

2019

Comprehensive Annual Financial Report *for the year ended* December 31, 2019



Ohio Public Employees Retirement System

2019

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Ohio Public Employees Retirement System

Prepared by OPERS Finance Division Staff

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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 217.

Annual report organization

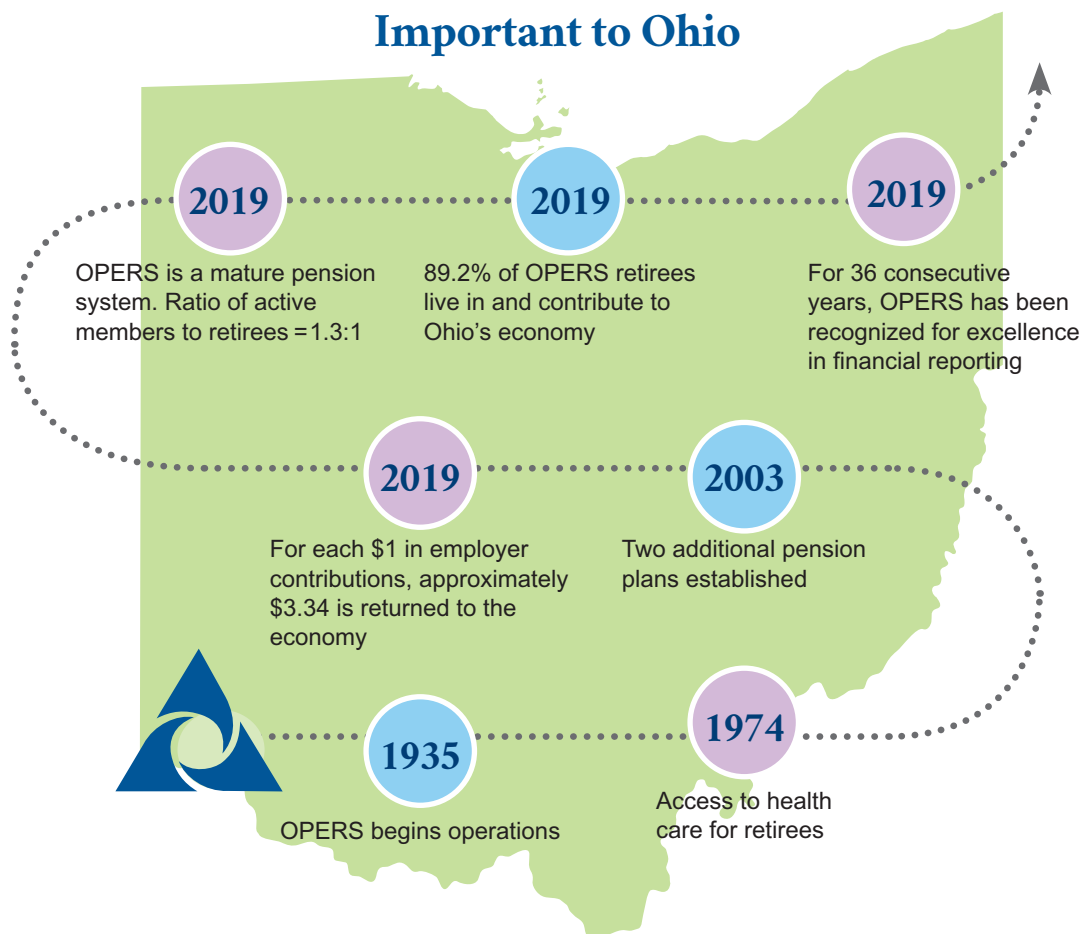
This annual report is divided into six sections, listed as each appears in this document:

- 1 Introductory Section**—with the Letter of Transmittal, organizational chart, and recognition awards garnered in 2019
- 2 Financial Section**—with the Independent Auditors' Report, Management's Discussion and Analysis, the financial statements of the System, Required Supplementary Information 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 valuations for pension and health care
- 5 Statistical Section**—with significant data pertaining to the System
- 6 Plan Statement**—with membership information and details about the retirement plans offered through OPERS

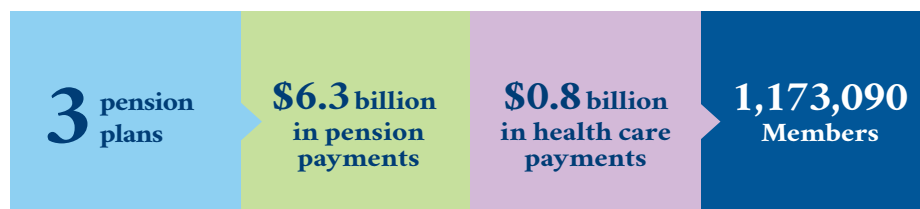
Introductory Section

OPERS was established in 1935—prior to the Social Security Administration. Since that time, OPERS has grown in service to Ohio's public employees and has become a national economic engine.

In strong or volatile financial landscapes, OPERS has consistently met its commitment to members. When strong financial markets were sustained, the program was enhanced. When change was needed, OPERS worked to create incremental adjustments to minimize impact on members. In every year from 1935 through 2019, OPERS delivered on the mission of providing a secure retirement to our members—having the courage to expand when prudent and adjust when necessary.



2019 Facts



Board of Trustees members as of January 2020



Stairs, left to right: James Tilling, General Assembly Appointed Investment Expert; Matthew Damschroder, Director Department of Administrative Services (Statutory Member); Harold Charles Elliott, Governor-Appointed Investment Expert; Tim Steitz, Representative for Retirees; Lance Osborne, Treasurer-Appointed Investment Expert

Bottom row, left to right: Julie Albers, Representative for County Employees; Chris Mabe, Representative for State Employees and Board Vice Chair; Randy Desposito, Representative for Non-Teaching College/University Employees; Cinthia Sledz, Representative for Miscellaneous Employees; Steve Toth, Representative for Retirees; Ken Thomas, Representative for Municipal Employees and Board Chair

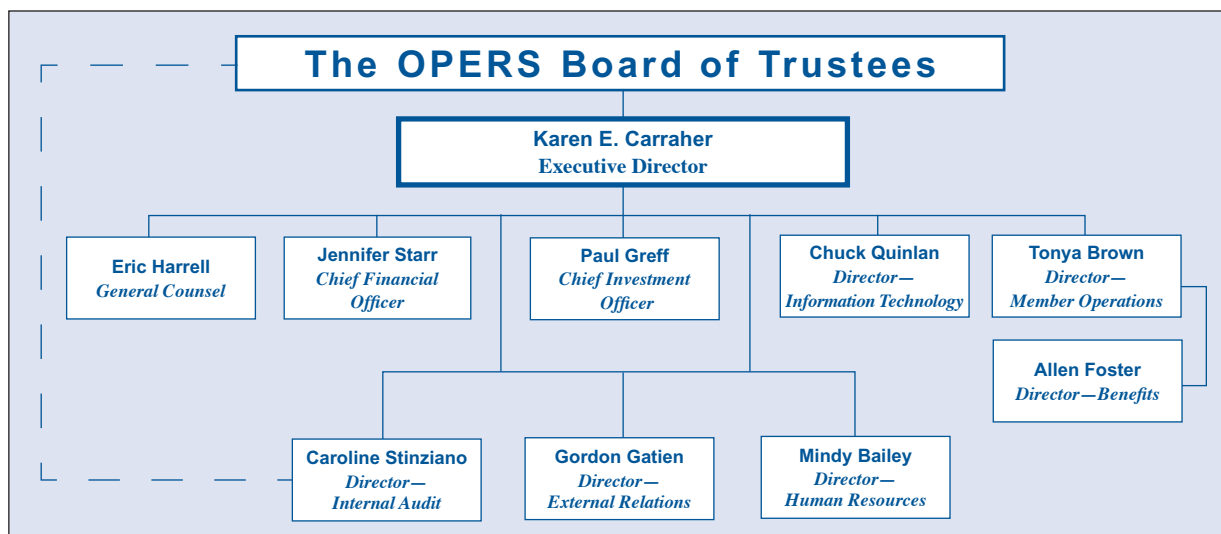
Following state guidelines, the OPERS building was closed in late March—May 2020. Image shown here is from 2018 CAFR.

The 11-member Board of Trustees 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 elected 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 typically meets monthly and receives no compensation, but is reimbursed for necessary expenses.



Leadership Team



Leadership Team (left to right): Eric Harrell, General Counsel; Tonya Brown, Director—Member Operations; Jennifer Starr, Chief Financial Officer; Gordon Gatien, Director—External Relations; Allen Foster, Director—Benefits; Karen Carraher, Executive Director; Chuck Quinlan, Director—Information Technology; Paul Greff—Chief Investment Officer; Caroline Stinziano, Director—Internal Audit; Mindy Bailey, Director—Human Resources

Following state guidelines, the OPERS building was closed in late March—May 2020. Image shown here is from 2018 CAFR.

Advisors to the Board of Trustees

Investment Policy

NEPC, LLC

Cambridge, Massachusetts

AON Hewitt Investment Consulting, Inc.

Chicago, Illinois

Actuary

Gabriel, Roeder, Smith & Company

Southfield, Michigan

Auditor

CliftonLarsonAllen LLP

Toledo, Ohio

(under contract with the Auditor of State)

See pages 102-105 for a list of investment commissions, fees and external asset managers.



Ohio Public Employees Retirement System

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

June 8, 2020

Dear Chairman and Members of the Board of Trustees:

On behalf of all management and staff, it's our pleasure to present you with the *2019 Comprehensive Annual Financial Report* (CAFR or annual report). This document reflects the ongoing commitment of activities undertaken by the Ohio Public Employees Retirement System (OPERS or System) for the fiscal year ended December 31, 2019.

Fiscal year 2019 marked a year of significant progress. The investment markets were very strong, resulting in positive returns that exceeded expectations. The OPERS Board of Trustees finalized plans for future changes that will improve the funding of the System and set the organization on a path to better weather ongoing challenges. Member and retiree outreach as well as education and communication efforts were at a record level. During 2019, actions were initiated that, once approved, will set the course for the System for the next decade.

OPERS is a mature plan—meaning we have almost as many retirees as we have active members. As of the end of 2019, the ratio of working active members to retirees was 1.3 to 1.0 compared to a decade ago of 2.0 to 1.0. Managing a mature system demands we proactively address challenges including:

- Being more impacted by investment market downturns,
- Having to maintain a higher level of liquidity,
- Having fewer active members supporting the unfunded debt,
- Having less ability to make changes to active members that will yield meaningful reductions in liabilities, and
- Providing financial support to our members for health care.

While all these challenges, and many others not listed, are daunting, we know that only by facing challenges proactively, structuring incremental steps, evaluating our progress and adjusting our action plan can we address challenges and maintain steady progress toward funding the plan. We regularly work with our members and stakeholders to find solutions and keep each informed.

As we work to address challenges, we remain grounded by five overarching plan goals—designed to help us evolve. Specifically, the goals are:

- Provide a stable pension for all OPERS retirees
- Continue to provide a meaningful retiree health care program
- Minimize drastic plan design changes
- Be financially positioned to react to market volatility
- Maintain intergenerational equity

The 2019 activities reported here illustrate our focus and progress on the path to move OPERS forward in continuing to deliver on our promise of providing a secure retirement for our members—present and future.

Overview of OPERS

OPERS was established and exists solely for the purpose of providing retirement, disability and survivor benefits to Ohio public employees. Created by legislation in 1933, OPERS began operations January 1, 1935, prior to the Social Security Administration. In 1974, OPERS added access to health care—an element of significant importance to retirees—yet health care is neither mandated nor guaranteed. In 2003, OPERS increased the pension plan options offered to three distinct plans. More information on current benefits can be found in the Plan Statement starting on page 217.

As of year-end 2019, OPERS served approximately 1,173,000 members, including 215,000 retirees and beneficiaries. In addition, the System works with approximately 3,700 public employers. With a net asset base of \$106.3 billion, OPERS is the largest public pension system in Ohio and the 12th largest public pension system in the nation. These numbers clearly demonstrate OPERS' importance as an economic driver for the state of Ohio.

Pension Funding

As of December 31, 2019, the date of the latest actuarial valuation, OPERS was 79.5% funded, which is an improvement over the prior year's 77.5% funded level. The improved funding position relates entirely to strong investment returns in 2019. The funded ratio is a key measure of the System as it reflects OPERS has accumulated approximately 80% of the assets necessary to fund the liability for both active and retired members. By law, OPERS is obligated to pay the benefits that have commenced with retirees. To make these payments each year, OPERS transfers funds from the active member funding (the Employers' Accumulation Fund) to the retired member funding (the Annuity and Pension Reserve Fund and the Survivors' Benefit Fund). Thus, the active member funding is 44%. The amortization period reflects how long it will take to fund remaining liabilities based on the current actuarial assumptions. With the 2019 results, the OPERS amortization period decreased from 27 years to 23 years.

Prior to the completion of the 2019 fiscal year, OPERS had initiated steps to review the long-term funding plan and to adjust that plan to address the growing unfunded liability. As of the end of 2018, following a down investment market and a reduction in the forward-looking long-term pension investment return assumption from 7.5% to 7.2%, the unfunded

liability had reached an all-time high of \$24.4 billion. The Board adopted a plan (discussed in the Key Activities in 2019 section on page 10) that includes multiple steps to address the unfunded liability. Following the adoption of that plan, calendar year 2019 wrapped up with an unfunded liability of \$22.8 billion. The reduction in the unfunded liability is a result solely from the favorable 2019 investment returns.

Board-approved components of the plan to reduce the unfunded liability require legislative approval. Because the plan has not yet been enacted, the targeted improvement to the unfunded liability has not been realized. Therefore, to further improve the funding position, the System will need legislative approval to enact changes designed to reduce the \$22.8 billion unfunded liability. As always, the System will work responsibly and in partnership with members to address the concerns that are inevitable when change is proposed.

The Actuarial Section, beginning on page 135, provides complete schedules of funding progress for pension and health care.

Investments

Investment results are always an important focus since investment returns provide approximately two-thirds of the funding for a retiree's ultimate pension. The key components of investment management for a portfolio such as OPERS' are asset allocation and diversification, both of which are regularly reviewed.

OPERS' continuing investment goal is to attain a return over the long term that will provide adequate funding for benefits. We recognize that yearly returns will vary with the market volatility, but the goal is to structure an investment portfolio that will provide long-term returns. This long-term approach is balanced keeping in mind the short-term liquidity needs.

Overall, 2019 was a very strong year. The total OPERS portfolio for 2019 returned 17.59%. The 2019 return exceeded the target actuarial return of 7.20% and was slightly above the benchmark return of 17.40%. While the 2019 return of 17.59% was very positive, it also illustrates the ongoing market volatility when comparing the strong 2019 return to the negative return of 2018 of -3.38% and to the positive return of 2017 of 16.62%.

OPERS' total portfolio is made up of underlying portfolios that fund pension benefits and the health care program. These underlying portfolios have different asset allocations; thus, their investment returns will vary.

The underlying investment portfolios are: the Defined Benefit portfolio, the Defined Contribution portfolio, and the Health Care portfolio. By portfolio, the 2019 returns were:

- Defined Benefit portfolio returned 17.23%, compared to the benchmark return of 17.06%, and the anticipated actuarial funding plan rate of 7.20%.
- The Defined Contribution portfolio returned 21.74%, compared to the benchmark return of 21.66%.
- The Health Care portfolio returned 19.59%, compared to the benchmark return of 19.20%, and the anticipated actuarial funding plan rate of 6.00%.

A complete discussion of investment returns, activities, asset allocation strategy, safeguards, and policies governing those activities can be found in the Investment Section, beginning on page 89. Additionally, information on investment fees and commissions can be found beginning on page 102.

Long-Term Assumed Rate of Return

To achieve the required funding necessary to provide pension benefits and health care coverage, OPERS collects member and employer contributions and invests those assets. The investment assets are expected to earn a targeted investment return over the long term. As the System has matured, investment earnings have become the largest source of funding for member benefits.

Establishing the long-term investment return assumption is an important element in managing the funding. OPERS has independent actuarial consultants perform periodic evaluations of the reasonableness of all funding assumptions and make recommendations. Establishing the long-term investment return assumption (also referred to as the discount rate) involves forward looking market projections. While the full assumption study, referred to as the experience study is performed every five years, the independent actuarial consultants review the reasonableness of assumptions every year to ensure that market conditions and other events do not necessitate a change in assumptions.

OPERS' last experience study was completed in 2016 and was based on a review of the period 2010-2015. At that time, the forward-looking long-term pension investment return assumption was reduced from 8.0% to 7.5%. In October 2018, the long-term investment return assumption for pension was modified from 7.5% to 7.2%, based on changes in the market outlook. Similarly, the long-term investment return assumption for health care was reduced from 6.5% to 6.0%. The Health Care portfolio long-term investment earnings assumption is lower than the pension portfolio as the Health Care portfolio has a shorter duration. Thus, the Health Care portfolio has more liquid assets and excludes the illiquid assets that provided relatively favorable returns for the pension portfolio. OPERS does not anticipate additional changes to be considered until the next scheduled experience study to be completed in 2021 unless investment market conditions deteriorate substantially.

Establishing a realistic long-term investment earnings assumption is a responsible and necessary function to adequately fund the plan. Too high of an assumption will ultimately result in benefit reductions, while too low of an assumption may result in an overcorrection through benefit changes. Either will result in a mismatch of funding burden on future generations for today's obligations. Thus, continued monitoring and assessment of assumptions is a responsible action and a best practice in managing the System.

Changes to the long-term assumed rate of return have a significant impact on the liabilities. The 2018 change in the long-term assumed rate of return for the pension portfolio from 7.5% to 7.2% increased the pension liabilities by \$3.4 billion. Similarly, the reduction in the long-term assumed rate of return for the Health Care portfolio from 6.5% to 6.0% increased the health care liabilities by \$1.0 billion. These decisions, while challenging, demonstrate the System's commitment to our mission.

Health Care Funding—Health Care Preservation Plan 3.1

Although health care is neither mandated nor guaranteed, the Board, management and staff, recognize the importance to our members of providing access to meaningful health care as it is a significant component of a secure retirement. This dedication to 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 health care costs continue to increase significantly faster than inflation.

Two major issues combined to create the immediate health care challenge. First, we anticipate that health care expenses will continue to grow as the number—and life expectancies—of our retirees continues to grow. Second, the funding status of the pension requires that all contributions be allocated to improve the pension funding. Thus, until the pension funding improves there is no funding source for health care for the foreseeable future. As a result, we are working with members, retirees and stakeholders to evaluate additional changes to extend the time the current health care trust can fund health care expenditures.

As of December 31, 2018, the date of the most recent health care valuation, health care liabilities exceeded the assets accumulated to fund the liabilities by \$6.2 billion. We must be realistic: The combination of existing and projected health-care expenditures, coupled with the current restriction that OPERS cannot actively contribute to the health care fund, means that the current health care trust fund is expected to last only approximately 11 years.

To address the lack of health care funding, the OPERS Board initiated a review of the health care program beginning in 2018. This project, referred to as Health Care Preservation Plan 3.1 (HCPP 3.1), culminated in recommendations in 2019, and subsequent approval in the first quarter of 2020. A high-level summary of changes to the health care program are described in the next section.

Key Activities in 2019

A Comprehensive Plan to Reduce the Unfunded Liability

During 2019, the OPERS Board approved a four-part plan with a goal of reducing the unfunded pension liabilities. As noted previously, the pension unfunded liability as of the end of 2018 was \$24.4 billion, the highest unfunded liability in OPERS history. The plan consists of the following:

Proposed Retiree Cost-of-Living Adjustment Freeze

The first component of the plan is a two-year freeze on retiree cost-of-living adjustments (COLAs) for the calendar years 2022 and 2023. A significant portion of the unfunded liability relates to retiree benefits and the two-year freeze on the COLA helps provide intergenerational equity. This proposal would also modify COLAs for new retirees as of 2022 to begin 24 months after retirement rather than the current 12 months. This component of the plan has been approved by the Board. However, OPERS will need legislative approval to implement the change.

Combined Plan and Member-Directed Plan Changes

The second component of the plan involves changes to the Combined Plan and the Member-Directed (defined contribution) Plan. Beginning in 2022, the Combined Plan

will be consolidated under the Traditional Pension Plan (defined benefit plan) and the Combined Plan option will no longer be available for new hires beginning in 2022. Additionally, the Member-Directed Plan will be modified including the vesting schedule, annuitization, mitigating rate, COLA, and retiree medical account funding. These changes will impact new members hired beginning in 2022. These changes have been approved by the Board and do not require legislative approval. These changes are in the process of being implemented.

New Group D Tier

OPERS will create a new benefit tier for new members hired beginning in 2022. The specifics of this new tier are in discussion with stakeholder groups and will be finalized in 2021. This component requires legislative approval prior to implementation.

Health Care 3.1

Changes to the health care program represent the final component of the plan. These changes, also effective beginning in 2022, will eliminate the current group plan for pre-Medicare retirees and replace it with a health reimbursement account (HRA) augmented by the assistance from a vendor to help members select a plan on the open market. The amount of the HRA allowance would vary based on the member's age at which health care commenced and years of service. The HRA model was put in place for the Medicare retirees in 2015 and has been successful. Changes have also been proposed to allowances for Medicare retirees, beginning in 2022. This component of the plan does not require legislative approval and is in the process of being implemented.

The combination of these four parts to the plan are designed to reduce the cost of both the pension plan and the health care program. The cost reductions are necessary to adequately fund the pension program and to extend the health care program.

Other Key 2019 Activities

Internal processes and investment in technology—The System has an ongoing goal to provide excellent service to the ever-increasing numbers of members without the commensurate increase in staff. The Internal Technology and Business Process Redesign project attained its targeted milestones and was completed in 2019. The internal technology enhancements will provide for more responsive features for members. The result of this multi-year technology improvement is the System's reduction of staff yielding a savings of approximately \$4.5 million.

Outreach and education—Customer service is always a high priority and education is critical during times of anticipated change. We work to ensure all stakeholders—especially current retirees and our members, the retirees of tomorrow—understand the challenges, can provide feedback on options and ultimately understand the outcome. This was especially true during 2019 as we increased our outreach to ensure members and retirees understood the rationale for the need for change as well as the proposed changes. This extensive communication outreach will continue through 2022, the effective date of the proposed changes. We work to provide plain-language information on plan types, benefits options, the financial realities of retirement and more to each audience.

Here's an overview of our outreach and education for 2019:

- Approximately 343,000 members received accurate, personalized, account information via an annual account statement to help ensure each understands the status of benefits earned.
- More than 600 educational seminars were conducted throughout the state and more than 140 webinars.
- The OPERS website attracted more than 1,400,000 individual hits, while the Member Services Call Center fielded more than 425,000 calls.
- Staff conducted specialized seminars throughout the state to educate on the pension and health care funding challenges and to ensure members were informed of the process that will be used to consider options.
- Staff continued to deploy electronic means for communication as well as via email blasts, social media outlets and external website pages.

Impact of 2020

As of the date of this letter, the economic climate has drastically changed in 2020 due to the pandemic COVID-19 crisis. The investment markets have dropped to new lows and the market is extremely volatile. While it is too early to predict the impact of the 2020 investment market and other economic factors on the OPERS investment portfolio and funding position, it is important to note the rapid change from the end of 2019. Accordingly, we recommend the 2019 financial results be understood in the context of the potential impact of 2020.

Report Contents and Structure

This CAFR is designed to comply with the reporting requirements of Governmental Accounting Standards Board (GASB) and in accordance with the 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.

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 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.

Additionally, readers are encouraged to refer to the Investment Section for information on investment policies and strategies, safeguards on investments, and yield.

2019 Financial Highlights

Funded Status: Funded status measures the progress of accumulating the funds necessary to meet future obligations. We are dedicated to maintaining and enhancing the stability of this System. As a result, OPERS has remained in compliance within the legally mandated 30-year funding requirement.

The December 31, 2019 valuation funded status is 79.5%. The unfunded liability is expected to be funded within 23 years on a funding basis. As discussed previously, the improvement in these results reflect the 2019 strong investment market. For more information on assumptions, refer to the Actuarial Section beginning on page 135.

As of the December 31, 2018, health care actuarial funding valuation (the most recent), OPERS was 65.3% funded. In the absence of employer contributions, the health care fund is expected to become insolvent after 11 years.

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 of \$1.5 billion in member and \$2.1 billion in employer contributions for the year ended December 31, 2019. Total net position is \$106.3 billion as of December 31, 2019.

Expenses: Expenses (including pension benefit payments, health care coverage payments and account refunds) for fiscal year 2019 were \$7.6 billion. In 2019, OPERS paid \$6.3 billion in pension benefits and \$0.8 billion in health care to almost 215,000 OPERS retirees and their beneficiaries. Because approximately 90% of all OPERS retirees remain in Ohio, this represents a significant driver for Ohio's economy.

Administrative Costs: OPERS management remains diligent in monitoring and, where possible, reducing or containing expenses. Administrative costs are paid through investment returns generated; our goal is always to be responsible stewards of public funds. Administrative costs in 2019 were \$119.6 million, including investment expenses.

Complete details of all administrative expenses are included in the Financial Section, on page 88. In addition, the Management's Discussion and Analysis, beginning on page 22, has a more detailed discussion of the OPERS funded status and 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

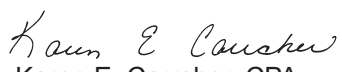
This CAFR is the result of the combined teamwork of the System's staff under the direction of the Board. Our sincere appreciation is extended to all who assisted in and contributed toward the completion of this document.

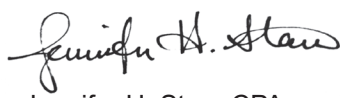
This annual report is designed to provide complete and reliable information for transparent communication and to serve as a resource. We take our fiscal responsibility very seriously. We are effective and diligent managers of the assets held in trust for members of this System.

This organization is led by a dedicated and diligent Board that works tirelessly with OPERS management and staff to help position us for the future. Each of us has a fiduciary responsibility to make decisions in the best interest of all one million members. As stewards of the trust funds, we must take actions and make the responsible decisions that will carry this organization forward so that we can deliver on an important component of financial retirement security for all generations in our membership.

We embrace our responsibilities of being prudent stewards *and* to proactively prepare for the anticipated challenges ahead. To wait for negative financial impacts would be irresponsible in the extreme. We are pleased to report that the activities of 2019 strengthened the System and positioned us for the future. We will continue to take responsible actions to position OPERS to be a strong pension system and we will do this working with members, retirees and stakeholders. We are honored to be associated with, appreciate, and acknowledge the efforts of all involved as, together, we prepare for and step into the future.

Respectfully Submitted,


Karen E. Carraher, CPA
Executive Director


Jennifer H. Starr, CPA
Chief Financial Officer



Jennifer Starr and Karen Carraher standing with 36 years of awards for excellence in financial reporting.

Following state guidelines, the OPERS building was closed in late March—May 2020. Image shown here is from 2018 CAFR.

Introductory Section

Fiduciary Responsibilities

The Board and executive management of OPERS are fiduciaries of the pension and health care 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
Chief Financial Officer
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:

- **2018 Certificate of Achievement**—For the 36th 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, 2018. In order to be awarded a certificate of achievement, a government organization must publish an easily readable and efficiently organized comprehensive annual financial report that satisfies both generally accepted accounting principles and applicable legal requirements.



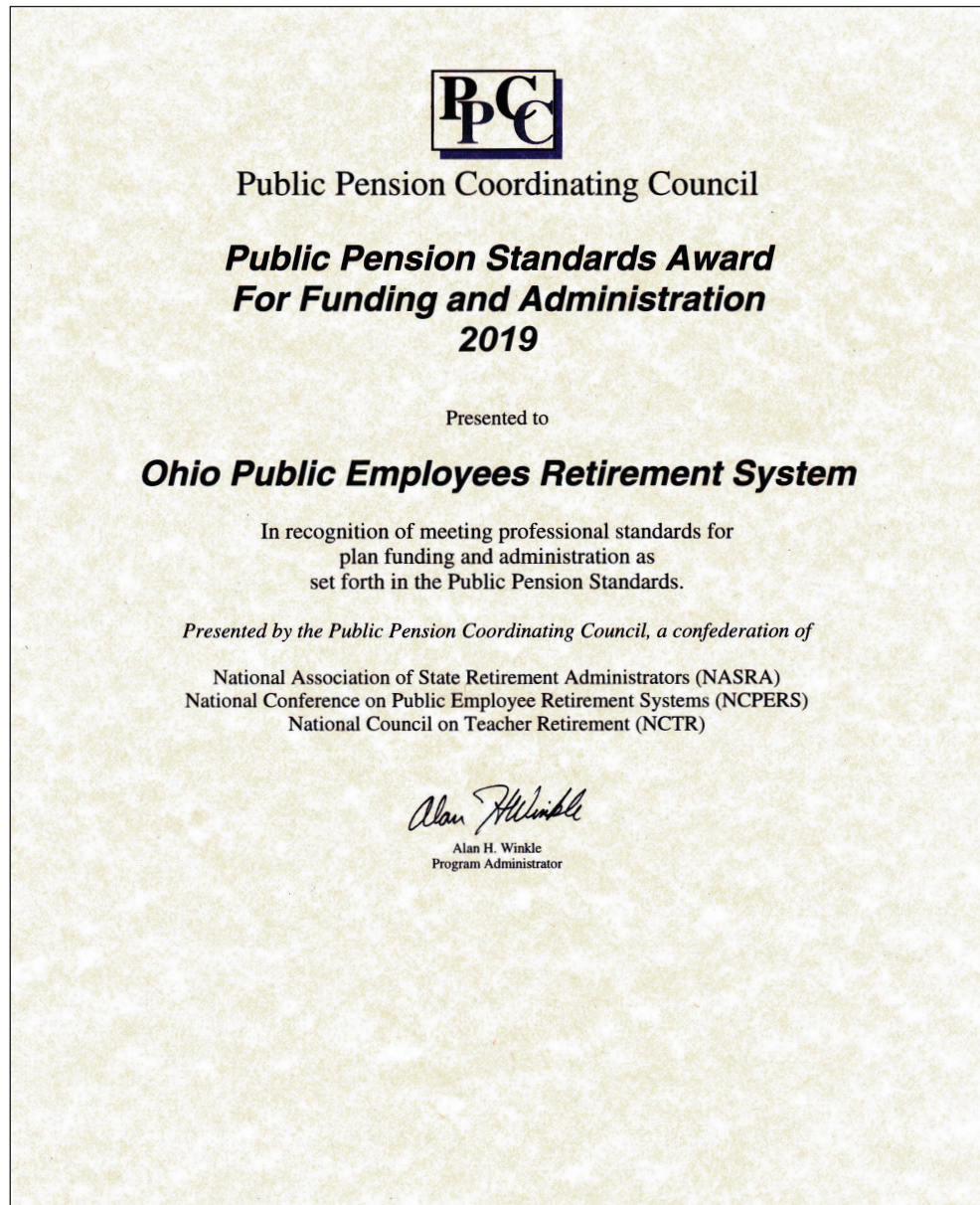
Certificate of Achievement for Excellence in Financial Reporting



- **2018 Award for Outstanding Achievement**—For the ninth consecutive year, OPERS has received the GFOA Award for Outstanding Achievement in Popular Annual Financial Reporting for its popular annual financial report for the fiscal year ended December 31, 2018. 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. OPERS has received this award for each year we have produced a popular annual financial report.

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

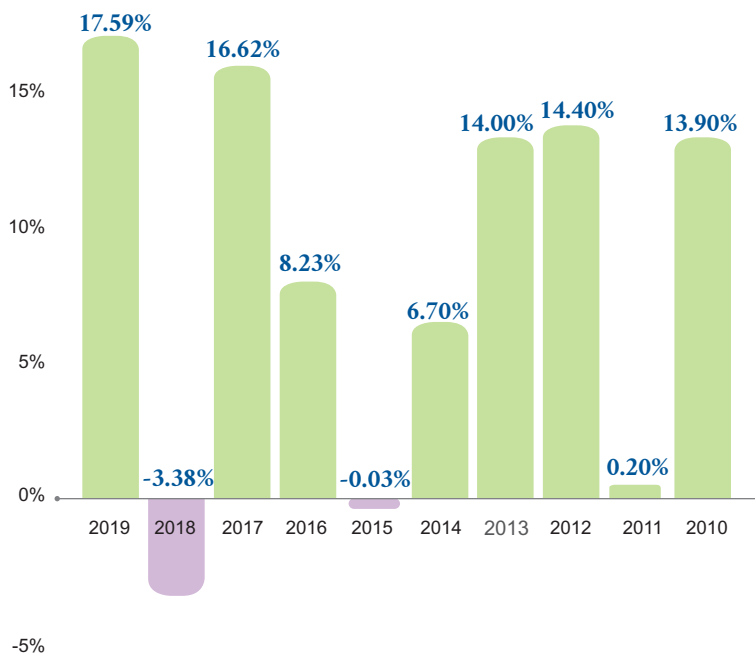
- **2019 Public Pension Standards Award**—Issued by the Public Pension Coordinating Council, this award recognizes OPERS for demonstrating a high level of plan design, funding, member communications and administrative practices. The standards serve as a benchmark by which all public defined benefit plans are managed.

**2019 Public Pension Standards Award**

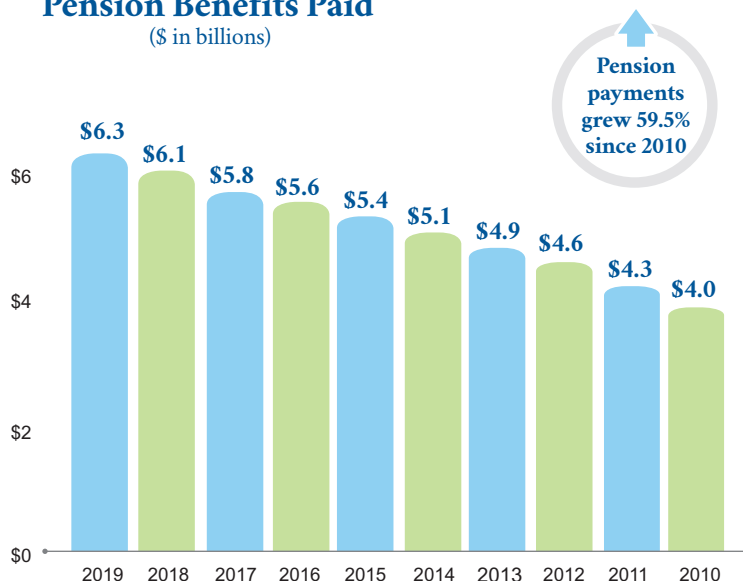
Financial Section

Each year, OPERS receives member and employer contributions and carefully invests those funds over a member's working career. Although some variables are beyond our control such as investment market fluctuations, OPERS meets its commitments. When investment income falls short, we need to liquidate funds from investible assets to pay benefits—meaning fewer funds are available to invest later.

Investment Returns



Pension Benefits Paid (\$ in billions)



Administering the System

Some variables ARE controllable. OPERS works to contain administrative costs—costs paid through investment income. By controlling costs, OPERS maximizes the amount of investible assets in the long run.

\$57

Cost of pension administration per OPERS member

\$74

Peer average for pensions

Per 2019 CEM annual survey

Controlling administrative expenses

As prudent stewards of public trusts, we work to reduce expenses without jeopardizing service:

2019

\$76.2 million

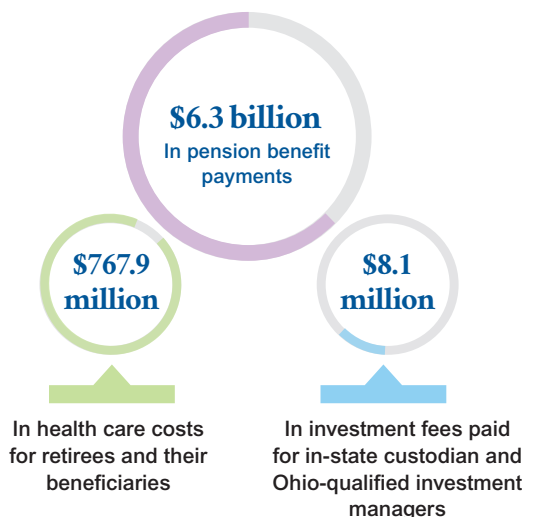
2018

\$76.9 million

2017

\$77.3 million

Where it all goes





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INDEPENDENT AUDITORS' REPORT

Board of Trustees
The Ohio Public Employees Retirement System, and
The Honorable Keith Faber, 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, 2019, and the related combining statement of changes in fiduciary net position for the year then ended and the related notes to the financial statements, 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, 2019, 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.



Board of Trustees
The Ohio Public Employees Retirement System, and
The Honorable Keith Faber, 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 and related ratios – traditional pension plan, combined plan and member directed plan, member and employer contributions – traditional plan, employer contributions – traditional plan, combined plan and member-directed plan, investment returns – defined benefit portfolio, changes in net OPEB liability and related ratios – health care, employer contributions – health care, investment returns – health care portfolio, 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 8, 2020, 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 solely describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of OPERS' 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

Toledo, Ohio
June 8, 2020

The management of the Ohio Public Employees Retirement System (OPERS or System) offers readers of the System's financial statements this narrative overview of the financial activities of OPERS for the year ended December 31, 2019. 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 36.

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 161, 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 Statement of Fiduciary Net Position
2. Combining Statement 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 and Related Ratios—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 Changes in Net OPEB Liability and Related Ratios—Health Care
6. Schedule of Employer Contributions—Health Care
7. Schedule of Investment Returns—Health Care Portfolio
8. 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 the health care trust described beginning below. Please refer to the Plan Statement, beginning on page 217, for a comprehensive description of the plan structures and benefits. These plans 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 hybrid defined benefit/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 annuitize their defined contribution account balances.

 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 annuitize his/her benefit.

 115 Health Care Trust

The 115 Health Care Trust (115 Trust or Health Care Trust) was established in 2014, under Section 115 of the Internal Revenue Code (IRC). The initial purpose of the 115 Trust was to fund health reimbursement arrangement (HRA) accounts for Medicare-enrolled retirees in conjunction with the implementation of the OPERS Medicare Connector (Connector) in 2016. This type of arrangement was not permissible by the IRS under OPERS' former health care trust structure. In 2016, OPERS received favorable rulings from the IRS allowing OPERS to consolidate all health care assets into the 115 Trust. As a result, the 401(h) Health Care Trust, which held funding for Traditional Pension Plan and Combined Plan health care, and the Voluntary Employees' Beneficiary Association Trust (VEBA), which held funding for Member-Directed Plan health care, closed on June 30, 2016 and the net positions transferred to the 115 Trust on July 1, 2016.

From 2016 forward, the 115 Trust includes the funds for retiree health care for the Traditional Pension, Combined and Member-Directed plans. The portion of the employer contribution rate allocated to fund health care for the Traditional Pension and Combined plans is comparable, as the same coverage options are provided to participants in both plans. Non Medicare-eligible retirees in these plans may receive an allowance to offset the premium of OPERS-sponsored health care coverage. Medicare-enrolled retirees in the Traditional Pension and Combined plans may have an allowance deposited into an HRA account to be used toward the health care program of their choice selected with the assistance of an OPERS vendor.

Upon separation or retirement of a Member-Directed Plan participant, the participant may use the vested funds in his/her retiree medical account for qualified health care expenses. Vesting requirements for Member-Directed health care have changed over the life of the plan. The plan 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 plan are required to participate for 15 years to become fully vested. Additional details on the OPERS health care program and the Member-Directed Plan health care vesting schedule can be found in the Plan Statement beginning on page 217.

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

Combining Statement of Fiduciary Net Position

The Combining Statement of Fiduciary Net Position is a point-in-time snapshot of fund balances at fiscal year-end for pension and health care. It reflects assets available to pay future benefits to retirees, and any liabilities owed as of the statement date. The resulting Net Position (equal to Assets less Liabilities) represents the value of assets held in trust for pension benefits and health care. (See Combining Statement of Fiduciary Net Position as of December 31, 2019 on pages 36-37 of this report.)

Combining Statement of Changes in Fiduciary Net Position

The Combining Statement of Changes in Fiduciary Net Position displays the effect of financial transactions that occurred during the fiscal year, where Additions less Deductions equal Net Increase (or Net Decrease) in net position. This Net Increase or Decrease in net position reflects the change in the value of fiduciary net position that occurred between the current and prior year. (See Combining Statement of Changes in Fiduciary Net Position for the year ended December 31, 2019 on pages 38-39 of this report.)

Notes to Combining Financial Statements

The Notes to Combining Financial Statements provide additional information that is essential for a comprehensive understanding of the data provided in the financial statements and is an integral part of 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. (See Notes to Combining Financial Statements, December 31, 2019 on pages 40-75 of this report.)

The financial statements described are prepared in accordance with Governmental Accounting Standards Board (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 48.

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, this annual report includes additional Required Supplementary Information (RSI) schedules and required notes. The RSI includes schedules of changes in net pension liability and net other post-employment benefit (OPEB), or health care, liability, investment returns for the defined benefit portion of the pension plans and for the health care trust, and schedules of employer contributions for both defined benefit pension plans and health care. The schedules of funding progress for defined benefit pension plans and health care have been included in the Actuarial Section of this document. Each of the schedules includes historical-trend information when required by standards, except when historical information is unavailable prior to the implementation of GASB Statement No. 67 (GASB 67), *Financial Reporting for Pension Plans*, and GASB Statement No. 74 (GASB 74), *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*.

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

The Schedules of Changes in Net Pension Liability and Related Ratios (pages 76-79) include actuarial information regarding the increase (or decrease) of each element of the net pension liability between the beginning and end of the year for the OPERS defined benefit pension plans. The information reported in these schedules was 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 from those used to calculate the funded status of a plan (also referred to as the Funding Basis throughout this document). The key difference is the Accounting Basis schedule uses the fair value of assets rather than the smoothed value of assets used for the Funding Basis (refer to page 29 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 153. GASB 67 breaks the link between accounting and funding. Although 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 80) 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. This schedule includes both member and employer contributions 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 should 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 Enforcement divisions. Members in the Public Safety and Law Enforcement 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 on the next page.

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

The Schedules of Employer Contributions (pages 81-82) provide historical-trend information regarding the value of total annual contributions required to be paid by employers 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 annuitize their benefit. These annuities for 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

The Schedule of Investment Returns (page 83) provides information regarding the annual money-weighted rates of return on pension plan investments in the Defined Benefit portfolio, 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 Changes in Net OPEB Liability and Related Ratios—Health Care

The Schedule of Changes in Net OPEB Liability and Related Ratios (page 84) includes actuarial information regarding the increase (or decrease) of each element of the net OPEB liability between the beginning and end of the year for OPERS defined benefit health care plans. The values included in this schedule were calculated using the assumptions and requirements defined in GASB 74 (also referred to as the Accounting Basis throughout this document, similar to GASB 67). The calculation method defined in GASB 74 requires different assumptions from those used to calculate the funded status of a plan (also referred to as the Funding Basis throughout this document). Similar to GASB 67, 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 29 for additional information on actuarial smoothing techniques). Therefore, the GASB 74 Accounting Basis net OPEB liability results differ from the Funding Basis unfunded actuarial accrued health care liability results provided in the Schedule of Funding Progress included on page 30 of this section and in the Actuarial Section of this document on page 155. Also similar to GASB 67, GASB 74 breaks the link between accounting and funding. While these changes will 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 74 implementation in 2017. The schedule will be expanded each subsequent year until it contains the required 10-year presentation.

 Schedule of Employer Contributions—Health Care

The Schedule of Employer Contributions (page 85) presents historical-trend information regarding the value of actuarially determined health care contributions, and the actual amounts remitted. The information contained in this schedule also reflects the required contributions based on the contribution rates approved by the Board. Based on the provisions of GASB 74, all OPERS health care plans are considered to be defined benefit other post-employment plans (OPEB). Therefore, the information contained in this schedule includes health care funding for the Traditional Pension Plan, the Combined Plan and the Member-Directed Plan.

 Schedule of Investment Returns—Health Care

The Schedule of Investment Returns (page 85) provides information regarding the annual money-weighted rates of return on investments in the Health Care portfolio, calculated and presented as required by GASB 74. Historical information is not available prior to the GASB 74 implementation in 2017. The schedule will be expanded each subsequent year until it contains the required 10-year presentation.

 Notes to Required Supplementary Information

The Notes to Required Supplementary Information (pages 86-87) provides background information, a summary of the actuarial assumptions used in determining contribution rates 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 reflects the total operating costs of managing the System, by major expense category (page 88).

 Schedule of Investment Expenses

The Schedule of Investment Expenses summarizes the costs incurred in managing the investment assets of the System (page 88). These costs are reported as Investment Administrative Expenses in the Combining Statement of Changes in Fiduciary Net Position, and are reflected as a reduction in net investment income or loss.

Financial Highlights

- The investment portfolio reported a total gain of 17.59% for the year ended December 31, 2019, compared to a total loss of 3.38% in 2018. The total portfolio, as of year end, is divided into three sub-portfolios: the Defined Benefit portfolio, the Health Care portfolio, and the Defined Contribution portfolio. The Defined Benefit portfolio reported an investment gain of 17.23% in 2019, compared to a loss of 2.99% in 2018. The Health Care portfolio reported an investment gain of 19.59% in 2019, compared to a loss of 5.76% in 2018. The Defined Contribution portfolio reported an investment gain of 21.74% in 2019, compared to a loss of 6.65% in 2018.
- Net position increased by \$12.2 billion to \$106.3 billion as of December 31, 2019, compared to \$94.1 billion in 2018. Net income from investing activities totaled \$16.1 billion in 2019, compared to net loss from investing activities of \$3.4 billion in 2018. Table 1 presents a two-year comparative history of Changes to Fiduciary Net Position.

 Changes to Fiduciary Net Position (for the years ended December 31, 2019 and 2018)				Table 1
	2019	2018	Amount Increase/ (Decrease) from 2018 to 2019	Percent Increase/ (Decrease) from 2018 to 2019
Member and Employer Contributions	\$3,638,060,339	\$3,493,407,600	\$144,652,739	4.1%
Contract Receipts and Other Income	99,418,251	109,449,524	(10,031,273)	(9.2)
Net Income/(Loss) from Investing Activity	16,100,992,982	(3,350,345,567)	19,451,338,549	>100.0
Total Additions	19,838,471,572	252,511,557	19,585,960,015	>100.0
Benefits, Health Care and Account Refunds	7,559,224,869	7,432,963,218	126,261,651	1.7
Administrative and Other Expenses	107,378,644	102,310,563	5,068,081	5.0
Total Deductions	7,666,603,513	7,535,273,781	131,329,732	1.7
Net Increase/(Decrease) in Net Position	12,171,868,059	(7,282,762,224)	19,454,630,283	>100.0
Net Position, Beginning of Year	94,143,057,612	101,425,819,836	(7,282,762,224)	(7.2)
Net Position, End of Year	\$106,314,925,671	\$94,143,057,612	\$12,171,868,059	12.9%

- OPERS continues its goal of ensuring financial stability of both the pension and health care funds. In 2016, the Board adopted changes to the pension and health care actuarial assumptions based on the results of an experience study for the period 2011 through 2015. The experience study incorporates both a historical review and forward-looking projections to determine the appropriate assumptions to maintain the pension plan on a path toward full funding. As reported in 2016, the most notable changes included a reduction in the long-term pension investment return assumption from 8.0% to 7.5% and a change in mortality tables for both pension benefits and health care coverage.

In addition to the experience studies, conditions are monitored and assumptions are reviewed annually to ensure that the assumptions remain reasonable until the next scheduled experience study. If conditions change materially, it may become necessary to review and update assumptions in advance of the next scheduled experience study. In 2018, the Board adopted changes to further reduce the long-term pension investment return assumption from 7.5% to 7.2% and the long-term health care investment return assumption from 6.5% to 6.0%. (Refer to the Actuarial Section, beginning on page 135, for more information on actuarial assumptions.)

- OPERS presents current pension funding information in Table 2, which 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, 2019. The health care funding presented in this document (refer to Table 3) remains a year in arrears as the most recent health care funding information is as of December 31, 2018.

Schedule of Funding Progress—Funding Basis (\$ in millions)				Defined Benefit Plans ¹ —Table 2	
Valuation Year	Actuarial Accrued Liabilities (AAL)	Valuation Assets	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Funding Years
2019	\$111,371	\$88,572	\$22,799	79.5%	23
2018	108,705	84,287	24,418	77.5	27
2017 ^e	106,090	83,292	22,798	78.5	25
2017	102,656	83,292	19,364	81.1	18
2016	100,167	80,280	19,887	80.1	19
2015 ^a	97,177	78,061	19,116	80.3	20
2015 ^b	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 ^c	83,878	67,855	16,023	80.9	26
2012 ^d	87,105	67,855	19,250	77.9	30
2011	84,530	65,436	19,094	77.4	30
2010 ^a	80,485	63,649	16,836	79.1	24
2010 ^b	79,630	60,600	19,030	76.1	29

^a Revised actuarial assumptions based on experience study.

^b Results from original valuation prior to re-statement after completion of experience study.

^c Results reflecting the provisions of Senate Bill 343.

^d Results prior to the provisions of Senate Bill 343.

^e Results after change in discount rate from 7.5% to 7.2%.

¹ Defined Benefit Plans include the Traditional Pension Plan, the defined benefit portion of the Combined Plan and purchased annuities in the Member-Directed Plan.

- As previously noted, the OPERS net investment income for the year ended December 31, 2019 totaled \$16.1 billion, a 17.59% gain on the total OPERS portfolio. Net investment income for the Defined Benefit portfolio comprised \$13.6 billion of this total, or a gain of 17.23%. The net investment income for the Health Care portfolio was \$2.2 billion, or a gain of 19.59%, and the Defined Contribution portfolio included an investment gain of \$0.3 billion, or a gain of 21.74%. As with all mature retirement systems, OPERS' primary source of funding benefit payments in the future is investment income.
- 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, value of assets is based on the actuarial value of assets which smooths market gains and losses over a rolling four-year period, subject to a 12% market corridor. This differs from the Accounting Basis (or GASB 67 and GASB 74 basis), which calculates the funding status using the market value of assets.
- As a result of actuarial smoothing techniques, 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. Conversely, during periods of extended market gains, the fair value of assets will usually be greater than the funding, or actuarial value, of assets.

- To ensure the funding value of assets and the market value of assets remain within reasonable proximity of each other, 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 2018, the market value of assets was lower than the funding value by \$2.9 billion. At the end of 2019, the market value of assets was higher than the funding value by \$3.2 billion.
- By law, OPERS is obligated to pay certain benefits that have commenced with retirees. To make these payments each year, and to account for benefits that have commenced with retirees, OPERS transfers funds from the active member (the Employers' Accumulation Fund) to the retiree funds (the Annuity and Pension Reserve Fund and the Survivors' Benefit Fund). Thus, the active member funding is 44% and 39% as of December 31, 2019 and 2018, respectively, after this annual transfer.
- As noted previously, in October 2018, OPERS reduced the long-term pension investment-earnings assumption from 7.5% to 7.2%. The net impact of this reduction in the assumption was to increase the pension liability by approximately \$3.4 billion. At the same time, OPERS reduced the long-term health care investment-earnings assumption from 6.5% to 6.0%. The net impact of this reduction in the assumption was to increase the health care liability by approximately \$1.0 billion. These new long-term investment-earning assumptions reflect updated market conditions. Tables 2 and 3 reflect the liabilities under the old assumption and the revised assumption as of the end of 2017.
- As of December 31, 2019, the date of the latest actuarial valuation, the funded ratio for defined benefit pensions was 79.5%. 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 increased from 2018 to 2019 by 2.0%, due to the investment gain of 2019. The December 31, 2019 actuarial report indicates that, if future activity proceeds according to assumptions, OPERS would accumulate sufficient assets to pay all pension liabilities for active members and retirees within 23 years on a Funding Basis compared to 27 years for 2018.

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 ¹
2018	\$17,849	\$11,647	\$6,202	65.3%	11
2017 ^c	18,393	12,021	6,372	65.4	13
2017	17,389	12,021	5,368	69.1	13
2016	19,924	12,098	7,826	60.7	12
2015 ^a	19,224	11,933	7,291	62.1	Indefinite
2015 ^b	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 ^a	30,531	12,320	18,211	40.4	11
2010 ^b	26,929	11,267	15,662	41.8	11
2009	31,558	10,936	20,622	34.7	11

^a Revised actuarial assumptions based on experience study.

^b Results from original valuation prior to re-statement after completion of experience study.

^c Results after change in discount rate from 6.5% to 6.0%.

¹ Solvency Years represents 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.

- 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, 2018, the date of the latest health care actuarial valuation under the Funding Basis, the revised actuarial liability for health care was \$17.8 billion and the System had accumulated assets of \$11.6 billion for that obligation, leaving an unfunded actuarial accrued liability of \$6.2 billion. The \$6.2 billion unfunded actuarial accrued liability is a decrease from the 2017 unfunded actuarial accrued liability of \$6.4 billion. The decrease results from continued savings from the 2013 plan design changes. The funded ratio declined slightly from 65.4% at the end of 2017 to 65.3% in 2018.
- Health care coverage is not statutorily guaranteed and is subordinate to pension funding. In 2018, based on the pension funding status, OPERS increased the portion of the 14% employer contribution rate allocated to pension funding from 13% in 2017 to the full 14%. Correspondingly, with all of the 14% employer contribution rate allocated to pension funding, no funds were available for health care in 2018 and 2019. This is a decrease from the 1% health care funding in 2017. This allocation is expected to continue until the pension funding improves.

The funding progress of health care is measured in terms of solvency years, or the number of years 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. As of December 31, 2018, the date of the latest health care actuarial valuation under the Funding Basis, health care funding is expected to remain solvent for 11 years. Refer to Table 3 for a comparative history of actuarial liabilities and solvency years for health care.

On January 15, 2020, in a continued effort to reduce the cost and lengthen the solvency period of the OPERS health care program, the Board approved changes to the health care program that will affect both pre-Medicare and Medicare-eligible retirees. These changes will go into effect January 1, 2022. Refer to Note 10 for further information.

Analysis of Financial Activities

The OPERS funding objective is to meet long-term benefit obligations with investment income and contributions. The following discussion provides an analysis of the current-year financial activities. Comparative data is presented, where appropriate.

Additions to Fiduciary Net Position (Revenues)

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 2019 were \$19.8 billion, and include member and employer contributions of \$3.6 billion, net income from investment activities of \$16.1 billion and other income totaling approximately \$0.1 billion. Other income consists of purchased service agreements, employer interest and penalty charges, vendor performance guarantees, settlements, interplan activities, 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 2018 were \$0.3 billion, comprised of \$3.5 billion in contribution revenues, \$3.3 billion in net loss from investment activities, and other income totaling approximately \$0.1 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, 2019 and 2018)				Table 4
	2019	2018	Amount Increase/ (Decrease) from 2018 to 2019	Percent Increase/ (Decrease) from 2018 to 2019
Member Contributions	\$1,516,077,941	\$1,455,771,629	\$60,306,312	4.1%
Employer Contributions	2,121,982,398	2,037,635,971	84,346,427	4.1
Contract and Other Receipts	67,502,046	81,169,718	(13,667,672)	(16.8)
Other Income, net	696,586	2,844,546	(2,147,960)	(75.5)
Interplan Activity	31,219,619	25,435,260	5,784,359	22.7
Net Income/(Loss) from Investing Activity	16,100,992,982	(3,350,345,567)	19,451,338,549	>100.0
Total Additions	\$19,838,471,572	\$252,511,557	\$19,585,960,015	>100.0%

Member and employer contributions for 2019, compared to 2018, increased by \$144.7 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 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 2019, approximately 8,232 active members retired and generally will be replaced with less-tenured or entry-level staff. This is the lowest number of new retirees in the past 10 years. The 2019 increase in contributions is greater than the 2018 increase in contributions of 2.4% and reflects the impact of wage increases.

Contracts and Other Receipts represents funds received for member purchase of service contracts, employer early retirement incentive programs, and funds received from other Ohio retirement systems for members with service credit under more than one retirement system. These receipts totaled \$67.5 million in 2019, compared to \$81.2 million received in 2018. This net decrease of \$13.7 million is comprised of a decrease of \$10.5 million in retirement transfers from other Ohio retirement systems for members selecting a joint retirement option, and \$5.8 million decrease of purchases of service, offset by an increase of \$2.6 million in alternative retirement plan contributions due to an increase in the assessed mitigating rate from 2.0% in 2018 to 2.44% in 2019.

Other Income, net, is comprised of miscellaneous proceeds, gains or losses on the disposal of fixed assets and litigation settlements activity. Other income for 2019 was \$0.7 million, compared to \$2.8 million in 2018. This activity typically fluctuates from year-to-year. In 2019, rental income of \$0.5 million is reflected in the other income amount, flat compared to 2018, along with other miscellaneous receipts. In 2018, favorable litigation settlements for \$1.3 million and favorable prescription drug plan audit findings of \$0.7 million are reflected in the other income amount, along with other miscellaneous receipts.

Interplan Activity represents transfers to record activity occurring between the plans. This activity includes members changing from one plan to another. Interplan Activity in 2019 resulted in a net inflow of \$31.2 million, compared to \$25.4 million in 2018. Since this activity represents payments between plans, 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.)

Net Income/(Loss) from Investing Activity represents total investment income/loss net of external management fees and administrative expenses. Investment income includes dividends, interest, gains or losses on the sale of investments, and change in fair value of investments. OPERS reflects both income and management fees from external managers in this category.

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 current-year activity within Net Income/(Loss) from Investing Activity, refer to the Financial Highlights section beginning 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 2019 were \$7.7 billion, an increase of \$0.1 billion, or 1.7%, compared to 2018. Pension benefits and health care expenses comprised \$7.1 billion and \$7.0 billion in 2019 and 2018, respectively. Included within health care costs were \$251.2 million and \$250.0 million in 2019 and 2018, respectively, in health care-related receipts netted against health care expenses. Refunds of member contributions, including interest and additional payments on withdrawal where required by statute, fluctuate each year, and were \$472.6 million in 2019, or 4.2% higher than 2018. Non-investment related administrative expenses decreased by \$0.7 million to \$76.2 million and represented 1% of the total expenses. Pension benefits and health care expenses paid on behalf of current retirees and their beneficiaries comprised approximately 92.4% of the total expenses reported. The remaining expenses were comprised of interplan activity transactions representing the expenses associated with members changing from one plan to another. 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, 2019 and 2018) Table 5				
	2019	2018	Amount Increase/ (Decrease) from 2018 to 2019	Percent Increase/ (Decrease) from 2018 to 2019
Benefits—Pension	\$6,318,731,252	\$6,109,237,279	\$209,493,973	3.4%
Benefits—Health Care Expenses	767,888,929	870,284,919	(102,395,990)	(11.8)
Refunds	472,604,688	453,441,020	19,163,668	4.2
Administrative Expenses	76,159,025	76,875,303	(716,278)	(0.9)
Interplan Activity	31,219,619	25,435,260	5,784,359	22.7
Total Deductions	\$7,666,603,513	\$7,535,273,781	\$131,329,732	1.7%

Pension benefits totaled \$6.3 billion in 2019, an increase of \$0.2 billion, or 3.4%, over 2018 benefits. The increase in 2019 reflects the combination of a net growth of 0.9% in the total number of retirees and beneficiaries receiving benefits, an annual simple cost-of-living adjustment granted on the retiree's benefit anniversary, and demographic changes in the retiree population. As expected, with the majority of the 2012 changes to both pension and health care fully implemented, members are opting to work longer and the growth in new retirees is declining. The 8,232 new retirees in 2019 is less than the most recent 10-year average of 10,224. The cost of retirements will continue to increase as newer retirees with higher FAS and a longer working career replace deceased long-time retirees with lower FAS and a shorter working career. The cumulative increase associated with the cost-of-living adjustments was \$1.4 billion at the end of 2019. Refer to the Schedules of Average Benefits on page 204 of the Statistical Section for details related to the new retiree populations by year. Refer to the Plan Statement beginning on page 217 for details on pension benefits.

Total health care expenses decreased in 2019 by \$102.4 million, or 11.8%, to \$767.9 million, compared to 2018. The implementation of GASB 74 in 2017 requires health care receipts, or payments, from retirees and health care vendors to OPERS, to offset the related health care expenses incurred by OPERS during the year. In 2019, health care expenses were reduced by \$251.2 million, compared to \$250.0 million in 2018, including retiree-paid health care premiums, prescription rebates and federal subsidies. The majority of the decrease in health care expenses reflects the continued savings from changes to the health care plan approved in 2012 and the continued decline in enrollment for non-Medicare retirees.

Almost half of the health care expenses are comprised of medical, dental, vision, and prescription drug costs, as well as reimbursements to retirees for Medicare Part A premiums. Medical, dental, vision and disease-management costs, netted against health care receipts represent approximately 29% of the total health care expenses for 2019, a decrease from 35% in 2018. Prescription drug costs comprised 15% and 16% of total health care expenses in 2019 and 2018, respectively. Medicare Part A premium reimbursements were approximately 4%, an increase from 3% in 2018. Retirees who did not contribute to Medicare during their career, and to a lesser extent their spouses, may receive reimbursement of their Medicare Part A premium to qualify for participation in the Connector.

OPERS provides self-insured group health care and prescription drug plans for non-Medicare eligible recipients and their eligible dependents. Costs in self-insured plans will fluctuate based on overall market costs from claims experience, catastrophic claims and processing timing. The overall number of retirees and dependents in health care plans in 2019 decreased by 7.7%. As anticipated with the phase-out of the spousal health care subsidy, the number of spouses and other dependents enrolled in OPERS coverage decreased by almost 3,500, or 11.1%, in 2019 and by 4,700, or 12.9%, in 2018. Correspondingly, OPERS' total non-Medicare eligible health care cost (includes medical, dental, vision and disease management) decreased by 26.2% to \$223.6 million (after netting \$251.2 million in health care-related receipts against the costs), compared to \$303.0 million in 2018 (after netting \$250.0 million in health care-related receipts against the costs). Prescription drug costs decreased 16.8% to \$113.6 million in 2019, compared to \$136.6 million in 2018.

Beginning January 1, 2016, Medicare-enrolled 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. In 2019, reimbursements of qualified medical expenses through the HRA for retirees and their qualified dependents decreased by 0.3% to \$398.3 million, compared to 2018. Reimbursements of qualified medical expenses from health care accounts for Member-Directed Plan participants increased by 14.5% to \$4.7 million in 2019, compared to 2018. In addition, OPERS closed the wellness retiree medical account plan at the end of 2016 and transferred balances to the HRA for members with accounts in both plans starting in 2017. For those without an HRA, OPERS initiated automatic reimbursements of premiums paid through pension deduction. Premiums paid and transfer of balances to the HRA for 2019 totaled \$0.2 million, a decrease of \$1.5 million from 2018 activity. For more information on activity in member health care accounts, refer to the table on page 192 of the Statistical Section.

Refunds of member accounts are at the discretion of the member and vary from year-to-year. Members may refund their account if they have been separated from OPERS-covered employment for at least two months. However, upon retirement or termination, Combined Plan and Member-Directed Plan participants may choose to annuitize their benefit, receive a refund of their account balance or transfer their account balance to another plan. In 2019, member-elected refunds totaled \$472.6 million, compared to \$453.4 million in 2018. Accordingly, refunds represent disbursements of inactive member accounts. The number of refunded accounts of 23,946, in 2019, decreased by 2.0% when compared to 2018. However, the average member balance refunded in 2019 increased and was approximately \$19,700, compared to the 2018 average of approximately \$18,600.

OPERS has consistently managed its administrative expense budget with no material variances in either 2019 or 2018. Administrative Expenses shown in Table 5 do not include investment administrative expenses. Administrative Expenses totaled \$76.2 million in 2019, compared to \$76.9 million in 2018. The decrease in 2019 Administrative Expenses results from the capitalization of internal labor costs related to capital projects.

Net Position Summary

Net position may serve over time as a useful indicator of OPERS' financial status. At the close of calendar years 2019 and 2018, the net positions of OPERS totaled \$106.3 billion and \$94.1 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, 2019 and 2018)			Table 6	
	2019	2018	Amount Increase/ (Decrease) from 2018 to 2019	Percent Increase/ (Decrease) from 2018 to 2019
Current and Other Assets	\$1,026,437,605	\$890,923,998	\$135,513,607	15.2%
Cash and Investments at Fair Value	114,560,532,688	102,134,370,442	12,426,162,246	12.2
Capital Assets	127,717,312	127,110,017	607,295	0.5
Total Assets	115,714,687,605	103,152,404,457	12,562,283,148	12.2
Total Liabilities	9,399,761,934	9,009,346,845	390,415,089	4.3
Net Position, End of Year	106,314,925,671	94,143,057,612	12,171,868,059	12.9
Net Position, Beginning of Year	94,143,057,612	101,425,819,836	(7,282,762,224)	(7.2)
Net Increase/(Decrease) in Net Position	\$12,171,868,059	(\$7,282,762,224)	\$19,454,630,283	>100.0%

Summary

OPERS remains dedicated to keeping this System strong today and well into the future. OPERS continues to proactively manage the System in a manner that proactively addresses issues and trends; thus contributing to the strength of the System. The funding levels and 2019 results are found, in detail, and by category, in this annual report.

 Combining Statement of Fiduciary Net Position (as of December 31, 2019)			
	Pension		
	Traditional Pension Plan	Combined Plan	Member-Directed Plan
Assets			
Cash and Cash Equivalents	\$4,308,875,497	\$25,533,095	\$419,694
Receivables			
Members and Employers	269,056,774	8,396,103	9,337,816
Vendor and Other	1,479,105		
Investment Sales Proceeds	360,717,975	2,711,496	214,052
Accrued Interest and Dividends	257,172,065	1,888,352	67,290
Total Receivables	888,425,919	12,995,951	9,619,158
Investments			
Fixed Income	23,846,047,395	335,316,886	311,404,524
Domestic Equities	15,725,916,835	434,708,005	612,148,355
Real Estate	8,842,540,476	64,928,637	2,313,655
Private Equity	9,863,587,197	72,425,935	2,580,812
International Equities	18,224,481,012	287,481,288	297,443,331
Other Investments	10,117,378,437	74,289,464	2,647,218
Total Investments	86,619,951,352	1,269,150,215	1,228,537,895
Collateral on Loaned Securities	8,278,711,065	57,596,103	2,195,178
Capital Assets			
Land	2,626,888	82,647	82,550
Building and Building Improvements	77,940,997	2,452,172	2,449,303
Furniture and Equipment	122,949,689	4,653,928	3,372,759
Total Capital Assets	203,517,574	7,188,747	5,904,612
Accumulated Depreciation	(104,470,997)	(3,250,000)	(3,229,468)
Net Capital Assets	99,046,577	3,938,747	2,675,144
Prepaid Expenses and Other Assets	2,536,831		
TOTAL ASSETS	100,197,547,241	1,369,214,111	1,243,447,069
Liabilities			
Undistributed Deposits	2,310,786		
Benefits Payable	600,465		
Investment Commitments Payable	778,596,013	5,960,527	667,474
Accounts Payable and Other Liabilities	17,976,593		
Obligations Under Securities Lending	8,276,453,666	57,580,397	2,194,580
TOTAL LIABILITIES	9,075,937,523	63,540,924	2,862,054
Net Positions Restricted for Pensions and OPEB	\$91,121,609,718	\$1,305,673,187	\$1,240,585,015

See Notes to Combining Financial Statements, beginning on page 40.

Financial Section

(continued from page 36)	
115 Health Care Trust	Total Pension and Health Care
\$818,204,587	\$5,153,032,873
1,892,495	288,683,188
12,585,164	14,064,269
52,212,702	415,856,225
46,169,385	305,297,092
112,859,746	1,023,900,774
4,855,122,000	29,347,890,805
3,183,847,864	19,956,621,059
	8,909,782,768
	9,938,593,944
2,674,811,901	21,484,217,532
1,237,576,242	11,431,891,361
11,951,358,007	101,068,997,469
	8,338,502,346
942,728	3,734,813
27,971,184	110,813,656
34,246,182	165,222,558
63,160,094	279,771,027
(41,103,250)	(152,053,715)
22,056,844	127,717,312
	2,536,831
12,904,479,184	115,714,687,605
196,350	2,507,136
115,181,776	115,782,241
142,043,307	927,267,321
	17,976,593
	8,336,228,643
257,421,433	9,399,761,934
\$12,647,057,751	\$106,314,925,671

 Combining Statement of Changes in Fiduciary Net Position (for the year ended December 31, 2019)			
	Pension		
	Traditional Pension Plan	Combined Plan	Member-Directed Plan
Additions			
Member Contributions	\$1,410,501,971	\$44,786,688	\$60,789,282
Employer Contributions	1,974,172,176	62,699,159	60,792,922
Contract and Other Receipts	66,023,563	291,108	646,566
Other Income, net	694,862		
Interplan Activity	31,219,619		
Total Non-investment Income	3,482,612,191	107,776,955	122,228,770
Income/(Loss) from Investing Activities			
Net Increase in the Fair Value of Investments	9,068,695,295	171,192,443	207,884,484
Bond Interest	875,706,483	7,128,753	2,202,063
Dividends	2,281,803,972	15,890,570	635,001
Real Estate Operating Income, net	692,342,471	4,816,723	183,592
International Income	1,584,824	11,026	420
Other Investment Income	1,135,622,581	7,900,684	301,139
External Asset Management Fees	(514,586,284)	(3,730,860)	(381,419)
Net Investment Income	13,541,169,342	203,209,339	210,825,280
From Securities Lending Activity			
Securities Lending Income	234,345,926	1,630,380	62,139
Securities Lending Expenses	(205,419,934)	(1,429,138)	(54,469)
Net Securities Lending Income	28,925,992	201,242	7,670
Unrealized Loss	(509,691)	(5,715)	(223)
Net Income from Securities Lending	28,416,301	195,527	7,447
Investment Administrative Expenses	(37,048,483)	(434,437)	(405,305)
Net Income from Investing Activity	13,532,537,160	202,970,429	210,427,422
TOTAL ADDITIONS	17,015,149,351	310,747,384	332,656,192
Deductions			
Benefits	6,310,936,996	5,310,887	2,483,369
Refunds of Contributions	407,308,374	17,531,723	47,764,591
Administrative Expenses	51,899,317	3,906,211	2,395,830
Interplan Activity		14,415,338	16,804,281
TOTAL DEDUCTIONS	6,770,144,687	41,164,159	69,448,071
Net Increase	10,245,004,664	269,583,225	263,208,121
Net Positions Restricted for Pensions and OPEB			
Balance, Beginning of Year	80,876,605,054	1,036,089,962	977,376,894
Balance, End of Year	\$91,121,609,718	\$1,305,673,187	\$1,240,585,015

See Notes to Combining Financial Statements, beginning on page 40.

Financial Section

(continued from page 38)	
115 Health Care Trust	Total Pension and Health Care
\$24,318,141	\$1,516,077,941
540,809	2,121,982,398
1,724	67,502,046
	696,586
	31,219,619
24,860,674	3,737,478,590
1,600,900,770	11,048,672,992
162,002,938	1,047,040,237
428,602,794	2,726,932,337
	697,342,786
227,029	1,823,299
2,172,948	1,145,997,352
(33,296,008)	(551,994,571)
2,160,610,471	16,115,814,432
	236,038,445
	(206,903,541)
	29,134,904
	(515,629)
	28,619,275
(5,552,500)	(43,440,725)
2,155,057,971	16,100,992,982
2,179,918,645	19,838,471,572
767,888,929	7,086,620,181
	472,604,688
17,957,667	76,159,025
	31,219,619
785,846,596	7,666,603,513
1,394,072,049	12,171,868,059
11,252,985,702	94,143,057,612
\$12,647,057,751	\$106,314,925,671

1. Description of OPERS

- a. Organization**—The Ohio Public Employees Retirement System (OPERS or System) 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.

The OPERS health care plans 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. 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 who purchase supplemental coverage through the Connector may receive a monthly allowance in their health reimbursement arrangement (HRA) account that can be used to reimburse eligible health care expenses. Upon termination or retirement, Member-Directed Plan participants can use vested retiree medical account (RMA) funds for reimbursement of qualified medical expenses. Members who elect the Member-Directed Plan after July 1, 2015 will vest in the RMA 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 in the RMA over a five-year period at a rate of 20% per year. Please see the Plan Statement beginning on page 217 for additional details. Health care coverage is neither guaranteed nor statutorily required.

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 the HRA, as the prior trust structure, the 401(h) Health Care Trust (401(h) Trust) and the Voluntary Employees' Beneficiary Association Trust (VEBA Trust), could not legally support the 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) 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 VEBA Trust accumulated funding for RMAs for participants in 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 2016, the 115 Trust, established under IRC Section 115, is the funding vehicle for all health care plans.

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 year ended December 31, 2019, 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
- Member-Directed Plan
- 115 Health Care Trust

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; 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 an investment expert Board member. 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 typically 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 (five years) are entitled to a future retirement benefit from OPERS. Employer, employee and retiree data as of December 31, 2019 is found on the next page.

 Plan Membership						
	Traditional Pension Plan	Combined Plan ¹	Member-Directed Plan	115 Health Care Trust ²		2019 Total
				Traditional Pension and Combined Plans Retiree-Sponsored Programs	Member-Directed Plan Retiree-Sponsored Program	
As of December 31, 2019						
Employer Units						3,694
State Division						246
Local Division						3,212
Law Enforcement and Public Safety Divisions						236
Retirees and Inactive Members—Defined Benefit Pension						867,672
Retirees and Primary Beneficiaries currently receiving benefits	214,278	391	316			214,985
Dependents and Other Beneficiaries currently receiving benefits	4,522	7	3			4,532
Inactive Members eligible for, but not yet receiving, benefits ³	9,146	108				9,254
Inactive Members not yet age-eligible for benefits ³	28,458	736				29,194
Inactive Members eligible for refund value of account only ³	608,262	1,445				609,707
Retirees and Inactive Members—Defined Contribution Accounts						5,512
Retirees currently receiving benefits		4	4			8
Inactive Members			5,504			5,504
Retirees and Inactive Members—Health Care						180,032
Retirees and Primary Beneficiaries currently receiving benefits				142,369	6,940	149,309
Dependent and Other Beneficiaries currently receiving benefits				28,141		28,141
Inactive Members eligible for, but not yet receiving, benefits				2,582		2,582
Active Employees						304,446
State Division	99,832	2,761	3,740			106,333
Local Division	178,555	4,758	6,691			190,004
Law Enforcement Division	8,049					8,049
Public Safety Division	60					60

¹ Combined Plan members receiving a defined formula benefit may also be receiving a distribution of their defined contribution account, therefore may be counted more than once in this table.

² All health care coverage is funded through the 115 Health Care Trust. This table reflects the breakout of health care programs between those supporting members in the Traditional Pension Plan and Combined Plan, and a separate column for the Member-Directed Plan.

³ Inactive members in transition Groups A and B with at least five years of service are eligible for a retirement benefit at the age of 60. Inactive members in transition Group C with at least five years of service are eligible for a retirement benefit at the age of 62. 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, were eligible to retire no later than five years after January 7, 2013, comprise transition Group A. Members who had at least 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 five years 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 217 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 initial amount of a member's pension benefit is vested in upon receipt of the initial benefit payment for calculation of an 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 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 annuitization of their benefit (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 five years of total service 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 five years of total service 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, updated by House Bill 520, and the corresponding Combined Plan document specify 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. 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.

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, generally, 30 years of qualifying service at any age. Beginning with January 2016 premiums, Medicare-enrolled 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 and other programs. Additional details on health care coverage can be found in the Plan Statement beginning on page 217.

Participants in the Member-Directed Plan are not eligible for 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 an RMA. Upon separation or retirement, participants may be reimbursed for qualified medical expenses from these accounts.

An additional RMA was also established several years ago when three health care coverage levels were available to retirees. These RMA balances were transferred to the HRA for retirees with both types of accounts. OPERS initiated an automatic claims payment process for reimbursements for retiree health care costs paid through pension deduction. This process will reimburse members for eligible health care premiums paid to OPERS, currently through pension deduction, up to the member's available RMA balance.

- **Other Benefits**—Once a benefit recipient retiring under the Traditional Pension Plan has received benefits for 12 months, the member receives an annual cost-of-living adjustment. This cost-of-living adjustment is calculated on the member's original base retirement benefit at the date of retirement and is not compounded. Members retiring under the Combined Plan receive a cost-of-living adjustment on the defined benefit portion of their retirement benefit. For those who retired prior to January 7, 2013, the cost-of-living adjustment is 3%. For those retiring on or after to January 7, 2013, beginning in 2019, the adjustment is based on the average percentage increase in the Consumer Price Index, capped at 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 and applicable plan documents require a two-month waiting period after service termination before the refund may be paid. 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, as determined by the Board.

A Combined Plan member's refund may consist of member contributions for the purchase of service plus interest, qualifying employer funds, as determined by the Board, 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, 2019. 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 2019 were \$1,974,172,176. Employer contributions for the Combined Plan for 2019 were \$62,699,159. 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 2019. With the assistance of the System's actuary and Board approval, a portion of each employer contribution to OPERS may be set aside for the funding of post-employment health care coverage. For 2019, no portion of the employer contribution rate was allocated to health care for the Traditional Pension Plan and the Combined Plan. The employer contribution as a percent of covered payroll deposited for Member-Directed Plan health care accounts for 2019 was 4.0%.

 Board of Trustees—Approved Contribution Rates—All Plans		
	2019 Employee Rate	2019 Employer Rate
State Division	10.0%	14.0%
Local Division	10.0	14.0
Law Enforcement Division	13.0	18.1
Public Safety Division	12.0	18.1

The member and employer contribution rates for the State and Local divisions are currently set at the maximums authorized by the ORC of 10.0% and 14.0%, respectively. The Public Safety and Law Enforcement employer rates are also set at the maximum authorized rate of 18.1%. The member rate for Public Safety 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 2.0% greater than the Public Safety rate.

ORC Chapter 145 assigns authority to the Board to amend the funding policy. As of December 31, 2019, 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, 2019, the date of the last pension actuarial study, the funding period for all defined benefits of the System was 23 years.

- d. **Federal Subsidies**—OPERS participated in federal programs that subsidized or provided reimbursements to the 115 Trust. Retiree Drug Subsidy (RDS) is a voluntary federal program that reimburses 28% of the cost of prescription drugs for Medicare beneficiaries in the United States. OPERS continues to participate in the RDS program with minimal subsidy generated primarily from Medicare-eligible participants who are re-employed and enrolled in the OPERS Medicare Secondary Plan and the Commercial prescription drug plan. Beginning 2017, health care-related receipts were netted against expenses included in the Benefits line item in the Combining Statement of Changes in Fiduciary Net Position.

- e. **Commitments and Contingencies**—OPERS has committed to fund various private equity and closed-end real estate investments totaling approximately \$8.6 billion as of December 31, 2019. The expected funding dates for these commitments extend through 2025. 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 Statement of Fiduciary Net Position when a present obligation exists and a condition that requires 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*. GASB 74 also requires health care expenses be reported net of certain health care receipts. Beginning with the implementation of GASB 74 in 2017, the presentation of retiree-paid health care premiums, federal subsidy and rebates, rebates previously included in Contract and Other Receipts, has been revised and these health care receipts included in health care expenses in Benefits under Deductions in the Combining Statement of Changes in Fiduciary Net Position. Previously, these receipts were reflected in the Additions section of the statement. Health care liabilities contain estimates on incurred but not reported amounts for the current year.

OPERS notionally funds and tracks member balances in the HRA, Member-Directed health care accounts and wellness RMAs. As of December 31, 2019, the notional member balances in the HRAs were \$403.8 million and the amount recognized as currently due for 2019 claims based on estimates was \$43.6 million. As of December 31, 2019, the notional member balances in the Member-Directed health care accounts and wellness RMAs were \$258.1 million and \$1.2 million, respectively. The claim amounts currently due as of December 31, 2019 were estimated at \$1.2 million and \$0.2 million, respectively. As previously noted, the Member-Directed health care accounts 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 reflected in the 115 Trust, OPERS internally accounts for health care activity separately. Total net position reported for the 115 Trust as of December 31, 2019 was \$12.6 billion, which includes a net position of \$319.3 million in the Member-Directed health care plan.

Refunds, for any member who makes a written application to withdraw his/her contributions, are payable two months after termination of the member's OPERS-covered employment. 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), 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, 2019 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, or 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 their trade date.

The accounting and reporting policies of OPERS conform to accounting principles generally accepted in the United States (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, as well as the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

In June 2017, GASB issued Statement No. 87 (GASB 87), *Leases*. The primary objective of this statement is to increase the usefulness of financial statements by requiring recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. Under this statement, a lessee is required to recognize a lease liability and an intangible right-to-use leased asset. A lessor is required to recognize a lease receivable and a deferred inflow of resources. The effective date of this standard is reporting periods beginning after December 15, 2020. OPERS is currently evaluating this statement with initial implementation planned for the 2020 annual report.

In May 2019, GASB issued Statement No. 91, *Conduit Debt Obligations*. The primary objectives of this statement are to provide a single method of reporting conduit debt obligations by issuers and eliminate diversity in practice associated with (1) commitments extended by issuers, (2) arrangements associated with conduit debt obligations, and (3) related note disclosures. OPERS has no debt obligations under the scope of this statement, therefore this statement does not apply.

In January 2020, GASB issued Statement No. 92 (GASB 92), *Omnibus 2020*. This statement addresses practice issues that have been identified during implementation and application of certain GASB statements. Topics include issues related to interim financial reports for leases, reporting of intra-entity transfers, post-employment benefit arrangements that are not administered by a trust, government acquisitions, public entity risk pools, nonrecurring fair value measurement, and derivative instruments. The only impact of this statement to OPERS is that derivatives will now be referred to as derivative instruments; OPERS implemented the provisions of GASB 92 in the current-year financial statements.

In March 2020, GASB issued Statement No. 93, *Replacement of Interbank Offered Rates*. This statement is in response to global reference rate reform, under which the London Interbank Offered Rate (LIBOR) is expected to cease to exist in its current form at the end of 2021, prompting governments to amend or replace financial instruments utilizing LIBOR as a reference rate. The effective date of this standard is for reporting periods beginning after June 15, 2021, except for certain provisions that are effective for reporting periods beginning after December 31, 2021. OPERS is currently evaluating this statement.

In March 2020, GASB issued Statement No. 94, *Public-Private and Public-Public Partnerships and Availability Payment Arrangements*. The primary objective of this statement is to improve financial reporting by addressing issues related to public-private and public-public partnership arrangements (PPPs). This Statement also provides guidance for accounting and financial reporting for availability payment arrangements (APAs). The proposed guidance is similar to that of the new leasing standards contained in GASB 87. OPERS does not participate in PPPs or APAs under the scope of this statement, therefore this statement does not apply.

- 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 health care trust are invested under the direction of the OPERS Investment staff in conformance with policies approved by the Board.

Investments are generally 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, private equity and 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 2019 were \$7,441,119. 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 Statement No. 72, *Fair Value Measurement and Application*. 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. In 2019, OPERS began capitalizing certain implementation costs for subscription-based information technology arrangements (SBITA). The capitalizable implementation costs for SBITA were determined using criteria in a recent exposure draft issued by GASB, similar to current guidance we follow for intangible assets.

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	3-10

The table below is a schedule of the capital asset account balances as of December 31, 2018 and 2019, with changes to those account balances during the year ended December 31, 2019:

 Capital Asset Account Balances				
	Land	Building and Building Improvements	Furniture and Equipment	Total Capital Assets
Cost				
Balances December 31, 2018	\$3,734,813	\$110,872,623	\$152,855,877	\$267,463,313
Additions			12,670,579	12,670,579
Disposals		(58,967)	(303,898)	(362,865)
Balances December 31, 2019	3,734,813	110,813,656	165,222,558	279,771,027
Accumulated Depreciation				
Balances December 31, 2018		38,747,194	101,606,102	140,353,296
Depreciation Expense		2,321,149	9,703,491	12,024,640
Disposals		(20,323)	(303,898)	(324,221)
Balances December 31, 2019		41,048,020	111,005,695	152,053,715
Net Capital Assets December 31, 2019	\$3,734,813	\$69,765,636	\$54,216,863	\$127,717,312

- 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 to dependents of deceased members.

- **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 and monthly deposits to an HRA for Medicare-enrolled retirees and eligible dependents of deceased members under the Connector program.
- **The Annuity and Pension Reserve Fund**—is the fund from which retirement benefits that do not exceed the IRC 415(b) limitations and health care coverage are paid. By law, OPERS is obligated to pay certain benefits that have commenced with retirees. In order to make these payments each year and hold sufficient assets in this fund to pay the vested benefits of all retirees and beneficiaries as of the actuarial valuation date, OPERS transfers funds from the active member employer fund (the Employers' Accumulation Fund) to the pension funds (the Annuity and Pension Reserve Fund and the Survivors' Benefit Fund). Thus, the active member funding was 44% as of December 31, 2019.
- **The Survivors' Benefit Fund**—is the fund from which benefits due to beneficiaries of deceased members of the System that do not exceed the IRC 415(b) limitations are paid. Refer to the description under the Annuity and Pension Reserve Fund for additional information.
- **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.
- **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 Employers' Accumulation Health Care Fund (IRC 115)**—is used to accumulate a portion of employer contributions into an RMA for members electing to participate in the Member-Directed Plan.

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 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 and monthly deposits to an HRA for Medicare-enrolled retirees and eligible dependents of deceased members under the Connector program.
- **The Annuity and Pension Reserve Fund**—is the fund from which retirement benefits and health care coverage are paid.
- **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 Chapter 145 and the IRC-required funds are not mutually exclusive. The Combining Statement of Fiduciary Net Position and the Combining Statement of Changes in Fiduciary Net Position (pages 36-39) 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 as of December 31, 2019 were as follows:

 Statutory and IRC Fund Balances (as of December 31, 2019)					
	Traditional Pension Plan	Combined Plan	Member-Directed Plan	115 Health Care Trust	Total
Employees' Savings Fund	\$15,209,312,543	\$3,426,466	\$94,476		\$15,212,833,485
Employers' Accumulation Fund	11,147,191,027	630,733,294	3,556,429	\$12,647,057,751	24,428,538,501
Annuity and Pension Reserve Fund	62,789,212,909	34,924,190	20,191,106		62,844,328,205
Survivors' Benefit Fund	1,846,874,240				1,846,874,240
Defined Contribution Fund		636,589,237	1,216,743,004		1,853,332,241
Income Fund	121,965,749				121,965,749
Expense Fund	7,053,250				7,053,250
Total	\$91,121,609,718	\$1,305,673,187	\$1,240,585,015	\$12,647,057,751	\$106,314,925,671

- g. Risk Management**—OPERS is exposed to various risks of loss related to theft of, damage to, or 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. 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 2019 were related to the employee health care coverage (see Note 7).

3. Cash and Investments

A summary of cash, cash equivalents and investments held as of December 31, 2019 was as follows:

 Summary of Cash, Cash Equivalents and Investments (as of December 31, 2019)	
	2019 Fair Value
Cash and Cash Equivalents	
Cash	\$72,041,883
Cash Equivalents	
Commercial Paper	1,857,448,614
U.S. Treasury Obligations	315,721,443
Repurchase Agreements	1,555,000,000
Interest-Bearing Short-Term Certificates	50,000,000
Short-Term Investment Funds (STIF)	1,302,820,933
Subtotal Cash Equivalents	5,080,990,990
Total Cash and Cash Equivalents	\$5,153,032,873
Investments	
Fixed Income	
U.S. Corporate Bonds	\$5,575,037,701
Non-U.S. Notes and Bonds	7,969,939,890
U.S. Government and Agencies	11,696,800,870
U.S. Mortgage Backed	4,106,112,344
Subtotal Fixed Income	29,347,890,805
Domestic Equities	19,956,621,059
Real Estate	8,909,782,768
Private Equity	9,938,593,944
International Equities	21,484,217,532
Other Investments ¹	11,431,891,361
Total Investments Before Collateral on Loaned Securities	101,068,997,469
Collateral on Loaned Securities	
Securities and Reinvested Cash Collateral for Loaned Securities	8,338,502,346
Total Collateral on Loaned Securities	8,338,502,346
Total Investments Including Collateral on Loaned Securities	\$109,407,499,815
Total Cash, Cash Equivalents and Investments	\$114,560,532,688

¹Includes hedge funds, derivative instruments and risk parity.

- 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 balances reported was \$72,041,883 at December 31, 2019. OPERS has not experienced any losses in accounts and the System is not exposed to 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 Health Care 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 and health care assets must be within 20% of the average effective duration of the benchmark.

The following table presents the credit quality ratings and effective durations of OPERS fixed income assets, including short-term investments, as of December 31, 2019:

 2019 Average Credit Quality and Exposure Levels of Guaranteed Investments					
Fixed Income Security Type	Fair Value	Percent of All Fixed Income Assets	Weighted Average Duration to Maturity (years)	AAA	AA
Commercial Paper	\$1,857,448,614	5.40%	0.17	\$1,529,196,141	\$249,254,124
Short-Term Investment Funds (STIF)	1,302,820,933	3.78	0.08	1,302,820,933	
Repurchase Agreements	1,555,000,000	4.52	0.03		
Interest-Bearing Short-Term Certificates	50,000,000	0.15	0.97	50,000,000	
Corporate Bonds	4,529,169,151	13.15	5.23	55,656,685	469,978,286
Municipal Bonds	44,732,394	0.13	9.25	16,800,000	15,000,000
Asset-Backed Securities	505,596,117	1.47	2.88	261,792,901	47,421,384
Mortgages	1,142,358,373	3.32	4.64	444,064,784	139,886,909
Agency Mortgages	2,855,017,415	8.29	4.36		2,855,017,415
Non-U.S. Corporate Bonds	2,400,613,949	6.97	4.92	136,645,372	237,099,368
Non-U.S. Mortgage & Asset-Backed Securities	633,448,421	1.84	1.81	550,635,792	55,117,749
Non-U.S. Government	4,935,877,518	14.34	6.55		206,096,943
Agency Bonds	710,788,004	2.06	2.43		710,788,004
Commingled Long-Term Global Funds	648,949,182	1.88	3.80	44,672,585	546,773,012
Total Non-Government Guaranteed	23,171,820,071	67.30		4,392,285,193	5,532,433,194
U.S. Treasury Notes	7,002,845,008	20.34	3.37		7,002,845,008
U.S. Treasury Bonds	1,330,481,132	3.86	18.50		1,330,481,132
U.S. Treasury Inflation Protected	2,608,014,141	7.58	9.32		2,608,014,141
U.S. Treasury Discount Notes	315,721,443	0.92	0.19		315,721,443
Total Fixed Income and Cash Equivalents	\$34,428,881,795	100.00%	4.82	\$4,392,285,193	\$16,789,494,918

 2019 Average Credit Quality and Exposure Levels of Guaranteed Investments (continued from page 56)								
A	BBB	BB	B	CCC	CC	C	D	Not Rated
\$78,998,349								
930,000,000								\$625,000,000
877,645,796	\$1,517,086,520	\$979,982,799	\$481,249,482	\$110,791,199	\$2,886,816	\$1,267,098	\$4,469,087	28,155,383
9,965,544	2,966,850							
31,841,610	134,680,328	14,719,872	913,925		3,796,970		3,199,696	7,229,431
150,181,964	270,938,764	73,707,055					170,981	63,407,916
493,536,903	653,584,527	370,203,713	279,948,699	96,418,016	1,214,386		122,850	131,840,115
		11,679,338						16,015,542
883,172,052	1,483,210,778	888,132,722	1,044,674,283	188,655,391	100,183,181		18,887,897	122,864,271
								57,503,585
3,455,342,218	4,062,467,767	2,338,425,499	1,806,786,389	395,864,606	108,081,353	1,267,098	26,850,511	1,052,016,243
\$3,455,342,218	\$4,062,467,767	\$2,338,425,499	\$1,806,786,389	\$395,864,606	\$108,081,353	\$1,267,098	\$26,850,511	\$1,052,016,243

- 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, 2019, 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 investment 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 the next page for foreign currency detail.

 Exposure to Foreign Currency Risk in U.S. Dollars (as of December 31, 2019)						
Currency	Cash	Forwards	Fixed Income	International Equities	Real Estate	Private Equity
Argentine Peso	\$1,910,211		\$25,764,125			
Australian Dollar	5,837,770			\$707,685,559		
Belarusian Ruble			10,925,418			
Brazilian Real	1,402,724	\$14,894,108	306,438,995	408,961,803		
British Pound Sterling	6,004,743	7,345		2,037,120,436		\$729,419,869
Canadian Dollar	106,652			636,976,827		
Chilean Peso	508	12,691,666	49,134,313	7,549,667		
Chinese Yuan Renminbi	317,124	(284,675)		28,782,291		
Colombian Peso	11,747		174,818,417	3,304,126		
Costa Rican Colón			1,987,816			
Czech Koruna	28,871	43,567,909	81,143,493	4,610,539		
Danish Krone	452,877			321,482,211		
Dominican Peso	79,514		51,789,745			
Egyptian Pound	2,987,960		66,753,056	6,400,038		
Euro Currency	1,971,231	(104,461,603)	105,297,973	3,479,447,395	\$15,245,266	994,855,406
Georgian Lari			9,451,682			
Ghanaian Cedi	14		14,915,621			
Hong Kong Dollar	1,370,312	(220,609)		1,359,321,648		
Hungarian Forint	205,901	9,987,348	50,599,739	21,288,637		
Indian Rupee	296,499		38,827,614	384,345,226		
Indonesian Rupiah	1,284,797	(36,532,485)	345,957,432	140,253,753		
Israeli Shekel	170,734			71,688,191		
Japanese Yen	2,208,449	536,267		2,789,599,517		
Kazakhstani Tenge			9,880,774			
Kenyan Shilling			18,730,006			
Kuwaiti Dinar	233,319			4,491,686		
Malaysian Ringgit	378,892		120,004,416	45,617,039		
Mexican Peso	17,324,770	(31,212,225)	341,776,807	84,622,964		
New Zealand Dollar	375,683			43,029,364		
Nigerian Naira	5,372		6,402,611			
Norwegian Krone	1,773,492			110,077,369		
Peruvian Nuevo Sol	368,118	(9,591,313)	81,952,696	490,503		
Philippine Peso	55,181		9,343,004	25,141,172		
Polish Zloty	164,978	11,783,075	188,778,199	38,568,546		
Qatari Rial	22,250			13,462,142		
Romanian New Leu			22,704,353			
Russian Ruble	49,477	(19,372,485)	298,579,797			
Saudi Riyal	73,656			36,325,796		
Singapore Dollar	1,089,702			183,841,279		
South African Rand	1,428,628		297,348,290	167,357,122		
South Korean Won	420,003			682,713,576		
Swedish Krona	13,707			253,727,908		
Swiss Franc	456,950	(15,372,022)		981,444,821		
Taiwan Dollar	1,573,654			452,471,697		
Thailand Baht	22,270	13,344,643	114,429,672	123,630,172		
Turkish Lira	99,633		114,325,942	69,469,442		
UAE Dirham	14,471			18,102,782		
Ukrainian Hryvnia	92,968		28,568,853			
Uruguay Peso			55,497,133			
Total	\$52,685,812	(\$110,235,056)	\$3,042,127,992	\$15,743,403,244	\$15,245,266	\$1,724,275,275

- 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 or collateral securities considered liquid and agrees to return the collateral for the same securities in the future. 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. Cash collateral from securities loaned is, simultaneous to the loan, reinvested in repurchase agreements and short-term securities. OPERS does not have the ability to pledge or sell reinvested collateral securities during the term of a loan absent a broker default. OPERS has the ability to pledge or sell collateral securities from securities loaned. If the fair value of the collateral held falls below the required levels, additional collateral is provided. As of December 31, 2019, the fair value of securities on loan was \$8,132,625,518. Associated collateral totaling \$8,336,228,643 was received, of which \$7,903,764,558 was reinvested cash collateral and \$432,464,085 was securities collateral. The fair market value of reinvested collateral was \$8,338,502,346 as of December 31, 2019, which includes a net unrealized loss on securities lending activity totaling \$515,629. Net securities 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 securities 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 securities lending income is equal to gross income less broker rebates, agent fees, and unrealized losses on collateral. Securities lending income for 2019 was recorded on an accrual basis.
- h. Derivative Instruments**—Derivative instruments 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 derivative instruments:
- **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 Statement of Changes in Fiduciary Net Position. The forward-currency purchases are recognized in Investment Commitments Payable on the Combining Statement 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 are included as net increase/decrease in the fair value of investments in the Combining Statement of Changes in Fiduciary Net Position. The net realized and unrealized loss on forward-currency contracts for the year 2019 was \$6,965,737.
- 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, 2019)	
Forward-currency purchases	\$129,037,326
Forward-currency sales	(\$239,272,385)
Unrealized loss	(\$2,023,912)

- 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 Statement 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, 2019. The net realized and unrealized gain on futures contracts for the year 2019 was \$765,452,044.

 Futures Positions Held (as of December 31, 2019)		
Futures Contracts	Number of Contracts	Contract Principal
U.S. Equity Index Futures purchased long	18,867	\$3,021,240,835
U.S. Treasury Futures purchased long	18,600	\$2,790,373,516
U.S. Treasury Futures purchased short	143	(\$19,408,736)
Non-U.S. Equity Index Futures purchased long	27,494	\$1,919,206,975

- 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 the price of the reference obligation or in the counterparty's ability to meet the terms of the contract. OPERS held total return swaps with a notional value of \$1,544,027,314 as of December 31, 2019. The unrealized loss as of December 31, 2019 was \$1,125,468. The net realized and unrealized gain in total return swaps for the year 2019 was \$190,364,005.
- 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 credit default swaps with a notional value of \$335,000,000 as of December 31, 2019. The net realized and unrealized loss in credit default swaps for the year 2019 was \$14,428,458.
- 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. OPERS held options with a notional value of \$194,404 as of December 31, 2019. The net realized and unrealized loss in options for the year 2019 was \$511,765.

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, 2019:

 Investments and Short-Term Holdings Measured At Fair Value (as of December 31, 2019)				
	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	\$5,129,543,508		\$4,780,054,852	\$349,488,656
Non-U.S. Notes and Bonds	7,969,939,890		7,151,673,963	818,265,927
U.S. Government and Agencies	11,652,128,285		11,618,006,210	34,122,075
U.S. Mortgage Backed	3,997,375,786		3,963,458,344	33,917,442
Total Fixed Income	28,748,987,469		27,513,193,369	1,235,794,100
Equities				
Domestic Equities	19,029,350,999	\$18,997,278,957	1,630,316	30,441,726
International Equities	18,480,375,797	18,338,565,132	113,108,826	28,701,839
Total Equities	37,509,726,796	37,335,844,089	114,739,142	59,143,565
Total Investments by Fair Value Level	\$66,258,714,265	\$37,335,844,089	\$27,627,932,511	\$1,294,937,665
Investments Measured at the Net Asset Value (NAV)				
Real Estate	\$8,909,782,768			
Private Equity	9,938,593,944			
Other Investments ¹	11,435,048,082			
Commingled Mutual Funds				
U.S. Corporate Bonds	7,457,740			
U.S. Mortgage Backed	108,736,558			
International Equities	2,557,503,520			
Defined Contribution Commingled Mutual Funds				
Domestic Equities	927,270,060			
U.S. Corporate Bonds	299,095,911			
U.S. Government and Agencies	44,672,585			
International Equities	446,338,215			
Total Investments Measured at the NAV	\$34,674,499,383			
Investment Derivative Instruments				
Foreign Exchange Contracts	(\$2,023,912)		(\$2,023,912)	
Swaps (Total Return and Credit Default)	(1,327,213)		(1,327,213)	
Options	194,404		194,404	
Total Investment Derivative Instruments	(\$3,156,721)		(\$3,156,721)	
Investments Not Subject to Fair Value Leveling (at cost or amortized cost)				
Cash	\$72,041,883			
Commercial Paper	1,857,448,614			
Interest-Bearing Short-Term Certificates	50,000,000			
Repurchase Agreements	1,555,000,000			
Short-Term Investment Funds (STIF)	1,302,820,933			
U.S. Treasury Obligations	315,721,443			
Stable Value Funds ²	138,940,542			
Total Investments Not Subject to Fair Value Leveling	\$5,291,973,415			
Total Cash and Investments Before Collateral on Loaned Securities	\$106,222,030,342			

¹ Includes hedge funds and risk parity.

² Valued at contract value, which approximates fair value.

 Other Investment Derivative Instruments (as of December 31, 2019)				
	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	\$129,037,326		\$129,037,326	
Investment Sales Proceeds—Forward-Currency Sales	(\$239,272,385)		(\$239,272,385)	

 Securities and Reinvested Cash Collateral for Loaned Securities (as of December 31, 2019)				
	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	\$1,470,065,438		\$1,470,065,438	
U.S. Corporate Bonds	2,026,069,087		2,026,069,087	
Non-U.S. Corporate Notes and Bonds	512,464,084		512,464,084	
Total Investments by Fair Value Level	4,008,598,609		4,008,598,609	
Investments Not Subject to Fair Value Leveling				
(at cost or amortized cost)				
Cash	47,954,947			
Certificates of Deposit	898,973,800			
Commercial Paper	1,157,147,546			
Commingled Funds	470,015,715			
Receivables/Payables	3,721,254			
Repurchase Agreements	997,917,377			
Short-Term Debt				
Short-Term Investment Funds	185,000,000			
U.S. Treasury Obligations Less than One Year	569,173,098			
Total Securities and Reinvested Cash Collateral for Loaned Securities	\$8,338,502,346		\$4,008,598,609	

Investments classified as Level 1 in the previous tables are comprised of U.S. corporate notes, common stock, international equity and exchange-traded funds.

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 derivative instruments, including foreign exchange contracts and swaps.

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

Changes in the significant unobservable inputs in the table on page 62 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, including 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. 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 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.

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

As of December 31, 2019, 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, 2019:

 Investments Measured at the Net Asset Value (NAV) (as of December 31, 2019)				
	Net Asset Value	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Real Estate				
Closed-End Private Real Estate ¹	\$974,473,553	\$1,356,480,721	N/A	N/A
Open-End Private Real Estate ²	2,075,959,983	154,619,716	Quarterly	90 Days
Separate Account Private Real Estate ³	5,859,349,232	930,000,000	N/A	N/A
Private Equity⁴	9,938,593,944	6,139,816,781	N/A	N/A
Other Investments⁵				
Event-Driven ⁶	1,406,422,122	N/A	Monthly, Quarterly, Annual	30-90 Days
Long/Short Equity ⁷	952,574,822	N/A	Monthly, Quarterly	5-60 Days
Multi-strategy ⁸	5,922,625,471	N/A	Monthly	3-5 Days
Relative Value ⁹	1,546,279,964	N/A	Monthly, Quarterly	30-60 Days
Tactical Trading ¹⁰	1,607,145,703	N/A	Monthly, Quarterly	2-60 Days
Commingled Mutual Funds¹¹				
U.S. Corporate Bonds	7,457,740	N/A	Monthly	10 Days
U.S. Mortgage Backed	108,736,558	N/A	Monthly	15 Days
International Equities	2,557,503,520	N/A	Daily, Monthly	1-7 Days
Defined Contribution Commingled Mutual Funds¹²				
Domestic Equities	927,270,060	N/A	Daily	Daily
U.S. Corporate Bonds	299,095,911	N/A	Daily	Daily
U.S. Government and Agencies	44,672,585	N/A	Daily	Daily
International Equities	446,338,215	N/A	Daily	Daily
Total Investments Measured at the NAV	\$34,674,499,383			

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. The valuations are based on manager-provided net asset values, located in quarterly capital account statements, that are cash flow adjusted to the end of the reporting period.

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. The valuations are based on manager-provided net asset values, located in quarterly capital account statements, that are cash flow adjusted to the end of the reporting period.

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. The valuations are based on manager-provided net asset values, located in quarterly capital account statements, that are cash flow adjusted to the end of the reporting period.

⁴ **Private Equity**—Private equity invests through closed-end, finite-life, commingled funds that are typically structured as limited partnerships, where the investors are LPs and the fund sponsor/manager is the GP. The LPs have limited control and limited liability. Private equity closed-end funds typically invest in corporate finance, venture capital and

special situations (secondary fund-of-funds and distressed debt strategies). The valuations are based on manager-provided net asset values, located in quarterly capital account statements, that are cash flow adjusted to the end of the reporting period.

- ⁵ **Other Investments**—Includes hedge funds and risk parity.
- ⁶ **Event Driven**—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 instrument securities. Event-driven exposure includes a combination of sensitivities to equity markets, credit markets and company-specific developments. The valuations are based on manager-provided net asset values located in the monthly capital account statements, that are adjusted for estimated performance.
- ⁷ **Long/Short Equity**—Equity hedge strategies maintain positions both long and short in primarily equity and equity derivative instrument 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 capitalization and valuation ranges of typical portfolios. The valuations are based on manager-provided net asset values located in the monthly capital account statements, and are adjusted for estimated performance.
- ⁸ **Multi-strategy**—Multi-strategy managers combine several strategies within the same fund 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, derivative instruments risk, and leverage risk. The valuations are based on manager-provided net asset values located in the monthly capital account statements, that are adjusted for estimated performance.
- ⁹ **Relative Value**—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 instrument 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. The valuations are based on manager-provided net asset values located in the monthly capital account statements, that are adjusted for estimated performance.
- ¹⁰ **Tactical Trading**—Tactical-trading 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. The valuations are based on manager-provided net asset values located in the monthly capital account statements, that are adjusted for estimated performance.
- ¹¹ **Commingled Mutual Funds**—The commingled mutual funds seek to outperform the Bloomberg Barclays U.S. Corporate High Yield Bond Index, Bloomberg Barclays U.S. Aggregate Bond Index, MSCI All Country World Free x U.S. Index, and MSCI Emerging Markets Small Cap Index (net). The valuations are based on manager-provided net asset values located in the monthly capital account statements.
- ¹² **Defined Contribution Commingled Mutual Funds**—The defined contribution funds, other than the Stable Value Fund, not included in this activity, 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 valuations are based on manager-provided net asset values located in the monthly capital account statements.

4. Vacation and Sick Leave

As of December 31, 2019, OPERS accrual for unused vacation and sick leave for employees was \$8,750,133. 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, 2019 are as follows:

 Annual Required Pension and Health Care Contributions				
Year Ended	Pension		Health Care	
	Annual Required Contributions	Percent Contributed	Annual Required Contributions	Percent Contributed
2019	\$6,340,518	100%	\$540,224	100%

In accordance with accounting rules, internal payroll related to the implementation of capital projects is capitalized as part of the fixed asset cost. In 2019, OPERS began capitalizing certain implementation costs for subscription-based information technology arrangements (SBITA). The capitalizable implementation costs for SBITA were determined using accounting criteria in a recent exposure draft issued by GASB, similar to current guidance we follow for intangible assets. The capitalized cost includes salary and wages, as well as the corresponding employer-paid Medicare and retirement contribution expenses. The portion of the 2019 annual required contribution included in fixed assets was \$406,744 for pension and \$34,655 for health care. The portion of SBITA capitalized in 2019 was \$2.9 million.

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 2019. Employees share in the cost of their coverage by payroll deductions, which are netted against the claims cost. Employee deductions and vendor rebates totaled \$3,770,827 in 2019, including accrued estimated vendor rebates of \$200,000 to be received in 2020 related to 2019 claims. The summary of changes in the liability for self-insured employee health care for the year ended December 31, 2019 follows:

 Employee Health Insurance Liability	
	2019
Balance January 1	\$461,711
Claims Incurred	7,777,377
Claims Paid	(7,777,377)
Change in Estimated Claims Incurred but Not Reported	214,114
Balance December 31	\$675,825

The liability for self-insured employee health care is included in Accounts Payable and Other Liabilities on the Combining Statement 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, 2019 are as follows:

 Net Pension Liability/(Asset) (\$ in millions)				
As of December 31, 2019	All Plans	Traditional Pension Plan	Combined Plan ¹	Member-Directed Plan ¹
Total Pension Liability	\$111,368	\$110,887	\$461	\$20
Plan Fiduciary Net Position	91,815	91,122	669	24
Employers' Net Pension Liability/(Asset)	\$19,553	\$19,765	(\$208)	(\$4)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability/(Asset)	82.44%	82.17%	145.28%	118.84%

¹ The Combined Plan and Member-Directed Plan information in the Net Pension Liability/(Asset) 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, 2019, using the following key actuarial assumptions and methods applied to all prior periods included in the measurement in accordance with the requirements of GASB 67:

 Key Methods and Assumptions Used in Valuation of Total Pension Liability			
Actuarial Information	Traditional Pension Plan	Combined Plan	Member-Directed Plan
Measurement and Valuation Date	December 31, 2019	December 31, 2019	December 31, 2019
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	7.20%	7.20%	7.20%
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 Post-1/7/2013 Retirees: 1.40% Simple through 2020, then 2.15% Simple	Pre-1/7/2013 Retirees: 3.00% Simple Post-1/7/2013 Retirees: 1.40% Simple through 2020, then 2.15% Simple	Pre-1/7/2013 Retirees: 3.00% Simple Post-1/7/2013 Retirees: 1.40% Simple through 2020, then 2.15% Simple

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

The discount rate used to measure the total pension liability was 7.2% 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 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 rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic real rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Defined Benefit portfolio's target asset allocation as of December 31, 2019, these best estimates are summarized in the following table:

 Asset Class	Target Allocation as of December 31, 2019	Weighted Average Long-Term Expected Real Rate of Return
		(Arithmetic)
Fixed Income	25.00%	1.83%
Domestic Equities	19.00	5.75
Real Estate	10.00	5.20
Private Equity	12.00	10.70
International Equities	21.00	7.66
Other Investments	13.00	4.98
TOTAL	100.00%	5.61%

During 2019, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution 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, 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 was 17.2% for 2019.

The following table presents the net pension liability or asset calculated using the discount rate of 7.2%, and the expected net pension liability or asset 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, 2019	1% Decrease 6.2%	Current Discount Rate 7.2%	1% Increase 8.2%
All Plans	\$32,472	\$19,553	\$7,955
Traditional Pension Plan	\$32,600	\$19,765	\$8,228
Combined Plan	(\$126)	(\$208)	(\$268)
Member-Directed Plan	(\$2)	(\$4)	(\$5)

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 153-154. The Member-Directed Plan is a defined contribution pension plan allowing members at retirement to have the option to convert their defined contribution account to a defined benefit annuity. The defined contribution annuitized balances under this plan were included in this annual report from a GASB 67 perspective.

9. Net OPEB Liability—Health Care

The components of the net OPEB liability of the defined benefit health care plans as of December 31, 2019 were as follows:

 Net OPEB Liability (\$ in millions)	
As of December 31, 2019	
Total OPEB Liability	\$26,460
Plan Fiduciary Net Position	12,647
Employers' Net OPEB Liability	\$13,813
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability	47.80%

The total OPEB liability was determined by an actuarial valuation as of December 31, 2018, rolled forward to the measurement date of December 31, 2019, by incorporating the expected value of health care cost accruals, the actual health care payments, and interest accruals during the year for the defined benefit health care plans. In accordance with GASB Statement No. 75 (GASB 75), *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*, the Member-Directed Plan health care is a defined benefit health care plan, although the pension plan is defined contribution. Interest of 4.0% is credited to member accounts as long as the Defined Benefit portfolio earns a positive return. Beginning January 2020, interest will accrue based on the investment performance of the OPERS Stable Value Fund, not to exceed 4.0%

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 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 System and plan members. The total OPEB liability was determined by an actuarial valuation as of December 31, 2018, rolled forward to the measurement date of December 31, 2019.

The actuarial valuation used the following key actuarial assumptions and methods applied to all prior periods included in the measurement in accordance with the requirements of GASB 74:

 Key Methods and Assumptions Used in Valuation of Total OPEB Liability	
Actuarial Information	
Actuarial Valuation Date	December 31, 2018
Rolled-Forward Measurement Date	December 31, 2019
Experience Study	5-Year Period Ended December 31, 2015
Actuarial Cost Method	Individual entry age normal
Actuarial Assumptions	
Single Discount Rate	3.16%
Investment Rate of Return	6.00%
Municipal Bond Rate	2.75%
Wage Inflation	3.25%
Projected Salary Increases	3.25%-10.75% (includes wage inflation at 3.25%)
Health Care Cost Trend Rate	10.5% initial, 3.50% ultimate in 2030

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

A single discount rate of 3.16% was used to measure the total OPEB liability on the measurement date of December 31, 2019. Projected benefit payments are required to be discounted to their actuarial present value using a single discount rate that reflects (1) a long-term expected rate of return on OPEB plan investments (to the extent that the health care fiduciary net position is projected to be sufficient to pay benefits), and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate are not met). This single discount rate was based on the actuarial assumed rate of return on the health care investment portfolio of 6.00% and a municipal bond rate of 2.75%. The projection of cash flows used to determine this single discount rate assumed that employer contributions will be made at rates equal to the actuarially

determined contribution rate. Based on these assumptions, the health care fiduciary net position and future contributions were sufficient to finance health care costs through the year 2034. As a result, the actuarial assumed long-term expected rate of return on health care investments was applied to projected costs through the year 2034, and the municipal bond rate was applied to all health care costs after that date.

The allocation of investment assets within the Health Care portfolio is approved by the Board as outlined in the annual investment plan. Assets are managed on a total return basis with a long-term objective of continuing to offer a sustainable health care program for current and future retirees. The System's primary goal is to achieve and maintain a fully funded status for benefits provided through the defined pension plans. Health care is a discretionary benefit. The long-term expected rate of return on health care 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 rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic real rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Health Care portfolio's target asset allocation as of December 31, 2019, these best estimates are summarized in the following table:

 Asset Class	Target Allocation as of December 31, 2019	Weighted Average Long-Term Expected Real Rate of Return
		(Arithmetic)
Fixed Income	36.00%	1.53%
Domestic Equities	21.00	5.75
REITs	6.00	5.69
International Equities	23.00	7.66
Other Investments	14.00	4.90
TOTAL	100.00%	4.55%

During 2019, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Health Care portfolio includes the assets for health care expenses for the Traditional Pension Plan, Combined Plan and Member-Directed Plan eligible members. Within the Health Care portfolio, if any contributions are made into the plans, the contributions are assumed to be received continuously throughout the year based on the actual payroll payable at the time contributions are made. Health care-related payments are assumed to occur mid-year. 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 Health Care portfolio was 19.7% for 2019.

The following table presents the net OPEB liability calculated using the single discount rate of 3.16%, and the expected net OPEB 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 OPEB Liability to Changes in the Discount Rate (\$ in millions)			
As of December 31, 2019	1% Decrease 2.16%	Single Discount Rate 3.16%	1% Increase 4.16%
Employers' Net OPEB Liability	\$18,076	\$13,813	\$10,399

Changes in the health care cost trend rate may also have a significant impact on the net OPEB liability. The following table presents the net OPEB liability calculated using the assumed trend rates, and the expected net OPEB liability if it were calculated using a health care cost trend rate that is 1.0% lower or 1.0% higher than the current rate.

 Sensitivity of Net OPEB Liability to Changes in the Health Care Cost Trend Rate (\$ in millions)			
As of December 31, 2019	1% Decrease	Current Health Care Cost Trend Rate Assumption	1% Increase
Employers' Net OPEB Liability	\$13,405	\$13,813	\$14,215

Retiree health care valuations use a health care cost-trend assumption with changes over several years built into that assumption. The near-term rates reflect increases in the current cost of health care; the trend starting in 2020 is 10.50%. If this trend continues for future years, the projection indicates that years from now virtually all expenditures will be for health care. A more reasonable alternative is the health plan cost trend will decrease to a level at, or near, wage inflation. On this basis, the actuaries project premium rate increases will continue to exceed wage inflation for approximately the next decade, but by less each year, until leveling off at an ultimate rate, assumed to be 3.50% in the most recent valuation.

The funding status of health care and the Schedule of Funding Progress are found in the Actuarial Section of this document on page 155.

10. Subsequent Events

Subsequent to December 31, 2019, the global economy was impacted by the COVID-19 pandemic and market volatility increased significantly. It is likely that 2020 investment market conditions and other economic factors will be negatively impacted; however, the overall impact on the OPERS investment portfolio and funding position is unknown at this time.

On January 15, 2020, the Board approved several changes to the health care plan offered to Medicare and pre-Medicare retirees in efforts to decrease costs and increase the solvency of the health care plan. These changes are effective January 1, 2022, and include changes to base allowances and eligibility for Medicare retirees, as well as replacing OPERS-sponsored medical plans for pre-Medicare retirees with monthly allowances, similar to the program for Medicare retirees. These changes are not reflected in the current year financial statements but are expected to decrease the associated OPEB liability.

Defined Benefit Pension Plans

The Schedules of Changes in Net Pension Liability and Related Ratios display 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 Payroll represents the collective total of the OPERS eligible wages of all OPERS employers within each plan. GASB 67 requires that data be reported for 10 years; however, data prior to 2014 is not available.

Schedule of Changes in Net Pension Liability and Related Ratios (\$ in millions)						All Plans ¹
	2019	2018	2017	2016	2015	2014
Net Change in Total Pension Liability						
Service Cost	\$1,988.6	\$1,976.7	\$1,823.3	\$1,763.4	\$1,710.7	\$1,685.3
Interest on Total Pension Liability	7,655.8	7,475.5	7,347.3	7,131.5	6,978.9	6,778.9
Changes of Benefit Terms	-	-	-	-	-	-
Difference Between Expected and Actual Experience	(249.2)	(339.8)	(456.1)	37.5	(334.0)	(321.4)
Changes in Assumptions	-	3,433.9	-	5,344.6	-	-
Benefit Payments, Including Refunds of Employee Contributions	(6,728.5)	(6,498.4)	(6,227.6)	(5,942.8)	(5,808.6)	(5,502.2)
Net Change in Total Pension Liability	2,666.7	6,047.9	2,486.9	8,334.2	2,547.0	2,640.6
Total Pension Liability—Beginning	108,701.2	102,653.3	100,166.4	91,832.2	89,285.2	86,644.6
Total Pension Liability—Ending	\$111,367.9	\$108,701.2	\$102,653.3	\$100,166.4	\$91,832.2	\$89,285.2
Net Change in Plan Fiduciary Net Position						
Employer Contributions	\$2,037.3	\$1,958.6	\$1,779.6	\$1,606.0	\$1,564.7	\$1,520.3
Member Contributions	1,410.5	1,354.2	1,324.5	1,294.8	1,246.7	1,228.1
Net Investment Income/(Loss)	13,630.5	(2,541.1)	12,657.6	5,976.9	276.3	5,074.7
Benefit Payments, Including Refunds of Employee Contributions	(6,728.5)	(6,498.4)	(6,227.6)	(5,942.8)	(5,808.6)	(5,502.2)
Non-Investment Administrative Expenses	(51.9)	(51.8)	(52.2)	(51.9)	(49.1)	(49.8)
Other ²	89.3	100.9	108.8	71.1	66.9	125.5
Net Change in Plan Fiduciary Net Position	10,387.2	(5,677.6)	9,590.7	2,954.1	(2,703.1)	2,396.6
Plan Fiduciary Net Position—Beginning	81,427.3	87,104.9	77,514.2	74,560.1	77,263.2	74,866.6
Plan Fiduciary Net Position—Ending	\$91,814.5	\$81,427.3	\$87,104.9	\$77,514.2	\$74,560.1	\$77,263.2
Net Pension Liability/(Asset)	\$19,553.4	\$27,273.9	\$15,548.4	\$22,652.2	\$17,272.1	\$12,022.0
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset)	82.44%	74.91%	84.85%	77.39%	81.19%	86.54%
Covered Payroll	\$14,987.6	\$14,391.1	\$14,058.0	\$13,717.6	\$13,177.0	\$12,932.5
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	130.46%	189.52%	110.60%	165.13%	131.08%	92.96%

¹Includes Traditional Pension Plan and defined benefit portions of Combined Plan and Member-Directed Plan. Does not tie exactly to the combined total of the following three schedules for the Traditional Pension Plan, Combined Plan and Member-Directed Plan due to rounding.

²Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 86.

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

Schedule of Changes in Net Pension Liability and Related Ratios (\$ in millions)				Traditional Pension Plan ¹		
	2019	2018	2017	2016	2015	2014
Net Change in Total Pension Liability						
Service Cost	\$1,959.5	\$1,948.6	\$1,796.9	\$1,738.6	\$1,687.0	\$1,659.6
Interest on Total Pension Liability	7,623.7	7,446.3	7,320.5	7,107.3	6,956.7	6,759.0
Changes of Benefit Terms	-	-	-	-	-	-
Difference Between Expected and Actual Experience	(242.3)	(331.5)	(441.6)	45.5	(322.3)	(309.7)
Changes in Assumptions	-	3,417.0	-	5,328.8	-	-
Benefit Payments, Including Refunds of Employee Contributions	(6,718.2)	(6,489.7)	(6,219.8)	(5,936.9)	(5,804.1)	(5,498.8)
Net Change in Total Pension Liability	2,622.7	5,990.7	2,456.0	8,283.3	2,517.3	2,610.1
Total Pension Liability—Beginning	108,264.6	102,273.9	99,817.9	91,534.6	89,017.3	86,407.2
Total Pension Liability—Ending	\$110,887.3	\$108,264.6	\$102,273.9	\$99,817.9	\$91,534.6	\$89,017.3
Net Change in Plan Fiduciary Net Position						
Employer Contributions	\$1,974.2	\$1,895.5	\$1,722.9	\$1,556.5	\$1,498.7	\$1,476.1
Member Contributions	1,410.5	1,354.2	1,324.5	1,294.8	1,246.7	1,228.1
Net Investment Income/(Loss)	13,532.5	(2,524.6)	12,586.4	5,947.2	274.9	5,056.3
Benefit Payments, Including Refunds of Employee Contributions	(6,718.2)	(6,489.7)	(6,219.8)	(5,936.9)	(5,804.1)	(5,498.8)
Non-Investment Administrative Expenses	(51.9)	(51.8)	(52.2)	(51.9)	(49.1)	(49.8)
Other ²	98.0	107.1	114.4	86.6	90.0	125.8
Net Change in Plan Fiduciary Net Position	10,245.1	(5,709.3)	9,476.2	2,896.3	(2,742.9)	2,337.7
Plan Fiduciary Net Position—Beginning	80,876.5	86,585.8	77,109.6	74,213.3	76,956.2	74,618.5
Plan Fiduciary Net Position—Ending	\$91,121.6	\$80,876.5	\$86,585.8	\$77,109.6	\$74,213.3	\$76,956.2
Net Pension Liability/(Asset)	\$19,765.7	\$27,388.1	\$15,688.1	\$22,708.3	\$17,321.3	\$12,061.1
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset)	82.17%	74.70%	84.66%	77.25%	81.08%	86.45%
Covered Payroll	\$13,931.9	\$13,375.7	\$13,085.0	\$12,794.0	\$12,321.2	\$12,139.7
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	141.87%	204.76%	119.89%	177.49%	140.58%	99.35%

¹ Includes money purchase annuities for re-employed retirees and additional annuities.

² Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 86.

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

Schedule of Changes in Net Pension Liability and Related Ratios (\$ in millions)					Combined Plan ¹	
	2019	2018	2017	2016	2015	2014
Net Change in Total Pension Liability						
Service Cost	\$29.0	\$28.1	\$26.4	\$24.8	\$23.7	\$25.7
Interest on Total Pension Liability	31.0	28.3	26.0	23.5	21.6	19.4
Changes of Benefit Terms	-	-	-	-	-	-
Difference Between Expected and Actual Experience	(11.8)	(12.3)	(17.9)	(10.2)	(13.3)	(13.2)
Changes in Assumptions	-	16.5	-	15.2	-	-
Benefit Payments, Including Refunds of Employee Contributions	(7.3)	(6.1)	(5.6)	(5.0)	(3.7)	(2.8)
Net Change in Total Pension Liability	40.9	54.5	28.9	48.3	28.3	29.1
Total Pension Liability—Beginning	419.6	365.1	336.2	287.9	259.6	230.5
Total Pension Liability—Ending	\$460.5	\$419.6	\$365.1	\$336.2	\$287.9	\$259.6
Net Change in Plan Fiduciary Net Position						
Employer Contributions	\$62.7	\$60.2	\$53.6	\$47.1	\$44.0	\$44.2
Member Contributions	-	-	-	-	-	-
Net Investment Income/(Loss)	94.4	(15.9)	68.6	28.8	1.3	17.9
Benefit Payments, Including Refunds of Employee Contributions	(7.3)	(6.1)	(5.6)	(5.0)	(3.7)	(2.8)
Non-Investment Administrative Expenses	-	-	-	-	-	-
Other ²	(12.2)	(8.0)	(7.3)	(15.6)	(3.1)	(2.2)
Net Change in Plan Fiduciary Net Position	137.6	30.2	109.3	55.3	38.5	57.1
Plan Fiduciary Net Position—Beginning	531.4	501.2	391.9	336.6	298.1	241.0
Plan Fiduciary Net Position—Ending	\$669.0	\$531.4	\$501.2	\$391.9	\$336.6	\$298.1
Net Pension Liability/(Asset)	(\$208.5)	(\$111.8)	(\$136.1)	(\$55.7)	(\$48.7)	(\$38.5)
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset)	145.28%	126.64%	137.28%	116.55%	116.90%	114.83%
Covered Payroll	\$447.9	\$430.5	\$412.7	\$392.3	\$366.9	\$346.0
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	(46.56%)	(25.97%)	(32.99%)	(14.19%)	(13.26%)	(11.13%)

¹ Includes annuitized defined contribution accounts. The Combined Plan information in the Net Pension Asset 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.

² Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 86.

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

Schedule of Changes in Net Pension Liability and Related Ratios (\$ in millions)				Member-Directed Plan ¹		
	2019	2018	2017	2016	2015	2014
Net Change in Total Pension Liability						
Service Cost	-	-	-	-	-	-
Interest on Total Pension Liability	\$1.1	\$0.9	\$0.8	\$0.7	\$0.6	\$0.5
Changes of Benefit Terms	-	-	-	-	-	-
Difference Between Expected and Actual Experience	4.9	4.0	3.4	2.2	1.6	1.5
Changes in Assumptions	-	0.4	-	0.6	-	-
Benefit Payments, Including Refunds of Employee Contributions	(2.9)	(2.6)	(2.2)	(0.9)	(0.8)	(0.6)
Net Change in Total Pension Liability	3.1	2.7	2.0	2.6	1.4	1.4
Total Pension Liability—Beginning	17.0	14.3	12.3	9.7	8.3	6.9
Total Pension Liability—Ending	\$20.1	\$17.0	\$14.3	\$12.3	\$9.7	\$8.3
Net Change in Plan Fiduciary Net Position						
Employer Contributions	\$0.4	\$2.9	\$3.1	\$2.4	\$22.0	-
Member Contributions	-	-	-	-	-	-
Net Investment Income/(Loss)	3.6	(0.6)	2.5	0.9	0.1	\$0.5
Benefit Payments, Including Refunds of Employee Contributions	(2.9)	(2.6)	(2.2)	(0.9)	(0.8)	(0.6)
Non-Investment Administrative Expenses	-	-	-	-	-	-
Other ²	3.5	1.8	1.7	0.1	(20.0)	1.9
Net Change in Plan Fiduciary Net Position	4.6	1.5	5.1	2.5	1.3	1.8
Plan Fiduciary Net Position—Beginning	19.3	17.8	12.7	10.2	8.9	7.1
Plan Fiduciary Net Position—Ending	\$23.9	\$19.3	\$17.8	\$12.7	\$10.2	\$8.9
Net Pension Liability/(Asset)	(\$3.8)	(\$2.3)	(\$3.5)	(\$0.4)	(\$0.5)	(\$0.6)
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability/(Asset)	118.84%	113.42%	124.46%	103.40%	103.91%	107.10%
Covered Payroll	\$607.9	\$584.8	\$560.3	\$531.3	\$488.9	\$446.8
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	(0.62%)	(0.39%)	(0.62%)	(0.08%)	(0.08%)	(0.13%)

¹ Includes annuitized defined contribution accounts. The Member-Directed Plan information in the Net Pension Asset 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.

² Other includes Contract and Other Receipts, Other Income and Interplan Activity.

See Notes to Required Supplementary Information, beginning on page 86.

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 Plan¹	
Year Ended December 31	Actuarially Determined Contributions ²	Contributions Paid	Contribution Deficiency/ (Excess)	Covered Payroll ³	Contributions as a Percent of Covered Payroll
2019	\$3,384,674,147	\$3,384,674,147	-	\$13,931,857,036	24.3%
2018	3,249,698,135	3,249,698,135	-	13,375,730,324	24.3
2017	3,047,313,879	3,047,313,879	-	13,085,037,696	23.3
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

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.

² The Board has approved all contribution rates as recommended by the actuary.

³ Covered Payroll was calculated based on actual information obtained from OPERS-contributing employers during the fiscal year.

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 of 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 82 shows all employer contributions to the plan as no separate actuarially determined contributions are calculated for annuities. Employer contributions are used to determine the proportionate share for employers of this actuarial liability and related activity. The tables beginning on the next page 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.

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Schedule of Employer Contributions ¹					All Plans
Year Ended December 31	Actuarially Determined Contributions	Contributions Paid	Contribution Deficiency/ (Excess)	Covered Payroll ²	Contributions as a Percent of Covered Payroll
2019	\$2,097,664,257	\$2,097,664,257	-	\$14,987,616,732	14.0%
2018	2,014,194,303	2,014,194,303	-	14,391,093,639	14.0
2017	1,832,523,797	1,832,523,797	-	14,058,005,653	13.0
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

Schedule of Employer Contributions ¹					Traditional Pension Plan
Year Ended December 31	Actuarially Determined Contributions	Contributions Paid	Contribution Deficiency/ (Excess)	Covered Payroll ²	Contributions as a Percent of Covered Payroll
2019	\$1,974,172,176	\$1,974,172,176	-	\$13,931,857,036	14.2%
2018	1,895,462,837	1,895,462,837	-	13,375,730,324	14.2
2017	1,722,856,378	1,722,856,378	-	13,085,037,696	13.2
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

¹ 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 Statement of Changes in Fiduciary Net Position.

² Covered Payroll was calculated based on actual information obtained from OPERS-contributing employers during the fiscal year.

See Notes to Required Supplementary Information, beginning on page 86.

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

Schedule of Employer Contributions ¹					Combined Plan
Year Ended December 31	Actuarially Determined Contributions	Contributions Paid	Contribution Deficiency/ (Excess)	Covered Payroll ²	Contributions as a Percent of Covered Payroll
2019	\$62,699,159	\$62,699,159	-	\$447,866,875	14.0%
2018	60,249,275	60,249,275	-	430,541,632	14.0
2017	53,636,897	53,636,897	-	412,658,782	13.0
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

Schedule of Employer Contributions ¹					Member-Directed Plan
Year Ended December 31	Actuarially Determined Contributions	Contributions Paid	Contribution Deficiency/ (Excess)	Covered Payroll ^{2, 3}	Contributions as a Percent of Covered Payroll
2019	\$60,792,922	\$60,792,922	-	\$607,892,821	10.0%
2018	58,482,191	58,482,191	-	584,821,683	10.0
2017	56,030,522	56,030,522	-	560,309,175	10.0
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	-		

¹ 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 Statement of Changes in Fiduciary Net Position.

² Covered Payroll was calculated based on actual information obtained from OPERS-contributing employers during the fiscal year.

³ Covered Payroll calculated in conjunction with GASB 67 implementation in 2014. Information not available prior to 2014 implementation.

See Notes to Required Supplementary Information, beginning on page 86.

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

During 2019, OPERS managed its investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution 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 the same for all plans within the portfolio. GASB 67 requires that data be reported for 10 years; however, data prior to 2014 is not available.

 Schedule of Investment Returns Defined Benefit Portfolio	
Year	Annual Money-Weighted Rate of Return Net of Investment Expenses
2019	17.2%
2018	(2.9)
2017	16.8
2016	8.3
2015	0.4
2014	6.9

See Notes to Required Supplementary Information, beginning on page 86.

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

Post-employment Health Care Coverage or OPEB

The Schedule of Changes in Net OPEB Liability and Related Ratios displays the components of the total OPEB liability and plan fiduciary net position for the defined benefit health care plans, calculated in conformity with the requirements of GASB 74. Covered Payroll represents the collective total of the OPERS eligible wages of all OPERS employers within each pension plan. GASB 74 requires that data be reported for 10 years; however, data prior to 2017 is not available.

Schedule of Changes in Net OPEB Liability and Related Ratios (\$ in millions)			Health Care
	2019	2018	2017
Net Change in Total OPEB Liability			
Service Cost	\$542.3	\$617.4	\$546.9
Interest on Total OPEB Liability	957.4	906.7	921.2
Changes of Health Care Terms	-	-	-
Difference Between Expected and Actual Experience	(1,982.8)	(52.8)	12.5
Changes in Assumptions	3,420.0	11.5	1,168.7
Health Care Payments, Including Refunds of Employee Contributions	(767.9)	(870.3)	(952.0)
Net Change in Total OPEB Liability	2,169.0	612.5	1,697.3
Total OPEB Liability—Beginning	24,290.6	23,678.1	21,980.8
Total OPEB Liability—Ending	\$26,459.6	\$24,290.6	\$23,678.1
Net Change in Plan Fiduciary Net Position			
Employer Contributions	\$24.3	\$23.4	\$157.4
Contributions—Non-employer Contributing Entities	-	-	-
Employee Contributions	-	-	-
Net Investment Income/(Loss)	2,155.1	(700.4)	1,756.8
Health Care Payments, Including Refunds of Employee Contributions	(767.9)	(870.3)	(952.0)
Non-Investment Administrative Expenses	(18.0)	(19.6)	(24.9)
Other ¹	0.7	1.0	1.0
Net Change in Plan Fiduciary Net Position	1,394.2	(1,565.9)	938.3
Plan Fiduciary Net Position—Beginning	11,252.9	12,818.8	11,880.5
Plan Fiduciary Net Position—Ending	\$12,647.1	\$11,252.9	\$12,818.8
Net OPEB Liability	\$13,812.6	\$13,037.7	\$10,859.3
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	47.80%	46.33%	54.14%
Covered Payroll	\$14,987.6	\$14,391.1	\$14,058.0
Net OPEB Liability as a Percentage of Covered Payroll	92.16%	90.60%	77.25%

¹ Other includes Contract and Other Receipts and Other Income.

With the assistance of the System's actuary, the Board may approve a portion of each employer contribution to OPERS to be set aside for the funding of post-employment health care coverage. No employer contributions were allocated to health care in 2019. The employer contribution as a percent of covered payroll deposited for the Member-Directed Plan participants' health care accounts for 2019 was 4.0%. Interest of 4.0% is credited to member accounts as long as the Defined Benefit portfolio earns a positive return. Beginning January 2020, interest will accrue based on the investment performance of the OPERS Stable Value Fund, not to exceed 4.0%.

See Notes to Required Supplementary Information, beginning on page 86.

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

The table below displays the actuarially determined contributions for employers allocated to health care based on the actuarially determined rate, and the amount of these contributions paid by the employers each year based on the allocations determined by the Board. Due to the discretionary nature of health care funding and the potential for frequent changes in allocations, including no funding to health care for some plans, the calculation of proportionate shares of employers is based on total employer contributions, as disclosed in the Schedules of Employer Contributions within the Defined Benefit Pension Plans section of the Required Supplementary Information.

 Schedule of Employer Contributions					Health Care
Year Ended December 31	Actuarially Determined Contributions	Contributions Paid	Contribution Deficiency/(Excess)	Covered Payroll ¹	Contributions as a Percent of Covered Payroll
2019	\$855,315,505	\$24,318,141	\$830,997,364	\$14,987,616,732	0.2%
2018	850,929,552	23,441,668	827,487,884	14,391,093,640	0.2
2017	739,451,097	157,417,888	582,033,209	14,058,005,653	1.1
2016 ^a	762,698,127	284,903,259	477,794,868	13,717,592,219	2.1
2015	731,847,564	253,673,333	478,174,231	13,177,006,156	1.9
2014	684,421,764	247,083,670	437,338,094	12,932,540,544	2.0
2013	1,555,931,467	120,056,440	1,435,875,027	12,331,162,054	1.1
2012	1,422,859,434	494,048,415	928,811,019	12,193,467,217	4.2
2011	1,831,329,260	503,458,216	1,327,871,044	12,399,464,698	4.2
2010	1,650,917,533	628,685,237	1,022,232,296	12,449,782,144	5.2

^a In 2016, IRS guidance allowed OPERS to consolidate all health care funding into the 115 Trust. Based on criteria in GASB 74, all OPERS health care plans are reported as defined benefit OPEB. Therefore, beginning in 2016, the total employer contributions presented includes the contributions for all health care plans.

¹ Covered Payroll was calculated based on actual information obtained from OPERS-contributing employers during the fiscal year, which differs from the Covered Payroll in the funding valuation. Covered Payroll used in the funding valuation is based on the annualized pay rate of all pension plan active members as of the valuation date.

During 2019, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Health Care portfolio includes the assets for health care expenses for the Traditional Pension Plan, Combined Plan and Member-Directed Plan eligible members. Within the Health Care portfolio, contributions into the plan are assumed to be received continuously through the year based on the actual payroll payable at the time contributions are made, and health care-related payments are assumed to occur mid-year. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. GASB 74 requires that data be reported for 10 years; however, data prior to 2017 is not available.

 Schedule of Investment Returns		Health Care Portfolio
Year	Annual Money-Weighted Rate of Return Net of Investment Expenses	
2019	19.7%	
2018	(5.6%)	
2017	15.3%	

See Notes to Required Supplementary Information, beginning on page 86.

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. The actuarial assumptions and methods used to determine contribution rates for the year ended December 31, 2019 are based on the December 31, 2017 pension actuarial valuation and are described below.

- **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.
- **Asset Valuation Method**—For actuarial purposes, assets are valued utilizing a method that recognizes assumed total investment returns 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%.
- **Amortization Method**—Level percent of payroll, closed amortization period, for the Traditional Pension and Combined plans; Level dollar, closed amortization period, for the Member-Directed Plan.
- **Investment Return**—An investment rate of return of 7.50% compounded annually (net after investment expenses) was assumed for 2017 and 7.20% for the years ended December 31, 2018 and 2019.
- **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.
- **Salary Scale**—Wage inflation plus additional projected salary increases ranged up to 7.50% per year depending on age, attributable to seniority and merit, or 3.25% to 10.75%, including inflation.
- **Cost-of-living Adjustments**—Pre-January 7, 2013 retirees: 3.0% simple; post-January 7, 2013 retirees: 3.0% simple through 2018, then 2.15% simple.
- **Multiple Decrement Tables-Mortality**—Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

Post-employment Health Care Coverage or OPEB

Actuarial Assumptions and Methods Used in Determining Contribution Rates

The Actuarial Determined Employer Contribution for the year ended December 31, 2019 was based on the December 31, 2017 health care actuarial valuation. The actuarial assumptions and methods used to determine contribution rates are described below.

- **Valuation Method**—Individual entry age actuarial cost method of valuation is used in determining health care liabilities and normal cost. Differences between assumed and actual experience (the actuarial gains and losses) become part of the total OPEB liability.
- **Asset Valuation Method**—For actuarial purposes, assets are valued utilizing a method that recognizes assumed total investment returns 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%.
- **Amortization Method**—Level percent of payroll, open 15 year amortization period.
- **Investment Return**—An investment rate of return of 6.50% compounded annually (net after investment and administrative expenses) was assumed for 2017 and 6.00% for the years ended December 31, 2018 and 2019.
- **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.
- **Salary Scale**—Wage inflation plus additional projected salary increases ranged up to 7.50% per year depending on age, attributable to seniority and merit, or 3.25% to 10.75%, including inflation.
- **Multiple Decrement Tables-Mortality**—Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

Factors Significantly Affecting Trends in Reported Amounts

There were no recent significant changes of pension benefit terms, health care plans, investment policies, the size or composition of the population covered by the benefit terms and health care plans impacting the actuarial valuation studies for pension and health care for the measurement date of December 31, 2019.

On January 15, 2020, the Board approved several changes to the health care plan offered to Medicare and pre-Medicare retirees in efforts to decrease costs and increase the solvency of the health care plan. These changes are effective January 1, 2022 and include changes to base allowances and eligibility for Medicare retirees, as well as replacing OPERS-sponsored medical plans for pre-Medicare retirees with monthly allowances, similar to the program for Medicare retirees. These changes are not reflected in the current year financial statements, nor are they reflected in the December 31, 2019 measurement date health care valuation. However, these changes are expected to decrease the associated OPEB liability calculation for the measurement date of December 31, 2020.

 Administrative Expenses (for the year ended December 31, 2019)	
Personnel Expenses	
Wages and Salaries	\$49,269,970
Retirement Contributions—OPERS	6,439,343
Retirement Contributions—Medicare	689,963
Employee Insurance	9,212,100
Other Personnel Expense	150,326
Purchased Services and Supplies	
Professional Expenses	
Audit Services	236,674
Actuarial Services	880,670
Consulting Services	766,317
Investment and Financial Services	16,106,282
Legal and Investigation Services	1,255,990
Medical Examinations	778,397
Retirement Study Council	311,688
Custodial and Banking Fees	4,012,012
Information Technology	9,359,773
Communications	1,856,150
Office Supplies, Equipment and Other Miscellaneous	630,328
Education—Member and Staff	1,246,830
Facility Expenses	4,372,297
Subtotal Operating Expenses	107,575,110
Depreciation Expense	
Building	2,321,149
Furniture and Equipment	9,703,491
Subtotal Depreciation	12,024,640
Total Administrative Expenses	119,599,750
Investment Expenses	(43,440,725)
Net Administrative Expenses	\$76,159,025

 Schedule of Investment Expenses¹ (for the year ended December 31, 2019)	
Investment Staff Expense	\$19,108,504
Investment Services	21,368,560
Investment Legal Services	949,236
Allocation of Administrative Expenses (See Note 2b to Financial Statements)	2,014,425
Total Investment Expenses	\$43,440,725

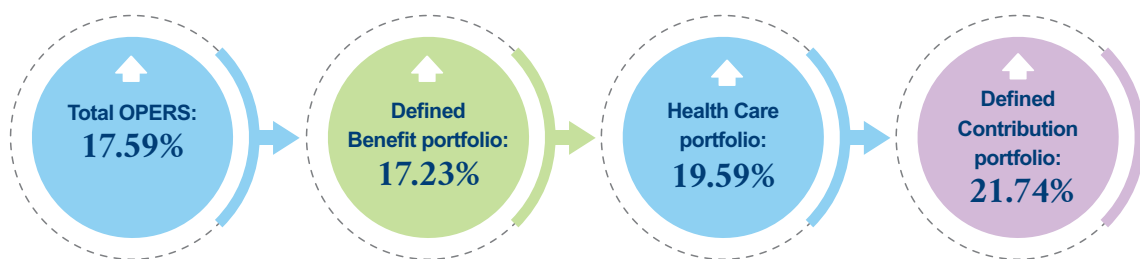
¹ Excludes fees and commissions, please see Schedules of Brokerage Commissions Paid beginning on page 102.

Investment Section

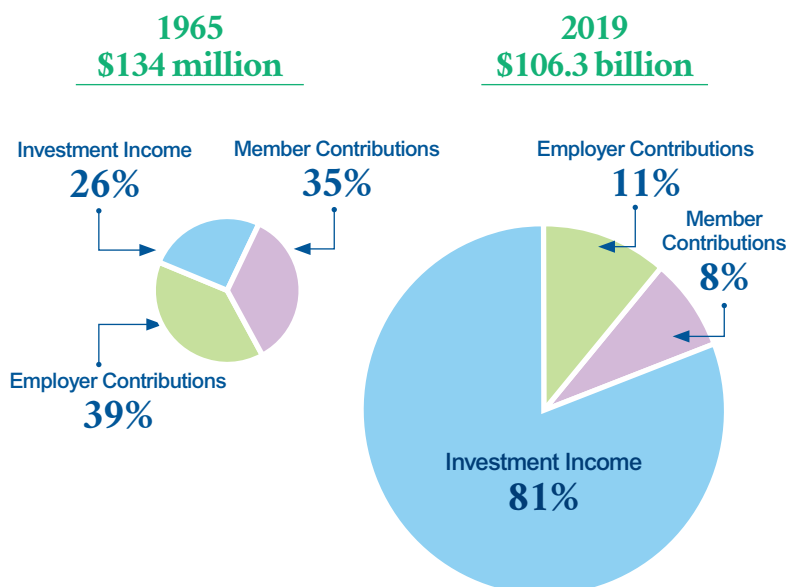
As the 12th largest state pension fund in the nation, OPERS is an economic driver—within Ohio, across the nation, and globally. OPERS adheres to the proven investment principles of diligent funding, asset allocation and strong diversification. The OPERS investment professionals know the importance of strong investment returns and are committed to exceeding established benchmarks.

The demand for strong investment returns has never been higher. Investment income generates approximately two-thirds of all pension benefits. Additionally, investment income is also the only funding for health care currently available. The OPERS investment professionals seek to maximize opportunities and mitigate risk to ensure the highest possible returns from a volatile investment market. Although 2019 was a strong year, only through maximizing the potential of each year can OPERS be in the position of building a strong foundation able to absorb the losses produced in years of poor returns.

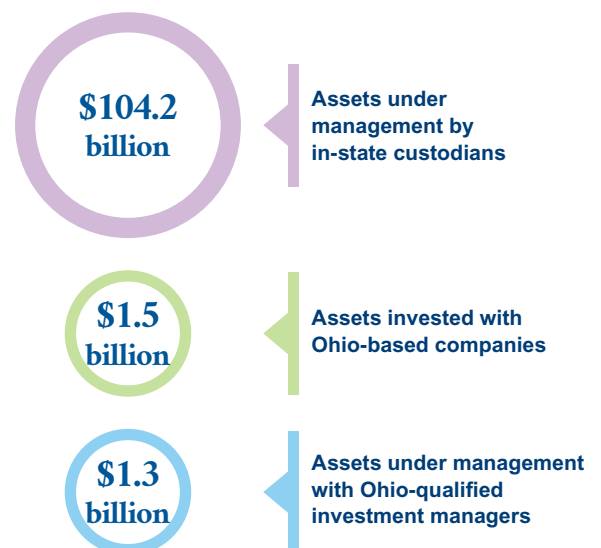
2019 Investment Returns



Where funding comes from—Then and now



Fueling the Ohio economy





Ohio Public Employees Retirement System

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

To My Fellow Members:

Every year presents both challenges and opportunities; and the experienced staff in OPERS Investment Division works to position capital to take advantage of these opportunities while minimizing the impact of challenges. At the end of 2018, no one expected the strong investment opportunities that were presented during 2019. In fact, for the year, every OPERS asset class and sub-asset class had a positive return. Therefore, I am pleased to report that for both OPERS portfolios—the Defined Benefit Fund and the Health Care Trust Fund—results strongly exceeded expectations and produced net results of 17.2% and 19.6%, respectively.

Providing Perspective

While it is a pleasure to report those returns, it is important to remember that the U.S. S&P 500 Index lost almost 20% in the fourth quarter of 2018. That loss fell just short of hitting an official bear market for stocks, and led all financial assets (except cash and U.S. Treasuries) to negative returns for the entirety of 2018.

As we looked to 2019, most experts were not optimistic for positive returns. Some market participants feared a global economic slowdown. They anticipated escalating trade wars and voiced concerns about the Federal Reserve's desire to raise interest rates too fast given the real and anticipated pace of economic growth.

What Made 2019 Robust

A variety of events boosted the market in 2019. One opportunity was presented when the Federal Reserve dramatically changed course and lowered its benchmark interest rate by 0.75% in three separate cuts. This action provided a tailwind to boost financial markets. Several global central banks then followed the U.S. Federal Reserve and lowered their rates. Investors were once again pressured to search for yield and, with ample global liquidity, invested in assets such as equities and corporate and emerging market bonds. Additionally, the year ended on a high note with U.S. unemployment at a record low of 3.5% and many leading economic indicators suggesting improving fundamentals. Consequently, all asset classes experienced tremendous appreciation in 2019, making it one of the best years of this 10-year bull market.

Why Each Year Matters

Throughout 2019, we constantly assessed the impact on OPERS to the challenges faced by a mature pension plan. Specifically, our challenge is the necessity of generating sufficient income by our investments to provide funding for benefit payments. The reality is the OPERS Defined Benefit Fund must currently provide approximately \$526 million in benefit payments each month.

That means if investment income cannot cover the benefit payments, OPERS staff must sell assets in down or flat markets to raise funds for the benefit payments. Selling low erodes our financial foundation; we would rather invest at lower prices to reap the benefits of future strong gains.

In 2019, Investment Division staff worked to exceed our performance benchmarks in a very strong market. We succeeded and produced the value-add shown below:

- The Defined Benefit Fund return of 17.2% exceeded our performance benchmark by 0.17%.
- The Health Care Trust Fund return of 19.6% exceeded our performance benchmark by 0.39%.

Without a doubt, 2019 was a good year and Investment Division staff added value. But one year is not enough to repair the loss of principal caused by volatile markets of the past and OPERS' growing payout profile.

Maximizing 2019 Opportunities

In 2019, two major changes were made to the Defined Benefit Fund. First, in April, the OPERS Board of Trustees approved a new asset allocation mix that was jointly recommended by OPERS investment staff and the Board's investment consultant. The approved recommendation modified our asset allocation by eliminating the externally managed global tactical asset allocation and reducing hedge fund investments. Those assets were reallocated to U.S. Treasuries and a combination of global public and private equities. Second, this action also increased the amount of internally managed assets by roughly \$4 billion, raising the level of internally managed assets from 44% to 47%.

Why Our Actions Are Important

These actions have provided a more optimal allocation of assets between internal and external managers. Unfortunately, with the ongoing volatile markets, active external managers have struggled to add value, a struggle that may continue. Therefore, staff moved some assets from active U.S. equity external managers to our passive internal portfolios. This fee savings will enable staff to focus on investing in areas where active managers have a higher probability of success, such as fixed income, private equity, and non-U.S. equity markets.

The results of these actions were positive; a net reduction in fees and a simplification in the structure of the Defined Benefit Fund. By eliminating some fees and reducing others, the cost of external managers was reduced by roughly \$41 million on an annual basis. Additionally, by streamlining the portfolios to reduce complexity, better transparency was delivered.

Our ongoing goal is to enable staff to continue to add value more than the policy benchmark, as has been the tradition in recent years. According to CEM, the most widely accepted pension benchmarking entity, OPERS investment staff has provided 0.45% in added value per year over the five years ending in 2018. That 0.45% translates to adding approximately \$2.5 billion to the plan throughout that time period.

What to Expect in 2020

Each year has a story, but because OPERS is a long-term investor with a significant time horizon, it is important to place each year within the context of a bigger story. Historically, equity markets face a headwind at the start of a year following a year of greater than 25% returns and elevated stock multiples. Although January 2020 bucked that tradition, as of the writing of this letter, that headwind materialized, and the markets are reacting with anticipated volatility.

Additionally, we saw in 2019 some underlying issues that created concerns for how 2020 would evolve. First, in August 2019, the yield on a 10-year Treasury fell below that of a two-year Treasury, resulting in an inversion of the yield curve. Why is this a concern? Historically, an inverted yield curve precedes an economic recession in the coming 12-24 months.

Second, the technology sector and a few other companies contributed a disproportionate amount of the S&P 500's total return for the year 2019. The technology sector contributed one-third of the S&P 500's annual return, and the top 10 performing companies, which are just two percent of all 500 companies, contributed one-half of the annual return. This narrowing of winning sectors concerns investors, since the preference is to see all sectors rise together, which indicates a broader strengthening of the economy.

Third, as with any election year, uncertainties surrounding the 2020 election will inhibit investors from committing assets to perceived opportunities.

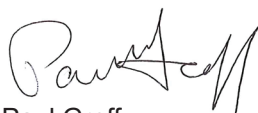
Fourth, as of the date of this letter, the economic climate has drastically changed in 2020 due to the pandemic COVID-19 crisis. Other than U.S. Treasury bonds, the investment markets have dropped precipitously and volatility is extremely elevated. Accordingly, we recommend the 2019 financial results be understood in the context of the potential impact of 2020.

Final Thoughts

Generally, 2019 was a great year and a great year is always rewarding to attain and report. I am confident the changes made in 2019 will help position OPERS to continue to meet its commitments.

Of course, no one knows what challenges and opportunities will be presented in any given year. However, I do know that through diligent funding, adherence to asset allocation strategies and ongoing review and refinement of our actions, this team of investment experts will continue to position OPERS to meet its ongoing obligations.

We are honored to work with the OPERS Board of Trustees. The OPERS Board has been committed, conscientious and courageous in structuring sustainable changes to help address the challenges of our mature pension system. Together with the Board, I know that OPERS management and each member of your investment staff are equally dedicated. I am confident this team—with guidance and insight from our Board—will continue to deliver results exceeding our benchmarks.



Paul Greff
Chief Investment Officer
April 30, 2020

Note: 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, securities lending money market returns are net of custodial fees, transfer agent expenses, and professional fees.

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.





NEPC, LLC

255 State Street
Boston, MA 02109
617 374 1300 FAX 617 374 1313
csvendsen@nepc.com
nepc.com

April 14, 2020

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-plans.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

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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, CFA
Partner



Introduction

The total OPERS investment portfolio, as reflected in the Combining Statement of Fiduciary Net Position, pages 36-37, is comprised of Defined Benefit, Health Care, and Defined Contribution portfolio assets. The Defined Benefit portfolio assets originate from Traditional Pension Plan member and employer contributions, employer contributions to the Combined Plan, and funds from defined contribution accounts for annuities. The investment of these assets is the responsibility of the Investment staff, adhering to the policies approved by the OPERS Board of Trustees.

The Health Care portfolio assets are segregated from the pension portfolio and invested with a more conservative and shorter term asset-allocation strategy. The Health Care portfolio is comprised of assets set aside to provide post-employment health care for the retirees of the Traditional Pension Plan, Combined Plan and Member-Directed Plan. The investment of these assets is the responsibility of the Investment staff, adhering to the policies approved by the Board. Prior to 2017, health care assets were included in two trusts established under Internal Revenue Code Sections 115 and 401(h). Accordingly, historical information was reported in this section as the 115 Health Care Trust and 401(h) Health Care Trust portfolios. The 401(h) Health Care Trust portfolio was transferred to the 115 Health Care Trust portfolio on July 1, 2016. One portfolio remains for health care. Historical information in this section reflects the different health care portfolios in place for the time periods reported.

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 of 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 97) relates to System-wide investments and includes the assets of all three portfolios as of December 31, 2019. The balance of information in this Investment Section is organized as follows: Defined Benefit portfolio investments (pages 107-111) relating exclusively to defined benefit assets; Health Care portfolio investments (pages 113-117) relating exclusively to health care assets; and Defined Contribution portfolio investments (pages 119-121) relating exclusively to defined contribution assets. The Investment Objectives and Policies and Asset Class Policies (pages 122-132) provide information on the System investment policies and performance objectives.

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, securities lending money market returns are net of custodial fees, transfer agent expenses, and professional fees.

A complete list of assets held as of December 31, 2019 is available upon request.

The table below reflects the total investment portfolio, which includes three component portfolios, as of December 31, 2019: the Defined Benefit portfolio, the Health Care 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 36-37.

 Summary of Cash, Cash Equivalents and Investments (as of December 31, 2019)		
	Fair Value	Percent of Total Fair Value
Cash and Cash Equivalents		
Cash	\$72,041,883	0.07%
Cash Equivalents		
Commercial Paper	1,857,448,614	1.75
U.S. Treasury Obligations	315,721,443	0.30
Repurchase Agreements	1,555,000,000	1.46
Interest-Bearing Short-Term Certificates	50,000,000	0.05
Short-Term Investment Funds (STIF)	1,302,820,933	1.22
Total Cash and Cash Equivalents	5,153,032,873	4.85
Investments		
Fixed Income		
U.S. Corporate Bonds	5,575,037,701	5.25
Non-U.S. Notes and Bonds	7,969,939,890	7.50
U.S. Government and Agencies	11,696,800,870	11.01
U.S. Mortgage Backed	4,106,112,344	3.87
Subtotal Fixed Income	29,347,890,805	27.63
Domestic Equities	19,956,621,059	18.79
Real Estate	8,909,782,768	8.39
Private Equity	9,938,593,944	9.36
International Equities	21,484,217,532	20.22
Other Investments ¹	11,431,891,361	10.76
Total Long-Term Investments	101,068,997,469	95.15
Total Cash, Cash Equivalents and Investments	\$106,222,030,342	100.00%

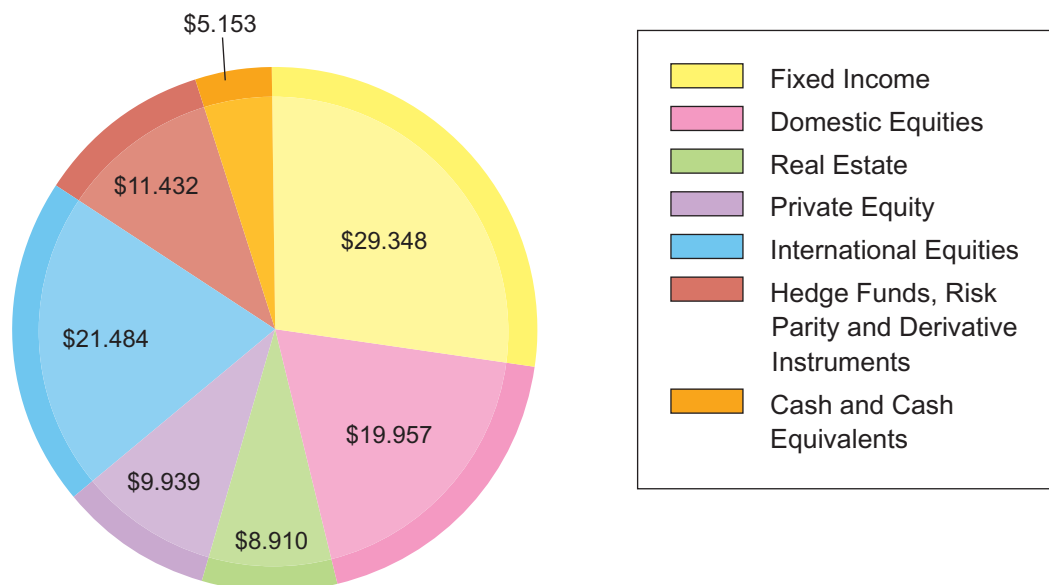
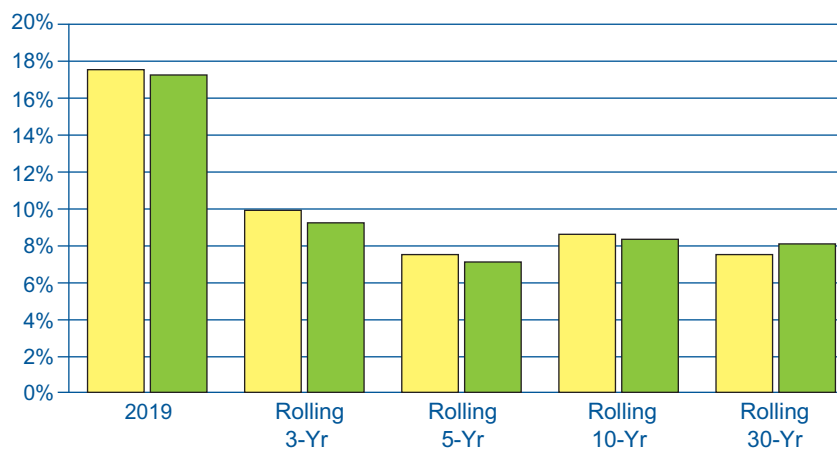
¹ Includes hedge funds, derivative instruments and risk parity.

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

 Total Summary of Cash, Cash Equivalents and Investments by Portfolio¹ (as of December 31, 2019)				
	Defined Benefit	Health Care	Defined Contribution	Total
Fixed Income	\$24,027,382,485	\$4,855,122,000	\$465,386,320	\$29,347,890,805
Domestic Equities	15,845,503,134	3,183,847,864	927,270,061	19,956,621,059
Real Estate	8,909,782,768			8,909,782,768
Private Equity	9,938,593,944			9,938,593,944
International Equities	18,363,067,415	2,674,811,901	446,338,216	21,484,217,532
Other Investments ²	10,194,315,119	1,237,576,242		11,431,891,361
Cash and Cash Equivalents	4,334,828,286	818,204,587		5,153,032,873
Total	\$91,613,473,151	\$12,769,562,594	\$1,838,994,597	\$106,222,030,342

¹ Assets summarized on performance basis.

² Includes hedge funds, derivative instruments and risk parity.


Total Investment Summary (as of December 31, 2019, \$ in billions)

Total Investment Returns—Annual Rates of Return¹


■ Total Investment Returns

■ Policy Benchmark Returns

2019	17.59%	9.84%	7.47%	8.58%	7.48%
Rolling 3-Yr	9.84%	9.27%	7.19%	8.17%	8.04% ^a
Rolling 5-Yr	7.47%	7.19%	8.58%	7.48%	
Rolling 10-Yr	8.58%	8.17%	7.48%		
Rolling 30-Yr	7.48%	8.04% ^a			

^a The benchmark returns for 1996 and prior years were estimated.

¹ Annual Rates of Return—The returns are the result of the returns generated by Defined Benefit, Health Care 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, Health Care 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.

 Historical Investment Returns					
Year	Total Portfolio Return	Total Defined Benefit Return ¹	Total 401(h) Health Care Trust Return ¹	Total 115 Health Care Trust Return (Health Care Portfolio)	Total Defined Contribution Return ²
2019	17.59%	17.23%		19.59%	21.74%
2018	(3.38)	(2.99)		(5.76)	(6.65)
2017	16.62	16.82		15.25	17.39
2016	8.23	8.31 ^a	4.73% ^a	5.11 ^a	9.51
2015	(0.03)	0.33	(2.18)	(3.23)	(1.71)
2014	6.70	6.96	5.28	(0.03) ^b	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			

^a 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 the total health care assets for the year ended December 31, 2016 was 7.55%. The number disclosed in the 115 Health Care Trust column, 5.11%, represents the return for the 115 Health Care Trust portfolio assets.

^b 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.

¹ 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.

² Defined Contribution plans commenced January 1, 2003, with a separate portfolio established in 2004.

 Largest Equity Holdings (by fair value)¹ (as of December 31, 2019)		
Description	Shares	Fair Value
Apple Inc.	2,781,893	\$816,902,879
Microsoft Corp.	4,874,212	768,663,232
Amazon.com Inc.	253,250	467,965,480
Facebook Inc.	1,485,368	304,871,782
JPMorgan Chase & Co.	2,008,966	280,049,860
Samsung Electronics Co. Ltd.	5,795,143	279,622,007
Alibaba Group Holding Ltd.	1,257,851	266,790,197
Berkshire Hathaway Inc.	1,171,575	265,361,738
Alphabet Inc. Class A	187,735	251,450,382
Alphabet Inc. Class C	184,796	247,075,948
Total	20,000,789	\$3,948,753,505

 Largest Bond Holdings (by fair value)¹ (as of December 31, 2019)					
Description	Coupon	Maturity	Rating	Par Value	Fair Value
U.S. Treasury Bond	2.500%	2/15/2045	AAA	\$309,208,000	\$316,310,121
U.S. Treasury Note	1.375	1/31/2021	AAA	239,920,000	239,254,596
U.S. Treasury Note	1.375	5/31/2021	AAA	231,316,000	230,611,210
Fannie Mae Pool	3.000	1/1/2049	AAA	225,000,000	228,199,219
U.S. Treasury Note	2.000	2/28/2021	AAA	225,190,000	226,131,224
U.S. Treasury Note	1.625	6/30/2021	AAA	188,691,000	188,764,708
Fannie Mae Pool	3.500	2/1/2048	AAA	166,929,892	176,114,358
U.S. Treasury Note	1.125	7/31/2021	AAA	169,364,000	168,107,002
U.S. Treasury Note	2.000	8/15/2025	AAA	159,816,000	162,013,470
U.S. Treasury Bond	2.500	8/15/2046	AAA	162,713,000	158,543,479
Total				\$2,078,147,892	\$2,094,049,387

¹ A complete list of assets held as of December 31, 2019 is available upon request.

 U.S. Equity Commissions (for the year ended December 31, 2019)			
Brokerage Firm	U.S. Equity Commissions Paid	Shares Traded	Average Commission Per Share
UBS Securities LLC	\$592,449	60,879,531	\$0.010
J.P. Morgan Securities LLC	231,619	58,111,303	0.004
Investment Technology Group Inc.	163,075	25,403,579	0.006
Merrill Lynch & Co. Inc.	136,703	17,836,959	0.008
RBC Capital Markets Corp.	122,180	8,397,094	0.015
Credit Suisse Securities (USA) LLC	120,094	7,466,515	0.016
Morgan Stanley & Co.	110,194	38,367,956	0.003
Liquidnet Inc.	78,464	4,359,304	0.018
Sanford C. Bernstein & Co.	66,474	8,057,880	0.008
Barclays Capital Inc.	61,481	6,075,564	0.010
Goldman Sachs & Co.	59,111	34,473,167	0.002
Citigroup Global Markets Inc.	50,040	4,854,864	0.010
Pershing LLC	45,843	2,263,600	0.020
Instinet LLC	36,357	3,809,879	0.010
Weeden & Co.	31,611	4,053,085	0.008
KeyBanc Capital Markets Inc.	27,244	1,362,210	0.020
Cowen Inc.	26,490	1,260,402	0.021
Cantor Fitzgerald & Co. Inc.	26,222	1,963,173	0.013
HSBC Securities Inc.	24,292	2,813,256	0.009
Wells Fargo Securities LLC	23,782	2,264,071	0.011
ISI Group Inc.	23,151	1,166,740	0.020
Jefferies & Co.	22,530	1,809,371	0.012
Other Commissions less than \$20,000	145,579	15,020,880	0.010
Total U.S. Equity Commissions	\$2,224,985	312,070,383	\$0.007

 Non-U.S. Equity Commissions (for the year ended December 31, 2019)			
Brokerage Firm	Non-U.S. Equity Commissions Paid	Shares Traded	Average Commission Per Share
Citigroup Global Markets Inc.	\$314,410	116,968,710	\$0.003
Morgan Stanley & Co.	283,110	111,667,166	0.003
Instinet LLC	280,030	176,134,930	0.002
J.P. Morgan Securities LLC	249,085	163,813,579	0.002
Merrill Lynch & Co. Inc.	246,633	147,424,426	0.002
Goldman Sachs & Co.	216,749	185,738,657	0.001
Credit Suisse Securities LLC	198,464	93,226,718	0.002
Deutsche Bank Securities Inc.	179,836	213,213,738	0.001
HSBC Securities Inc.	165,626	89,471,612	0.002
UBS Securities LLC	160,379	175,387,898	0.001
Sanford C. Bernstein & Co.	159,855	39,842,101	0.004
Societe Generale Securities Services	139,955	34,924,021	0.004
Macquarie Bank Ltd.	106,724	44,067,228	0.002
Jefferies & Co.	101,179	24,268,789	0.004
S.G. Securities	97,545	63,155,954	0.002
Investment Technology Group Inc.	87,527	148,025,249	0.001
Banque BNP Paribas	84,368	55,172,113	0.002
Credit Lyonnais Bank	77,789	75,952,479	0.001
Daiwa Capital Markets Inc.	66,075	2,062,629	0.032
Bank of New York Mellon Corp.	46,659	14,479,787	0.003
Exane	45,905	4,399,580	0.010
Barclays Capital Inc.	42,202	4,691,622	0.009
Bank of America Securities Inc.	38,749	6,887,693	0.006
Arqaam Capital Ltd.	36,945	3,463,190	0.011
CLSA Global Markets Pte Ltd.	35,679	13,368,596	0.003
RBC Capital Markets Corp.	31,679	7,940,180	0.004
Banco Bradesco SA	29,511	6,715,712	0.004
Mizuho Securities	27,619	2,916,673	0.009
SMBC Nikko Securities Inc.	25,151	740,670	0.034
ICICI Brokerage Services Ltd.	21,630	18,377,635	0.001
Other Commissions less than \$20,000	410,584	166,710,415	0.002
Total Non-U.S. Equity Commissions	\$4,007,652	2,211,209,750	\$0.002

 Futures Commissions (for the year ended December 31, 2019)			
Brokerage Firm	Futures Commissions Paid	Contracts Traded	Average Commission Per Contract
Goldman Sachs & Co.	\$868,660	404,566	\$2.15
Credit Suisse Securities LLC	339,822	171,704	1.98
Total Futures Commissions	\$1,208,482	576,270	\$2.10
Total U.S. Equity, Non-U.S. Equity and Futures Commissions	\$7,441,119	N/A	N/A

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 \$480,191 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 2019, \$362,500 of investment research services were purchased using CSA funds.

 Schedule of Fees to External Asset Managers by Portfolio (for the year ended December 31, 2019)				
	Defined Benefit	Health Care	Defined Contribution	Total
Fixed Income	\$20,559,888	\$2,187,487	\$186,076	\$22,933,451
Domestic Equities	11,753,293	1,380,984	108,176	13,242,453
International Equities	48,842,241	5,064,026	77,510	53,983,777
Private Equity ¹	209,993,998			209,993,998
Other Investments ¹	156,671,359	24,663,511		181,334,870
Real Estate ¹	70,506,022			70,506,022
Total Fees	\$518,326,801	\$33,296,008	\$371,762	\$551,994,571

¹ 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 in the Combining Statement of Changes in Fiduciary Net Position. OPERS makes a good faith attempt to account for fees that are not readily separable. Net Management Fees are net of management fee offsets. Performance Fees represent the investment managers' share of the profits realized by the fund during the period. Other Investments includes hedge funds, derivative instruments and risk parity.

 Schedule of Fees to External Asset Managers by Category (for the year ended December 31, 2019)					
	Net Management Fees	Fund Expenses	Subtotal	Performance Fees	Total
Fixed Income	\$22,933,451		\$22,933,451		\$22,933,451
Domestic Equities	13,242,453		13,242,453		13,242,453
International Equities	53,983,777		53,983,777		53,983,777
Private Equity ¹	97,431,653	\$31,536,497	128,968,150	\$81,025,848	209,993,998
Other Investments ¹	100,175,924	22,909,580	123,085,504	58,249,366	181,334,870
Real Estate ¹	50,594,432	5,031,190	55,625,622	14,880,400	70,506,022
Total Fees	\$338,361,690	\$59,477,267	\$397,838,957	\$154,155,614	\$551,994,571

¹ 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 in the Combining Statement of Changes in Fiduciary Net Position. OPERS makes a good faith attempt to account for fees that are not readily separable. Net Management Fees are net of management fee offsets. Performance Fees represent the investment managers' share of the profits realized by the fund during the period. Other Investments includes hedge funds, derivative instruments and risk parity.


Schedule of External Asset Managers (for the year ended December 31, 2019)

U.S. Equity Managers

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

Non-U.S. Equity Managers

Acadian	Fisher Investments	Strategic Global Advisors
AQR Capital Management LLC	J.P. Morgan	T. Rowe Price International Ltd.
Arrowstreet	J O Hambro Capital Management Ltd.	Vontobel Asset Management
Baillie Gifford	Lazard	Walter Scott & Partners
BlackRock Financial Management Inc.	LSV	Wasatch Advisors Inc.
Copper Rock Capital Partners LLC	Oldfield Partners LLP	
Dimensional Fund Advisors	Schroder Investment Management NA Inc.	

Bond Managers

Aberdeen Asset Management	Fort Washington Investment Advisors Inc.	Nomura Group
AFL-CIO Housing Investment Trust	Franklin Templeton Institutional LLC	Post Advisory Group
Ashmore Investment Management Ltd.	Lazard	Stone Harbor
Capital Guardian	Loomis, Sayles & Company LP	
CIFC	Neuberger Berman	

Hedge Fund Managers

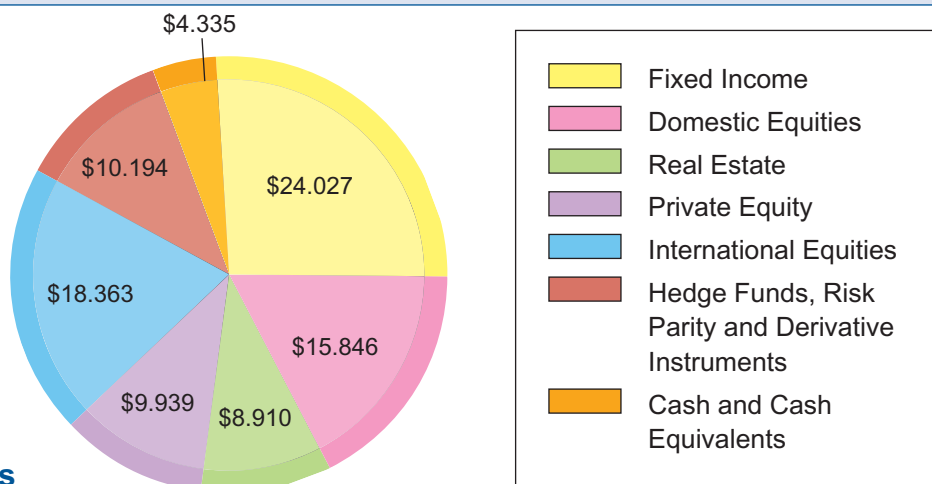
AQR Capital Management LLC	Egerton Capital	Panagora Asset Management
Aristeia Capital LLC	First Quadrant	Prisma Capital Partners LP
Arrowgrass Partnership	Graham Capital	Putnam Investments
Ascend Partners	Highline Capital Partners	Schroders
Beach Point Capital Management	K2 Advisors	Scopia Capital
BlackRock Financial Management Inc.	Kepos Capital	Sculptor Capital Management (fka Och Ziff Capital Management)
Bridgewater Associates	KLS Diversified Asset Management	Taconic Investment Partners
Brigade Capital Management LP	Kynikos Associates	Third Point Partners
Canyon Capital Advisors LLC	Lakewood Capital Partners	Visium Asset Management
Capital Fund Management S.A.	Lynx Asset Management AB	Wellington Management
CQS Management	Magnetar Financial LLC	Winton Capital
Davidson Kempner Institutional Partners LP	Oceanwood Capital Management LLP	York Capital Management

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As noted previously, the Investment Division manages the total investment portfolio by dividing it into three sub-portfolios. These portfolios are: the Defined Benefit portfolio, the Health Care portfolio, and the Defined Contribution 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, 2019, \$ in billions)



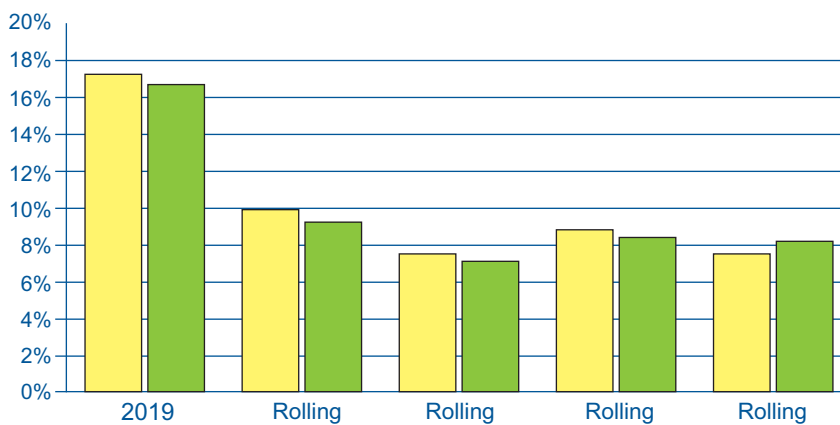
Investment Returns

The Defined Benefit portfolio reported an investment return of 17.23% in 2019. 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 2019 was 17.06%.



Investment Returns—Annual Rates of Return¹

Defined Benefit Portfolio



Defined Benefit Portfolio Returns	17.23%	9.93%	7.62%	8.75%	7.53%
Policy Benchmark Returns	17.06%	9.33%	7.31%	8.32%	8.07% ^a

^a The benchmark returns for 1996 and prior years were estimated.

¹ 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.

² 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.

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

 Schedule of Investment Results (for the year ended December 31, 2019)		Defined Benefit Portfolio	
	2019	Rolling 3-Year	Rolling 5-Year
Total Defined Benefit Portfolio	17.23%	9.93%	7.62%
Total Defined Benefit Portfolio Benchmark¹	17.06	9.33	7.31
U.S. Equity Composite	30.67	14.56	11.12
U.S. Equity Composite Benchmark	31.02	14.57	11.24
Non-U.S. Equity Composite	22.88	11.33	6.83
Non-U.S. Equity Composite Benchmark	21.09	10.09	5.75
Core Fixed Composite	8.72	4.07	3.16
Core Fixed Composite Benchmark	8.72	4.03	3.05
TIPS Composite	8.42	3.27	2.59
TIPS Composite Benchmark	8.43	3.32	2.62
High Yield Composite	14.59	6.20	5.79
High Yield Composite Benchmark	14.32	6.37	6.13
Emerging Markets Debt Composite	13.17	6.38	4.30
Emerging Markets Debt Composite Benchmark	14.01	6.61	4.39
Securitized Debt Composite	11.70	7.42	5.23
Securitized Debt Composite Benchmark	10.70	6.37	5.50
Floating Rate Debt Composite ²	13.06	10.46	7.01
Floating Rate Debt Composite Benchmark ²	5.94	4.84	3.92
Private Equity Composite	10.39	15.10	11.54
Private Equity Composite Benchmark	8.02	12.67	10.47
Real Estate Composite	7.70	6.90	9.73
Real Estate Composite Benchmark	5.49	7.19	9.21
Hedge Funds Composite	7.66	4.38	3.04
Hedge Funds Composite Benchmark	8.47	4.08	3.36
Commodities Composite	17.54	2.62	(3.96)
Commodities Composite Benchmark	17.63	2.35	(4.32)
Cash Composite	2.49	1.96	1.38
Cash Composite Benchmark	2.28	1.67	1.07
Additional Annuity Composite	2.55	2.30	2.08
Additional Annuity Composite Benchmark	2.28	1.67	1.07
Risk Parity Composite	30.30	11.63	7.56
Risk Parity Composite Benchmark	29.94	9.22	7.57
GTAA Composite ³	9.92	6.93	4.36
GTAA Composite Benchmark ³	12.14	7.94	4.86
U.S. Treasury Composite	6.84	3.31	N/A
U.S. Treasury Composite Benchmark	6.86	3.31	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 110.

² Returns for this asset class are as of August 31, 2019. Floating Rate Debt began being liquidated in September 2019. Only residual assets remain.

³ Returns for this asset class are as of June 30, 2019. GTAA began being liquidated in July 2019.

 Historical Asset Class Target Allocations			Defined Benefit Portfolio		
Asset Class	2019	2018	2017	2016	2015
U.S. Equity	20.0%	20.9%	22.0%	22.4%	22.3%
Opportunistic	2.0	0.1	0.1	0.1	0.1
Core Bonds	11.0	10.9	8.9	9.8	9.5
Floating Rate Debt	0.0	0.1	0.1	0.2	0.5
Global High Yield	N/A	N/A	N/A	1.0	1.0
Securitized Debt	1.0	1.0	1.0	1.0	1.0
Non-U.S. Equity	20.0	20.0	18.9	18.5	18.6
Private Real Estate	10.0	10.0	10.0	10.0	10.0
Private Equity	12.0	10.0	10.0	10.0	10.0
High Yield	2.0	2.0	3.0	3.0	3.0
Emerging Markets Debt	6.0	6.0	7.0	6.0	6.0
Hedge Funds	5.0	8.0	8.0	8.0	8.0
Commodities	1.0	1.0	1.0	1.0	1.0
Risk Parity	5.0	5.0	5.0	5.0	5.0
GTAA	N/A	2.0	2.0	2.0	2.0
TIPS	2.0	2.0	2.0	1.0	1.0
U.S. Treasury	3.0	1.0	1.0	1.0	1.0
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:

Asset Class Composite Benchmarks	Historical Asset Class Composite Benchmark Indices					Defined Benefit Portfolio				
	As of December 31									
	2019	2018	2017	2016	2015					
U.S. Equity	Russell 3000 Stock Index ¹	Russell 3000 Stock Index	Russell 3000 Stock Index	Russell 3000 Stock Index	Russell 3000 Stock Index					
Opportunistic	Custom Opportunistic Benchmark ²	Custom Opportunistic Benchmark	Custom Opportunistic Benchmark	Custom Opportunistic Benchmark	Custom Opportunistic Benchmark					
Core Bonds	Bloomberg Barclays U.S. Aggregate Bond Index ³	Bloomberg Barclays U.S. Aggregate Bond Index	Bloomberg Barclays U.S. Aggregate Bond Index	Bloomberg Barclays U.S. Aggregate Bond Index	Custom Core Fixed Benchmark					
Floating Rate Debt	Credit Suisse Leveraged Loan Index ⁴	Credit Suisse Leveraged Loan Index	Credit Suisse Leveraged Loan Index	Credit Suisse Leveraged Loan Index	Credit Suisse Leveraged Loan Index					
Global High Yield	N/A	N/A	N/A	Bloomberg Barclays Global High Yield Index	Barclays Global High Yield Index					
Securitized Debt	Custom Securitized Debt Benchmark ⁵	Custom Securitized Debt Benchmark	Non-Agency CMBS Component of Bloomberg Barclays U.S. Aggregate Bond Index + 2%	Bloomberg Barclays CMBS Index + 2%	Barclays CMBS Index + 2%					
Non-U.S. Equity	Custom Non-U.S. Equity Benchmark (net) ⁶	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 Benchmark ⁷	Custom Private Real Estate Benchmark	Custom Private Real Estate Benchmark	Custom Private Real Estate Benchmark	Custom Private Real Estate Benchmark					
Private Equity	SSPEI Index ⁸	SSPEI Index	SSPEI Index	SSPEI Index	SSPEI Index					
Cash Equivalents	BofAML U.S. 3-Month Treasury Bill Index ⁹	BofAML U.S. 3-Month Treasury Bill Index	BofAML U.S. 3-Month Treasury Bill Index	BofAML U.S. 3-Month Treasury Bill Index	BofAML U.S. 3-Month Treasury Bill Index					
High Yield	Bloomberg Barclays U.S. Corporate High Yield Bond Index ¹⁰	Bloomberg Barclays U.S. Corporate High Yield Bond Index	Bloomberg Barclays U.S. Corporate High Yield Bond Index	Bloomberg Barclays U.S. Corporate High Yield Bond Index	Barclays Capital U.S. Corporate High Yield Bond Index					
Emerging Markets Debt	Custom Emerging Markets Debt Benchmark ¹¹	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 ¹²	Custom Hedge Funds Benchmark	Custom Hedge Funds Benchmark	Custom Hedge Funds Benchmark	Custom Hedge Funds Benchmark					
Commodities	S&P Goldman Sachs Commodity Total Return Index ¹³	S&P Goldman Sachs Commodity Total Return Index	S&P Goldman Sachs Commodity Total Return Index	S&P Goldman Sachs Commodity Total Return Index	S&P Goldman Sachs Commodity Total Return Index					
Risk Parity	HFR Risk Parity Vol 15 Institutional Index ¹⁴	HFR Risk Parity Vol 15 Institutional Index	Custom Risk Parity Benchmark	Custom Risk Parity Benchmark	Custom Risk Parity Benchmark					
GTAA	Custom GTAA Benchmark ¹⁵	Custom GTAA Benchmark	Custom GTAA Benchmark	Custom GTAA Benchmark	Custom GTAA Benchmark					
TIPS	Bloomberg Barclays U.S. TIPS Index ¹⁶	Bloomberg Barclays U.S. TIPS Index	Bloomberg Barclays U.S. TIPS Index	Bloomberg Barclays U.S. TIPS Index	Barclays U.S. TIPS Index					
U.S. Treasury	Bloomberg Barclays U.S. Treasury Index ¹⁷	Bloomberg Barclays U.S. Treasury Index	Bloomberg Barclays U.S. Treasury Index	Bloomberg Barclays U.S. Treasury Index	Barclays U.S. Treasury Index					

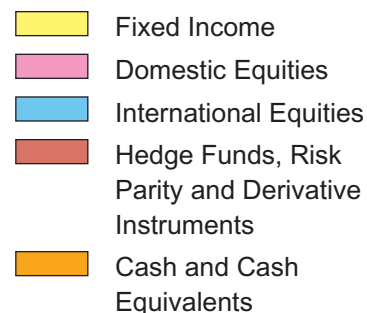
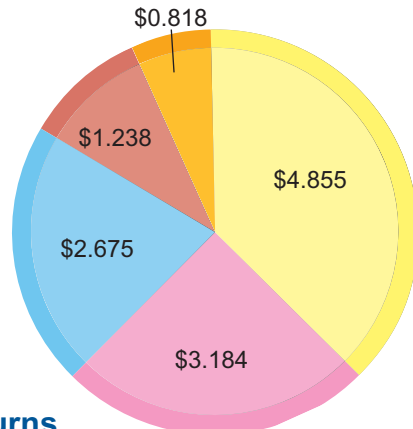
Footnotes found on next page.

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, 2019:

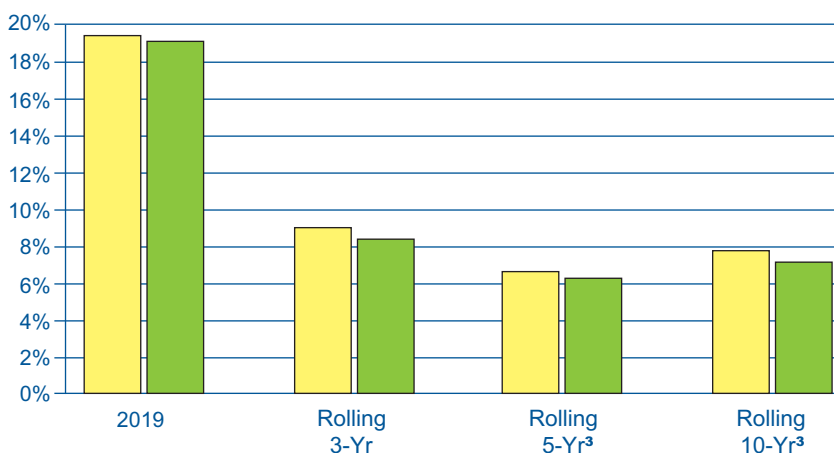
- ¹ **Russell 3000 Stock Index**—A capitalization-weighted stock index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.
- ² **Custom Opportunistic Benchmark**—Market value weight of the underlying portfolio benchmarks.
- ³ **Bloomberg Barclays U.S. Aggregate Bond Index**—A market capitalization-weighted index covering the universe of most U.S. traded investment grade bonds, excluding municipal bonds and TIPS.
- ⁴ **Credit Suisse Leveraged Loan Index**—Is designed to mirror the investible universe of the U.S.-denominated leveraged loan market.
- ⁵ **Custom Securitized Debt Benchmark**—As of December 31, 2019, blend was 50% Bloomberg Barclays non-agency investment grade CMBS: BBB total return index unhedged USD, 50% Bloomberg Barclays non-agency CMBS agg eligible total return index value unhedged USD.
- ⁶ **Custom Non-U.S. Equity Benchmark (net)**—As of December 31, 2019, blend was 55% MSCI World Index x U.S. Standard (net), 31% MSCI Emerging Markets Standard Index (net), 10% MSCI World Index x U.S. Small Cap (net), and 4% MSCI Emerging Markets Small Cap Index (net).
- ⁷ **Custom Private Real Estate Benchmark**—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.
- ⁸ **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.
- ⁹ **Bank of America Merrill Lynch (BofAML) U.S. 3-Month Treasury Bill Index**—The three-month Treasury Bill return as measured by Bank of America Merrill Lynch.
- ¹⁰ **Bloomberg Barclays U.S. Corporate High Yield Bond Index**—Covers the universe of fixed rate, non-investment grade debt.
- ¹¹ **Custom Emerging Markets Debt Benchmark**—As of December 31, 2019, blend was 50% J.P. Morgan EMBI Global Bond Index, and 50% J.P. Morgan GBI-Emerging Markets Global Diversified USD Index.
- ¹² **Custom Hedge Funds Benchmark**—As of December 31, 2019, blend was 30% HFRI Event-Driven (Total) Index, 20% HFRI Equity Hedge (Total) Index, 25% HFRI Macro (Total) Index, 25% HFRI Relative Value (Total) Index.
- ¹³ **Standard & Poor's Goldman Sachs Commodity (S&P GSCI) Total Return 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.
- ¹⁴ **HFR Risk Parity Vol 15 Institutional Index**—Includes funds with a volatility target of 15% or greater and are classified as Volatility Target: 15%. Funds must have assets under management of USD \$500 million or greater in order to be considered for inclusion in an HFR Risk Parity Institutional Index.
- ¹⁵ **Custom Global Tactical Asset Allocation (GTAA) Benchmark**—Market value weight of the underlying portfolio benchmarks.
- ¹⁶ **Bloomberg Barclays U.S. TIPS Index**—Consists of inflation-protected securities issued by the U.S. Treasury.
- 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 bond 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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Health Care Portfolio Asset Allocation (as of December 31, 2019, \$ in billions)

Investment Returns

The Health Care portfolio reported an investment return of 19.59% in 2019. 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 2019 was 19.20%.

Prior to 2017, health care assets were included in two trusts established under Internal Revenue Code Sections 115 and 401(h). Accordingly, historical information was reported in this section under 115 Health Care Trust and 401(h) Health Care Trust portfolios. The 401(h) Health Care Trust portfolio was transferred to the 115 Health Care Trust portfolio on July 1, 2016; one Health Care portfolio remains. Historical information in this section reflects the different health care portfolios in place for the time periods reported.


Investment Returns—Annual Rates of Return¹
Health Care Portfolio


2019 **Rolling 3-Yr** **Rolling 5-Yr³** **Rolling 10-Yr³**

 Health Care Portfolio Returns ²	19.59%	9.11%	6.43%	7.53%
 Policy Benchmark Returns ²	19.20%	8.61%	6.24%	7.19%

¹ Annual Rates of Return—The Health Care 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 Health Care portfolio 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.

² The Health Care portfolio (previously known as 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.

³ The 115 Health Care Trust portfolio was established in September 2014, and the 401(h) Health Care Trust portfolio was closed on June 30, 2016 with the assets transferring to the 115 Health Care Trust portfolio on July 1, 2016. Beginning 2017, one health care trust exists, referred to as the Health Care portfolio. The Rolling 5-year returns and the Rolling 10-year returns are the combined returns of the former 115 Health Care Trust portfolio and the 401(h) Health Care Trust portfolio for all years prior to 2017.

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

 Schedule of Investment Results (for the year ended December 31, 2019)		Health Care Portfolio	
	2019	Rolling 3-Year	Rolling 5-Year ¹
Total Health Care Portfolio	19.59%	9.11%	6.43%
Total Health Care Portfolio Benchmark²	19.20	8.61	6.24
U.S. Equity Composite	30.67	14.56	11.12
U.S. Equity Composite Benchmark	31.02	14.57	11.24
Non-U.S. Equity Composite	22.88	11.33	6.83
Non-U.S. Equity Composite Benchmark	21.09	10.09	5.75
Core Fixed Composite	8.72	4.07	3.16
Core Fixed Composite Benchmark	8.72	4.03	3.05
TIPS Composite	8.42	3.27	2.59
TIPS Composite Benchmark	8.43	3.32	2.62
High Yield Composite	14.59	6.20	5.79
High Yield Composite Benchmark	14.32	6.37	6.13
Emerging Markets Debt Composite	13.17	6.38	4.30
Emerging Markets Debt Composite Benchmark	14.01	6.61	4.39
Securitized Debt Composite	11.70	7.42	5.23
Securitized Debt Composite Benchmark	10.70	6.37	5.50
Floating Rate Debt Composite ³	13.06	10.46	7.01
Floating Rate Debt Composite Benchmark ³	5.94	4.84	3.92
REITs Composite	23.23	7.05	6.45
REITs Composite Benchmark	23.10	6.95	6.39
Hedge Funds Composite	7.66	4.38	3.04
Hedge Funds Composite Benchmark	8.47	4.08	3.36
Commodities Composite	17.54	2.62	(3.96)
Commodities Composite Benchmark	17.63	2.35	(4.32)
Cash Composite ⁴	2.50	1.97	1.38
Cash Composite Benchmark ⁴	2.28	1.67	1.07
Risk Parity Composite	30.30	11.63	7.56
Risk Parity Composite Benchmark	29.94	9.22	7.57
GTAA Composite ⁵	9.58	5.39	4.73
GTAA Composite Benchmark ⁵	13.36	7.23	5.56
U.S. Treasury Composite	6.84	3.31	N/A
U.S. Treasury Composite Benchmark	6.86	3.31	N/A

Footnotes found on next page.

- ¹ The 115 Health Care Trust portfolio was established in September 2014, and the 401(h) Health Care Trust portfolio was closed on June 30, 2016 with the assets transferring to the 115 Health Care Trust portfolio on July 1, 2016. As of 2017, one health care trust remained, referred to as the Health Care portfolio. In the graph (page 114), the Rolling 5-Year Returns shows the combined returns of the former 115 Health Care Trust portfolio and the 401(h) Health Care Trust portfolio for all years prior to 2017.
- ² **Health Care Portfolio Benchmark**—The returns for this benchmark are derived from the asset class composite benchmark returns summarized in the table on the previous page, the historical asset class target allocations listed in the table below, and the asset class composite benchmark indices listed in the table on page 116.
- ³ Returns for this asset class are as of August 31, 2019. Floating Rate Debt began being liquidated in September 2019. Only residual assets remain.
- ⁴ Cash Composites have a zero allocation but can hold residual cash balances of the Health Care portfolio. This can result in residual performance that does not affect the overall Health Care portfolio.
- ⁵ Returns for this asset class are as of September 30, 2019. GTAA began liquidation in October 2019.

 Historical Asset Class Target Allocations					Health Care Portfolio		
Asset Class	2019	2018	2017 ^a	2016 ^b		2015 ^c	
	115	115	115	401(h)	115	401(h)	115
U.S. Equity	22.0%	22.9%	24.1%	24.7%	24.5%	24.4%	9.8%
Commodities	2.0	2.0	2.0	2.0	2.0	2.0	1.0
Opportunistic	2.0	0.1	0.1	0.1	0.1	0.1	0.1
Core Bonds	18.0	17.9	15.9	16.6	16.8	16.5	7.0
Floating Rate Debt	0.0	0.1	0.1	0.4	0.2	0.5	N/A
Global High Yield	N/A	N/A	N/A	1.5	1.5	1.5	N/A
Securitized Debt	1.0	1.0	1.0	1.0	1.0	1.0	N/A
TIPS	6.0	6.0	6.0	5.0	5.0	5.0	2.0
High Yield	2.0	2.0	3.0	2.5	2.5	2.5	1.0
Non-U.S. Equity	22.0	22.0	20.8	20.2	20.4	20.5	8.1
Emerging Markets Debt	6.0	6.0	7.0	6.0	6.0	6.0	2.0
REITs	6.0	6.0	6.0	6.0	6.0	6.0	3.0
Hedge Funds	5.0	6.0	6.0	6.0	6.0	6.0	3.0
Risk Parity	5.0	5.0	5.0	5.0	5.0	5.0	3.0
GTAA	N/A	2.0	2.0	2.0	2.0	2.0	1.0
U.S. Treasury	3.0	1.0	1.0	1.0	1.0	1.0	N/A
Short-Term Liquidity	N/A	N/A	N/A	N/A	N/A	N/A	59.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

^a As of 2017, one health care trust remained, the 115 Health Care Trust.

^b With the transfer of the 401(h) Health Care Trust (401(h)) 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) prior to June 30, 2016.

^c The 115 Health Care Trust 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).

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					Health Care Portfolio¹⁷
Asset Class Composite Benchmarks	As of December 31				
	2019	2018	2017	2016	2015
U.S. Equity	Russell 3000 Stock Index ¹	Russell 3000 Stock Index	Russell 3000 Stock Index	Russell 3000 Stock Index	Russell 3000 Stock Index
Commodities	S&P Goldman Sachs Commodity Total Return Index ²	S&P Goldman Sachs Commodity Total Return Index	S&P Goldman Sachs Commodity Total Return Index	S&P Goldman Sachs Commodity Total Return Index	S&P Goldman Sachs Commodity Total Return 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 Bond Index ⁴	Bloomberg Barclays U.S. Aggregate Bond Index	Bloomberg Barclays U.S. Aggregate Bond Index	Bloomberg Barclays U.S. Aggregate Bond Index	Custom Core Fixed Benchmark
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	N/A	N/A	N/A	Bloomberg Barclays Global High Yield Index	Barclays Global High Yield Index
Securitized Debt	Custom Securitized Debt Benchmark ⁶	Custom Securitized Debt Benchmark	Non-Agency CMBS Component of Bloomberg Barclays U.S. Aggregate Bond Index + 2%	Bloomberg Barclays CMBS Index + 2%	Barclays CMBS Index + 2%
TIPS	Bloomberg Barclays U.S. TIPS Index ⁷	Bloomberg Barclays U.S. TIPS Index	Bloomberg Barclays U.S. TIPS Index	Bloomberg Barclays U.S. TIPS Index	Barclays U.S. TIPS Index
High Yield	Bloomberg Barclays U.S. Corporate High Yield Bond Index ⁸	Bloomberg Barclays U.S. Corporate High Yield Bond Index	Bloomberg Barclays U.S. Corporate High Yield Bond Index	Bloomberg Barclays U.S. Corporate High Yield Bond Index	Barclays Capital U.S. Corporate High Yield Bond Index
Non-U.S. Equity	Custom Non-U.S. Equity Benchmark (net) ⁹	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 ¹⁰	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 Total Return Index ¹¹	DJ U.S. Select RESI Total Return Index	DJ U.S. Select RESI Total Return Index	DJ U.S. Select RESI Total Return Index	DJ U.S. Select RESI Total Return Index
Cash Equivalents	BofAML U.S. 3-Month Treasury Bill Index ¹²	BofAML U.S. 3-Month Treasury Bill Index	BofAML U.S. 3-Month Treasury Bill Index	BofAML U.S. 3-Month Treasury Bill Index	BofAML U.S. 3-Month Treasury Bill Index
Hedge Funds	Custom Hedge Funds Benchmark ¹³	Custom Hedge Funds Benchmark	Custom Hedge Funds Benchmark	Custom Hedge Funds Benchmark	Custom Hedge Funds Benchmark
Risk Parity	HFR Risk Parity Vol 15 Institutional Index ¹⁴	HFR Risk Parity Vol 15 Institutional Index	Custom Risk Parity Benchmark	Custom Risk Parity Benchmark	Custom Risk Parity Benchmark
GTAA	Custom GTAA Benchmark ¹⁵	Custom GTAA Benchmark	Custom GTAA Benchmark	Custom GTAA Benchmark	Custom GTAA Benchmark
U.S. Treasury	Bloomberg Barclays U.S. Treasury Index ¹⁶	Bloomberg Barclays U.S. Treasury Index	Bloomberg Barclays U.S. Treasury Index	Bloomberg Barclays U.S. Treasury Index	Barclays U.S. Treasury Index
Short-Term Liquidity	N/A	N/A	N/A	N/A	90-day U.S. Treasury Bill Index

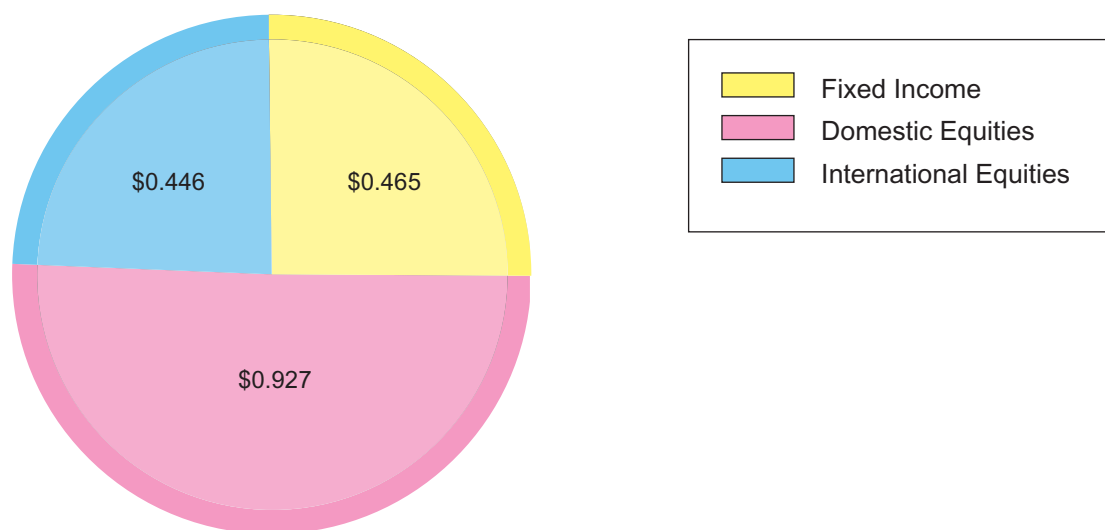
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Footnotes for Schedule of Investment Results—Health Care Portfolio

The footnotes below provide definitions for the asset class composite benchmark indices as of December 31, 2019:

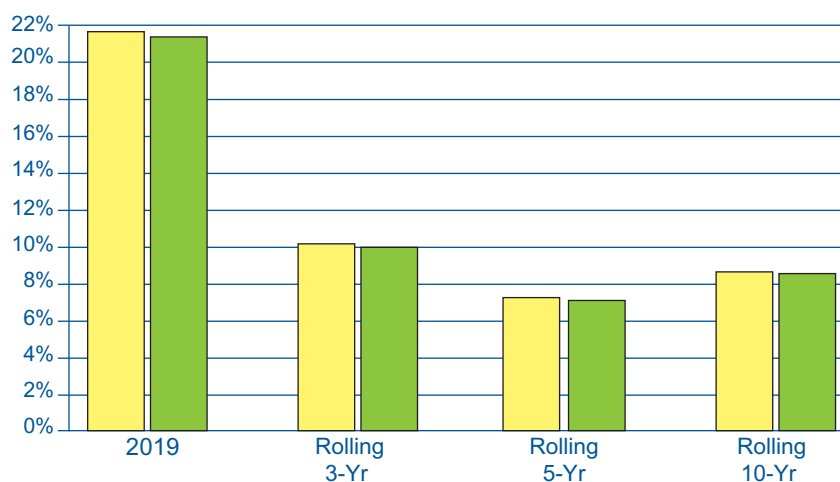
- ¹ **Russell 3000 Stock Index**—A capitalization-weighted stock index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.
- ² **Standard & Poor's Goldman Sachs Commodity (S&P GSCI) Total Return 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.
- ³ **Custom Opportunistic Benchmark**—Market value weight of the underlying portfolio benchmarks.
- ⁴ **Bloomberg Barclays U.S. Aggregate Bond 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 **Custom Securitized Debt Benchmark**—As of December 31, 2019, blend was 50% Bloomberg Barclays non-agency investment grade CMBS: BBB total return index unhedged USD, 50% Bloomberg Barclays non-agency CMBS agg eligible total return index value unhedged USD.
- ⁷ **Bloomberg Barclays U.S. TIPS Index**—Consists of Inflation-Protection securities issued by the U.S. Treasury.
- ⁸ **Bloomberg Barclays U.S. Corporate High Yield Bond Index**—Covers the universe of fixed rate, non-investment grade debt.
- ⁹ **Custom Non-U.S. Equity Benchmark (net)**—As of December 31, 2019, blend was 55% MSCI World Index x U.S. Standard (net), 31% MSCI Emerging Markets Standard Index (net), 10% MSCI World Index x U.S. Small Cap (net), and 4% MSCI Emerging Markets Small Cap Index (net).
- ¹⁰ **Custom Emerging Markets Debt Benchmark**—As of December 31, 2019, blend was 50% J.P. Morgan EMBI Global Bond Index, and 50% J.P. Morgan GBI-Emerging Markets Global Diversified USD Index.
- ¹¹ **DJ U.S. Select RESI Total Return Index**—The Dow Jones U.S. Select RESI Total Return Index represents equity REITs and REOCs traded in the U.S.
- ¹² **Bank of America Merrill Lynch (BofAML) U.S. 3-Month Treasury Bill Index**—The three-month Treasury Bill return as measured by Bank of America Merrill Lynch.
- ¹³ **Custom Hedge Funds Benchmark**—As of December 31, 2019, blend was 30% HFRI Event-Driven (Total) Index, 20% HFRI Equity Hedge (Total) Index, 25% HFRI Macro (Total) Index, 25% HFRI Relative Value (Total) Index.
- ¹⁴ **HFR Risk Parity Vol 15 Institutional Index**—Includes funds with a volatility target of 15% or greater and are classified as Volatility Target: 15%. Funds must have assets under management of USD \$500 million or greater in order to be considered for inclusion in an HFR Risk Parity Institutional Index.
- ¹⁵ **Custom Global Tactical Asset Allocation (GTAA) Benchmark**—Market value weight of the underlying portfolio benchmarks.
- ¹⁶ **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 Bond 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.
- ¹⁷ The 115 Health Care Trust portfolio was established in September 2014, and the 401(h) Health Care Trust portfolio was closed on June 30, 2016 with the assets transferring to the 115 Health Care Trust on July 1, 2016. This table represents benchmark indices for both portfolios for the years disclosed. Beginning 2017, as there is only one health care trust, this section was renamed to Health Care Portfolio.

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Defined Contribution Portfolio Asset Allocation (as of December 31, 2019, \$ in billions)


Investment Returns

The Defined Contribution portfolio reported an investment return of 21.74% in 2019. The portfolio composite is derived from the individual investment option returns and their actual year-end market values. Members may not invest in this portfolio composite, but choose to invest in the individual investment options provided. The returns for the investment options, and their respective indices, are shown on the following page.


Investment Returns—Annual Rates of Return¹
Defined Contribution Portfolio


Defined Contribution Portfolio Returns	21.74%	10.08%	7.51%	8.58%
Policy Benchmark Returns	21.66%	10.00%	7.43%	8.54%

¹ 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 the respective benchmarks are shown below:

 Schedule of Investment Results (for the year ended December 31, 2019)		Defined Contribution Portfolio	
	2019	Rolling 3-Year	Rolling 5-Year
Target Payout Fund	12.42%	5.87%	4.28%
Target Payout Fund Index ¹	12.36	5.73	4.23
Target 2020 Fund	13.47	6.71	5.01
Target 2020 Fund Index ²	13.68	6.66	4.92
Target 2025 Fund	17.04	8.25	5.97
Target 2025 Fund Index ³	17.22	8.16	5.93
Target 2030 Fund	20.17	9.36	6.82
Target 2030 Fund Index ⁴	20.03	9.37	6.74
Target 2035 Fund	21.81	9.85	7.11
Target 2035 Fund Index ⁵	21.70	9.89	7.11
Target 2040 Fund	22.49	10.10	7.24
Target 2040 Fund Index ⁶	22.37	10.02	7.19
Target 2045 Fund	22.96	10.34	7.46
Target 2045 Fund Index ⁷	22.82	10.29	7.38
Target 2050 Fund	23.20	10.51	7.53
Target 2050 Fund Index ⁸	23.21	10.47	7.47
Target 2055 Fund	23.93	10.56	7.58
Target 2055 Fund Index ⁹	23.60	10.49	7.49
Target 2060 Fund	23.74	10.54	N/A
Target 2060 Fund Index ¹⁰	23.60	10.49	N/A
Stable Value Index Portfolio	2.55	2.30	2.08
Stable Value Index Benchmark ¹¹	2.08	1.58	1.61
Bond Index Portfolio	8.70	4.02	3.03
Bloomberg Barclays U.S. Aggregate Bond Index Benchmark ¹²	8.72	4.03	3.05
U.S. Stock Index Portfolio	31.00	14.55	11.23
Russell 3000 Stock Index Benchmark ¹³	31.02	14.57	11.24
Large Cap Index Portfolio	31.42	14.99	11.42
Russell 1000 Stock Index Benchmark ¹⁴	31.43	15.05	11.48
Small Cap Index Portfolio	25.52	8.57	8.19
Russell 2000 Stock Index Benchmark ¹⁵	25.53	8.59	8.23
Non-U.S. Stock Index Portfolio	21.83	10.17	5.87
MSCI ACWI Net Dividend Return x U.S. Index Benchmark ¹⁶	21.51	9.86	5.50

Footnotes found on next page.

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, 2019:

- ¹ **Target Payout Fund Index**—Blend was 25% Bloomberg Barclays Government 1-3 Year Index, 32% Bloomberg Barclays U.S. Aggregate Bond Index, 10% Russell 1000 Index, 5% Russell 2000 Index, 15% MSCI ACWI Net Dividend Return x U.S. Index, 13% Bloomberg Barclays U.S. TIPS Index.
- ² **Target 2020 Fund Index**—Blend was 21% Bloomberg Barclays Government 1-3 Year Index, 33% Bloomberg Barclays U.S. Aggregate Bond Index, 11% Russell 1000 Index, 6% Russell 2000 Index, 17% MSCI ACWI Net Dividend Return x U.S. Index, 12% Bloomberg Barclays U.S. TIPS Index.
- ³ **Target 2025 Fund Index**—Blend was 4% Bloomberg Barclays Government 1-3 Year Index, 38% Bloomberg Barclays U.S. Aggregate Bond Index, 14% Russell 1000 Index, 11% Russell 2000 Index, 25% MSCI ACWI Net Dividend Return x U.S. Index, 8% Bloomberg Barclays U.S. TIPS Index.
- ⁴ **Target 2030 Fund Index**—Blend was 31% Bloomberg Barclays U.S. Aggregate Bond Index, 18% Russell 1000 Index, 15% Russell 2000 Index, 33% MSCI ACWI Net Dividend Return x U.S. Index, 1% Bloomberg Barclays U.S. Government/Credit Index, 2% Bloomberg Barclays U.S. TIPS Index.
- ⁵ **Target 2035 Fund Index**—Blend was 16% Bloomberg Barclays U.S. Aggregate Bond Index, 21% Russell 1000 Index, 18% Russell 2000 Index, 39% MSCI ACWI Net Dividend Return x U.S. Index, 6% Bloomberg Barclays U.S. Government/Credit Index.
- ⁶ **Target 2040 Fund Index**—Blend was 10% Bloomberg Barclays U.S. Aggregate Bond Index, 22% Russell 1000 Index, 19% Russell 2000 Index, 41% MSCI ACWI Net Dividend Return x U.S. Index, 8% Bloomberg Barclays U.S. Government/Credit Index.
- ⁷ **Target 2045 Fund Index**—Blend was 8% Bloomberg Barclays U.S. Aggregate Bond Index, 23% Russell 1000 Index, 19% Russell 2000 Index, 42% MSCI ACWI Net Dividend Return x U.S. Index, 8% Bloomberg Barclays U.S. Government/Credit Index.
- ⁸ **Target 2050 Fund Index**—Blend was 7% Bloomberg Barclays U.S. Aggregate Bond Index, 24% Russell 1000 Index, 20% Russell 2000 Index, 43% MSCI ACWI Net Dividend Return x U.S. Index, 6% Bloomberg Barclays U.S. Government/Credit Index.
- ⁹ **Target 2055 Fund Index**—Blend was 5% Bloomberg Barclays U.S. Aggregate Bond Index, 25% Russell 1000 Index, 20% Russell 2000 Index, 45% MSCI ACWI Net Dividend Return x U.S. Index, 5% Bloomberg Barclays U.S. Government/Credit Index.
- ¹⁰ **Target 2060 Fund Index**—Blend was 5% Bloomberg Barclays U.S. Aggregate Bond Index, 25% Russell 1000 Index, 20% Russell 2000 Index, 45% MSCI ACWI Net Dividend Return x U.S. Index, 5% Bloomberg Barclays U.S. Government/Credit Index. The fund was launched in December 2015; thus, the 5-year rolling returns information does not exist.
- ¹¹ **Stable Value Index Benchmark**—Blend was 15% Bloomberg Barclays U.S. Aggregate Bond Index, 45% Bloomberg Barclays 1-5 Year Government/Corporate Bond Index, 35% Bloomberg Barclays Intermediate Government/Corporate Bond Index, 5% Bank of America Merrill Lynch 3-Month U.S. Treasury Bill Index.
- ¹² **Bloomberg Barclays U.S. Aggregate Bond 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 Net Dividend Return x U.S. Index (MSCI ACWI Net Dividend Return x U.S. Index) Benchmark**—A capitalization-weighted index of stocks representing 45 developed and emerging country markets, excluding the U.S. market.

The largest direct investments in the state of Ohio, measured at the fair value of OPERS' investment in the securities of firms headquartered in Ohio, totaled approximately \$0.4 billion at the end of the year.

The largest indirect investments, measured at the fair value of OPERS' investment in the securities of companies with the largest employment presence in the state, totaled approximately \$1.5 billion. Employment presence is measured by the number of employees 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 in which OPERS held investments at the end of 2019 employed more than 206,000 people.

 Top Ohio Holdings (as of December 31, 2019)				
Direct		Indirect		
Largest Firms Headquartered In Ohio	Fair Value	Firms with Largest Employment Presence	Ohio Employment Estimated Headcount	Fair Value
Procter & Gamble Co.	\$188,492,211	Wal-Mart Stores Inc.	49,330	\$105,378,161
Welltower Inc.	46,123,920	Kroger Co.	45,340	9,468,192
American Electric Power Co. Inc.	29,490,995	JPMorgan Chase & Co.	21,000	280,049,860
Sherwin Williams Co.	29,096,472	Honda Motor Co. Ltd.	15,000	8,522,699
Progressive Corp.	27,784,440	United Parcel Service Inc.	14,425	51,327,884
Marathon Petroleum Corp.	23,213,361	Lowe's Companies Inc.	13,400	56,276,182
TransDigm Group Inc.	12,237,120	Home Depot Inc.	12,350	153,338,138
STERIS plc	11,559,990	General Electric Co.	12,000	57,649,491
Parker-Hannifin Corp.	10,254,982	Berkshire Hathaway Inc.	11,800	265,361,738
Kroger Co.	9,468,192	Amazon.com Inc.	11,500	467,965,480
Total	\$387,721,683	Total	206,145	\$1,455,337,825

Investment Objectives and Policies

The investment and fiduciary responsibilities of the Board are governed by ORC 145.11, 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 administrative expenses. Prudent Person standards apply.

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 2019 fiscal year.

The OPERS Board manages the assets in a fashion that reflects 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 portfolios through diversification, adhering to portfolio guidelines, providing risk budgeting, adhering to compliance and ongoing 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 129 and are posted on the OPERS website, OPERS.org, where they can be viewed in their entirety.

Note: Policies adapted to meet plain-language standards of the OPERS Comprehensive Annual Financial Report and provide an overview. Complete policy information, with exact verbiage approved by the Board, is available on OPERS.org.

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 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. A comprehensive strategic asset allocation review is completed approximately every three-to-five years or if market conditions change substantially. This review helps to assess the continuing appropriateness of the asset allocation policy. Additionally, the review may also include a study of portfolio design and comparisons with peers. An actuarial experience study was completed in 2016 that resulted in a reduction to the long-term actuarial assumed rate of return from 8.0% to 7.5%. Since the reduction related to decreased long-term return expectations, there were no major portfolio changes required.

In addition to the experience studies, conditions are monitored and assumptions are reviewed annually to ensure that the assumptions remain reasonable until the next scheduled experience study. If conditions change materially, it may become necessary to review and update assumptions in advance of the next scheduled experience study. In 2018, the Board adopted changes to further reduce the long-term pension investment return assumption from 7.5% to 7.2%, and the long-term health care investment return assumption from 6.5% to 6.0%. The Defined Benefit portfolio completed a strategic asset allocation review in 2019, and the next strategic asset allocation review for the Health Care portfolio is scheduled to be completed in 2020. As a result of the strategic asset allocation review for the Defined Benefit portfolio, the following changes were approved: a 3% reduction in the Hedge Fund asset class, the elimination of the 2% allocation to Global Tactical Asset Allocation, an increase of 2% to Private Equity, an increase of 1% to Non-U.S. Equity, and an increase of 2% to U.S. Treasuries.

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's asset allocation policy establishes a framework designed to achieve 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, currently 7.2%, over a reasonably longer time horizon.

The Board sets target allocations to various asset classes designed to meet the OPERS long-term investment objectives. Allocations for the Public Equity and Fixed Income asset classes are 40% and 25%, respectively, with the remaining 30% and 5% allocated to Alternatives (Private Equity, Real Estate, Commodities, Hedge Funds, and Opportunistic) and Risk Parity, 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	40.0%	32 to 48%	
U.S. Equity	Custom Allocation ¹	+/- 5%	Russell 3000 Stock Index
Non-U.S. Equity	Custom Allocation ¹	+/- 5%	Custom benchmark of the following indices: 55% MSCI World Index x U.S. Standard (net) 10% MSCI World Index x U.S. Small Cap (net) 31% MSCI Emerging Markets Standard Index (net) 4% MSCI Emerging Markets Small Cap Index (net)
Fixed Income	25.0%	17 to 33%	
Core Fixed	11.0	8 to 14	Bloomberg Barclays U.S. Aggregate Bond Index
Emerging Markets Debt	6.0	4 to 8	Custom benchmark of the following indices: 50% J.P. Morgan Emerging Markets Bond Index (EMBI) Global 50% J.P. Morgan Government Bond Index (GBI)—Emerging Markets Global Diversified USD Index
Floating Rate Debt	0.0	0 to 2	Credit Suisse Leveraged Loan Index
Securitized Debt	1.0	0 to 2	Custom benchmark of the following indices: 50% Bloomberg Barclays Non-Agency Investment Grade CMBS: BBB Total Return Index Unhedged USD 50% Bloomberg Barclays Non-Agency CMBS Agg Eligible Total Return Index Value Unhedged USD
TIPS	2.0	0 to 5	Bloomberg Barclays U.S. TIPS Index
High Yield	2.0	1 to 5	Bloomberg Barclays U.S. Corporate High Yield Bond Index
U.S. Treasury	3.0	0 to 5	Bloomberg Barclays U.S. Treasury Index
Alternatives	30.0%	21 to 39%	
Private Equity	12.0	7 to 17	State Street Private Equity Index (SSPEI)
Real Estate	10.0	5 to 15	Net NFI-ODCE Index plus 85 basis points
Hedge Funds	5.0	1 to 9	Custom benchmark using the HFRI single-strategy indices weighted by the target allocations listed in the <i>Annual Investment Plan</i>
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%	HFR Risk Parity Vol 15 Institutional Index
Operating Cash	0.0%	0 to 5%	N/A
Total	100.0%		

¹ The custom allocation is set to the fixed U.S. Equity and Non-U.S. Equity target weights.

Health Care Investment Policies

Investment Objective

The primary objective of the Health Care portfolio is to provide funding for discretionary health care for eligible members. The assets of the Health Care 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 designed to achieve the long-term investment objective. The Health Care portfolio performance objective is to exceed the performance benchmark net of investment expenses. The table below sets forth targets, ranges and performance benchmarks for each asset class:

 Health Care Asset Allocation			
Asset Class	Target Allocation	Range	Benchmark Index
Public Equity	44.0%	35 to 53%	
U.S. Equity	Custom Allocation ¹	+/- 5%	Russell 3000 Stock Index
Non-U.S. Equity	Custom Allocation ¹	+/- 5%	Custom benchmark of the following indices: 55% MSCI World Index x U.S. Standard (net) 10% MSCI World Index x U.S. Small Cap (net) 31% MSCI Emerging Markets Standard Index (net) 4% MSCI Emerging Markets Small Cap Index (net)
Fixed Income	36.0%	25 to 47%	
Core Fixed	18.0	13 to 23	Bloomberg Barclays U.S. Aggregate Bond Index
Emerging Markets Debt	6.0	4 to 8	Custom benchmark of the following indices: 50% J.P. Morgan Emerging Markets Bond Index (EMBI) Global 50% J.P. Morgan Government Bond Index (GBI)—Emerging Markets Global Diversified USD Index
Floating Rate Debt	0.0	0 to 2	Credit Suisse Leveraged Loan Index
Securitized Debt	1.0	0 to 2	Custom benchmark of the following indices: 50% Bloomberg Barclays Non-Agency Investment Grade CMBS: BBB Total Return Index Unhedged USD 50% Bloomberg Barclays Non-Agency CMBS Agg Eligible Total Return Index Value Unhedged USD
TIPS	6.0	3 to 9	Bloomberg Barclays U.S. TIPS Index
High Yield	2.0	0 to 5	Bloomberg Barclays U.S. Corporate High Yield Bond Index
U.S. Treasury	3.0	0 to 5	Bloomberg Barclays U.S. Treasury Index
Alternatives	15.0%	8 to 23%	
REITs	6.0	3 to 9	Dow Jones U.S. Select RESI Total Return Index
Hedge Funds	5.0	1 to 9	Custom benchmark using the HFRI single-strategy indices weighted by the target allocations listed in the <i>Annual Investment Plan</i>
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%	HFR Risk Parity Vol 15 Institutional Index
Operating Cash	0.0%	0 to 5%	N/A
Total	100.0%		

¹ The custom allocation is set to the fixed U.S. Equity and Non-U.S. Equity target weights.

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 the target date fund that most closely corresponds to the member's 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, allocations to such assets are reduced to better preserve accumulated capital, while simultaneously increasing 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 OPERS target date fund, for the period December 1, 2019 through November 30, 2020, are on the next page.

 Defined Contribution Asset Allocation										
	OPERS Target Date Funds									
	Payout		2020		2025		2030		2035	
	Target	Range	Target	Range	Target	Range	Target	Range	Target	Range
OPERS Investment Fund										
Large Cap Index Fund	10.0%	+/-2.0%	11.0%	+/-2.0%	14.0%	+/-2.0%	18.0%	+/-3.0%	21.0%	+/-3.0%
Small Cap Index Fund	5.0	+/-2.0	6.0	+/-2.0	11.0	+/-2.0	15.0	+/-3.0	18.0	+/-3.0
Non-U.S. Stock Index Fund	15.0	+/-3.0	17.0	+/-3.0	25.0	+/-4.0	33.0	+/-4.0	39.0	+/-5.0
Bond Index Fund	32.0	+/-4.0	33.0	+/-4.0	38.0	+/-5.0	31.0	+/-4.0	16.0	+/-3.0
Short-Term Bond Fund	25.0	+/-4.0	21.0	+/-3.0	4.0	+/-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	1.0	+/-1.0	6.0	+/-2.0
TIPS Fund	13.0	+/-2.0	12.0	+/-2.0	8.0	+/-2.0	2.0	+/-1.0	0.0	+/-0.0

 Defined Contribution Asset Allocation (continued)										
	OPERS Target Date Funds									
	2040		2045		2050		2055		2060	
	Target	Range	Target	Range	Target	Range	Target	Range	Target	Range
OPERS Investment Fund										
Large Cap Index Fund	22.0%	+/-3.0%	23.0%	+/-3.0%	24.0%	+/-3.0%	25.0%	+/-4.0%	25.0%	+/-4.0%
Small Cap Index Fund	19.0	+/-3.0	19.0	+/-3.0	20.0	+/-3.0	20.0	+/-3.0	20.0	+/-3.0
Non-U.S. Stock Index Fund	41.0	+/-5.0	42.0	+/-5.0	43.0	+/-5.0	45.0	+/-5.0	45.0	+/-5.0
Bond Index Fund	10.0	+/-2.0	8.0	+/-2.0	7.0	+/-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	8.0	+/-2.0	6.0	+/-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 ¹
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 Net Dividend Return x U.S.

¹ 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 Bill Index. A typical stable value fund return fluctuates less than 1% 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 own 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. (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 ensures target date funds conform to the asset allocation policy through quarterly review and rebalancing.

Performance Objectives and Risk Management

The performance objective for the target date funds is 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 objective for the OPERS funds is to meet the return of 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.

Cash

Cash management seeks to preserve principal, provide liquidity and exceed its target benchmark, net of fees. This program actively invests cash and lending cash collateral relative to the target benchmarks for each portfolio. Interest rate, credit and liquidity risk are managed with quantitative and qualitative constraints.

Commodities

Commodity investments provide exposure to global commodities and achieve returns comparable to or in excess of the benchmark return, net of fees. Commodity portfolios are governed by guidelines that establish management parameters to achieve competitive 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.

Derivatives

Derivative instruments are used periodically to mitigate risk and to smooth trading efficiencies so that the risk/return profile of individual securities or portfolios are better managed. Derivative instruments may be used to enhance returns and reduce risk by managing or hedging exposure including, but not limited to stock markets, commodities and currencies.

Derivative instruments are grouped into three categories:

- **Category I:** Securities-based and traded either via an exchange or over-the-counter transactions.
- **Category II:** Non-securities-based, exchange-traded such as futures, options on futures or options.
- **Category III:** Non-securities-based, over-the-counter transactions.

To manage overall fund liquidity and to balance the use of derivative instruments and physical securities, limits have been established:

- Use of Category III derivative instruments are limited to 10% of the total net asset value of public market assets held in separate accounts, excluding foreign exchange derivative instruments used for hedging. (Additional portfolio-level restrictions may apply.)
- The combined gross notional exposure of Category II and Category III derivative instruments will not exceed 20% of total net asset value, excluding foreign exchange derivative instruments used for hedging. (Additional portfolio-level restrictions may apply.)
- Currency forwards are one year or less to maturity, unless approved by the chief investment officer.

Fixed Income

A broad exposure to fixed-income asset classes to ensure diversification and provide a competitive return is the overriding goal. In doing so, OPERS is better positioned to provide for the known liabilities associated with the defined benefit plan and the health care trust. Diversification is established via activity in a variety of sub-asset classes including market debt, floating rate debt, securities debt, Treasury inflation-protected securities (TIPS), high yield and U.S. Treasuries.

Both active and passive management strategies are used by internal and external portfolio managers. Internal managers position the majority of the fixed income portfolio with risk-controlled active strategies, focusing on investment-grade securities and managing the TIPS and U.S. Treasury allocations as indices. External managers, with special expertise, manage the high yield, emerging debt and floating rate debt investments.

Global Tactical Asset Allocation (GTAA)

GTAA capitalizes 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. 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 derivative instruments, and some degree of leverage may be employed.

The overall benchmark for GTAA is the market value weight of the underlying managers' benchmarks. 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.

Hedge Funds

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

The performance objective is a custom benchmark using the HFRI single-strategy indices weighted by the target allocation.

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. Direct Hedge Fund managers are limited to 12% of the Hedge Fund's sub-asset class market value.

Opportunistic

Investments in the Opportunistic sub-asset class include investment strategies or assets not currently used in the respective Defined Benefit or Health Care portfolios, but which have the potential to improve investment results over time. Assets and strategies used 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 has a specific performance benchmark.

The overall benchmark is the market value weight of the underlying benchmarks. Long-term returns should match or exceed the OPERS Total Fund benchmark, which is a measure of the 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 or Health Care portfolio assets at the time of funding.

Private Equity

Private equity seeks competitive returns plus a liquidity premium by investing with managers who have a consistent record of producing superior returns. Not publicly traded, this sub-asset class provides access to opportunities that may be long term.

Exclusively using external managers who employ active management strategies, private equity adds diversification to the Defined Benefit portfolio. Risk is managed by limiting the commitment amount to single, closed-end commingled funds to \$600 million for primary funds and to \$800 million for fund of funds, including secondary fund of funds. Additionally, specific quantitative and qualitative constraints govern the fund.

Performance is benchmarked against the State Street Private Equity Index (SSPEI).

Public Equities (domestic and international stocks)

With both active (active trades) and passive (indexed funds) components, this program provides broad exposure to global, publicly traded, stock markets. The active management of the program is structured to allow managers to identify and capture opportunities.

Both active and passive components are designed to produce risk-adjusted return, net of fees, that exceeds benchmarks over a complete market cycle—at all times conducting business within pre-established risk constraints.

This program is monitored using a tracking error range—tracking error is a statistical variance measurement that shows the degree to which OPERS returns differ from industry returns:

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: 55% MSCI World Index x U.S. Standard (net) 10% MSCI World Index x U.S. Small Cap (net) 31% MSCI Emerging Markets Standard Index (net) 4% MSCI Emerging Markets Small Cap Index (net)	0-300 basis points

Real Estate

The global real estate program encompasses both private and public markets.

The private market real estate initiative is limited to 20% of the private-market activity. A summary of the long-term guidelines are as follows:

- At least 80% of the private real estate portfolio is invested in apartment, industrial, office and retail assets.
- Holdings outside the U.S. are limited to no more than 25% of the total.
- Any single direct investment is limited to 10% of the target allocation.
- Single closed-end commingled funds are limited to either \$400 million or 5% of the target allocation, whichever is greater.
- Single open-end commingled funds are limited to 10% of the target allocation.

The public market real estate portfolio manager is internal and uses a passive-management strategy.

The OPERS real estate program performance is monitored, or benchmarked, using the National Council of Real Estate Investment Fiduciaries (NCREIF) Fund Index—Open End Diversified Core Equity (ODCE). This asset class is expected to meet or exceed the net ODCE plus 85 basis points, over rolling five-year periods. Health Care portfolio real estate is benchmarked against the Dow Jones U.S. Select RESI Total Return Index.

Risk Parity

Risk Parity is an alternative allocation of assets designed to achieve a better balance of economic outcomes in growth and inflation environments. This requires investing in multiple asset types and leveraging exposures to global markets in order to obtain the desired risk exposure. 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 and Health Care portfolios.

The overall benchmark is the market value weight of the underlying managers' benchmarks. The Board sets performance expectation through approval of the *Annual Investment Plan*. By allocating to multiple Risk Parity managers, concentration to any one manager is limited.

Securities Lending

The Securities Lending program actively lends securities through various programs to qualified borrowers to provide incremental income to the respective asset classes. Performance of the securities lending program is assessed annually.

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.

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 this section. The expected rate of return is based on the asset allocation in place during the year presented and the actuarial assumed rate of return is the assumption used by our actuaries for the annual actuarial valuations, described further in the Actuarial Section. Finally, the single discount and long-term municipal bond rates are applicable to the implementation of Governmental Accounting Standards Board Statement No. 74 in 2017, including 2016 beginning balances. These rates are used in the Accounting Basis valuations for health care and not available prior to 2016.

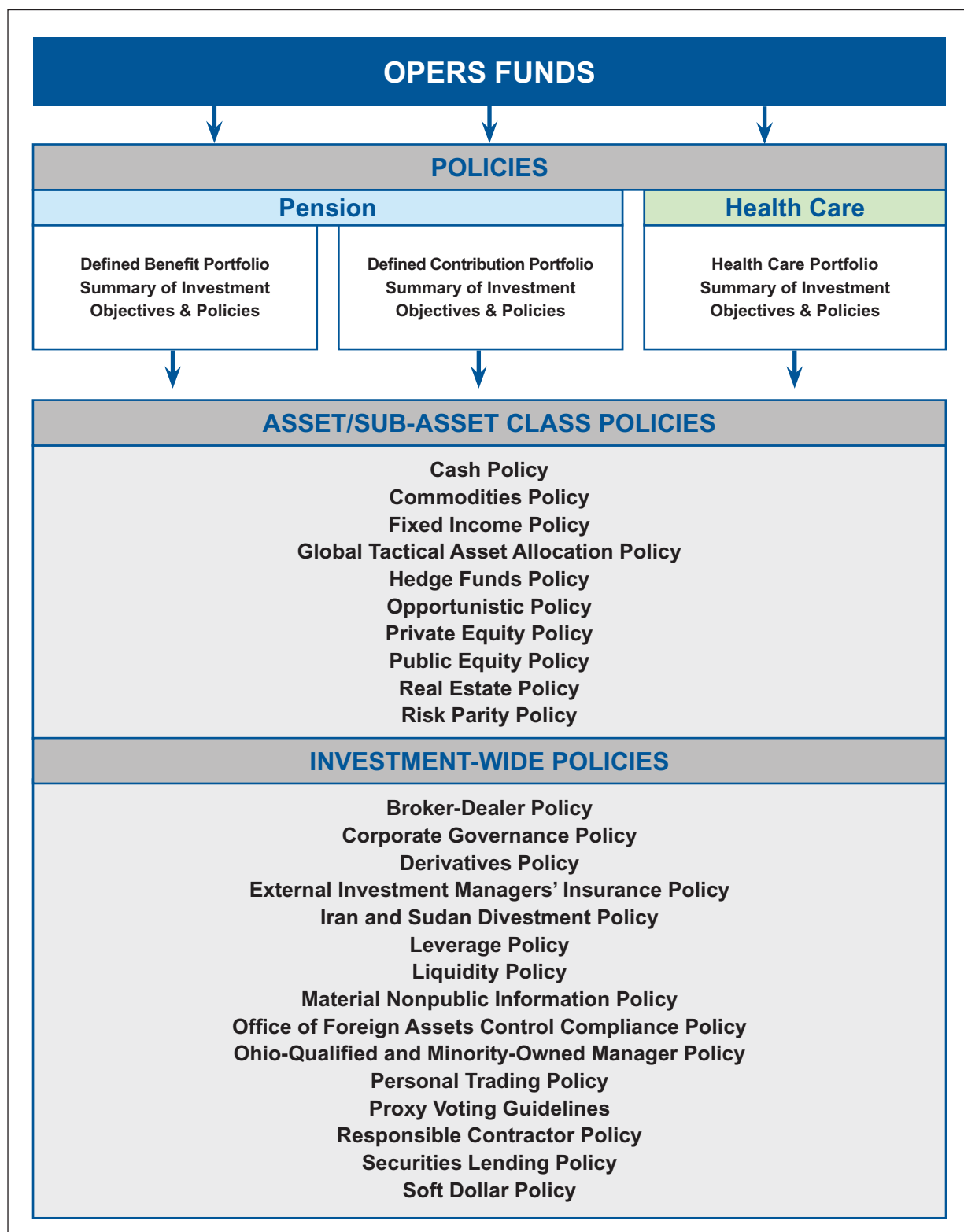
Rates are presented for seven years in the following table:

 Investment Rates by Portfolio							
	2019	2018	2017	2016	2015	2014	2013
Defined Benefit Portfolio							
Actual Rate of Return	17.23%	(2.99%)	16.82%	8.31%	0.33%	6.96%	14.38%
Benchmark Return	17.06	(3.07)	15.19	8.64	0.25	5.81	14.24
Long-Term Expected Rate of Return	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Actuarial Assumed Rate of Return	7.20	7.20	7.50	7.50	8.00	8.00	8.00
Health Care Portfolio¹							
Actual Rate of Return	19.59%	(5.76%)	15.25%	7.55%	(2.18%)	5.28%	11.36%
Benchmark Return	19.20	(5.96)	14.31	7.75	(1.88)	5.01	10.70
Long-Term Expected Rate of Return	6.50	6.50	6.50	6.50	6.50	6.50	6.50
Actuarial Assumed Rate of Return	6.00	6.00	6.50	5.00	5.00	5.00	5.00
Single Discount Rate (GASB 74) ²	3.16	3.96	3.85	4.23	N/A	N/A	N/A
Long-Term Municipal Bond Rate ²	2.75	3.71	3.31	3.78	N/A	N/A	N/A

¹ 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 portfolios can be found in this 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 this 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.

² Projected benefit payments are required to be discounted to their actuarial present value using a Single Discount Rate that reflects (1) a long-term expected rate of return on other post-employment benefits (OPEB) plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits), and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met). Additional information on the Single Discount Rate can be found in Note 9 of the Notes to Combining Financial Statements found in the Financial Section.

The following exhibit illustrates the structure and relationship of the 28 investment policies within the total System and its three investment portfolios in 2019.



Actuarial Section

To structure positive, sustainable change, OPERS relies on many financial professionals to help the System adapt to anticipated challenges. Actuarial principles have provided OPERS management and the Board with accurate assessments using mathematical and statistical methods. These assessments, or forecasts, help OPERS define, analyze and ultimately structure financial solutions for the future.

Longer Life Expectancies

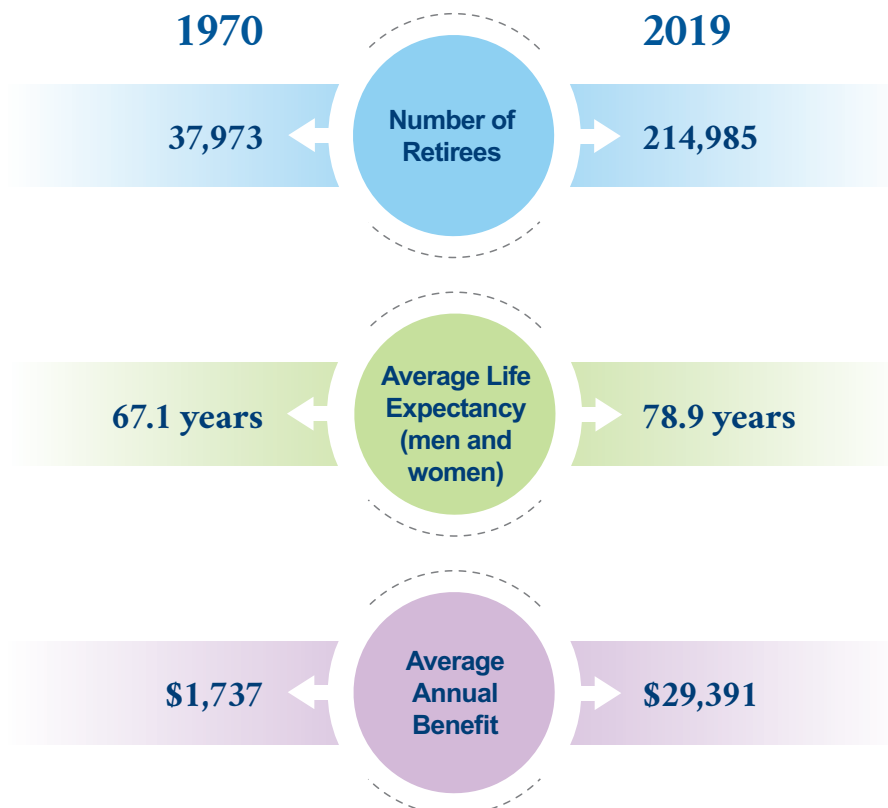


Oldest OPERS member:
108 years
(as of 2019)



Number of members older than 100:
99 members

Retirement by the Numbers



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May 29, 2020

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, 2019. 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 Nos. 74 and 75 (retiree health benefits, or OPEB). 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, 2019 for GASB Statement Nos. 67 and 68 and December 31, 2019 for GASB Statement Nos. 74 and 75.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

Retirement Board
Ohio Public Employees Retirement System
May 29, 2020
Page 2

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

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
- Net OPEB Liability – Health Care
- Key Methods and Assumptions Used in Valuation of Total OPEB Liability
- Sensitivity of Net OPEB Liability to Changes in the Discount Rate
- Sensitivity of Net OPEB Liability to Changes in the Health Care Cost Trend Rate
- Schedule of Changes in Net Pension Liability and Related Ratios
- Schedules of Member and Employer Contributions
- Schedule of Changes in Net OPEB Liability and Related Ratios

Actuarial Section

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

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 7.20%. 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 7.20%. For determining the Net OPEB Liability (NOL) under GASB Statement No. 74, assets are valued on a market basis. The long-term assumed rate of investment return on Health Care fund assets is 6.00%. Based upon the results of a projection performed in accordance with GASB Statement No. 74 parameters, the Single Discount Rate for purposes of discounting Health Care liabilities for OPEB financial reporting purposes is 3.16%.



Retirement Board
Ohio Public Employees Retirement System
May 29, 2020
Page 3

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, 2019 valuations were based upon assumptions that were recommended in connection with an Experience Study covering the 2011-2015 period and updated in conjunction with an Investment Return Assumption review performed between the December 31, 2017 and December 31, 2018 valuations.

The computed pension amortization period as of the December 31, 2019 annual valuation is 23 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, 2019 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, PhD



Mita D. Drazilov, ASA, FCA, MAAA

BBM/MDD:dj



The defined benefit pension and health care actuarial information presented in this *2019 Comprehensive Annual Financial Report* (CAFR) is based on the most current actuarial valuations for the System. The pension valuation data is presented as of December 31, 2019; the health care valuation data is presented as of December 31, 2018, based on the most recent data available. The pension actuarial assumptions are applicable to 2019. The health care actuarial assumptions in this section are applicable to 2018, unless otherwise noted. This section presents actuarial information for pension and health care on a Funding Basis. 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 in the Financial Section of the CAFR on a financial reporting basis, or Accounting Basis. Also, in conjunction with GASB Statement No. 74 (GASB 74), *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans* (or OPEB), OPERS is reporting actuarial results of health care as of the December 31, 2018 valuation date, rolled forward to the measurement date of December 31, 2019.

The Accounting Basis calculation methodologies defined by GASB 67 and 74 require different methods and may require different assumptions than are used to calculate the funded status of a plan. For example, both GASB 67 and 74 require the use of the fair value of assets, instead of the smoothed value of assets used for the Funding Basis. Both GASB 67 and 74 require that the actuarial information presented under the Accounting Basis represent the most current year-end or measurement period. The GASB 67 net pension liability and the GASB 74 net OPEB, or health care, 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 153. GASB 67 and 74 break 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 contributions needed to fund the plans. The assumptions disclosed in this section were used for both funding and financial reporting valuations, unless otherwise noted.

OPERS conducts an experience study every five years in accordance with Ohio Revised Code Section 145.22. The 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 majority of the methods and assumptions disclosed in this section in 2016. In addition to the experience studies, conditions are monitored and assumptions are reviewed annually to ensure the assumptions remain reasonable until the next scheduled experience study. If conditions change materially, it may become necessary to review and update assumptions in advance of the next scheduled experience study. In 2018, the Board adopted changes to further reduce the long-term pension investment return assumption from 7.5% to 7.2%. The long-term health care investment return assumption was reduced from 6.5% to 6.0%.

These methods and assumptions apply to the pension plans (Traditional Pension Plan, Combined Plan, and Member-Directed Plan) as well as health care.

Pension plan and health care details can be found in the Plan Statement beginning on page 217.

Funding Method

The individual entry-age actuarial-cost method of valuation was used in determining pension and health care liabilities and normal costs under both of the funding valuations included in this section, as well as the financial reporting valuations done under GASB 67 and 74 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.

Economic Assumptions

The following economic assumptions were used by the actuary in the pension and health care valuations, as noted:

- **Investment Return**—For pension, 7.20% compounded annually, net of administrative expenses. For health care, 6.00% compounded annually, net of administrative expenses.
- **Wage Inflation Rate**—Calculated at 3.25% per year. 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 the effects of pay changes related to individual merit and seniority.
- **Price Inflation**—For pension, 2.50% of the investment return rate and wage inflation rate is assumed to be price inflation.
- **Assumed Real Rate of Return Over Wage Inflation**—For pension, 3.95% per year. For health care, 2.75% per year. The assumed real rate of return for the Funding Basis is defined as the portion of the pension and the health care investment return, 7.20% and 6.00%, respectively, that is more than the assumed total wage growth rate of 3.25%. Refer to the Notes to Combining Financial Statements, Note 9, in the Financial Section for more information on the Single Discount Rate used for the Accounting Basis calculations of the health care liability.
- **Active Member Population**—For pension, the sum of the active members in the Traditional Pension Plan and Combined Plan is 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.
- **Health Care Payments**—For the 2018 health care valuation, health care expenses were assumed to increase initially at 10.50% before leveling off to 3.50% in 2030. For projection and valuation purposes, health reimbursement arrangement accounts and retiree medical accounts (RMA), including Member-Directed Plan health care and wellness RMA accounts, are assumed to be allocated to the members and cannot be used in the future to fund other retiree health care expenses.
- **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 was for merit and/or seniority increases, and the balance recognizes the wage inflation rate. The following table, on the next page, describes annual increase percentages for sample ages.

Individual Employee Pay Increases									
Age	Merit and Seniority				Wage Inflation	Total Increase Next Year			
	State	Local	Public Safety	Law		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	0.11	0.06	0.47	0.47	0.37	0.26	0.78	1.38
55	5 & over	0.28	0.17	1.05	1.05	0.90	0.71	2.32	2.65
60	5 & over	0.48	0.26	1.25	1.25	1.00	0.85	2.60	2.75

The turnover probabilities in the tables on page 141 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. Members eligible for an annuity benefit may be eligible to participate in one of the OPERS health care plans. The method of distribution and the resulting liabilities are calculated for this population based on the following assumptions:

- **Withdrawal from Service**—Assumes that: 1) members terminating before age 35, 2) members terminating with less than five years of service, and 3) 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. Members eligible for an annuity may be eligible to participate in OPERS health care.

Asset Valuation Method

For actuarial purposes, and under the Funding Basis, the funding value of defined benefit pension and health care assets recognizes total assumed investment returns 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 market value by more than 12%.

Valuation Data

The demographic and financial data used in the actuarial valuations were provided to the actuary by OPERS. 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 page 144:

- **Mortality**—For pension and health care, pre-retirement mortality rates were based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates were based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees were based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year were determined by applying the MP-2015 mortality improvement scale to all of 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 144 through 148.

Senate Bill (SB) 343 was enacted into law with an effective date of January 7, 2013. In the legislation, members were categorized into three pension groups with varying provisions of the law applicable to each group:

- **Transition Group A**—Members eligible to retire under law in effect prior to SB 343, or who were eligible to retire no later than five years after January 7, 2013.
- **Transition Group B**—Members who had earned at least 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.
- **Transition Group C**—Members who are not in either of the other groups, as well as members who were hired on or after January 7, 2013.

See the Plan Statement beginning on page 217 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 attained the following division specific years of service credit and 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.

Years of Service	State		Local	
	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.

Years of 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 age 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 age 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

The tables below display statistical information regarding the average defined pension 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
2019	57.9	23.3	\$44,368	\$21,912	71.1	\$28,784
2018	57.8	23.2	43,386	21,456	70.7	27,981
2017	57.7	23.1	42,479	21,016	70.4	27,192
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

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
2019	64.8	11.1	\$50,618	\$4,686	69.1	\$5,107
2018	64.8	10.6	49,007	4,338	68.7	4,697
2017	64.7	10.3	47,455	4,000	68.2	4,304
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

Actuarial Valuation Data

Actuarial Section

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		
Valuation Year	Participating Employers ¹	Employer Units ¹	Active Members				Retired Lives		
			Number	Annual Payroll ² (\$ millions)	Average Pay ²	Percent Increase in Average Pay ²	Number ³	Annual Allowance (\$ millions)	Average Allowance
2019	3,219	3,694	285,843	\$13,528	\$47,327	2.56%	220,448	\$6,219	\$28,209
2018	3,221	3,693	284,808 ^a	13,143	46,147	11.95	218,226	5,986	27,431
2017	3,227	3,683	323,318	13,328	41,223	2.12	216,260	5,766	26,663
2016	3,232	3,678	323,179	13,046	40,368	3.17	213,550	5,527	25,882
2015	3,247	3,683	321,383	12,575	39,128	2.53	210,792	5,296	25,124
2014	3,251	3,692	322,318	12,300	38,161	3.41	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

Actuarial Valuation Data							Combined Plan		
Valuation Year	Participating Employers ¹	Employer Units ¹	Active Members				Retired Lives		
			Number	Annual Payroll ² (\$ millions)	Average Pay ²	Percent Increase in Average Pay ²	Number ³	Annual Allowance (\$ millions)	Average Allowance
2019	3,219	3,694	7,549	\$439	\$58,153	4.91%	392	\$2	\$5,107
2018	3,221	3,693	7,739	429	55,434	5.15	339	2	4,697
2017	3,227	3,683	7,948	419	52,718	2.84	283	1	4,304
2016	3,232	3,678	7,803	400	51,262	4.25	239	1	3,956
2015	3,247	3,283	7,626	375	49,174	3.56	196	1	3,596
2014	3,251	3,692	7,455	354	47,485	3.85	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

^a In 2018, the data aggregation methodology was modified for active and inactive member counts after system reconfigurations. No material impact to the actuarial valuations resulted.

¹ 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.

² The Annual Payroll, Average Pay and Percent Increase in Average Pay values in this table, for 2014 through 2016, were restated to reflect the annual covered payroll calculated under the Funding Basis. The annual covered payroll under the Funding Basis represents the annualized pay rate for all active Traditional Pension and Combined plan members. The previous amounts reported were calculated under the Accounting Basis, which calculated annual covered payroll based on member contributions submitted within a given calendar year.

³ The number of Retired Lives represents an individual count of retirees and beneficiaries.

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 ¹			Combined Plan ¹		
	Number ²	Annual Allowance (\$ millions)	Average Allowance	Number ²	Annual Allowance (\$ millions)	Average Allowance
2019	317	\$2	\$5,301	267	\$1	\$4,097
2018	280	1	4,948	230	1	3,840
2017	242	1	4,849	193	1	3,623
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

¹ Plan inception January 1, 2003.

² Number represents an individual count of retirees and beneficiaries.

Retirees and Beneficiaries Added to and Removed from Rolls Actuarial Section

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, 2019.

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 217 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	Average Age at Retirement ¹	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2019	8,088	62.8	\$233,501,735	6,148	\$121,202,196	212,713	\$6,201,602,950	3.9%	\$29,155
2018	8,294	62.7	227,073,532	6,326	123,469,913	210,773	5,968,955,234	3.9	28,319
2017	8,610	61.5	236,113,024	6,185	115,031,952	208,805	5,746,885,962	4.3	27,523
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 ^a	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

Schedule of Retirees and Beneficiaries Added to and Removed from Rolls								Combined Plan—Defined Benefit ²	
Year Ended	Added to Rolls			Removed from Rolls		Rolls at End of Year		Percentage Increase in Annual Allowances	Average Annual Allowances
	Number	Average Age at Retirement ¹	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2019	55	64.9	\$370,742	1	\$2,601	391	\$1,996,370	25.7%	\$5,106
2018	54	64.4	334,790	0	0	337	1,587,670	30.4	4,711
2017	49	64.1	279,099	4	16,442	283	1,217,952	31.0	4,304
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 ^a	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

^a Data aggregation methodology modified from values reported in the 2011 Comprehensive Annual Financial Report.

¹ Average age of new age-and-service retirees only, beginning in 2017. Information for prior years is unavailable.

² Plan inception January 1, 2003.

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. This section also includes the Schedules of Funding Progress for health care. Separate schedules are displayed for each pension plan and health care reflecting the funding status of the plans on a valuation, or funding, basis. See pages 193 and 195 in the Statistical Section for the schedules of funding progress on an accounting, or financial, basis, for pension and health care, respectively. Separate schedules are included in the Required Supplementary Information of the Financial Section disclosing the 10-year schedule of actuarially determined contributions and actual contributions paid.

 Schedule of Funding Progress—Funding Basis¹ (\$ 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
2019	\$111,371	\$88,572	\$22,799	79.5%	\$14,380	159%	23
2018	108,705	84,287	24,418	77.5	13,807	177	27
2017 ^c	106,090	83,292	22,798	78.5	13,498	169	25
2017	102,656	83,292	19,364	81.1	13,498	143	18
2016	100,167	80,280	19,887	80.1	13,186	151	19
2015 ^a	97,177	78,061	19,116	80.3	12,688	148	20
2015 ^b	91,832	78,061	13,771	85.0	12,688	106	19
2014	89,285	74,865	14,420	83.8	12,486	114	21
2013	86,645	71,411	15,234	82.4	12,331	124	24
2012	83,878	67,855	16,023	80.9	12,193	131	26
2011	84,530	65,436	19,094	77.4	12,399	154	30
2010 ^a	80,485	63,649	16,836	79.1	12,450	135	24
2010 ^b	79,630	60,600	19,030	76.1	12,450	153	29

 Schedule of Funding Progress—Funding Basis¹ (\$ 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
2019	\$110,887	\$87,903	\$22,984	79.3%	\$13,932	165%	23
2018	108,265	83,715	24,550	77.3	13,376	184	28
2017 ^c	105,691	82,797	22,894	78.3	13,085	175	26
2017	102,274	82,797	19,477	81.0	13,085	149	19
2016	99,818	79,865	19,953	80.0	12,794	156	20
2015 ^a	96,863	77,700	19,163	80.2	12,321	152	20
2015 ^b	91,535	77,700	13,835	84.9	12,321	110	19
2014	89,017	74,567	14,450	83.8	12,140	117	21
2013	86,407	71,175	15,232	82.4	12,000	127	25
2012	83,664	67,670	15,994	80.9	11,884	135	26
2011	84,325	65,274	19,051	77.4	12,103	157	30
2010 ^a	80,307	63,515	16,792	79.1	12,165	138	25
2010 ^b	79,459	60,461	18,998	76.1	12,165	156	30

^a Revised actuarial assumptions based on experience study.

^b Results from original valuation prior to re-statement after completion of experience study.

^c Revised actuarial assumptions based on change in discount rate from 7.5% to 7.2%.

¹ The amounts reported on this schedule do not include assets or liabilities for health care. For the health care funding progress, refer to the table on page 155.

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 ¹ (\$ 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
2019	\$461	\$646	(\$185)	140.1%	\$448	0%	0
2018	420	552	(132)	131.3	431	0	0
2017 ^c	382	479	(97)	125.3	413	0	0
2017	365	479	(114)	131.0	413	0	0
2016	336	402	(66)	119.6	392	0	0
2015 ^a	303	350	(47)	115.6	367	0	0
2015 ^b	288	350	(62)	121.7	367	0	0
2014	260	289	(29)	111.2	346	0	0
2013	230	229	1	99.5	331	0	0
2012	212	183	29	86.2	310	9	1
2011	203	161	42	79.3	296	14	2
2010 ^a	177	134	43	75.5	284	15	3
2010 ^b	171	138	33	80.5	284	12	2

^a Revised actuarial assumptions based on experience study.

^b Results from original valuation prior to re-statement after completion of experience study.

^c Revised actuarial assumptions based on change in discount rate from 7.5% to 7.2%.

¹ The amounts reported on this schedule do not include assets or liabilities for health care. For the health care funding progress, refer to the table on page 155.

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 ¹ (\$ 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
2019	\$22,821	\$22,821	\$0	100.0%	N/A	N/A
2018	19,917	19,917	0	100.0	N/A	N/A
2017 ^d	16,770	16,770	0	100.0	N/A	N/A
2016 ^c	12,961	12,961	0	100.0	N/A	N/A
2015 ^a	10,291	10,622	(331)	103.2	N/A	N/A
2015 ^b	9,767	10,622	(855)	108.8	N/A	N/A
2014	8,291	8,772	(481)	105.8	N/A	N/A
2013	6,884	6,826	58	99.2	N/A	N/A
2012	2,666	2,524	142	94.7	N/A	N/A
2011	1,173	1,156	17	98.6	N/A	N/A
2010 ^a	496	454	42	91.5	N/A	N/A
2010 ^b	490	439	51	89.6	N/A	N/A

^a Revised actuarial assumptions based on experience study.

^b Results from original valuation prior to re-statement after completion of experience study.

^c Restated upon finalization of actuarial valuation subsequent to issuance of the 2016 CAFR.

^d Revised actuarial assumptions based on change in discount rate from 7.5% to 7.2% did not have an impact on the results from original valuation prior to the change in discount rate.

¹ The amounts reported on this schedule do not include assets or liabilities for health care. Participants in the Member-Directed Plan do not have access to health care provided to the members of the Traditional Pension Plan or Combined Plan. Instead, a portion of the employer contributions are deposited in a retiree medical account. The retiree medical account can reimburse qualified medical expenses when a Member-Directed Plan participant terminates service or retires. For the health care funding progress, refer to the table on page 155.

The health care assets provide 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, as well as the Member-Directed Plan retiree medical accounts. The schedule below displays the estimated solvency years the health care assets will be able to provide health care under the intermediate actuarial assumptions.

Schedule of Funding Progress—Funding Basis (\$ in millions)							Health Care
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	Solvency Years ¹
2018	\$17,849	\$11,647	\$6,202	65.3%	\$13,807	45%	11
2017 ^c	18,393	12,021	6,372	65.4	13,498	47	13
2017	17,389	12,021	5,368	69.1	13,498	40	13
2016	19,924	12,098	7,826	60.7	13,186	59	12
2015 ^a	19,224	11,933	7,291	62.1	12,688	57	Indefinite
2015 ^b	18,515	11,933	6,582	64.5	12,688	52	Indefinite
2014	19,405	12,062	7,343	62.2	12,486	59	Indefinite
2013	19,784	12,031	7,753	60.8	12,331	63	Indefinite
2012	19,182	12,193	6,989	63.6	12,193	57	Indefinite
2011	31,020	12,115	18,905	39.1	12,399	153	10
2010 ^a	30,531	12,320	18,211	40.4	12,450	146	11
2010 ^b	26,929	11,267	15,662	41.8	12,450	126	11
2009	31,558	10,936	20,622	34.7	12,548	165	11

^a Revised actuarial assumptions based on experience study.

^b Results from original valuation prior to re-statement after completion of experience study.

^c Revised actuarial assumptions based on change in discount rate from 6.5% to 6.0%.

¹ 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.

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 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 or fully covered by the remaining value of actuarial assets at year end.

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			Valuation Assets ¹	Portions of Accrued Liabilities Covered by Reported Assets		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active/Inactive Members (Employer-Financed Portion)		(1)	(2) ^d	(3)
2019	\$15,209	\$70,089	\$25,589	\$87,903	100%	100%	10%
2018	14,764	68,379	25,122	83,715	100	100	2
2017 ^c	14,298	66,546	24,847	82,797	100	100	8
2017	14,298	64,834	23,142	82,797	100	100	16
2016	13,912	62,798	23,108	79,865	100	100	14
2015 ^a	13,469	56,376	27,018	77,700	100	100	29
2015 ^b	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 ^a	12,134	42,362	25,811	63,515	100	100	35
2010 ^b	12,134	41,715	25,609	60,461	100	100	26

^a Results restated based on experience study.

^b Results from original valuation prior to completion of experience study.

^c Revised actuarial assumptions based on change in discount rate from 7.5% to 7.2%.

^d By law, OPERS is obligated to pay certain benefits that have commenced with retirees. In order to make these payments each year and hold sufficient assets in this fund to pay the vested benefits of all retirees and beneficiaries as of the actuarial valuation date, OPERS transfers funds from the active member employer fund (the Employers' Accumulation Fund) to the pension funds (the Annuity and Pension Reserve Fund and the Survivors' Benefit Fund). Thus, the amount available for active member funding is negatively impacted.

¹ Does not include assets set aside for health care.

 Accrued Pension Liabilities (\$ in millions)					Combined Plan		
Valuation Year	Aggregate Accrued Liabilities for			Valuation Assets ¹	Portions of Accrued Liabilities Covered by Reported Assets		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active/Inactive Members (Employer-Financed Portion)		(1)	(2) ^d	(3)
2019	\$3	\$37	\$421	\$646	100%	100%	144%
2018	3	31	386	552	100	100	134
2017 ^c	3	24	355	479	100	100	127
2017	3	23	340	479	100	100	133
2016	3	18	315	402	100	100	121
2015 ^a	2	14	287	350	100	100	116
2015 ^b	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 ^a	1	1	175	134	100	100	75
2010 ^b	1	1	169	138	100	100	80

^a Results restated based on experience study.

^b Results from original valuation prior to completion of experience study.

^c Revised actuarial assumptions based on change in discount rate from 7.5% to 7.2%.

^d By law, OPERS is obligated to pay certain benefits that have commenced with retirees. In order to make these payments each year and hold sufficient assets in this fund to pay the vested benefits of all retirees and beneficiaries as of the actuarial valuation date, OPERS transfers funds from the active member employer fund (the Employers' Accumulation Fund) to the pension funds (the Annuity and Pension Reserve Fund and the Survivors' Benefit Fund). Thus, the amount available for active member funding is negatively impacted.

¹ Does not include assets set aside for health care.

Actual vs. Recommended Contribution Rates

The Board adopted all contribution rates as recommended by the actuary.

The following tables display the actual financial experience in relation to the actuarially assumed experience for each of the defined benefit pension plans and health care. Actuarial gains and losses in accrued liabilities result from differences between the assumed experience and actual experience.

Analysis of Financial Experience (\$ in millions, continued on next page)				
Type of Activity	Gains (or Losses) for Year			
	2019	2018	2017	2016
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.	\$16.9	\$51.2	\$62.2	\$55.5
Disability Retirements When disability claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs.	95.2	79.6	72.8	61.2
Death-In-Service Annuities When survivor claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs.	35.2	45.9	36.0	41.3
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.	14.1	31.1	(6.1)	5.2
Pay Increases When pay increases are less than assumed, a gain results. If pay increases are greater than assumed, a loss occurs.	189.7	183.0	410.6	(48.1)
Investment Return When investment returns are greater than assumed, a gain results. If investment returns are less than assumed, a loss occurs.	1,565.8	(1,743.5)	203.5	(467.8)
Retiree Mortality¹ 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.	12.3	121.8	82.4	31.9
Retiree Cost-of-Living Adjustments When cost-of-living adjustments are less than assumed, a gain results. If cost-of-living adjustments are greater than assumed, a loss occurs.	108.0	(104.6)		
Gains/(Losses) During Year From Financial Experience	\$2,037.2	(\$1,335.5)	\$861.4	(\$320.8)

Analysis of Financial Experience (\$ in millions, continued on next page)				
Type of Activity	Gains (or Losses) for Year			
	2019	2018	2017	2016
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.	(\$0.07)	\$0.05	\$0.21	\$0.06
Disability Retirements When disability claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs.	5.89	4.32	4.30	3.82
Death-In-Service Annuities When survivor claims are less than assumed, a gain results. If claims are greater than assumed, a loss occurs.	0.58	0.53	(0.04)	0.94
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.	0.46	(0.04)	(1.16)	(0.44)
Pay Increases When pay increases are less than assumed, a gain results. If pay increases are greater than assumed, a loss occurs.	4.64	3.42	9.89	4.09
Investment Return When investment returns are greater than assumed, a gain results. If investment returns are less than assumed, a loss occurs.	9.88	(9.22)	3.99	(2.02)
Retiree Mortality¹ 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.	(0.17)	0.16	0.02	(0.03)
Retiree Cost-of-Living Adjustments When cost-of-living adjustments are less than assumed, a gain results. If cost-of-living adjustments are greater than assumed, a loss occurs.	0.17	(0.12)		
Gains/(Losses) During Year From Financial Experience	\$21.38	(\$0.90)	\$17.21	\$6.42

¹ In 2019, the data aggregation methodology was modified for retiree mortality. Restated data for years prior to 2019 is not available.

Traditional Pension Plan					
Gains (or Losses) for Year					
2015	2014	2013	2012	2011	2010
\$71.6	(\$91.9)	(\$77.2)	(\$113.2)	(\$179.0)	(\$20.5)
83.1	95.0	64.0	71.6	88.1	59.2
41.0	40.4	29.5	42.0	36.1	32.0
22.1	4.7	(13.0)	8.9	15.9	99.8
367.1	461.8	551.7	1,261.7	359.5	773.7
261.6	471.3	617.1	(398.4)	(1,193.8)	153.5
74.4	95.8	140.4			
\$920.9	\$1,077.1	\$1,312.5	\$872.6	(\$873.2)	\$1,097.7

Combined Plan					
Gains (or Losses) for Year					
2015	2014	2013	2012	2011	2010
\$0.07	(\$0.16)	(\$0.09)	(\$0.11)	(\$0.09)	(\$0.12)
3.93	4.66	4.34	4.86	4.52	2.78
0.42	1.04	0.66	0.59	(0.02)	0.04
0.23	(0.74)	(0.09)	0.44	0.55	(1.67)
5.92	4.92	5.53	7.55	3.00	2.29
(0.08)	3.05	2.84	(0.38)	(2.69)	(3.44)
0.29	0.04	0.10			
\$10.78	\$12.81	\$13.29	\$12.95	\$5.27	(\$0.12)

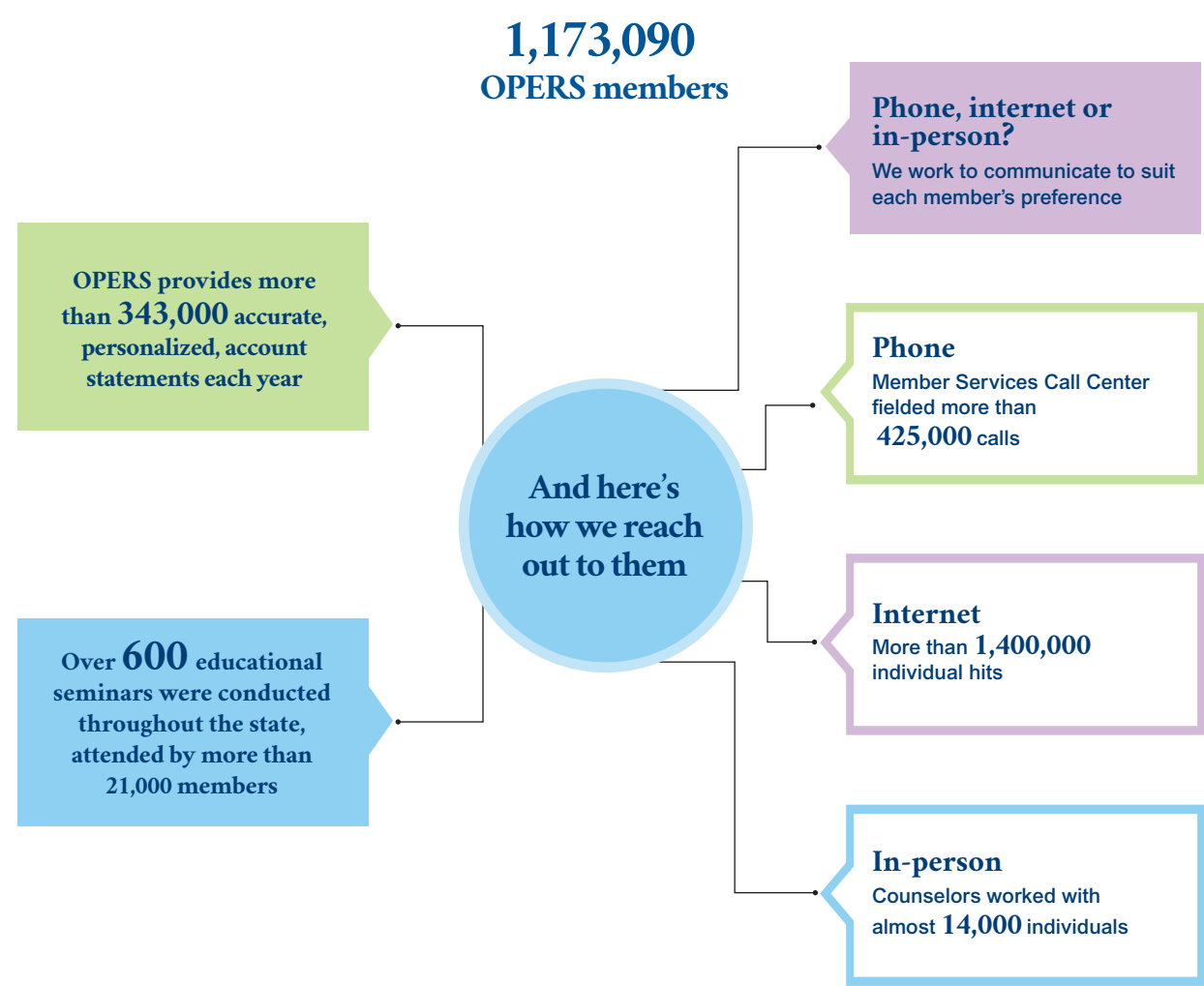
 Analysis of Financial Experience¹ (\$ in millions)		Health Care
Type of Activity	Gains (or Losses) for Year	
	2018	
Premiums Gains/(losses) resulting from actual premiums in valuation year versus that assumed from prior valuation, and changes in assumed future premium increases.	\$484.7	
Investment Return When investment returns are greater than assumed, a gain results. If investment returns are less than assumed, a loss occurs.	(204.4)	
Other Sources Difference between assumed and actual experience in other sources, including but not limited to, benefits paid, demographic experience, data adjustments and method changes.	952.0	
Gains/(Losses) During Year From Financial Experience	\$1,232.3	

¹ This schedule was added for the valuation year ended December 31, 2018. Data prior to 2018 is not available.

Statistical Section

Can statistics predict the future? Of course not. But statistics can help track incremental changes over time—just like OPERS uses statistics to help spot trends so that responsible decisions can be made to protect the longevity of the System. Only through careful analysis of data can OPERS continue to make the changes necessary to continue to meet our commitments.

We recognize change may be unsettling, so we never forget the people behind the numbers. When change is necessary, we work to provide members and other stakeholders the information needed so that when change is proposed, all understand the need.



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,
- Health Care Expenses by Type,
- Refunds by Type, and
- Number of Refund Payments by Plan.

The schedules on pages 193 through 194 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. Health care coverage is not statutorily guaranteed and may be changed to ensure long-term solvency of the plans and OPERS' ability to provide future coverage for all eligible retirees. The schedules on pages 195 through 196 display similar information for health care assets and projected liabilities under both the accounting basis (GASB Statement No. 74) and the funding basis. The Health Care Solvency schedule shows the estimated number of years, under the funding basis, for which assets are available to cover the projected liabilities. Refer to the schedules of pension and health care assets vs. liabilities.

The schedules beginning on page 192 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 include:

- Funds Restricted for Member Health Care Accounts,
- Pension Assets vs. Pension Liabilities,
- Health Care Assets vs. Liabilities,
- Contribution Rates (Health Care),
- Health Care Self-Funding Rate,
- Investment Rates by Portfolio—Defined Benefit and Health Care,
- 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,
- 2019 Pension Benefits and Retirees by Ohio County,
- Retirees by Geographical Location,
- Contribution Rates (Pension Plans),
- Number of Employer Units, and
- Principal Participating Employers.

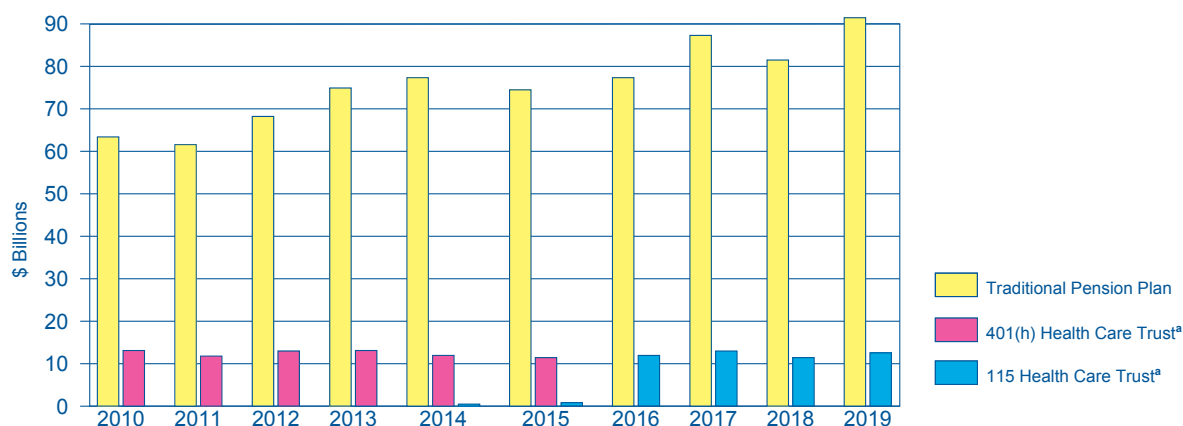
All non-accounting data is derived from OPERS internal sources.

Statistical Section



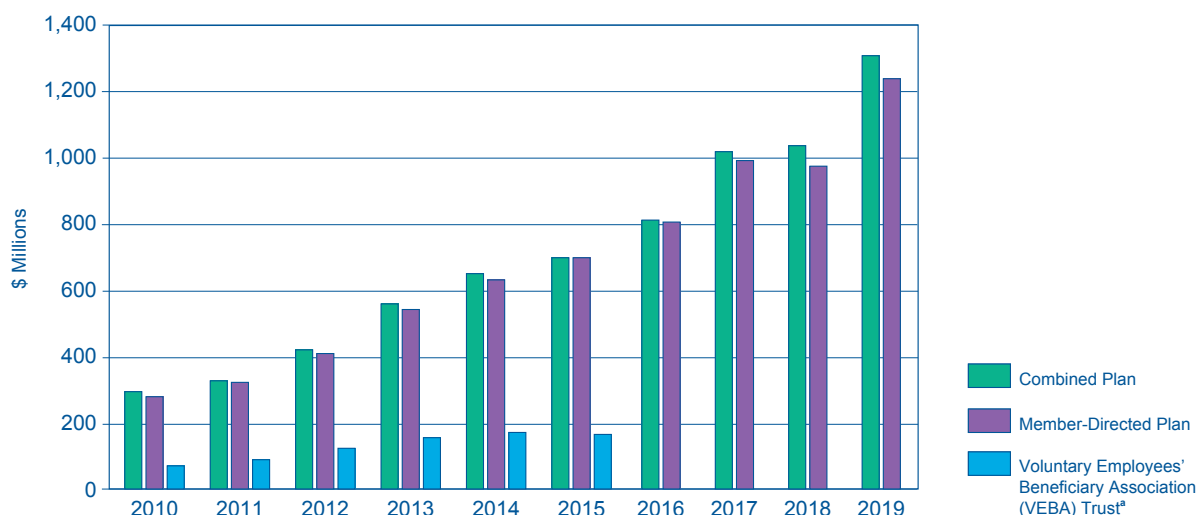
Net Position by Plan

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	115 Health Care Trust ¹	401(h) Health Care Trust	Voluntary Employees' Beneficiary Association (VEBA) Trust	Total Net Position
2019	\$91,121,609,718	\$1,305,673,187	\$1,240,585,015	\$12,647,057,751			\$106,314,925,671
2018	80,876,605,054	1,036,089,962	977,376,894	11,252,985,702			94,143,057,612
2017	86,585,851,024	1,022,418,029	998,717,118	12,818,833,665			101,425,819,836
2016 ^a	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	841,112,040	\$10,671,068,181	\$166,446,806	87,291,401,818
2014	76,956,230,642	650,249,727	635,272,613	386,080,172	12,440,522,790	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 ^b	61,330,891,370	333,095,015	317,193,338		11,959,000,311	90,696,132	74,030,876,166
2010 ^b	63,153,243,166	300,437,631	279,096,442		12,682,612,422	76,231,029	76,491,620,690

^a The 401(h) Health Care Trust and the 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.

^b 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.

¹ The 115 Health Care Trust was established in 2014.

 Statutory Fund Balance by Plan (last 10 fiscal years) (continued on next page)				
Year	2019	2018	2017	2016
All Plans				
Employees' Savings Fund	\$15,212,833,485	\$14,767,713,107	\$14,300,330,700	\$13,914,959,537
Employers' Accumulation Fund—Pension/Health Care	24,428,538,501	16,550,272,093	25,650,181,722	19,218,910,213
Annuity and Pension Reserve Fund	62,844,328,205	59,469,119,341	58,106,232,497	54,462,722,183
Survivors' Benefit Fund	1,846,874,240	1,766,560,528	1,742,699,663	1,669,466,891
Defined Contribution Fund—Retirement/Health Care	1,853,332,241	1,462,705,849	1,502,124,254	1,216,155,401
Income Fund	121,965,749	122,296,958	112,115,080	123,776,306
Expense Fund	7,053,250	4,389,736	12,135,920	4,833,694
Total Fund Balance	\$106,314,925,671	\$94,143,057,612	\$101,425,819,836	\$90,610,824,225
Traditional Pension Plan				
Employees' Savings Fund	\$15,209,312,543	\$14,764,276,344	\$14,297,505,057	\$13,912,277,541
Employers' Accumulation Fund—Pension	11,147,191,027	4,795,082,942	12,351,857,327	6,965,583,478
Annuity and Pension Reserve Fund	62,789,212,909	59,423,998,546	58,069,537,977	54,433,695,575
Survivors' Benefit Fund	1,846,874,240	1,766,560,528	1,742,699,663	1,669,466,891
Income Fund	121,965,749	122,296,958	112,115,080	123,776,306
Expense Fund	7,053,250	4,389,736	12,135,920	4,833,694
Total Fund Balance	\$91,121,609,718	\$80,876,605,054	\$86,585,851,024	\$77,109,633,485
Combined Plan				
Employees' Savings Fund	\$3,426,466	\$3,342,013	\$2,587,678	\$2,629,485
Employers' Accumulation Fund—Pension	630,733,294	499,982,476	476,864,676	372,135,835
Annuity and Pension Reserve Fund	34,924,190	28,176,089	21,799,531	17,116,877
Defined Contribution Fund—Retirement	636,589,237	504,589,384	521,166,144	423,969,820
Total Fund Balance	\$1,305,673,187	\$1,036,089,962	\$1,022,418,029	\$815,852,017
Member-Directed Plan				
Employees' Savings Fund	\$94,476	\$94,750	\$237,965	\$52,511
Employers' Accumulation Fund—Pension	3,556,429	2,220,973	2,626,054	703,037
Annuity and Pension Reserve Fund	20,191,106	16,944,706	14,894,989	11,909,731
Defined Contribution Fund—Retirement	1,216,743,004	958,116,465	980,958,110	792,185,581
Total Fund Balance	\$1,240,585,015	\$977,376,894	\$998,717,118	\$804,850,860
115 Health Care Trust¹				
Employers' Accumulation Fund—Health Care	\$12,647,057,751	\$11,252,985,702	\$12,818,833,665	\$11,880,487,863
Total Fund Balance	\$12,647,057,751	\$11,252,985,702	\$12,818,833,665	\$11,880,487,863
401(h) Health Care Trust¹				
Employers' Accumulation Fund—Health Care				
Total Fund Balance				
Voluntary Employees' Beneficiary Association (VEBA) Trust¹				
Defined Contribution Fund—Health Care				
Total Fund Balance				

^a 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.

¹ The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the 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.

Statistical Section

 Statutory Fund Balance by Plan					
2015	2014	2013	2012	2011 ^a	2010 ^a
\$13,471,062,846 16,076,648,809 54,705,647,821 1,694,085,497 1,219,165,845 122,714,098 2,076,902	\$13,194,306,671 22,768,644,951 52,331,183,968 1,675,926,615 1,154,079,903 114,494,235 5,258,765	\$12,828,423,536 22,852,975,720 50,525,254,541 1,654,787,855 1,011,655,646 113,671,739 3,167,261	\$12,641,655,468 19,074,270,351 47,232,908,883 1,627,212,197 763,702,610 107,444,000	\$12,300,117,438 15,959,261,830 43,513,048,458 1,568,050,108 587,622,632 99,016,985 3,758,715	\$12,134,839,989 22,278,219,189 39,927,499,750 1,527,374,797 522,426,170 99,070,651 2,190,144
\$87,291,401,818	\$91,243,895,108	\$88,989,936,298	\$81,447,193,509	\$74,030,876,166	\$76,491,620,690
\$13,468,694,332 4,243,982,790 54,681,766,733 1,694,085,497 122,714,098 2,076,902	\$13,191,067,352 9,655,043,969 52,314,439,706 1,675,926,615 114,494,235 5,258,765	\$12,826,142,567 9,507,406,396 50,513,356,451 1,654,787,855 113,671,739 3,167,261	\$12,639,906,042 6,066,140,290 47,227,389,270 1,627,212,197 107,444,000	\$12,298,673,251 3,850,924,715 43,510,467,596 1,568,050,108 99,016,985 3,758,715	\$12,133,856,642 9,464,360,661 39,926,390,271 1,527,374,797 99,070,651 2,190,144
\$74,213,320,352	\$76,956,230,642	\$74,618,532,269	\$67,668,091,799	\$61,330,891,370	\$63,153,243,166
\$2,343,149 320,876,515 13,366,406 364,328,339	\$2,994,501 286,747,478 8,359,792 352,147,956	\$1,894,549 233,588,347 5,481,510 318,648,483	\$1,606,472 179,466,995 3,114,881 236,009,198	\$1,362,904 149,374,928 1,514,253 180,842,930	\$975,589 131,266,975 644,239 167,550,828
\$700,914,409	\$650,249,727	\$559,612,889	\$420,197,546	\$333,095,015	\$300,437,631
\$25,365 (390,717) 10,514,682 688,390,700	\$244,818 250,542 8,384,470 626,392,783	\$386,420 296,170 6,416,580 539,922,867	\$142,954 37,744 2,404,732 408,077,537	\$81,283 (38,124) 1,066,609 316,083,570	\$7,758 (20,869) 465,240 278,644,313
\$698,540,030	\$635,272,613	\$547,022,037	\$410,662,967	\$317,193,338	\$279,096,442
\$841,112,040	\$386,080,172				
\$841,112,040	\$386,080,172				
\$10,671,068,181	\$12,440,522,790	\$13,111,684,807	\$12,828,625,322	\$11,959,000,311	\$12,682,612,422
\$10,671,068,181	\$12,440,522,790	\$13,111,684,807	\$12,828,625,322	\$11,959,000,311	\$12,682,612,422
\$166,446,806	\$175,539,164	\$153,084,296	\$119,615,875	\$90,696,132	\$76,231,029
\$166,446,806	\$175,539,164	\$153,084,296	\$119,615,875	\$90,696,132	\$76,231,029

 Fiduciary Net Position by Year (last 10 fiscal years) (continued through page 169)				
Year	2019	2018	2017	2016
All Plans				
Assets				
Cash and Cash Equivalents	\$5,153,032,873	\$3,986,157,970	\$4,625,708,094	\$4,586,305,505
Receivables	1,023,900,774	888,861,210	1,113,071,247	1,112,083,698
Investments	101,068,997,469	89,977,800,332	96,357,409,903	85,449,650,603
Collateral on Loaned Securities	8,338,502,346	8,170,412,140	7,935,816,160	8,288,355,523
Net Capital Assets	127,717,312	127,110,017	131,801,306	132,961,073
Prepaid Expenses and Other Assets	2,536,831	2,062,788	1,304,949	764,515
Total Assets	115,714,687,605	103,152,404,457	110,165,111,659	99,570,120,917
Liabilities and Net Position				
Benefits Payable	115,782,241	120,372,871	114,904,201	110,396,253
Investment Commitments Payable	927,267,321	702,901,475	671,584,704	539,826,060
Obligations Under Securities Lending	8,336,228,643	8,167,622,811	7,933,640,759	8,285,285,181
Other Liabilities	20,483,729	18,449,688	19,162,159	23,789,198
Net Position (Fund Balance)	106,314,925,671	94,143,057,612	101,425,819,836	90,610,824,225
Total Liabilities and Net Position	\$115,714,687,605	\$103,152,404,457	\$110,165,111,659	\$99,570,120,917
Traditional Pension Plan				
Assets				
Cash and Cash Equivalents	\$4,308,875,497	\$3,374,454,554	\$3,781,114,065	\$3,695,255,724
Receivables	888,425,919	768,486,959	954,982,358	880,590,006
Investments	86,619,951,352	77,239,220,653	82,334,875,328	72,913,065,131
Collateral on Loaned Securities	8,278,711,065	8,116,371,929	7,891,300,747	8,247,367,947
Net Capital Assets	99,046,577	96,834,232	99,218,172	98,085,389
Prepaid Expenses and Other Assets	2,536,831	2,062,788	1,304,949	764,515
Total Assets	100,197,547,241	89,597,431,115	95,062,795,619	85,835,128,712
Liabilities and Net Position				
Benefits Payable	600,465	840,787	260,431	1,253,982
Investment Commitments Payable	778,596,013	588,145,541	568,614,823	456,426,672
Obligations Under Securities Lending	8,276,453,666	8,113,604,843	7,889,137,549	8,244,312,788
Other Liabilities	20,287,379	18,234,890	18,931,792	23,501,785
Net Position (Fund Balance)	91,121,609,718	80,876,605,054	86,585,851,024	77,109,633,485
Total Liabilities and Net Position	\$100,197,547,241	\$89,597,431,115	\$95,062,795,619	\$85,835,128,712
Combined Plan				
Assets				
Cash and Cash Equivalents	\$25,533,095	\$16,264,772	\$18,789,542	\$15,750,245
Receivables	12,995,951	12,076,641	14,429,447	12,005,543
Investments	1,269,150,215	1,008,282,317	988,897,434	787,029,411
Collateral on Loaned Securities	57,596,103	52,042,473	42,918,686	39,693,971
Net Capital Assets	3,938,747	3,905,804	3,947,072	3,885,497
Total Assets	1,369,214,111	1,092,572,007	1,068,982,181	858,364,667
Liabilities and Net Position				
Investment Commitments Payable	5,960,527	4,460,993	3,657,231	2,833,383
Obligations Under Securities Lending	57,580,397	52,021,052	42,906,921	39,679,267
Other Liabilities				
Net Position (Fund Balance)	1,305,673,187	1,036,089,962	1,022,418,029	815,852,017
Total Liabilities and Net Position	\$1,369,214,111	\$1,092,572,007	\$1,068,982,181	\$858,364,667
Member-Directed Plan				
Assets				
Cash and Cash Equivalents	\$419,694	\$255,302	\$1,938,245	\$666,696
Receivables	9,619,158	10,324,579	13,193,710	11,590,244
Investments	1,228,537,895	965,305,936	981,494,690	790,661,959
Collateral on Loaned Securities	2,195,178	1,997,738	1,596,727	1,293,605
Net Capital Assets	2,675,144	2,757,251	2,891,519	2,962,075
Total Assets	1,243,447,069	980,640,806	1,001,114,891	807,174,579
Liabilities and Net Position				
Investment Commitments Payable	667,474	1,266,996	801,484	1,030,593
Obligations Under Securities Lending	2,194,580	1,996,916	1,596,289	1,293,126
Other Liabilities				
Net Position (Fund Balance)	1,240,585,015	977,376,894	998,717,118	804,850,860
Total Liabilities and Net Position	\$1,243,447,069	\$980,640,806	\$1,001,114,891	\$807,174,579

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 Fiduciary Net Position by Year					
2015	2014	2013	2012	2011 ^a	2010 ^a
\$3,064,065,686 954,980,282 83,819,475,118 8,270,812,672 132,811,651 1,217,369	\$2,882,858,353 1,088,837,041 87,891,142,075 7,854,368,780 133,629,210 2,261,461	\$3,333,382,605 1,092,845,990 85,137,610,781 6,958,964,420 131,389,851 2,912,709	\$2,780,697,535 2,212,003,770 77,617,850,120 6,827,172,458 121,172,935 3,841,978	\$2,847,839,851 1,554,352,796 71,149,016,095 10,401,223,945 112,092,861 779,630	\$3,654,805,279 1,437,458,798 72,661,379,153 9,250,107,607 112,130,055 471,611
96,243,362,778	99,853,096,920	96,657,106,356	89,562,738,796	86,065,305,178	87,116,352,503
93,550,718 475,568,951 8,271,338,789 111,502,502 87,291,401,818	99,844,976 593,164,943 7,852,803,699 63,388,194 91,243,895,108	90,115,030 554,398,461 6,953,717,885 68,938,682 88,989,936,298	101,188,640 1,116,869,935 6,816,672,766 80,813,946 81,447,193,509	119,591,363 1,423,836,318 10,410,130,422 80,870,909 74,030,876,166	142,993,825 1,155,469,120 9,250,107,607 76,161,261 76,491,620,690
\$96,243,362,778	\$99,853,096,920	\$96,657,106,356	\$89,562,738,796	\$86,065,305,178	\$87,116,352,503
\$2,381,670,021 637,347,978 71,514,345,166 8,215,428,672 96,541,605 1,217,369	\$2,357,796,670 709,932,322 74,279,082,505 7,809,036,934 96,963,543 2,261,461	\$2,826,596,339 760,735,070 71,393,042,048 6,924,316,299 98,948,820 2,912,709	\$2,324,824,614 1,690,953,615 64,487,332,183 6,797,920,566 85,661,140 3,841,978	\$2,321,930,951 1,181,127,055 58,890,460,789 10,363,838,801 84,923,332 779,630	\$2,969,362,112 1,039,459,387 59,973,039,802 7,708,958,738 85,155,975 471,611
82,846,550,811	85,255,073,435	82,006,551,285	75,390,534,096	72,843,060,558	71,776,447,625
255,699 393,965,905 8,215,951,266 23,057,589 74,213,320,352	311,575 475,297,939 7,807,480,885 15,752,394 76,956,230,642	78,477 451,977,660 6,919,095,886 16,866,993 74,618,532,269	682,136 918,234,060 6,787,465,861 16,060,240 67,668,091,799	1,061,656 1,124,645,829 10,372,713,265 13,748,438 61,330,891,370	31,862 899,118,485 7,708,958,738 15,095,374 63,153,243,166
\$82,846,550,811	\$85,255,073,435	\$82,006,551,285	\$75,390,534,096	\$72,843,060,558	\$71,776,447,625
\$10,566,328 22,378,455 674,801,893 34,258,885 3,950,559	\$8,947,770 21,472,538 623,991,406 27,497,528 3,998,438	\$9,425,463 17,071,301 534,668,467 20,966,014 3,921,730	\$6,574,926 9,350,843 416,161,716 18,059,949 4,357,765	\$6,248,674 7,707,808 339,986,995 23,506,898 65,084	\$7,127,776 6,892,606 303,637,263 15,196,825 34,750
745,956,120	685,907,680	586,052,975	454,505,199	377,515,459	332,889,220
1,801,004 34,261,065 8,979,642 700,914,409	1,787,256 27,492,049 6,378,648 650,249,727	1,549,789 20,950,208 3,940,089 559,612,889	2,690,744 18,032,174 13,584,735 420,197,546	2,823,632 23,527,027 18,069,785 333,095,015	1,950,989 15,196,825 15,303,775 300,437,631
\$745,956,120	\$685,907,680	\$586,052,975	\$454,505,199	\$377,515,459	\$332,889,220
\$334,220 23,237,455 677,842,112 2,237,421 3,025,179	\$274,295 21,577,499 638,145,075 767,134 3,150,369	\$282,346 15,586,438 560,933,809 482,373 2,856,649	\$91,299 6,821,748 432,851,458 205,837 3,667,974	\$980,013 7,353,279 338,695,474 111,647 94,933	\$1,349,705 5,657,850 301,502,301 40,463 38,662
706,676,387	663,914,372	580,141,615	443,638,316	347,235,346	308,588,981
245,260 2,237,563 5,653,534 698,540,030	137,585 766,982 27,737,192 635,272,613	196,803 482,009 32,440,766 547,022,037	155,855 205,521 32,613,973 410,662,967	123,669 111,743 29,806,596 317,193,338	6,707 40,463 29,445,369 279,096,442
\$706,676,387	\$663,914,372	\$580,141,615	\$443,638,316	\$347,235,346	\$308,588,981

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 Fiduciary Net Position by Year (last 10 fiscal years)				
Year	2019	2018	2017	2016
115 Health Care Trust¹				
Assets				
Cash and Cash Equivalents	\$818,204,587	\$595,183,342	\$823,866,242	\$874,632,840
Receivables	112,859,746	97,973,031	130,465,732	207,897,905
Investments	11,951,358,007	10,764,991,426	12,052,142,451	10,958,894,102
Net Capital Assets	22,056,844	23,612,730	25,744,543	28,028,112
Total Assets	12,904,479,184	11,481,760,529	13,032,218,968	12,069,452,959
Liabilities and Net Position				
Benefits Payable	115,181,776	119,532,084	114,643,770	109,142,271
Investment Commitments Payable	142,043,307	109,027,945	98,511,166	79,535,412
Other Liabilities	196,350	214,798	230,367	287,413
Net Position (Fund Balance)	12,647,057,751	11,252,985,702	12,818,833,665	11,880,487,863
Total Liabilities and Net Position	\$12,904,479,184	\$11,481,760,529	\$13,032,218,968	\$12,069,452,959
401(h) Health Care Trust¹				
Assets				
Cash and Cash Equivalents				
Receivables				
Investments				
Collateral on Loaned Securities				
Net Capital Assets				
Total Assets				
Liabilities and Net Position				
Benefits Payable				
Investment Commitments Payable				
Obligations Under Securities Lending				
Other Liabilities				
Net Position (Fund Balance)				
Total Liabilities and Net Position				
Voluntary Employees' Beneficiary Association (VEBA) Trust¹				
Assets				
Cash and Cash Equivalents				
Receivables				
Investments				
Collateral on Loaned Securities				
Net Capital Assets				
Total Assets				
Liabilities and Net Position				
Benefits Payable				
Investment Commitments Payable				
Obligations Under Securities Lending				
Other Liabilities				
Net Position (Fund Balance)				
Total Liabilities and Net Position				

^a 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 Cash Equivalents line and has no impact on the total net position of the System.

¹ The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the VEBA Trust were terminated as of June 30, 2016. The net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

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 Fiduciary Net Position by Year					
2015	2014	2013	2012	2011 ^a	2010 ^a
\$228,930,728 173,883,586 484,975,264 1,441,984	\$7,797,254 197,641,190 182,748,955				
889,231,562	388,187,399				
1,634,811 1,789,658 44,695,053 841,112,040	1,803,774 303,453 386,080,172				
\$889,231,562	\$388,187,399				
\$437,888,805 83,230,392 10,314,427,768 27,020,679	\$503,893,407 125,472,731 12,008,141,647 28,631,421	\$491,371,340 290,484,285 12,510,470,437 24,866,659	\$446,851,345 500,838,389 12,167,526,143 26,625,770	\$516,841,401 355,160,439 11,492,400,597 26,945,871	\$673,728,399 383,127,242 12,011,299,168 1,517,578,594 26,862,896
10,862,567,644	12,666,139,206	13,317,192,721	13,141,841,647	12,391,348,308	14,612,596,299
91,451,759 76,923,764 23,123,940 10,671,068,181	99,279,185 113,120,724 13,216,507 12,440,522,790	90,019,865 99,797,215 15,690,834 13,111,684,807	100,495,333 194,165,994 18,554,998 12,828,625,322	118,529,285 294,572,622 19,246,090 11,959,000,311	142,952,643 253,257,695 1,517,578,594 16,194,945 12,682,612,422
\$10,862,567,644	\$12,666,139,206	\$13,317,192,721	\$13,141,841,647	\$12,391,348,308	\$14,612,596,299
\$4,675,584 14,902,416 153,082,915 18,887,694 831,645	\$4,148,957 12,740,761 159,032,487 17,067,184 885,439	\$5,707,117 8,968,896 138,496,020 13,199,734 795,993	\$2,355,351 4,039,175 113,978,620 10,986,106 860,286	\$1,838,812 3,004,215 87,472,240 13,766,599 63,641	\$3,237,287 2,321,713 71,900,619 8,332,987 37,772
192,380,254	193,874,828	167,167,760	132,219,538	106,145,507	85,830,378
208,449 843,360 18,888,895 5,992,744 166,446,806	254,216 1,017,665 17,063,783 175,539,164	16,688 876,994 13,189,782 153,084,296	11,171 1,623,282 10,969,210 119,615,875	422 1,670,566 13,778,387 90,696,132	9,320 1,135,244 8,332,987 121,798 76,231,029
\$192,380,254	\$193,874,828	\$167,167,760	\$132,219,538	\$106,145,507	\$85,830,378

 Changes in Fiduciary Net Position (last 10 fiscal years) (continued through page 177)				
Year	2019	2018	2017	2016
All Plans				
Additions				
Member Contributions	\$1,516,077,941	\$1,455,771,629	\$1,421,754,296	\$1,387,215,220
Employer Contributions	2,121,982,398	2,037,635,971	1,989,941,685	1,941,632,324
Contracts and Other Receipts ¹	67,502,046	81,169,718	93,061,535	172,338,832
Retiree-Paid Health Care Premiums ¹				184,368,783
Federal Subsidy ¹				4,065,058
Net Income/(Loss) from Investing Activity	16,100,992,982	(3,350,345,567)	14,619,914,555	6,926,572,065
Other Income/(Expense), net	696,586	2,844,546	2,641,100	(2,544,366)
Interplan Activity	31,219,619	25,435,260	20,961,756	17,205,339
Total Additions	19,838,471,572	252,511,557	18,148,274,927	10,630,853,255
Deductions				
Pension Benefits	6,318,731,252	6,109,237,279	5,839,789,809	5,588,000,966
Health Care Expenses ¹	767,888,929	870,284,919	952,001,573	1,197,374,344
Refunds of Contributions	472,604,688	453,441,020	443,220,698	429,791,141
Administrative Expenses	76,159,025	76,875,303	77,305,480	79,059,058
Interplan Activity	31,219,619	25,435,260	20,961,756	17,205,339
Total Deductions	7,666,603,513	7,535,273,781	7,333,279,316	7,311,430,848
Net Increase/(Decrease)	12,171,868,059	(7,282,762,224)	10,814,995,611	3,319,422,407
Net Position Restricted for Pensions and OPEB, Beginning of Year	94,143,057,612	101,425,819,836	90,610,824,225	87,291,401,818
Net Position Restricted for Pensions and OPEB, End of Year	\$106,314,925,671	\$94,143,057,612	\$101,425,819,836	\$90,610,824,225
Traditional Pension Plan				
Additions				
Member Contributions	\$1,410,501,971	\$1,354,235,298	\$1,324,457,501	\$1,294,853,664
Employer Contributions	1,974,172,176	1,895,462,837	1,722,856,378	1,556,529,162
Contracts and Other Receipts	66,023,563	79,562,553	90,937,696	77,862,156
Net Income/(Loss) from Investing Activity	13,532,537,160	(2,524,213,911)	12,586,432,979	5,947,233,326
Other Income/(Expense), net	694,862	2,112,353	2,516,572	(2,560,081)
Interplan Activity	31,219,619	25,435,260	20,961,756	11,168,557
Total Additions	17,015,149,351	832,594,390	15,748,162,882	8,885,086,784
Deductions				
Pension Benefits	6,310,936,996	6,101,603,746	5,835,175,377	5,584,517,896
Refunds of Contributions	407,308,374	388,067,394	384,615,309	352,362,641
Administrative Expenses	51,899,317	52,169,220	52,154,657	51,871,700
Interplan Activity				
Total Deductions	6,770,144,687	6,541,840,360	6,271,945,343	5,988,752,237
Special Item²				(21,414)
Net Increase/(Decrease)	10,245,004,664	(5,709,245,970)	9,476,217,539	2,896,313,133
Net Position Restricted for Pensions, Beginning of Year	80,876,605,054	86,585,851,024	77,109,633,485	74,213,320,352
Net Position Restricted for Pensions, End of Year	\$91,121,609,718	\$80,876,605,054	\$86,585,851,024	\$77,109,633,485

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 Changes in Fiduciary Net Position					
2015	2014	2013	2012	2011 ^a	2010
\$1,332,308,994 1,864,823,741 172,067,637 248,601,375 175,930,875 9,415,961 (4,887,359) 19,759,373	\$1,307,428,830 1,829,907,525 270,728,202 238,406,380 176,619,891 5,775,317,835 8,304,360 10,357,663	\$1,279,945,223 1,794,039,132 250,228,379 178,140,822 105,965,762 11,006,164,375 13,898,739 13,034,171	\$1,266,800,236 1,778,728,069 218,259,489 159,614,898 182,579,917 10,375,431,044 12,103,692 16,981,683	\$1,286,385,298 1,809,470,716 211,847,098 148,370,246 192,118,407 179,956,702 11,255,503 10,077,664	\$1,275,688,737 1,796,343,429 197,507,372 111,638,313 142,658,293 9,268,181,189 7,930,265 10,528,250
3,818,020,597	9,617,070,686	14,641,416,603	14,010,499,028	3,849,481,634	12,810,475,848
5,401,880,992 1,822,571,428 449,265,410 77,036,684 19,759,373	5,112,123,787 1,740,814,106 425,701,829 74,114,491 10,357,663	4,931,491,707 1,644,244,641 441,284,204 68,619,091 13,034,171	4,590,938,871 1,609,157,697 307,486,279 69,617,155 16,981,683	4,329,918,267 1,576,457,152 323,672,042 70,101,033 10,077,664	3,961,552,022 1,568,065,943 233,054,714 71,030,458 10,528,250
7,770,513,887	7,363,111,876	7,098,673,814	6,594,181,685	6,310,226,158	5,844,231,387
(3,952,493,290)	2,253,958,810	7,542,742,789	7,416,317,343	(2,460,744,524)	6,966,244,461
91,243,895,108	88,989,936,298	81,447,193,509	74,030,876,166	76,491,620,690	69,525,376,229
\$87,291,401,818	\$91,243,895,108	\$88,989,936,298	\$81,447,193,509	\$74,030,876,166	\$76,491,620,690
\$1,246,732,014 1,498,679,737 75,209,820 274,898,652 (4,887,369) 19,759,373	\$1,228,144,074 1,476,074,083 114,830,564 5,056,307,357 625,549 10,357,663	\$1,206,808,750 1,571,758,150 121,818,099 9,423,847,940 414,878 13,034,171	\$1,199,073,380 1,208,150,727 122,281,629 8,713,817,411 329,493 16,918,042	\$1,221,597,118 1,233,002,841 121,560,871 274,530,266 340,460 10,077,664	\$1,217,388,746 1,097,711,440 113,080,115 7,678,536,712 763,943 10,501,974
3,110,392,227	7,886,339,290	12,337,681,988	11,260,570,682	2,861,109,220	10,117,982,930
5,398,844,664 405,320,800 49,137,053	5,109,100,939 389,707,612 49,832,366	4,928,972,847 411,321,700 46,946,971	4,589,973,216 284,217,216 49,179,821	4,329,452,581 302,812,289 51,196,146	3,961,217,461 219,808,143 52,375,762
5,853,302,517	5,548,640,917	5,387,241,518	4,923,370,253	4,683,461,016	4,233,401,366
(2,742,910,290) 76,956,230,642	2,337,698,373 74,618,532,269	6,950,440,470 67,668,091,799	6,337,200,429 61,330,891,370	(1,822,351,796) 63,153,243,166	5,884,581,564 57,630,423,957
\$74,213,320,352	\$76,956,230,642	\$74,618,532,269	\$67,668,091,799	\$61,330,891,370	\$63,515,005,521

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 Changes in Fiduciary Net Position (last 10 fiscal years)				
Year	2019	2018	2017	2016
Combined Plan				
Additions				
Member Contributions	\$44,786,688	\$43,054,163	\$41,265,878	\$39,232,690
Employer Contributions	62,699,159	60,249,275	53,636,897	47,079,023
Contracts and Other Receipts	291,108	515,564	688,384	620,078
Net Income/(Loss) from Investing Activity	202,970,429	(54,622,602)	142,733,244	63,694,711
Other Income, net			2,135	
Total Additions	310,747,384	49,196,400	238,326,538	150,626,502
Deductions				
Pension Benefits	5,310,887	4,489,811	3,089,538	1,981,664
Refunds of Contributions	17,531,723	16,808,080	16,220,141	21,857,512
Administrative Expenses	3,906,211	2,730,700	3,181,465	2,559,387
Interplan Activity	14,415,338	11,495,876	9,269,382	9,290,331
Total Deductions	41,164,159	35,524,467	31,760,526	35,688,894
Net Increase/(Decrease)	269,583,225	13,671,933	206,566,012	114,937,608
Net Position Restricted for Pensions, Beginning of Year	1,036,089,962	1,022,418,029	815,852,017	700,914,409
Net Position Restricted for Pensions, End of Year	\$1,305,673,187	\$1,036,089,962	\$1,022,418,029	\$815,852,017
Member-Directed Plan				
Additions				
Member Contributions	\$60,789,282	\$58,482,168	\$56,030,917	\$53,128,866
Employer Contributions	60,792,922	58,482,191	56,030,522	53,120,880
Contracts and Other Receipts	646,566	812,423	577,914	527,291
Net Income/(Loss) from Investing Activity	210,427,422	(71,099,374)	139,385,790	66,099,386
Other Income, net			4,511	
Total Additions	332,656,192	46,677,408	252,029,654	172,876,423
Deductions				
Pension Benefits	2,483,369	3,143,722	1,524,894	1,501,406
Refunds of Contributions	47,764,591	48,565,546	42,385,248	55,570,988
Administrative Expenses	2,395,830	2,368,980	2,560,880	2,305,383
Interplan Activity	16,804,281	13,939,384	11,692,374	7,187,816
Total Deductions	69,448,071	68,017,632	58,163,396	66,565,593
Net Increase/(Decrease)	263,208,121	(21,340,224)	193,866,258	106,310,830
Net Position Restricted for Pensions, Beginning of Year	977,376,894	998,717,118	804,850,860	698,540,030
Net Position Restricted for Pensions, End of Year	\$1,240,585,015	\$977,376,894	\$998,717,118	\$804,850,860

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Statistical Section

 Changes in Fiduciary Net Position					
2015	2014	2013	2012	2011 ^a	2010
\$36,685,161 44,022,120 492,260 (6,501,919)	\$34,604,398 44,196,044 412,808 32,379,863	\$32,535,565 45,427,520 680,258 78,379,140	\$30,193,165 23,998,486 745,347 50,732,608	\$29,256,952 23,280,520 386,879 (5,810,229)	\$27,272,707 26,432,761 384,947 35,971,101 1,267
74,697,622	111,593,113	157,022,483	105,669,606	47,114,122	90,062,783
1,791,115 12,577,944 2,522,610 7,141,271	2,230,987 10,974,442 2,375,278 5,375,568	1,526,005 7,731,155 2,264,293 6,085,687	610,545 6,173,714 2,295,688 9,487,128	305,215 6,462,849 2,559,312 5,129,362	128,366 3,540,043 2,584,673 6,043,719
24,032,940	20,956,275	17,607,140	18,567,075	14,456,738	12,296,801
50,664,682 650,249,727	90,636,838 559,612,889	139,415,343 420,197,546	87,102,531 333,095,015	32,657,384 300,437,631	77,765,982 223,384,797
\$700,914,409	\$650,249,727	\$559,612,889	\$420,197,546	\$333,095,015	\$301,150,779
\$48,891,819 68,448,551 495,540 (13,070,950)	\$44,680,358 47,851,530 700,770 28,212,549	\$40,600,908 38,540,851 785,072 88,633,791	\$37,533,691 35,646,573 492,890 46,860,344	\$35,531,228 33,746,291 802,270 (10,151,205)	\$31,027,284 29,527,197 462,075 34,223,485 1,108
104,764,960	121,445,207	168,560,622	120,533,498	59,928,584	95,241,149
1,245,213 31,366,666 2,260,306 6,625,358	791,861 25,019,775 2,400,900 4,982,095	992,855 22,231,349 2,028,864 6,948,484	355,110 17,095,349 2,118,855 7,494,555	160,471 14,396,904 2,354,183 4,920,130	206,195 9,706,528 2,435,285 4,382,873
41,497,543	33,194,631	32,201,552	27,063,869	21,831,688	16,730,881
63,267,417 635,272,613	88,250,576 547,022,037	136,359,070 410,662,967	93,469,629 317,193,338	38,096,896 279,096,442	78,510,268 200,588,070
\$698,540,030	\$635,272,613	\$547,022,037	\$410,662,967	\$317,193,338	\$279,098,338

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 Changes in Fiduciary Net Position (last 10 fiscal years)				
Year	2019	2018	2017	2016
115 Health Care Trust²				
Additions				
Employer Contributions	\$24,318,141	\$23,441,668	\$157,417,888	\$274,419,455
Contracts and Other Receipts ¹	540,809	279,178	857,541	93,306,585
Retiree-Paid Health Care Premiums ¹				184,368,783
Federal Subsidy ¹				4,065,058
Net Income/(Loss) from Investing Activity	2,155,057,971	(700,409,680)	1,751,362,542	352,629,538
Other Income, net	1,724	732,193	117,882	15,715
Interplan Activity				6,036,782
Total Additions	2,179,918,645	(675,956,641)	1,909,755,853	914,841,916
Deductions				
Health Care Expenses ¹	767,888,929	870,284,919	952,001,573	1,195,956,899
Administrative Expenses	17,957,667	19,606,403	19,408,478	21,693,387
Total Deductions	785,846,596	889,891,322	971,410,051	1,217,650,286
Special Item²				11,342,184,193
Net Increase/(Decrease)	1,394,072,049	(1,565,847,963)	938,345,802	11,039,375,823
Net Position Restricted for OPEB, Beginning of Year	11,252,985,702	12,818,833,665	11,880,487,863	841,112,040
Net Position Restricted for OPEB, End of Year	\$12,647,057,751	\$11,252,985,702	\$12,818,833,665	\$11,880,487,863
401(h) Health Care Trust³				
Additions				
Employer Contributions				
Contracts and Other Receipts				
Retiree-Paid Health Care Premiums				
Federal Subsidy				
Net Income/(Loss) from Investing Activity				\$490,208,570
Other Income, net				
Total Additions				490,208,570
Deductions				
Health Care Expenses				
Administrative Expenses				
Total Deductions				
Special Item²				(11,161,276,751)
Net Increase/(Decrease)				(10,671,068,181)
Net Position Restricted for OPEB, Beginning of Year				10,671,068,181
Net Position Restricted for OPEB, End of Year				\$0

See footnotes on page 176

Statistical Section

 Changes in Fiduciary Net Position					
2015	2014	2013	2012	2011 ^a	2010
\$253,673,333 95,860,582	\$111,561,319 143,813,190				
175,930,875 (23,073,355) 10	131,904,250 (1,193,356) 76,970				
502,391,445	386,162,373				
45,184,620 2,174,957	82,201				
47,359,577	82,201				
455,031,868 386,080,172	386,080,172				
\$841,112,040	\$386,080,172				

\$9,435 248,601,375 (223,464,384)	\$135,522,351 10,950,386 238,406,380 44,715,641 648,566,894 7,601,841	\$120,056,440 126,941,889 178,140,822 105,965,762 1,397,348,823 13,483,861	\$494,048,415 94,730,390 159,614,898 182,579,917 1,549,970,894 11,774,199	\$503,458,216 89,087,996 148,370,246 192,118,407 (78,923,627) 10,915,043	\$628,685,237 83,572,868 111,638,313 142,658,293 1,511,164,964 7,163,609
25,146,426	1,085,763,493	1,941,937,597	2,492,718,713	865,026,281	2,484,883,284
1,774,989,836 19,611,199	1,738,596,173 18,329,337	1,642,525,598 16,352,514	1,607,921,528 15,172,174	1,575,561,578 13,076,814	1,567,551,611 12,782,968
1,794,601,035	1,756,925,510	1,658,878,112	1,623,093,702	1,588,638,392	1,580,334,579
(1,769,454,609) 12,440,522,790	(671,162,017) 13,111,684,807	283,059,485 12,828,625,322	869,625,011 11,959,000,311	(723,612,111) 12,682,612,422	904,548,705 11,415,195,274
\$10,671,068,181	\$12,440,522,790	\$13,111,684,807	\$12,828,625,322	\$11,959,000,311	\$12,319,743,979

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 Changes in Fiduciary Net Position (last 10 fiscal years)				
Year	2019	2018	2017	2016
Voluntary Employees' Beneficiary Association (VEBA) Trust				
Additions				
Employer Contributions ⁴				\$10,483,804
Contracts and Other Receipts				22,722
Net Income/(Loss) from Investing Activity				6,706,534
Other Income, net				
Interplan Activity				
Total Additions				17,213,060
Deductions				
Health Care Expenses				1,417,445
Administrative Expenses				629,201
Interplan Activity				727,192
Total Deductions				2,773,838
Special Item²				(180,886,028)
Net Increase/(Decrease)				(166,446,806)
Net Position Restricted for OPEB, Beginning of Year				166,446,806
Net Position Restricted for OPEB, End of Year				\$0

^a 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.

¹ GASB Statement No. 74 requires health care expenses be reported net of certain health care receipts. The presentation of Retiree-Paid Health Care Premiums, Federal Subsidy and formulary rebates included in Contracts and Other Receipts has been revised and is now included in Health Care Expenses, starting in 2017 upon implementation of this standard.

² The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the VEBA Trust were terminated as of June 30, 2016. 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.

³ 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 formerly consisted 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 and is now reflected in the appropriate plan claims line item.

⁴ 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.

Statistical Section

 Changes in Fiduciary Net Position					
2015	2014	2013	2012	2011 ^a	2010
	\$14,702,198	\$18,256,171	\$16,883,868	\$15,982,848	\$13,986,794
	20,484	3,061	9,233	9,082	7,367
\$627,917	11,044,528	17,954,681	14,049,787	311,497	8,284,927
			63,641		338
					26,276
627,917	25,767,210	36,213,913	31,006,529	16,303,427	22,305,702
2,396,972	2,217,933	1,719,043	1,236,169	895,574	514,332
1,330,559	1,094,409	1,026,449	850,617	914,578	851,770
5,992,744				28,172	101,658
9,720,275	3,312,342	2,745,492	2,086,786	1,838,324	1,467,760
(9,092,358)	22,454,868	33,468,421	28,919,743	14,465,103	20,837,942
175,539,164	153,084,296	119,615,875	90,696,132	76,231,029	55,784,131
\$166,446,806	\$175,539,164	\$153,084,296	\$119,615,875	\$90,696,132	\$76,622,073


Additions by Source (last 10 fiscal years)

(continued through page 181)

Year	2019	2018	2017	2016
All Plans¹				
Member Contributions	\$1,516,077,941	\$1,455,771,629	\$1,421,754,296	\$1,387,215,220
Employer Contributions	2,121,982,398	2,037,635,971	1,989,941,685	1,941,632,324
Purchase of Service	13,773,612	19,608,589	22,466,320	18,073,121
Retiree-Paid Health Care Premiums ²				184,368,783
Early Retirement Incentive Payments	1,843,828	2,082,248	5,537,160	
Transfers from Other Retirement Systems	32,689,498	43,166,016	51,563,749	44,266,370
Vendor Rebates and Other Receipts ²	210,056	30,000	117,285	91,735,221
Additional Annuity/Voluntary Contributions	1,908,125	2,128,309	2,136,358	2,074,383
Other Employer Payments	17,076,927	14,154,556	11,240,663	16,189,737
Federal Subsidy ²				4,065,058
Net Income/(Loss) from Investing Activity	16,100,992,982	(3,350,345,567)	14,619,914,555	6,926,572,065
Other Income/(Expense), net	696,586	2,844,546	2,641,100	(2,544,366)
Interplan Activity	31,219,619	25,435,260	20,961,756	17,205,339
Total Additions	\$19,838,471,572	\$252,511,557	\$18,148,274,927	\$10,630,853,255
Traditional Pension Plan				
Member Contributions	\$1,410,501,971	\$1,354,235,298	\$1,324,457,501	\$1,294,853,664
Employer Contributions	1,974,172,176	1,895,462,837	1,722,856,378	1,556,529,162
Purchase of Service	13,635,133	19,435,537	22,321,608	17,926,008
Early Retirement Incentive Payments	1,712,584	1,950,680	5,227,186	
Transfers from Other Retirement Systems	32,689,498	43,166,016	51,563,749	44,199,326
Additional Annuity Contributions	1,244,462	1,014,664	1,182,500	1,235,194
Other Employer Payments	16,741,886	13,995,656	10,642,653	14,501,628
Net Income/(Loss) from Investing Activity	13,532,537,160	(2,524,213,911)	12,586,432,979	5,947,233,326
Other Income/(Expense), net	694,862	2,112,353	2,516,572	(2,560,081)
Interplan Activity	31,219,619	25,435,260	20,961,756	11,168,557
Total Additions	\$17,015,149,351	\$832,594,390	\$15,748,162,882	\$8,885,086,784
Combined Plan				
Member Contributions	\$44,786,688	\$43,054,163	\$41,265,878	\$39,232,690
Employer Contributions	62,699,159	60,249,275	53,636,897	47,079,023
Purchase of Service	138,210	171,324	141,951	136,029
Transfers from Other Retirement Systems				
Voluntary Contributions	149,940	326,985	398,332	336,536
Other Employer Payments	2,958	17,255	148,101	147,513
Net Income/(Loss) from Investing Activity	202,970,429	(54,622,602)	142,733,244	63,694,711
Other Income, net			2,135	
Total Additions	\$310,747,384	\$49,196,400	\$238,326,538	\$150,626,502
Member-Directed Plan				
Member Contributions	\$60,789,282	\$58,482,168	\$56,030,917	\$53,128,866
Employer Contributions	60,792,922	58,482,191	56,030,522	53,120,880
Purchase of Service	269	1,728	2,761	11,084
Voluntary Contributions	513,723	786,660	555,526	502,653
Other Employer Payments	132,574	24,035	19,627	13,554
Net Income/(Loss) from Investing Activity	210,427,422	(71,099,374)	139,385,790	66,099,386
Other Income, net			4,511	
Total Additions	\$332,656,192	\$46,677,408	\$252,029,654	\$172,876,423

See footnotes on page 180

Statistical Section

 Additions by Source					
2015	2014	2013	2012	2011	2010
\$1,332,308,994	\$1,307,428,830	\$1,279,945,223	\$1,266,800,236	\$1,286,385,298	\$1,275,688,737
1,864,823,741	1,829,907,525	1,794,039,132	1,778,728,069	1,809,470,716	1,796,343,429
22,850,005	26,521,581	60,100,714	62,507,139	59,976,857	51,936,153
248,601,375	238,406,380	178,140,822	159,614,898	148,370,246	111,638,313
2,636,885	15,180,991	7,294,662	13,568,992	23,366,505	27,964,615
47,270,349	69,328,737	46,370,923	39,590,467	31,487,779	31,862,677
91,372,473	150,377,554	121,660,735	90,103,930	84,515,422	72,854,648
1,668,697	1,693,612	5,786,692	5,402,253	5,334,480	5,296,310
6,269,228	7,625,727	9,014,653	7,086,708	7,166,055	7,592,969
175,930,875	176,619,891	105,965,762	182,579,917	192,118,407	142,658,293
9,415,961	5,775,317,835	11,006,164,375	10,375,431,044	179,956,702	9,268,181,189
(4,887,359)	8,304,360	13,898,739	12,103,692	11,255,503	7,930,265
19,759,373	10,357,663	13,034,171	16,981,683	10,077,664	10,528,250
\$3,818,020,597	\$9,617,070,686	\$14,641,416,603	\$14,010,499,028	\$3,849,481,634	\$12,810,475,848
\$1,246,732,014	\$1,228,144,074	\$1,206,808,750	\$1,199,073,380	\$1,221,597,118	\$1,217,388,746
1,498,679,737	1,476,074,083	1,571,758,150	1,208,150,727	1,233,002,841	1,097,711,440
22,718,488	26,297,267	59,756,708	62,193,231	59,770,075	51,738,819
2,649,968	14,427,760	6,943,575	13,134,027	22,388,005	26,567,998
43,081,440	66,309,930	42,242,610	36,013,336	28,505,778	23,234,777
830,196	945,803	4,744,751	4,530,704	4,447,182	4,699,133
5,929,728	6,849,804	8,130,455	6,410,331	6,449,831	6,839,388
274,898,652	5,056,307,357	9,423,847,940	8,713,817,411	274,530,266	7,678,536,712
(4,887,369)	625,549	414,878	329,493	340,460	763,943
19,759,373	10,357,663	13,034,171	16,918,042	10,077,664	10,501,974
\$3,110,392,227	\$7,886,339,290	\$12,337,681,988	\$11,260,570,682	\$2,861,109,220	\$10,117,982,930
\$36,685,161	\$34,604,398	\$32,535,565	\$30,193,165	\$29,256,952	\$27,272,707
44,022,120	44,196,044	45,427,520	23,998,486	23,280,520	26,432,761
131,373	218,582	343,752	313,711	201,906	150,035
				35,957	
353,335	153,014	270,861	425,653	134,608	177,121
7,552	41,212	65,645	5,983	14,408	57,791
(6,501,919)	32,379,863	78,379,140	50,732,608	(5,810,229)	35,971,101
					1,267
\$74,697,622	\$111,593,113	\$157,022,483	\$105,669,606	\$47,114,122	\$90,062,783
\$48,891,819	\$44,680,358	\$40,600,908	\$37,533,691	\$35,531,228	\$31,027,284
68,448,551	47,851,530	38,540,851	35,646,573	33,746,291	29,527,197
144	5,732	254	197	4,876	(1,168)
485,166	594,795	771,080	445,896	752,690	420,056
10,230	100,243	13,738	46,797	44,704	43,187
(13,070,950)	28,212,549	88,633,791	46,860,344	(10,151,205)	34,223,485
					1,108
\$104,764,960	\$121,445,207	\$168,560,622	\$120,533,498	\$59,928,584	\$95,241,149

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 Additions by Source (last 10 fiscal years)				
Year	2019	2018	2017	2016
115 Health Care Trust³				
Employer Contributions	\$24,318,141	\$23,441,668	\$157,417,888	\$274,419,455
Retiree-Paid Health Care Premiums ²				184,368,783
Early Retirement Incentive Payments	131,244	131,568	309,974	
Transfers from Other Retirement Systems				67,044
Vendor Rebates and Other Receipts ²	210,056	30,000	117,285	91,735,221
Other Employer Payments	199,509	117,610	430,282	1,504,320
Federal Subsidy—Medicare Part D ²				122,044
Federal Subsidy—Medicare PDP ²				3,943,014
Net Income/(Loss) from Investing Activity	2,155,057,971	(700,409,680)	1,751,362,542	352,629,538
Other Income, net	1,724	732,193	117,882	15,715
Interplan Activity				6,036,782
Total Additions	\$2,179,918,645	(\$675,956,641)	\$1,909,755,853	\$914,841,916
401(h) Health Care Trust^{1, 3}				
Employer Contributions				
Purchase of Service				
Retiree-Paid Health Care Premiums				
Early Retirement Incentive Payments				
Transfers from Other Retirement Systems				
Vendor Rebates and Other Receipts				
Other Employer Payments				
Federal Subsidy—Medicare Part D				
Federal Subsidy—Medicare PDP				
Federal Subsidy—Early Retiree Reinsurance Program				
Net Income/(Loss) from Investing Activity				\$490,208,570
Other Income, net				
Total Additions				\$490,208,570
Voluntary Employees' Beneficiary Association (VEBA) Trust³				
Employer Contributions ⁴				\$10,483,804
Vendor Rebates and Other Receipts				
Other Employer Payments				22,722
Net Income/(Loss) from Investing Activity				6,706,534
Other Income, net				
Interplan Activity				
Total Additions				\$17,213,060

¹ In 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.

² GASB Statement No. 74 requires health care expenses be reported net of certain health care receipts. The presentation of Retiree-Paid Health Care Premiums, Federal Subsidy and formulary rebates included in Contracts and Other Receipts has been revised and is now included in Health Care Expenses, starting in 2017 upon implementation of this standard.

³ The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the VEBA Trust were terminated as of June 30, 2016. The net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

⁴ 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.

Statistical Section

 Additions by Source					
2015	2014	2013	2012	2011	2010
\$253,673,333 (13,083) 4,188,909 91,362,132 322,624 743,345 175,187,530 (23,073,355) 10	\$111,561,319 2,742,476 140,981,424 89,290 223,579 131,680,671 (1,193,356) 76,970				
\$502,391,445	\$386,162,373				
\$248,601,375 10,341 (906) (223,464,384)	\$135,522,351 238,406,380 753,231 276,331 9,396,130 524,694 170,515 44,545,126 648,566,894 7,601,841	\$120,056,440 178,140,822 351,087 4,128,313 121,660,735 801,754 246,139 105,719,623 1,397,348,823 13,483,861	\$494,048,415 159,614,898 434,965 3,577,131 90,103,930 614,364 926,931 181,652,986 1,549,970,894 11,774,199	\$503,458,216 148,370,246 978,500 2,946,044 84,515,422 648,030 788,419 81,802,880 109,527,108 (78,923,627) 10,915,043	\$628,685,237 48,467 111,638,313 1,396,617 8,627,900 72,854,394 645,490 72,100,529 70,557,764 1,511,164,964 7,163,609
\$25,146,426	\$1,085,763,493	\$1,941,937,597	\$2,492,718,713	\$865,026,281	\$2,484,883,284
\$627,917	\$14,702,198 20,484 11,044,528	\$18,256,171 3,061 17,954,681	\$16,883,868 9,233 14,049,787 63,641	\$15,982,848 9,082 311,497	\$13,986,794 254 7,113 8,284,927 338 26,276
\$627,917	\$25,767,210	\$36,213,913	\$31,006,529	\$16,303,427	\$22,305,702


Deductions by Type (last 10 fiscal years)

(continued through page 185)

Year	2019	2018	2017	2016
All Plans¹				
Pension—Annuities	\$6,304,870,000	\$6,093,820,180	\$5,828,340,070	\$5,577,629,182
Pension—Installment Payments	3,020,894	3,939,145	1,618,270	1,112,846
Pension—Other	8,768,755	9,578,847	7,893,619	7,857,337
Disability Case Management and Exams	2,071,603	1,899,107	1,937,850	1,401,601
Refunds	472,604,688	453,441,020	443,220,698	429,791,141
Medicare Parts A and B	27,592,178	25,719,123	23,597,598	50,445,768
Medical	190,799,426	266,028,377	296,063,521	588,576,618
Prescription Drug	113,576,636	136,584,728	148,293,992	170,627,591
Dental	27,990,391	31,626,966	30,321,168	55,456,293
Vision	4,803,238	5,238,871	5,518,194	9,902,183
Disease Management	3,060	79,224	3,304,104	2,090,646
Wellness Retiree Medical Account Plan Claims	152,950	1,607,726	15,038,205	6,990,116
Health Reimbursement Account Plan Claims	398,266,249	399,291,867	423,371,301	310,233,492
Member-Directed Retiree Medical Account Plan Claims	4,704,801	4,108,037	6,493,490	3,051,637
Administrative Expenses	76,159,025	76,875,303	77,305,480	79,059,058
Interplan Activity	31,219,619	25,435,260	20,961,756	17,205,339
Total Deductions	\$7,666,603,513	\$7,535,273,781	\$7,333,279,316	\$7,311,430,848
Traditional Pension Plan				
Pension—Annuities	\$6,300,103,138	\$6,090,125,792	\$5,825,344,908	\$5,575,258,958
Pension—Other	8,762,255	9,578,847	7,892,619	7,857,337
Disability Case Management and Exams	2,071,603	1,899,107	1,937,850	1,401,601
Refunds	407,308,374	388,067,394	384,615,309	352,362,641
Administrative Expenses	51,899,317	52,169,220	52,154,657	51,871,700
Interplan Activity				
Total Deductions	\$6,770,144,687	\$6,541,840,360	\$6,271,945,343	\$5,988,752,237
Combined Plan				
Pension—Annuities	\$3,178,430	\$2,362,506	\$1,863,005	\$1,443,631
Pension—Installment Payments	2,125,957	2,127,305	1,225,533	538,033
Pension—Other	6,500		1,000	
Refunds	17,531,723	16,808,080	16,220,141	21,857,512
Administrative Expenses	3,906,211	2,730,700	3,181,465	2,559,387
Interplan Activity	14,415,338	11,495,876	9,269,382	9,290,331
Total Deductions	\$41,164,159	\$35,524,467	\$31,760,526	\$35,688,894
Member-Directed Plan				
Pension—Annuities	\$1,588,432	\$1,331,882	\$1,132,157	\$926,593
Pension—Installment Payments	894,937	1,811,840	392,737	574,813
Refunds	47,764,591	48,565,546	42,385,248	55,570,988
Administrative Expenses	2,395,830	2,368,980	2,560,880	2,305,383
Interplan Activity	16,804,281	13,939,384	11,692,374	7,187,816
Total Deductions	\$69,448,071	\$68,017,632	\$58,163,396	\$66,565,593

See footnotes on page 184

Statistical Section

 Deductions by Type					
2015	2014	2013	2012	2011	2010
\$5,390,859,219	\$5,101,735,902	\$4,920,408,972	\$4,582,583,776	\$4,322,202,507	\$3,954,057,452
1,003,891	1,628,513	1,549,139	463,923	207,443	246,225
8,647,208	7,482,091	7,913,434	7,891,172	7,508,317	7,248,345
1,370,674	1,277,281	1,620,162			
449,265,410	425,701,829	441,284,204	307,486,279	323,672,042	233,054,714
77,867,474	113,967,145	112,820,822	112,530,781	109,072,281	107,770,173
940,420,011	921,172,088	912,071,417	888,700,307	872,219,550	871,299,322
672,710,524	634,474,812	551,391,403	541,552,286	530,404,030	526,054,523
53,818,027	50,907,491	48,106,058	41,711,390	38,467,223	38,978,748
9,847,918	9,564,606	9,038,035	7,896,366	7,288,175	7,668,138
3,865,654	3,840,401	4,535,512	4,711,813	4,620,914	2,557,254
16,460,228	4,669,630	4,562,351	10,818,585	13,489,405	13,223,453
45,184,620					
2,396,972	2,217,933	1,719,043	1,236,169	895,574	514,332
77,036,684	74,114,491	68,619,091	69,617,154	70,101,033	71,030,458
19,759,373	10,357,663	13,034,171	16,981,684	10,077,664	10,528,250
\$7,770,513,887	\$7,363,111,876	\$7,098,673,814	\$6,594,181,685	\$6,310,226,158	\$5,844,231,387
\$5,388,827,561	\$5,100,341,567	\$4,919,439,251	\$4,582,082,044	\$4,321,944,264	\$3,953,969,116
8,646,429	7,482,091	7,913,434	7,891,172	7,508,317	7,248,345
1,370,674	1,277,281	1,620,162			
405,320,800	389,707,612	411,321,700	284,217,216	302,812,289	219,808,143
49,137,053	49,832,366	46,946,971	49,179,821	51,196,146	52,375,762
\$5,853,302,517	\$5,548,640,917	\$5,387,241,518	\$4,923,370,253	\$4,683,461,016	\$4,233,401,366
\$1,255,978	\$773,394	\$533,920	\$273,809	\$187,051	\$61,125
534,358	1,457,593	992,085	336,736	118,164	67,241
779					
12,577,944	10,974,442	7,731,155	6,173,714	6,462,849	3,540,043
2,522,610	2,375,278	2,264,293	2,295,688	2,559,312	2,584,673
7,141,271	5,375,568	6,085,687	9,487,128	5,129,362	6,043,719
\$24,032,940	\$20,956,275	\$17,607,140	\$18,567,075	\$14,456,738	\$12,296,801
\$775,680	\$620,941	\$435,801	\$227,923	\$71,192	\$27,211
469,533	170,920	557,054	127,187	89,279	178,984
31,366,666	25,019,775	22,231,349	17,095,349	14,396,904	9,706,528
2,260,306	2,400,900	2,028,864	2,118,854	2,354,183	2,435,285
6,625,358	4,982,095	6,948,484	7,494,556	4,920,130	4,382,873
\$41,497,543	\$33,194,631	\$32,201,552	\$27,063,869	\$21,831,688	\$16,730,881

continued on page 184

continued from page 183

 Deductions by Type (last 10 fiscal years)				
Year	2019	2018	2017	2016
115 Health Care Trust^{1, 2}				
Medicare Parts A and B	\$27,592,178	\$25,719,123	\$23,597,598	\$50,445,768
Medical	405,183,547	485,597,781	512,594,568	588,576,618
Medical—Health Care Receipts	(214,384,121)	(219,569,404)	(216,531,047)	
Prescription Drug	113,576,636	136,584,728	148,293,992	170,627,591
Dental	59,440,671	57,730,622	52,497,066	55,456,293
Dental—Health Care Receipts	(31,450,280)	(26,103,656)	(22,175,898)	
Vision	10,200,203	9,562,830	9,554,018	9,902,183
Vision—Health Care Receipts	(5,396,965)	(4,323,959)	(4,035,824)	
Disease Management	3,060	79,224	3,304,104	2,090,646
Wellness Retiree Medical Account Plan Claims	152,950	1,607,726	15,038,205	6,990,116
Health Reimbursement Account Plan Claims	398,266,249	399,291,867	423,371,301	310,233,492
Member-Directed Retiree Medical Account Plan Claims	4,704,801	4,108,037	6,493,490	1,634,192
Administrative Expenses	17,957,667	19,606,403	19,408,478	21,693,387
Total Deductions	\$785,846,596	\$889,891,322	\$971,410,051	\$1,217,650,286
401(h) Health Care Trust^{2, 3}				
Medicare Parts A and B				
Medical				
Prescription Drug				
Dental				
Vision				
Disease Management				
Wellness Retiree Medical Account Plan Claims				
Administrative Expenses				
Total Deductions				
Voluntary Employees' Beneficiary Association (VEBA) Trust²				
Member-Directed Retiree Medical Account Plan Claims				\$1,417,445
Administrative Expenses				629,201
Interplan Activity				727,192
Total Deductions				\$2,773,838

¹ GASB Statement No. 74 requires health care expenses be reported net of certain health care receipts. The presentation of Retiree-Paid Health Care Premiums, Federal Subsidy and formulary rebates included in Contracts and Other Receipts has been revised. Starting in 2017, upon implementation of GASB 74, these line items were included in Health Care Expenses. In this schedule, the receipts are included with Medical, Dental and Vision line items beginning in 2017.

² The 115 Health Care Trust was established in 2014. The 401(h) Health Care Trust and the VEBA Trust were terminated as of June 30, 2016. The net positions of these trusts were consolidated into the 115 Health Care Trust on July 1, 2016.

³ The 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 formerly consisted 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 and is now reflected in the appropriate plan claims line item within this schedule.

Statistical Section

 Deductions by Type					
2015	2014	2013	2012	2011	2010
\$45,184,620					
2,174,957	\$82,201				
\$47,359,577	\$82,201				
\$77,867,474	\$113,967,145	\$112,820,822	\$112,530,781	\$109,072,281	\$107,770,173
940,420,011	921,172,088	912,071,417	888,700,307	872,219,550	871,299,322
672,710,524	634,474,812	551,391,403	541,552,286	530,404,030	526,054,523
53,818,027	50,907,491	48,106,058	41,711,390	38,467,223	38,978,748
9,847,918	9,564,606	9,038,035	7,896,366	7,288,175	7,668,138
3,865,654	3,840,401	4,535,512	4,711,813	4,620,914	2,557,254
16,460,228	4,669,630	4,562,351	10,818,585	13,489,405	13,223,453
19,611,199	18,329,337	16,352,514	15,172,174	13,076,814	12,782,968
\$1,794,601,035	\$1,756,925,510	\$1,658,878,112	\$1,623,093,702	\$1,588,638,392	\$1,580,334,579
\$2,396,972	\$2,217,933	\$1,719,043	\$1,236,169	\$895,574	\$514,332
1,330,559	1,094,409	1,026,449	850,617	914,578	851,770
5,992,744				28,172	101,658
\$9,720,275	\$3,312,342	\$2,745,492	\$2,086,786	\$1,838,324	\$1,467,760

Statistical Section

 Benefits by Type (last 10 fiscal years) (continued on next page)				
Year	2019	2018	2017	2016
All Plans¹				
Annuities and Installment Payments ²	\$5,678,160,071	\$5,534,199,818	\$5,288,583,786	\$5,272,086,225
Disabilities	782,933,551	825,032,060	847,508,744	974,782,897
Other Systems/Death/QEBA ³	13,085,244	13,561,339	11,737,599	11,682,188
Survivors	209,317,315	201,721,351	199,058,257	206,548,755
Wellness Retiree Medical Account Plan Claims	152,950	1,607,726	15,038,205	6,990,116
Health Reimbursement Account Plan Claims	398,266,249	399,291,867	423,371,301	310,233,492
Member-Directed Retiree Medical Account Plan Claims ²	4,704,801	4,108,037	6,493,490	3,051,637
Total Pension Benefits and Health Care	\$7,086,620,181	\$6,979,522,198	\$6,791,791,382	\$6,785,375,310
Traditional Pension Plan Pension Benefits				
Age-and-Service Annuities	\$5,371,860,284	\$5,169,969,144	\$4,916,944,682	\$4,676,894,918
Disabilities	651,557,547	651,168,863	649,478,101	648,136,068
Other Systems	67,171	90,762	113,934	291,376
Survivors	207,496,643	198,522,383	192,915,530	187,233,171
Additional Annuities	5,961,467	5,864,866	5,698,454	5,653,264
Money Purchase Annuities	60,982,311	62,517,151	58,402,011	54,918,287
Death	8,762,255	9,578,847	7,892,618	7,857,337
QEBA ³	4,249,318	3,891,730	3,730,047	3,533,475
Total Pension Benefits	\$6,310,936,996	\$6,101,603,746	\$5,835,175,377	\$5,584,517,896
Combined Plan Pension Benefits				
Annuities	\$3,178,430	\$2,362,506	\$1,863,005	\$1,443,631
Installment Payments	2,125,957	2,127,305	1,225,533	538,033
Death	6,500		1,000	
Total Pension Benefits	\$5,310,887	\$4,489,811	\$3,089,538	\$1,981,664
Member-Directed Plan Pension Benefits				
Annuities	\$1,588,432	\$1,331,882	\$1,132,157	\$926,593
Installment Payments	894,937	1,811,840	392,737	574,813
Total Pension Benefits	\$2,483,369	\$3,143,722	\$1,524,894	\$1,501,406
115 Health Care Trust⁴ Health Care				
Annuities ⁵	\$391,064,476	\$443,342,537	\$454,218,561	\$531,136,686
Annuities—Health Care Receipts ⁵	(159,496,223)	(155,127,413)	(151,293,354)	
Disabilities ⁵	221,863,263	267,018,801	286,728,726	326,646,829
Disabilities—Health Care Receipts ⁵	(90,487,259)	(93,155,604)	(88,698,083)	
Survivors ⁵	3,068,556	4,912,970	8,894,059	19,315,584
Survivors—Health Care Receipts ⁵	(1,247,884)	(1,714,002)	(2,751,332)	
Wellness Retiree Medical Account Plan Claims	152,950	1,607,726	15,038,205	6,990,116
Health Reimbursement Account Plan Claims	398,266,249	399,291,867	423,371,301	310,233,492
Member-Directed Retiree Medical Account Plan Claims ²	4,704,801	4,108,037	6,493,490	1,634,192
Total Health Care	\$767,888,929	\$870,284,919	\$952,001,573	\$1,195,956,899
401(h) Health Care Trust⁴ Health Care				
Annuities				
Disabilities				
Survivors				
Wellness Retiree Medical Account Plan Claims				
Total Health Care				
Voluntary Employees' Beneficiary Association (VEBA) Trust⁴ Health Care				
Member-Directed Retiree Medical Account Plan Claims ²				\$1,417,445
Total Health Care				\$1,417,445

¹ The 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 formerly consisted 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 and is now reflected in the appropriate plan claims line item within this schedule.

² 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.

³ Qualified Excess Benefit Arrangement (QEBA) commenced in 2000.

Statistical Section

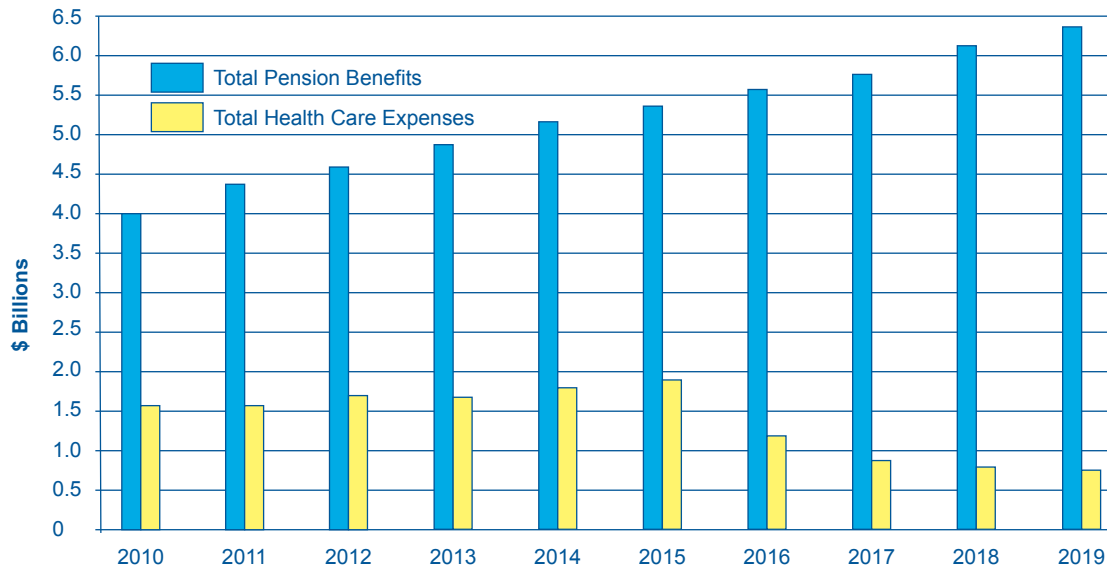
 Benefits by Type					
2015	2014	2013	2012	2011	2010
\$5,833,988,140 1,070,397,368 12,010,912 244,014,180 16,460,228 45,184,620 2,396,972	\$5,534,152,991 1,057,979,091 10,646,707 243,271,541 4,669,630	\$5,277,262,585 1,040,711,575 13,550,680 237,930,114 4,562,351	\$4,903,795,068 1,017,238,745 34,367,830 232,640,171 10,818,585	\$4,644,669,875 984,655,943 31,381,217 231,283,405 13,489,405	\$4,284,189,841 982,774,343 26,785,331 222,130,665 13,223,453
\$7,224,452,420	\$6,852,937,893	\$6,575,736,348	\$6,200,096,568	\$5,906,375,419	\$5,529,617,965
\$4,500,470,313 642,937,688 503,683 182,549,547 5,491,671 55,385,312 8,646,429 2,860,021	\$4,228,575,327 634,409,874 987,644 178,633,434 5,421,653 51,413,944 7,482,091 2,176,972	\$4,044,320,992 624,038,549 3,534,484 174,766,735 26,011,745 46,284,146 7,913,434 2,102,762	\$3,739,845,743 603,354,845 24,815,413 170,092,349 4,341,522 37,970,927 7,891,172 1,661,245	\$3,518,341,988 578,018,246 22,453,906 165,488,973 4,324,569 31,897,588 7,508,317 1,418,994	\$3,185,230,279 556,074,897 18,490,323 159,725,674 3,432,344 29,968,936 7,248,345 1,046,663
\$5,398,844,664	\$5,109,100,939	\$4,928,972,847	\$4,589,973,216	\$4,329,452,581	\$3,961,217,461
\$1,255,978 534,358 779	\$773,394 1,457,593	\$533,920 992,085	\$273,809 336,736	\$187,051 118,164	\$61,125 67,241
\$1,791,115	\$2,230,987	\$1,526,005	\$610,545	\$305,215	\$128,366
\$775,680 469,533	\$620,941 170,920	\$435,801 557,054	\$227,923 127,187	\$71,192 89,279	\$27,211 178,984
\$1,245,213	\$791,861	\$992,855	\$355,110	\$160,471	\$206,195
\$45,184,620					
\$45,184,620					
\$1,269,605,295 427,459,680 61,464,633 16,460,228	\$1,245,719,219 423,569,217 64,638,107 4,669,630	\$1,158,126,842 416,673,026 63,163,379 4,562,351	\$1,120,671,221 413,883,900 62,547,822 10,818,585	\$1,089,640,044 406,637,697 65,794,432 13,489,405	\$1,065,223,721 426,699,446 62,404,991 13,223,453
\$1,774,989,836	\$1,738,596,173	\$1,642,525,598	\$1,607,921,528	\$1,575,561,578	\$1,567,551,611
\$2,396,972	\$2,217,933	\$1,719,043	\$1,236,169	\$895,574	\$514,332
\$2,396,972	\$2,217,933	\$1,719,043	\$1,236,169	\$895,574	\$514,332

⁴ 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 VEBA 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.

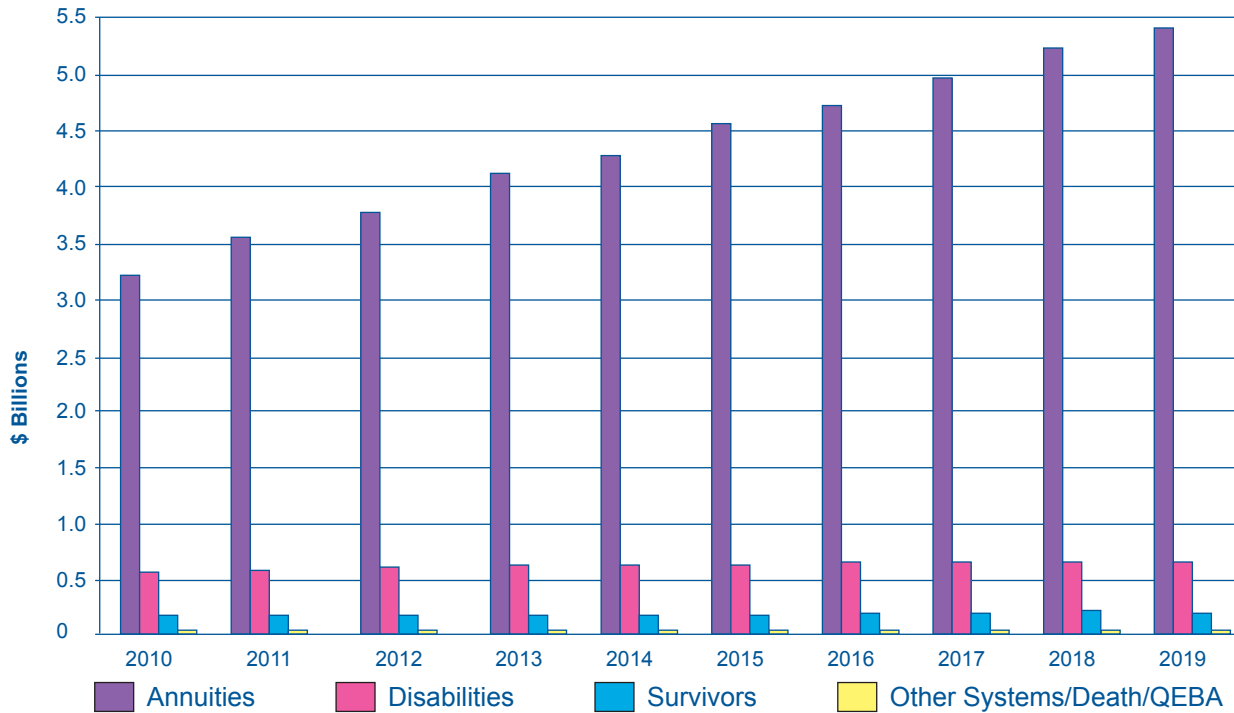
⁵ GASB Statement No. 74 requires health care expenses be reported net of certain health care receipts. The presentation of Retiree-Paid Health Care Premiums, Federal Subsidy and formulary rebates included in Vendor Rebates and Other Receipts (beginning on page 178) has been revised and is now included in health care deductions, starting in 2017 upon implementation of this standard. These health care receipts are broken out by Annuities, Disabilities and Survivors on this schedule.



Benefits by Type



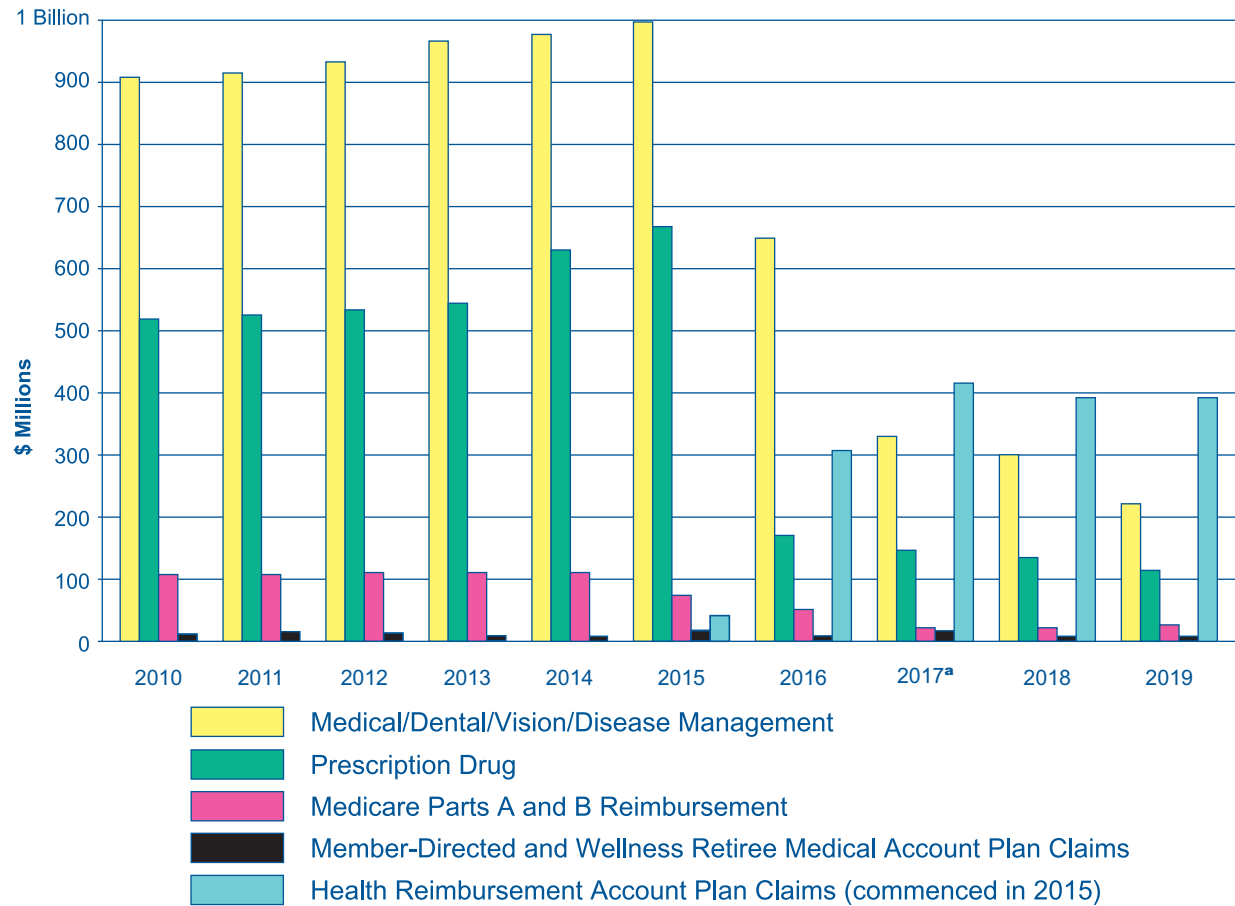
Pension Benefits by Type



Statistical Section



Health Care Expenses by Type



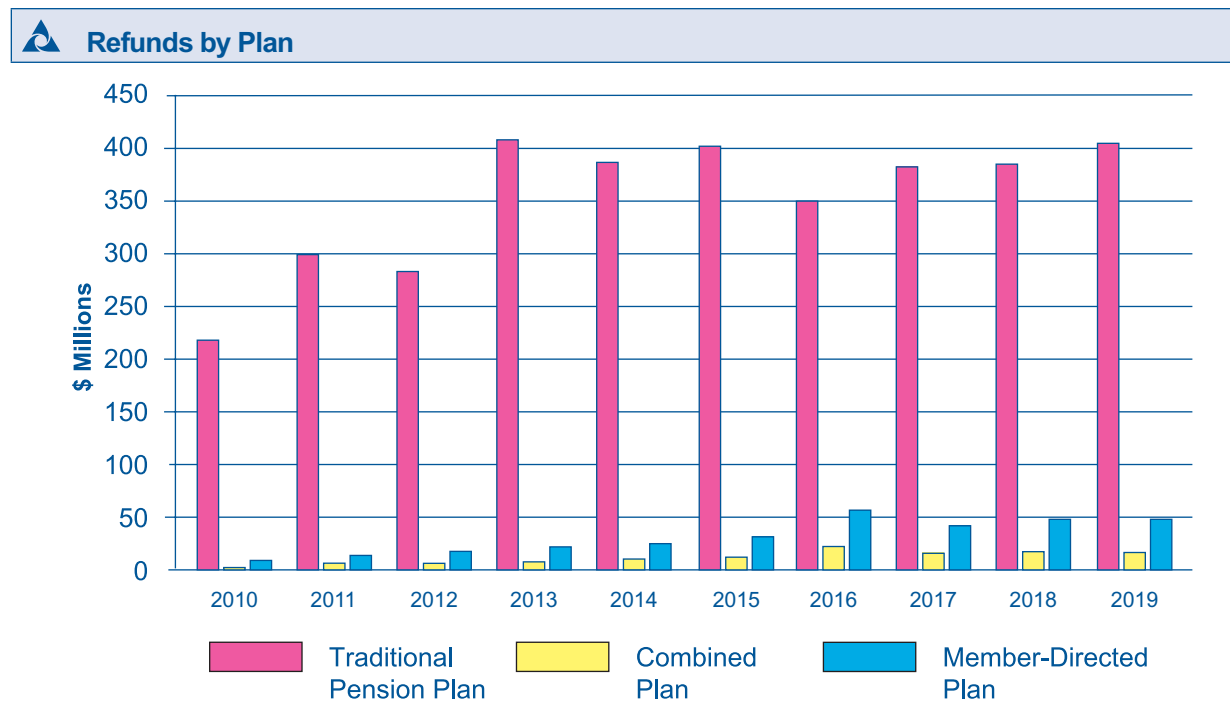
^a Beginning in 2017, GASB Statement No. 74 requires health care expenses to be reported net of certain health care receipts. The presentation of Retiree-Paid Health Care Premiums, Federal Subsidy and formulary rebates included in Vendor Rebates and Other Receipts (beginning on page 178) has been revised and is now included in health care deductions. In this table, the receipts are netted against the Medical/Dental/Vision/Disease Management category.

 Refunds by Type (last 10 fiscal years) (continued on next page)				
Year	2019	2018	2017	2016
All Plans				
Separation	\$380,168,028	\$365,839,603	\$348,274,709	\$342,642,457
Beneficiaries	31,696,726	32,354,667	30,944,474	31,834,420
Other	60,739,934	55,246,750	64,001,515	55,314,264
Total Refunds	\$472,604,688	\$453,441,020	\$443,220,698	\$429,791,141
Traditional Pension Plan				
Separation	\$316,621,469	\$302,012,833	\$291,311,871	\$266,436,121
Beneficiaries	29,946,971	30,807,811	29,301,923	30,612,256
Other	60,739,934	55,246,750	64,001,515	55,314,264
Total Refunds	\$407,308,374	\$388,067,394	\$384,615,309	\$352,362,641
Combined Plan				
Separation	\$17,137,391	\$16,540,234	\$15,716,660	\$21,752,826
Beneficiaries	394,332	267,846	503,481	104,686
Total Refunds	\$17,531,723	\$16,808,080	\$16,220,141	\$21,857,512
Member-Directed Plan				
Separation	\$46,409,168	\$47,286,536	\$41,246,178	\$54,453,510
Beneficiaries	1,355,423	1,279,010	1,139,070	1,117,478
Total Refunds	\$47,764,591	\$48,565,546	\$42,385,248	\$55,570,988

 Number of Refund Payments by Plan (last 10 fiscal years)				
Year	Traditional Pension Plan	Combined Plan	Member-Directed Plan	Total
2019	22,108	487	1,351	23,946
2018	22,317	573	1,539	24,429
2017	23,409	544	1,401	25,354
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

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 Refunds by Type					
2015	2014	2013	2012	2011	2010
\$322,526,720 25,357,397 101,381,293	\$313,034,142 22,186,469 90,481,218	\$299,488,361 17,577,111 124,218,732	\$275,020,766 23,366,136 9,099,376	\$291,727,781 21,276,967 10,667,294	\$205,298,464 20,870,868 6,885,382
\$449,265,410	\$425,701,829	\$441,284,204	\$307,486,278	\$323,672,042	\$233,054,714
\$279,546,170 24,393,337 101,381,293	\$277,494,212 21,732,182 90,481,218	\$270,224,068 16,878,900 124,218,732	\$252,159,989 22,957,850 9,099,376	\$271,336,582 20,808,413 10,667,294	\$192,608,328 20,314,433 6,885,382
\$405,320,800	\$389,707,612	\$411,321,700	\$284,217,215	\$302,812,289	\$219,808,143
\$12,254,484 323,460	\$10,789,116 185,326	\$7,605,803 125,352	\$6,138,096 35,618	\$6,319,318 143,531	\$3,515,815 24,228
\$12,577,944	\$10,974,442	\$7,731,155	\$6,173,714	\$6,462,849	\$3,540,043
\$30,726,066 640,600	\$24,750,814 268,961	\$21,658,490 572,859	\$16,722,681 372,668	\$14,071,881 325,023	\$9,174,321 532,207
\$31,366,666	\$25,019,775	\$22,231,349	\$17,095,349	\$14,396,904	\$9,706,528



OPERS notionally funds and tracks member balances in the health reimbursement arrangement (HRA), Member-Directed Plan health care accounts, and wellness health care accounts. The Combining Statement of Fiduciary Net Position recognizes health care payments as liabilities when a present obligation exists and a condition requires that the event creating the liability has taken place. Therefore, health care liabilities are recognized when the benefits are currently due and payable in accordance with benefit terms, as clarified in GASB Statement No. 74 (GASB 74), *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*. Health care liabilities recorded in the combining financial statements also contain estimates on incurred but not reported amounts for the current year. As a result, unspent balances remaining in the member health care accounts are not recorded as liabilities in the combining financial statements beyond what is described here as clarified in GASB 74. Total funds restricted for health care costs of all OPERS health care plans are \$12.6 billion as of December 31, 2019. While OPERS is not required to disclose the funds restricted for health care by individual plans, we do track the funds set aside in member health care accounts. This table shows these balances and a summary of activity for the year for the member HRA, Member-Directed Plan, and wellness health care accounts, starting with the year 2016 as that was the year of implementation for the HRA and the consolidation of all health care assets into one trust.

 Funds Restricted for Member Health Care Accounts (last four years, \$ in millions)				
Year	2019	2018	2017	2016
Health Reimbursement Arrangement (HRA) Accounts				
Notional Deposits into Member Accounts	\$417.7	\$441.2	\$529.1	\$546.8
Transferred In—Wellness RMA	0.1	0.5	8.5	
Health Care Claims Paid	(354.7)	(360.4)	(388.1)	(292.8)
Health Care Claims Accrued	(43.6)	(38.9)	(35.3)	(17.4)
Transfer to 115 Trust—Forfeitures ²	(5.5)	(3.4)		
Net Increase in Member Accounts	14.0	39.0	114.2	236.6
Balance, Beginning of Year	389.8	350.8	236.6	
Balance, End of Year	\$403.8	\$389.8	\$350.8	\$236.6
Wellness Retiree Medical Accounts (RMA)¹				
Notional Deposits into Member Accounts				\$2.5
Transferred Out—HRA	(\$0.1)	(\$0.5)	(\$8.5)	
Health Care Claims Paid		(0.6)	(4.6)	(5.4)
Health Care Claims Accrued	(0.2)	(0.5)	(2.0)	(1.8)
Net Decrease in Member Accounts	(0.3)	(1.6)	(15.1)	(4.7)
Balance, Beginning of Year	1.5	3.1	18.2	22.9
Balance, End of Year	\$1.2	\$1.5	\$3.1	\$18.2
Member-Directed RMAs				
Notional Deposits into Member Accounts	\$24.3	\$34.8	\$30.0	\$23.5
Health Care Claims Paid	(3.5)	(3.0)	(6.4)	(2.7)
Health Care Claims Accrued	(1.2)	(1.1)	(0.1)	(0.4)
Transfer to MD RMA Reserve—Forfeitures	(2.5)			
Net Increase in Member Accounts	17.1	30.7	23.5	20.4
Balance, Beginning of Year	241.0	210.3	186.8	166.4
Balance, End of Year	\$258.1	\$241.0	\$210.3	\$186.8
Net Position, End of Year, Member-Directed Health Care	\$319.3	\$248.9	\$242.0	\$195.3
Total Funds Restricted for Member Health Care Accounts	\$663.1	\$632.3	\$564.2	\$441.6

¹ Enrollment in wellness incentive programs was discontinued December 2016. Therefore, deposits to the wellness RMAs ceased. If wellness RMA account holders also had an HRA account, the balance in the wellness RMA was transferred to the HRA. In addition, OPERS initiated an automatic claims payment process for reimbursements for retiree health care costs paid through pension deduction. This process will reimburse members for eligible health care premiums paid to OPERS up to the member's available wellness RMA balance.

² Upon the death of an HRA participant, the participant's coverage terminates. Any unused amount in the deceased participant's HRA is forfeited 24 months after the date of death. The HRA program began in 2016; therefore, 2018 activity represents the first eligible forfeitures under the program.

Statistical Section

Pension Assets vs Pension Liabilities—Accounting Basis ¹ (last six fiscal years, \$ in millions)						All Plans
Year	2019	2018	2017	2016	2015	2014
Plan Fiduciary Net Position	\$91,815	\$81,427	\$87,105	\$77,514	\$74,560	\$77,263
Total Pension Liability	\$111,368	\$108,701	\$102,653	\$100,166	\$91,832	\$89,285
Employers' Net Pension (Asset)/Liability	\$19,553	\$27,274	\$15,548	\$22,652	\$17,272	\$12,022
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	82.44%	74.91%	84.85%	77.39%	81.19%	86.54%

Pension Assets vs Pension Liabilities—Accounting Basis ¹ (last six fiscal years, \$ in millions)					Traditional Pension Plan	
Year	2019	2018	2017	2016	2015	2014
Plan Fiduciary Net Position	\$91,122	\$80,876	\$86,586	\$77,110	\$74,213	\$76,956
Total Pension Liability	\$110,887	\$108,264	\$102,274	\$99,818	\$91,534	\$89,017
Employers' Net Pension (Asset)/Liability	\$19,765	\$27,388	\$15,688	\$22,708	\$17,321	\$12,061
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	82.17%	74.70%	84.66%	77.25%	81.08%	86.45%

Pension Assets vs Pension Liabilities—Accounting Basis ¹ (last six fiscal years, \$ in millions)						Combined Plan
Year	2019	2018	2017	2016	2015	2014
Plan Fiduciary Net Position	\$669	\$532	\$501	\$392	\$337	\$298
Total Pension Liability	\$461	\$420	\$365	\$336	\$288	\$260
Employers' Net Pension (Asset)/Liability	(\$208)	(\$112)	(\$136)	(\$56)	(\$49)	(\$38)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	145.28%	126.64%	137.28%	116.55%	116.90%	114.83%

Pension Assets vs Pension Liabilities—Accounting Basis ¹ (last six fiscal years, \$ in millions)					Member-Directed Plan	
Year	2019	2018	2017	2016	2015	2014
Plan Fiduciary Net Position	\$24	\$19	\$18	\$12	\$10	\$9
Total Pension Liability	\$20	\$17	\$14	\$12	\$10	\$8
Employers' Net Pension (Asset)/Liability	(\$4)	(\$2)	(\$4)	(\$0)	(\$0)	(\$1)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	118.84%	113.42%	124.46%	103.40%	103.91%	107.10%

¹ The Accounting Basis is calculated under 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 69 in the Financial Section.

The calculation method defined in GASB 67 (Accounting Basis) requires different assumptions than are used to calculate the funded status of a plan (Funding Basis). The following table identifies the two key differences between the two methods. Additional details on the Accounting Basis actuarial assumptions can be found in the Financial Section (see Note 8 on page 69). Funding Basis assumptions can be found in the Actuarial Section starting on page 135.

		
Valuation Basis	Accounting	Funding
Measurement and Valuation Date	December 31, 2019	December 31, 2019
Assets Valuation Method	Fair Value	4-year, smoothed market-12% corridor ²
Investment Rate of Return Used to Calculate Liability	Single Discount Rate ¹ 7.2%	Actuarial Assumed 7.2%

¹ As required in GASB 67, a Single Discount Rate may be required to measure the pension liability if existing assets are not projected to be available to make all projected future benefit payments of current plan members. The GASB 67 pension calculation determined that a blended rate for the year ended December 31, 2019 was not needed. Therefore, the long-term expected rate of return on pension plan investments, 7.2%, was applied to all periods of projected benefit payments to determine the Total Pension Liability.

² 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%.

Statistical Section

Pension Assets vs Pension Liabilities—Funding Basis ¹ (last 10 fiscal years, \$ in millions)													All Plans	
Year	2019	2018	2017 ^a	2017	2016 ^f	2015 ^a	2015 ^b	2014	2013	2012 ^d	2012 ^c	2011	2010 ^{a, e}	2010 ^b
Pension Assets	\$88,572	\$84,287	\$83,292	\$83,292	\$80,280	\$78,061	\$78,061	\$74,865	\$71,411	\$67,855	\$67,855	\$65,436	\$63,649	\$60,600
Accrued Liabilities	\$111,371	\$108,705	\$106,090	\$102,656	\$100,167	\$97,177	\$91,832	\$89,285	\$86,645	\$83,878	\$87,105	\$84,530	\$80,485	\$79,630
Unfunded Liabilities	\$22,799	\$24,418	\$22,798	\$19,364	\$19,887	\$19,116	\$13,771	\$14,420	\$15,234	\$16,023	\$19,250	\$19,094	\$16,836	\$19,030
Funded Ratio	79.53%	77.54%	78.51%	81.14%	80.15%	80.33%	85.00%	83.85%	82.42%	80.90%	77.90%	77.41%	79.08%	76.10%
Amortization Years	23	27	25	18	19	20	19	21	24	26	30	30	24	29
Net Unrealized Gains/(Losses) ²	\$3,243	(\$2,860)	\$3,813	\$3,813	(\$2,766)	(\$3,501)	(\$3,501)	\$2,398	\$3,455	\$0	\$0	(\$3,589)	\$0	\$3,050

Pension Assets vs Pension Liabilities—Funding Basis ¹ (last 10 fiscal years, \$ in millions)												Traditional Pension Plan		
Year	2019	2018	2017 ^a	2017	2016	2015 ^a	2015 ^b	2014	2013	2012 ^d	2012 ^c	2011	2010 ^{a, e}	2010 ^b
Pension Assets	\$87,903	\$83,715	\$82,797	\$82,797	\$79,865	\$77,700	\$77,700	\$74,567	\$71,175	\$67,670	\$67,670	\$65,274	\$63,515	\$60,461
Accrued Liabilities	\$110,887	\$108,265	\$105,691	\$102,274	\$99,818	\$96,863	\$91,535	\$89,017	\$86,407	\$83,664	\$86,876	\$84,325	\$80,307	\$79,459
Unfunded Liabilities	\$22,984	\$24,550	\$22,894	\$19,477	\$19,953	\$19,163	\$13,835	\$14,450	\$15,232	\$15,994	\$19,206	\$19,051	\$16,792	\$18,998
Funded Ratio	79.27%	77.32%	78.34%	80.96%	80.01%	80.22%	84.89%	83.77%	82.37%	80.88%	77.89%	77.41%	79.09%	76.09%
Amortization Years	23	28	26	19	20	20	19	21	25	26	31	30	25	30
Net Unrealized Gains/(Losses) ²	\$3,219	(\$2,839)	\$3,789	\$3,789	(\$2,755)	(\$3,487)	(\$3,487)	\$2,389	\$3,443	(\$2)	(\$2)	(\$3,581)	\$0	\$3,054

Pension Assets vs Pension Liabilities—Funding Basis ¹ (last 10 fiscal years, \$ in millions)													Combined Plan	
Year	2019	2018	2017 ^a	2017	2016	2015 ^a	2015 ^b	2014	2013	2012 ^d	2012 ^c	2011	2010 ^{a, e}	2010 ^b
Pension Assets	\$646	\$552	\$479	\$479	\$402	\$350	\$350	\$289	\$229	\$183	\$183	\$161	\$134	\$138
Accrued Liabilities	\$461	\$420	\$382	\$365	\$336	\$303	\$288	\$260	\$230	\$212	\$226	\$203	\$177	\$171
Unfunded Liabilities	(\$185)	(\$132)	(\$97)	(\$114)	(\$66)	(\$47)	(\$62)	(\$29)	\$1	\$29	\$43	\$42	\$43	\$33
Funded Ratio	140.08%	131.43%	125.39%	130.97%	119.62%	115.59%	121.71%	111.15%	99.57%	86.32%	80.97%	79.31%	75.71%	80.70%
Amortization Years	0	0	0	0	0	0	0	0	0	1	0	2	3	2
Net Unrealized Gains/(Losses) ²	\$23	(\$20)	\$23	\$23	(\$10)	(\$14)	(\$14)	\$9	\$12	\$2	\$2	(\$8)	\$0	(\$4)

Pension Assets vs Pension Liabilities—Funding Basis ¹ (last 10 fiscal years, \$ in millions)													Member-Directed Annuities
Year	2019	2018	2017 ^a	2017	2016 ^f	2015 ^a	2015 ^b	2014	2013	2012	2011	2010 ^{a, e}	2010 ^b
Pension Assets	\$22,821	\$19,917	\$16,770	\$16,770	\$12,961	\$10,622	\$10,622	\$8,772	\$6,826	\$2,524	\$1,156	\$0.454	\$0.439
Accrued Liabilities	\$22,821	\$19,917	\$16,770	\$16,770	\$12,961	\$10,291	\$9,767	\$8,291	\$6,884	\$2,666	\$1,173	\$0.496	\$0.490
Unfunded Liabilities	\$0	\$0	\$0	\$0	\$0	(\$0.331)	(\$0.855)	(\$0.481)	\$0.058	\$0.142	\$0.017	\$0.042	\$0.051
Funded Ratio	100.00%	100.00%	100.00%	100.00%	100.00%	103.22%	108.75%	105.80%	99.16%	94.67%	98.55%	91.54%	89.63%
Net Unrealized Gains/(Losses) ²	\$1.021	(\$0.656)	\$0.989	\$0.989	(\$0.296)	(\$0.473)	(\$0.473)	\$0.108	\$0.273	\$0.062	(\$0.044)	\$0	\$0.015

^a Information after completion of the experience study.

^b Information prior to completion of the experience study.

^c Information prior to benefit changes enacted January 7, 2013.

^d Valuation revised to reflect benefit changes enacted January 7, 2013.

^e Funding Value was set to Market Value as of December 31, 2010.

^f Restated upon finalization of actuarial valuation subsequent to issuance of 2016 CAFR.

^g Information after change in discount rate from 7.5% to 7.2%.

¹ Table presents actuarial information on a Funding Basis. For more information on the Funding Basis, refer to the Actuarial Section beginning on page 135.

² For actuarial purposes, and under the Funding Basis, the funding value of defined benefit assets recognizes total assumed investment returns each year. Differences between actual and assumed investment returns are phased in, or smoothed, over a closed four-year period. The funding value is not permitted to deviate from fair value by more than 12%. This amount represents the net unrealized investment gains/losses remaining at the end of each year to be smoothed in future years.

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 Health Care Assets vs Health Care Liabilities—Accounting Basis¹ (last three years, \$ in millions)			
Year	2019	2018	2017
Plan Fiduciary Net Position	\$12,647	\$11,253	\$12,819
Total OPEB Liability	\$26,460	\$24,291	\$23,678
Employers' Net OPEB Liability	\$13,813	\$13,038	\$10,859
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability	47.80%	46.33%	54.14%

¹ The Accounting Basis is calculated under GASB 74. GASB 74 was implemented as of December 31, 2017, data prior to 2017 is not available. For more information on the Accounting Basis, refer to Note 9 on page 72 in the Financial Section.

The calculation method defined in GASB 74 (Accounting Basis) requires different assumptions than are used to calculate the funded status of the program (Funding Basis). The following table identifies the key differences between the two methods. Additional details on the Accounting Basis actuarial assumptions can be found in the Financial Section (see Note 9 on page 72). Funding Basis assumptions can be found in the Actuarial Section starting on page 135.

 Health Care Assumptions—Key Differences Between Accounting and Funding Valuations		
Valuation Basis	Accounting	Funding
Actuarial Valuation Date	December 31, 2018	December 31, 2018
Rolled-Forward Measurement Date	December 31, 2019	N/A
Assets Valuation Method	Fair Value	4-year, smoothed market—12% corridor ²
Investment Rate of Return Used to Calculate Liability	Single Discount Rate ¹ 3.16%	Actuarial Assumed 6.00%

¹ Projected benefit payments are required to be discounted to their actuarial present value using a Single Discount Rate that reflects: (1) a long-term expected rate of return on OPEB plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits), and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the rolled-forward measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met). For the purpose of this rolled-forward measurement date valuation, the expected rate of return on OPEB plan investments is 6.00%; the municipal bond rate is 2.75% (based on the daily rate closest to but not later than the measurement date of the Fidelity 20-year Municipal GO AA Index). The resulting Single Discount Rate is 3.16%.

² For actuarial purposes, and under the Funding Basis, the funding value of defined benefit assets recognizes total assumed investment returns 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%.

 Health Care Assets vs Liabilities—Funding Basis¹ (last 10 fiscal years, \$ in millions)												Total Health Care Fund	
Year	2018	2017 ^d	2017	2016	2015 ^a	2015 ^b	2014	2013	2012	2011	2010 ^{a, c}	2010 ^b	2009
Health Care Assets	\$11,647	\$12,021	\$12,021	\$12,098	\$11,933	\$11,933	\$12,062	\$12,031	\$12,193	\$12,115	\$12,320	\$11,267	\$10,936
Accrued Liabilities	\$17,849	\$18,393	\$17,389	\$19,924	\$19,224	\$18,515	\$19,405	\$19,784	\$19,182	\$31,020	\$30,531	\$26,929	\$31,558
Unfunded Liabilities	\$6,202	\$6,372	\$5,368	\$7,826	\$7,291	\$6,582	\$7,343	\$7,753	\$6,989	\$18,905	\$18,211	\$15,662	\$20,622
Funded Ratio	65.25%	65.36%	69.13%	60.72%	62.10%	64.45%	62.16%	60.81%	63.56%	39.06%	40.35%	41.84%	34.65%
Solvency Period	11	13	13	12	Indefinite ²	Indefinite ²	Indefinite ²	Indefinite ²	Indefinite ²	10	11	11	11
Net Unrealized Gains/(Losses) ³	(\$394)	\$797	\$797	(\$218)	(\$421)	(\$421)	\$764	\$1,080	\$635	(\$519)	\$0	\$1,052	\$479

^a Information after completion of the experience study.

^b Information prior to completion of the experience study.

^c Funding Value was set to Market Value as of December 31, 2010.

^d Information after change in discount rate from 6.5% to 6.0%.

¹ This table presents actuarial information on a Funding Basis. For more information on the Funding Basis, refer to the Actuarial Section beginning on page 135.

² Funds expected to be sufficient to fund future health care needs.

³ For actuarial purposes, and under the Funding Basis, the funding value of defined benefit assets recognizes total assumed investment returns each year.

Differences between actual and assumed investment returns are phased in, or smoothed, over a closed four-year period. The funding value is not permitted to deviate from fair value by more than 12%. This amount represents the net unrealized investment gains/losses remaining at the end of each year to be smoothed in the future years.

The Board approved changes to the OPERS health care plans in 2012. The ultimate goal of the health care changes was to match the income to the health care trust (assumed to be 4%) and disbursements from the health care trust (also assumed to be 4%). Additionally, the Board established a health care stabilization fund to hold income in excess of 4%. The balance of the stabilization fund will supplement income to the health care core (operating) fund when employer contributions or investment income of 4% was not available during the year or disbursements from the trust exceed 4% during the year. The stabilization fund is an accounting function only and not listed separately in the combining financial statements. Health care valuations disclosed previously (both on a Funding and Accounting basis) are prepared using total health care fund assets. The table below displays the valuation results for the health care plans using only the core fund assets and no stabilization fund assets.

 Health Care Assets vs Liabilities¹ (last seven fiscal years, \$ in millions)							Health Care—Core Fund		
Year	2018	2017 ^c	2017	2016 ^d	2015 ^a	2015 ^b	2014	2013	2012
Health Care Assets	\$10,162	\$10,113	\$10,113	\$10,143	\$10,109	\$10,109	\$10,622	\$11,110	\$11,759
Accrued Liabilities	\$17,849	\$18,393	\$17,389	\$19,924	\$19,224	\$18,515	\$19,405	\$19,784	\$19,182
Unfunded Liabilities	\$7,687	\$8,280	\$7,276	\$9,781	\$9,115	\$8,406	\$8,783	\$8,674	\$7,423
Funded Ratio	56.94%	54.98%	58.16%	50.91%	52.59%	54.60%	54.74%	56.16%	61.30%
Solvency Period	10	10	10	10	Indefinite ²	Indefinite ²	Indefinite ²	Indefinite ²	Indefinite ²

^a Information after completion of the experience study.

^b Information prior to completion of the experience study.

^c Information after change in discount rate from 6.5% to 6.0%.

^d Assets recalculated after issuance of 2017 report.

¹ As the stabilization fund was created in 2012, information prior to 2012 is not available.

² Funds expected to be sufficient to fund future health care needs.

 Contribution Rates				
Year	Actuarially Determined Contribution Rate	Employer Contribution Rate Funding Health Care		Note
	All Plans	Traditional Pension Plan	Combined Plan	
2019	5.93%	0.00%	0.00%	
2018	5.75	0.00	0.00	
2017	5.26	1.00	1.00	
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)

(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 5.50% for the period January 1, 2010 through February 28, 2010, and decreased to 5.00% 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%.

 Health Care Self-Funding Rate¹	
Year	Rate
2018	5.10%
2017 ^c	4.80
2017	4.80
2016	4.60
2015 ^a	4.70
2015 ^b	4.00
2014	4.10
2013	4.10
2012	3.80
2011	6.40
2010	6.70
2009	8.00

^a Information after completion of the experience study.

^b Information prior to completion of the experience study.

^c Information after change in discount rate from 6.5% to 6.0%.

¹ 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.

Statistical Section

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 expected rate of return is based on the asset allocation in place during the year presented and the actuarial assumed rate of return is the assumption used by our actuaries for the annual actuarial valuations, described further in the Actuarial Section. Finally, the single discount and long-term municipal bond rates are applicable to the implementation of GASB 74 in 2017, including 2016 opening balances. These rates are used in the Accounting Basis valuations for health care and not available prior to 2016.

Rates are presented for seven years in the following table:

 Investment Rates by Portfolio							
	2019	2018	2017	2016	2015	2014	2013
Defined Benefit Portfolio							
Actual Rate of Return	17.23%	(2.99%)	16.82%	8.31%	0.33%	6.96%	14.38%
Benchmark Return	17.06	(3.07)	15.19	8.64	0.25	5.81	14.24
Long-Term Expected Rate of Return	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Actuarial Assumed Rate of Return	7.20	7.20	7.50	7.50	8.00	8.00	8.00
Health Care Portfolio¹							
Actual Rate of Return	19.59%	(5.76%)	15.25%	7.55%	(2.18%)	5.28%	11.36%
Benchmark Return	19.20	(5.96)	14.31	7.75	(1.88)	5.01	10.70
Long-Term Expected Rate of Return	6.50	6.50	6.50	6.50	6.50	6.50	6.50
Actuarial Assumed Rate of Return	6.00	6.00	6.50	5.00	5.00	5.00	5.00
Single Discount Rate (GASB 74) ²	3.16	3.96	3.85	4.23	N/A	N/A	N/A
Long-Term Municipal Bond Rate ²	2.75	3.71	3.31	3.78	N/A	N/A	N/A

¹ 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 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.

² Projected benefit payments are required to be discounted to their actuarial present value using a Single Discount Rate that reflects (1) a long-term expected rate of return on OPEB plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits), and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met). Additional information on the Single Discount Rate can be found in Note 9 of the Notes to Combining Financial Statements found in the Financial Section.

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 2019 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
2019	181,623	20,090	12,565	214,278
2018	179,113	20,684	12,541	212,338
2017	176,445	21,322	12,590	210,357
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

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 217). 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 2019. 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
2019	176,792	3,266	180,058	1,565	181,623
2018	174,382	3,166	177,548	1,565	179,113
2017	171,766	3,127	174,893	1,552	176,445
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

Statistical Section

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, annuitize, 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 annuitize, transfer their defined contribution account to another financial institution, or refund their account (refer to the Plan Statement beginning on page 217).

 Combined Plan¹					
Year End	Age-and-Service Annuities	Annuitized DC Accounts	Installment Payments	Liquidated or Deferred DC Accounts ²	Number of Retirees
2019	391	266	4		391
2018	337	229	4		337
2017	283	193	6		283
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

¹ 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.

² Beginning in 2013, the number of members receiving a defined benefit age-and-service benefit does 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 Plan¹			
Year End	Annuities	Installment Payments	Total
2019	316	4	320
2018	278	5	283
2017	242	5	247
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

¹ 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 OPERS health care plans. The 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. 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
2019	142,369	28,141	170,510
2018	146,410	31,670	178,080
2017 ^a	150,363	36,362	186,725
2016 ^a	153,272	42,230	195,502
2015	170,688	52,109	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

^a Restated amounts for Health Care Connector.

The Member-Directed Plan Retiree Medical Account 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 Member-Directed Plan health care 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 Member-Directed Plan health care is accumulated in the 115 Trust.

 Member-Directed Plan Retiree Health Care	
Year End	Total Covered Lives
2019	6,940
2018	6,660
2017	6,203
2016	5,605
2015	4,063
2014	3,509
2013	3,112
2012	2,589
2011	2,073
2010	1,577

Statistical Section

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 2019)							
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	10,515	1,863	12,378	38	539	628	13,583
\$300-499	8,263	514	8,777	89	1,678	282	10,826
\$500-999	21,606	558	22,164	670	3,752	371	26,957
\$1,000-1,499	20,850	169	21,019	2,118	2,860	163	26,160
\$1,500-1,999	19,042	78	19,120	3,594	1,483	77	24,274
\$2,000 & Over	96,516	84	96,600	13,581	2,253	44	112,478
Totals	176,792	3,266	180,058	20,090	12,565	1,565	214,278

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 annuitize, 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 2019)			
Amount of Monthly Benefit	Employer Age-and-Service Annuities	Annuitized DC Accounts	DC Installment Payments
\$1-299	151	142	
\$300-499	122	79	
\$500-999	100	36	
\$1,000-1,499	16	7	
\$1,500-1,999	2	1	
\$2,000 & Over		1	
Various			4
Totals	391	266	4

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 2019)			
Amount of Monthly Benefit	Annuitized DC Accounts	DC Installment Payments	Total Retirees
\$1-299	135		135
\$300-499	69		69
\$500-999	86		86
\$1,000-1,499	20		20
\$1,500-1,999	3		3
\$2,000 & Over	3		3
Various		4	4
Totals	316	4	320

Number of New Pension Retirees

The values included in the following tables represent the number of new benefit recipients each year. The 2011 through 2019 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
2019	7,204	527	404	8,135
2018	7,475	513	364	8,352
2017	7,668	550	446	8,664
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

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 the Plan Statement beginning on page 217). 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 2019 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
2019	7,147	10	7,157	47	7,204
2018	7,402	15	7,417	58	7,475
2017	7,601	13	7,614	54	7,668
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

Statistical Section

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 annuitize, 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
2019	55	38		
2018	54	36		
2017	49	38		
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

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
2019	42		42
2018	38		38
2017	25		25
2016	34		34
2015	31		31
2014	24		24
2013	69		69
2012	24	1	25
2011	20	6	26
2010	8	4	12

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 217 for benefit eligibility requirements). The Average Final Average Salary represents a composite for each group.

The 2011 through 2019 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 Benefits¹ (last 10 fiscal years)		Traditional Pension Plan							
Retirement Effective Dates		Years Credited Service							Total New Retirees
		0-4	5-9	10-14	15-19	20-24	25-30	30+	
2019	Average Monthly Benefit	\$678	\$629	\$996	\$1,437	\$1,949	\$2,679	\$3,826	\$2,406
	Average Final Average Salary	\$21,882	\$38,395	\$46,178	\$50,300	\$55,634	\$61,597	\$69,902	\$57,847
	Number of Active Recipients	74	751	974	945	1,271	1,267	2,806	8,088
2018	Average Monthly Benefit	\$670	\$579	\$945	\$1,323	\$1,828	\$2,586	\$3,690	\$2,281
	Average Final Average Salary	\$24,425	\$35,398	\$43,003	\$45,656	\$52,019	\$58,989	\$67,673	\$54,739
	Number of Active Recipients	77	788	1,004	968	1,301	1,389	2,767	8,294
2017	Average Monthly Benefit	\$625	\$627	\$940	\$1,335	\$1,866	\$2,499	\$3,509	\$2,285
	Average Final Average Salary	\$19,913	\$36,979	\$43,150	\$46,261	\$52,750	\$57,846	\$65,276	\$54,640
	Number of Active Recipients	89	743	989	945	1,272	1,444	3,128	8,610
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

¹ All years begin January 1 and end December 31.

Statistical Section

Schedule of Average Benefits (continued)

 Schedule of Average Benefits¹ (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
2019	Average Monthly Benefit		\$288	\$568	\$600	\$994	\$562
	Average Final Average Salary		\$52,173	\$65,659	\$52,662	\$77,770	\$59,573
	Number of Active Recipients		11	20	19	5	55
2018	Average Monthly Benefit		\$261	\$527	\$659	\$1,429	\$517
	Average Final Average Salary		\$51,411	\$58,150	\$58,940	\$122,395	\$57,937
	Number of Active Recipients		13	25	15	1	54
2017	Average Monthly Benefit		\$303	\$507	\$627	\$1,097	\$475
	Average Final Average Salary		\$47,088	\$54,249	\$51,388	\$62,070	\$52,275
	Number of Active Recipients		13	31	4	1	49
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

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 2019 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
2019	304,446	653,659	214,985	1,173,090
2018 ^a	303,920	628,091	212,953	1,144,964
2017	347,730	559,587	210,882	1,118,199
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

 Member Count—Pension Plans				Traditional Pension Plan
Year End	Active	Inactive	Retirees	Total
2019	286,496	645,866	214,278	1,146,640
2018 ^a	285,487	620,572	212,338	1,118,397
2017	328,207	553,393	210,357	1,091,957
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

^a In 2018, the data aggregation methodology was modified for Active and Inactive counts after system reconfigurations. Restated data for years prior to 2018 is not available.

Statistical Section

Member Counts by Plan (continued)

Member Count—Pension Plans				Combined Plan
Year End	Active	Inactive	Retirees	Total
2019	7,519	2,289	391	10,199
2018 ^a	7,692	2,143	337	10,172
2017	7,905	1,825	283	10,013
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

Member Count—Pension Plans				Member-Directed Plan
Year End	Active	Inactive	Retirees	Total
2019	10,431	5,504	316	16,251
2018 ^a	10,741	5,376	278	16,395
2017	11,618	4,369	242	16,229
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

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
2019	304,446	652,237	214,963	1,171,646
2018 ^a	303,920	626,684	212,937	1,143,541
2017	347,729	558,205	210,868	1,116,802
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

^a In 2018, the data aggregation methodology was modified for Active and Inactive counts after system reconfigurations. Restated data for years prior to 2018 is not available.

continued on page 208

Member Counts by Plan (continued)

The values included in the tables below represent the number of individuals covered by the OPERS health care plans. Members include active and inactive employees, retirees, primary beneficiaries, dependents and other beneficiaries. In addition to a retiree, a primary benefit recipient could be a survivor of a deceased retiree. The survivor is continuing to receive coverage on the retiree's account, which is representative of the OPERS contributing membership. Dependents and Other Beneficiaries primarily receive dental and vision coverage.

 Member Count—Health Care Plans					Total All Health Care Plans
Year End	Active	Inactive	Retirees & Primary Beneficiaries	Dependents & Other Beneficiaries	Total
2019	10,534	5,317	149,309	28,141	193,301
2018	10,976	5,081	153,070	31,670	200,797
2017 ^a	11,613	4,309	156,566	36,362	208,850
2016 ^a	11,469	3,976	158,877	42,230	216,552
2015	11,235	4,764	174,751	52,109	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

 Member Count—Health Care Plans					Traditional Pension Plan and Combined Plan
Year End	Active	Inactive	Retirees & Primary Beneficiaries	Dependents & Other Beneficiaries	Total
2019	N/A	N/A	142,369	28,141	170,510
2018	N/A	N/A	146,410	31,670	178,080
2017 ^a	N/A	N/A	150,363	36,362	186,725
2016 ^a	N/A	N/A	153,272	42,230	195,502
2015	N/A	N/A	170,688	52,109	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

^a Restated amounts for Health Care Connector.

Statistical Section

Member Counts by Plan (continued)

The Member-Directed Health Care Plan table 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 217.)

 Member Count—Health Care Plans			Member-Directed Health Care Plan	
Year End	Active	Inactive	Retiree Recipients	Total
2019	10,534	5,317	6,940	22,791
2018	10,976	5,081	6,660	22,717
2017	11,613	4,309	6,203	22,125
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

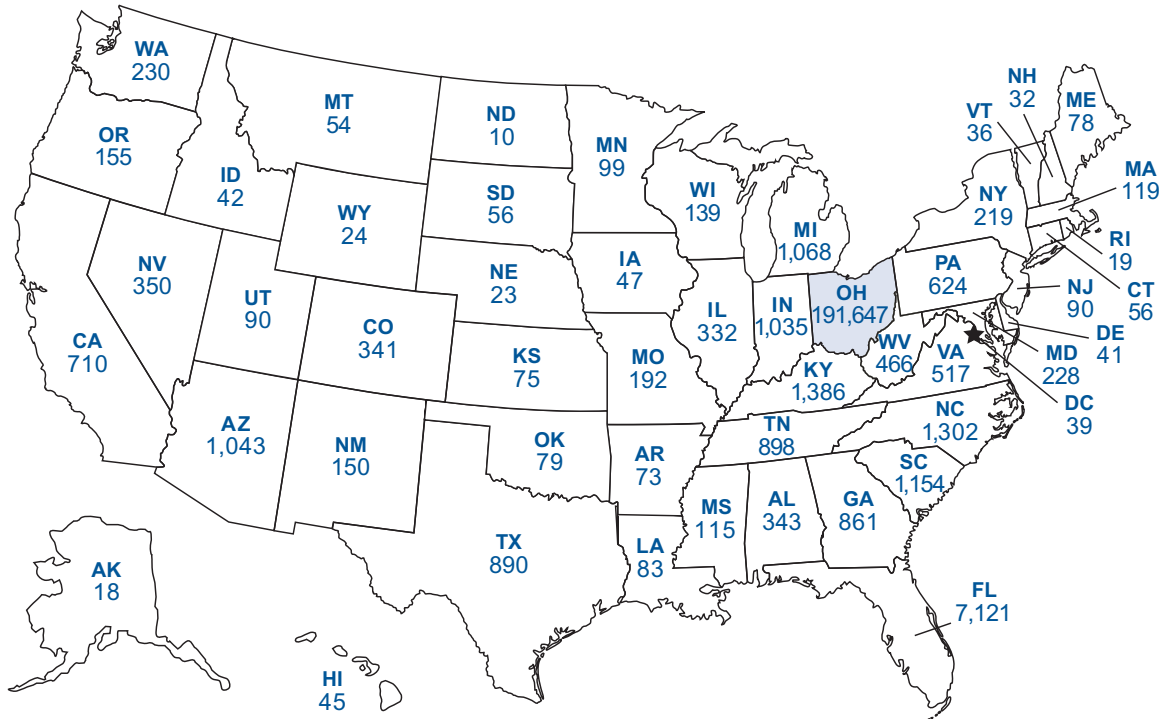


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Retirees by Geographical Location (as of December 31, 2019)

Retirees by State



Retirees Outside United States

Armed Forces—Europe.....2	Israel.....4	Puerto Rico.....21
Armed Forces—Pacific4	Italy5	Scotland.....1
Australia.....2	Japan.....2	Senegal1
Bulgaria1	Jordan.....1	Serbia1
Canada25	Latvia1	Slovakia2
China1	Lebanon.....1	South Africa1
Czech Republic1	Lithuania.....1	Spain3
England3	Mexico1	Switzerland.....1
Ethiopia.....1	Northern Ireland.....2	Thailand.....3
France4	New Zealand2	Turkey.....2
Germany.....2	Northern Mariana Islands1	United Kingdom4
Greece.....2	Norway1	Virgin Islands3
India.....1	Philippines2	West Indies.....1
Ireland.....1	Poland1	

 Contribution Rates at December 31			Traditional Pension Plan				
	Year	Member Rates	Employer Rates			Total Employer Rates	Total Employer and Member Rates
			Normal Cost	Unfunded Liability	Health		
State	2019	10.00%	3.87%	10.13%	0.00%	14.00%	24.00%
	2018	10.00	3.15	10.85	0.00	14.00	24.00
	2017	10.00	3.21	9.79	1.00	14.00	24.00
	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 ^a	10.00	5.35	3.65	5.00	14.00	24.00
Local	2019	10.00%	3.71%	10.29%	0.00%	14.00%	24.00%
	2018	10.00	2.82	11.18	0.00	14.00	24.00
	2017	10.00	2.89	10.11	1.00	14.00	24.00
	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 ^a	10.00	5.06	3.94	5.00	14.00	24.00
Law Enforcement	2019	13.00%	6.75%	11.35%	0.00%	18.10%	31.10%
	2018	13.00	5.23	12.87	0.00	18.10	31.10
	2017	13.00	5.34	11.76	1.00	18.10	31.10
	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 ^a	11.10	8.95	3.92	5.00	17.87	28.97
Public Safety	2019	12.00%	5.45%	12.65%	0.00%	18.10%	30.10%
	2018	12.00	4.07	14.03	0.00	18.10	30.10
	2017	12.00	4.16	12.94	1.00	18.10	30.10
	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 ^a	10.50	8.55	4.32	5.00	17.87	28.37

^a The health care contribution rate decreased from 5.5% to 5.0%, effective March 1, 2010.

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Statistical Section

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 Contribution Rates at December 31								Combined Plan
	Year	Member Rates	Employer Rates				Total Employer Rates	Total Employer and Member Rates
			Normal Cost	Unfunded Liability ¹	Mitigating Rate	Health		
State	2019	10.00%	7.29%	4.27%	2.44%	0.00%	14.00%	24.00%
	2018	10.00	7.52	4.48	2.00	0.00	14.00	24.00
	2017	10.00	7.52	3.98	1.50	1.00	14.00	24.00
	2016	10.00	7.56	3.44	1.00	2.00	14.00	24.00
	2015	10.00	7.54	3.69	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 ^a	10.00	7.18	1.82	0.77	4.23	14.00	24.00
Local	2019	10.00%	7.46%	4.10%	2.44%	0.00%	14.00%	24.00%
	2018	10.00	7.38	4.62	2.00	0.00	14.00	24.00
	2017	10.00	7.40	4.10	1.50	1.00	14.00	24.00
	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 ^a	10.00	6.87	2.13	0.77	4.23	14.00	24.00

^a The health care contribution rate decreased from 4.73% to 4.23%, effective March 1, 2010.

¹ Unfunded Liability includes the impact of defined contribution account purchases of defined benefit annuities.

 Contribution Rates at December 31								Member-Directed Plan
	Year	Member Rates	Employer Rates				Total Employer Rates	Total Employer and Member Rates
			Normal Cost	Unfunded Liability	Administrative Fee	Mitigating Rate	Health ¹	
State	2019	10.00%	7.50%	N/A	0.06%	2.44%	4.00%	14.00%
	2018	10.00	7.50	N/A	0.50	2.00	4.00	14.00
	2017	10.00	8.00	N/A	0.50	1.50	4.00	14.00
	2016	10.00	8.50	N/A	0.50	1.00	4.00	14.00
	2015	10.00	8.73	N/A		0.77	4.50	14.00
	2014	10.00	8.73	N/A		0.77	4.50	14.00
	2013	10.00	8.73	N/A		0.77	4.50	14.00
	2012	10.00	8.73	N/A		0.77	4.50	14.00
	2011	10.00	8.73	N/A		0.77	4.50	14.00
	2010	10.00	8.73	N/A		0.77	4.50	14.00
Local	2019	10.00%	7.50%	N/A	0.06%	2.44%	4.00%	14.00%
	2018	10.00	7.50	N/A	0.50	2.00	4.00	14.00
	2017	10.00	8.00	N/A	0.50	1.50	4.00	14.00
	2016	10.00	8.50	N/A	0.50	1.00	4.00	14.00
	2015	10.00	8.73	N/A		0.77	4.50	14.00
	2014	10.00	8.73	N/A		0.77	4.50	14.00
	2013	10.00	8.73	N/A		0.77	4.50	14.00
	2012	10.00	8.73	N/A		0.77	4.50	14.00
	2011	10.00	8.73	N/A		0.77	4.50	14.00
	2010	10.00	8.73	N/A		0.77	4.50	14.00

¹ Beginning October 2014, the Board approved the funding of participant Member-Directed Plan health care accounts using the reserves in the Member-Directed Plan health care plan (formerly 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 plan start-up and administrative costs. Contributions resumed to the Member-Directed health care plan January 2016.

Number of Employer Units									All Plans ¹
Calendar Year	State	County	Law Enforcement	Municipalities	Villages	Miscellaneous	Libraries	Townships	Totals
2019	246	251	236	243	654	503	253	1,308	3,694
2018	247	248	236	242	656	503	253	1,308	3,693
2017	248	233	236	242	658	505	253	1,308	3,683
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

¹ 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, 2019 was 3,219.

Employer Units						
Employers by Employer Unit Ranking	2019			2010		
	Covered Employees	Rank	Percentage of Total System	Covered Employees	Rank	Percentage of Total System
The Ohio State University	34,249	1	11.25%	21,022	1	5.89%
MetroHealth Medical Center	7,589	2	2.49	5,562	8	1.56
Cuyahoga County	7,538	3	2.48	8,530	2	2.39
Franklin County	5,769	4	1.89	6,581	3	1.85
City of Cleveland	5,494	5	1.80	5,844	6	1.64
City of Columbus	5,111	6	1.68	6,124	4	1.72
Ohio Department of Transportation	5,097	7	1.67	5,684	7	1.59
University of Cincinnati	4,246	8	1.39	6,085	5	1.71
Ohio University	3,856	9	1.27	N/A	N/A	N/A
Hamilton County	3,777	10	1.24	4,509	10	1.26
Montgomery County	N/A	N/A	N/A	4,612	9	1.29
All Others (see table on page 215)	221,720	N/A	72.84	282,181	N/A	79.10
Total	304,446	N/A	100.00%	356,734	N/A	100.00%

Statistical Section

 Principal Participating Employers						
Employers by Participating Employer Ranking	2019			2010 ^a		
	Covered Employees	Rank	Percentage of Total System	Covered Employees	Rank	Percentage of Total System
The Ohio State University	34,316	1	11.27%	21,022	1	5.89%
Cuyahoga County	7,728	2	2.54	8,530	2	2.39
MetroHealth Medical Center	7,589	3	2.49	5,562	8	1.56
Franklin County	6,585	4	2.16	6,581	3	1.85
City of Columbus	5,606	5	1.84	6,124	4	1.72
City of Cleveland	5,494	6	1.80	5,844	6	1.64
Ohio Department of Transportation	5,097	7	1.67	5,684	7	1.59
University of Cincinnati	4,308	8	1.42	6,085	5	1.71
Hamilton County	4,243	9	1.39	4,509	10	1.26
Montgomery County	4,125	10	1.35	4,612	9	1.29
All Others (see table below)	219,355	N/A	72.07	282,181	N/A	79.10
Total	304,446	N/A	100.00%	356,734	N/A	100.00%

 Employers—All Other Categories¹								
Employer Type	2019				2010 ^a			
	Employer Units		Participating Employers		Employer Units		Participating Employers	
	Number	Employees	Number	Employees	Number	Employees	Number	Employees
State	242	59,408	151	64,027	266	84,835	266	84,835
County	247	61,962	115	62,265	210	78,098	210	78,098
Municipalities	241	39,439	233	39,082	245	49,124	245	49,124
Miscellaneous	503	19,631	496	19,523	491	20,907	491	20,907
Libraries	253	12,414	252	12,403	253	13,342	253	13,342
Townships	1,308	9,983	1,307	11,307	1,308	14,539	1,308	14,539
Villages	654	10,720	655	10,748	675	14,091	675	14,091
Law Enforcement/Public Safety	236	8,163	N/A	N/A	241	7,245	241	7,245
Total	3,684	221,720	3,209	219,355	3,689	282,181	3,689	282,181

^a 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 2010 in this table reflect the number of employers based on employer units.

¹ This table displays additional information on the All Other category in the table above and the table on the previous page presenting the 10 largest employers. To get the total number of employers reported in the table and related footnote on page 214, combine the numbers in this table with those on page 214 for the employer units (10 plus 3,684 = 3,694 for 2019) and participating employers (10 plus 3,209 = 3,219 for 2019). GASB requires a 10 year look-back to the year being presented. Therefore, information for 2011 through 2018 is not relevant.

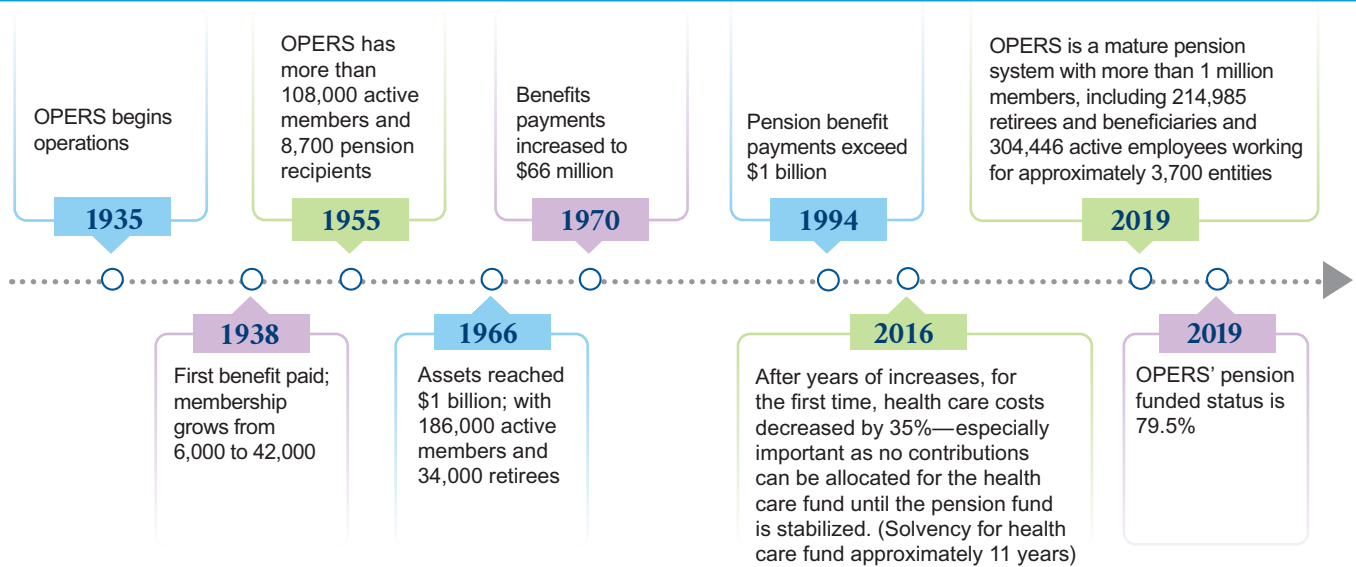
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Plan Statement

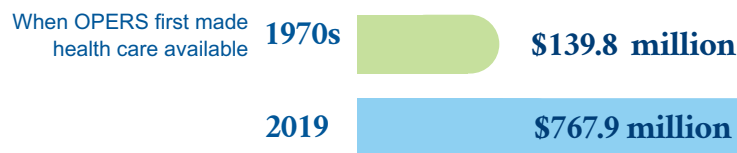
The OPERS mission is clear: to provide financial security in retirement for our members.

The OPERS commitment to that mission is equally clear—since 1935, OPERS has ensured each member receives the pension benefit earned—every member, every month, every year.

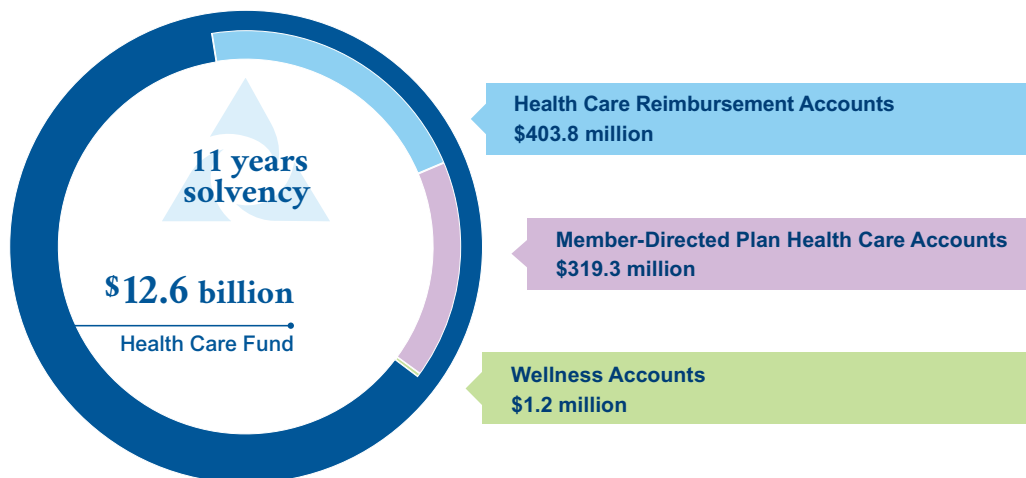
OPERS recognizes the importance of access to health care as another important element of financial security in retirement. Although health care is neither mandated nor guaranteed, the System has been committed to extending the solvency of the health care fund. Because OPERS cannot actively contribute to the health care program currently, the only option to help extend the life of the fund is to reduce expenses where possible. We seek to implement incremental changes with limited impact to members to achieve greater solvency for the health care fund.



Ever-increasing cost of health care:



Health Care Funds by Type



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 in Ohio, 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 beginning public employment unless 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. The 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 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 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 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 2019 was 14.0%. Employers in the Law Enforcement and Public Safety divisions contributed 18.1%.

The 2019 employee contribution rate for State and Local members was 10.0% of eligible salary. Members in the Public Safety division contributed 12.0% of eligible salary, while members in the Law Enforcement division contributed 13.0%. Individual accounts for each OPERS member 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 (pre- or post-tax) 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 and 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 (pre- or post-tax) 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 his/her 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 the law in effect prior to the legislation or who were eligible to retire no later than five years after January 7, 2013, comprise retirement Group A. Members who had 20 years of service credit prior to January 7, 2013, or who will be eligible to retire under the law in effect prior to the legislation 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
	65	5	Any	32	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
			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 for 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 current CBBC factor in effect is 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 that 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;

- 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. The current minimum eligible salary required to earn full-time service credit is \$660. In 2020, the minimum eligible salary required to earn full-time service will increase to \$673.08.

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. A number of features are common to both plans.

A member who has at least five years 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 his/her 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/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 later of: 1) the last day for which compensation was paid or 2) the attainment of eligibility for the disability benefit. A disability benefit recipient may be required to undergo periodic medical examinations. 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 is applied to disability recipients (excluding Law Enforcement division disability recipients) whose application for disability was received by OPERS on or after January 7, 2013. Disability benefit recipients are 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 her/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 benefit 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 benefit 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 finite 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 his/her account. The service retirement benefit amount is the greater of:

- 2.2% of FAS multiplied by the years of service (contributing and disability) not to exceed 45% of FAS; or
- 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. Combined Plan 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, he/she 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 were 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 no children are 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.

Plan Statement

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 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, during active military service, or upon attaining age 22.

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

When a benefit recipient has received benefits for 12 months, current law provides for an annual cost-of-living adjustment. This cost-of-living adjustment 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 cost-of-living adjustment is 3%. For those retiring subsequent to January 7, 2013, beginning in calendar year 2019, the cost-of-living adjustment 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 two months have elapsed since the member terminated public service. 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 two months have elapsed since the member terminated public employment. 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 below.

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%

Plan Statement

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 benefit 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 benefit 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 elect to participate in the OPERS-sponsored coverage offered to re-employed retirees. Their health reimbursement arrangement (HRA) allowance deposit is suspended 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 below 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 or lump-sum payment 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 for the annuity benefit 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 guaranteed nor statutorily required. Ohio law currently requires Medicare Part A equivalent coverage or Medicare Part A premium reimbursement for eligible retirees and their eligible dependents.

Eligibility

Members who 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 220 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 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

Currently, Medicare eligible retirees are able to select medical and prescription drug plans from a range of options and may elect optional vision and dental plans. Retirees and eligible dependents enrolled in Medicare Parts A and B have the option to enroll in a Medicare supplemental plan with the assistance of the OPERS Medicare Connector. The OPERS Medicare Connector is a relationship with a vendor selected by OPERS to assist retirees, spouses and dependents with selecting a medical and pharmacy plan. Monthly allowances, based on years of service and the age at which the retiree first enrolled in OPERS coverage, are deposited into an HRA.

For non-Medicare retirees and eligible dependents, OPERS sponsors medical and prescription coverage through a professionally managed self-insured plan. An allowance to offset a portion of the monthly premium is offered to retirees and eligible dependents. The allowance is based on the retiree's years of service and age when they first enrolled in OPERS coverage.

Medicare-eligible retirees who choose to become re-employed or survivors who become employed in an OPERS-covered position are prohibited from participating in an HRA. For this group of retirees, OPERS sponsors secondary coverage through a professionally managed self-insured program. Retirees who enroll in this plan are provided with a monthly allowance to offset a portion of the monthly premium. Medicare-eligible spouses and dependents can also enroll in this plan as long as the retiree is enrolled.

A monthly allowance for health care coverage for eligible retirees and their eligible dependents is provided by OPERS. The base allowance is determined by OPERS. For those retiring on or after January 1, 2015, the allowance is based on years of qualifying service credit and age when the retiree first enrolled in OPERS health care. Monthly allowances range between 51% and 90% of the premium base. Those who retired prior to January 1, 2015, with an allowance at or above 75%, will have an allowance of at least 75%.

Plan Statement

While spouses have access to select a health care plan, OPERS does not provide any financial support. Spouses who are not Medicare-eligible currently have access to OPERS group coverage at full cost. Spouses who are Medicare-eligible have access to the OPERS Medicare Connector also at full cost. 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.

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

When members become Medicare-eligible, recipients and their covered dependents enrolled in OPERS health care must enroll in Medicare Part B (medical) to participate in a plan sponsored by OPERS.

Low Income Discount

Retirees 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. In 2017, OPERS expanded the low income discount policy for surviving spouses. Surviving spouses enrolled in Medicare Parts A and B that meet the income requirements of the program are eligible to continue receiving a 2019 spousal HRA allowance for health care. Recipients who may be eligible for the discount or the HRA allowance are required to provide proof of income and re-apply each year.

Dental and Vision Coverage

Recipients and dependents also have access to dental and vision coverage. These are fully insured products with the benefit recipient paying the total cost of coverage, including premiums, plan deductibles, and out-of-pocket expenses.

Health Care 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. Since January 1, 2017, interest on the accounts accrued only if the defined benefit investment portfolio earned a return greater than zero in the prior year. Beginning January 1, 2020, interest will accrue based on the investment performance of the OPERS Stable Value Fund, not to exceed 4%. 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 account 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%

Note: The information contained in this section is intended to be a summary only. Complete pension and health care details can be obtained through OPERS. This document reflects approved information as of the date listed. All plans are subject to change. Health care is not a statutorily guaranteed benefit. 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 an allowance.

Mission

To provide secure
retirement benefits
for our members.

Vision

To be your trusted retirement
partner delivering responsive
high-quality service.

