. This liability fluctuates from year to year based on changes in the claims experience.

† Beginning in 2015, Retiree-Paid Health Care Premiums was reported separately and not included in the Member Contributions line item. For comparability, this activity has been reclassified from Member Contributions to Retiree-Paid Health Care Premiums for all prior years presented.

## Additions by Source

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $1,266,800,236 | $1,286,385,298 | $1,275,688,737 | $1,290,805,214 | $1,303,865,947 | $1,227,345,099 |
| 1,778,728,069 | 1,809,470,716 | 1,796,343,429 | 1,822,639,448 | 1,840,585,266 | 1,798,305,461 |
| 62,507,139 | 59,976,857 | 51,936,153 | 42,247,663 | 47,326,741 | 45,091,289 |
| 159,614,898 | 148,370,246 | 111,638,313 | 94,370,543 | 82,695,255 | 79,198,959 |
| 13,568,992 | 23,366,505 | 27,964,615 | 93,149,748 | 34,588,480 | 30,078,951 |
| 39,590,467 | 31,487,779 | 31,862,677 | 26,142,599 | 43,533,703 | 24,071,283 |
| 90,103,930 | 84,515,422 | 72,854,648 | 47,557,407 | 44,672,114 | 41,826,091 |
| 5,402,253 | 5,334,480 | 5,296,310 | 3,915,521 | 4,498,262 | 5,538,887 |
| 7,086,708 | 7,166,055 | 7,592,969 | 6,169,728 | 6,144,202 | 4,888,343 |
| 182,579,917 | 192,118,407 | 142,658,293 | 69,132,772 | 63,310,194 | 59,075,120 |
| 10,375,431,044 | 179,956,702 | 9,268,181,189 | 12,274,797,785 | (22,770,412,901) | 6,594,053,702 |
| 12,103,692 | 11,255,503 | 7,930,265 | 794,525 | 1,635,996 | 110,559 |
| 16,981,683 | 10,077,664 | 10,528,250 | 7,879,768 | 7,470,205 | 5,730,846 |
| **$14,010,499,028** | **$3,849,481,634** | **$12,810,475,848** | **$15,779,602,721** | **($19,290,086,536)** | **$9,915,314,590** |
| | | | | | |
| $1,199,073,380 | $1,221,597,118 | $1,217,388,746 | $1,236,966,262 | $1,253,053,822 | $1,183,959,051 |
| 1,208,150,727 | 1,233,002,841 | 1,097,711,440 | 1,019,582,360 | 892,693,746 | 1,051,808,289 |
| 62,193,231 | 59,770,075 | 51,738,819 | 42,177,769 | 47,167,085 | 44,994,292 |
| 13,134,027 | 22,388,005 | 26,567,998 | 87,738,002 | 32,401,549 | 27,838,050 |
| 36,013,336 | 28,505,778 | 23,234,777 | 20,972,055 | 24,779,353 | 23,209,103 |
| 4,530,704 | 4,447,182 | 4,699,133 | 3,705,856 | 3,615,649 | 4,879,268 |
| 6,410,331 | 6,449,831 | 6,839,388 | 5,638,454 | 5,387,481 | 4,237,146 |
| 8,713,817,411 | 274,530,266 | 7,678,536,712 | 9,822,978,753 | (19,258,540,437) | 5,717,111,026 |
| 329,493 | 340,460 | 763,943 | 140,494 | 1,021,007 | 40,061 |
| 16,918,042 | 10,077,664 | 10,501,974 | 7,839,790 | 7,289,779 | 4,969,740 |
| **$11,260,570,682** | **$2,861,109,220** | **$10,117,982,930** | **$12,247,739,795** | **($16,991,130,966)** | **$8,063,046,026** |
| | | | | | |
| $30,193,165 | $29,256,952 | $27,272,707 | $26,096,068 | $25,123,220 | $21,907,704 |
| 23,998,486 | 23,280,520 | 26,432,761 | 23,397,299 | 20,352,999 | 19,241,579 |
| 313,711 | 201,906 | 150,035 | 68,726 | 159,371 | 83,440 |
| | 35,957 | | | | |
| 425,653 | 134,608 | 177,121 | 48,855 | 684,634 | 239,505 |
| 5,983 | 14,408 | 57,791 | 7,242 | | 24,335 |
| 50,732,608 | (5,810,229) | 35,971,101 | 44,034,607 | (53,571,566) | 9,866,238 |
| | | 1,267 | | | |
| | | | | 68,857 | 411,764 |
| **$105,669,606** | **$47,114,122** | **$90,062,783** | **$93,652,797** | **($7,182,485)** | **$51,774,565** |
| | | | | | |
| $37,533,691 | $35,531,228 | $31,027,284 | $27,742,884 | $25,688,905 | $21,478,344 |
| 35,646,573 | 33,746,291 | 29,527,197 | 26,356,764 | 24,411,834 | 21,048,014 |
| 197 | 4,876 | (1,168) | 1,168 | 285 | |
| 445,896 | 752,690 | 420,056 | 160,810 | 197,979 | 420,114 |
| 46,797 | 44,704 | 43,187 | 11,854 | 25,221 | 33,602 |
| 46,860,344 | (10,151,205) | 34,223,485 | 42,835,328 | (46,084,400) | 5,860,816 |
| | | 1,108 | | | |
| | | | | 55,277 | 278,478 |
| **$120,533,498** | **$59,928,584** | **$95,241,149** | **$97,108,808** | **$4,295,101** | **$49,119,368** |

continued on page 192

continued from page 191

## Additions by Source (last 10 fiscal years)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **401(h) Health Care Trust*/**** | | | | |
| Employer Contributions | | | $135,522,351 | $120,056,440 |
| Purchase of Service | | | | |
| Retiree-Paid Health Care Premiums† | | $248,601,375 | 238,406,380 | 178,140,822 |
| Early Retirement Incentive Payments | | | 753,231 | 351,087 |
| Transfers from Other Retirement Systems | | | 276,331 | 4,128,313 |
| Vendor Rebates and Other Receipts | | 10,341 | 9,396,130 | 121,660,735 |
| Other Employer Payments | | (906) | 524,694 | 801,754 |
| Federal Subsidy—Medicare Part D | | | 170,515 | 246,139 |
| Federal Subsidy—Medicare PDP | | | 44,545,126 | 105,719,623 |
| Federal Subsidy—Early Retiree Reinsurance Program | | | | |
| Net Income/(Loss) from Investing Activity | $490,208,570 | (223,464,384) | 648,566,894 | 1,397,348,823 |
| Other Income, net | | | 7,601,841 | 13,483,861 |
| **Total Additions** | **$490,208,570** | **$25,146,426** | **$1,085,763,493** | **$1,941,937,597** |
| **115 Health Care Trust**** | | | | |
| Employer Contributions | $274,419,455 | $253,673,333 | $111,561,319 | |
| Retiree-Paid Health Care Premiums† | 184,368,783 | | | |
| Early Retirement Incentive Payments | | (13,083) | | |
| Transfers from Other Retirement Systems | 67,044 | 4,188,909 | 2,742,476 | |
| Vendor Rebates and Other Receipts | 91,735,221 | 91,362,132 | 140,981,424 | |
| Other Employer Payments | 1,504,320 | 322,624 | 89,290 | |
| Federal Subsidy—Medicare Part D | 122,044 | 743,345 | 223,579 | |
| Federal Subsidy—Medicare PDP | 3,943,014 | 175,187,530 | 131,680,671 | |
| Net Income/(Loss) from Investing Activity | 352,629,538 | (23,073,355) | (1,193,356) | |
| Other Income, net | 15,715 | 10 | 76,970 | |
| Interplan Activity | 6,036,782 | | | |
| **Total Additions** | **$914,841,916** | **$502,391,445** | **$386,162,373** | |
| **Voluntary Employees' Beneficiary Association Trust**** | | | | |
| Employer Contributions*** | $10,483,804 | | $14,702,198 | $18,256,171 |
| Vendor Rebates and Other Receipts | | | | |
| Other Employer Payments | 22,722 | | 20,484 | 3,061 |
| Net Income/(Loss) from Investing Activity | 6,706,534 | $627,917 | 11,044,528 | 17,954,681 |
| Other Income, net | | | | |
| Interplan Activity | | | | |
| **Total Additions** | **$17,213,060** | **$627,917** | **$25,767,210** | **$36,213,913** |

* The year 2010 401(h) Health Care Trust expenses were restated for reclassification of Pending Medical Claims adjustment from Health Care Medical Expense to Other Income. Pending Medical Claims consists of the annual adjustment made to the incurred but not reported liability included in Benefits Payable. This liability fluctuates from year to year based on changes in the claims experience.

** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association (VEBA) Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

*** Beginning October 2014, the Board approved the funding of the VEBA Trust participant accounts using the reserves in the VEBA Trust rather than the allocation of employer contributions. Instead, employer contributions were allocated to the Member-Directed Plan to repay the original plan start-up and administrative costs. Contributions to the VEBA Trust resumed January 1, 2016.

† Beginning 2015, Retiree-Paid Health Care Premiums was reported separately and not included in the Member Contributions line item. For comparability, this activity has been reclassified from Member Contributions to Retiree-Paid Health Care Premiums for all prior years presented.

## Additions by Source

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $494,048,415 | $503,458,216 | $628,685,237 | $740,817,891 | $891,561,073 | $695,967,837 |
| | | 48,467 | | | 13,557 |
| 159,614,898 | 148,370,246 | 111,638,313 | 94,370,543 | 82,695,255 | 79,198,959 |
| 434,965 | 978,500 | 1,396,617 | 5,411,746 | 2,186,931 | 2,240,901 |
| 3,577,131 | 2,946,044 | 8,627,900 | 5,170,544 | 18,754,350 | 862,180 |
| 90,103,930 | 84,515,422 | 72,854,394 | 47,557,407 | 44,672,114 | 41,826,091 |
| 614,364 | 648,030 | 645,490 | 509,850 | 730,147 | 591,288 |
| 926,931 | 788,419 | 72,100,529 | 69,132,772 | 63,310,194 | 59,075,120 |
| 181,652,986 | 81,802,880 | | | | |
| | 109,527,108 | 70,557,764 | | | |
| 1,549,970,894 | (78,923,627) | 1,511,164,964 | 2,356,554,863 | (3,400,647,342) | 858,614,433 |
| 11,774,199 | 10,915,043 | 7,163,609 | 654,031 | 614,989 | 70,498 |
| **$2,492,718,713** | **$865,026,281** | **$2,484,883,284** | **$3,320,179,647** | **($2,296,122,289)** | **$1,738,460,864** |

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $16,883,868 | $15,982,848 | $13,986,794 | $12,485,134 | $11,565,614 | $10,239,742 |
| | | 254 | | | |
| 9,233 | 9,082 | 7,113 | 2,328 | 1,353 | 1,972 |
| 14,049,787 | 311,497 | 8,284,927 | 8,394,234 | (11,569,156) | 2,601,189 |
| | | 338 | | | |
| 63,641 | | 26,276 | 39,978 | 56,292 | 70,864 |
| **$31,006,529** | **$16,303,427** | **$22,305,702** | **$20,921,674** | **$54,103** | **$12,913,767** |

## Deductions by Type (last 10 fiscal years)

(continued through page 197)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans**** | | | | |
| Pension—Annuities | $5,577,629,182 | $5,390,859,219 | $5,101,735,902 | $4,920,408,972 |
| Pension—Installment Payments | 1,112,846 | 1,003,891 | 1,628,513 | 1,549,139 |
| Pension—Other | 7,857,337 | 8,647,208 | 7,482,091 | 7,913,434 |
| Disability Case Management and Exams | 1,401,601 | 1,370,674 | 1,277,281 | 1,620,162 |
| Refunds | 429,791,141 | 449,265,410 | 425,701,829 | 441,284,204 |
| Medicare Parts A and B | 50,445,768 | 77,867,474 | 113,967,145 | 112,820,822 |
| Medical* | 608,133,751 | 940,420,011 | 921,172,088 | 912,071,417 |
| Pending Medical Claims | | | | |
| Prescription Drug | 170,627,591 | 672,710,524 | 634,474,812 | 551,391,403 |
| Dental* | 55,456,293 | 53,818,027 | 50,907,491 | 48,106,058 |
| Vision* | 9,902,183 | 9,847,918 | 9,564,606 | 9,038,035 |
| Disease Management* | 2,090,646 | 3,865,654 | 3,840,401 | 4,535,512 |
| Wellness Retiree Medical Account Plan Claims | 5,228,251 | 16,460,228 | 4,669,630 | 4,562,351 |
| Health Reimbursement Account Plan Claims | 292,375,150 | 45,184,620 | | |
| Member-Directed Retiree Medical Account Plan Claims | 3,114,711 | 2,396,972 | 2,217,933 | 1,719,043 |
| Administrative Expenses | 79,059,058 | 77,036,684 | 74,114,491 | 68,619,091 |
| Interplan Activity | 17,205,339 | 19,759,373 | 10,357,663 | 13,034,171 |
| **Total Deductions** | **$7,311,430,848** | **$7,770,513,887** | **$7,363,111,876** | **$7,098,673,814** |
| **Traditional Pension Plan** | | | | |
| Pension--Annuities | $5,575,258,958 | $5,388,827,561 | $5,100,341,567 | $4,919,439,251 |
| Pension--Other | 7,857,337 | 8,646,429 | 7,482,091 | 7,913,434 |
| Disability Case Management and Exams | 1,401,601 | 1,370,674 | 1,277,281 | 1,620,162 |
| Refunds | 352,362,641 | 405,320,800 | 389,707,612 | 411,321,700 |
| Administrative Expenses | 51,871,700 | 49,137,053 | 49,832,366 | 46,946,971 |
| Interplan Activity | | | | |
| **Total Deductions** | **$5,988,752,237** | **$5,853,302,517** | **$5,548,640,917** | **$5,387,241,518** |
| **Combined Plan** | | | | |
| Pension—Annuities | $1,443,631 | $1,255,978 | $773,394 | $533,920 |
| Pension—Other | | 779 | | |
| Pension—Installment Payments | 538,033 | 534,358 | 1,457,593 | 992,085 |
| Refunds | 21,857,512 | 12,577,944 | 10,974,442 | 7,731,155 |
| Administrative Expenses | 2,559,387 | 2,522,610 | 2,375,278 | 2,264,293 |
| Interplan Activity | 9,290,331 | 7,141,271 | 5,375,568 | 6,085,687 |
| **Total Deductions** | **$35,688,894** | **$24,032,940** | **$20,956,275** | **$17,607,140** |
| **Member-Directed Plan** | | | | |
| Pension—Annuities | $926,593 | $775,680 | $620,941 | $435,801 |
| Pension—Installment Payments | 574,813 | 469,533 | 170,920 | 557,054 |
| Refunds | 55,570,988 | 31,366,666 | 25,019,775 | 22,231,349 |
| Administrative Expenses | 2,305,383 | 2,260,306 | 2,400,900 | 2,028,864 |
| Interplan Activity | 7,187,816 | 6,625,358 | 4,982,095 | 6,948,484 |
| **Total Deductions** | **$66,565,593** | **$41,497,543** | **$33,194,631** | **$32,201,552** |

* The breakdown of medical disbursements between Medical, Dental, Vision, and Disease Management is not available for 2009 and prior.

** The 401(h) Health Care Trust expenses in 2010 were restated for reclassification of Pending Medical Claims adjustment from Health Care Medical Expense to Other Income. Pending Medical Claims consists of the annual adjustment made to the incurred but not reported liability included in Benefits Payable. This liability fluctuates from year to year based on changes in the claims experience.

## Deductions by Type

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $4,582,583,776 | $4,322,202,507 | $3,954,057,452 | $3,653,998,513 | $3,381,914,006 | $3,130,094,411 |
| 463,923 | 207,443 | 246,225 | 50,709 | 41,250 | 9,600 |
| 7,891,172 | 7,508,317 | 7,248,345 | 7,124,887 | 6,998,605 | 6,891,186 |
| 307,486,279 | 323,672,042 | 233,054,714 | 222,580,254 | 221,300,825 | 221,092,748 |
| 112,530,781 | 109,072,281 | 107,770,173 | 105,854,803 | 103,934,337 | 99,175,973 |
| 888,700,307 | 872,219,550 | 871,299,322 | 877,861,028 | 827,135,910 | 745,052,859 |
| | | | | | 4,121,292 |
| 541,552,286 | 530,404,030 | 526,054,523 | 494,674,419 | 441,059,097 | 431,405,495 |
| 41,711,390 | 38,467,223 | 38,978,748 | | | |
| 7,896,366 | 7,288,175 | 7,668,138 | | | |
| 4,711,813 | 4,620,914 | 2,557,254 | | | |
| 10,818,585 | 13,489,405 | 13,223,453 | 9,642,605 | 5,016,829 | 3,020,425 |
| 1,236,169 | 895,574 | 514,332 | 233,364 | 128,346 | 53,812 |
| 69,617,154 | 70,101,033 | 71,030,458 | 75,844,945 | 74,022,980 | 69,305,991 |
| 16,981,684 | 10,077,664 | 10,528,250 | 7,879,768 | 7,470,205 | 5,730,846 |
| **$6,594,181,685** | **$6,310,226,158** | **$5,844,231,387** | **$5,455,745,295** | **$5,069,022,390** | **$4,715,954,638** |

| | | | | | |
|---|---|---|---|---|---|
| $4,582,082,044 | $4,321,944,264 | $3,953,969,116 | $3,653,951,822 | $3,381,864,191 | $3,130,087,724 |
| 7,891,172 | 7,508,317 | 7,248,345 | 7,124,887 | 6,998,605 | 6,891,186 |
| 284,217,216 | 302,812,289 | 219,808,143 | 212,209,227 | 212,802,651 | 213,007,451 |
| 49,179,821 | 51,196,146 | 52,375,762 | 56,805,048 | 53,853,085 | 50,053,260 |
| | | | 36,008 | 180,426 | 718,220 |
| **$4,923,370,253** | **$4,683,461,016** | **$4,233,401,366** | **$3,930,126,992** | **$3,655,698,958** | **$3,400,757,841** |

| | | | | | |
|---|---|---|---|---|---|
| $273,809 | $187,051 | $61,125 | $30,566 | $11,911 | $5,451 |
| 336,736 | 118,164 | 67,241 | 5,000 | | |
| 6,173,714 | 6,462,849 | 3,540,043 | 2,905,883 | 3,623,723 | 2,707,630 |
| 2,295,688 | 2,559,312 | 2,584,673 | 2,638,279 | 2,990,092 | 3,890,828 |
| 9,487,128 | 5,129,362 | 6,043,719 | 3,638,757 | 4,105,870 | 2,305,124 |
| **$18,567,075** | **$14,456,738** | **$12,296,801** | **$9,218,485** | **$10,731,596** | **$8,909,033** |

| | | | | | |
|---|---|---|---|---|---|
| $227,923 | $71,192 | $27,211 | $16,125 | $37,904 | $1,236 |
| 127,187 | 89,279 | 178,984 | 45,709 | 41,250 | 9,600 |
| 17,095,349 | 14,396,904 | 9,706,528 | 7,465,144 | 4,874,451 | 5,377,667 |
| 2,118,854 | 2,354,183 | 2,435,285 | 2,514,665 | 2,762,484 | 3,601,327 |
| 7,494,556 | 4,920,130 | 4,382,873 | 3,821,116 | 3,183,909 | 2,707,502 |
| **$27,063,869** | **$21,831,688** | **$16,730,881** | **$13,862,759** | **$10,899,998** | **$11,697,332** |

continued on page 196

continued from page 195

## Deductions by Type (last 10 fiscal years, continued)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **401(h) Health Care Trust**/*** | | | | |
| Medicare Parts A and B | | $77,867,474 | $113,967,145 | $112,820,822 |
| Medical* | | 940,420,011 | 921,172,088 | 912,071,417 |
| Pending Medical Claims | | | | |
| Prescription Drug | | 672,710,524 | 634,474,812 | 551,391,403 |
| Dental* | | 53,818,027 | 50,907,491 | 48,106,058 |
| Vision* | | 9,847,918 | 9,564,606 | 9,038,035 |
| Disease Management* | | 3,865,654 | 3,840,401 | 4,535,512 |
| Wellness Retiree Medical Account Plan Claims | | 16,460,228 | 4,669,630 | 4,562,351 |
| Administrative Expenses | | 19,611,199 | 18,329,337 | 16,352,514 |
| **Total Deductions** | | **$1,794,601,035** | **$1,756,925,510** | **$1,658,878,112** |
| **115 Health Care Trust*** ** | | | | |
| Medicare Parts A and B | $50,445,768 | | | |
| Medical | 608,133,751 | | | |
| Prescription Drug | 170,627,591 | | | |
| Dental | 55,456,293 | | | |
| Vision | 9,902,183 | | | |
| Disease Management | 2,090,646 | | | |
| Wellness Retiree Medical Account Plan Claims | 5,228,251 | | | |
| Health Reimbursement Account Plan Claims | 292,375,150 | $45,184,620 | | |
| Member-Directed Retiree Medical Account Plan Claims | 1,697,266 | | | |
| Administrative Expenses | 21,693,387 | 2,174,957 | $82,201 | |
| **Total Deductions** | **$1,217,650,286** | **$47,359,577** | **$82,201** | |
| **Voluntary Employees' Beneficiary Association Trust*** ** | | | | |
| Member-Directed Retiree Medical Account Plan Claims | $1,417,445 | $2,396,972 | $2,217,933 | $1,719,043 |
| Administrative Expenses | 629,201 | 1,330,559 | 1,094,409 | 1,026,449 |
| Interplan Activity | 727,192 | 5,992,744 | | |
| **Total Deductions** | **$2,773,838** | **$9,720,275** | **$3,312,342** | **$2,745,492** |

* The breakdown of medical disbursements between Medical, Dental, Vision, and Disease Management is not available for 2009 and prior.

** The 401(h) Health Care Trust expenses in 2010 were restated for reclassification of Pending Medical Claims adjustment from Health Care Medical Expense to Other Income. Pending Medical Claims consists of the annual adjustment made to the incurred but not reported liability included in Benefits Payable. This liability fluctuates from year to year based on changes in the claims experience.

*** The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust were terminated as of June 30, 2016 and the net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

## Deductions by Type

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $112,530,781 | $109,072,281 | $107,770,173 | $105,854,803 | $103,934,337 | $99,175,973 |
| 888,700,307 | 872,219,550 | 871,299,322 | 877,861,028 | 827,135,910 | 745,052,859 |
| | | | | | 4,121,292 |
| 541,552,286 | 530,404,030 | 526,054,523 | 494,674,419 | 441,059,097 | 431,405,495 |
| 41,711,390 | 38,467,223 | 38,978,748 | | | |
| 7,896,366 | 7,288,175 | 7,668,138 | | | |
| 4,711,813 | 4,620,914 | 2,557,254 | | | |
| 10,818,585 | 13,489,405 | 13,223,453 | 9,642,605 | 5,016,829 | 3,020,425 |
| 15,172,174 | 13,076,814 | 12,782,968 | 13,033,595 | 13,596,943 | 10,796,417 |
| **$1,623,093,702** | **$1,588,638,392** | **$1,580,334,579** | **$1,501,066,450** | **$1,390,743,116** | **$1,293,572,461** |
| | | | | | |
| $1,236,169 | $895,574 | $514,332 | $233,364 | $128,346 | $53,812 |
| 850,617 | 914,578 | 851,770 | 853,358 | 820,376 | 964,159 |
| | 28,172 | 101,658 | 383,887 | | |
| **$2,086,786** | **$1,838,324** | **$1,467,760** | **$1,470,609** | **$948,722** | **$1,017,971** |

## Benefits by Type (last 10 fiscal years)

(continued on next page)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans**** | | | | |
| Annuities and Installment Payments**** | $5,272,086,225 | $5,833,988,140 | $5,534,152,991 | $5,277,262,585 |
| Disabilities | 974,782,897 | 1,070,397,368 | 1,057,979,091 | 1,040,711,575 |
| Other Systems/Death/QEBA* | 11,682,188 | 12,010,912 | 10,646,707 | 13,550,680 |
| Survivors | 206,548,755 | 244,014,180 | 243,271,541 | 237,930,114 |
| Wellness Retiree Medical Account Plan Claims | 6,990,116 | 16,460,228 | 4,669,630 | 4,562,351 |
| Health Reimbursement Account Plan Claims | 310,233,492 | 45,184,620 | | |
| Member-Directed Retiree Medical Account Plan Claims**** | 3,051,637 | 2,396,972 | 2,217,933 | 1,719,043 |
| **Total Pension Benefits and Health Care** | **$6,785,375,310** | **$7,224,452,420** | **$6,852,937,893** | **$6,575,736,348** |
| **Traditional Pension Plan** | | | | |
| **Pension Benefits** | | | | |
| Age-and-Service Annuities | $4,676,894,918 | $4,500,470,313 | $4,228,575,327 | $4,044,320,992 |
| Disabilities | 648,136,068 | 642,937,688 | 634,409,874 | 624,038,549 |
| Other Systems | 291,376 | 503,683 | 987,644 | 3,534,484 |
| Survivors | 187,233,171 | 182,549,547 | 178,633,434 | 174,766,735 |
| Additional Annuities | 5,653,264 | 5,491,671 | 5,421,653 | 26,011,745 |
| Money Purchase Annuities | 54,918,287 | 55,385,312 | 51,413,944 | 46,284,146 |
| Death | 7,857,337 | 8,646,429 | 7,482,091 | 7,913,434 |
| QEBA* | 3,533,475 | 2,860,021 | 2,176,972 | 2,102,762 |
| **Total Pension Benefits** | **$5,584,517,896** | **$5,398,844,664** | **$5,109,100,939** | **$4,928,972,847** |
| **Combined Plan** | | | | |
| **Pension Benefits** | | | | |
| Annuities | $1,443,631 | $1,255,978 | $773,394 | $533,920 |
| Installment Payments | 538,033 | 534,358 | 1,457,593 | 992,085 |
| Death | | 779 | | |
| **Total Pension Benefits** | **$1,981,664** | **$1,791,115** | **$2,230,987** | **$1,526,005** |
| **Member-Directed Plan** | | | | |
| **Pension Benefits** | | | | |
| Annuities | $926,593 | $775,860 | $620,941 | $435,801 |
| Installment Payments | 574,813 | 469,553 | 170,920 | 557,054 |
| **Total Pension Benefits** | **$1,501,406** | **$1,245,413** | **$791,861** | **$992,855** |
| **401(h) Health Care Trust***** | | | | |
| **Health Care**** | | | | |
| Annuities | | $1,269,605,295 | $1,245,719,219 | $1,158,126,842 |
| Disabilities | | 427,459,680 | 423,569,217 | 416,673,026 |
| Survivors | | 61,464,633 | 64,638,107 | 63,163,379 |
| Wellness Retiree Medical Account Plan Claims | | 16,460,228 | 4,669,630 | 4,562,351 |
| **Total Health Care** | | **$1,774,989,836** | **$1,738,596,173** | **$1,642,525,598** |
| **115 Health Care Trust***** | | | | |
| **Health Care** | | | | |
| Annuities | $531,136,686 | | | |
| Disabilities | 326,646,829 | | | |
| Survivors | 19,315,584 | | | |
| Wellness Retiree Medical Account Plan Claims | 6,990,116 | | | |
| Health Reimbursement Account Plan Claims | 310,233,492 | $45,184,620 | | |
| Member-Directed Retiree Medical Account Plan Claims**** | 1,634,192 | | | |
| **Total Health Care** | **$1,195,956,899** | **$45,184,620** | | |
| **Voluntary Employees' Beneficiary Association Trust***** | | | | |
| **Health Care** | | | | |
| Member-Directed Retiree Medical Account Plan Claims**** | $1,417,445 | $2,396,972 | $2,217,933 | $1,719,043 |
| **Total Health Care** | **$1,417,445** | **$2,396,972** | **$2,217,933** | **$1,719,043** |

* Qualified Excess Benefit Arrangement (QEBA) commenced in 2000.

** The 401(h) Health Care Trust expenses in 2010 were restated for reclassification of Pending Medical Claims adjustment from Health Care Medical Expense to Other Income. Pending Medical Claims consists of the annual adjustment made to the incurred but not reported liability included in Benefits Payable. This liability fluctuates from year to year based on changes in the claims experience.

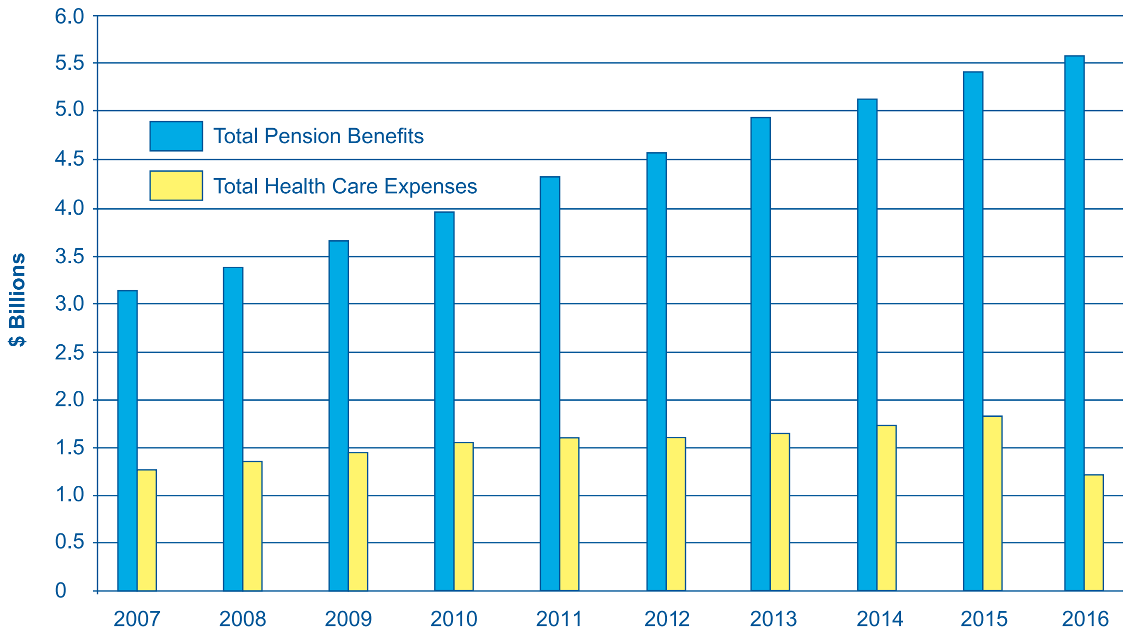
*** The 115 Health Care Trust was established and funding began in 2014. Notional deposits to retiree accounts and initial health care disbursements began in October 2015, during the initial open enrollment period, for January 2016 premium reimbursements. The 401(h) Health Care Trust and the Voluntary Employees' Beneficiary Association Trust were terminated as of June 30, 2016 and the net positions of these trusts consolidated into the 115 Health Care Trust on July 1, 2016.

**** Prior to 2016, the Member-Directed Retiree Medical Account Plan Claims were categorized with Annuities and Installment Payments. In order to consistently report all health care activity, the Member-Directed Retiree Medical Account Plan Claims is included on a separate line, similar to Wellness Retiree Medical Account Plan Claims and Health Reimbursement Account Plan Claims. The line item for Annuities and Installment Payments has been reduced for the Retiree Medical Account Plan Claims for all previous years presented.

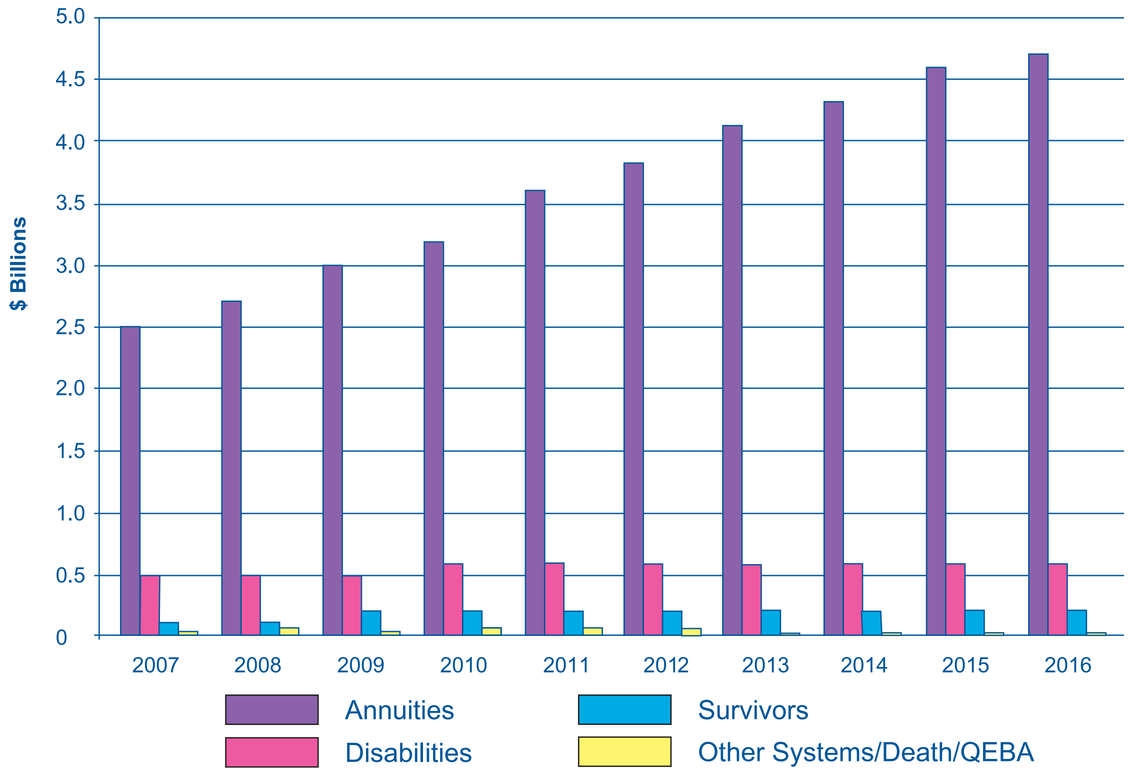
## Benefits by Type

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $4,903,795,068 | $4,644,669,875 | $4,284,189,841 | $3,936,639,166 | $3,612,396,852 | $3,332,173,964 |
| 1,017,238,745 | 984,655,943 | 982,774,343 | 966,748,686 | 915,061,487 | 861,927,107 |
| 34,367,830 | 31,381,217 | 26,785,331 | 20,803,990 | 25,216,043 | 21,293,226 |
| 232,640,171 | 231,283,405 | 222,130,665 | 215,372,517 | 208,408,823 | 201,356,519 |
| 10,818,585 | 13,489,405 | 13,223,453 | 9,642,605 | 5,016,829 | 3,020,425 |
| 1,236,169 | 895,574 | 514,332 | 233,364 | 128,346 | 53,812 |
| **$6,200,096,568** | **$5,906,375,419** | **$5,529,617,965** | **$5,149,440,328** | **$4,766,228,380** | **$4,419,825,053** |
| $3,739,845,743 | $3,518,341,988 | $3,185,230,279 | $2,929,672,689 | $2,676,785,413 | $2,466,754,245 |
| 603,354,845 | 578,018,246 | 556,074,897 | 529,948,352 | 509,082,328 | 481,728,386 |
| 24,815,413 | 22,453,906 | 18,490,323 | 13,014,368 | 17,565,698 | 13,929,119 |
| 170,092,349 | 165,488,973 | 159,725,674 | 154,482,707 | 149,770,901 | 144,011,334 |
| 4,341,522 | 4,324,569 | 3,432,344 | 2,867,888 | 2,537,528 | 2,044,243 |
| 37,970,927 | 31,897,588 | 29,968,936 | 23,301,083 | 25,470,583 | 21,147,476 |
| 7,891,172 | 7,508,317 | 7,248,345 | 7,124,887 | 6,998,605 | 6,891,186 |
| 1,661,245 | 1,418,994 | 1,046,663 | 664,735 | 651,740 | 472,921 |
| **$4,589,973,216** | **$4,329,452,581** | **$3,961,217,461** | **$3,661,076,709** | **$3,388,862,796** | **$3,136,978,910** |
| $273,809 | $187,051 | $61,125 | $30,566 | $11,911 | $5,451 |
| 336,736 | 118,164 | 67,241 | 5,000 | | |
| **$610,545** | **$305,215** | **$128,366** | **$35,566** | **$11,911** | **$5,451** |
| $227,923 | $71,192 | $27,211 | $16,125 | $37,904 | $1,236 |
| 127,187 | 89,279 | 178,984 | 45,709 | 41,250 | 9,600 |
| **$355,110** | **$160,471** | **$206,195** | **$61,834** | **$79,154** | **$10,836** |
| $1,120,671,221 | $1,089,640,044 | $1,065,223,721 | $980,700,106 | $907,512,263 | $842,211,713 |
| 413,883,900 | 406,637,697 | 426,699,446 | 436,800,334 | 405,979,159 | 380,198,721 |
| 62,547,822 | 65,794,432 | 62,404,991 | 60,889,810 | 58,637,922 | 57,345,185 |
| 10,818,585 | 13,489,405 | 13,223,453 | 9,642,605 | 5,016,829 | 3,020,425 |
| **$1,607,921,528** | **$1,575,561,578** | **$1,567,551,611** | **$1,488,032,855** | **$1,377,146,173** | **$1,282,776,044** |
| | | | | | |
| | | | | | |
| $1,236,169 | $895,574 | $514,332 | $233,364 | $128,346 | $53,812 |
| **$1,236,169** | **$895,574** | **$514,332** | **$233,364** | **$128,346** | **$53,812** |

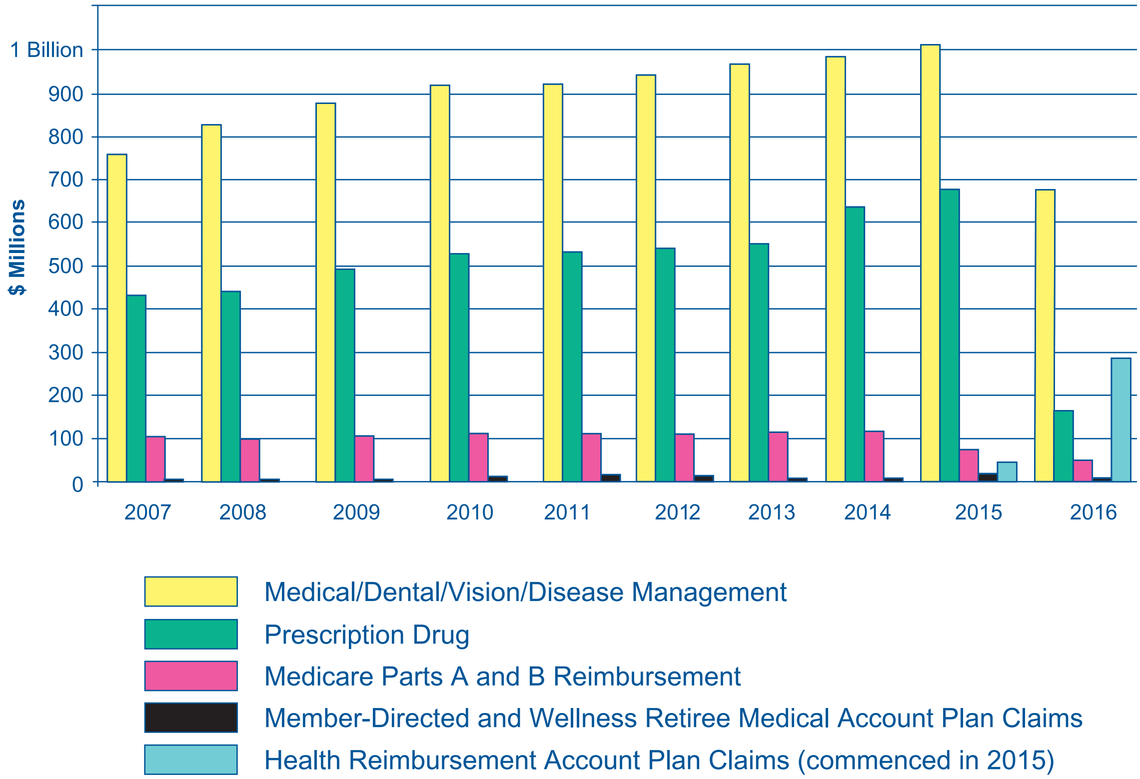
## Benefits by Type




## Pension Benefits by Type



## Health Care Expenses by Type



## Refunds by Type (last 10 fiscal years)

| Year | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **All Plans** | | | | |
| Separation | $342,642,457 | $322,526,720 | $313,034,142 | $299,488,361 |
| Beneficiaries | 31,834,420 | 25,357,397 | 22,186,469 | 17,577,111 |
| Other | 55,314,264 | 101,381,293 | 90,481,218 | 124,218,732 |
| **Total Refunds** | **$429,791,141** | **$449,265,410** | **$425,701,829** | **$441,284,204** |
| **Traditional Pension Plan** | | | | |
| Separation | $266,436,121 | $279,546,170 | $277,494,212 | $270,224,068 |
| Beneficiaries | 30,612,256 | 24,393,337 | 21,732,182 | 16,878,900 |
| Other | 55,314,264 | 101,381,293 | 90,481,218 | 124,218,732 |
| **Total Refunds** | **$352,362,641** | **$405,320,800** | **$389,707,612** | **$411,321,700** |
| **Combined Plan** | | | | |
| Separation | $21,752,826 | $12,254,484 | $10,789,116 | $7,605,803 |
| Beneficiaries | 104,686 | 323,460 | 185,326 | 125,352 |
| **Total Refunds** | **$21,857,512** | **$12,577,944** | **$10,974,442** | **$7,731,155** |
| **Member-Directed Plan** | | | | |
| Separation | $54,453,510 | $30,726,066 | $24,750,814 | $21,658,490 |
| Beneficiaries | 1,117,478 | 640,600 | 268,961 | 572,859 |
| **Total Refunds** | **$55,570,988** | **$31,366,666** | **$25,019,775** | **$22,231,349** |

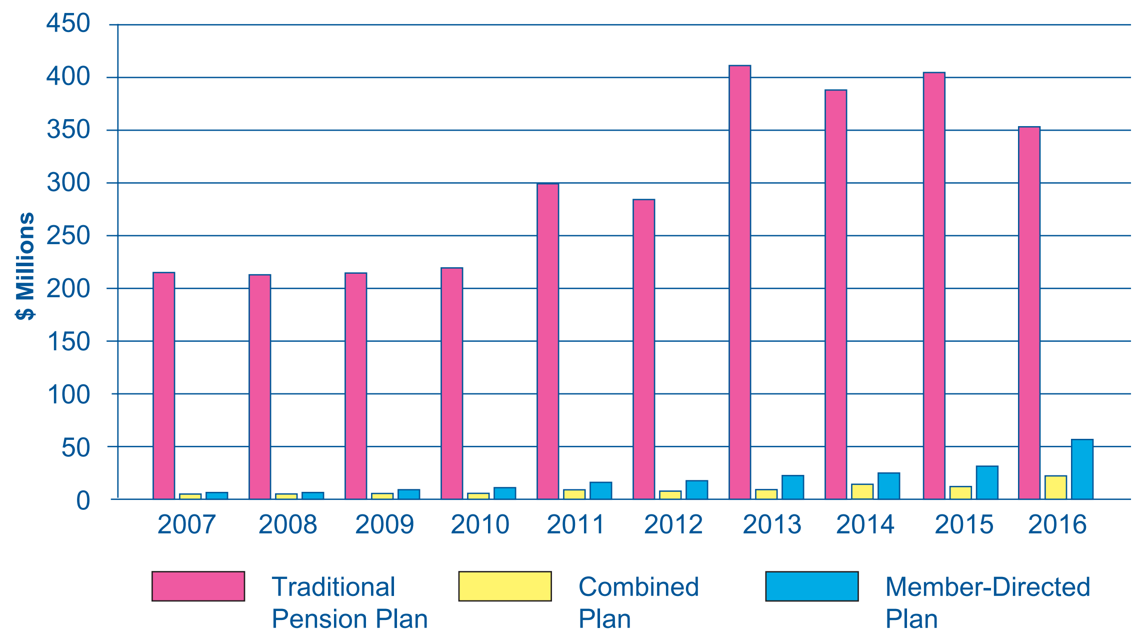
## Number of Refund Payments by Plan (last 10 fiscal years)

| Year | Traditional Pension Plan | Combined Plan | Member-Directed Plan | Total |
|---|---|---|---|---|
| 2016 | 22,024 | 935 | 2,462 | 25,421 |
| 2015 | 29,454 | 412 | 998 | 30,864 |
| 2014 | 29,014 | 387 | 878 | 30,279 |
| 2013 | 25,670 | 378 | 1,071 | 27,119 |
| 2012 | 24,487 | 384 | 1,099 | 25,970 |
| 2011 | 26,686 | 391 | 893 | 27,970 |
| 2010 | 21,797 | 345 | 736 | 22,878 |
| 2009 | 21,413 | 389 | 822 | 22,624 |
| 2008 | 23,173 | 451 | 799 | 24,423 |
| 2007 | 23,679 | 378 | 739 | 24,796 |

## Refunds by Type (continued)

| 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|
| $275,020,766 | $291,727,781 | $205,298,464 | $192,467,640 | $192,910,095 | $196,668,493 |
| 23,366,136 | 21,276,967 | 20,870,868 | 21,549,473 | 19,118,230 | 18,590,739 |
| 9,099,376 | 10,667,294 | 6,885,382 | 8,563,141 | 9,272,500 | 5,833,515 |
| **$307,486,278** | **$323,672,042** | **$233,054,714** | **$222,580,254** | **$221,300,825** | **$221,092,747** |
| $252,159,989 | $271,336,582 | $192,608,328 | $182,274,674 | $184,463,536 | $188,635,768 |
| 22,957,850 | 20,808,413 | 20,314,433 | 21,371,412 | 19,066,615 | 18,538,167 |
| 9,099,376 | 10,667,294 | 6,885,382 | 8,563,141 | 9,272,500 | 5,833,515 |
| **$284,217,215** | **$302,812,289** | **$219,808,143** | **$212,209,227** | **$212,802,651** | **$213,007,450** |
| $6,138,096 | $6,319,318 | $3,515,815 | $2,824,743 | $3,596,259 | $2,665,357 |
| 35,618 | 143,531 | 24,228 | 81,140 | 27,464 | 42,273 |
| **$6,173,714** | **$6,462,849** | **$3,540,043** | **$2,905,883** | **$3,623,723** | **$2,707,630** |
| $16,722,681 | $14,071,881 | $9,174,321 | $7,368,223 | $4,850,300 | $5,367,368 |
| 372,668 | 325,023 | 532,207 | 96,921 | 24,151 | 10,299 |
| **$17,095,349** | **$14,396,904** | **$9,706,528** | **$7,465,144** | **$4,874,451** | **$5,377,667** |

## Refunds by Plan



## Pension Assets vs Pension Liabilities—Accounting Basis* (last three fiscal years, $ in millions) — All Plans

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| Plan Fiduciary Net Position | $77,514 | $74,560 | $77,263 |
| Total Pension Liability | $100,166 | $91,832 | $89,285 |
| Employers' Net Pension Asset/(Liability) | ($22,652) | ($17,272) | ($12,022) |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | 77.39% | 81.19% | 86.54% |

## Pension Assets vs Pension Liabilities—Accounting Basis* (last three fiscal years, $ in millions) — Traditional Pension Plan

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| Plan Fiduciary Net Position | $77,110 | $74,213 | $76,956 |
| Total Pension Liability | $99,818 | $91,534 | $89,017 |
| Employers' Net Pension Asset/(Liability) | ($22,708) | ($17,321) | ($12,061) |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | 77.25% | 81.08% | 86.45% |

## Pension Assets vs Pension Liabilities—Accounting Basis* (last three fiscal years, $ in millions) — Combined Plan

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| Plan Fiduciary Net Position | $392 | $337 | $298 |
| Total Pension Liability | $336 | $288 | $260 |
| Employers' Net Pension Asset/(Liability) | $56 | $49 | $38 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | 116.55% | 116.90% | 114.83% |

## Pension Assets vs Pension Liabilities—Accounting Basis* (last three fiscal years, $ in millions) — Member-Directed Plan

| Year | 2016 | 2015 | 2014 |
|---|---|---|---|
| Plan Fiduciary Net Position | $12 | $10 | $9 |
| Total Pension Liability | $12 | $10 | $8 |
| Employers' Net Pension Asset/(Liability) | $0 | $0 | $1 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | 103.40% | 103.91% | 107.10% |

*The Accounting Basis is calculated under Governmental Accounting Standards Board Statement No. 67 (GASB 67). GASB 67 was initially implemented in 2014, data for years prior to 2014 is not available. For more information on the Accounting Basis, refer to Note 8 starting on page 75 in the Financial Section.

### Pension Assets vs Pension Liabilities—Funding Basis* (last 10 fiscal years, $ in millions) — All Plans

| Year | 2016 | 2015*** | 2015** | 2014 | 2013 | 2012## | 2012# | 2011 | 2010*** | 2010** | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pension Assets | $80,280 | $78,061 | $78,061 | $74,865 | $71,411 | $67,855 | $67,855 | $65,436 | $63,649 | $60,600 | $57,629 | $55,315 | $67,151 |
| Accrued Liabilities | $100,166 | $97,177 | $91,832 | $89,285 | $86,645 | $83,878 | $87,105 | $84,530 | $80,485 | $79,630 | $76,555 | $73,466 | $69,734 |
| Unfunded Liabilities | ($19,886) | ($19,116) | ($13,771) | ($14,420) | ($15,234) | ($16,023) | ($19,250) | ($19,094) | ($16,836) | ($19,030) | ($18,926) | ($18,151) | ($2,583) |
| Funded Ratio | 80.15% | 80.33% | 85.00% | 83.85% | 82.42% | 80.90% | 77.90% | 77.41% | 79.08% | 76.10% | 75.28% | 75.29% | 96.30% |
| Amortization Years | 19 | 20 | 19 | 21 | 24 | 26 | 30 | 30 | 24 | 29 | 30 | 30 | 14 |

### Pension Assets vs Pension Liabilities—Funding Basis* (last 10 fiscal years, $ in millions) — Traditional Pension Plan

| Year | 2016 | 2015*** | 2015** | 2014 | 2013 | 2012## | 2012# | 2011 | 2010*** | 2010** | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pension Assets | $79,865 | $77,700 | $77,700 | $74,567 | $71,175 | $67,670 | $67,670 | $65,274 | $63,515 | $60,461 | $57,519 | $55,230 | $67,067 |
| Accrued Liabilities | $99,818 | $96,863 | $91,535 | $89,017 | $86,407 | $83,664 | $86,876 | $84,325 | $80,307 | $79,459 | $76,407 | $73,346 | $69,639 |
| Unfunded Liabilities | ($19,953) | ($19,163) | ($13,835) | ($14,450) | ($15,232) | ($15,994) | ($19,206) | ($19,051) | ($16,792) | ($18,998) | ($18,888) | ($18,116) | ($2,572) |
| Funded Ratio | 80.01% | 80.22% | 84.89% | 83.77% | 82.37% | 80.88% | 77.89% | 77.41% | 79.09% | 76.09% | 75.28% | 75.30% | 96.31% |
| Amortization Years | 20 | 20 | 19 | 21 | 25 | 26 | 31 | 30 | 25 | 30 | 30 | 30 | 14 |

### Pension Assets vs Pension Liabilities—Funding Basis* (last 10 fiscal years, $ in millions) — Combined Plan

| Year | 2016 | 2015*** | 2015** | 2014 | 2013 | 2012## | 2012# | 2011 | 2010*** | 2010** | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pension Assets | $402 | $350 | $350 | $289 | $229 | $183 | $183 | $161 | $134 | $138 | $110 | $85 | $84 |
| Accrued Liabilities | $336 | $303 | $288 | $260 | $230 | $212 | $226 | $203 | $177 | $171 | $148 | $120 | $95 |
| Unfunded Liabilities | $66 | $47 | $62 | $29 | ($1) | ($29) | ($43) | ($42) | ($43) | ($33) | ($38) | ($35) | ($11) |
| Funded Ratio | 119.62% | 115.59% | 121.71% | 111.15% | 99.57% | 86.32% | 80.97% | 79.31% | 75.71% | 80.70% | 74.32% | 70.83% | 88.42% |
| Amortization Years | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 2 | 3 | 4 | N/A |

* This table presents actuarial information on a Funding Basis. For more information on the Funding Basis, refer to the Actuarial Section beginning on page 147.
** Information prior to completion of the experience study.
*** Information after completion of the experience study.
# Information prior to benefit changes enacted January 7, 2013.
## Valuation revised to reflect benefit changes enacted January 7, 2013.

### Pension Assets vs Pension Liabilities—Funding Basis* (last nine fiscal years, $ in millions) — Member-Directed Annuities

| Year | 2016 | 2015*** | 2015** | 2014 | 2013 | 2012 | 2011 | 2010*** | 2010** | 2009 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pension Assets | $12.961 | $10.622 | $10.622 | $8.772 | $6.826 | $2.524 | $1.156 | $0.454 | $0.439 | $0.206 | $0.148 |
| Accrued Liabilities | $12.249 | $10.291 | $9.767 | $8.291 | $6.884 | $2.666 | $1.173 | $0.496 | $0.490 | $0.253 | $0.166 |
| Unfunded Liabilities | $0.712 | $0.331 | $0.855 | $0.481 | ($0.058) | ($0.142) | ($0.017) | ($0.042) | ($0.051) | ($0.047) | ($0.018) |
| Funded Ratio | 105.82% | 103.22% | 108.75% | 105.80% | 99.16% | 94.67% | 98.55% | 91.54% | 89.63% | 81.39% | 88.95% |

* This table presents actuarial information on a Funding Basis. For more information on the Funding Basis, refer to the Actuarial Section beginning on page 147. The Member-Directed Plan commenced January 1, 2003. Actuarial data for retirement annuities not available prior to 2008.
** Information prior to completion of the experience study.
*** Information after completion of the experience study.

## Health Care Assets vs Liabilities (last 10 fiscal years, $ in millions) — Health Care

| Year | 2015* | 2014 | 2013 | 2012 | 2011 | 2010** | 2010* | 2009 | 2008 | 2007 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Health Care Assets | $11,933 | $12,062 | $12,031 | $12,193 | $12,115 | $12,320 | $11,267 | $10,936 | $10,748 | $12,801 | $12,025 |
| Accrued Liabilities | $18,515 | $19,405 | $19,784 | $19,182 | $31,020 | $30,531 | $26,929 | $31,558 | $29,623 | $29,825 | $30,748 |
| Unfunded Liabilities | ($6,582) | ($7,343) | ($7,753) | ($6,989) | ($18,905) | ($18,211) | ($15,662) | ($20,622) | ($18,875) | ($17,024) | ($18,723) |
| Funded Ratio | 64.45% | 62.16% | 60.81% | 63.56% | 39.06% | 40.35% | 41.84% | 34.65% | 36.28% | 42.92% | 39.11% |
| Solvency Period | Indefinite*** | Indefinite*** | Indefinite*** | Indefinite*** | 10 | 11 | 11 | 11 | 11 | 31 | 27 |

* Information prior to completion of the experience study.
** Information after completion of the experience study.
*** Funds expected to be sufficient to fund future health care needs.

## Contribution Rates

| | Annual Required Contribution Rate | Employer Contribution Rate Funding Health Care | | |
|---|---|---|---|---|
| Year | All Plans | Traditional Pension Plan | Combined Plan | Note |
| 2016 | 5.56% | 2.00% | 2.00% | |
| 2015 | 5.77 | 2.00 | 2.00 | |
| 2014 | 5.54 | 2.00 | 2.00 | |
| 2013 | 12.96 | 1.00 | 1.00 | (1) |
| 2012 | 11.52 | 4.00 | 6.05 | (1) |
| 2011 | 14.55 | 4.00 | 6.05 | (1) |
| 2010 | 13.34 | 5.08 | 4.31 | (1) (2) |
| 2009 | 13.26 | 5.88 | 5.02 | (1) (3) |
| 2008 | 14.57 | 7.00 | 5.90 | (1) |
| 2007 | 16.35 | 5.50 | 5.50 | (4) |

(1) From 2008 through 2010, the employer contribution rate allocated to health care by the Combined Plan was less than the Traditional Pension Plan. Payment of the impact of the rate difference commenced in 2011 and continued in 2012. The total repaid to the 401(h) Health Care Trust exceeded the required amount. As a result, the amount contributed to the 401(h) Health Care Trust by the Combined Plan in 2013 was less than the actual contribution rate listed above.

(2) The portion of the employer contribution rate allocated to fund health care for the Traditional Pension Plan was 5.5% for the period January 1, 2010 through February 28, 2010, and decreased to 5.0% for the period March 1, 2010 through December 31, 2010. The overall effective rate for the year was 5.08%. The rates for the Combined Plan for the same periods were 4.73% and 4.23%, respectively, for an overall effective rate for the year of 4.31%.

(3) The portion of the employer contribution rate allocated to fund health care for the Traditional Pension Plan was 7% for the period January 1, 2009 through March 31, 2009, and decreased to 5.5% for the period April 1, 2009 through December 31, 2009. The overall effective rate for the year was 5.88%. The rates for the Combined Plan for the same periods were 5.90% and 4.73%, respectively, for an overall effective rate for the year of 5.02%.

(4) The portion of the employer contribution rate allocated to fund health care for both the Traditional Pension Plan and Combined Plan was 5% for the period January 1, 2007 through June 30, 2007 and increased to 6% for the period July 1, 2007 through December 31, 2007. The overall effective rate for the year was 5.5%.

## Health Care Self-Funding Rate*

| Year | Rate |
|---|---|
| 2015 | 4.00% |
| 2014 | 4.10 |
| 2013 | 4.10 |
| 2012 | 3.80 |
| 2011 | 6.40 |
| 2010 | 6.70 |
| 2009 | 8.00 |
| 2008 | 7.70 |
| 2007 | 7.40 |
| 2006 | 8.10 |

* The self-funding rate is the percentage of contribution required to fund health care indefinitely without regard to repayment of the liability within 30 years.

## Number of Retirees/Benefit Recipients by Category

The values included in the following tables represent the number of individuals receiving benefit payments. The 2011 through 2016 counts represent retired member accounts only, regardless of the number of recipients designated by the retiree's plan of payment. These statistics are representative of the OPERS contributing membership. Prior to 2011, the values represent the number of individuals receiving a benefit payment from OPERS, where one retiree's account may be issued to multiple recipients or beneficiaries. Restated data for years prior to 2011 is not available.

### Traditional Pension Plan

| Year End | Annuities | Disabilities | Survivors | Total |
|---|---|---|---|---|
| 2016 | 173,500 | 21,848 | 12,569 | 207,917 |
| 2015 | 170,411 | 22,230 | 12,570 | 205,211 |
| 2014 | 167,608 | 22,532 | 12,649 | 202,789 |
| 2013 | 160,815 | 22,791 | 12,743 | 196,349 |
| 2012 | 155,008 | 22,768 | 12,712 | 190,488 |
| 2011 | 149,598 | 22,476 | 12,802 | 184,876 |
| 2010 | 143,035 | 23,041 | 13,437 | 179,513 |
| 2009 | 135,918 | 22,651 | 13,358 | 171,927 |
| 2008 | 130,734 | 22,515 | 13,250 | 166,499 |
| 2007 | 126,002 | 22,108 | 13,232 | 161,342 |

Annuities are comprised of a defined formula benefit paid to contributing members retiring with an age-and-service benefit, as well as, benefit annuities paid through the Additional Annuity and Money Purchase plans (refer to Plan Statement beginning on page 227). Members who retired from other Ohio retirement systems may return to OPERS-covered employment under the OPERS Money Purchase plan. These members receive an annuity in accordance with that program, based on the contributions paid during the re-employment period.

The table below displays the composition of the Traditional Pension Plan Annuities by type for 2011 through 2016. The Other Annuities column represents Money Purchase and Additional Annuity plan benefits. These benefits may accrue to members whose primary retirement is with OPERS or through another Ohio retirement system (ORS retirees).

### Traditional Pension Plan Annuities

| Year End | Age-and-Service Annuities | Age-and-Service Receiving Other Annuities | Subtotal Age-and-Service Annuities | Other Annuities (ORS retirees) | Total |
|---|---|---|---|---|---|
| 2016 | 168,924 | 3,039 | 171,963 | 1,537 | 173,500 |
| 2015 | 165,997 | 2,913 | 168,910 | 1,501 | 170,411 |
| 2014 | 163,313 | 2,830 | 166,143 | 1,465 | 167,608 |
| 2013 | 156,755 | 2,643 | 159,398 | 1,417 | 160,815 |
| 2012 | 151,765 | 2,112 | 153,877 | 1,131 | 155,008 |
| 2011 | 146,687 | 1,901 | 148,588 | 1,010 | 149,598 |

## Number of Retirees/Benefit Recipients by Category (continued)

The values included in the table below represent the number of retirees receiving benefit payments. Members in the Combined Plan receive an age-and-service defined formula benefit annuity from their employer contribution account, and may not elect a retirement distribution from their defined contribution account until they qualify for a defined benefit retirement. Prior to 2012, members in both the Combined Plan and Member-Directed Plan had the option to defer all or a portion of their defined contribution account, elect to purchase an annuity, or elect to receive installment payments from the defined contribution account. Effective April 1, 2012, the installment payment options were eliminated and new retirees may elect to purchase an annuity, transfer their defined contribution account to another financial institution, or refund their account (refer to the Plan Statement beginning on page 227).

### Combined Plan*

| Year End | Age-and-Service Annuities | Annuitized DC Accounts | Installment Payments | Liquidated or Deferred DC Accounts** | Number of Retirees |
|---|---|---|---|---|---|
| 2016 | 238 | 158 | 6 | | 238 |
| 2015 | 196 | 128 | 7 | | 196 |
| 2014 | 156 | 99 | 7 | | 156 |
| 2013 | 100 | 64 | 7 | 1 | 100 |
| 2012 | 55 | 37 | 13 | 5 | 55 |
| 2011 | 36 | 22 | 13 | 1 | 36 |
| 2010 | 21 | 13 | 7 | 1 | 21 |
| 2009 | 9 | 6 | 3 | | 9 |
| 2008 | 7 | 5 | | 2 | 7 |
| 2007 | 2 | 2 | | | 2 |

* As of April 1, 2012, no member had elected a combination annuity and installment payment benefit distribution since commencement of the plan January 1, 2003. Retirements effective on or after April 1, 2012, no longer have this option.

** Beginning in 2013, the number of members receiving a defined benefit age-and-service benefit will not equal the number of members receiving a defined contribution benefit. The defined contribution options of transferring the defined contribution account to another financial institution or refunding the account are recorded in OPERS systems as refund transactions. These specific types of refunds cannot be segregated from withdrawal from service refunds.

### Member-Directed Plan*

| Year End | Annuities | Installment Payments | Total |
|---|---|---|---|
| 2016 | 219 | 7 | 226 |
| 2015 | 185 | 9 | 194 |
| 2014 | 154 | 13 | 167 |
| 2013 | 131 | 14 | 145 |
| 2012 | 62 | 16 | 78 |
| 2011 | 38 | 15 | 53 |
| 2010 | 18 | 13 | 31 |
| 2009 | 9 | 10 | 19 |
| 2008 | 5 | 5 | 10 |
| 2007 | 2 | 2 | 4 |

* As of April 1, 2012, no member had elected a combination annuity and installment payment benefit distribution since commencement of the plan on January 1, 2003. Retirements effective on or after April 1, 2012, no longer have this option.

## Number of Covered Lives by Category

The values included in the tables below represent the number of lives covered by the OPERS health care plans. The 2010 through 2016 counts for the Health Care Plans table reflect the number of retirees and primary beneficiaries, and the number of additional dependents and other beneficiaries receiving coverage. In addition to a retiree, a primary benefit recipient could be a survivor of a deceased retiree continuing to receive coverage on the member's account. The values in this column represent OPERS contributing membership, while dependents and other beneficiaries represent other family members receiving primarily dental and vision coverage through a retiree's account. Corresponding data for years prior to 2010 is not available. These counts represent all Traditional Pension Plan and Combined Plan retirees, dependents, and beneficiaries receiving post-employment health care coverage.

### Health Care Plans

| Year End | Number of Retirees and Primary Beneficiaries | Number of Dependents and Other Beneficiaries | Total Covered Lives |
|---|---|---|---|
| 2016 | 170,590 | 42,938 | 213,528 |
| 2015 | 170,687 | 52,110 | 222,797 |
| 2014 | 167,327 | 58,692 | 226,019 |
| 2013 | 165,967 | 61,041 | 227,008 |
| 2012 | 163,940 | 62,456 | 226,396 |
| 2011 | 161,315 | 62,507 | 223,822 |
| 2010 | 157,269 | 60,624 | 217,893 |
| 2009 | N/A | N/A | 213,220 |
| 2008 | N/A | N/A | 208,857 |
| 2007 | N/A | N/A | 204,514 |

The Member-Directed Plan Retiree Medical Account (RMA) is an account in the member's name that can be used to reimburse qualified medical expenses for Member-Directed Plan retirees and eligible family members. Funding for the RMA was accumulated in a Voluntary Employees' Beneficiary Association Trust (VEBA Trust). The VEBA Trust was closed as of June 30, 2016 and the net position transferred into the 115 Health Care Trust (115 Trust) on July 1, 2016. Beginning July 1, 2016, funding for the RMA is accumulated in the 115 Trust.

### Member-Directed Plan Retiree Medical Accounts

| Year End | Total Covered Lives |
|---|---|
| 2016 | 5,605 |
| 2015 | 4,063 |
| 2014 | 3,509 |
| 2013 | 3,112 |
| 2012 | 2,589 |
| 2011 | 2,073 |
| 2010 | 1,577 |
| 2009 | 1,260 |
| 2008 | 365 |
| 2007 | 176 |

## Schedule of Retirees by Benefit Type and Amount

The values included in the following tables represent the number of retired members receiving benefits. Other Annuities represents Money Purchase and Additional Annuity plan benefits. These benefits may accrue to members whose primary retirement is with OPERS or with another Ohio retirement system (ORS retirees).

### Traditional Pension Plan (as of December 2016)

| Amount of Monthly Benefit | Age-and-Service Annuities | Age-and-Service Receiving Other Annuities | Subtotal Age-and-Service Annuities | Disabilities | Survivors | Other Annuities (ORS retirees) | Total Retirees |
|---|---|---|---|---|---|---|---|
| $1-299 | 11,836 | 1,778 | 13,614 | 55 | 640 | 624 | 14,933 |
| $300-499 | 8,850 | 488 | 9,338 | 120 | 1,885 | 278 | 11,621 |
| $500-999 | 23,085 | 473 | 23,558 | 1,031 | 4,171 | 361 | 29,121 |
| $1,000-1,499 | 21,470 | 152 | 21,622 | 2,905 | 2,685 | 160 | 27,372 |
| $1,500-1,999 | 18,730 | 73 | 18,803 | 4,534 | 1,326 | 73 | 24,736 |
| $2,000 & Over | 84,953 | 75 | 85,028 | 13,203 | 1,862 | 41 | 100,134 |
| **Totals** | **168,924** | **3,039** | **171,963** | **21,848** | **12,569** | **1,537** | **207,917** |

Effective April 1, 2012, members electing to retire in the Combined Plan and Member-Directed Plan have the option to use their defined contribution account to purchase a defined benefit annuity, to transfer their defined contribution account to another financial institution, or to receive a refund of their defined contribution account. Prior to April 1, 2012, these members also had the option to draw on their defined contribution account under an installment payment plan. The installment payment option is still effective for members who retired prior to April 1, 2012.

Combined Plan members are also eligible for a defined formula benefit from their employer contributions. The Employer Age-and-Service Annuities column represents members receiving a formula benefit. Members may receive payments of their defined contribution accounts under the methods described above. For those members who retired prior to April 1, 2012, only installment payments with a remaining account balance are counted.

### Combined Plan (as of December 2016)

| Amount of Monthly Benefit | Employer Age-and-Service Annuities | Annuitized DC Accounts | DC Installment Payments |
|---|---|---|---|
| $1-299 | 122 | 100 | |
| $300-499 | 78 | 40 | |
| $500-999 | 35 | 13 | |
| $1,000-1,499 | 3 | 4 | |
| $1,500-1,999 | | 1 | |
| $2,000 & Over | | | |
| Various | | | 6 |
| **Totals** | **238** | **158** | **6** |

The Member-Directed Plan table displays the distribution of members electing either a defined benefit annuity or an installment payment option. For those members who retired prior to April 1, 2012, only installment payments with a remaining account balance are counted.

### Member-Directed Plan (as of December 2016)

| Amount of Monthly Benefit | Annuitized DC Accounts | DC Installment Payments | Total Retirees |
|---|---|---|---|
| $1-299 | 109 | | 109 |
| $300-499 | 55 | | 55 |
| $500-999 | 41 | | 41 |
| $1,000-1,499 | 12 | | 12 |
| $1,500-1,999 | | | |
| $2,000 & Over | 2 | | 2 |
| Various | | 7 | 7 |
| **Totals** | **219** | **7** | **226** |

## Number of New Pension Retirees

The values included in the following tables represent the number of new benefit recipients each year. The 2011 through 2016 counts represent retired members only, regardless of the number of recipients designated by the retiree's plan of payment. These statistics are representative of contributing membership. Prior to 2011, the values represent the number of new individuals receiving a benefit payment from OPERS where one retiree account may be issued to multiple recipients or beneficiaries. Related data for years prior to 2011 is not available.

### Traditional Pension Plan

| Year | Annuities | Disabilities | Survivors | Total |
|---|---|---|---|---|
| 2016 | 7,388 | 641 | 430 | 8,459 |
| 2015 | 7,209 | 737 | 355 | 8,301 |
| 2014 | 11,011 | 702 | 368 | 12,081 |
| 2013 | 9,831 | 971 | 446 | 11,248 |
| 2012 | 9,793 | 1,245 | 358 | 11,396 |
| 2011 | 10,885 | 1,051 | 400 | 12,336 |
| 2010 | 10,503 | 1,327 | 737 | 12,567 |
| 2009 | 9,026 | 1,132 | 723 | 10,881 |
| 2008 | 8,689 | 1,351 | 695 | 10,735 |
| 2007 | 7,701 | 1,429 | 731 | 9,861 |

Annuities are comprised of a defined formula benefit paid to contributing members retiring with an age-and-service, as well as benefit annuities paid through the Additional Annuity and Money Purchase plans (refer to the Plan Statement beginning on page 227). Members who retired from other Ohio retirement systems may return to OPERS-covered employment under the OPERS Money Purchase plan. These members receive an annuity in accordance with that program based on the contributions paid during the re-employed period.

The table below displays the composition of the 2011 through 2016 Traditional Pension Plan Annuities by type. The Other Annuities column represents Money Purchase and Additional Annuity plan benefits. These benefits may accrue to members whose primary retirement is with OPERS or through another Ohio retirement system (ORS retirees). Comparable data for years prior to 2011 is not available.

### Traditional Pension Plan Annuities

| Year | Age-and-Service Annuities | Age-and-Service Receiving Other Annuities | Subtotal Age-and-Service Annuities | Other Annuities (ORS retirees) | Total |
|---|---|---|---|---|---|
| 2016 | 7,316 | 7 | 7,323 | 65 | 7,388 |
| 2015 | 7,127 | 16 | 7,143 | 66 | 7,209 |
| 2014 | 10,915 | 16 | 10,931 | 80 | 11,011 |
| 2013 | 9,476 | 53 | 9,529 | 302 | 9,831 |
| 2012 | 9,607 | 53 | 9,660 | 133 | 9,793 |
| 2011 | 10,730 | 54 | 10,784 | 101 | 10,885 |

## Number of New Pension Retirees (continued)

Effective April 1, 2012, members electing to retire in the Combined Plan and Member-Directed Plan have the option to use their defined contribution account to purchase a defined benefit annuity, to transfer their defined contribution account to another financial institution, or to receive a refund of their defined contribution account. Prior to April 1, 2012, these members also had the option to draw on their defined contribution account under an installment payment plan. The installment payment option is still effective for members who retired prior to April 1, 2012, with no new elections after that date.

Combined Plan members are also eligible for a defined formula benefit from their employer contributions. The Employer Age-and-Service Annuities column represents members receiving a formula benefit. Members may receive payments of their defined contribution accounts under the methods described above.

### Combined Plan

| Year | Employer Age-and-Service Annuities | Member Annuitized Defined Contribution Accounts | Defined Contribution Installment Payments | Liquidated or Deferred Defined Contribution Accounts |
|---|---|---|---|---|
| 2016 | 43 | 30 | | |
| 2015 | 41 | 30 | | |
| 2014 | 56 | 35 | | |
| 2013 | 45 | 27 | | |
| 2012 | 19 | 15 | 1 | 3 |
| 2011 | 15 | 9 | 7 | |
| 2010 | 12 | 7 | 4 | 1 |
| 2009 | 2 | 1 | 1 | |
| 2008 | 5 | 3 | 2 | |
| 2007 | 1 | 1 | | |

The Member-Directed Plan table displays the distribution of members electing either a defined benefit annuity or an installment payment option.

### Member-Directed Plan

| Year | Annuities | Installment Payments | Total |
|---|---|---|---|
| 2016 | 34 | | 34 |
| 2015 | 31 | | 31 |
| 2014 | 24 | | 24 |
| 2013 | 69 | | 69 |
| 2012 | 24 | 1 | 25 |
| 2011 | 20 | 6 | 26 |
| 2010 | 8 | 4 | 12 |
| 2009 | 6 | 5 | 11 |
| 2008 | 3 | 4 | 7 |
| 2007 | 2 | 1 | 3 |

## Schedule of Average Benefits

This schedule displays the number of new retirees each year, grouped by years of credited service. Prior year numbers are not adjusted as members roll off the rolls. Retirement benefits are calculated based on the final average salary (FAS) of the member, representing the member's three (or five) highest years of earnings (refer to the Plan Statement beginning on page 227 for benefit eligibility requirements). The Average Final Average Salary represents a composite for each group.

The 2011 through 2016 statistics include members with less than five years of service. Comparable data for years prior to 2011 is not available. The Total New Retirees column represents the average monthly benefit and average FAS for the retiree counts listed in each year.

### Schedule of Average Benefits* (last 10 fiscal years) — Traditional Pension Plan

| | | Years Credited Service | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Retirement Effective Dates | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-30 | 30+ | Total New Retirees |
| 2016 | Average Monthly Benefit | $480 | $607 | $924 | $1,275 | $1,817 | $2,464 | $3,476 | $2,208 |
| | Average Final Average Salary | $14,983 | $34,240 | $40,609 | $45,105 | $51,292 | $57,163 | $64,642 | $52,969 |
| | Number of Active Recipients | 96 | 768 | 1,011 | 925 | 1,238 | 1,467 | 2,889 | 8,394 |
| 2015 | Average Monthly Benefit | $301 | $573 | $865 | $1,248 | $1,816 | $2,413 | $3,464 | $2,053 |
| | Average Final Average Salary | $9,347 | $33,258 | $37,596 | $42,780 | $50,311 | $56,473 | $64,158 | $50,136 |
| | Number of Active Recipients | 180 | 907 | 1,165 | 967 | 1,183 | 1,247 | 2,586 | 8,235 |
| 2014 | Average Monthly Benefit | $289 | $560 | $832 | $1,218 | $1,787 | $2,370 | $3,282 | $1,880 |
| | Average Final Average Salary | $9,637 | $31,679 | $39,122 | $43,897 | $49,666 | $55,301 | $61,233 | $48,693 |
| | Number of Active Recipients | 163 | 926 | 2,341 | 1,964 | 1,451 | 2,044 | 3,112 | 12,001 |
| 2013 | Average Monthly Benefit | $310 | $555 | $879 | $1,271 | $1,823 | $2,362 | $3,402 | $2,021 |
| | Average Final Average Salary | $9,762 | $30,394 | $38,438 | $43,362 | $48,627 | $54,957 | $61,752 | $48,997 |
| | Number of Active Recipients | 167 | 1,030 | 1,747 | 1,413 | 1,495 | 1,810 | 3,284 | 10,946 |
| 2012 | Average Monthly Benefit | $236 | $668 | $904 | $1,323 | $1,824 | $2,361 | $3,309 | $2,078 |
| | Average Final Average Salary | $7,385 | $31,007 | $37,923 | $43,991 | $47,969 | $54,624 | $60,927 | $49,262 |
| | Number of Active Recipients | 146 | 1,035 | 1,677 | 1,353 | 1,544 | 1,761 | 3,747 | 11,263 |
| 2011 | Average Monthly Benefit | $309 | $606 | $897 | $1,320 | $1,857 | $2,361 | $3,270 | $2,186 |
| | Average Final Average Salary | $10,126 | $30,676 | $37,732 | $43,790 | $49,365 | $55,207 | $60,228 | $50,406 |
| | Number of Active Recipients | 156 | 962 | 1,569 | 1,410 | 1,518 | 1,786 | 4,834 | 12,235 |
| 2010 | Average Monthly Benefit | | $684 | $893 | $1,216 | $1,623 | $2,218 | $3,315 | $2,190 |
| | Average Final Average Salary | | $30,128 | $36,592 | $41,616 | $45,312 | $51,264 | $58,633 | $48,897 |
| | Number of Active Recipients | | 806 | 1,460 | 1,203 | 1,249 | 1,493 | 4,396 | 10,607 |
| 2009 | Average Monthly Benefit | | $670 | $901 | $1,217 | $1,608 | $2,195 | $3,263 | $2,228 |
| | Average Final Average Salary | | $30,925 | $37,211 | $42,333 | $45,453 | $51,770 | $57,750 | $49,335 |
| | Number of Active Recipients | | 801 | 1,435 | 1,111 | 1,205 | 1,389 | 4,898 | 10,839 |
| 2008 | Average Monthly Benefit | | $658 | $803 | $1,102 | $1,491 | $2,140 | $3,006 | $1,980 |
| | Average Final Average Salary | | $28,690 | $34,193 | $39,625 | $43,193 | $49,965 | $55,247 | $46,068 |
| | Number of Active Recipients | | 784 | 1,360 | 1,012 | 1,066 | 1,268 | 3,750 | 9,240 |
| 2007*** | Average Monthly Benefit | | $767 | $816 | $1,099 | $1,519 | $2,063 | $2,977 | $1,927 |
| | Average Final Average Salary | | $31,477 | $34,991 | $40,020 | $44,015 | $48,653 | $54,941 | $45,837 |
| | Number of Active Recipients** | | 852 | 1,558 | 1,165 | 1,131 | 1,240 | 3,787 | 9,733 |

* All years begin January 1 and end December 31.
** Number of Active Recipients restated to include retirements initiated in prior years that are finalized in reported year.
*** Values restated to remove Combined Plan formula benefit information.

## Schedule of Average Benefits (continued)

### Schedule of Average Benefits* (last 10 fiscal years) — Combined Plan

| Retirement Effective Dates | | Years Credited Service 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | Total New Retirees |
|---|---|---|---|---|---|---|---|
| 2016 | Average Monthly Benefit | | $285 | $471 | $588 | | $406 |
| | Average Final Average Salary | | $49,655 | $54,075 | $53,375 | | $52,279 |
| | Number of Active Recipients | | 17 | 23 | 3 | | 43 |
| 2015 | Average Monthly Benefit | $5 | $272 | $382 | $370 | | $331 |
| | Average Final Average Salary | $1,933 | $54,371 | $48,705 | $35,431 | | $48,342 |
| | Number of Active Recipients | 1 | 15 | 21 | 4 | | 41 |
| 2014 | Average Monthly Benefit | | $274 | $346 | $363 | $270 | $332 |
| | Average Final Average Salary | | $45,794 | $45,889 | $48,167 | $15,897 | $45,458 |
| | Number of Active Recipients | | 10 | 42 | 3 | 1 | 56 |
| 2013 | Average Monthly Benefit | | $211 | $300 | | | $247 |
| | Average Final Average Salary | | $41,043 | $41,121 | | | $41,074 |
| | Number of Active Recipients | | 27 | 18 | | | 45 |
| 2012 | Average Monthly Benefit | | $255 | $263 | | | $259 |
| | Average Final Average Salary | | $48,341 | $39,064 | | | $43,459 |
| | Number of Active Recipients | | 9 | 10 | | | 19 |
| 2011 | Average Monthly Benefit | | $237 | $454 | | | $281 |
| | Average Final Average Salary | | $49,177 | $75,127 | | | $54,367 |
| | Number of Active Recipients | | 12 | 3 | | | 15 |
| 2010 | Average Monthly Benefit | | $229 | $217 | | | $225 |
| | Average Final Average Salary | | $61,819 | $33,958 | | | $51,688 |
| | Number of Active Recipients | | 7 | 4 | | | 11 |
| 2009 | Average Monthly Benefit | | $212 | $232 | | | $222 |
| | Average Final Average Salary | | $54,215 | $42,062 | | | $48,139 |
| | Number of Active Recipients | | 1 | 1 | | | 2 |
| 2008 | Average Monthly Benefit | | $95 | $85 | | | $91 |
| | Average Final Average Salary | | $25,665 | $21,305 | | | $23,921 |
| | Number of Active Recipients | | 3 | 2 | | | 5 |
| 2007 | Average Monthly Benefit | | $152 | | | | $152 |
| | Average Final Average Salary | | $37,369 | | | | $37,369 |
| | Number of Active Recipients | | 1 | | | | 1 |

* All years begin January 1 and end December 31.

## Member Counts by Plan

The tables below represent the number of members in each retirement plan based on their status in the plan. Eligible members have the ability to change plans during their career, and leave their contribution accounts behind with the plan under which the contribution was made. Accordingly, a member may be active in one plan and inactive in another. See the table at the bottom of the next page for a composite total count of active, inactive, and retired members regardless of plan.

The 2011 through 2016 Benefit Recipient counts represent retired members only, regardless of the number of recipients designated by the retiree's plan of payment. These statistics are representative of OPERS contributing membership. Prior to 2011, the values represent the number of individuals receiving a benefit payment from OPERS where one retiree account may be issued to multiple recipients or beneficiaries.

### Member Count—Pension Plans — Total All Pension Plans

| Year End | Active | Inactive | Retirees | Total |
|---|---|---|---|---|
| 2016 | 346,959 | 537,309 | 208,381 | 1,092,649 |
| 2015 | 345,622 | 516,049 | 205,601 | 1,067,272 |
| 2014 | 346,509 | 498,610 | 203,112 | 1,048,231 |
| 2013 | 347,727 | 483,521 | 196,594 | 1,027,842 |
| 2012 | 348,235 | 467,298 | 190,621 | 1,006,154 |
| 2011 | 349,189 | 452,718 | 184,965 | 986,872 |
| 2010 | 356,734 | 438,434 | 179,565 | 974,733 |
| 2009 | 365,229 | 416,548 | 171,955 | 953,732 |
| 2008 | 374,002 | 395,445 | 166,516 | 935,963 |
| 2007 | 382,177 | 364,823 | 161,348 | 908,348 |

### Member Count—Pension Plans — Traditional Pension Plan

| Year End | Active | Inactive | Retirees | Total |
|---|---|---|---|---|
| 2016 | 327,705 | 531,533 | 207,917 | 1,067,155 |
| 2015 | 326,795 | 509,194 | 205,211 | 1,041,200 |
| 2014 | 328,341 | 492,548 | 202,789 | 1,023,678 |
| 2013 | 330,595 | 478,291 | 196,349 | 1,005,235 |
| 2012 | 331,836 | 462,597 | 190,488 | 984,921 |
| 2011 | 333,340 | 448,417 | 184,876 | 966,633 |
| 2010 | 341,779 | 434,804 | 179,513 | 956,096 |
| 2009 | 351,166 | 413,461 | 171,927 | 936,554 |
| 2008 | 360,107 | 392,687 | 166,499 | 919,293 |
| 2007 | 368,780 | 362,742 | 161,342 | 892,864 |

## Member Counts by Plan (continued)

**Member Count—Pension Plans — Combined Plan**

| Year End | Active | Inactive | Retirees | Total |
|---|---|---|---|---|
| 2016 | 7,777 | 1,754 | 238 | 9,769 |
| 2015 | 7,587 | 2,031 | 196 | 9,814 |
| 2014 | 7,413 | 1,818 | 156 | 9,387 |
| 2013 | 7,175 | 1,637 | 100 | 8,912 |
| 2012 | 6,903 | 1,460 | 55 | 8,418 |
| 2011 | 6,674 | 1,314 | 36 | 8,024 |
| 2010 | 6,554 | 1,052 | 21 | 7,627 |
| 2009 | 6,403 | 942 | 9 | 7,354 |
| 2008 | 6,376 | 846 | 7 | 7,229 |
| 2007 | 6,244 | 659 | 2 | 6,905 |

**Member Count—Pension Plans — Member-Directed Plan**

| Year End | Active | Inactive | Retirees | Total |
|---|---|---|---|---|
| 2016 | 11,477 | 4,022 | 226 | 15,725 |
| 2015 | 11,240 | 4,824 | 194 | 16,258 |
| 2014 | 10,755 | 4,244 | 167 | 15,166 |
| 2013 | 9,957 | 3,593 | 145 | 13,695 |
| 2012 | 9,496 | 3,241 | 78 | 12,815 |
| 2011 | 9,175 | 2,987 | 53 | 12,215 |
| 2010 | 8,401 | 2,578 | 31 | 11,010 |
| 2009 | 7,660 | 2,145 | 19 | 9,824 |
| 2008 | 7,519 | 1,912 | 10 | 9,441 |
| 2007 | 7,153 | 1,422 | 4 | 8,579 |

The table below represents a System-level member count regardless of the plan of participation selected by the member. Only OPERS members are included in this table and each member is counted only once. Actively contributing retired OPERS members who return to OPERS-covered employment under the Money Purchase Plan are reported as retirees. Comparable data for years prior to 2011 is not available.

**Member Count—Pension Plans — All Plans**

| Year End | Active | Inactive | Retirees | Total |
|---|---|---|---|---|
| 2016 | 346,959 | 535,941 | 208,361 | 1,091,261 |
| 2015 | 345,621 | 514,607 | 205,581 | 1,065,809 |
| 2014 | 346,508 | 497,212 | 203,091 | 1,046,811 |
| 2013 | 347,727 | 482,156 | 196,575 | 1,026,458 |
| 2012 | 348,235 | 465,940 | 190,619 | 1,004,794 |
| 2011 | 349,188 | 451,353 | 184,963 | 985,504 |

continued on page 217

## Member Counts by Plan (continued)

The values included in the tables below represent the number of individuals covered by the OPERS health care plans. Prior to July 1, 2016, OPERS maintained three health care trusts (the 401(h), 115 and the Voluntary Employees' Beneficiary Association, or VEBA, trusts). The 401(h) Trust and the VEBA Trust were closed as of June 30, 2016 and the net positions were transferred to the 115 Health Care Trust. The table below titled Traditional Pension Plan and Combined Plan contains retirees and beneficiaries of these plans. This table in prior years was titled 401(h) Health Care Trust. While the title of the table has changed, the population of retirees remains constant. The 2010 through 2016 counts in this table reflect the number of retirees and primary beneficiaries only. In addition to a retiree, a primary benefit recipient could be a survivor of a deceased retiree continuing to receive coverage on the retiree's account, which is representative of the OPERS contributing membership. Dependents and Other Beneficiaries, primarily receiving dental and vision coverage, is shown separately for 2010 through 2016. Corresponding data for years prior to 2010 is not available.

### Member Count—Health Care Plans — Total All Health Care Plans

| Year End | Active | Inactive | Retirees & Primary Beneficiaries | Dependents & Other Beneficiaries | Total |
|---|---|---|---|---|---|
| 2016 | 11,469 | 3,976 | 176,195 | 42,938 | 234,578 |
| 2015 | 11,235 | 4,764 | 174,750 | 52,110 | 242,859 |
| 2014 | 10,745 | 4,194 | 170,836 | 58,692 | 244,467 |
| 2013 | 9,962 | 3,543 | 169,079 | 61,041 | 243,625 |
| 2012 | 9,501 | 3,189 | 166,529 | 62,456 | 241,675 |
| 2011 | 9,170 | 2,918 | 163,388 | 62,507 | 237,983 |
| 2010 | 8,392 | 2,574 | 158,846 | 60,624 | 230,436 |
| 2009 | 7,660 | 2,126 | 214,480 | | 224,266 |
| 2008 | 7,520 | 1,886 | 209,222 | | 218,628 |
| 2007 | 6,942 | 1,440 | 204,690 | | 213,072 |

### Member Count—Health Care Plans — Traditional Pension Plan and Combined Plan

| Year End | Active | Inactive | Retirees & Primary Beneficiaries* | Dependents & Other Beneficiaries* | Total |
|---|---|---|---|---|---|
| 2016 | N/A | N/A | 170,590 | 42,938 | 213,528 |
| 2015 | N/A | N/A | 170,687 | 52,110 | 222,797 |
| 2014 | N/A | N/A | 167,327 | 58,692 | 226,019 |
| 2013 | N/A | N/A | 165,967 | 61,041 | 227,008 |
| 2012 | N/A | N/A | 163,940 | 62,456 | 226,396 |
| 2011 | N/A | N/A | 161,315 | 62,507 | 223,822 |
| 2010 | N/A | N/A | 157,269 | 60,624 | 217,893 |
| 2009 | N/A | N/A | 213,220 | | 213,220 |
| 2008 | N/A | N/A | 208,857 | | 208,857 |
| 2007 | N/A | N/A | 204,514 | | 204,514 |

* Prior to 2010, Retirees & Primary Beneficiaries was defined as the total number of covered lives.

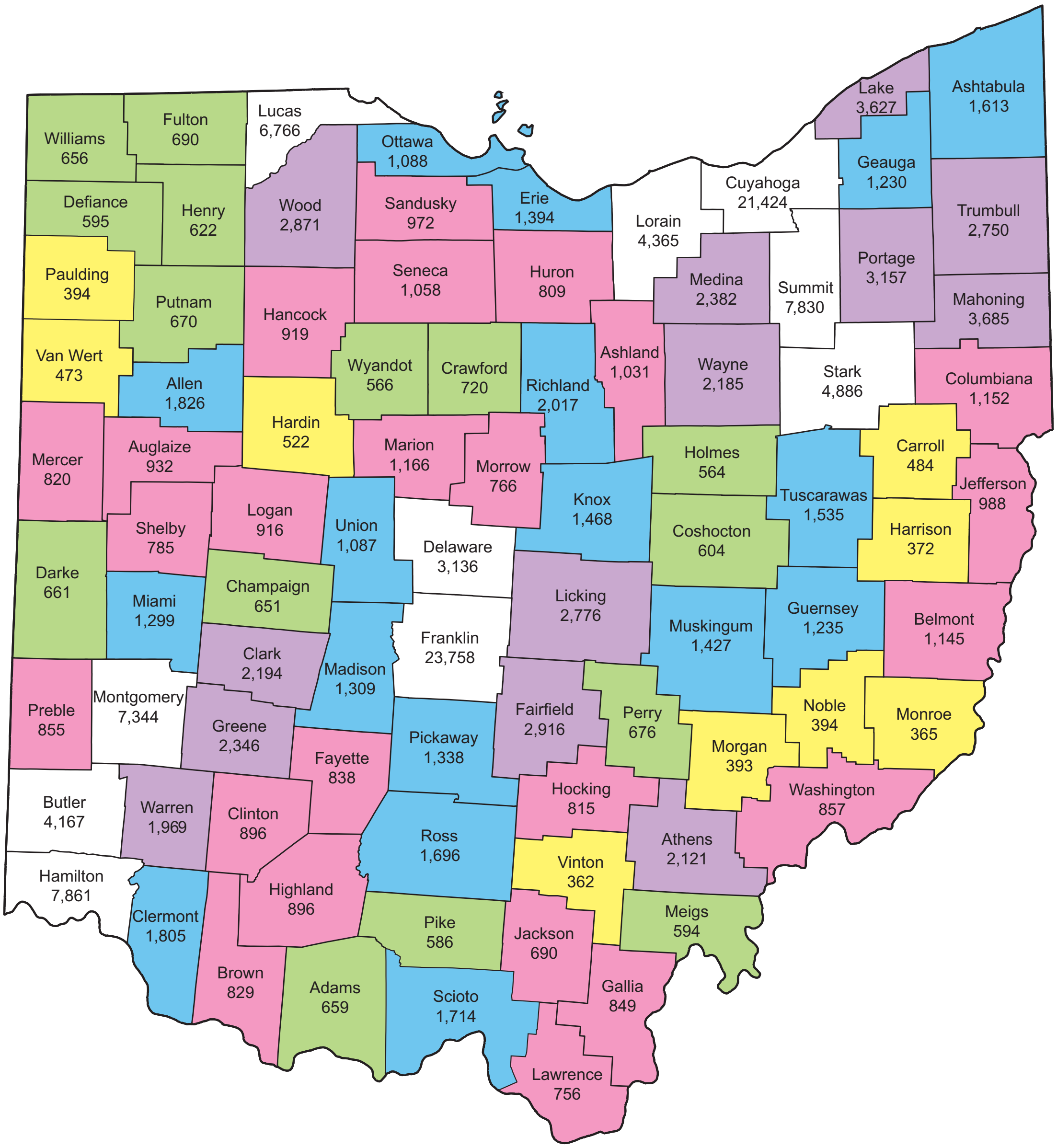
## Member Counts by Plan (continued)

The Member-Directed Retiree Medical Account (RMA) Plan table, formerly titled the VEBA Trust, represents participant counts in this plan for members in the Member-Directed Plan. Contributions are paid into the account during the member's career for use after retirement. The account is in the member's name and can only be used by the member to pay qualified medical expenses for the retiree and eligible family members. (Refer to the Plan Statement beginning on page 227.)

### Member Count—Health Care Plans — Member-Directed RMA

| Year End | Active | Inactive | Retiree Recipients | Total |
|---|---|---|---|---|
| 2016 | 11,469 | 3,976 | 5,605 | 21,050 |
| 2015 | 11,235 | 4,764 | 4,063 | 20,062 |
| 2014 | 10,745 | 4,194 | 3,509 | 18,448 |
| 2013 | 9,962 | 3,543 | 3,112 | 16,617 |
| 2012 | 9,501 | 3,189 | 2,589 | 15,279 |
| 2011 | 9,170 | 2,918 | 2,073 | 14,161 |
| 2010 | 8,392 | 2,574 | 1,577 | 12,543 |
| 2009 | 7,660 | 2,126 | 1,260 | 11,046 |
| 2008 | 7,520 | 1,886 | 365 | 9,771 |
| 2007 | 6,942 | 1,440 | 176 | 8,558 |

## 2016 Pension Benefits and Retirees by Ohio County



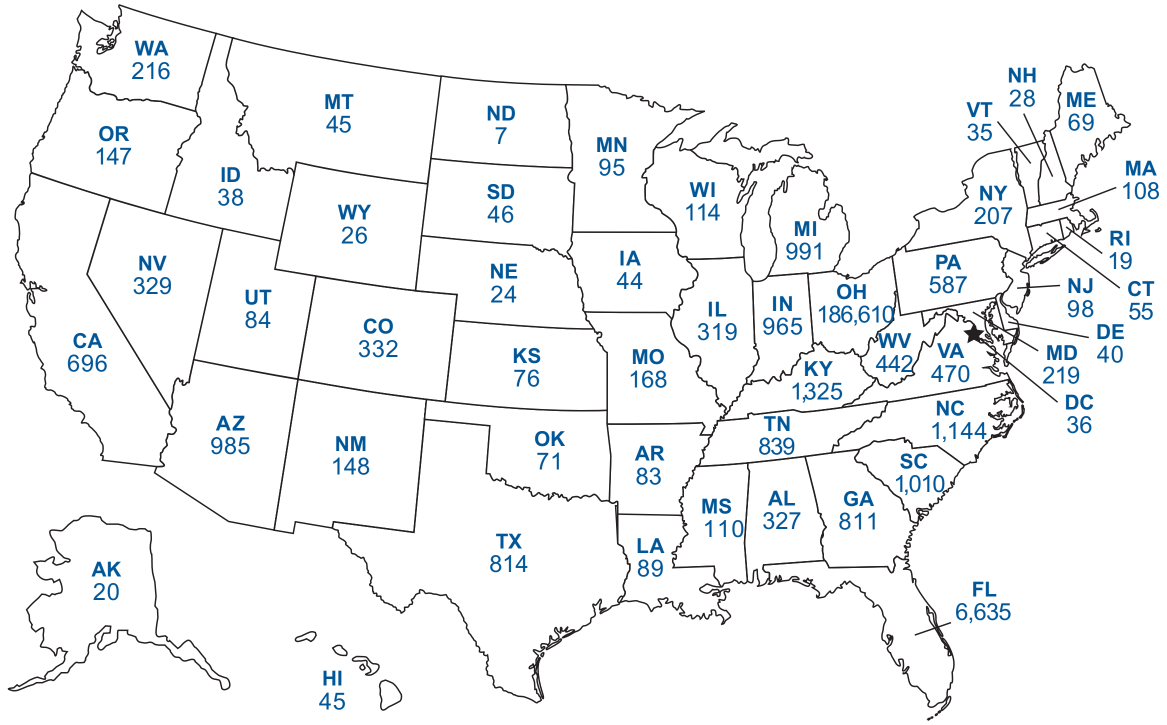

### Color Key

- $0 - $10 million
- $10 - $15 million
- $15 - $25 million
- $25 - $50 million
- $50 - $100 million
- $100 million +

Of the 208,361 retirees in OPERS, 186,610, or 89.6%, remain Ohio residents as of December 31, 2016. Pension benefit payments exceeding $5.0 billion this year are distributed throughout Ohio to retirees and their beneficiaries, representing the OPERS impact on the state's economy.

## Retirees by Geographical Location (as of December 31, 2016)

### Retirees by State




### Retirees Outside United States

Armed Forces—Europe.........5
Armed Forces—Pacific .........2
Australia...............................3
Austria .................................1
Bulgaria ................................1
Canada ...............................27
China ...................................1
Costa Rica ............................2
England ................................3
Ethiopia................................1
France ..................................4
Germany...............................2
Greece..................................1
Hungary................................1
India.....................................1
Ireland..................................3
Israel....................................6
Italy .....................................5
Japan....................................2
Jordan...................................1
Latvia ...................................1
Lebanon................................1
Lithuania ..............................1
N. Ireland .............................1
New Zealand ........................2
Northern Mariana Islands ......1
Norway ................................1
Peru .....................................1
Philippines ............................1
Poland .................................1
Puerto Rico.........................19
Romania ...............................1
Scotland................................2
Singapore .............................1
Slovakia ...............................2
Spain ...................................3
Thailand................................3
Turkey..................................1
United Kingdom ....................1
Virgin Islands ........................3
West Indies...........................1

## Contribution Rates at December 31 — Traditional Pension Plan

| | Year | Member Rates | Employer Rates: Normal Cost | Employer Rates: Unfunded Liability | Employer Rates: Health | Total Employer Rates | Total Aggregate Employer and Member Rates |
|---|---|---|---|---|---|---|---|
| State | 2016 | 10.00% | 3.32% | 8.68% | 2.00% | 14.00% | 24.00% |
| | 2015 | 10.00 | 3.31 | 8.69 | 2.00 | 14.00 | 24.00 |
| | 2014 | 10.00 | 5.28 | 6.72 | 2.00 | 14.00 | 24.00 |
| | 2013 | 10.00 | 5.39 | 7.61 | 1.00 | 14.00 | 24.00 |
| | 2012 | 10.00 | 5.36 | 4.64 | 4.00 | 14.00 | 24.00 |
| | 2011 | 10.00 | 5.34 | 4.66 | 4.00 | 14.00 | 24.00 |
| | 2010*** | 10.00 | 5.35 | 3.65 | 5.00 | 14.00 | 24.00 |
| | 2009** | 10.00 | 4.89 | 3.61 | 5.50 | 14.00 | 24.00 |
| | 2008 | 10.00 | 4.89 | 2.11 | 7.00 | 14.00 | 24.00 |
| | 2007* | 9.50 | 4.21 | 3.56 | 6.00 | 13.77 | 23.27 |
| Local | 2016 | 10.00% | 2.98% | 9.02% | 2.00% | 14.00% | 24.00% |
| | 2015 | 10.00 | 2.98 | 9.02 | 2.00 | 14.00 | 24.00 |
| | 2014 | 10.00 | 5.05 | 6.95 | 2.00 | 14.00 | 24.00 |
| | 2013 | 10.00 | 5.05 | 7.95 | 1.00 | 14.00 | 24.00 |
| | 2012 | 10.00 | 5.05 | 4.95 | 4.00 | 14.00 | 24.00 |
| | 2011 | 10.00 | 5.04 | 4.96 | 4.00 | 14.00 | 24.00 |
| | 2010*** | 10.00 | 5.06 | 3.94 | 5.00 | 14.00 | 24.00 |
| | 2009** | 10.00 | 4.46 | 4.04 | 5.50 | 14.00 | 24.00 |
| | 2008 | 10.00 | 4.46 | 2.54 | 7.00 | 14.00 | 24.00 |
| | 2007* | 9.50 | 4.10 | 3.75 | 6.00 | 13.85 | 23.35 |
| Law Enforcement | 2016 | 13.00% | 5.45% | 10.65% | 2.00% | 18.10% | 31.10% |
| | 2015 | 13.00 | 5.44 | 10.66 | 2.00 | 18.10 | 31.10 |
| | 2014 | 13.00 | 7.18 | 8.92 | 2.00 | 18.10 | 31.10 |
| | 2013 | 12.60 | 7.90 | 9.20 | 1.00 | 18.10 | 30.70 |
| | 2012 | 12.10 | 8.16 | 5.94 | 4.00 | 18.10 | 30.20 |
| | 2011 | 11.60 | 8.43 | 5.67 | 4.00 | 18.10 | 29.70 |
| | 2010*** | 11.10 | 8.95 | 3.92 | 5.00 | 17.87 | 28.97 |
| | 2009** | 10.10 | 9.65 | 2.48 | 5.50 | 17.63 | 27.73 |
| | 2008 | 10.10 | 9.65 | 0.75 | 7.00 | 17.40 | 27.50 |
| | 2007* | 10.10 | 7.62 | 3.55 | 6.00 | 17.17 | 27.27 |
| Public Safety | 2016 | 12.00% | 4.12% | 11.98% | 2.00% | 18.10% | 30.10% |
| | 2015 | 12.00 | 3.96 | 12.14 | 2.00 | 18.10 | 30.10 |
| | 2014 | 12.00 | 6.12 | 9.98 | 2.00 | 18.10 | 30.10 |
| | 2013 | 12.00 | 7.62 | 9.48 | 1.00 | 18.10 | 30.10 |
| | 2012 | 11.50 | 7.77 | 6.33 | 4.00 | 18.10 | 29.60 |
| | 2011 | 11.00 | 8.32 | 5.78 | 4.00 | 18.10 | 29.10 |
| | 2010*** | 10.50 | 8.55 | 4.32 | 5.00 | 17.87 | 28.37 |
| | 2009** | 10.10 | 8.63 | 3.50 | 5.50 | 17.63 | 27.73 |
| | 2008 | 10.10 | 8.63 | 1.77 | 7.00 | 17.40 | 27.50 |
| | 2007* | 9.75 | 7.16 | 4.01 | 6.00 | 17.17 | 26.92 |

* The health care contribution rate increased from 5.0% to 6.0% effective July 1, 2007.
** The health care contribution rate decreased from 7.0% to 5.5% effective April 1, 2009.
*** The health care contribution rate decreased from 5.5% to 5.0% effective March 1, 2010.

continued on page 222

continued from page 221

## Contribution Rates at December 31 — Combined Plan

| | Year | Member Rates | Employer Rates: Normal Cost | Employer Rates: Unfunded Liability* | Employer Rates: Mitigation Rate | Employer Rates: Health | Total Employer Rates | Total Aggregate Employer and Member Rates |
|---|---|---|---|---|---|---|---|---|
| State | 2016 | 10.00% | 7.56% | 3.44% | 1.00% | 2.00% | 14.00% | 24.00% |
| | 2015 | 10.00 | 7.64 | 3.49 | 0.77 | 2.00 | 14.00 | 24.00 |
| | 2014 | 10.00 | 6.99 | 4.24 | 0.77 | 2.00 | 14.00 | 24.00 |
| | 2013 | 10.00 | 7.20 | 5.03 | 0.77 | 1.00 | 14.00 | 24.00 |
| | 2012 | 10.00 | 7.18 | 0.00 | 0.77 | 6.05 | 14.00 | 24.00 |
| | 2011 | 10.00 | 7.18 | 0.00 | 0.77 | 6.05 | 14.00 | 24.00 |
| | 2010**** | 10.00 | 7.18 | 1.82 | 0.77 | 4.23 | 14.00 | 24.00 |
| | 2009*** | 10.00 | 7.21 | 1.29 | 0.77 | 4.73 | 14.00 | 24.00 |
| | 2008 | 10.00 | 7.21 | 0.12 | 0.77 | 5.90 | 14.00 | 24.00 |
| | 2007** | 9.50 | 7.23 | N/A | 0.54 | 6.00 | 13.77 | 23.27 |
| Local | 2016 | 10.00% | 7.42% | 3.58% | 1.00% | 2.00% | 14.00% | 24.00% |
| | 2015 | 10.00 | 7.41 | 3.82 | 0.77 | 2.00 | 14.00 | 24.00 |
| | 2014 | 10.00 | 6.83 | 4.40 | 0.77 | 2.00 | 14.00 | 24.00 |
| | 2013 | 10.00 | 6.87 | 5.36 | 0.77 | 1.00 | 14.00 | 24.00 |
| | 2012 | 10.00 | 6.88 | 0.30 | 0.77 | 6.05 | 14.00 | 24.00 |
| | 2011 | 10.00 | 6.88 | 0.30 | 0.77 | 6.05 | 14.00 | 24.00 |
| | 2010**** | 10.00 | 6.87 | 2.13 | 0.77 | 4.23 | 14.00 | 24.00 |
| | 2009*** | 10.00 | 6.88 | 1.62 | 0.77 | 4.73 | 14.00 | 24.00 |
| | 2008 | 10.00 | 6.88 | 0.45 | 0.77 | 5.90 | 14.00 | 24.00 |
| | 2007** | 9.50 | 7.15 | N/A | 0.70 | 6.00 | 13.85 | 23.35 |

* Unfunded Liability includes the impact of defined contribution account purchases of defined benefit annuities.
** The health care contribution rate increased from 5.00% to 6.00% effective July 1, 2007.
*** The health care contribution rate decreased from 5.90% to 4.73% effective April 1, 2009.
**** The health care contribution rate decreased from 4.73% to 4.23% effective March 1, 2010.

## Contribution Rates at December 31 — Member-Directed Plan

| | Year | Member Rates | Employer Rates: Normal Cost | Employer Rates: Unfunded Liability | Employer Rates: Administrative Fee | Employer Rates: Mitigation Rate | Employer Rates: Health* | Total Employer Rates | Total Aggregate Employer and Member Rates |
|---|---|---|---|---|---|---|---|---|---|
| State | 2016 | 10.00% | 8.50% | N/A | 0.50% | 1.00% | 4.00% | 14.00% | 24.00% |
| | 2015 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2014 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2013 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2012 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2011 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2010 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2009 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2008 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2007 | 9.50 | 8.73 | N/A | | 0.54 | 4.50 | 13.77 | 23.27 |
| Local | 2016 | 10.00% | 8.50% | N/A | 0.50% | 1.00% | 4.00% | 14.00% | 24.00% |
| | 2015 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2014 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2013 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2012 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2011 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2010 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2009 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2008 | 10.00 | 8.73 | N/A | | 0.77 | 4.50 | 14.00 | 24.00 |
| | 2007 | 9.50 | 8.65 | N/A | | 0.70 | 4.50 | 13.85 | 23.35 |

* Beginning October 2014, the Board approved the funding of participant Member-Directed Retiree Medical Account (RMA) Plan accounts using the reserves in the Member-Directed RMA (formerly titled the VEBA Trust) rather than the allocation of employer contributions. Instead, employer contributions were allocated to the Member-Directed Plan through December 31, 2015 to repay the original plan start-up and administrative costs. Contributions resumed into the Member-Directed RMA in January 2016.

## Number of Employer Units — All Plans*

| Calendar Year | State | County** | Law Enforcement | Municipalities | Villages | Miscellaneous | Libraries | Townships | Totals |
|---|---|---|---|---|---|---|---|---|---|
| 2016 | 250 | 221 | 235 | 244 | 660 | 507 | 253 | 1,308 | 3,678 |
| 2015 | 260 | 215 | 239 | 244 | 665 | 498 | 253 | 1,309 | 3,683 |
| 2014 | 264 | 217 | 241 | 245 | 667 | 496 | 253 | 1,309 | 3,692 |
| 2013 | 282 | 219 | 244 | 245 | 673 | 494 | 253 | 1,308 | 3,718 |
| 2012 | 271 | 214 | 242 | 245 | 678 | 491 | 253 | 1,308 | 3,702 |
| 2011 | 271 | 211 | 241 | 246 | 675 | 490 | 253 | 1,308 | 3,695 |
| 2010 | 269 | 215 | 241 | 247 | 675 | 491 | 253 | 1,308 | 3,699 |
| 2009 | 270 | 238 | 237 | 248 | 671 | 489 | 253 | 1,308 | 3,714 |
| 2008 | 269 | 244 | 248 | 251 | 670 | 474 | 254 | 1,314 | 3,724 |
| 2007 | 273 | 241 | 245 | 251 | 671 | 465 | 254 | 1,314 | 3,714 |

* The number of employer units exceeds the number of reporting employers as some employers report multiple divisions or agencies. This count also includes private-sector employers that have assumed privatized functions from public employers for indeterminate periods. The number of employers reporting at December 31, 2016 was 3,232.

** Effective January 1, 2010, House Bill 420 transferred authority for managing county law libraries to County Law Library Resource Boards within county governments. This consolidation with county governments resulted in a reduction in the number of individual employer units.

## Principal Participating Employers

| Employers by Participating Employer Ranking | 2016 | | | 2007* | | |
|---|---|---|---|---|---|---|
| | Covered Employees | Rank | Percentage of Total System | Covered Employees | Rank | Percentage of Total System |
| The Ohio State University | 38,062 | 1 | 10.97% | 24,517 | 1 | 6.42% |
| Cuyahoga County | 8,132 | 2 | 2.34 | 9,592 | 2 | 2.51 |
| MetroHealth Medical Center | 7,334 | 3 | 2.11 | 6,020 | 4 | 1.58 |
| Franklin County | 7,034 | 4 | 2.03 | 5,918 | 5 | 1.55 |
| University of Cincinnati | 6,972 | 5 | 2.01 | 5,681 | 7 | 1.49 |
| City of Columbus | 6,018 | 6 | 1.74 | 5,357 | 9 | 1.40 |
| Ohio Department of Transportation | 5,539 | 7 | 1.60 | 5,835 | 6 | 1.53 |
| City of Cleveland | 5,482 | 8 | 1.58 | 6,218 | 3 | 1.63 |
| Ohio University | 5,234 | 9 | 1.51 | N/A | N/A | N/A |
| Kent State University | 5,133 | 10 | 1.48 | N/A | N/A | N/A |
| Hamilton County | N/A | N/A | N/A | 5,452 | 8 | 1.43 |
| Montgomery County | N/A | N/A | N/A | 4,046 | 10 | 1.06 |
| All Other (see table on page 225) | 251,869 | N/A | 72.63 | 303,541 | N/A | 79.40 |
| **Total** | **346,809** | **N/A** | **100.00%** | **382,177** | **N/A** | **100.00%** |

* The implementation of GASB 67 in 2014 modified the requirements of this schedule. Prior to GASB 67, OPERS reported number of employer units only. Beginning 2014, OPERS changed the presentation to reflect the number of participating employers, which is most associated with the reporting entities. A reporting entity can include multiple employer units. For example, a single reporting entity (a county) may report as three employer units (a county, a hospital and law enforcement). The OPERS employer system is dynamic and historical reports based on participating employers by employer type, or reporting entities by employer type, do not exist. As a result, the values for 2007 in this table reflect the number of employers based on employer units.

## Employer Units

| Employers by Employer Unit Ranking | 2016 | | | 2007 | | |
|---|---|---|---|---|---|---|
| | Covered Employees | Rank | Percentage of Total System | Covered Employees | Rank | Percentage of Total System |
| The Ohio State University | 38,012 | 1 | 10.96% | 24,517 | 1 | 6.42% |
| Cuyahoga County | 7,957 | 2 | 2.30 | 9,592 | 2 | 2.51 |
| MetroHealth Medical Center | 7,334 | 3 | 2.11 | 6,020 | 4 | 1.58 |
| University of Cincinnati | 6,910 | 4 | 1.99 | 5,681 | 7 | 1.49 |
| Franklin County | 6,447 | 5 | 1.86 | 5,918 | 5 | 1.55 |
| Ohio Department of Transportation | 5,539 | 6 | 1.60 | 5,835 | 6 | 1.53 |
| City of Columbus | 5,526 | 7 | 1.59 | 5,357 | 9 | 1.40 |
| City of Cleveland | 5,482 | 8 | 1.58 | 6,218 | 3 | 1.63 |
| Ohio University | 5,205 | 9 | 1.50 | N/A | N/A | N/A |
| Kent State University | 5,104 | 10 | 1.47 | N/A | N/A | N/A |
| Hamilton County | N/A | N/A | N/A | 5,452 | 8 | 1.43 |
| Montgomery County | N/A | N/A | N/A | 4,046 | 10 | 1.06 |
| All Other (see table on page 225) | 253,293 | N/A | 73.04 | 303,541 | N/A | 79.40 |
| **Total** | **346,809** | **N/A** | **100.00%** | **382,177** | **N/A** | **100.00%** |

## Employers—All Other Categories*

| Employer Type | 2016 | | | | 2007** | | | |
|---|---|---|---|---|---|---|---|---|
| | Employer Units | | Participating Employers | | Employer Units | | Participating Employers | |
| | Number | Employees | Number | Employees | Number | Employees | Number | Employees |
| State | 245 | 64,297 | 154 | 65,040 | 270 | 87,992 | 270 | 87,992 |
| County | 218 | 72,916 | 118 | 78,323 | 237 | 74,168 | 237 | 74,168 |
| Municipalities | 242 | 48,339 | 233 | 47,999 | 249 | 55,106 | 249 | 55,106 |
| Miscellaneous | 507 | 21,762 | 499 | 21,295 | 464 | 30,874 | 464 | 30,874 |
| Libraries | 253 | 12,873 | 252 | 12,857 | 254 | 15,559 | 254 | 15,559 |
| Townships | 1,308 | 11,236 | 1,307 | 12,501 | 1,314 | 15,076 | 1,314 | 15,076 |
| Villages | 660 | 13,845 | 659 | 13,854 | 671 | 14,992 | 671 | 14,992 |
| Law Enforcement/Public Safety | 235 | 8,025 | N/A | N/A | 245 | 9,774 | 245 | 9,774 |
| **Total** | **3,668** | **253,293** | **3,222** | **251,869** | **3,704** | **303,541** | **3,704** | **303,541** |

* This table displays additional information on the All Other category in the two tables on the previous page. To get the total number of employers reported in the table and related footnote on page 223, combine the numbers in this table with those on page 224 for the employer units (10 plus 3,668 = 3,678 for 2016) and participating employers (10 plus 3,222 = 3,232 for 2016). GASB requires a 10 year look-back to the year being presented. Therefore, information for 2008 through 2015 is not relevant.

** The implementation of GASB 67 in 2014 modified the requirements of this schedule. Prior to GASB 67, OPERS reported number of employer units only. Beginning 2014, OPERS changed the presentation to reflect the number of participating employers, which is most associated with the reporting entities. A reporting entity can include multiple employer units. For example, a single reporting entity (a county) may report as three employer units (a county, hospital and law enforcement). The OPERS employer system is dynamic and historical reports based on participating employers by employer type, or reporting entities by employer type, do not exist. As a result, the values for 2007 in this table reflect the number of employers based on employer units.

## Investment Rates by Portfolio—Defined Benefit and Health Care

OPERS uses several rates to evaluate the results of the investment portfolios. Actual and benchmark returns for the years listed can be found in the Investment Section. The portfolio target return is based on the asset allocation in place during the year presented and the actuarial assumed rate of return, or discount rate, is the assumption used by our actuaries for the annual actuarial valuations, described further in the Actuarial Section.

Rates are presented for four years in the following table:

## Investment Rates by Portfolio

| | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|
| **Defined Benefit Portfolio** | | | | |
| Actual Rate of Return | 8.31% | 0.33% | 6.96% | 14.38% |
| Benchmark Return | 8.64% | 0.25% | 5.81% | 14.24% |
| Portfolio Target Rate of Return | 8.00% | 8.00% | 8.00% | 8.00% |
| Actuarial Assumed Rate of Return | 7.50% | 8.00% | 8.00% | 8.00% |
| **Health Care Portfolio*** | | | | |
| Actual Rate of Return | 7.55% | (2.18%) | 5.28% | 11.36% |
| Benchmark Return | 7.75% | (1.88%) | 5.01% | 10.70% |
| Portfolio Target Rate of Return | 6.50% | 6.50% | 6.50% | 6.50% |
| Actuarial Assumed Rate of Return | 5.00% | 5.00% | 5.00% | 5.00% |

* In 2016, the 401(h) Health Care Trust closed and assets were transferred to the 115 Health Care Trust. The 2016 partial year results for both of these portfolios can be found in the Investment Section, reflecting six month returns for the 410(h) Health Care Trust. For 2016, this chart displays the combined health care rates as disclosed in the Investment Section. For previous years, the rates represent the 401(h) Health Care Trust, as the majority of the health care assets resided in this trust until transferred to the 115 Health Care Trust.

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# Plan Statement

## *Dedicated to:* Delivering Benefits

The business of pension may seem complex. However, OPERS works to ensure each and every member understands the status of his or her benefits. Why is this a priority? Detailed, accurate account information is one tool for individual members to make important, personal, retirement decisions. After all, you would never buy a home without knowing the price—similarly, no one should retire without knowing the financial security earned throughout their working career.

At OPERS, we work to provide needed information to each and every member. Finances are personal, retirement is personal—we make the business of pensions comprehensible and personal for each of our members. Here's how:

- This Plan Statement provides an overview of pension benefits. Each year, more than 300,000 members receive an individualized account statement online or delivered via U.S. mail (member's choice).
- More than 389 in-person seminars were offered throughout the state.
- Members who could not make it to seminars have the option of online webinars—available 24/7.
- Online tools are up and running to ensure members have up-to-date account information: In 2016, approximately 79 percent of all retirement applications were completed online.
- Some members prefer to discuss their situation with a retirement counselor, OPERS has 16 counselors who worked with more than 18,200 members in 2016.

We are with our members the first day of their working career, throughout their career and, ultimately, we are with our members through their retirement. It's not just our business; it's personal.

The Ohio Public Employees Retirement System (OPERS or System) was created in 1935 by the Ohio General Assembly to provide retirement, disability, and survivor benefit programs to state and local employees. This summary outlines the plan features; however, it is not a substitute for the state and federal laws that govern OPERS.

All public employees, except those covered by another state retirement system in Ohio or by the Cincinnati Retirement System, are required to become contributing members of OPERS when they begin public employment unless they are exempted or excluded.

The law provides for optional membership for elected public officials who did not contribute on prior elective service. Students, not already members, working for the public school, college, or university that they are attending may be exempt from contributing to OPERS by filing a request for exemption within the first month of employment.

OPERS provides special retirement coverage for certain law enforcement officers whose primary duties are to preserve the peace, to protect life and property, and to enforce the laws of Ohio. This Law Enforcement division has its own retirement, disability, and survivor benefit eligibility provisions.

## Plan Types

For more than 80 years, OPERS has provided members with retirement benefits under a defined benefit plan, known as the Traditional Pension Plan.

In 2000, legislation required OPERS to establish one or more defined contribution plans to be offered to members in addition to the existing Traditional Pension Plan. OPERS began offering three retirement plans to its members on January 1, 2003. The plans include the Traditional Pension Plan, the Member-Directed Plan, and the Combined Plan. A brief overview of each plan is provided below.

Effective January 7, 2013, legislation modified components of the Traditional Pension and Combined plans. Members were impacted by these changes to varying degrees based on their retirement group. Three retirement groups (A, B and C) were designed to ease the transition for key components of the pension plan changes.

- **The Traditional Pension Plan**

  The Traditional Pension Plan is a defined benefit plan under which a member's retirement benefit is based on a formula. The formula is determined by the years of service credit and the average of the three or five (based on retirement group) highest years of eligible salary, referred to as final average salary (FAS). OPERS investment professionals manage the investment of employee and employer contributions to ensure that funds are available to pay the formula benefit.

- **The Member-Directed Plan**

  The Member-Directed Plan is a defined contribution plan under which employee and a portion of the employer contributions are deposited into a member's individual account and the member directs the investment by selecting from professionally managed OPERS investment options. The investment options include six core funds comprised of a series of fixed income and equity funds, 10 target date funds, and a self-directed brokerage account. Members become vested in the employer contributions at a rate of 20% for each year of participation until the member is fully vested at the end of five years. The account value available at retirement is based on employee and vested employer contributions and the investment gains and losses on those contributions.

## Plan Statement

- **The Combined Plan**

  The Combined Plan is a retirement plan with both a defined benefit and a defined contribution component. The employer contributions fund the defined benefit portion of the Combined Plan. The member's defined benefit retirement component is determined by a formula similar to, but lower than, the Traditional Pension Plan formula. OPERS investment professionals manage the investment of the employer contributions to ensure that funds are available to pay the formula benefit. Under the defined contribution component of the Combined Plan, employee contributions are deposited into the member's individual account and the member directs the investment by selecting from professionally managed OPERS investment options. The investment options include six core funds comprised of a series of fixed income and equity funds, 10 target date funds, and a self-directed brokerage account. The defined contribution account value available at retirement is based on employee contributions and the investment gains and losses on those contributions.

## Contributions

Employers are required to make contributions to the System on the basis of a percentage of eligible salary and at a rate based upon the recommendations of the OPERS actuary subject to the statutory limitations. Penalties and interest are assessed for late payments. The contribution rate for State and Local employers in 2016 was 14.0%. Employers in the Law Enforcement and Public Safety divisions contributed 18.1%.

The 2016 employee contribution rate for State and Local members was 10.0% of eligible salary. Members in the Public Safely division contributed 12.0% of eligible salary, while members in the Law Enforcement division contributed 13.0%. Individual accounts for each member of OPERS are maintained and funds contributed by members of the Traditional Pension Plan are fully refundable at service termination or death. The refund value of contributions made by members of the Combined Plan and the Member-Directed Plan are subject to changes (gains or losses) that occur as a result of the member's selected investment options.

## Additional Voluntary Contributions

- **The Traditional Pension Plan**

  A member or a re-employed retiree who is contributing to a money purchase annuity may deposit additional money or rollover funds into the Additional Annuity Program. Voluntary after-tax additional annuity deposits are limited by federal tax law to 100% of a member's annual income from all public employers contributing to OPERS or to the current annual IRS limitation, whichever is less. Additional Annuity deposits are invested in the OPERS Stable Value Fund where they are subject to daily investment gains and losses. Earnings are tax-deferred until the time of distribution.

  Upon termination of employment or retirement, the member may either elect to receive a refund of the account value or an annuity. The annuity program offers the same payment options as those offered for an age-and-service retirement under the Traditional Pension Plan.

- **The Member-Directed Plan and Combined Plan**

  Members participating in the Member-Directed or Combined plans may deposit additional money or rollover funds into their individual defined contribution account. Voluntary after-tax deposits are limited by federal tax law to 100% of a member's annual income from all public employers contributing to OPERS or to the current annual IRS limitation, whichever is less. The additional contributions are invested in the same investment options the member selected for their individual defined contribution account, and are subject to investment gains and losses.

Upon termination of employment or retirement, members may elect to receive either a lump-sum refund of the account value or any of the retirement distribution options available to defined contribution accounts.

## Benefits under the Traditional Pension Plan or the Combined Plan

### Age-and-Service Retirement

In 2012, the Ohio General Assembly enacted into law a number of significant plan design changes that became effective on January 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the new law applicable to each group. Members who were eligible to retire under law in effect prior to the legislation or who will be eligible to retire no later than five years after January 7, 2013, comprise retirement Group A. Members who have 20 years of service credit prior to January 7, 2013, or who will be eligible to retire no later than 10 years after January 7, 2013, are included in retirement Group B. Group C includes those members who are not in either of the other groups and members who were hired on or after January 7, 2013.

Retirement benefits are specific to each plan and members must meet the eligibility requirements based on their age and years of service within the plan. Retirement eligibility also varies by division and retirement group. The charts below show the retirement eligibility requirements for all divisions and retirement groups. The requirements for the State and Local divisions apply to members who participate in either the Traditional Pension Plan or the Combined Plan. The Law Enforcement and Public Safety divisions are only applicable to the Traditional Pension Plan.

| Unreduced | Group A | | Group B | | Group C | |
|---|---|---|---|---|---|---|
| | Age | Service | Age | Service | Age | Service |
| State/Local | Any | 30 | 52 | 31 | 55 | 32 |
| | | | Any | 32 | | |
| | 65 | 5 | 66 | 5 | 67 | 5 |
| Law Enforcement | 48 | 25 | 50 | 25 | 52 | 25 |
| | 62 | 15 | 64 | 15 | 64 | 15 |
| Public Safety | 52 | 25 | 54 | 25 | 56 | 25 |
| | 62 | 15 | 64 | 15 | 64 | 15 |
| Law and Public Safety (public safety benefit) | 52 | 25 | 54 | 25 | 56 | 25 |

| Reduced | Group A | | Group B | | Group C | |
|---|---|---|---|---|---|---|
| | Age | Service | Age | Service | Age | Service |
| State/Local | 55 | 25 | 55 | 25 | 57 | 25 |
| | 60 | 5 | 60 | 5 | 62 | 5 |
| Law Enforcement | 52 | 15 | 52 | 15 | 56 | 15 |
| | N/A | N/A | 48 | 25 | 48 | 25 |
| Public Safety | 52 | 15 | 52 | 15 | 56 | 15 |
| | 48 | 25 | 48 | 25 | 52 | 25 |
| Law and Public Safety (public safety benefit) | 48 | 25 | 48 | 25 | 52 | 25 |

## Plan Statement

Benefit payments vary in amount depending on years of service credit, FAS, age, and plan of payment selection. FAS is the average of the three highest years of eligible salary for Groups A and B; and the average of the five highest years of eligible salary for members in Group C. The age-and-service formula benefit cannot exceed 100% of FAS (Law Enforcement is 90%) or the limits under Internal Revenue Code Section 415 and may be subject to the contribution-based benefit cap (CBBC). The base benefit amount calculated by the formula will be reduced if a member begins receiving a retirement benefit before he/she reaches the age-and-service requirements for an unreduced benefit.

In the Traditional Pension Plan, the benefit formula for State and Local members in retirement Groups A and B applies a factor of 2.2% to the member’s FAS for the first 30 years of service. A factor of 2.5% is applied to years of service in excess of 30. The benefit formula for State and Local members in retirement Group C applies a factor of 2.2% to the member’s FAS for the first 35 years of service and a factor of 2.5% is applied to years of service in excess of 35.

In the Traditional Pension Plan, the benefit formula for members in the Public Safety and Law Enforcement divisions applies a factor of 2.5% to member’s FAS for the first 25 years of service as a Public Safety or Law Enforcement member. A factor of 2.1% is applied to years of service in excess of 25.

In the Combined Plan, the benefit formula for the defined benefit component of the plan for State and Local members in retirement Groups A and B applies a factor of 1.0% to the member’s FAS for the first 30 years of service. A factor of 1.25% is applied to years of service in excess of 30. The benefit formula for retirement Group C applies a factor of 1.0% to the member’s FAS and the first 35 years of service and a factor of 1.25% is applied to years in excess of 35. In the defined contribution component of the Combined Plan, the current value of the individual account is available at retirement. The balance can be rolled over to another eligible retirement plan, made payable to the member with taxes withheld, or converted to a lifetime annuity through OPERS, or a combination of the three options.

Beginning in January 2013, the CBBC was introduced to reduce the impact of inflating FAS. For purposes of determining the CBBC, the member’s accumulated contributions (less any contributions attributed to a non-law annuity) are combined with a portion of employer-paid delinquent contributions, a portion of early retirement incentive plan funding and member contributions used to fund a disability under the original plan, if applicable. The total accumulated member contributions (as calculated in the previous sentence) are multiplied by the OPERS Board of Trustees (Board)-established CBBC factor. The CBBC factor in effect for 2016 was 6.0. The member is eligible for the lesser of an annuity calculated on FAS and years of service credit or the calculated CBBC value. The CBBC applies to all new retirees, with an exception for certain members in Group A. The reduction caused by the CBBC for retirement Group A members may not exceed 5% of the retirement allowance the member would have otherwise received unless, for any full month of service after January 1, 1987, the member’s monthly eligible salary was less than $1,000.

Service credit allowed under Chapter 145 of the Ohio Revised Code for retirement eligibility and calculation of a formula benefit includes:

1) Service to the state of Ohio or an Ohio political subdivision for which contributions have been paid;
2) Certain military service which interrupted contributing public service;
3) Any out-of-public service period of three years or less during which the member was receiving an award under the Ohio Bureau of Workers’ Compensation;
4) Previously unreported service in Ohio;
5) Service purchased by the member for:
    a) Military service that pre-dates public employment;

b) Prisoner-of-war service;

c) An authorized leave of absence that did not exceed one year;

d) Comparable public service that is not being used for other retirement programs except Social Security, performed outside Ohio or with the federal government, or for which contributions were made to an Ohio municipal retirement system;

e) Restoration of previously refunded service;

f) Restoration of previously refunded service from the Ohio Police and Fire Pension Fund, Ohio State Highway Patrol Retirement System, or Cincinnati Retirement System, not being used for any other retirement benefit;

g) Service that was previously covered by a valid exemption under OPERS;

h) The amount of 35% additional credit on completed terms of full-time contributing elected official service, or board, commission, or other public body service by members who are appointed by the Governor with the advice and consent of the Senate;

i) Service purchased in the Combined Plan or the Traditional Pension Plan representing contributing service earned in the Member-Directed Plan or Combined Plan; and,

j) Restoration of contributing service earned in the Traditional Pension Plan prior to January 1, 2003 that was transferred to the Member-Directed Plan or the Combined Plan at initial plan selection.

6) Service purchased by an employer under a retirement incentive plan.

Beginning in 2014, the minimum eligible salary required to earn full-time service was increased to $600 per month, with an index feature that is based on salary increases granted to township trustees. Township trustees will receive a salary increase in 2016 and, thus, the minimum eligible salary will increase by that same percentage beginning in calendar year 2017. Beginning January 1, 2017, the minimum eligible salary required to earn full-time service will be $630; in 2018, it will increase to $660.

A choice of several benefit payment plans is available. The choices include benefits payable throughout the member's lifetime (Single Life Plan) or in a lesser amount during the individual's life but continuing after the member's death to one or more survivors (the Joint Life Plan or the Multiple Life Plan).

A benefit payable under Joint Life Plan or Multiple Life Plan is the actuarial equivalent of the Single Life Plan, but the payment to the member is reduced because it is based on the combined life expectancies of the member and the beneficiary(ies).

The Multiple Life Plan is an option available to members whose retirement is effective on or after November 1, 2006. The payment plan is a multiple joint survivorship annuity providing benefits to the member throughout his/her lifetime, with payments continuing to the member's surviving beneficiaries after the member's death. The member may designate two-to-four beneficiaries, with each receiving at least 10% of the benefit (exceptions are court ordered spousal benefits). Total allocations to all beneficiaries may not exceed 100% of the benefit.

Effective January 1, 2004, OPERS established a Partial Lump-Sum Option Payment (PLOP) for certain retirees and benefit recipients. The PLOP is an option at retirement that allows a recipient to receive a lump-sum benefit payment along with a reduced monthly retirement allowance. The PLOP cannot be less than six times or more than 36 times the monthly amount that would be payable to the member under the plan of payment selected, and cannot result in a monthly allowance that is less than 50% of that monthly amount. The total amount paid as a lump sum and a monthly benefit is the actuarial equivalent of the amount that would have been paid had the lump sum not been selected.

## Plan Statement

### Disability Benefits

OPERS members are eligible for one of two disability programs: the original plan or the revised plan. Employees who had contributions on deposit with OPERS on July 29, 1992, had a one-time opportunity to select coverage under one of these programs. Employees hired after July 29, 1992, are covered only under the revised plan. There are a number of features common to both plans.

A member who has at least 60 contributing months of service credit in either the Traditional Pension Plan or the Combined Plan and who becomes permanently mentally or physically disabled from the performance of their last public position may apply to OPERS for monthly disability benefits. Members in the Law Enforcement or Public Safety divisions may apply for disability at any time if the disabling condition was the result of an on-duty illness or injury. Coverage is limited to illness or injury that occurs before the member's contributing service terminates or, in the case of illness or injury that results from the member's employment, becomes evident no later than two years after the date the contributing service ends. The coverage does not extend to disability resulting from elective cosmetic surgery other than reconstructive surgery.

Application must be made within two years from the date the member's contributing service ended, unless the Board determines that the member was physically or mentally incapacitated for duty and unable to make an application. The member must not be receiving an age-and-service retirement benefit or have received a refund of his or her accumulated contributions. If the Board approves the disability benefit application and the member is otherwise eligible, the benefit is effective the first day of the month following the member's service termination. A disability benefit recipient may be required to undergo periodic medical examinations (based on House Bill 520 effective April 5, 2017). A disability benefit terminates under either disability plan if the member is no longer disabled, returns to public employment, chooses to begin receiving an age-and-service benefit, or dies.

A new disability standard will be applied to disability recipients (excluding Law Enforcement division disability recipients) whose application for disability was received by the retirement system on or after January 7, 2013. Disability benefit recipients will be evaluated under an "own occupation" standard (at the time of application and for the first three years of disability). This time period may be extended from three years to five years, if the recipient is receiving rehabilitative services acceptable to a physician selected by the Board. The "own occupation" standard requires the benefit recipient to be physically or mentally incapable of performing the duties of his/her last public position. Subsequent to the three-year or five-year period, the benefit recipient is evaluated under an "any occupation" standard. The "any occupation" standard for terminating a benefit requires the benefit recipient to be physically or mentally incapable of performing the duties of any position that meets the following criteria:

1) Replaces at least 75% of the recipient's inflation-adjusted FAS;

2) Can reasonably be found in the recipient's regional job market; and

3) The recipient is qualified to perform based on the recipient's experience or education.

Members covered under the original plan must apply for disability benefits prior to turning age 60 (or age 62 for members in retirement Group C). Under the original plan, the amount of the disability allowance is based on the member's FAS and total service credit, plus the length of time between the effective date of disability and age 60 (or 62). The disability benefit cannot exceed 75%, nor be less than 30%, of the member's FAS. The disability benefit continues for the member's lifetime as long as the qualifying disability persists. The benefit is funded by the employee's accumulated contributions and reserves accumulated from employer contributions. The benefit is fully taxable until age 60 (or 62), after which a specified dollar amount each month, representing the return of previously taxed contributions, is tax-free. For a law enforcement member disabled due to an on-duty injury or illness, 30% of the benefit payment is excludable from taxable income.

Under the revised plan, the disability allowance is based on the member's FAS and service credit. The disability benefit cannot be less than 45%, or exceed 60%, of the member's FAS. The benefit is funded by reserves accumulated from employer contributions, and is fully taxable. For a law enforcement member disabled due to an on-duty injury or illness, 45% of the benefit payment is excludable from taxable income.

Benefits under the revised plan are payable for only a definite period of time, depending on the member's age on the benefit effective date. When the disability benefit ends, the member may apply for a service retirement benefit or a refund of their account. The service retirement benefit amount is the greater of: a) 2.2% of FAS multiplied by the years of service (contributing and disability) not to exceed 45% of FAS; or b) the regular or law enforcement benefit calculation using only the member's years of contributing service.

The disability benefit for Combined Plan members is calculated using the same formulas and criteria described above. Those members are required to transfer their individual defined contribution accounts to the Traditional Pension Plan to fund the benefit.

Members who apply for a disability benefit on or after January 7, 2013 are required to apply for Social Security Disability Insurance (SSDI). If a member is determined to be eligible for SSDI benefit, they may be subject to an offset to the extent that the member's OPERS disability benefit plus the SSDI benefit exceed the member's FAS, adjusted for inflation. The offset does not apply to a disability recipient who is a law enforcement member or who has at least five years of service credit for periods during which the recipient had earnings from other employment that was taxable under the Federal Insurance Contributions Act.

### Survivor Benefits

A member's beneficiary is determined by statutory automatic succession unless a specific designation is made in writing on a form provided by OPERS. Listed below is the order of automatic succession under Ohio law:

1) Spouse,
2) Children,
3) Dependent parents,
4) If none of the above, parents share equally in a refund of the account; and
5) If none of the foregoing, a refund of the account is paid to the estate.

Qualified beneficiaries will be eligible to receive monthly survivor benefits if, at the time of the member's death, at least one of the following qualifications was met:

1) The member had 18 months of Ohio service credit with three of those months within the two and one-half years immediately before death; or
2) The member was receiving a disability benefit from OPERS; or
3) The member was eligible for retirement but did not retire.

If none of these qualifications was met at the member's death, a refund of the member's OPERS account value as defined by the Ohio Revised Code may be made. The member's beneficiary may choose a refund of the member's account only if there are no children eligible for monthly benefits. If the member dies while receiving a disability benefit under the original plan and eligible survivors select a cash refund of the account, the amount is reduced by the amount of disability benefits that had already been paid. There is no reduction in amount if the member dies while receiving a benefit under the revised disability plan or while still working.

Qualified surviving spouses (with no children eligible for monthly benefits) may receive a benefit representing the greater of $250 a month or an annual benefit equal to 25% of the decedent's FAS. If the decedent had 20 or more years of service, the percent of FAS increases with each year of service over 20 up to a maximum of 60%. Benefits begin when a qualified surviving spouse reaches age 62, or at any age if the decedent had 10 or more years of Ohio service credit, qualifying children, or the spouse is adjudged physically or mentally incompetent. Benefits to a qualified survivor terminate when the survivor ceases to meet eligibility requirements.

If a deceased member was eligible for a service retirement benefit at time of death, a surviving spouse or other sole dependent beneficiary may elect to receive a monthly benefit calculated as though the member had retired and elected the Joint Life Plan with 100% to the survivor. This joint survivor option provides a monthly allowance that continues through the beneficiary's lifetime. The beneficiary also has the option of electing a PLOP.

A child of a deceased member may qualify for monthly benefits if the child has never been married and is under age 18, or 22, if a qualified student attending an accredited school. House Bill 520, effective April 5, 2017, removes the education requirement and allows children of deceased members to receive a survivor benefit until the age of 22. A child who is adjudged physically or mentally incompetent at the time of the member's death is eligible for benefits regardless of age. Benefits terminate upon the child's first marriage, adoption by someone other than a step-parent, abandonment, death, or during active military service.

A dependent parent is one who received at least one-half support from the member during the 12 months preceding the member's death. A dependent parent may receive survivor benefits if age 65 or older, or at any age if adjudged physically or mentally incompetent at the time of the member's death. Survivor benefit payments terminate upon the parent's death.

The eligible survivors of Combined Plan members may elect to receive monthly survivor benefits. The survivor benefit is calculated using the same formulas and criteria described above, and the member's defined contribution account is transferred to the Traditional Pension Plan to fund the benefit.

## Additional Benefits

### Cost-of-Living Adjustment (COLA)

When a benefit recipient has received benefits for 12 months, an annual COLA is provided. This COLA is calculated on the base retirement benefit at the date of retirement and is not compounded. For those who retired prior to January 7, 2013, the COLA will continue to be a 3% simple annual COLA. For those retiring subsequent to January 7, 2013, beginning in calendar year 2019, the COLA will be based on the average percentage increase in the Consumer Price Index, capped at 3%.

### Death Benefit

Upon the death of an age-and-service or disability benefit recipient, a lump-sum death benefit is paid to the qualified beneficiary. The benefit ranges from $500 to $2,500 based on the recipient's years of service credit.

### Qualified Excess Benefit Arrangement

Total benefit payments to an individual are subject to the limitations identified in Section 415(b) of the Internal Revenue Code. In 2003, OPERS implemented a Qualified Excess Benefit Arrangement (QEBA) that allows OPERS recipients to receive the amount of their benefit that is subject to the IRS limits.

### Refunds

A refund may be issued after three months have elapsed since the member terminated public service (House Bill 520, effective April 5, 2017, changes this requirement to two months). For members of the Traditional Pension Plan, the refund value is equal to their member contributions plus interest. Members of the Combined Plan may refund their defined contribution account balance comprised of member contributions and investment gains or losses on those contributions, and any member contributions plus interest in the defined benefit portion of the plan arising from the purchase of eligible service. Members of the Traditional Pension Plan and the Combined Plan may also qualify for an additional amount calculated on their eligible contributions. If the member has at least five but less than 10 years of qualified service credit in the plan, the additional amount is 33% of the member's eligible contributions. Members with at least 10 years of qualified service credit in the plan may receive an additional amount equal to 67% of eligible contributions.

Under the Traditional Pension Plan, full recovery of all employee contributions to OPERS is guaranteed. If the individual is eligible for a monthly retirement benefit and is legally married at the time the refund application is filed, spousal consent is required. A Traditional Pension Plan member who is also a member of the State Teachers Retirement System of Ohio or the School Employees Retirement System of Ohio is not required to refund from all systems at the time the member seeks a refund from OPERS.

Refunded service credit may be restored in the Traditional Pension Plan and the Combined Plan if the member returns to OPERS-covered employment for at least 18 months in the plan from which the refund was issued. The amount refunded, including interest and the additional amount (if applicable), must be repaid for service credit to be restored. The member must also pay interest (compounded annually) at a rate determined by the Board for the period from the date of refund to the date the refunded amount is repaid.

## Benefits under the Member-Directed Plan

### Retirement

Members participating in the Member-Directed Plan are eligible to retire after they reach age 55. The current vested value of the individual account is available at retirement. The balance can be converted to a lifetime annuity through OPERS; or a portion of the balance can be converted to an annuity through OPERS and the remainder can be rolled over to another eligible retirement plan or made payable to the member with taxes withheld.

### Disability and Survivor Benefits

Participants in the Member-Directed Plan are not eligible for disability or survivor benefits. In the event of disability or death, the vested portion of the member's individual account is available for refund to the member or qualified beneficiaries.

### Refunds

A refund may be issued after three months have elapsed since the member terminated public employment (House Bill 520, effective April 5, 2017, changes this requirement to two months). Members participating in the Member-Directed Plan may receive employee contributions and investment gains or losses on those contributions. Depending on length of participation in the Member-Directed Plan, a member may also receive a portion of the employer contributions, plus any investment gains or losses on those contributions, based on the schedule on the next page.

| Years of Participation | Percent Vested |
|---|---|
| Less than 1 year | 0% |
| 1 year | 20% |
| 2 years | 40% |
| 3 years | 60% |
| 4 years | 80% |
| 5 or more years | 100% |

## Coverage and Benefits for Re-employed Retirees

After a member retires, re-employment in an OPERS-covered job, including service in an elected position, is permitted but may affect continuing receipt of an age-and-service retirement benefit. Contributions must begin from the first day of re-employment, however members who are re-employed anytime within the first two months after their effective retirement benefit date will forfeit their retirement allowance during this two-month period. This prohibition applies even if salary is waived for the two-month forfeiture period. OPERS health care coverage is also not available during any period of pension forfeiture, and contributions remitted during the two-month forfeiture period will not be included in the calculation of a Money Purchase Plan benefit.

An OPERS retiree who returns to work in an OPERS-covered position must enroll in the employer's health care plan if the employer offers a plan to other employees in similar positions. After the two-month forfeiture period, the retiree may continue his/her participation in an OPERS health care plan. The coverage provided by the employer plan is primary and the OPERS coverage is secondary. Federal law prohibits retirees from being covered by the OPERS health care plans as secondary coverage if the retiree is enrolled in a high deductible health plan and a health savings account. If the OPERS retiree is over age 65 and employer-sponsored coverage is not available, the retiree may either elect to participate in the OPERS-sponsored coverage offered to re-employed retirees or forgo funding and reimbursement in the Health Reimbursement Arrangement (HRA) during the period of re-employment. The HRA was established for the OPERS Medicare Connector. Refer to the Health Care Coverage for Traditional Pension Plan and Combined Plan section on the next page for more information on the OPERS Medicare Connector.

Retirees cannot continue to receive benefits and work as an independent contractor under a contract for any period of time for the employer from which they retired. This prohibition is applicable regardless of the number of hours or days actually worked. A retiree may be compensated under a contract for services as an independent contractor for another public employer. If this occurs within the first two months of retirement, he or she will forfeit pension benefits for the entire period of service as an independent contractor.

During re-employment, the retiree participates in the Money Purchase Plan. Upon termination of re-employment, retirees under age 65 may receive a refund of their Money Purchase account consisting of their employee contributions made during the period of re-employment, plus interest. Retirees age 65 and older may receive an annuity benefit that is based on the amount of their employee contributions during the period of re-employment plus interest, and an amount from the employer's contributions established by the Board. The additional amount paid from employer contributions is currently set at 67% of the employee contributions and interest. Payment options are the same as those described under the Age-and-Service Retirement section.

## Health Care Coverage for Traditional Pension Plan and Combined Plan

With one exception, OPERS-provided health care coverage is neither a guaranteed nor statutorily required benefit. Medicare Part A equivalent coverage or reimbursement for eligible retirees and their eligible dependents is currently required by Ohio law.

### Eligibility

Members that applied for age-and-service retirement with effective dates of December 1, 2014, or earlier, and who had 10 or more years of service credit, had access to OPERS-provided health care coverage on a subsidized basis. Beginning January 1, 2015, members must be at least age 60 with 20 years of qualifying service. Members in Group A are eligible for coverage at any age with 30 or more years of qualifying service. Members in Groups B and C are eligible for coverage at any age with 31 and 32 years of qualifying service, respectively. See the Age-and-Service Retirement section beginning on page 230 for a description of Groups A, B and C.

Qualifying service credit for determining eligibility to participate in the health care plans includes the following types of credit: contributing service, other Ohio retirement system service transfers, interrupted military (USERRA), unreported time, and restored (refunded) service. Beginning January 1, 2014, contributing service credit for health care will be accumulated only if the member's eligible salary is at least $1,000 per month. Partial health care credit will not be granted for months in which eligible salary is less than $1,000. Credit earned prior to January 2014 will not be affected by this requirement.

In addition to retirees, access to health care coverage is also available for disability recipients and primary survivor recipients. Spouses and dependents of eligible recipients, as defined in rules governing the health care plans, may be covered through additional premiums.

Recipients of disability benefits prior to January 1, 2014 have continued access to health care coverage while the disability benefit continues and will not be subject to the five-year rule described below. The allowance will be determined in the same way as an age-and-service retiree. If the recipient does not meet minimum age-and-service requirements, the minimum allowance will be used. Recipients with an initial disability effective date on or after January 1, 2014, will have coverage during the first five years of disability benefits. After five years, the recipient must meet minimum age-and-service health care eligibility requirements or be enrolled in Medicare due to disability status to remain enrolled in OPERS health care. If enrolled, the allowance will be determined in the same way as an age-and-service retiree.

### Coverage Options

In 2015, OPERS provided monthly allowances for health care coverage for retirees and their eligible dependents, both over and under the age of 65, based on the retiree's Medicare status. For those retiring on or after January 1, 2015, the allowance (subsidy) provided by OPERS will be based on age and years of qualifying service credit when a recipient first enrolls in OPERS health care. At the completion of a three-year transition that ends in 2018, monthly allowances will range between 51% and 90% of the full monthly premium and the same allowance table will be used for all retirees. Those who retired prior to January 1, 2015, with an allowance at or above 75%, will not have an allowance below 75%. Members retiring at any age with 30 (based on retirement group) or more years of qualifying service will have at least a 71% allowance.

Beginning in 2016, OPERS ceased offering the group plan for medical and pharmacy to Medicare-eligible retirees. Instead, their allowance is deposited to an HRA account and may be used to reimburse the cost of coverage selected through the OPERS Medicare Connector. The OPERS Medicare Connector is a relationship with a vendor selected by OPERS and tasked with assisting retirees, spouses and dependents with selecting a medical and pharmacy plan. OPERS introduced the OPERS

Medicare Connector in 2015, with an effective date of January 1, 2016, for Traditional Pension Plan and Combined Plan retirees enrolled in Medicare Parts A and B. OPERS continues to offer a self-insured medical plan and prescription drug plan for non-Medicare participants.

Over a three-year period that began in 2015, spouses are transitioning from their 2015 monthly allowance to zero as the allowance provided to spouses is being phased out. Spouses who are not yet eligible for Medicare will have access to OPERS group coverage at full cost through at least 2020. Spouses who are eligible for Medicare will have access to the OPERS Medicare Connector beginning in 2016. If the retiree has at least 20 years of qualifying service and is enrolled in OPERS health care, children (up to age 26) will receive half of the retiree's allowance percentage. If the recipient has less than 20 years of qualifying service, children (up to age 26) will transition from the 2015 allowance to zero over three years (2015 through 2017) and then will be ineligible.

### Medicare Part A

OPERS reimburses retirees who do not have premium-free Medicare Part A (hospitalization) for their Part A premiums as well as any applicable surcharges (late-enrollment fees). Retirees within this group must enroll in Medicare Part A and select medical coverage, and may select prescription coverage, through the OPERS Medicare Connector. OPERS also will reimburse 50 percent of the Medicare Part A premium and any applicable surcharges for eligible spouses. Proof of enrollment in Medicare Part A and confirmation that the retiree is not receiving reimbursement or payment from another source must be submitted. The premium reimbursement is added to the monthly pension benefit.

### Medicare Part B

Recipients and their covered dependents who are enrolled in OPERS health care must enroll in Medicare Part B (medical) when they become eligible in order to participate in a plan sponsored by OPERS.

OPERS provides for reimbursement of eligible retiree Medicare Part B premiums at an amount approved by the Board. Eligible retirees may receive reimbursement of the actual premiums paid up to a maximum of the Board-approved rate for as long as the retiree is enrolled in the plan. (OPERS does not provide this reimbursement benefit to retiree spouses.) Proof of enrollment in Medicare Part B and confirmation that the retiree is not receiving reimbursement or payment from another source must be submitted. The premium reimbursement is added to the monthly pension benefit. For calendar year 2016, the reimbursement was set at $31.81 per month. This reimbursement will be completely eliminated by 2017.

### Low Income Discount

Recipients not yet eligible for Medicare with household income at or below 200% of the poverty level may apply for a 30% reduction in the cost of medical and pharmacy premiums.

### Dental and Vision Coverage

Recipients and dependents also have access to dental and vision coverage. These are fully insured products with the retiree paying the total cost of coverage, including premiums, plan deductibles, and out-of-pocket expenses.

## Retiree Medical Account (RMA) for Member-Directed Plan Participants

Members participating in the Member-Directed Plan have a portion of the employer contribution credited to an individual Retiree Medical Account (RMA). In 2016, the account earned a fixed annual interest rate established by the Board. Members with an account prior to July 1, 2015, become vested in the account at a rate of 20% for each year of participation until the member is fully vested at the end of five years. For members establishing accounts on or after July 1, 2015, the vesting schedule is below. Upon a refund or retirement, distribution of the vested balance in the member's RMA may be used for the reimbursement of qualified medical expenses.

| Years of Participation | Percent Vested |
|---|---|
| 0-5 years | 0% |
| 6 years | 10% |
| 7 years | 20% |
| 8 years | 30% |
| 9 years | 40% |
| 10 years | 50% |
| 11 years | 60% |
| 12 years | 70% |
| 13 years | 80% |
| 14 years | 90% |
| 15 years | 100% |

Beginning January 1, 2017, interest on the RMA will accrue only if the investment portfolio containing the RMA assets earns a return greater than zero in the prior year.

**Note:** The information contained in this section is intended to be a summary only. More complete details can be obtained through OPERS. This document reflects information as of the date listed and approved changes. All plans are subject to change. Health care is not a statutorily guaranteed benefit and as such the Board has the discretion to review, rescind or modify the health care plans at any time. There is no promise, guarantee, contract, or vested right to health care coverage or a premium allowance.