ORANGE COUNTY

OCERS

EMPLOYEES RETIREMENT SYSTEM

An Anniversary Like No Other

COMPREHENSIVE ANNUAL FINANCIAL REPORT

For the Year Ended December 31, 2020

Orange County, California

ORANGE COUNTY

OCERS

EMPLOYEES RETIREMENT SYSTEM

75TH ANNIVERSARY 1945-2020

Orange County Employees Retirement System

COMPREHENSIVE ANNUAL FINANCIAL REPORT

For the Year Ended December 31, 2020

Prepared by: The Finance Department of the
Orange County Employees Retirement System

Issued by: Steve Delaney, Chief Executive Officer
Brenda Shott, Assistant CEO of Finance and Internal Operations

Orange County Employees Retirement System
2223 East Wellington Avenue, Suite 100
Santa Ana, CA 92701-3161

714.558.6200
www.ocers.org

Mission

We provide secure retirement and disability benefits with the highest standards of excellence.

Vision

To be a trusted partner providing premier pension administration, distinguished by consistent, quality member experiences and prudent financial stewardship.

Values

O*pen and Transparent*

C*ommitment to Superior Service*

E*ngaged and Dedicated Workforce*

R*eliable and Accurate*

S*ecure and Sustainable*

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INTRODUCTORY

Celebration 75th Anniversary

75th Anniversary

On January 14, 2020, the Orange County Board of Supervisors, members of the OCERS Board of Directors, OCERS Chief Executive Officer, Steve Delaney and the co-president of the Retired Employees Association of Orange County, Linda Robinson, celebrated OCERS' 75th Anniversary. A resolution, signed by all five members of the Board of Supervisors, recognized OCERS' many accomplishments and achievements throughout its 75 years of service.

During its history, OCERS membership increased from less than 1,000 members in 1945 to nearly 48,000 active, deferred and retired members and beneficiaries at the end of 2020. In 75 years, the funds available to provide pension and other post-employment benefits to its members has grown from zero to more than $19 billion.

OCERS looks forward to continuing to deliver secure retirement and disability benefits with the highest standards of excellence into the future for its members.

Letter of Transmittal

Active Participating Employers:

City of San Juan Capistrano

County of Orange

Orange County Cemetery District

Orange County Children & Families Commission

Orange County Employees Retirement System

Orange County Fire Authority

Orange County In-Home Supportive Services Public Authority

Orange County Local Agency Formation Commission

Orange County Public Law Library

Orange County Sanitation District

Orange County Transportation Authority

Superior Court of California, County of Orange

Transportation Corridor Agencies

June 4, 2021

Board of Retirement
Orange County Employees Retirement System
2223 East Wellington Avenue, Suite 100
Santa Ana, CA 92701

Dear Board Members,

We are pleased to present the Comprehensive Annual Financial Report (Annual Report) of the Orange County Employees Retirement System (OCERS or System) as of and for the year ended December 31, 2020. The information contained in this report is intended to provide a detailed overview of the System's financial and investment results for the year ended December 31, 2020. It also includes information from the most recently available actuarial valuation as of December 31, 2019.

OCERS and its Services

Established in 1945, OCERS is a public retirement system that has provided service retirement, disability, death and survivor benefits to its members for 75 years, administered in accordance with the County Employees Retirement Law of 1937 (CERL) and the California Public Employees' Pension Reform Act of 2013 (PEPRA).

Pursuant to certain provisions of CERL, OCERS is an independent governmental unit within the County of Orange, with a separate operating budget and professional staff. The California Constitution gives the Board of Retirement full authority over the administration of the System, which includes administering plan benefits for nearly 48,000 members, managing $19.3 billion in net assets, and serving 13 active agencies. A complete listing of both active and inactive agencies as of December 31, 2020, can be found on page 30, Section 2 of the Annual Report, under Note 1: Plan Descriptions.

This year's Annual Report theme was originally planned to highlight the celebration of OCERS' 75th Anniversary; however, it was never anticipated that this milestone anniversary would occur during a once-in-a-lifetime global pandemic. While the theme still focuses on OCERS' 75th Anniversary, it was "An Anniversary Like No Other" and we look back on how OCERS and its employers, despite these challenging times, continued to serve its members, adjusted to working remotely and found ways to celebrate personal milestones such as graduations, weddings and babies. It is an anniversary that OCERS will never forget!

Major Initiatives and Significant Events

OCERS 75th Anniversary

Much has changed in the 75 years since OCERS was established on January 1, 1945; over this time, we saw the development of innovations such as television, personal computers, E-mail, the internet, and smart phones. The one thing that remained constant throughout this ever-changing world, including an unprecedented global pandemic, was OCERS' commitment to provide superior customer service to our members and employers. In

January 2020, this commitment was recognized on the occasion of OCERS 75th anniversary with the presentation of a Resolution, signed by all five members of the Orange County Board of Supervisors, commending the OCERS Board of Retirement for delivering secure retirement and disability benefits with the very highest standards of excellence. In December 2020, OCERS was presented with proclamations from Congressman Lou Correa and Congresswoman Katie Porter, each congratulating OCERS on its 75th anniversary. It was an honor to receive these special recognitions and reaching this 75th anniversary milestone was a cause to celebrate for each and every OCERS' member.

Coronavirus COVID-19 Update

Over a year after the World Health Organization declared Coronavirus COVID-19 a global pandemic, followed by a Stay-at-Home Order issued by California Governor Gavin Newsom in March 2020, OCERS offices have remained closed to the public and staff has continued to work remotely. Despite these challenges, OCERS continued to focus on meeting the needs of its members and beneficiaries: benefits have continued to be paid in full and on-time without disruption; members can call and immediately speak to a retirement counselor during regular business hours; retirement informational sessions are available via webinar; and individual retirement appointments are conducted on-line or by phone to ensure the safety of our members. OCERS also installed a secure drop box in the lobby of the headquarters building to provide members a way to securely drop off paperwork, correspondence and parcels.

A direct result of working remotely was the need to procure and implement a virtual meeting solution, Zoom. Once the Governor's Executive Order suspended certain provisions of the Brown Act, this solution allowed OCERS to continue conducting its Board and Committee meetings virtually. Zoom has also been used to facilitate meetings with investment managers, consultants and OCERS' stakeholders as well as internal meetings, including various department and all team meetings, to help keep OCERS employees connected.

Although OCERS' employees continue to work remotely, safety measures have been implemented as part of OCERS headquarters building COVID-19 Prevention Plan. These measures include the installation of plexiglass around all cubicles, placing social distancing signs, hand sanitizer and disinfecting wipes throughout the building, upgrading air filtration throughout the building, and the removal of cubicles and reconfiguration of office space and reassignment of employee work stations to ensure there is adequate room for social distancing once employees return to work.

Alameda Case

In late July 2020, the California Supreme Court issued an opinion in what is known as the "Alameda" case (Alameda County Deputy Sheriffs Association et al v. Alameda County Employees Retirement Association and Board of Retirement of ACERA (S247095)). This decision impacted how OCERS and other public pension systems in California pay benefits to members who receive certain pay items. OCERS has no authority or discretion to calculate pension benefits in a manner inconsistent with the Supreme Court decision. Although the decision impacts only a small number of OCERS' retirees, the Board of Retirement has been taking a measured approach to the implementation of the Alameda decision and recognizes the impact this decision has had on affected members. The Board of Retirement is continuing to evaluate a list of certain pay items to be modified from "pensionable" to "non-pensionable" and will further consider this item at upcoming board meetings.

County Volunteer Incentive Program

Between July 1 and November 30, 2020, the Member Services Department saw a tremendous increase in the number of new retirement applications processed due to the Voluntary Incentive Program (VIP) offered by OCERS' largest employer, the County of Orange (County). The VIP was launched by the County as a way to manage revenue reductions that occurred as a result of the COVID-19 pandemic and offered an incentive to separate from active employment to eligible employees. During this period, Member Services processed 624 retirement applications, more than double the 303 retirement applications completed for the same period in 2019.

Enhanced Information Security

OCERS has implemented several enhanced security features, including a single sign-on system to provide one-click access to OCERS' cloud applications that provides strong authentication while eliminating the need for repeatedly entering usernames and passwords; multi-factor authentication to protect user accounts from common attacks; and an electronic signature system to enhance efficiency and safety while allowing for the secure signing of documents from virtually anywhere.

Key Staff Additions

Prior to the Stay-at-Home Order, OCERS had completed a competitive recruitment and selection process and named Jeff Lamberson as its new Director of Member Services. Mr. Lamberson assumed his new position in February 2020 after previously serving in various management roles in the retirement industry since 1995.

Board Member Updates

Mr. Shawn Dewane and Mr. Charles Packard were reconfirmed as appointed members by the Orange County Board of Supervisors for another 3-year term beginning January 1, 2020. The Board of Supervisors also appointed Mr. Arthur Hidalgo to replace the seat previously held by appointed Board Member David Ball whose regular term ended December 31, 2019. Ms. Adele Tagaloa and Mr. Frank Eley were elected General Board Member and Retired Board Member, respectively, on October 22, 2019 and began serving their three-year terms in January 2020.

Financial Information

OCERS' management is responsible for the complete and fair presentation of the financial information in accordance with generally accepted accounting principles in the United States of America (GAAP). To the best of our knowledge, the enclosed data is accurate in all material respects and is reported in a manner designed to fairly present the financial position and operating results of OCERS. Macias Gini & O'Connell LLP (MGO) audited the accompanying basic financial statements and related disclosures and has issued an unmodified opinion in the independent auditor's report found on page 15, Section 2 of the Annual Report. The financial audit provides reasonable assurance that OCERS' financial statements are presented in conformity with GAAP and are free from material misstatement.

The Annual Report was prepared in accordance with GAAP and reporting guidelines set forth by the Governmental Accounting Standards Board (GASB) and CERL. GAAP requires that management provide a narrative introduction, overview, and analysis to accompany the basic financial statements in the form of management's discussion and analysis (MD&A). This letter of transmittal is designed to complement the MD&A and should be read in conjunction with it. OCERS' MD&A can be found immediately following the independent auditor's report.

OCERS' management is responsible for establishing a system of internal controls to safeguard assets, maintain accurate and reliable accounting records, protect member privacy, detect and prevent fraud, and provide a reasonable basis for asserting that financial statements are fairly presented. OCERS' internal controls are designed to provide reasonable, but not absolute, assurance these objectives are met. The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits likely to be derived and that the valuation of costs and benefits requires estimates and judgment by management. In addition, oversight of internal controls and operational efficiency is provided by OCERS' Audit Committee and supported by internal auditing staff.

Investment Activities

The Board of Retirement (with the participation of the Investment Committee, OCERS' Investment Division, and Investment Consultants) has exclusive control of all investments of the System and is responsible for the establishment of investment objectives, strategies and policies. OCERS' Investment Policy Statement helps guide decisions that impact OCERS' investment structure with the overall objective to invest the assets of the System solely for the benefit of its members while attempting to minimize employer contributions and investment and administration costs. In April 2020, the Investment Committee adopted a new asset allocation that increased public and private equity while decreasing fixed income, credit, and real assets. As of April 2020, the new asset allocation had a 20-year annualized expected return of 7.8%, a 13.6% standard deviation, and a 0.4 Sharpe ratio according to the capital market assumptions of Meketa Investment Group (Meketa), OCERS' general investment consultant. The Investment Division and Meketa plan to move towards the new asset allocation targets over 18 months.

During 2020, the OCERS' Investment Division began moving towards the new asset allocation targets including an increase to public equity by 12%; increase to private equity by 3%; decrease to fixed income by 6%; decrease to credit by 4%; and a decrease to real assets by 5%. After the new asset allocation was adopted, the Investment Division rebalanced $800 million to global public equities from fixed income and credit. Since private equity and real assets are more illiquid assets, those changes will take longer to implement, but core real estate redemptions were put in place to help move towards the lower real assets target. The Investment Division began implementing its new risk management system in 2020. The new risk management system will be used to monitor and report risk at the total portfolio level, asset class level, and manager level. Since March 2020, the Investment Division continued to work effectively while working remotely, having conducted a total of 664 meetings and calls (including 54% with current investment managers and 46% with prospective investment managers).

Letter of Transmittal

(continued)

For the year ended December 31, 2020, OCERS' investment portfolio returned 11.4%, net of fees. The net annualized net return over the last 25 years was approximately 7.6%, which is a similar period to the historical average years of service for a new OCERS' retiree of approximately 23 years for a general member and 24 years for a safety member. Both the one-year and 25 year net returns exceed our 7.00% long-term assumed earnings rate.

Pension Actuarial Funding Status

OCERS maintains a funding goal to establish contributions that fully fund the System's liabilities, and that, as a percentage of payroll, remain as level as possible for each generation of active members. It also ensures that contributions are sufficient for each generation of active members to avoid an inter-generational burden on future employees' contributions. Actuarial valuations are performed annually with actuarial experience investigations conducted triennially in accordance with state statute. The use of realistic assumptions is important in maintaining the necessary funding while paying promised benefits. Each year the actual experience of the System is compared to our assumptions and the differences are studied to determine whether changes in the contribution requirements are necessary. In addition, triennially, the actuarial experience investigation is undertaken to review the actuarial assumptions and compare the actual experience during the preceding three year period with that expected under those assumptions. The latest experience investigation was completed during 2020 for plan years ending in 2017 through 2019.The Board adopted changes in several assumptions that were incorporated into the 2020 actuarial valuation, including lowering the inflation rate from 2.75% to 2.50% and maintaining the retiree cost-of-living assumption at 2.75%.

As of the most current actuarial valuation for the year ended December 31, 2019, OCERS' funding status was 73.17% on a valuation basis, versus 75.36% on a market value basis, with an Unfunded Actuarial Accrued Liability (UAAL) of $5.9 billion. Average employer and employee contribution rates for the year ended December 31, 2019, were 41.49% and 12.31%, respectively.

Budget

The Board of Retirement approves OCERS' annual budget. The 1937 Act limits OCERS' annual administrative expenses, excluding the costs of administration for computer software and hardware and computer technology consulting services, to twenty-one hundredths of one percent (0.21%) of OCERS' actuarial accrued liability. OCERS' 2020 administrative expense of $18.6 million was 0.08% of OCERS' actuarial accrued liability.

Certificate of Achievement

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to OCERS for its Annual Report for the year ended December 31, 2019. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized comprehensive annual financial report. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current Annual Report continues to meet the Certificate of Achievement Program's requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

OCERS was also the recipient of the Public Pension Coordinating Council (PPCC) Award in recognition of compliance with professional standards for plan funding and administration for the year ended December 31, 2019. This is awarded to a retirement system that meets the professional standards for plan design and administration as set forth in the Public Pension Standards, including a Comprehensive Benefit Program, Funding Adequacy, Actuarial Valuation, Independent Audit, Investments, and Communications. A Public Pension Standards Award is valid for a period of one year.

Acknowledgements

We would like to take this opportunity to thank the members of the System for their continued confidence in OCERS during the past year. Also, we would like to express our thanks to the Board of Retirement for its dedicated effort in supporting the System throughout this past year. Finally, we would like to thank the staff and consultants for their commitment to OCERS and their diligent work to assure the System's continued success. We hope everyone continues to stay safe and healthy in these difficult times.

Respectfully submitted,

Steve Delaney
Chief Executive Officer

Brenda M Shott

Brenda Shott
Assistant Chief Executive Officer, Finance & Internal Operations

Members of the Board of Retirement

As of December 31, 2020

Roger Hilton
Chair Person
Elected by
Safety Members

Shawn Dewane
Vice Chair Person
Appointed by
the Board of Supervisors

Frank E. Eley
Elected by
Retired Members

Shari L. Freidenrich
Treasurer-Tax Collector
County of Orange

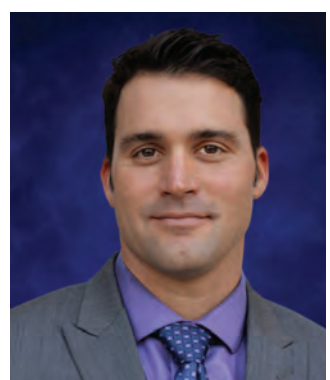
Arthur Hidalgo
Appointed by
the Board of Supervisors

Wayne Lindholm
Appointed by
the Board of Supervisors

Charles E. Packard
Appointed by
the Board of Supervisors

Chris Prevatt
Elected by
General Members

Adele Tagaloa
Elected by
General Members



Jeremy Vallone
Alternate Elected by
Safety Members

Organization of OCERS

Board of Retirement

The Board of Retirement is responsible for establishing policies governing the administration of the retirement plan, disability determinations, assuring benefit payments, establishing investment policy for the System and monitoring execution of its policies. The Board of Retirement consists of nine members and one alternate. Four members of the Board of Retirement are appointed by the Board of Supervisors of the County; four members are elected by active members of the System, including two by the general members, two by the safety members, of which one is the alternate member; one member is elected by the retirees; and the Treasurer of the County, elected by registered voters in the County, serves as an Ex-Officio member.

Executive Division

This division consists of the Chief Executive Officer (CEO) who implements and executes policies promulgated by the Board of Retirement. Two Assistant CEOs, a Director of Internal Audit, a Chief Investment Officer and a General Counsel assist the CEO in the daily operations of the System.

Investment Division

This division is responsible for the administration and management of the investment program, in accordance with policies, regulations, and guidelines set forth by the Board of Retirement. It is responsible for the interface with investment managers, including hiring and termination of investment managers, monitoring investment performance objectives, adherence to investment guidelines, conducting due diligence visits to investment managers' sites, and interviewing prospective investment managers. This division is also responsible for the interface with outside investment consultants in reviewing and evaluating all investment managers' performance and investment manager fees. Refer to the Investment Section on pages 89 and 90 for the Schedule of Commissions and Schedule of Investment Expenses and Investment Summary.

External Operations Division

This division is comprised of the following departments: Member Services, Disabilities and Communications.

The Member Services Department is responsible for providing all benefit services to the members of the System. This includes benefit calculations, preparation of data to support applications for retirement, preparation of the retiree payroll, processing contribution transmittals, membership counseling, and retirement seminars.

The Disabilities Department is responsible for reviewing claims and medical records of the members of the System; interviewing applicants and witnesses; preparing written reports of findings and recommendations; and making presentations to the Disability Committee and the Board of Retirement regarding the disposition of cases.

The Communications Department is responsible for developing and coordinating information for members and employers through publications, newsletters, seminars, video content, social media and publishing content to the website.

Internal Operations Division

This division is comprised of the following departments: Finance, Information Technology, Information Security, Human Resources and Operations Support Services.

The Finance Department is responsible for all of the financial records and reports of OCERS. This includes the preparation of the Annual Report, monthly and quarterly financial statements and the annual operating budget. The Finance Department also maintains OCERS' system of internal controls; processes and accounts for retirement payroll and refunds of contributions and interest to members; collects and accounts for employers' and members' contributions; reconciles investment portfolios; and pays costs incurred for goods received and services rendered.

The Information Technology Department is responsible for OCERS' network systems, personal computers, mobile devices, website and databases, as well as providing programming and technical support for the Pension Administration System. In addition, this department is responsible for administering all telecommunications and audio/visual services.

The Information Security Department is responsible for overseeing the security of OCERS' data and systems with a focus on protecting members' information and the systems, which are relied on for daily operations. In addition, this department is responsible for overseeing the business continuity/disaster recovery program.

The Human Resources Department is responsible for providing human resources services including leading recruitment and on-boarding efforts, training and developing staff, supporting a high performing workforce, health and safety, maintaining intraoffice relationships, and other labor relations.

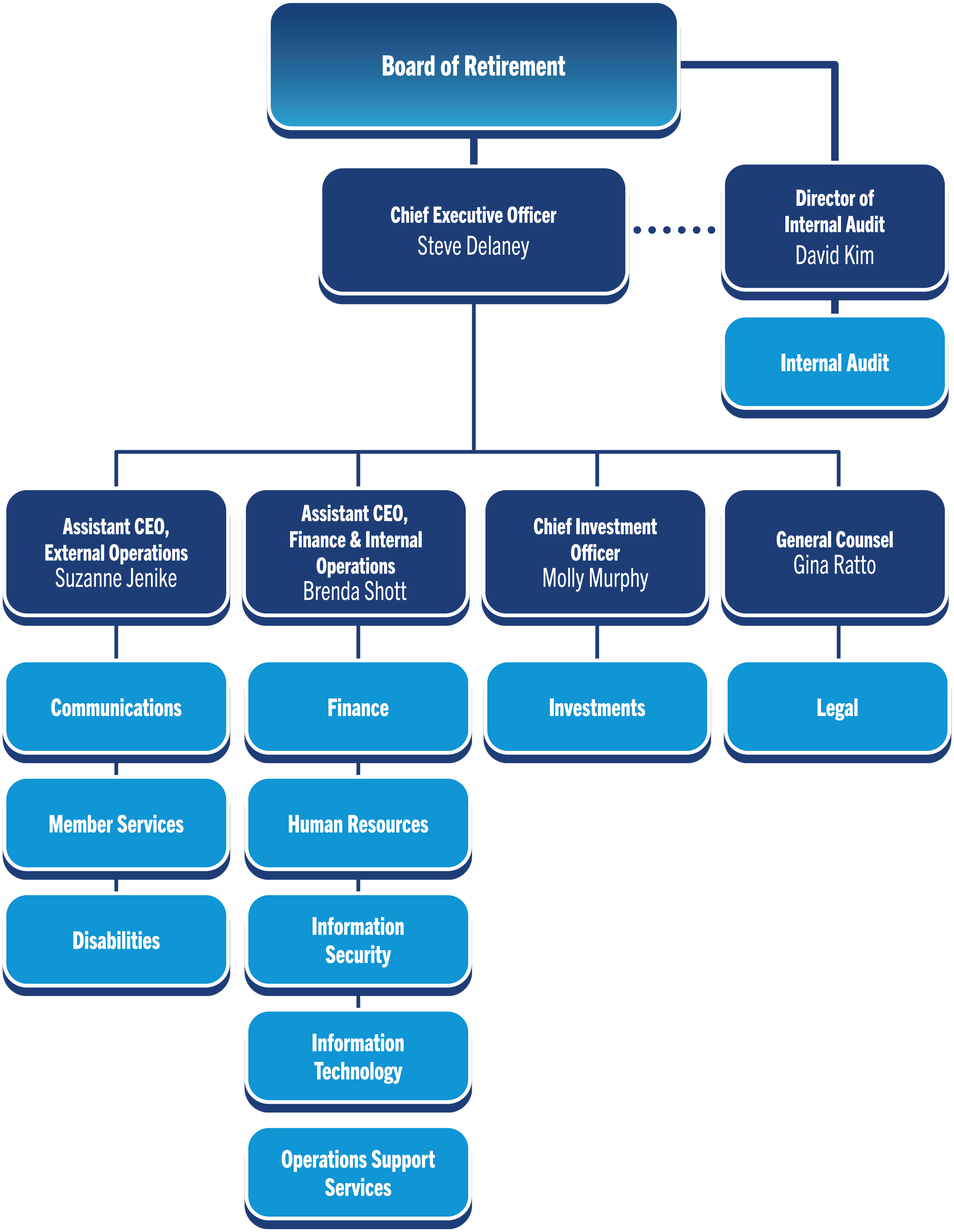
The Operations Support Services Department is responsible for procurement and contract administration, operational risk management, facilities management, building safety and security, and mailroom operations.

Legal Division

This division provides legal advice and representation to the Board of Retirement and OCERS on a wide variety of issues. Among other things, this includes issues involving pension benefits, disability retirements, investments, legislation and vendor contracts.

Administrative Organization Chart

As of December 31, 2020



List of Professional Consultants

As of December 31, 2020

Actuary

The Segal Company

Investment Consultant

Meketa Investment Group

Private Equity and Private Real Assets Consultant

Aksia TorreyCove Capital Partners LLC

Real Estate Consultant

The Townsend Group, an Aon Company

Independent Auditor

Macias Gini & O'Connell LLP

Investment Counsel

Foley and Lardner, LLP
Foster Garvey PC
K&L Gates LLP
Morgan, Lewis & Bockius LLP
Nossaman LLP

Fiduciary Counsel

Reed Smith, LLP

Tax Counsel

Reed Smith, LLP

Custodian

State Street Bank and Trust Company

Note: Schedule of Commissions, Schedule of Investment Expenses and Investment Summary and List of Investment Managers, can be found in the Investment Section on pages 89, 90 and 92, respectively.

Certificate of Achievement for Excellence in Financial Reporting

Public Pension Standards Award for Funding and Administration

Public Pension Coordinating Council

Public Pension Standards Award
For Funding and Administration
2020

Presented to

Orange County Employees Retirement System

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

Presented by the Public Pension Coordinating Council, a confederation of

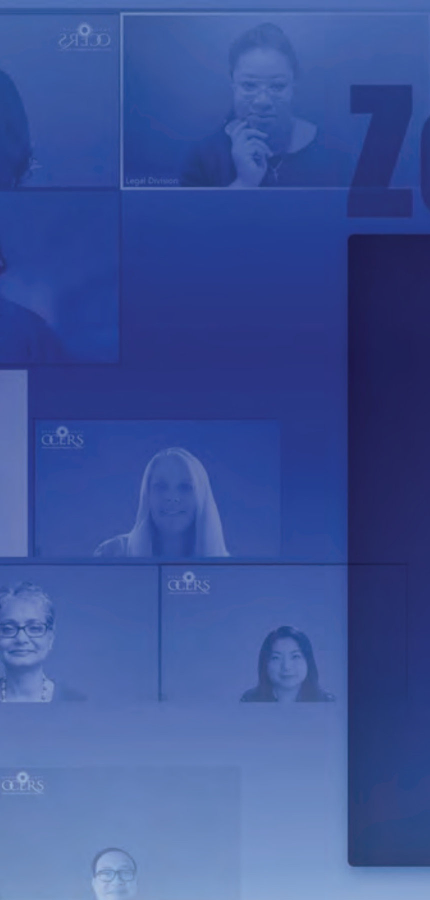
National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

Alan H. Winkle
Program Administrator

Section

FINANCIAL

New Ways of Communicating
Zoom Meetings



New Ways of Communicating

Fortunately for the OCERS team members, a new internet telephone system was implemented prior to the work from home directive. Team members were able to receive and make calls using their work phone number from their computers at home.

The new system also allowed teams to stay connected with their team members using the group chat capability and group calling.

Weekly all staff Zoom meetings kept the team members connected with the other departments and divisions, and weekly themes, such as bring your child (or pet) to work, brought levity to the meetings.

ORANGE COUNTY

OCERS

EMPLOYEES RETIREMENT SYSTEM

75TH

ANNIVERSARY 1945-2020

Independent Auditor's Report

MGO Certified Public Accountants

Independent Auditor's Report

To the Board of Retirement of the
Orange County Employees Retirement System
Santa Ana, California

Report on the Financial Statements

We have audited the accompanying financial statements of the Orange County Employees Retirement System (the System), as of and for the year ended December 31, 2020, and the related notes to the financial statements, which collectively comprise the System's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

Our responsibility is to express opinions 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 auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Orange County Employees Retirement System as of December 31, 2020, and the changes in its fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matter

As discussed in Note 8 to the basic financial statements, based on the actuarial valuation of the pension plan's total pension liability as of December 31, 2019, rolled forward to December 31, 2020, the total pension liability of participating employers exceeded the pension plan's fiduciary net position by $4.2 billion. The actuarial valuation is sensitive to the underlying assumptions, including the discount rate of 7.0 percent, which represents the long-term expected rate of return on investments.

Our opinion is not modified with respect to this matter.

Other Matters

Prior-Year Comparative Information

The financial statements include summarized prior-year comparative information. Such information does not include all of the information required to constitute a presentation in conformity with accounting principles generally accepted in the United States of America. Accordingly, such information should be read in conjunction with the System's financial statements for the year ended December 31, 2019, from which such partial information was derived.

We have previously audited the System's 2019 financial statements, and we expressed an unmodified opinion on the financial statements in our report dated June 4, 2020. In our opinion, the summarized comparative information presented herein as of and for the year ended December 31, 2019, is consistent, in all material respects, with the audited financial statements from which it has been derived.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis, the Schedule of Changes in Net Pension Liability of Participating Employers, Schedule of Investment Returns, Schedule of Employer Contributions, Notes to the Required Supplementary Information, and Significant Factors Affecting Trends in Actuarial Information – Pension Plan, 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 System's basic financial statements. The other supplementary information, introductory, investments, actuarial, statistical, and glossary sections as listed in the table of contents are presented for purposes of additional analysis and are not a required part of the basic financial statements.

Independent Auditor's Report

(continued)

The other supplementary information 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 other supplemental information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

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

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated June 4, 2021 on our consideration of the System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the System's internal control over financial reporting and compliance.

Macias Gini & O'Connell LLP

Irvine, California
June 4, 2021

Management's Discussion and Analysis

The Management's Discussion and Analysis (MD&A) of the Orange County Employees Retirement System (OCERS or System) presents the financial performance and provides a summary of OCERS' financial position and activities as of and for the year ended December 31, 2020. The narrative overview and analysis is presented in conjunction with the Letter of Transmittal, included in Section 1 – Introductory to this Comprehensive Annual Financial Report. The MD&A should be read in conjunction with OCERS' Basic Financial Statements as presented in this report. Amounts in this section have been grouped together to facilitate readability.

OCERS administers the OCERS pension plan—a cost-sharing multiple-employer defined benefit pension plan (the Plan) as well as acts as a trustee and custodian for retirement health benefit plan funds that are sponsored by participating employers. OCERS' financial information is comprised of four fiduciary funds: a defined benefit pension trust fund, two other postemployment benefit (OPEB) trust funds for retiree medical plans and a custodial fund held for the Orange County Transportation Authority (OCTA), a participating employer of OCERS.

Financial Highlights

- The net position restricted for pension, OPEB and employer as of December 31, 2020, totaled $19.3 billion, an increase of $2.2 billion or 12.7% from the prior year. The increase is primarily due to positive returns on investments during the year.

- Total additions to fiduciary net position were approximately $3.2 billion in 2020 and 2019.

  - Net investment income was approximately $2.2 billion in 2020 and 2019.The net year-to-date rate of return on investments on a fair value basis was approximately 11.4% in 2020 versus a 14.4% in 2019.

  - Contributions received from employers and employees totaled $983.3 million in 2020, a decrease of -0.7% compared to 2019 contributions received of $990.7 million primarily due to less employer contributions in the County health care fund, which decreased 23.5%, as well as a one time deferred UAAL payment received in the prior year.

- Total deductions from fiduciary net position increased $76.0 million from $961.5 million in 2019 to $1.0 billion in 2020.

  - Member pension benefit payments increased by $73.8 million or 8.3% in 2020 from $887.0 million to $960.8 million.

  - The number of retired members and beneficiaries receiving a benefit payment increased 5.4% from 18,420 payees at the end of 2019 to 19,419 payees as of December 31, 2020.

  - The average annual benefit paid to retired members and beneficiaries during 2020 was $49,480, an increase of 2.8% over the average annual benefit payment of $48,154 in 2019.

- The net pension liability of participating employers as calculated in the December 31, 2020, Governmental Accounting Standards Board (GASB) Statement No.67 Actuarial Valuation used for financial reporting purposes is $4.2 billion, which as a percentage of covered payroll is 220.67%. The plan fiduciary net position of the pension trust fund of $18.8 billion as a percentage of the total pension liability of $23.0 billion is 81.69%.

- Based upon the most recent actuarial funding valuation dated as of December 31, 2019, the funding status for the pension plan, as measured by the ratio of the actuarial value of assets (which smooths market gains and losses over five years) to the actuarial value of accrued liabilities was 73.17% versus 75.36% if market gains and losses were recognized immediately.

Overview of the Financial Statements

The following discussion and analysis serve as an introduction and overview of the OCERS' Basic Financial Statements. The Basic Financial Statements and required disclosures are prepared in accordance with accounting principles and reporting guidelines as set forth by the Governmental Accounting Standards Board (GASB). These pronouncements require OCERS to make certain disclosures and to report using the full accrual method of accounting.

OCERS' Basic Financial Statements are comprised of the following:

Statement of Fiduciary Net Position

The Statement of Fiduciary Net Position presents the major categories of assets and liabilities and their related value as of year-end. The difference between assets and liabilities is reported as "Net Position Restricted for Pension, Other Postemployment Benefits and Employer," representing funds available to pay future benefits to plan participants. The Statement of Fiduciary Net Position includes prior year-end total balances for comparative purposes. Increases and decreases in Net Position Restricted for Pension, Other Postemployment Benefits and Employer, when analyzed over time, may serve as an indicator of whether OCERS' financial position is improving or deteriorating. Other factors, such as market conditions, should also be considered when measuring the overall financial health of the System.

The County of Orange (the County) and Orange County Fire Authority (OCFA) participate in irrevocable postemployment health care plan trusts (retiree medical plans) that are reported as other postemployment benefit trust funds in the Statement of Fiduciary Net Position as separate health care funds. OCERS serves as trustee for these trusts. Assets are commingled with pension trust assets for investment purposes and are used exclusively to pay health allowances. The County and OCFA have financial reporting responsibility of the retiree medical plans, including financial statement disclosures and required supplementary information regarding the retiree medical plans funded status and contributions, in accordance with GASB Statement No.74, *Financial Reporting for Postemployment Benefit Plans Other than Pension Plans*.

The OCTA has revocable trust assets held by OCERS in an investment capacity that are reported as a separate custodial fund. The purpose of the employer's trust is to provide certain OPEB benefits to eligible retired OCTA members. Assets are not commingled with those of the pension plan and health care plan trusts.

Statement of Changes in Fiduciary Net Position

The Statement of Changes in Fiduciary Net Position provides information about the financial activities during the reporting period that increased and decreased Net Position Restricted for Pension, Other Postemployment Benefits and Employers. The trend of additions versus deductions to the Plan indicates the strength of OCERS' financial position over time. For comparative purposes, prior year-end total balances are also provided.

To distinguish the activities of the health care plan trusts from the pension plan, the health care plan trusts are also reported separately in the Statement of Changes in Fiduciary Net Position as health care funds.

Under the financial reporting provisions of GASB Statement No. 84, *Fiduciary Activities* (GASB 84), the custodial fund reported activity for additions, deductions and net position as a new statement in the Statement of Changes in Fiduciary Net Position effective as of the year ended December 31, 2019.

Notes to the Basic Financial Statements

The Notes to the Basic Financial Statements are an integral part of the basic financial statements and provide additional information that is essential to acquire a full understanding of the information provided in the two statements discussed above. The notes include further discussion and details regarding OCERS' key policies, programs, investments and activities that occurred during the year.

Required Supplementary Information

The Required Supplementary Information (RSI) presents historical trend information related to the pension plan reported in the Basic Financial Statements. The pension plan includes a schedule of changes in net pension liability, a schedule of investment returns, a schedule of employer contributions and other required supplementary information as required by GASB Statement No.67, *Financial Reporting for Pension Plans – an Amendment of GASB Statement No. 25* (GASB 67). The information contained in the schedules is based on the actuarial valuation prepared for the pension plan and includes additional actuarial information that contributes to the understanding of the changes in the net pension liability of participating employers in the pension plan. The actuarial information is based upon assumptions made regarding future events at the time the valuation was performed. Therefore, the amounts presented in the schedules are management's estimates. A summary of factors that affected the trends of the actuarial information is included in this section as well.

Other Supplementary Information

The Other Supplementary Information includes schedules pertaining to contributions by employers and members, OCERS' administrative expenses, investment expenses, and professional services.

Financial Analysis

Tables 1 and 2 compare and summarize OCERS' financial activity for the current and prior years.

Table 1 : Fiduciary Net Position

As of December 31, 2020 and 2019
(Dollars in Thousands)

	12/31/2020	12/31/2019	Increase / (Decrease)	Percentage Change
Assets				
Cash and Cash Equivalents	$ 482,766	$ 425,804	$ 56,962	13.4%
Securities Lending Collateral	239,640	197,095	42,545	21.6%
Receivables	128,148	392,106	(263,958)	-67.3%
Investments at Fair Value	19,166,893	16,942,195	2,224,698	13.1%
Capital Assets, Net	13,713	16,060	(2,347)	-14.6%
Total Assets	**20,031,160**	**17,973,260**	**2,057,900**	**11.4%**
Liabilities				
Obligations Under Securities Lending Program	239,640	197,095	42,545	21.6%
Securities Purchased	118,326	309,015	(190,689)	-61.7%
Other	398,595	358,766	39,829	11.1%
Total Liabilities	**756,561**	**864,876**	**(108,315)**	**-12.5%**
Net Position Restricted for Pension, Other Postemployment Benefits and Employer	**$ 19,274,599**	**$ 17,108,384**	**$ 2,166,215**	**12.7%**

As of December 31, 2020, OCERS has a net position of $19.3 billion restricted for pension, other postemployment benefits and employer. Net position increased $2.2 billion, an increase of 12.7% over 2019. The increase in net position includes an increase in total assets of $2.1 billion and a decrease in total liabilities of $108.3 million.

The increase in total assets is primarily attributed to a $2.2 billion increase in total investments at fair value, a $57.0 million increase in cash and cash equivalents and a $42.5 million increase in securities lending collateral. The increase in investments at fair value can be attributed to increases in net appreciation of investments at fair value, earnings from interest and dividends and the investment of proceeds received from prepaid employer contributions. The increase in cash and cash equivalents is due to timing of investing redemptions, distributions, and contributions received near year-end. Securities lending collateral increased $42.5 million due to an increase in lending activity in the securities lending program.

The increase in total assets is offset by a decrease in receivables of $264.0 million. The decrease is primarily related to investment receivables and the timing of investments for unsettled trades.

Management's Discussion and Analysis

(continued)

The decrease in total liabilities of $108.3 million includes a decrease in the timing of unsettled security purchases of $190.7 million. This decrease was offset by an increase in the obligations under the securities lending program of $42.5 million, which is directly related to the increase in securities lending collateral as previously discussed. Other liabilities, which includes unearned contributions from prepaid employer contributions, foreign currency forward contracts, retiree payroll payables and other miscellaneous liabilities, such as investment manager fees, had an overall net increase of $39.8 million, primarily due to the receipt of larger prepaid employer contributions compared to the prior year.

Table 2 : Changes in Fiduciary Net Position

For the Years Ended December 31, 2020 and 2019

(Dollars in Thousands)

	12/31/2020	12/31/2019	Increase / (Decrease)	Percentage Change
Additions				
Employer Pension Contributions	$ 659,807	$ 653,793	$ 6,014	0.9%
Employer Health Care Contributions	43,535	56,899	(13,364)	-23.5%
Employee Pension Contributions	279,384	279,373	11	0.0%
Employer OPEB Contributions	613	613	-	0.0%
Net Investment Income/(Loss)	2,220,401	2,235,897	(15,496)	-0.7%
Total Additions	**3,203,740**	**3,226,575**	**(22,835)**	**-0.7%**
Deductions				
Participant Benefits - Pension	960,846	887,003	73,843	8.3%
Participant Benefits - Health Care	42,323	40,030	2,293	5.7%
Death Benefits	932	650	282	43.4%
Member Withdrawals and Refunds	11,547	13,249	(1,702)	-12.8%
Employer OPEB Payments	1,383	1,318	65	4.9%
Administrative Expenses - Pension	20,428	19,171	1,257	6.6%
Administrative Expenses - Health Care and Employer	66	61	5	8.2%
Total Deductions	**1,037,525**	**961,482**	**76,043**	**7.9%**
Increase/(Decrease) in Net Position Restricted for Pension, Other Postemployment Benefits and Employer	2,166,215	2,265,093	(98,878)	-4.4%
Net Position Restricted for Pension, Other Postemployment Benefits and Employer				
Beginning of the Year	17,108,384	14,843,291		
End of the Year	**$ 19,274,599**	**$ 17,108,384**		

Management's Discussion and Analysis

(continued)

Additions to Fiduciary Net Position

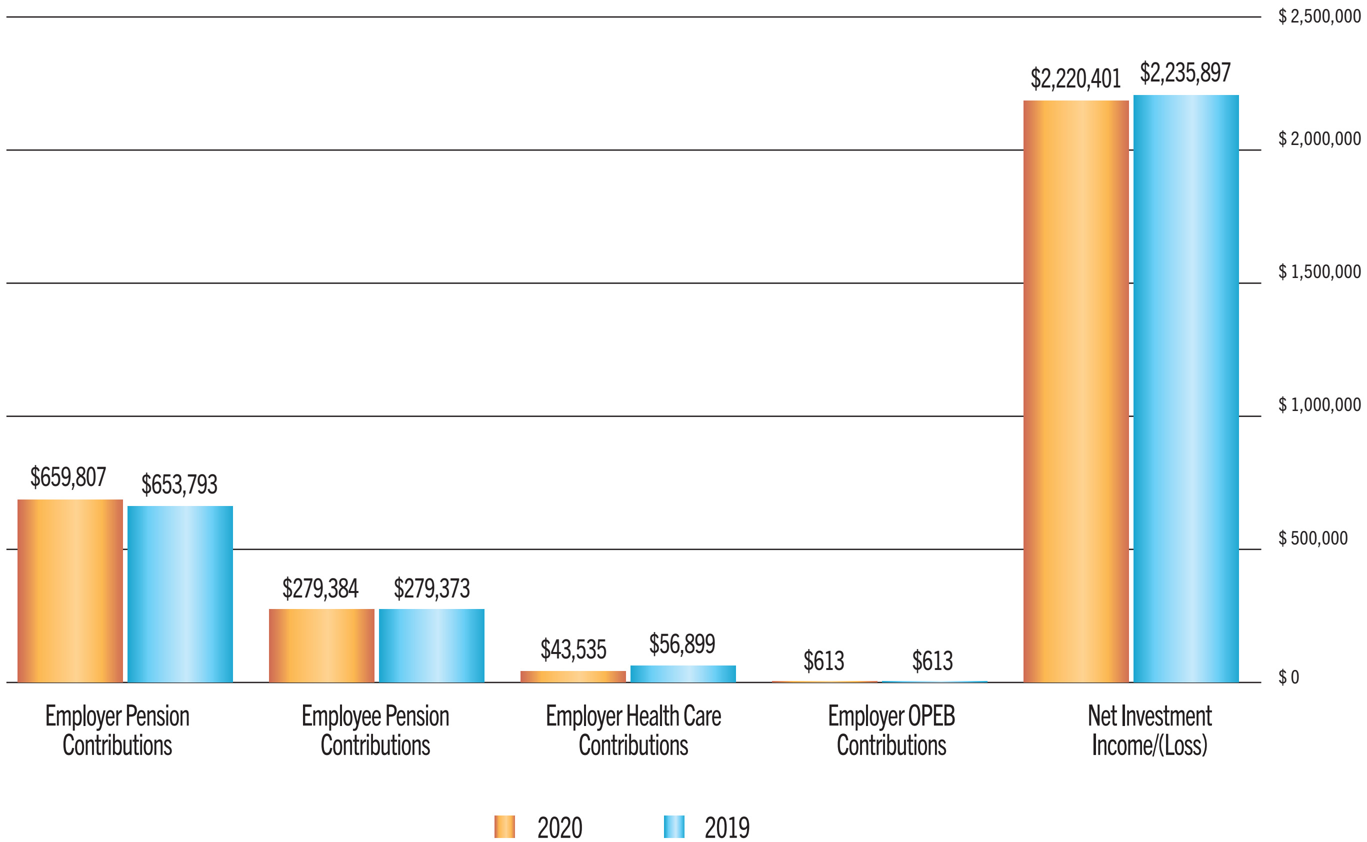
The primary funding sources of pension benefits are the collection of participating employer and member contributions and earnings on investments, net of investment expenses. Total additions for the year ended December 31, 2020 were $3.2 billion and slightly less than additions for the year ended December 31, 2019; the total decrease of -0.7%, or $22.8 million, is comprised of a decrease in investment income of $15.5 million and a net decrease in total contributions of $7.3 million.

Overall net investment returns for the year ended December 31, 2020 were 11.4% compared to 14.4% in 2019. Private equity and core fixed income were the only investment classifications that reported higher returns compared to the prior year, partly due to the increase in the number of new investment managers added to the private equity asset class. Private equity had a net return of 16.2% versus 10.9% in 2019. Core fixed income had a net return of 9.1% compared to 8.8% in 2019.

Total employer and employee pension contributions continued to rise due to increases in the average employer and employee contribution rates and increases in employee salaries. These increases were offset by a decrease in active employees participating in the plan due to the County Volunteer Incentive Program, which was offered by County of Orange to manage revenue reductions that occurred as a result of the COVID-19 pandemic and offered an incentive to separate from active employment to eligible employees. This led to a decrease of 4% in active members for the County of Orange in 2020. Employer health care contributions decreased due to less employer contributions received in the County health care fund.

Additions to Fiduciary Net Position

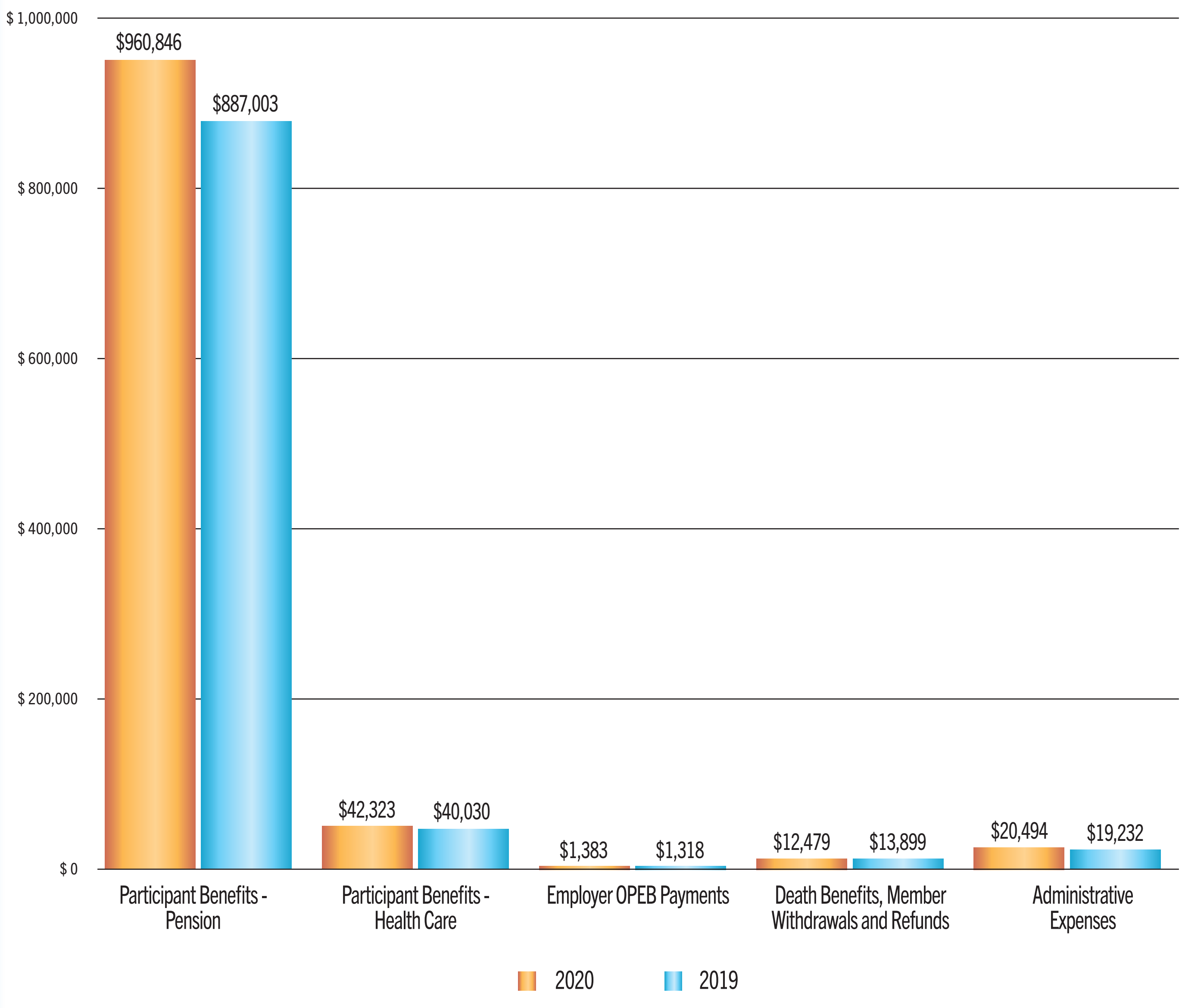
(Dollars in Thousands)



Deductions from Fiduciary Net Position

The costs associated with the System include payments of benefits to members and their beneficiaries, refunds of contributions to terminated members and the costs of administering the plan. Deductions from fiduciary net position increased $76.0 million or 7.9% compared to the prior year, primarily due to the continued and anticipated growth in member pension benefit payments, both in the total number of OCERS' retired members receiving a pension benefit and the average benefit received. Participant benefit payments for pension and health care have increased by $73.8 million and $2.3 million, respectively. Total benefit recipients increased by 999, from 18,420 to 19,419. The average annual pension benefit increased from $48,154 to $49,480.

Deductions from Fiduciary Net Position
(Dollars in Thousands)



OCERS Membership

The table below provides comparative OCERS' membership data for the last two years.

Table 3 : Membership Data
As of December 31, 2020 and 2019

	12/31/2020	12/31/2019	Increase/ (Decrease)	Percentage Change
Active Members	21,559	22,257	(698)	-3.1%
Retired Members	19,419	18,420	999	5.4%
Deferred Members	6,818	6,520	298	4.6%
Total Membership	**47,796**	**47,197**	**599**	1.3%

Total OCERS' membership increased during 2020 by 599 members. The number of active members decreased by 698 or -3.1% and the number of retirees increased by 999 or 5.4%, which can be attributed to the County of Orange offering eligible employees a voluntary separation and retirement incentive program in the fall of 2020; over 500 active employees accepted the offer to separate or retire and the vacated positions will be eliminated for at least one year.

Actuarial Valuations

In order to determine whether Net Position Restricted for Pension Benefits will be sufficient to meet future obligations, a calculation of the actuarial funded status is required. An actuarial valuation includes an appraisal of both the assets available to pay future benefits and the liabilities of the System, which represent the actuarial present value of all future benefits expected to be paid for each member. The purpose of the valuation is to determine the amount of future contributions by the employees and employers, which will be required to pay all expected future benefits. OCERS utilizes an independent actuarial firm, The Segal Company (Segal), to prepare an annual valuation. The most recent Annual Actuarial Valuation as of December 31, 2019 is included in the Actuarial Section of this report, and contains a detailed discussion of the funding requirements. This valuation is used for funding purposes and establishing employer and employee contribution rates. Segal also prepared a Governmental Accounting Standards Board (GASB) Statement No.67 Actuarial Valuation as of December 31, 2020, used for financial reporting purposes.

In order to prepare the valuations, the actuary must use several assumptions with regards to OCERS' members such as their life expectancy, projected salary increases over time, and the age at which members will retire. The actuary must also utilize assumptions with regards to how the assets will perform over time. All assumptions used by the actuary are reviewed and adjusted, as required, on a triennial basis and adopted by the Board of Retirement. The most recent triennial study was adopted by the Board on August 17, 2020, for the three-year experience period ended December 31, 2019. As a result, the following assumptions will be changed as of the December 31, 2020 valuation: inflation lowered from 2.75% to 2.50 (retiree cost-of-living assumption maintained at 2.75%); active member payroll increases lowered from 3.25% to 3.00%; and projected salary increases for general members lowered from a range of 4.25% to 12.25% to a range of 4.00% to 11.00% and for safety members, the range was changed from 4.75% to 17.25% to 4.60% to 15.00%. In addition, mortality rates will apply Pub-2010 Benefit-Weighted mortality tables as a starting point ("base table"), projected generationally using the two-dimensional Scale MP-2019, with adjustments to reflect mortality trends specific to OCERS.

The GASB 67 valuation provides the calculation of the employers' pension liability. In order to accommodate the annual reporting requirements of our employers in a timely manner, the valuation was prepared using the December 31, 2019 valuation as the basis for calculating the total pension liability (TPL) and rolled forward to December 31, 2020. Based on this actuarial valuation, the TPL was $23.0 billion compared to a fiduciary net position of $18.8 billion, resulting in the employers' net pension liability (NPL) of $4.2 billion and a fiduciary net position as a percentage of the TPL of 81.69%. The NPL as a percentage of covered payroll was 220.67%.

In the actuarial funding valuation for the pension plan as of December 31, 2019, the funding ratio of the valuation value of assets to actuarial accrued liabilities was 73.17%. The calculation of funding status takes into account OCERS' policy to smooth the impact of market volatility by spreading each year's gains or losses over five years. Using the market value of assets as of the valuation date, the funded status of OCERS' pension plan was 75.36% in 2019.

Investment Summary

OCERS' portfolio returned 11.4% net of fees for calendar year 2020, outperforming its total plan benchmark of 10.1%. The OCERS portfolio ended 2020 with a fair value of $19.3 billion, up from $17.1 billion at the end of 2019. The 11.4% net of fees return also outpaced OCERS' actuarial assumed rate of return of 7.0%. Over the trailing three years, five years, and ten years, OCERS has returned 7.8%, 9.3%, and 7.4% annualized net of fees, respectively.

OCERS' Investment Committee approved a new asset allocation policy in April 2020. The new asset allocation included an increase to public equity from 35% to 47% and to private equity from 10% to 13%. Fixed income was reduced from 17% to 11%. Credit was reduced from 11% to 7%. Real assets were reduced from 17% to 12%. OCERS plans to implement the asset allocation changes over 18 months. OCERS did rebalance a large portion of fixed income into equity markets before the fourth quarter 2020 equity rally that benefitted 2020 overall performance.

Global public equities led the way in performance in 2020 after a roller coaster year. Once the COVID-19 pandemic started spreading across the world, economies began shutting down causing global public equities to plummet early in 2020. At the end of the first quarter, OCERS' global equity portfolio was down 22.1%. However, equities rallied the rest of the year, especially during the fourth quarter after the vaccines were approved. OCERS' global equity portfolio finished 2020 up 19.1%. The global equity portfolio enjoyed a 16.1% gain in the fourth quarter alone. OCERS' emerging market equity portfolio returned 24.6% for the year. U.S. small cap stocks outperformed U.S. large cap stocks. OCERS' U.S. small cap equity portfolio gained 29.3% for the year, and the U.S. large cap equity portfolio earned 21.0%. OCERS' international equity portfolio lagged the U.S. but still gained 11.3% in 2020.

Fixed income markets also enjoyed a strong 2020 as the 10-year Treasury yields declined from 1.92% to 0.92% during the year. OCERS' core fixed income portfolio returned 9.1% for the year. Long-term Treasuries performed even better. OCERS' U.S. Long Treasury portfolio returned 18.2% in 2020 within the risk mitigation asset class.

It is customary to report private market performance on a quarterly lag. Therefore, OCERS' year-end performance will reflect returns as of the end of the third quarter for many private equity, private credit, and private real asset managers. OCERS' private equity portfolio returned 16.2% in 2020. OCERS' real estate portfolio gained 0.4% for the year as COVID-19 impacted several real estate sectors. OCERS' energy portfolio was a drag on performance as the demand for energy across the world dropped severely due to COVID-19 restrictions.

Request for Financial Information

This Comprehensive Annual Financial Report is designed to provide the Board of Retirement, plan members, participating employers, taxpayers, investment managers and other interested parties with a general overview of OCERS' financial condition and to demonstrate OCERS' accountability for the funds under its stewardship.

Please address any questions about this report or requests for additional information to:

Orange County Employees Retirement System
2223 East Wellington Avenue, Suite 100
Santa Ana, CA 92701

Section

FINANCIAL

BASIC FINANCIAL STATEMENTS

Weddings and Babies

As the global pandemic surged, couples planning weddings had to retool their idea of the perfect wedding day. A large wedding celebration surrounded by family and friends was postponed or canceled, or possibly replaced with a small socially distanced backyard wedding.

Couples getting married at the court house were allowed one witness, and no guests.

The pandemic could not stop babies from being born, but new parents had to protect themselves and their baby from the virus. Hospitals allowed no visitors.

After the baby and parents arrived at home, grandparents and other family members needed to be creative to meet the newest member of their family, such as viewing through glass, quarantining or getting tested for the virus before a visit, or social distancing outside.

Statement of Fiduciary Net Position

As of December 31, 2020
(with summarized comparative amounts as of December 31, 2019)
(Dollars in Thousands)

	Pension Trust Fund	Health Care Fund-County	Health Care Fund-OCFA	Custodial Fund - OCTA	Total Funds	Comparative Totals 2019
Assets						
Cash and Short-Term Investments						
Cash and Cash Equivalents	$ 470,884	$ 10,345	$ 1,053	$ 484	$ 482,766	$ 425,804
Securities Lending Collateral	233,977	5,140	523	-	239,640	197,095
Total Cash and Short-Term Investments	704,861	15,485	1,576	484	722,406	622,899
Receivables						
Investment Income	19,345	425	43	-	19,813	18,497
Securities Sales	87,866	1,930	196	-	89,992	343,910
Contributions	13,354	-	-	-	13,354	24,104
Foreign Currency Forward Contracts	542	12	1	-	555	526
Other Receivables	4,329	95	10	-	4,434	5,069
Total Receivables	125,436	2,462	250	-	128,148	392,106
Investments at Fair Value						
Global Public Equity	8,757,111	192,387	19,579	12,966	8,982,043	6,771,063
Private Equity	2,298,129	50,488	5,138	-	2,353,755	1,735,878
Core Fixed Income	2,319,111	50,949	5,185	6,129	2,381,374	2,861,107
Credit	1,508,921	33,150	3,374	-	1,545,445	1,612,909
Real Assets	2,017,034	44,313	4,510	-	2,065,857	2,252,709
Risk Mitigation	1,740,526	38,238	3,892	-	1,782,656	1,707,562
Absolute Return	469	10	1	-	480	967
Unique Strategies	53,976	1,186	121	-	55,283	-
Total Investments at Fair Value	18,695,277	410,721	41,800	19,095	19,166,893	16,942,195
Capital Assets, Net	13,713	-	-	-	13,713	16,060
Total Assets	**19,539,287**	**428,668**	**43,626**	**19,579**	**20,031,160**	**17,973,260**
Liabilities						
Obligations Under Securities Lending Program	233,977	5,140	523	-	239,640	197,095
Securities Purchased	115,530	2,538	258	-	118,326	309,015
Unearned Contributions	293,948	-	-	-	293,948	259,285
Foreign Currency Forward Contracts	362	8	1	-	371	200
Retiree Payroll Payable	80,841	4,740	847	-	86,428	77,803
Other	17,426	383	39	-	17,848	21,478
Total Liabilities	**742,084**	**12,809**	**1,668**	**-**	**756,561**	**864,876**
Net Position Restricted for Pension, Other Postemployment Benefits and Employer	**$18,797,203**	**$ 415,859**	**$ 41,958**	**$ 19,579**	**$19,274,599**	**$ 17,108,384**

The accompanying notes are an integral part of these financial statements.

Statement of Changes in Fiduciary Net Position

For the Year Ended December 31, 2020
(with summarized comparative amounts for the Year Ended December 31, 2019)
(Dollars in Thousands)

	Pension Trust Fund	Health Care Fund-County	Health Care Fund-OCFA	Custodial Fund - OCTA	Total Funds	Comparative Totals 2019
Additions						
Contributions						
Employer	$ 659,807	$ 41,559	$ 1,976	$ -	$ 703,342	$ 710,692
Employee	279,384	-	-	-	279,384	279,373
Employer OPEB Contributions	-	-	-	613	613	613
Total Contributions	939,191	41,559	1,976	613	983,339	990,678
Investment Income						
Net Appreciation in Fair Value of Investments	2,045,211	37,913	3,856	2,352	2,089,332	1,996,226
Dividends, Interest, & Other Investment Income	232,941	5,118	521	1	238,581	347,440
Securities Lending Income						
Gross Earnings	1,728	38	4	-	1,770	7,707
Less: Borrower Rebates and Bank Charges	(883)	(19)	(2)	-	(904)	(6,537)
Net Securities Lending Income	845	19	2	-	866	1,170
Total Investment Income	2,278,997	43,050	4,379	2,353	2,328,779	2,344,836
Investment Fees and Expenses	(105,813)	(2,325)	(237)	(3)	(108,378)	(108,939)
Net Investment Income	2,173,184	40,725	4,142	2,350	2,220,401	2,235,897
Total Additions	**3,112,375**	**82,284**	**6,118**	**2,963**	**3,203,740**	**3,226,575**
Deductions						
Participant Benefits	960,846	36,784	5,539	-	1,003,169	927,033
Death Benefits	932	-	-	-	932	650
Member Withdrawals and Refunds	11,547	-	-	-	11,547	13,249
Employer OPEB Payments	-	-	-	1,383	1,383	1,318
Administrative Expenses	20,428	22	22	22	20,494	19,232
Total Deductions	**993,753**	**36,806**	**5,561**	**1,405**	**1,037,525**	**961,482**
Net Increase	2,118,622	45,478	557	1,558	2,166,215	2,265,093
Net Position Restricted For Pension, Other Postemployment Benefits and Employer, Beginning of Year	16,678,581	370,381	41,401	18,021	17,108,384	14,843,291
Ending Net Position Restricted For Pension, Other Postemployment Benefits and Employer	**$ 18,797,203**	**$ 415,859**	**$ 41,958**	**$ 19,579**	**$ 19,274,599**	**$ 17,108,384**

The accompanying notes are an integral part of these financial statements.

Notes to the Basic Financial Statements

NOTE 1 : Plan Descriptions

The Orange County Employees Retirement System (OCERS or System) was established in 1945 under the provisions of the County Employees Retirement Law of 1937 (CERL). OCERS is governed by a ten-member Board of Retirement, nine voting members and one alternate member. Board membership consists of four members appointed by the County of Orange Board of Supervisors, five members elected by the members of the System, including an alternate, two by the general members, one by the safety members, and one by the retired members. Safety members elect the alternate member. The County of Orange Treasurer Tax-Collector, elected by the voters registered in the County, serves as an Ex-Officio member.

OCERS operates as a cost-sharing multiple-employer defined benefit pension plan for the County of Orange, Orange County Superior Court of California, City of San Juan Capistrano, and ten special districts: Orange County Cemetery District, Children and Families Commission of Orange County, Orange County Employees Retirement System, Orange County Fire Authority, Orange County In-Home Supportive Services Public Authority, Orange County Local Agency Formation Commission (LAFCO), Orange County Public Law Library, Orange County Sanitation District, Orange County Transportation Authority and Transportation Corridor Agencies. Capistrano Beach Sanitary District, Cypress Recreation & Parks District, Orange County Mosquito and Vector Control District, City of Rancho Santa Margarita, the Orange County Department of Education and the University of California, Irvine Medical Center and Campus are no longer active employers, but retired members and their beneficiaries, as well as deferred members, remain in the System. OCERS is legally and fiscally independent of the County of Orange.

Pension Plan Membership

OCERS provides retirement, disability and death benefits to general and safety members. Safety membership includes those members serving in active law enforcement, fire suppression and as probation officers. General membership applies to all other occupations. Plan retirement benefits are tiered based upon date of OCERS membership. Tier I members were hired prior to September 21, 1979 and use their highest one-year average salary to determine their retirement allowance while Tier II members were hired on or after September 21, 1979 and use their highest three-year average salary to determine their retirement allowance. All Public Employees Pension Reform Act (PEPRA) members hired on or after January 1, 2013 are Tier II and use their highest three-year average salary to determine their retirement allowance. Member rate groups are determined by employer, bargaining unit, and benefit plan (a description of the benefit plans can be found under Member Retirement Benefits). The benefit plan represents the benefit formula and tier that will be used in calculating a retirement benefit. All regular employees scheduled to work 20 hours or more per week become members of the plan upon commencing employment with one of OCERS' employers, with the exception of a provision adopted in 2014 that allows new members over the age of 60 to opt out of the plan if their employer has implemented the provision. Active members are categorized as vested in the table below upon accumulating five years of accredited service or attaining the age of 70. Additional information regarding the pension plan's benefit structure is included in the Summary Plan Description that is available on the web at **https://www.ocers.org/summary-plan-description.**

The following table is a summary of OCERS' general and safety membership as of December 31, 2020, consisting of active members, retired members or their beneficiaries, and deferred members who have terminated, but are not yet receiving benefits (further information regarding benefit eligibility for deferred members is described under the Deferred Members Benefits section):

NOTE 1 : Plan Descriptions (continued)

OCERS Membership - General Members

As of December 31, 2020

Rate Group	Benefit Plan	Tier	Active Vested	Active Non-Vested	Retired Members & Beneficiaries	Deferred Members	Total
1	A	I	-	-	326	1	327
1	B	II	626	2	489	285	1,402
1	U	II-PEPRA	333	569	6	327	1,235
Rate Group 1 Total			**959**	**571**	**821**	**613**	**2,964**
2	A	I	-	-	2,773	9	2,782
2	B	II	-	-	1,905	640	2,545
2	I	I	14	-	1,140	-	1,154
2	J	II	7,965	117	6,766	2,310	17,158
2	P	II	167	9	10	90	276
2	S	II	10	6	1	5	22
2	T	II-PEPRA Compliant	1,433	3,850	6	1,454	6,743
2	U	II-PEPRA	79	194	1	61	335
2	W	II-PEPRA Alternative	-	1	-	-	1
Rate Group 2 Total			**9,668**	**4,177**	**12,602**	**4,569**	**31,016**
3	A	I	-	-	79	1	80
3	B	II	39	13	63	44	159
3	G	I	-	-	30	-	30
3	H	II	292	-	365	52	709
3	U	II-PEPRA	67	207	2	39	315
Rate Group 3 Total			**398**	**220**	**539**	**136**	**1,293**
4	H	II	-	-	1	-	1
Rate Group 4 Total			**-**	**-**	**1**	**-**	**1**
5	A	I	1	-	370	3	374
5	B	II	879	17	1,117	515	2,528
5	U	II-PEPRA	30	395	2	132	559
Rate Group 5 Total			**910**	**412**	**1,489**	**650**	**3,461**
9	A	I	-	-	4	-	4
9	B	II	-	-	10	12	22
9	N	II	25	1	43	41	110
9	U	II-PEPRA	11	17	1	19	48
Rate Group 9 Total			**36**	**18**	**58**	**72**	**184**
10	A	I	-	-	7	-	7
10	B	II	-	-	40	8	48
10	I	I	-	-	16	-	16
10	J	II	105	-	144	89	338
10	N	II	23	19	2	18	62
10	U	II-PEPRA	35	143	2	119	299
Rate Group 10 Total			**163**	**162**	**211**	**234**	**770**
11	A	I	-	-	3	-	3
11	B	II	-	-	3	-	3
11	N	II	15	-	6	2	23
11	U	II-PEPRA	2	8	-	1	11
Rate Group 11 Total			**17**	**8**	**12**	**3**	**40**
12	A	I	-	-	2	-	2
12	B	II	-	-	3	1	4
12	H	II	12	-	7	2	21
12	U	II-PEPRA	1	1	-	-	2
Rate Group 12 Total			**13**	**1**	**12**	**3**	**29**
Total General Members			12,164	5,569	15,745	6,280	39,758

Notes to the Basic Financial Statements

NOTE 1 : Plan Descriptions (continued)

OCERS Membership - Safety Members

As of December 31, 2020

Rate Group	Benefit Plan	Tier	Active Vested	Active Non-Vested	Retired Members & Beneficiaries	Deferred Members	Total
6	C	I	-	-	86	-	86
6	D	II	-	-	45	34	79
6	E	I	-	-	45	-	45
6	F	II	601	4	324	171	1,100
6	V	II-PEPRA	11	63	0	13	87
Rate Group 6 Total			**612**	**67**	**500**	**218**	**1,397**
7	C	I	-	-	452	-	452
7	D	II	-	-	271	39	310
7	E	I	-	-	280	-	280
7	F	II	919	-	1,337	94	2,350
7	R	II	370	17	5	35	427
7	V	II-PEPRA	199	510	7	41	757
Rate Group 7 Total			**1,488**	**527**	**2,352**	**209**	**4,576**
8	C	I	-	-	27	-	27
8	D	II	-	-	69	4	73
8	E	I	-	-	16	-	16
8	F	II	619	1	707	45	1,372
8	R	II	38	122	1	7	168
8	V	II-PEPRA	81	271	2	55	409
Rate Group 8 Total			**738**	**394**	**822**	**111**	**2,065**
Total Safety Members			**2,838**	**988**	**3,674**	**538**	**8,038**
Grand Total			**15,002**	**6,557**	**19,419**	**6,818**	**47,796**

Member Retirement Benefits

Members are entitled to receive a retirement allowance with ten or more years of service credit beginning at age 50 (5 years of service and age 52 for General PEPRA plans and 5 years of service and age 50 for Safety PEPRA, for all plans except those identified as PEPRA compliant and PEPRA alternative), at any age with thirty years of service credit (twenty years of service credit for safety members), or if a part-time employee at age 55 or older with five or more years of service credit and at least ten years of active employment with a sponsoring agency covered by OCERS. Members attaining age 70 are eligible to retire regardless of credited service. Benefits received are determined by plan formula, age, years of service and final average salary (see Section 2, Notes to the Required Supplementary Information, for any changes in benefit terms). Member rate groups and benefit plans as of December 31, 2020, are as follows:

Notes to the Basic Financial Statements

NOTE 1 : Plan Descriptions (continued)

Rate Groups and Benefit Plans

As of December 31, 2020

Rate Group	Plan Type	Benefit Plan	Benefit Formula per Year of Service	Sponsoring Agencies
#1	General	A	2.0% @ 57	County of Orange and OC In-Home Supportive Services Public Authority (OC Department of Education, UCI Medical Center and Campus, Capistrano Beach Sanitary District, Cypress Recreation & Parks District, and OC Mosquito and Vector Control District are no longer active employers)
		B	1.67% @ 57.5	
		U	2.5% @ 67 PEPRA	
#2	General	A	2.0% @ 57	County of Orange; City of San Juan Capistrano; Orange County LAFCO; OCERS; Orange County Superior Court of California; and Children and Families Commission of Orange County
		B	1.67% @ 57.5	
		I	2.7% @ 55	
		J	2.7% @ 55	
		P	1.62% @ 65	
		S	2.0% @ 57	
		T	1.62% @ 65 PEPRA Compliant	
		U	2.5% @ 67 PEPRA	
		W	1.62% @ 65 PEPRA Alternative	
#3	General	A	2.0% @ 57	OC Sanitation District
		B	1.67% @ 57.5	
		G	2.5% @ 55	
		H	2.5% @ 55	
		U	2.5% @ 67 PEPRA	
#4	General	H	2.5% @ 55	City of Rancho Santa Margarita (no longer an active employer)
#5	General	A	2.0% @ 57	OC Transportation Authority
		B	1.67% @ 57.5	
		U	2.5% @ 67 PEPRA	
#6	Safety	C	2.0% @ 50	County of Orange (Probation)
		D	2.0% @ 50	
		E	3.0% @ 50	
		F	3.0% @ 50	
		V	2.7% @ 57 PEPRA	
#7	Safety	C	2.0% @ 50	County of Orange (Law Enforcement)
		D	2.0% @ 50	
		E	3.0% @ 50	
		F	3.0% @ 50	
		R	3.0% @ 50	
		V	2.7% @ 57 PEPRA	
#8	Safety	C	2.0% @ 50	OC Fire Authority
		D	2.0% @ 50	
		E	3.0% @ 50	
		F	3.0% @ 50	
		R	3.0% @ 50	
		V	2.7% @ 57 PEPRA	

Notes to the Basic Financial Statements

NOTE 1 : Plan Descriptions (continued)

Rate Groups and Benefit Plans (continued)

As of December 31, 2020

Rate Group	Plan Type	Benefit Plan	Benefit Formula per Year of Service	Sponsoring Agencies
#9	General	A	2.0% @ 57	Transportation Corridor Agencies
		B	1.67% @ 57.5	
		N	2.0% @ 55	
		U	2.5% @ 67 PEPRA	
#10	General	A	2.0% @ 57	OC Fire Authority
		B	1.67% @ 57.5	
		I	2.7% @ 55	
		J	2.7% @ 55	
		N	2.0% @ 55	
		U	2.5% @ 67 PEPRA	
#11	General	A	2.0% @ 57	OC Cemetery District
		B	1.67% @ 57.5	
		N	2.0% @ 55	
		U	2.5% @ 67 PEPRA	
#12	General	A	2.0% @ 57	OC Law Library
		B	1.67% @ 57.5	
		H	2.5% @ 55	
		U	2.5% @ 67 PEPRA	

Public Employees Pension Reform Act (PEPRA)

During 2012, the Public Employees Pension Reform Act (PEPRA) was signed into law, resulting in the creation of three new benefit formulas for employees entering OCERS on or after January 1, 2013: 1.62% @ 65 PEPRA - General; 2.5% @ 67 PEPRA - General; and 2.7% @ 57 PEPRA – Safety. New plan provisions include a cap on pensionable compensation at 120% of the social security taxable wage base limit, three year final average salary, and new cost-sharing requirements by members to pay at least 50% of the total normal cost of the plan.

Deferred Member Benefits

If a member terminates employment with a participating employer, the member is entitled to withdraw the employee contributions made, together with accumulated interest, unless the member enters a reciprocal retirement system within 180 days and leaves their accumulated contributions on deposit with OCERS and receives a deferred retirement allowance when eligible. There are different deferred retirement eligibility requirements for members with less than five years of service when terminating and leaving funds on deposit. It is possible for these members to earn a deferred retirement allowance upon attaining the age of 70, or upon accumulating reciprocal service. Members who terminate employment with a participating employer, and defer with five or more years of service may become eligible for a service retirement allowance when they would have accrued ten years of service and attain the age of 50 or greater (5 years of service and age 52 for PEPRA).

Disability Benefits

Members found by the Board of Retirement to be permanently incapacitated from the performance of their job are eligible for disability retirement benefits. A disability retirement benefit may either be service-connected or non-service-connected. Members applying for non-service-connected disability must have five or more years of eligible service credit. There are no service credit requirements for members applying for service-connected disability benefits, but the disabling condition must be a result of injury or disease arising out of or in the course of the member's employment.

Death Benefits

Death benefits are payable to eligible beneficiaries of OCERS members. Eligible beneficiaries of retired members may receive a percentage of a deceased member's retirement allowance based upon the retirement option selected by the member at the time of retirement. The beneficiary of a retired member will also receive a $1,000 burial benefit.

Survivor benefits for members who die prior to retirement are dependent upon a number of factors including whether or not the member was eligible for a service retirement or disability retirement at the time of death, and whether the death was job related. The eligible beneficiary of a member who is not eligible for service retirement or disability retirement is eligible to receive the member's accumulated contributions plus one month's salary for each year of creditable service, subject to a maximum of six month's salary. The eligible beneficiary of a member who is entitled to receive a service retirement or disability retirement, in lieu of the benefit described above, may elect to receive a monthly retirement allowance equal to 60% of the monthly allowance the member would have received for a non-service connected disability as of the day after the date of death, or a monthly allowance equal to the higher of 50% of the member's monthly compensation and service retirement allowance if the death was found to be service-connected.

Survivor benefits for deferred members (with no reciprocity) consist of a refund to eligible beneficiaries of all contributions and interest accumulated by the member as of the date of death.

Cost-of-Living Adjustments

Retired member monthly allowances will be adjusted annually in accordance with changes in the cost-of-living, as determined by the average annual change in the Consumer Price Index (CPI) for the prior calendar year. The cost-of-living adjustment is limited to a maximum increase or decrease of three percent per year as established by the Board of Retirement. The 2020 cost-of-living adjustment was 3%.

STAR COLA

Retired members and eligible beneficiaries who have lost more than 20% of their original retirement benefit's purchasing power due to inflation are eligible to receive the STAR COLA (Supplemental Targeted Adjustment for Retirees Cost-of-Living Adjustment). STAR COLA benefits are reviewed annually by the Board of Retirement and as of December 31, 2020, only those members that retired on or before April 1, 1980 are eligible to receive the STAR COLA benefit.

Postemployment Health Care Plans

OCERS serves as trustee for the County of Orange (County) and Orange County Fire Authority (OCFA) postemployment health care plan trusts established under Internal Revenue Code section 401(h), which are reported as other postemployment benefit trust funds in OCERS basic financial statements. Health care assets for the 401(h) trusts are commingled with pension trust assets for investment purposes and are used exclusively to pay health allowances to eligible retired members of the County of Orange and participating special districts including OCERS and the OCFA.

Notes to the Basic Financial Statements

NOTE 1 : Plan Descriptions (continued)

In July 2007, the County of Orange established under Internal Revenue Code both a 115 trust and a 401(h) trust as funding sources of retiree health care benefits, including grants, for the County of Orange Retiree Medical Plan (the "Plan"). The County maintains control and custody of all the 115 trust assets, which acts as a conduit for collecting contributions and passing them through to the 401(h) trust at their discretion, as well as distributing lump sum health care grant payments as part of a termination program that is being phased-out. OCERS maintains custody of the assets in the 401(h) trust and pays all primary benefits of the Plan as directed by the County. The County has evaluated the structure of its plan and related roles and responsibilities and has determined that the County is the plan administrator. Therefore, the County has taken financial reporting responsibility of the plan including financial statement disclosures and required supplementary information regarding the plan's funded status and contributions, in accordance with Governmental Accounting Standards Board (GASB) Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other than Pension Plans* (GASB 74). A publicly available financial report can be obtained from the County of Orange at 12 Civic Center Plaza, Santa Ana, California 92702 or their website at **http://ac.ocgov.com**.

As trustee of OCFA's 401(h) Other Postemployment Benefit (OPEB) trust fund, the sole source of funding for OCFA's postemployment health care plan, OCFA has evaluated the structure of its plan and related roles and responsibilities and has determined that OCFA is the plan administrator. Therefore, OCFA has taken financial reporting responsibility of the Plan including financial statement disclosures and required supplementary information regarding the plan's funded status and contributions, in accordance with GASB 74. A publicly available financial report can be obtained from the Orange County Fire Authority at 1 Fire Authority, Irvine, California 92602 or their website at **http://ocfa.org**.

Assets are allocated on the Statement of Fiduciary Net Position between the pension plan and the two 401(h) health care trusts based upon pro-rata shares of the net position after balances and transactions specific to the respective trusts are assigned. Contributions and benefit payment information for the pension plan and individual health care trusts are readily identified; however, investment income must be allocated and is based upon the individual health care trusts' pro-rata share of total fund assets.

Custodial Fund

In addition to serving as Trustee for the two 401(h) health care trusts, OCERS also provides investment advisory services to the Orange County Transportation Authority (OCTA) health care plan established in accordance with Internal Revenue Code section 115 (115 Plan). Investments in the 115 Plan are not commingled with those of the pension plan and 401(h) plan trusts, but rather are invested in separately managed index funds. OCTA's 115 Plan assets held by OCERS in an investment capacity are reported as a Custodial Fund. Additional information regarding the OCTA 115 Plan is available by contacting OCTA at 550 S. Main Street, Orange, California 92868 or their website at **http://www.octa.net.**

NOTE 2 : Summary of Significant Accounting Policies

Basis of Accounting

The accompanying financial statements have been prepared on the accrual basis of accounting and in accordance with accounting principles generally accepted in the United States of America (GAAP). Employee and employer contributions are recognized in the period in which contributions are due pursuant to legal requirements, and benefits and refunds are recognized when currently due and payable in accordance with plan terms. Unearned contributions represent prepaid employer contributions that will be recognized as an addition to plan net position in future periods. Investment income is recognized as revenue when earned. The net appreciation/(depreciation) in the fair value of investments is recorded as an increase/(decrease) to investment income based upon investment valuations, which includes both realized and unrealized gains and losses on investments.

Notes to the Basic Financial Statements

NOTE 2 : Summary of Significant Accounting Policies (continued)

Investment Policy and Valuation

State Street Bank and Trust (State Street) maintains custody of the majority of OCERS' investments held as of December 31, 2020. The acquisition of investments is authorized by state statute and OCERS' Investment Policy Statement (refer to Note 3: Investments for further information). Investments are reported at fair value on a trade-date basis. The allocation of investment assets is approved by OCERS' Board of Retirement, as outlined in the Investment Policy Statement, and System assets are invested solely for the benefit of plan participants and beneficiaries while attempting to minimize employer contributions and investment and administration costs. The Investment Policy Statement calls for an asset allocation plan that seeks to optimize long-term returns for the level of risk that the Board of Retirement considers appropriate. The current asset allocation adopted by the Board of Retirement as of December 31, 2020, is detailed in Section 3 - Investments. The Board of Retirement conducts a periodic review of the asset allocation plan to maintain an optimal allocation, and may also revise the asset allocation in response to significantly changing market conditions that may affect valuations and forward-looking expected returns of asset classes.

Plan investments consist of global public equity securities, core fixed income, real assets, credit, risk mitigation, absolute return and unique strategies, and private equity. Investments are reported at fair value and the overall valuation process and information sources by major asset classification are as follows:

Cash and Short-Term Investments

Cash and short-term investments represent funds held in operating accounts with State Street, Wells Fargo Bank and deposits held in a pooled account with the County of Orange Treasurer. Short-term investments are expected to be utilized within 30-90 days and are reported at fair value. OCERS is a participant in the County Treasurer's Orange County Investment Pool (OCIP). The OCIP is an external investment pool, is not rated, and is not registered with the Securities and Exchange Commission. The County Treasury Oversight Committee conducts OCIP oversight. Cash on deposit in the OCIP is stated at fair value. The OCIP values participant shares on an amortized cost basis during the year and adjusts to fair value at year-end. Deposits held in the OCIP are invested in the Orange County Money Market Fund and the Extended Fund. At December 31, 2020, the OCIP had a weighted average maturity of 227 days. The Orange County Money Market Fund is rated AAAm by Standard & Poor's. The Extended Fund is not rated. For further information regarding the OCIP, refer to the County of Orange's most recently available Comprehensive Annual Financial Report.

Global Public Equity

The majority of OCERS' domestic, international and global securities, including those traded in emerging markets, consist of institutional funds that are valued based on the fair value of underlying investments using pricing models or other valuation methodologies that use pricing inputs that are either directly or indirectly observable on the valuation date for the securities or assets held in the fund. Other domestic, international and global securities are actively traded on major security exchanges, or over-the-counter. Fair value for exchange traded securities is determined as of the close of the trading date in the primary market or agreed upon exchange. The last known price is used for listed securities that did not trade on a particular date. Fair value is obtained from third-party pricing sources for securities traded over-the-counter.

Core Fixed Income

Actively traded debt instruments such as those securities issued by the U.S. Treasury, Federal Agencies and corporate issuers are reported at fair value as of the close of the trading date. Fair values of irregularly traded debt securities are obtained from pricing vendors who employ modeling techniques in determining security values. Inputs typically employed by pricing vendors include cash flows, maturity and credit rating.

Real Assets

OCERS invests in real assets, which include agriculture, energy, infrastructure, real estate and timber holdings. The fair value for real estate, timber, energy, infrastructure and agriculture are determined based on independent appraisals and/or estimates made in good faith by the general partner or management.

Real estate assets are in commingled real estate funds structured as either limited partnerships or trust funds. Properties held in commingled funds are based on the investment's net asset value (NAV) per share provided by the investment management firms/general partners, who perform regular internal appraisals and obtained at regular intervals independent third-party appraisals and are further supported by annual financial statements, which are audited by an independent third-party accountant. Primary determinants of fair value include market and property type specific information, which typically involve a degree of expert judgment.

Other real asset funds, agriculture, energy, and infrastructure, are held in limited partnerships. The investment's NAV per share are provided by the investment management firms/general partners, and are further supported by annual financial statements, which are audited by an independent third-party accountant. Primary determinants of fair value include market specific information, which involves a degree of expert judgment.

Other Investments

OCERS invests in a variety of different credit strategies, alternative strategies which include private equity, absolute return and unique strategies, and risk mitigation investments.

Credit is a global allocation that includes a number of diverse fixed-income related strategies. It represents an allocation that is diversified by region, by credit quality, and by sources of risk. The general shared characteristics of these strategies are a degree of illiquidity, and a focus on current yield as a principal source of expected return. Hedging of market and individual security risks and diversified risk-controlled tactical trading may be permitted.

Credit is a combination of liquid and illiquid credit strategies and the fair value depends on the nature of the investment. For credit funds structured as partnerships, the fair values are based on NAV. Credit included in Level 2 of the fair value hierarchy may be estimated by the underlying managers in the absence of observable market data or the general partner may estimate the fair value in good faith using the best information available, which may incorporate the general partner's own assumptions. The liquid strategies comprised of multi-strategies are actively traded and are generally reported at fair value as of the close of the trading date. The illiquid strategies comprised of mortgages, direct lending and energy-based credit funds are valued initially at cost as an approximation of fair value with subsequent adjustments to fair value as determined by the general partner. The factors considered include readily available market quotes, earnings-multiple analysis using comparable companies or discounted cash flow analysis.

Private equity, absolute return and unique strategies are alternative strategies. The fair value of these alternative investments depends upon the nature of the investment and the underlying business. Typically, alternative investments are less liquid and subject to redemption restrictions. Fair value is determined either quarterly or semi-annually with valuations conducted by general partners, management and valuation specialists. Valuation techniques vary by investment type and involve expert judgment or estimates made in good faith using the best information available, including the general partner's or management's own assumptions. Investments reported at NAV are based on audited financial statements.

Risk mitigation investments include generally liquid investments with shorter redemption periods. Risk mitigation funds included in Level 2 are short-term investment funds and NAV is determined daily; for risk mitigation funds structured as partnerships, the fair values are based on NAV. Risk mitigation investments are uncorrelated or negatively correlated to economic growth assets.

Capital Assets

Capital assets consist of furniture, equipment, intangible assets, including computer software, and building and improvements for the portion of the OCERS' headquarters building used for plan administration. Capital assets are defined by OCERS as assets with an initial, individual cost of more than $25,000 and an estimated useful life in excess of one year. Such assets are recorded at cost. Capital assets are depreciated using the straight-line depreciation method over their estimated useful lives, ranging from five to fifteen years for furniture, equipment and building improvements; three years for purchased computer software; sixty years for buildings; and five years for the data center. Intangible assets are amortized over an estimated useful life of ten years.

Notes to the Basic Financial Statements

NOTE 2 : Summary of Significant Accounting Policies (continued)

Capital Assets

As of December 31, 2020
(Dollars in Thousands)

Building and Improvements	$ 5,196
Computer Software - Pension Administration System	21,853
Data Center	1,234
Construction in Progress	286
Total Capital Assets (at cost)	28,569
Less: Accumulated Depreciation and Amortization	(14,856)
Total Capital Assets (Net of Depreciation and Amortization)	**$ 13,713**

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect reported amounts of net position. Actual results could differ from those estimates.

Comparative Totals

The basic financial statements include certain prior-year summarized comparative information in total but not at the level of detail required for a presentation in conformity with GAAP. Accordingly, such information should be read in conjunction with OCERS' financial statements for the year ended December 31, 2019, from which the summarized information was derived.

NOTE 3 : Investments

OCERS may invest, in accordance with state statutes, in any form or type of investment deemed prudent by the Board of Retirement. Pension and 401(h) Health Care plan assets are restricted for the exclusive purposes of providing benefits to plan participants and defraying reasonable expenses of administering the plans. The Board of Retirement may invest, or delegate the authority to invest, the assets of the funds through the purchase, holding, or sale of any form or type of investment, financial instrument, or financial transaction. Custodial fund assets, restricted pursuant to section 115 of the Internal Revenue Code, are separately invested in domestic equity, international equity and domestic bond index funds in accordance with the respective OCTA Third-Party Administrative and Investment Management Agreement.

The following table shows the Investment Allocation as of December 31, 2020:

Investment Allocation

As of December 31, 2020

Investment Category	Policy	Target Ranges	Actual
Global Public Equity	47%	40% - 54%	47%
Core Fixed Income	11%	6% - 16%	12%
Credit	7%	4% - 10%	8%
Real Assets	12%	8% - 16%	11%
Absolute Return	0%	0%	0%
Private Equity	13%	9% - 17%	11%
Risk Mitigation	10%	6% - 14%	9%
Unique Strategies	0%	0% - 5%	0%
Cash	0%	0% - 5%	2%
Total	**100 %**		**100 %**

During 2020, the allocation to the global public equity and private equity categories increased while the allocation to the core fixed income, credit and real assets categories decreased.

Custodial Credit Risk

Custodial credit risk for deposits is the risk that in the event of a financial institution's failure, OCERS would not be able to recover its deposits. Deposits are exposed to custodial risk if they are not insured or not collateralized. As of December 31, 2020, OCERS' deposits with a financial institution are fully insured by Federal Deposit Insurance Corporation (FDIC) insurance up to $250,000 with the remaining balance exposed to custodial credit risk as it is not insured; however, the financial institution does collateralize the deposit of monies in excess of the FDIC insurance amount with eligible securities held by the pledging financial institution, but not in OCERS' name, which approximates $90.4 million. Deposits held by OCERS' custodial bank are not exposed to custodial credit risk as they are held in a qualified pool trust, separate from the custodial bank assets.

For an investment, custodial credit risk is the risk that, in the event of a counterparty failure, OCERS will not be able to recover the value of its investments or collateral securities that are in the possession of counterparties. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in OCERS' name or by other qualified third-party administrator trust accounts.

OCERS' investments and collateral received through securities lending are not exposed to custodial credit risk because all securities are held by OCERS' custodial bank in OCERS' name or by other qualified third-party administrator trust accounts. The risk is managed by the custodian bank by diversifying the number of counterparties, with periodic review of the credit quality of counterparties and by regularly posting/receiving margins. OCERS does not maintain any general policies regarding custodial credit risk.

Notes to the Basic Financial Statements

NOTE 3 : Investments (continued)

Credit Risk

By definition, credit risk measures the risk that an issuer or counterparty will not fulfill its obligations. S&P Global defines investment grade as those fixed income securities with ratings between AAA and BBB. OCERS' investment policy permits, on an opportunistic basis, the investment in fixed income securities rated below investment grade. A rating of NR represents pooled funds and other securities that have not been rated by S&P Global and NA represents securities explicitly guaranteed by the U.S. Government that are not subject to the GASB Statement No. 40 disclosure requirements. The credit ratings for individual OCERS' fixed income portfolios are monitored regularly.

As of December 31, 2020, the S&P Global credit ratings of the OCERS' fixed income portfolio were as follows:

Credit Ratings

As of December 31, 2020
(Dollars in Thousands)

Rating	Pooled	U.S. Treasuries	Corporates	Mortgages	Asset-Backed	Municipals	Agencies	International	Swaps	Total
AAA	$ -	$ -	$ 5,050	$ 12,076	$ 10,180	$ 1,445	$ -	$ -	$ -	$ 28,751
AA	-	-	23,323	203,884	14,052	26,759	-	7,220	-	275,238
A	-	-	77,381	16	4,610	15,140	-	28,448	-	125,595
BBB	-	-	252,388	1,864	9,040	2,084	-	78,980	-	344,356
BB	-	-	97,247	-	-	1,453	-	44,226	-	142,926
B	-	-	52,335	2,519	454	1,271	-	16,637	-	73,216
CCC	-	-	30,333	3,070	196	-	-	8,372	-	41,971
D	-	-	-	1,253	-	-	-	-	-	1,253
NR	1,151,269	-	22,796	51,164	32,792	4,705	5,878	4,705	1,663	1,274,972
NA	-	295,222	-	4,982	-	-	-	-	-	300,204
Total	$1,151,269	$295,222	$ 560,853	$ 280,828	$ 71,324	$ 52,857	$ 5,878	$ 188,588	$1,663	$ 2,608,482

This schedule reflects credit ratings for OCERS' fixed income portfolio, which includes $272.1 million of fixed income securities which are included in the Credit investment category and excludes $45.0 million of non-fixed income securities that are included in the Core Fixed Income investment category on the Statement of Fiduciary Net Position.

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Duration is a measure of the price sensitivity of a fixed-income portfolio to changes in interest rates. It is calculated as the weighted average time to receive a bond's coupon and principal payments. The longer the duration of a portfolio, the greater its price sensitivity to changes in interest rates.

Interest rate risk is managed through OCERS' investment policies requiring that investment managers investing on behalf of OCERS have applicable investment guidelines and that the effective durations of fixed income portfolios remain within a defined range of the benchmark's effective duration. The primary benchmark for domestic fixed income is a blend of two indices, the Bloomberg Barclays US Aggregate Total Return (80%), and the Bloomberg US TIPS Total Return (20%). As of December 31, 2020, the durations of these indices are 6.22 years and 7.56 years, respectively for a blended duration of 6.49 years. All investment managers were in compliance within their defined range.

OCERS invests in a variety of fixed income instruments including asset-backed securities, corporate obligations and commercial mortgage backed securities. The value, liquidity and income of these securities are sensitive to changes in overall economic conditions and the fair value of these securities may be affected by changes in interest rates, default rates and the value of the underlying securities.

The interest rate risk schedule presents the duration of fixed income securities by investment category as of December 31, 2020:

Interest Rate Risk Schedule

As of December 31, 2020
(Dollars in Thousands)

Category	Amount	Duration (in Years)	Percent
Pooled	$ 1,151,269	6.79	44%
U.S. Treasuries	295,222	7.21	11%
Corporates	540,430	7.26	21%
Mortgages	266,302	2.42	10%
Asset-Backed	63,765	3.34	3%
Municipals	52,857	9.58	2%
Agencies	5,878	2.63	0%
International	188,328	5.55	7%
No Effective Duration:			
Corporates	20,423	N/A	1%
Mortgages	14,526	N/A	1%
Asset-Backed	7,559	N/A	0%
International	260	N/A	0%
Swaps	1,663	N/A	0%
Total	**$ 2,608,482**	**6.24**	**100%**

This schedule reflects interest rate risk for OCERS' fixed income portfolio, which includes $272.1 million of fixed income securities which are included in the Credit investment category and excludes $45.0 million of non-fixed income securities that are included in the Core Fixed Income investment category on the Statement of Fiduciary Net Position.

Notes to the Basic Financial Statements

NOTE 3 : Investments (continued)

Foreign Currency Risk

The value of deposits or investments denominated in foreign currency may be adversely affected by changes in currency exchange rates. OCERS' investment policy permits investment in international securities that includes investments in international equity securities, global equity securities, emerging markets equity securities and debt, public real estate securities, and real return. Investment managers monitor currency exposures daily.

The following schedule represents OCERS' net exposure to foreign currency risk in U.S. dollars as of December 31, 2020:

Foreign Currency Risk Schedule

As of December 31, 2020
(Dollars in Thousands)

Currency in U.S. Dollar	Cash	Equity	Fixed Income	Forward Contracts	Swaps	Total
Australian Dollar	$ 76	$ 32,687	$ -	$ 424	$ 2	$ 33,189
Brazilian Real	-	3,060	-	(293)	152	2,919
Canadian Dollar	20	21,791	814	4	43	22,672
Danish Krone	40	32,372	-	(6)	-	32,406
Euro Currency	(65)	304,843	1,141	1	318	306,238
Hong Kong Dollar	73	47,591	-	-	165	47,829
Iceland Krona	(1,174)	1,669	1,479	-	-	1,974
Indonesian Rupiah	-	926	-	-	-	926
Japanese Yen	642	185,633	-	147	155	186,577
Mexican Peso	3	-	191	6	-	200
New Israeli Sheqel	-	765	-	2	-	767
New Zealand Dollar	-	2,488	-	923	-	3,411
Norwegian Krone	-	9,706	-	32	-	9,738
Pound Sterling	(40)	125,129	5,693	(483)	4	130,303
Polish Zloty	-	768	-	-	-	768
Russian Ruble	-	-	-	10	-	10
Singapore Dollar	16	6,026	-	1	-	6,043
South African Rand	-	1,522	-	30	-	1,552
South Korean Won	-	9,214	-	-	-	9,214
Swedish Krona	(13)	27,910	-	(139)	9	27,767
Swiss Franc	21	59,622	-	(475)	(305)	58,863
Thailand Bhat	-	525	-	-	-	525
Yuan Renminbi	-	3,768	-	-	-	3,768
Amount Exposed to Foreign Currency Risk	**$ (401)**	**$ 878,015**	**$ 9,318**	**$ 184**	**$ 543**	**$887,659**

The foreign currency amounts above are included within the cash and cash equivalents, global public equity, credit and core fixed income categories on the Statement of Fiduciary Net Position as of December 31, 2020.

Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of OCERS' investment in a single issuer. By policy, OCERS did not hold investments in any one issuer that represented five percent (5%) or more of plan net position and net investments. Investments issued or explicitly guaranteed by the U.S. Government and pooled investments are excluded from this policy requirement.

Concentration of Investments

As of December 31, 2020, OCERS did not hold investments in any one organization that represented five percent (5%) or more of the plan's fiduciary net position. Investments issued or explicitly guaranteed by the U.S. Government and pooled investments are excluded from this requirement.

Derivative Instruments

As of December 31, 2020, all derivative instruments held by OCERS are considered investments and not hedges for accounting purposes. Any reference to the term hedging in these financial statements references an economic activity and not an accounting method. All gains and losses associated with these activities are recognized as incurred in the Statement of Changes in Fiduciary Net Position.

The table that follows presents the related net appreciation/(depreciation) in fair value, the fair value amounts and the notional amounts of derivative instruments outstanding at December 31, 2020.

Notes to the Basic Financial Statements

NOTE 3 : Investments (continued)

Derivative Instruments

As of December 31, 2020
(Amounts in Thousands)

Derivative Instruments	Changes in Fair Value Net Appreciation/ (Depreciation) [4] Amount [1]	Fair Value at December 31, 2020 Classification	Amount [2]	Notional [3]
Commodity Futures Long	$ (6,548)	Cash	$ -	$ 3,622
Commodity Futures Short	(475)	Cash	-	(1)
Credit Default Swaps Bought	(17)	Cash	-	-
Credit Default Swaps Written	(1,234)	Core Fixed Income	1,370	49,833
Fixed Income Futures Long	28,665	Cash / Core Fixed Income	-	35,015
Fixed Income Futures Short	(2,038)	Core Fixed Income	-	(43,300)
Fixed Income Options Bought	348	Core Fixed Income	102	1,600
Fixed Income Options Written	(53)	Core Fixed Income	(55)	(25,689)
Futures Options Written	6	Core Fixed Income / Global Public Equity	-	-
FX Forwards	(3,972)	Foreign Currency Forward Contracts Receivables and Liabilities	184	282,849
Index Futures Long	(19,565)	Global Public Equity	-	1,672
Index Futures Short	(3,036)	Core Fixed Income	-	(26)
Pay Fixed Interest Rate Swaps	(8,164)	Core Fixed Income	102	24,477
Receive Fixed Interest Rate Swaps	1,311	Global Public Equity	191	23,853
Rights	1	Global Public Equity	-	31
Total Return Swaps Bond	2,829	Global Public Equity	(264)	22,451
Total Return Swaps Equity	422	Global Public Equity	467	(14,175)
Warrants	3	Global Public Equity	-	-
Grand Totals	$ (11,517)		$ 2,097	

[1] Negative values (in brackets) refer to losses
[2] Negative values refer to liabilities and are reported net of investments
[3] Notional may be a dollar amount or size of underlying for futures and options, negative values refer to short positions
[4] Excludes futures margin payments

Valuation of Derivative Instruments

Non-exchange traded instruments, such as swaps, are valued using similar methods as those described for debt securities.

Futures contracts are traded on exchanges and typically derive their value from underlying indices and are marked to market daily. All gains and losses associated with changes in the value of futures contracts also settle on a daily basis and result in the contracts themselves having no fair value at the end of any trading day, including December 31, 2020. Future variation margin accounts also settle daily and are recognized in the financial statements under net appreciation/(depreciation) in the fair value of the investments as incurred.

In general, option values are dependent upon a number of different factors, including the current market price of the underlying security, the strike price of the option, costs associated with holding a position in the underlying security including interest and dividends, the length of time until the option expires and an estimate of the future price volatility of the underlying security relative to the time period of the option.

Foreign currency forward contracts are agreements to buy or sell a currency at a specified exchange rate on a specified date. The fair value of a foreign currency forward is determined by the difference between the specified exchange rate and the closing exchange rate at December 31, 2020.

Custodial Credit Risk – Derivative Instruments

As of December 31, 2020, all investments in derivative instruments are held in OCERS' name and are not exposed to custodial credit risk as described in the previous discussion of custodial credit risk.

Notes to the Basic Financial Statements

NOTE 3 : Investments (continued)

Counterparty Credit Risk – Derivative Instruments

A summary of counterparty credit ratings relating to non-exchange traded derivatives in asset positions as of December 31, 2020 is as follows:

Counterparty Credit Risk Schedule for Derivative Instruments

As of December 31, 2020
(Dollars in Thousands)

Counterparty Name	S&P Rating	Foreign Currency Forward Contracts	Swaps	Total Fair Value
Bank of America CME	A-	$ -	$ 153	$ 153
Bank of America ICE	A-	-	1,189	1,189
Bank of America Merrill Lynch Securities Inc	A-	-	150	150
Bank of America, N.A.	A+	6	3	9
Barclays Capital	A	-	3	3
BNP Paribas SA	A+	219	2	221
Citibank N.A.	A+	1,451	4	1,455
Goldman Sachs Bank USA	BBB+	3	-	3
Goldman Sachs International	A+	-	3	3
HSBC Bank USA	A+	15	-	15
JP Morgan	A-	-	76	76
JPMorgan Chase Bank N.A.	A+	1,417	-	1,417
Morgan Stanley Capital Services Inc	BBB+	-	1	1
Morgan Stanley Co Incorporated	BBB+	-	431	431
UBS AG	A+	7	-	7
Other	NR	-	233	233
Total Non-Exchange Traded Derivatives in Asset Position		**$ 3,118**	**$ 2,248**	**$ 5,366**

Interest Rate Risk – Derivatives

At December 31, 2020, OCERS is exposed to interest rate risk on its investments in various swap arrangements based on daily interest rates for BRCDI (Brazilian Interbank Deposit Rate), CDOR (Canadian Dollar Offered Rate), LIBOR (London Interbank Offered Rate), SONIA (Sterling Overnight Index Average), and European reference rates. The following table illustrates the maturity periods of these investments:

Interest Rate Risk - Schedules for Derivative Instruments

As of December 31, 2020
(Dollars in Thousands)

Investment Type	Fair Value	Investment Maturities (in years)			
		Less Than 1	1-5	6-10	More than 10
Credit Default Swaps Written	$ 1,370	$ 5	$ 1,428	$ -	$ (63)
Fixed Income Options Bought	102	102	-	-	-
Fixed Income Options Written	(55)	(55)	-	-	-
Pay Fixed Interest Rate Swaps	102	-	(5)	4	103
Receive Fixed Interest Rate Swaps	191	-	196	-	(5)
Total Return Swaps Bond	(264)	(264)	-	-	-
Total Return Swaps Equity	467	467	-	-	-
Total	**$ 1,913**	**$ 255**	**$ 1,619**	**$ 4**	**$ 35**

Derivative Instruments Highly Sensitive to Interest Rate Changes

As of December 31, 2020
(Dollars in Thousands)

Investment Type	Receive Rate	Payable Rate	Fair Value	Notional
Pay Fixed Interest Swaps	Variable 0-month BRCDI	Fixed 2.86%-2.88%	$ (1)	$ 2,176
Pay Fixed Interest Swaps	Variable 12-month SONIA	Fixed 1.00%	4	15,310
Pay Fixed Interest Swaps	Variable 3-month LIBOR	Fixed 0.25%-1.15%	99	4,900
Pay Fixed Interest Swaps	Variable 6-month LIBOR	Fixed 0.08%-2.00%	-	2,092
Total Pay Fixed Interest Rate Swaps			**$ 102**	
Received Fixed Interest Rate Swaps	Fixed 1.22%-1.29%	Variable 3-month CDOR	42	1,962
Received Fixed Interest Rate Swaps	Fixed 3.36%	Variable 0-month BRCDI	153	18,790
Received Fixed Interest Rate Swaps	Fixed 1.40%	Variable 3-month LIBOR	(4)	3,100
Total Receive Fixed Interest Rate Swaps			**$ 191**	
Total Interest Rate Swaps			**$ 293**	

Foreign Currency Risk – Derivatives

At December 31, 2020, OCERS is exposed to foreign currency risk on investments in swaps and forward currency contracts denominated in foreign currencies that may be adversely affected by changes in the currency exchange rates.

Foreign Currency Risk Schedule for Derivative Instruments

As of December 31, 2020
(Dollars in Thousands)

		Currency Forward Contracts			
Currency Name	**Rights**	**Net Receivables**	**Net Payables**	**Swaps**	**Total Exposure**
Australian Dollar	$ -	$ 737	$ (313)	$ 2	$ 426
Brazilian Real	-	226	(519)	152	(141)
Canadian Dollar	-	15	(11)	43	47
Danish Krone	-	11	(17)	-	(6)
Euro Currency	-	240	(239)	318	319
Hong Kong Dollar	-	-	-	165	165
Japanese Yen	-	275	(128)	155	302
Mexican Peso	-	14	(8)	-	6
New Israeli Sheqel	-	71	(69)	-	2
New Zealand Dollar	-	977	(54)	-	923
Norwegian Krone	-	33	(1)	-	32
Pound Sterling	-	284	(767)	4	(479)
Russian Ruble	-	11	(1)	-	10
Singapore Dollar	-	7	(6)	-	1
South African Rand	-	33	(3)	-	30
Swedish Krona	-	161	(300)	9	(130)
Swiss Franc	-	23	(498)	(305)	(780)
Total Foreign Currency	$ -	$ 3,118	$ (2,934)	$ 543	$ 727
U.S. Dollar	47	-	-	1,323	1,370
Total	$ 47	$ 3,118	$ (2,934)	$ 1,866	$ 2,097

Rate of Return

For the year ended December 31, 2020, the annual money-weighted rate of return on the assets of the plan, net of investment expense, was 11.22%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the timing of cash flows and the changing amounts actually invested.

Securities Lending

OCERS is authorized by investment policy and state law to lend its investment securities including global public equities, core fixed income, and credit to broker/dealers in exchange for collateral in the form of either cash or securities. Lent domestic and international securities are collateralized with an initial fair value of not less than 102% or 105% depending on the nature of the loaned securities and the collateral received, of fair value of the loaned securities. The lending agent receives cash and non-cash collateral for the securities on loan. There are no restrictions on the amount of securities that can be lent at one time. State Street Bank serves, in accordance with a Securities Lending Authorization Agreement, as OCERS' agent to loan domestic and international securities. State Street Bank does not have the ability to pledge or sell collateral securities delivered absent a borrower default.

Cash collateral received on loaned securities is invested together with the cash collateral of other qualified tax-exempt investors in a collective investment fund managed by State Street. The collective investment fund is not rated and comprised of two separate investment pools: 1) a liquidity pool and 2) a duration pool. As of December 31, 2020, the liquidity pool had an average duration of 16 days and a weighted average maturity (WAM) of 76 days. The duration pool had an average duration of 18 days and a WAM of 1,539 days. Because loans are terminable at will, the duration of the loans did not generally match the duration of the investments made with the cash collateral. The Securities Lending Authorization Agreement requires State Street to indemnify OCERS if the broker/dealer fails to return any borrowed securities. During 2020, there were no failures to return loaned securities or to pay distributions by the borrowers. Furthermore, there were no losses due to borrower defaults. The fair value of securities on loan and the total cash and non- cash collateral held as of December 31, 2020 was $233.8 million and $239.6 million, respectively. The following table shows fair values of securities on loan and cash collateral received by asset class:

Securities on Loan and Collateral Received

As of December 31, 2020
(Dollars in Thousands)

Security Lent for Cash Collateral	Fair Value of OCERS' Securities Lent	Cash Collateral Received	Non-Cash Collateral Received	Total Collateral Received
Global Public Equity	$ 74,555	$ 77,309	$ -	$ 77,309
Core Fixed Income	132,747	135,286	-	135,286
Credit	26,532	27,045	-	27,045
Total	$ 233,834	$ 239,640	$ -	$ 239,640

Investments – Fair Value Measurements

OCERS categorizes its fair value measurements of its investments based on the three level fair value hierarchy established by GAAP. The fair value hierarchy is based on the valuation inputs used to measure fair value of the asset or liability and gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 inputs) and the lowest priority to unobservable inputs (Level 3 inputs). Unobservable inputs are developed using the best information available about the assumptions that market participants would use when pricing an investment. The three levels of the fair value hierarchy are:

- Level 1 - Unadjusted quoted prices for identical instruments in active markets.
- Level 2 - Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable.
- Level 3 - Valuations are derived from valuation techniques in which significant inputs are unobservable. Investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

Notes to the Basic Financial Statements

NOTE 3 : Investments (continued)

The following table represents the fair value measurements as of December 31, 2020:

Investments, Derivative Instruments and Securities Lending Collateral Measured at Fair Value

As of December 31, 2020
(Dollars in Thousands)

	12/31/2020	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. Fixed Income:				
Pooled	$ 1,151,269	$ -	$ 1,151,269	$ -
U.S. Treasuries	295,222	-	295,222	-
Corporates	560,853	-	560,853	-
Mortgages	280,828	-	279,812	1,016
Asset-backed	71,324	-	71,324	-
Municipals	52,857	-	52,857	-
Agencies	5,878	-	5,878	-
International	188,588	-	188,588	-
Total Fixed Income	**2,606,819**	**-**	**2,605,803**	**1,016**
Global Public Equity Investments:				
Domestic Equity	4,777,312	504,263	4,273,049	-
International Equity	2,465,581	902,455	1,563,126	-
Emerging Markets Equity	592,838	-	592,838	-
Total Global Public Equity	**7,835,731**	**1,406,718**	**6,429,013**	**-**
Real Assets:				
Agriculture	69,670	-	-	69,670
Real Estate	11,338	-	-	11,338
Timber	36,685	-	-	36,685
Total Real Assets	**117,693**	**-**	**-**	**117,693**
Other Investments:				
Risk Mitigation	555,694	-	555,694	-
Total Other Investments	**555,694**	**-**	**555,694**	**-**
Total Investments by Fair Value Level	**$ 11,115,937**	**$ 1,406,718**	**$ 9,590,510**	**$ 118,709**

Investments, Derivative Instruments and Securities Lending Collateral Measured at Fair Value

As of December 31, 2020
(Dollars in Thousands)
(Continued)

	12/31/2020	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments Measured at the Net Asset Value (NAV)				
Global Public Equity Investments:				
Domestic Equity	$ 1,312			
International Equity	294,177			
Emerging Markets Equity	900,810			
Total Global Public Equity	**1,196,299**			
Real Assets:				
Agriculture	64,508			
Energy	472,625			
Infrastructure	186,410			
Real Estate	1,224,621			
Total Real Assets	**1,948,164**			
Other Investments:				
Absolute Return	480			
Credit (includes private credit)	1,268,100			
Private Equity	2,353,755			
Risk Mitigation	1,226,962			
Unique Strategies	55,283			
Total Other Investments	**4,904,580**			
Total Investments Measured at the NAV	**$ 8,049,043**			
Investments Derivative Instruments				
Swaps:				
Interest Rate Swaps	$ 293	$ -	$ 203	$ -
Credit Default Swaps	1,370	-	1,370	-
Total Return Swaps	203	-	203	-
Options	47	-	47	-
Total Investment Derivative Instruments	**$ 1,913**	**$ -**	**$ 1,913**	**$ -**
Total Investments Measured at Fair Value	**$ 19,166,893**			
Investments Securities Lending Collateral				
Debt Securities:				
Core Fixed Income	$ 135,286	$ -	$ 135,286	$ -
Credit	27,045	-	27,045	-
Equity Investments:				
U.S. Equities	67,059	67,059	-	-
International Equities	10,250	10,250	-	-
Total Invested Securities Lending Collateral	**$ 239,640**	**$ 77,309**	**$ 162,331**	**$ -**

Core Fixed Income in the above schedule includes $272.1 million of fixed income securities, which are included in the Credit investment category; and excludes $45.0 million of non-fixed income securities and derivatives that are included in the Core Fixed Income investment category on the Statement of Fiduciary Net Position.

Notes to the Basic Financial Statements

NOTE 3 : Investments (continued)

Core fixed income include actively traded debt instruments such as those securities issued by the United States government, federal agencies, municipal obligations, foreign governments, and both U.S. and foreign corporate issuers. Core fixed income securities are reported at fair value as of the close of the trading date. Fair values for securities not traded on a regular basis are obtained from pricing vendors who employ modeling techniques, such as matrix pricing or discounted cash flow method, in determining security values. These inputs are observable, which supports the Level 2 fair value hierarchy. One fixed income mortgage security is leveled at Level 3 based on the investment manager's pricing policy.

Global public equity include U.S. and international equity securities, and emerging markets equity securities. Global public equity securities classified in Level 1 of the fair value hierarchy are primarily common and preferred stock or real estate investment trusts. Fair value for these exchange traded securities is determined as of the close of the trading date in the primary market or agreed upon exchange. The last known price is used for listed securities that did not trade on a particular date. Fair value is obtained from third-party pricing sources for securities traded over-the-counter. Global public equity securities classified in Level 2 of the fair value hierarchy consist of institutional funds that are valued based on the fair value of underlying investments using pricing models or other valuation methodologies that use pricing inputs that are either directly or indirectly observable on the valuation date for the securities or assets held in the fund.

Real assets investments at fair value include a variety of real return investments in agriculture, real estate and timber resources, which are held directly. Real estate assets held directly are appraised by independent third-party appraisers in accordance with the Uniform Standards of Professional Appraisal Practice. Independent appraisals use professional judgment, which is unobservable input, to determine the fair value of the asset; therefore these real estate investments are classified as Level 3. Agriculture and timber resources included in Level 3 are based on independent appraisals and/or the good faith estimates of management.

Other investments include two risk mitigation funds. These investments are classified in Level 2 of the fair value hierarchy and include primarily institutional mutual funds that are valued based on the fair value of underlying investments using pricing models or other valuation methodologies that use pricing inputs that are either directly or indirectly observable on the valuation date for the securities or assets held in the fund.

Derivative instruments classified as Level 2 are valued using a market approach with observable inputs from major indices as well as benchmark interest rates and foreign exchange rates.

Securities Lending represents cash collateral received for securities lent. The equity securities lent include U.S. equities and international and global equities in Level 1 of the fair value hierarchy, valued using a market approach for prices quoted in active markets for securities. Level 2 securities lent are core fixed income securities, which include U.S. government, federal agencies, and credit securities including municipal obligations along with corporate issuers.

NOTE 3 : Investments (continued)

Investments Measured at NAV, Unfunded Commitments and Redemption Terms

As of December 31, 2020
(Dollars in Thousands)

The System uses the Net Asset Value (NAV) to determine the fair value of the underlying investments, which (a) do not have a readily determinable fair value and (b) prepare their financial statements consistent with the measurement principles of an investment company following the accounting and reporting guidance of the Financial Accounting Standards Board (FASB) Accounting Standards Codification ("ASC") Topic 946 Financial Services--Investment Companies.

	Fair Value Measured at NAV	Unfunded Commitments	Redemption Frequency (If Currently Eligible)[1]	Redemption Notice Period
Investments Measured at the Net Asset Value (NAV)				
Global Public Equity:				
Domestic Equity	$ 1,312	$ -	S	60 days
International Equity	294,177	-	W	7 days
Emerging Markets Equity	900,810	-	M	30 days
Total Equity Investments Measured at the NAV	**1,196,299**	**-**		
Real Assets:				
Agriculture	64,508	22,451	Q	60 days
Energy	472,625	529,018	N/A	N/A
Infrastructure	186,410	296,675	N/A	N/A
Real Estate	1,224,621	366,437	Q, N/A	45-90 days, N/A
Total Real Assets Measured at the NAV	**1,948,164**	**1,214,581**		
Other Investments:				
Absolute Return	480	-	N/A	N/A
Credit (includes private credit)	1,268,100	497,809	M, Q, N/A	5-90 days, N/A
Private Equity	2,353,755	1,138,392	N/A	N/A
Risk Mitigation	1,226,962	-	D, W, M, Q	1-75 days
Unique Strategies	55,283	40,082	Q, N/A	60 days, N/A
Total Other Investments at the NAV	**$ 4,904,580**	**$ 1,676,283**		
Total Investments Measured at the NAV	**$ 8,049,043**	**$ 2,890,864**		

[1] D=Daily, W=Weekly, M=Monthly, S=Semi-Annually, Q=Quarterly

The investment types listed in the above table were measured at the Net Asset Value (NAV) as explained below:

Global public equity includes six institutional funds. One fund focuses primarily U.S. equity securities, two funds focus on international securities and three funds focus on emerging markets equities. The fair value of each fund has been determined using NAV per share or unit of the investments.

Real assets: Agriculture includes one fund that invests in a diversified portfolio of vegetable and permanent crop farmland in select major agricultural states. The fund is an open-end, infinite life, private REIT (real estate investment trust) subject to the redemption terms in the above schedule.

Real assets: Energy consists of seventeen limited partnerships that invest primarily in oil and gas related investments. There are no redemption terms for any of these partnerships. These investments are considered illiquid. During the life of the partnerships, distributions are received as underlying partnership investments are realized. The fair values of this investment type have been determined using estimates provided by the underlying partnerships and are at NAV. One of the partnerships is considered a going concern, and is included at a zero value.

Real assets: Infrastructure consists of six limited partnerships that invest primarily in energy related renewable infrastructure. There are no redemption terms for any of these partnerships. These investments are considered illiquid. During the life of the partnerships, distributions are received as underlying partnership investments are realized. The fair values of this investment type have been determined using estimates provided by the underlying partnerships and are at NAV.

Real assets: Real estate investments include sixteen funds consisting of primarily trust funds and limited partnerships. The purpose of these funds is to acquire, own, invest in real estate and real estate related assets with the intention of achieving current income, capital appreciation or both. These investments are valued through independent appraisals and other unobservable methods. The majority of these funds are closed-end funds with structured investment periods, and considered illiquid investments. All other funds have no redemption restrictions other than the restrictions noted above.

Absolute return: Direct hedge includes one limited partnership fund, which is winding down. No redemptions are available at this time. Proceeds will be distributed when liquidated.

Credit includes investments in twenty limited partnership funds. Fourteen of these funds are considered private credit investments, which are closed-end funds and are considered illiquid investments. These investments represent approximately 35% of the value. The remaining six funds allow for redemption based on the terms noted above. The fair value of these investments has been determined using NAV per share of the investments.

Private equity includes primarily investments in limited partnership funds, managed by various different investment managers. Generally, the partnership strategies are to maximize the return by participating in private equity and equity-related investments through a diversified portfolio of venture capital, growth equity, buyouts, special situation partnerships and other limited liability vehicles. Investments in these partnerships are typically for 10-12 years and are considered illiquid. Redemptions are restricted over the life of the partnership. During the life of the partnerships, distributions are received as underlying partnership investments are realized. The fair values of this investment type have been determined using NAV per share of the System's ownership interest in partners' capital.

Risk mitigation includes ten limited partnership funds, which allow redemption with proper notification. The funds assist in diversifying the portfolio and protecting in an economic downturn of growth assets. The strategies are uncorrelated or negatively correlated to economic growth assets. The fair value of these investments has been determined using NAV per share.

Unique strategies includes two limited partnership funds, one of the funds allows for redemptions and the other fund has no redemption terms and is considered an illiquid investment. This asset class provides additional diversification which can be used to help mitigate risk and provide value to the OCERS portfolio. These investments are valued at NAV.

Notes to the Basic Financial Statements

NOTE 4 : Funding Policy - Pension Plan

Employer and employee/member pension plan contribution requirements are determined as a percentage of employer payrolls. In determining contributions, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. The projected total pensionable compensation for all OCERS' employers for the year ended December 31, 2020 was $1.9 billion. Employer contribution rates are determined using the entry age normal actuarial cost method based upon a level percentage of payroll. The employer contributions provide for both normal cost and an amount to amortize any unfunded or overfunded actuarial accrued liabilities. By definition, the normal cost is the annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement benefit if all underlying assumptions are met. The actuarial valuation report as of December 31, 2017 established the contribution rates for the first six months of calendar year 2020 (second half of fiscal year 2019-2020), and the actuarial valuation report as of December 31, 2018 established the contribution rates for the last six months of calendar year 2020 (first half of fiscal year 2020-2021). For the year ended December 31, 2020, employer contribution rates ranged from 12.11% of payroll to 65.24% depending upon the benefit plan type. Employer pension contributions were $659.8 million for the year ended December 31, 2020 of which approximately $481.6 million and $97.5 million, net of prepayment discounts, were made by the County of Orange and the Orange County Fire Authority, respectively. Participating employers are required by Government Code sections 31453.5 and 31454 to contribute a percentage of covered salary to the Plan. The contribution requirements of participating active members and employers are established and may be amended by the OCERS' Board of Retirement. Participating employers may pay a portion of the participating active employees' contributions through negotiations and bargaining agreements. Employer contributions paid for by the employee through negotiated reverse pick-up arrangements are treated and reported as employee contributions. Employee contributions elected to be paid for by the employer under Section 31581.1 are treated and reported as employer contributions as these payments do not become part of the accumulated contributions of the employee and are immaterial. Employee contributions elected to be paid for by the employer under Section 31581.2 are treated and reported as employee contributions as these payments are credited to the employee account and become a part of their accumulated contributions.

Employee contributions are established by the OCERS' Board of Retirement and guided by state statute (Government Code sections 31621, 31621.5, 31621.8, 31639.25 and 31639.5) and vary based upon employee age at the time of entering OCERS membership. OCERS received $279.4 million in employee pension contributions for the year ended December 31, 2020. Average employee contribution rates for the year ended December 31, 2020 ranged between 9.63% and 17.22%.

NOTE 5 : Plan Reserves

The OCERS Board of Retirement adopted the Reserves and Interest-Crediting Policy to identify all the reserves maintained by OCERS and how funds are distributed to and from the relevant reserve. Employer and employee contributions are deposited into various legally-required reserve accounts established on a book value basis. Set forth below are the descriptions of OCERS' various reserve accounts:

Pension Reserve

Pension reserve represents funding set aside for retirement payments derived from employer contributions. Additions include transfers from the employer contribution reserve and interest credited. Deductions include benefit payments made to retired members.

Employee Contribution Reserve

Employee contribution reserve represents the balance of member contributions. Additions include member contributions and interest credited. Deductions include member refunds and transfers to the annuity reserve fund retirement benefits.

Employer Contribution Reserve

Employer contribution reserve represents the balance of employer contributions for active member future retirement benefits. Additions include employer contributions and interest credited. Deductions include transfers to the pension reserves in order to fund retirement benefits, disability benefits and death benefits.

Annuity Reserve

Annuity reserve represents funding set aside for retirement payments derived from contributions made by members. Additions include transfers from the employee contribution reserve and interest credited. Deductions include benefit payments made to retired members.

Notes to the Basic Financial Statements

NOTE 5 : Plan Reserves (continued)

Contra Account

A positive balance in this account represents excess earnings. A credit balance in this account represents the amount of interest credited to the reserve accounts that has not been paid for out of current or excess earnings. Additions include net increases to the fiduciary net position, which are decreased by interest credited to the reserves account.

County Investment Account (POB Proceeds) Reserve

County investment account (POB Proceeds) reserve represents the remaining proceeds from the County of Orange's 1994 Pension Obligation Bond issuance. The remaining proceeds are utilized, in accordance with a long standing agreement between OCERS and the County of Orange, to offset a portion of the annual actuarially-determined contribution rates for the County of Orange. In 2020, $5 million of the remaining proceeds were utilized to offset the actuarially determined contributions for the County of Orange.

OCSD UAAL Deferred Reserve

The Orange County Sanitation District (OCSD) UAAL Reserve represents the payment made by OCSD for its deferred UAAL. OCERS shall make annual transfers from the OCSD reserve account into the OCERS' employer contribution reserve account in the amount necessary to satisfy the actual UAAL attributed to OCSD. The intent of this transfer is to provide that the OCSD's future annual employer contribution obligation to OCERS shall consist of either the normal cost portion only, or the normal cost and amortizing installments of only such amount of future actual UAAL that exceeds to the amount of funds remaining in the OCSD reserve account.

Actuarial Deferred Return

The actuarial deferred return represents the balance of deferred earnings created by a five-year smoothing of actual gains and losses compared to the assumed investment rate of return.

Health Care Plan Reserves

Health care plan reserves represent assets held to pay medical benefits for eligible retirees of the 401(h) health care plans. Additions include employer contributions and investment earnings. Deductions include medical payments and administrative expenses.

Custodial Fund Reserve

Custodial fund reserve represents custodial assets held by OCERS in an investment capacity for the Orange County Transportation Authority (OCTA) health care plan. Additions include other postemployment benefit contributions and investment earnings. Deductions include other postemployment benefits and administrative expenses.

Total Plan Reserves

As of December 31, 2020

(Dollars in Thousands)

Valuation Reserves	
Pension Reserve	$ 10,683,446
Employee Contribution Reserve	3,494,518
Employer Contribution Reserve	2,866,443
Annuity Reserve	2,160,090
Contra Account	(1,550,368)
Non-Valuation Reserves	
County Investment Reserve	160,378
OCSD UAAL Deferred Reserve	13,433
Total Pension Fund Reserves (smoothed market actuarial value)	**17,827,940**
Actuarial Deferred Return	969,263
Net Position Restricted for Pensions including Non-Valuation Reserves	**18,797,203**
Health Care Reserves	457,817
Custodial Fund Reserve	19,579
Net Position-Total Funds	**$ 19,274,599**

Notes to the Basic Financial Statements

NOTE 6 : Administrative Expenses - Pension

As permitted by Government Code (Code) Section 31580.2, the Board of Retirement adopts an annual budget, financed from the System's assets, covering the entire expenses for the administration of OCERS. The Code provides that administrative expenses incurred in any year are to be charged against the earnings of the pension trust fund and are not to exceed twenty-one hundredths of one percent (0.21%) of OCERS' actuarial accrued liabilities, excluding investment related costs and expenditures for computer software, hardware and related technology consulting services. Administrative expenses incurred in calendar year 2020 were within the limits established by the Code. The following schedule represents the excess of the maximum allowed over actual administrative expenses for the year ended December 31, 2020.

Administrative Expense Compared to Actuarial Accrued Liability

For the Year Ended December 31, 2020
(Dollars in Thousands)

Projected Actuarial Accrued Liability (AAL) as of December 31, 2020	$	22,980,997
Maximum Allowed for Administrative Expense (AAL * 0.21%)		48,260
Actual Administrative Expense[1]		18,607
Excess of Allowed Over Actual Expense	**$**	**29,653**
Actual Administrative Expense as a Percentage of Projected Actuarial Accrued Liability as of December 31, 2020		0.08%
[1] Administrative Expense Reconciliation		
Administrative Expense per Statement of Changes in Fiduciary Net Position	$	20,428
Less: Administrative Expense Not Considered per CERL Section 31596.1		(1,821)
Administrative Expense Allowable Under CERL Section 31580.2	**$**	**18,607**

NOTE 7: Contingencies

At December 31, 2020, OCERS was involved in various litigation matters. In management's opinion, and after consultation with legal counsel, the outcome of these matters is not expected to have a material adverse effect on OCERS' financial position.

The net pension liability was measured as of December 31, 2020. The plan fiduciary net position was valued as of the measurement date while the total pension liability was determined based upon rolling forward the total pension liability from the actuarial valuation as of December 31, 2019. The components of the net pension liability as of December 31, 2020 are as follows:

Net Pension Liability

For the Year Ended December 31, 2020

(Dollars in Thousands)

Total Pension Liability	$ 23,010,450
Less: Plan Fiduciary Net Position	(18,797,203)
Net Pension Liability	**$ 4,213,247**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	**81.69%**

Actuarial Assumptions

Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future. Examples include future salary increases and investment earnings, expected retirement age, life expectancy and other relevant factors. Actuarially determined amounts are subject to continual revision as results are compared to past expectations and new estimates are made about the future. OCERS' independent actuary and Board of Retirement review the economic and demographic assumptions every three years and the actuarially determined contributions annually.

In preparing the actuarial valuation, the actuary has complied with the parameters set forth in GASB Statement No.67, *Financial Reporting for Pension Plans – an Amendment of GASB Statement No. 25* (GASB 67), and employed generally accepted actuarial methods and assumptions to measure the total pension liability of employers. The actuary's calculations are based upon member data and financial information provided by the System. Projection of benefits for financial reporting purposes is based on all benefits estimated to be payable through the System to current active, retired and inactive employees as a result of their past service and their expected future service.

The total pension liability as of December 31, 2020 was determined by the actuarial valuation as of December 31, 2019. The actuarial assumptions used were based on the results of an experience study for the period from January 1, 2017 through December 31, 2019 and they are the same assumptions used in the December 31, 2020 funding valuations for OCERS. In particular, the following actuarial assumptions were applied in the measurement:

Inflation	2.50%
Salary Increases	General: 4.00% to 11.00% and Safety: 4.60% to 15.00%, vary by service, including inflation
Cost of Living Adjustments	2.75% of retirement income
Investment Rate of Return	7.00%, net of pension plan investment expense, including inflation
Mortality Rates	Mortality rate tables changed to Pub-2010 Amount Weighted Above-Median Mortality Table, projected generationally using two-dimensional MP-2019 scale, adjusted separately for healthy and disabled for both general and safety members.
Other Assumptions	Actuarial experience study during the period of January 1, 2017 through December 31, 2019

Long-Term Expected Real Rate of Return

The long-term expected rate of return on pension plan investments[5] was determined using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns 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, adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation but before deducting investment expenses are shown in the following table. This information was used in the derivation of the long-term expected investment rate of return assumption for the December 31, 2020 actuarial valuation. This information will change every three years based on the actuarial experience study.

Long-Term Expected Real Rate of Return

For the Year Ended December 31, 2020

Asset Class	Target Allocation	Long-Term Expected Arithmetic Real Rate of Return
Large Cap Equity	23.10%	5.43%
Small Cap Equity	1.90%	6.21%
International Developed Equity	13.00%	6.67%
Emerging Markets Equity	9.00%	8.58%
Core Bonds	9.00%	1.10%
High Yield Bonds	1.50%	2.91%
TIPS	2.00%	0.65%
Emerging Market Debt	2.00%	3.25%
Corporate Credit	1.00%	0.53%
Long Duration Fixed Income	2.50%	1.44%
Real Estate	3.01%	4.42%
Private Equity	13.00%	9.41%
Value Added Real Estate	3.01%	7.42%
Opportunistic Real Estate	0.98%	10.18%
Energy	2.00%	9.68%
Infrastructure (Core Private)	1.50%	5.08%
Infrastructure (Non-Core Private)	1.50%	8.92%
CTA - Trend Following	2.50%	2.38%
Global Macro	2.50%	2.13%
Private Credit	2.50%	5.47%
Alternative Risk Premia	2.50%	2.50%
Total	100 %	

[5] The investment return assumption for funding purposes is developed net of both investment and administrative expenses; however, the same investment return assumption is used for financial reporting purposes, where it is considered gross of administrative expenses.

Notes to the Basic Financial Statements

NOTE 8 : Pension Disclosures (continued)

Discount Rate

The discount rate used to measure the total pension liability was 7.00% for the year ended December 31, 2020. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the plan fiduciary net position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability as of December 31, 2020.

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

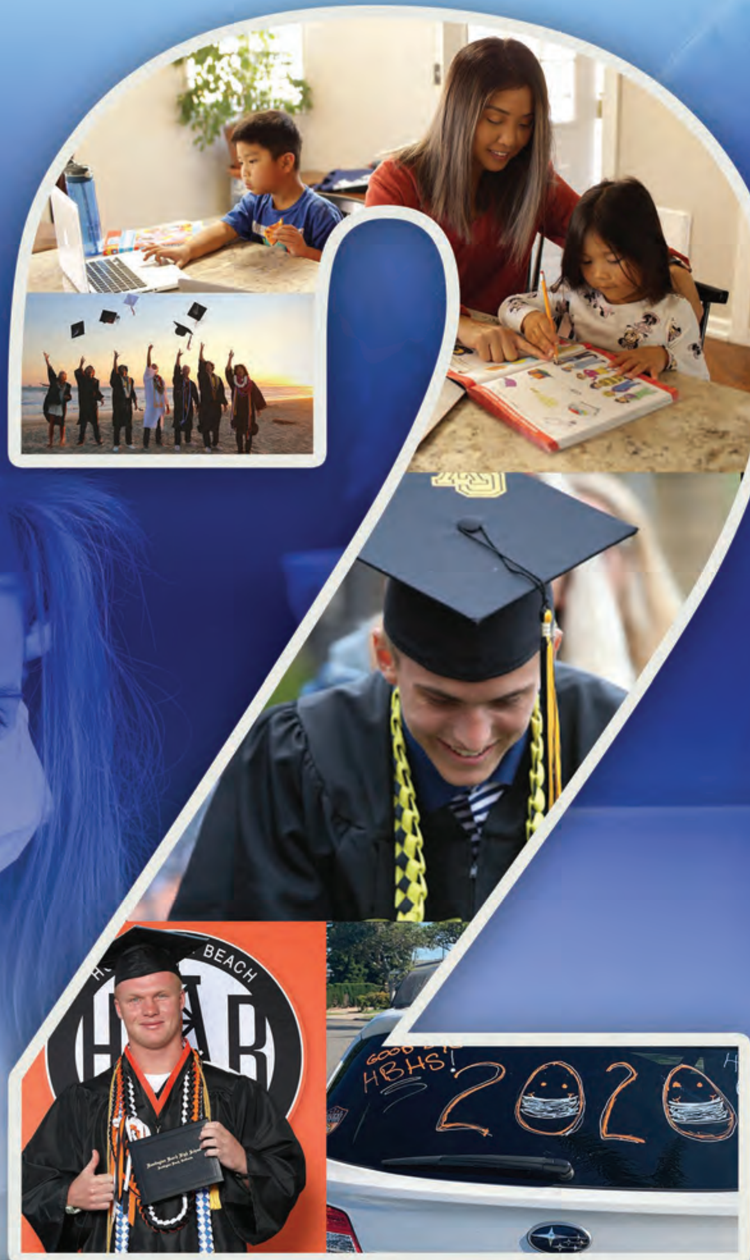
The following table represents the net pension liability as of December 31, 2020, of participating employers calculated using the discount rate of 7.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1.00% lower (6.00%) or 1.00% higher (8.00%) than the current rate:

Sensitivity of Net Pension Liability to Changes in the Discount Rate

As of December 31, 2020
(Dollars in Thousands)

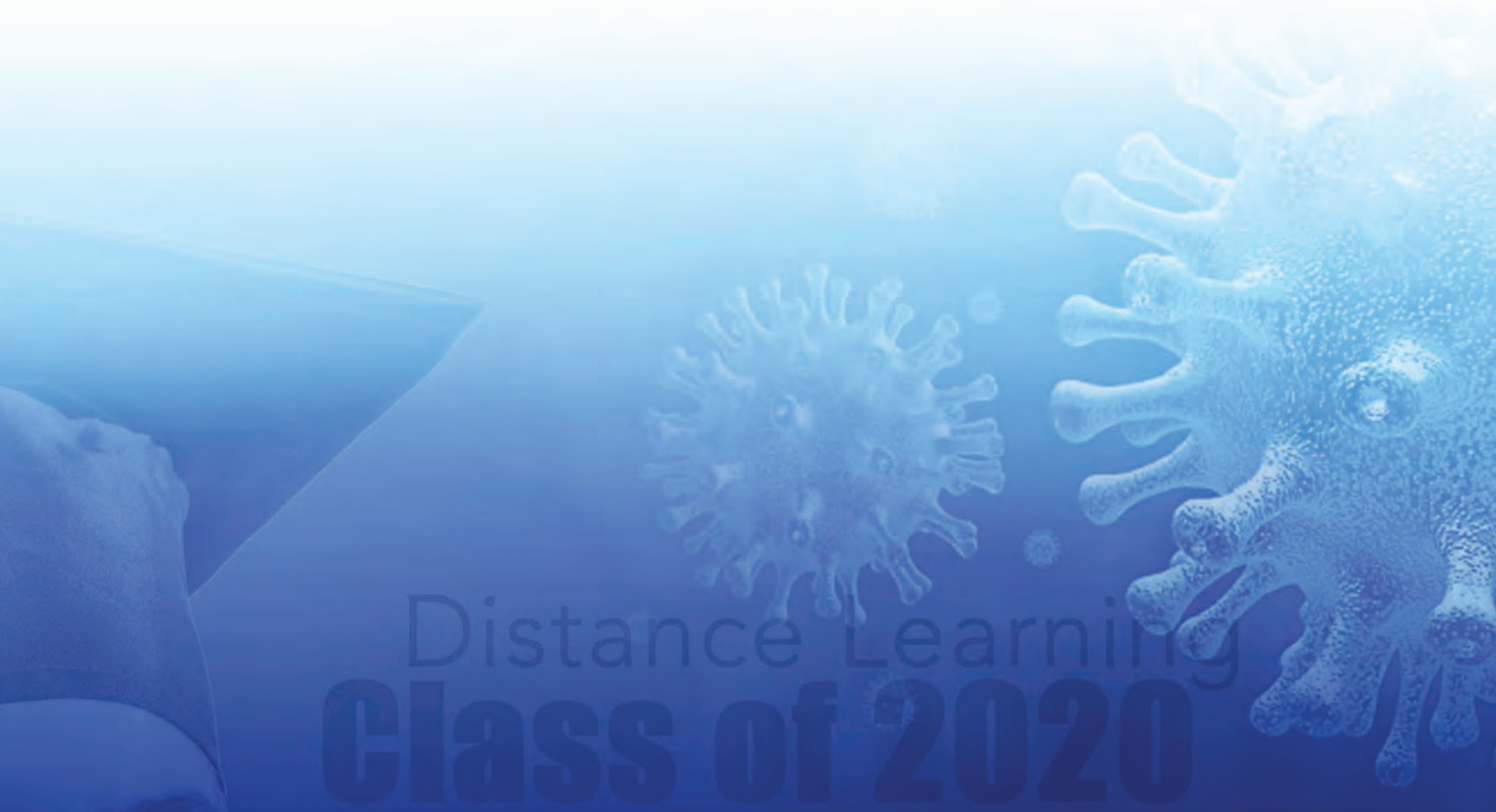
1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
$ 7,460,868	$ 4,213,247	$ 1,565,937

Section



FINANCIAL

REQUIRED SUPPLEMENTARY INFORMATION



Distance Learning and Class of 2020

By the end of March 2020, nearly all students had been sent home to continue the academic year distance learning from their homes. Teachers not only had to teach their students remotely, they needed to navigate their students through many technology challenges that were faced with the many applications being used. Parents working from home had to find a balance between completing their tasks at work in addition to assisting and guiding their children with remote learning.

So many activities were canceled, postponed or socially distanced, especially for the Class of 2020! Sporting events were canceled; prom and other year-end events were canceled. Graduation ceremonies were switched to students driving through school parking lots and waving good-bye to teachers and friends.

As the new school year approached in the fall, parents, students, and educators were faced with the dilemma of continuing distance learning, returning to the classroom or creating a hybrid learning format.

Schedule of Changes in Net Pension Liability of Participating Employers

For the Years Ended December 31, 2013 through 2020[1]
(Dollars in Thousands)

	2020	2019	2018
Total Pension Liability			
Service Cost	$ 512,255	$ 499,256	$ 491,373
Interest	1,535,954	1,452,644	1,379,917
Change of Benefit Terms	-	-	-
Differences Between Expected and Actual Experience	162,336	24,383	(118,124)
Changes of Assumptions	18,967	-	-
Benefit Payments, Including Refunds of Employee Contributions	(973,325)	(900,902)	(828,278)
Other	-	-	-
Net Change in Total Pension Liability	1,256,187	1,075,381	924,888
Total Pension Liability - Beginning	21,754,263	20,678,882	19,753,994
Total Pension Liability - Ending (a)	**$ 23,010,450**	**$ 21,754,263**	**$ 20,678,882**
Plan Fiduciary Net Position			
Contributions - Employer[3]	$ 659,807	$ 653,793	$ 580,905[5]
Contributions - Employee	279,384	279,373	270,070
Net Investment Income/(Loss)	2,173,184	2,183,808	(324,628)
Benefit Payments, Including Refunds of Employee Contributions	(973,325)	(900,902)	(828,278)
Administrative Expense	(20,428)	(19,171)	(18,284)
Net Change in Plan Fiduciary Net Position	2,118,622	2,196,901	(320,215)
Plan Fiduciary Net Position - Beginning	16,678,581	14,481,680	14,801,895
Plan Fiduciary Net Position - Ending (b)	18,797,203	16,678,581	14,481,680
Net Pension Liability (a) - (b) = (c)	**$ 4,213,247**	**$ 5,075,682**	**$ 6,197,202**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability (b)/(a)	81.69 %	76.67%	70.03%
Covered Payroll (d)[6]	$ 1,909,268	$ 1,783,054	$ 1,718,798
Plan Net Pension Liability as a Percentage of Covered Payroll (c)/(d)	220.67 %	284.66%	360.55%

[1] Data for years prior to 2013 is not available. Information will be presented over ten years as it becomes available prospectively.

[2] Orange County Public Law Library was separated out from the Orange County Sanitation District in Rate Group #3 and put into their own Rate Group (Rate Group #12) after the valuation as of December 31, 2015. There was an adjustment to the UAAL for Rate Group #3 that was originally included in the December 31, 2015 valuation. There was a credit of $509 given to the Orange County Public Law Library to reflect that their future service enhancement did not increase the UAAL.

[3] Reduced by discount for prepaid contributions and transfers from County Investment Account.

[4] A $24,042 transfer from the Orange County Sanitation District Deferred UAAL Account which was required to offset a UAAL increase for the assumption changes has been excluded from this amount.

[5] A $14,589 transfer from the Orange County Sanitation District Deferred UAAL Account which was required to offset a UAAL increase for the actuarial losses as of December 31, 2018 has been excluded from this amount.

[6] Covered payroll represents payroll on which contributions to the pension plan are based.

Schedule of Changes in Net Pension Liability of Participating Employers

For the Years Ended December 31, 2013 through 2020[1]
(Dollars in Thousands)

(continued)

	2017	2016	2015	2014	2013
Total Pension Liability					
Service Cost	$ 452,412	$ 427,473	$ 439,454	$ 438,600	$ 444,838
Interest	1,305,268	1,241,080	1,197,308	1,153,352	1,109,002
Change of Benefit Terms	-	-	-	-	-
Differences Between Expected and Actual Experience	(66,964)	(323,566)	(205,463)	(327,402)	(295,483)
Changes of Assumptions	827,197	-	-	(127,729)	-
Benefit Payments, Including Refunds of Employee Contributions	(764,344)	(717,976)	(675,963)	(630,678)	(586,284)
Other	-	(509)[2]	-	-	-
Net Change in Total Pension Liability	1,753,569	626,502	755,336	506,143	672,073
Total Pension Liability - Beginning	18,000,425	17,373,923	16,618,587	16,112,444	15,440,371
Total Pension Liability - Ending (a)	**$ 19,753,994**	**$ 18,000,425**	**$ 17,373,923**	**$ 16,618,587**	**$ 16,112,444**
Plan Fiduciary Net Position					
Contributions - Employer[3]	$ 572,104[4]	$ 567,196	$ 571,298	$ 625,520	$ 427,095
Contributions - Employee	262,294	258,297	249,271	232,656	209,301
Net Investment Income/(Loss)	1,939,635	1,061,243	(10,873)	499,195	1,152,647
Benefit Payments, Including Refunds of Employee Contributions	(764,344)	(717,976)	(675,963)	(630,678)	(586,284)
Administrative Expense	(17,002)	(16,870)	(12,521)	(11,905)	(11,705)
Net Change in Plan Fiduciary Net Position	1,992,687	1,151,890	121,212	714,788	1,191,054
Plan Fiduciary Net Position - Beginning	12,809,208	11,657,318	11,536,106	10,821,318	9,630,264
Plan Fiduciary Net Position - Ending (b)	14,801,895	12,809,208	11,657,318	11,536,106	10,821,318
Net Pension Liability (a) - (b) = (c)	**$ 4,952,099**	**$ 5,191,217**	**$ 5,716,605**	**$ 5,082,481**	**$ 5,291,126**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability (b)/(a)	74.93%	71.16%	67.10%	69.42%	67.16%
Covered Payroll (d)[6]	$ 1,678,322	$ 1,602,675	$ 1,521,036	$ 1,513,206	$ 1,494,745
Plan Net Pension Liability as a Percentage of Covered Payroll (c)/(d)	295.06%	323.91%	375.84%	335.88%	353.98%

Schedule of Investment Returns

For the Years Ended December 31, 2014 Through 2020[1]

Years Ended December 31	Annual Money Weighted Rate of Return, Net of Investment Expense
2014	4.64%
2015	-0.51%
2016	8.71%
2017	14.74%
2018	-1.31%
2019	14.81%
2020	11.22%

[1] Data for years prior to 2014 is not available. Information will be presented over ten years as it becomes available prospectively.

Schedule of Employer Contributions

For the Years Ended December 31, 2011 through 2020
(Dollars in Thousands)

Years Ended December 31	Actuarially Determined Contributions[1,2]	Actual Contributions[1,2]	Contribution Deficiency / (Excess)[3]	Covered Payroll	Contributions as a % of Covered Payroll
2011	$ 387,585	$ 387,585	$ -	$ 1,498,914	25.86%
2012	406,521	406,521	-	1,497,475	27.15%
2013	426,020	427,095[3]	(1,075)	1,494,745	28.57%
2014	476,320	625,520[3]	(149,200)	1,513,206	41.34%
2015	502,886	571,298[3]	(68,412)	1,521,036	37.56%
2016	521,447	567,196[3]	(45,749)	1,602,675	35.40%
2017	536,726[4]	572,104[3,4]	(35,378)	1,678,322	34.09%
2018	556,728[5]	580,905[3,5]	(24,177)	1,718,798	33.80%
2019	583,057	653,793[3]	(70,733)	1,783,054	36.67%
2020	638,215	659,807[3]	(21,592)	1,909,268	34.56%

[1] Excludes employer pickup of member contributions and transfers from County Investment Account (funded by pension obligation proceeds held by OCERS). Those transfers are as follows:

2011	$11,000	2016	$ -
2012	5,550	2017	-
2013	5,000	2018	-
2014	5,000	2019	-
2015	-	2020	5,000

[2] Reduced by discount for prepaid contributions

[3] Includes additional contributions made by employers towards the reduction of their UAAL.

[4] A $24,042 transfer from the Orange County Sanitation District Deferred UAAL Account, which was required to offset a UAAL increase for the assumption changes has been excluded from both these amounts.

[5] A $14,589 transfer from the Orange County Sanitation District Deferred UAAL Account which was required to offset a UAAL increase for the actuarial losses as of December 31, 2018 has been excluded from both of these amounts.

Notes to the Required Supplementary Information

Actuarial Valuation Methods and Assumptions

The actuarial determined contribution rates in the schedule of employer contributions are calculated as of December 31. Rates are effective eighteen months after the valuation date for the fiscal year that begins July 1. The following actuarial methods and assumptions were used to calculate the actuarially determined contributions for the year ended December 31, 2020:

Valuation Date	Actuarially determined contribution rates for the first six months of calendar year 2020 or the second half of fiscal year 2019-2020 are calculated based on the December 31, 2017 valuation. Actuarially determined contribution rates for the last six months of calendar year 2020 or the first half of fiscal year 2020-2021 are calculated based on the December 31, 2018 valuation.
Actuarial Cost Method	Entry Age Actuarial Cost Method
Amortization Method	Level percent of payroll for total unfunded actuarial accrued liability
Remaining Amortization Period	Effective December 31, 2013, the outstanding balance of the UAAL from the December 31, 2012 valuation was combined and re-amortized over a declining 20-year period. Any changes in UAAL due to actuarial gains or losses or due to changes in assumptions or methods will be amortized over separate 20-year periods. Any changes in UAAL due to plan amendments will be amortized over separate 15-year periods and any change in UAAL due to early retirement incentive programs will be amortized over a separate period of up to 5 years.
Asset Valuation Method	The Actuarial Value of Assets is determined by recognizing any difference between the actual and the expected market return over a five-year period. The Valuation Value of Assets is the Actuarial Value of Assets reduced by the value of the non-valuation reserves.

Actuarial Assumptions:	
December 31, 2017 Valuation	
Investment Rate of Return	7.00% net of pension plan investment expense, including inflation
Inflation Rate	2.75%
Real Across-the-Board Salary Increase	0.50%
Projected Salary Increases	General: 4.25% to 12.25% and Safety: 4.75% to 17.25%, vary by service, including inflation
Cost of Living Adjustments	2.75% of retirement income
Other Assumptions	Same as those used in the December 31, 2017 funding actuarial valuation
December 31, 2018 Valuation	
Investment Rate of Return	7.00% net of pension plan investment expense, including inflation
Inflation Rate	2.75%
Real Across-the-Board Salary Increase	0.50%
Projected Salary Increases	General: 4.25% to 12.25% and Safety: 4.75% to 17.25%, vary by service, including inflation
Cost of Living Adjustments	2.75% of retirement income
Other Assumptions	Same as those used in the December 31, 2018 funding actuarial valuation

Significant Factors Affecting Trends in Actuarial Information – Pension Plan

Changes in Benefit Terms

2016 • New employees hired by the City of San Juan Capistrano on and after July 1, 2016 will be offered a choice in retirement plan formulas; the PEPRA Plan U (2.5% at 67 PEPRA – General) or the alternate plan formula, Plan W (1.62% at 65 PEPRA – General).

• Orange County Public Law Library was moved from Rate Group #3 into its own rate group, Rate Group #12.

2012 • With the exception of OCTA, members with membership date on or after January 1, 2013 will be placed in PEPRA tiers: Plan T (1.62% at 65 PEPRA – General); Plan U (2.5% at 67 PEPRA – General); or Plan V (2.7% at 57 PEPRA – Safety).

2011 • Effective April 20, 2012, certain employees previously employed at the City of Santa Ana became employees of OCFA General and OCFA Safety and are eligible for benefits under Plan N (2 % at 55) and Plan F (3% at 50), respectively.

• Effective July 1, 2012, new General employees hired by the City of San Juan Capistrano will be covered under General Plan S (2% at 57).

Significant Factors Affecting Trends in Actuarial Information – Pension Plan

(continued)

Changes in Assumptions

2020 • The inflation rate was reduced from 2.75% to 2.50% (retiree cost-of-living assumption maintained at 2.75%).

• Projected salary increases for general members of 4.25% to 12.25% changed to 4.00% to 11.00% and safety members changed from 4.75% to 17.25% to 4.60% to 15.00%.

• Mortality rate tables changed to Pub-2010 Amount Weighted Above-Median Mortality Table, projected generationally using two-dimensional MP-2019 scale, adjusted separately for healthy and disabled for both general and safety members.

• The cost impact of assumption changes to employers is $19 million.

2017 • The assumed rate of return was decreased from 7.25% to 7.00%.

• The inflation rate was decreased from 3.00% to 2.75%.

• Projected salary increases for general members of 4.25% to 13.50% changed to 4.25% to 12.25% and safety members changed from 5.00% to 17.50% to 4.75% to 17.25%.

• Mortality rate tables changed to a Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally using two-dimensional MP-2016 scale, adjusted separately for healthy and disabled for both general and safety members.

• Impact due to assumption changes to be phased-in over three years.

2014 • The inflation rate was reduced from 3.25% to 3.00%

• Total wage inflation and payroll growth was reduced from 3.75% to 3.50%.

• Inclusion of additional cash-out assumptions in developing basic member contribution rates in the legacy plans.

• Mortality rates for after service retirement were changed to reflect longer life expectancies for Safety members and shorter life expectancies for General members and longer life expectancies for both General and Safety members for after disability retirement. The cost impact to employer to be phased in over three years.

2013 • The outstanding balance of the December 31, 2012 UAAL was combined and re-amortized over a 20-year period.

2012 • The investment rate of return was decreased from 7.75% to 7.25%.

• The inflation rate was decreased from 3.50% to 3.25%.

• Projected salary increases for general members of 4.50% to 11.50% changed to 4.75% to 13.75% and safety members changed from 4.50% to 13.50% to 4.75% to 17.75%.

2011 • Changes in mortality, disability, termination, retirement, salary scale, and annual pay-off assumptions in the December 31, 2010 triennial experience study increased the pension plan UAAL by $364 million.

Section

FINANCIAL

OTHER SUPPLEMENTARY INFORMATION

Living Under Quarantine

Vacations

Living Under Quarantine

As summer approached, and school ended and vacation time arrived, fewer travel plans were made.

College students and young adults left the confines of their campuses and cities, and came home with masks on their faces and gloves on their hands to prevent spreading the virus to their family.

Extended families gathered together and worked and played from the family homes. Neighborhoods were filled with families walking their dogs, riding their bikes and exercising in the confines of their neighborhood.

Families planned road trips and staycations instead of air travel to destinations farther away. Beaches and wide open spaces were recommended for family recreation.

Schedule of Contributions

For the Year Ended December 31, 2020
(Dollars in Thousands)

	Employee	Employer
Pension Trust Fund Contributions		
County of Orange	$ 212,913	$ 502,901
Orange County Fire Authority	28,291	99,179[1]
Orange County Superior Court of California	16,179	34,813
Orange County Transportation Authority	10,329	28,893
Orange County Sanitation District	8,329	8,481
UCI Medical Center & Campus	-	3,068[2]
Orange County Employees Retirement System	1,202	2,899
City of San Juan Capistrano	773	2,337
Transportation Corridor Agencies	748	865
Orange County Department of Education	-	286[2]
Orange County Cemetery District	168	207
Orange County In-Home Supportive Services Public Authority	124	165
Orange County Local Agency Formation Commission	43	158
Orange County Children & Families Commission	121	151
Orange County Public Law Library	164	135
Contributions Before Prepaid Discount	279,384	684,538
Prepaid Employer Contribution Discount	-	(24,731)
Total Pension Trust Fund Contributions	**279,384**	**659,807**
Health Care Fund - County Contributions	**-**	**41,559**
Health Care Fund - OCFA Contributions	**-**	**1,976**
Custodial Fund - OCTA Employer OPEB Contributions	**-**	**613**
Total Contributions	**$ 279,384**	**$ 703,955**

[1] Unfunded actuarial accrued liability payments were made for $21.6 million by the Orange County Fire Authority.

[2] Unfunded actuarial accrued liability payments have been made in accordance with a separate 20-year level dollar payment schedule to include liabilities for employee benefits related to past service credit.

Schedule of Administrative Expenses

For the Year Ended December 31, 2020
(Dollars in Thousands)

Pension Trust Fund Administrative Expenses	
Expenses Subject to the Statutory Limit	
Personnel Services	
Employee Salaries and Benefits	$ 12,843
Board Members' Allowance	15
Total Personnel Services	12,858
Office Operating Expenses	
Depreciation/Amortization	2,534
Professional Services	1,145
General Office and Administrative Expenses	1,430
Rent/Leased Real Property	640
Total Office Operating Expenses	5,749
Total Expenses Subject to the Statutory Limit	18,607
Expenses Not Subject to the Statutory Limit	
Information Technology Professional Services	1,014
Actuarial Fees	415
Equipment / Software	249
Information Security Professional Services	143
Total Expenses Not Subject to the Statutory Limit	1,821
Total Pension Trust Fund Administrative Expenses	**20,428**
Health Care Fund - County Administrative Expenses	**22**
Health Care Fund - OCFA Administrative Expenses	**22**
Custodial Fund - OCTA Administrative Expenses	**22**
Total Administrative Expenses	**$ 20,494**

Schedule of Investment Expenses

For the Year Ended December 31, 2020
(Dollars in Thousands)

Investment Management Fees*		
Global Public Equity		
U.S. Equity	$	2,935
International Equity		6,654
Emerging Markets Equity		4,756
Total Global Public Equity		14,345
Core Fixed Income		
U.S. Fixed Income		2,683
Total Core Fixed Income		2,683
Credit		
Emerging Markets Debt		2,935
Corporate Credit		1,424
Opportunistic Credit		3,916
Private Credit		3,202
Total Credit		11,477
Real Assets		
Real Estate		11,860
Real Return		
Timber		509
Agriculture		1,259
Infrastructure		3,929
Energy		5,635
Total Real Return		11,332
Total Real Assets		23,192
Absolute Return		
Direct Hedge Fund		6
Total Absolute Return		6
Private Equity		22,280
Risk Mitigation		14,083
Short-Term Investments		272
Total Investment Management Fees		**88,338**
Other Fund Expenses[1]		**14,638**
Other Investment Expenses		
Consulting/Research Fees		1,930
Investment Department Expenses		2,332
Legal Services		538
Custodian Services		580
Investment Service Providers		19
Total Other Investment Expenses		**5,399**
Security Lending Activity		
Security Lending Fees		212
Rebate Fees		692
Total Security Lending Activity		**904**
Custodial Fund - OCTA Investment Fees and Expenses		**3**
Total Investment Expenses	**$**	**109,282**

* Does not include undisclosed fees deducted at source.

[1] These costs include, but are not limited to, foreign income tax and other indirect flow-through investment expenses such as organizational expenses in limited partnership structures.

Schedule of Payments for Professional Services

For the Year Ended December 31, 2020
(Dollars in Thousands)

Type of Services*		
Professional Expenses Subject to the Statutory Limit		
Legal Counsel	$	(277)[1]
Information Technology Services		377
Medical/Disability Services		349
Other Consulting/Services		292
Other Legal Services		111
Administrative Services		125
Audit Services		122
Finance Services		46
Total Professional Expenses Subject to the Statutory Limit		**1,145**
Professional Expenses Not Subject to the Statutory Limit		
Consulting/Research Fees		1,930
Custodian Services		580
Information Technology Consultants		1,014
Investment Legal Services		538
Actuarial Services		415
Information Security Consultants		143
Investment Service Providers		19
Total Professional Expenses Not Subject to the Statutory Limit		**4,639**
Total Payments for Professional Expenses	**$**	**5,784**

* Detail for fees paid to investment professionals is presented in the Investment Section.
[1] The negative balance is a result of the reimbursement of fees from the prior years.

Section

INVESTMENTS

Economic Impacts

In response to the economic fallout of the COVID-19 pandemic in the United States, an economic stimulus bill, the Coronavirus Aid Relief and Economic Securities Act (CARES Act), was passed by Congress on March 27, 2020 to provide emergency assistance and health care response to individuals, families and business affected by the COVID-19 pandemic.

Many businesses and industries were greatly affected by the global shutdown, such as entertainment venues, restaurants, salons, gyms and the tourist and travel industry that Orange County heavily relies on for revenue. Some businesses were fluid and adjusted their operations, other businesses were unable to make the change and closed.

Grocery and food retailers had to respond to an unprecedented demand that strained the entire ecosystem. Many customers had to shift to the new normal of food and grocery delivery services and online ordering. In addition, many grocery stores struggled to meet consumer demands of everyday necessities such as toilet paper, flour and meat which led to empty grocery shelves for months during the pandemic. Disinfectants and hand sanitizers were also difficult to come by.

The unemployment rate for Orange County went from below 3% prior to the pandemic to over 7% as of the end of 2020.

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MEMORANDUM

TO: Board Members, Orange County Employees Retirement System
FROM: Stephen McCourt, Allan Emkin, Laura Wirick, Stephanie Sorg, Meketa Investment Group
DATE: April 15, 2021
RE: Investment Consultant's Statement for 2020 Comprehensive Annual Financial Report

This letter reviews the investment performance of the Orange County Employees Retirement System (OCERS) portfolio for the fiscal year ending December 31, 2020.

OCERS' stated mission is to provide secure retirement and disability benefits with the highest standards of excellence. To this end, OCERS strives to align the portfolio's asset allocation, investments, and other related decisions with the goals of the overall System. This alignment is a fundamental part of the Investment Committee's regular meetings, where performance is examined (both on an overall portfolio basis and at the manager level), asset allocation is reviewed and modified to fit changes in expected return, strategic and tactical decisions are discussed, and the System's liabilities are reviewed. Meketa Investment Group, OCERS' general consultant, works to provide guidance to the Board (the System's fiduciary), and assist the Board with performance evaluation, asset allocation, manager selection, and other industry best practices.

State Street Bank and Trust Company, OCERS' custodian, independently prepared the performance data used in this report. Rates of return are represented using a time-weighted rate of return methodology based upon market values.

2020 Calendar Year in Review

We entered calendar year 2020 facing considerable uncertainty regarding the path of fiscal and monetary policies, elevated valuations, declining growth in China, a general slowdown in global growth, the potential for additional trade issues, and political uncertainty in Europe and in the US. All these concerns weighed heavily on most investors' minds. That is, until a new virus, coined COVID-19, hit the globe and we were faced with extraordinary circumstances – regional lockdowns, businesses and school closures as we attempted to flatten the curve, economies essentially shut down.

By most accounts, global financial markets entered calendar 2020 on relatively strong footing. Equity markets continued their march higher early in the year, despite elevated valuations, as investors increasingly began to price in a reflationary growth impulse, as suggested by leading economic indicators in global developed and emerging markets. However, a relatively optimistic backdrop underwent a remarkably rapid shift over the course of just a few weeks.

April 15, 2021

In January, the first COVID-19 case, reportedly originating in Wuhan, China, was acknowledged by Chinese authorities. By March, the virus began to spread globally, particularly in Europe, with Italy and Spain reporting massive spikes in infections and mortality rates. By virtue of greater freedom of travel and 21st century globalization, the virus spread far more quickly than was initially expected based on previous viral outbreaks. In an effort to contain the spread, countries responded by enacting stringent lockdowns, or "stay at home orders" leading to an abrupt halt in production and consumption. Layoffs expanded dramatically and swiftly, as businesses were forced to close in an effort to stop the disease from spreading.

The impact of global lock-downs on financial markets was extreme. All major stock indices saw sharp selloffs in the first quarter of 2020. Volatility (the VIX), which had been relatively benign in 2019, finishing the year slightly below 14 and well below the long-term average, spiked above its prior peak during the Global Financial Crisis, briefly breaching 80 in early March.

At the depth of the drawdown from January 1 - March 23 the Russell 3000 returned -31.6%, the MSCI EAFE Index (developed market equities) -33.2%, and the MSCI Emerging Markets Index (emerging market equities) -31.8%. The perception of acute stress in credit markets, both in the US and abroad, led to solvency fears; the Barclays High Yield index fell -19.8%. By April, oil futures turned negative, with May delivery contract oil price of -$37 a barrel. Investors universally fled risk assets, in all forms, during the selloff in favor of perceived safer assets like US Treasuries.

Over this same time period, the spread between large cap stocks - which tend to experience less volatility in drawdowns - and small cap stocks - which are more pro-cyclical and volatile - widened during the selloff. The Russell 1000 returned -31.1% versus -39.7% for the Russell 2000, a spread of nearly 10.0%. The spread between large cap growth and small cap value further expanded during the selloff, with the Russell 1000 Growth declining 25.1% and the Russell 2000 Value falling 44.3%, for a spread of nearly 20.0%.

The rapid unwind of risk in early 2020, one of the fastest market selloffs in modern financial history, reinforced the importance of diversification. While equity and credit markets fell precipitously, bonds provided an offset for investors. The Bloomberg Barclays US Aggregate generated a return of 1.0% over the course of the drawdown noted above, and long-term Treasuries, measured by the Bloomberg Barclays Long US Government index, generated a return of 20.2%.

The volatility of the pandemic was exacerbated by volatility in oil prices, which experienced a rapid collapse early in 2020. Commodity and natural resource asset classes both participated in the broader market selloff; the Bloomberg Commodity Index and the S&P Global Natural Resources Index were down -23.1% and -44.6% at the trough, respectively.

To combat the expected significant decline in economic activity, fiscal and monetary authorities globally responded with immediate and historic stimulus measures. The Federal Reserve, in the midst of the March drawdown, immediately cut the Fed Funds Target Rate effectively to zero, and subsequently introduced aggressive stimulus measures, including backstop liquidity, funding programs, and trillions of

April 15, 2021

dollars in promised asset purchases. Meanwhile, fiscal authorities released over $2.4 trillion in targeted stimulus, with the promise of additional measures in the future. Importantly, both the speed of the response, and the breadth of the response, made the joint monetary/fiscal stimulus unprecedented.

Swift federal support for unemployment benefits and state mandated mortgage, rental and loan forbearance programs offset the sudden stop in economic activity in March and April. Comprehensive loan and PPP programs helped to support main street small and medium size businesses rescale their business activities to comply with social distancing rules. In spite of unprecedented federal and state support, unemployment soared to nearly 15.0% in the second quarter of 2020. In the second half of the year, as the economy stabilized and partially reopened the unemployment rate fell and by December the unemployment rate was 6.7%. By the end of 2020 approximately 10.7 million Americans were still unemployed though many continued to receive unemployment benefits. In contrast to high unemployment rates, the housing market benefited from record low mortgage rates so that many refinanced homes or purchased homes; providing a welcome tailwind for the US economy in the construction, retail, and financial sectors. The median home price rose 8.0% in 2020. Commercial real estate values suffered from falling vacancies and declining rents for most of the year but showed signs of recovery by year end.

In Japan and Europe, similarly aggressive monetary and fiscal measures were implemented, although it should be noted that they entered the crisis with no room to cut policy rates, so their focus was on quantitative easing and fiscal measures. China's rapid and aggressive response to the COVID pandemic was matched with comprehensive countercyclical stimulus spending and easing of credit conditions. Beijing successfully offset the collapse in consumer spending that resulted from lockdowns, with robust fixed asset investment in real estate and infrastructure. The Chinese economic response supported nearby Asian economies of Taiwan, Hong Kong, and South Korea. Demand for medical supplies and technology supported Asian exports to the US and Europe.

Robust stimulus across global developed and emerging economies, coupled with incremental positive news regarding the spread of COVID-19, and economies slowly reopening, set the stage for a relatively rapid rebound in risk assets in the second calendar quarter. This recovery, particularly in the riskier assets, continued throughout the year. In addition to the main themes noted above, the year closed out with the leadership change within the U.S. government following the November elections and, soon after, the approval of the first COVID vaccine. Vaccine approvals were a key catalyst for the significant year-end market rally that saw strong market performance across all major asset classes.

US equities, as represented by the Russell 3000 Index, finished the calendar year with a 20.9% return. Emerging markets (MSCI Emerging Markets) delivered 18.3% for the year with the index up 19.7% in the fourth quarter alone as a weak dollar and vaccine efficacy and approvals exceeded expectations and helped bolster returns. The MSCI EAFE Index, representing foreign developed markets, also saw stronger currency serving as a tailwind in the fourth quarter, with the euro rising against the dollar. Despite strong performance in Q4 of 16.0%, the EAFE Index, however was the equity laggard of the year returning 7.8%.

Investment Consultant's Statement

(continued)

April 15, 2021

In the wake of positive vaccine news, we saw a rotation away from growth stocks and into value stocks at year-end. For the quarter, the Russell 3000 Value index returned 17.2% versus 12.4% for its growth counterpart. That said, for the year, the extreme spread between the style indices continued to be evident. The Russell 3000 Growth returned 38.3% for the calendar year versus 2.9% for the Russell 3000 Value index – a 35.0% performance difference. The strong performance by the growth index was largely driven by the tech sector's strong return for the year (+45.2%) and driven in part by the work from home environment and increase in technological needs.

Similarly, we saw a rotation away from large cap stocks and into small cap stocks. The performance dispersion between the Russell 1000 Index (+13.7%) and the Russell 2000 Index (+31.4%) was so pronounced such that small cap performance at year-end is at the heels of its large cap counterpart. As of December 31, the Russell 1000 Index returned 21.0% for the year versus 20.0% for the Russell 2000 Index, essentially closing out the gap that had previously existed.

Within international developed markets, the MSCI EAFE opportunity set, of which Japan, the UK, and the Eurozone are featured most heavily, underperformed relative to the US and emerging markets. This can largely be attributed to the weak footing on which they entered the crisis to begin with, the robust spread of COVID-19; Europe's aging population and structure of care homes; and the stringency of lockdowns in many of these economies. Within emerging markets, we witnessed a wide spread between countries that were able to manage the virus' spread and deployed aggressive countermeasures (e.g., China: 27.3% YTD return) relative to countries facing already-dire economic circumstances (e.g., Brazil: -20.1%, Mexico: -4.2%, and South Africa: -9.5%). The same style regime observed in the US, with growth outperforming value through the first three quarters of the year, persisted in both developed and emerging international markets. Again, the relative performance of financials and information technology and consumer stocks were key drivers of the spread between value and growth indices.

The US Treasury yield curve declined materially during 2020 as investors flocked to this safe-haven asset early in the year and aggressive Federal Reserve policies were enacted through policy rate cuts and the quantitative easing program. As such, fixed income markets generated relatively strong results for the year. The Bloomberg Barclays US Aggregate produced a total return of 7.5% over the past year and the Bloomberg Barclays TIPS returned 11.0%. High yield bonds retraced their earlier losses, with the Bloomberg Barclays US High Yield index finishing at 7.1% for the year. However, the standout performer within fixed income has been long maturity Treasuries, with the Bloomberg Barclays Long US Government index gaining an impressive 17.6% over the past year.

While equities, and especially large cap growth equities, as well as fixed income, produced relatively strong results despite the COVID-19 shock, we saw mixed results from other asset classes. While energy prices have recovered to some extent, with WTI crude oil trading at $48.55 at the end of the calendar year, the current level still represents a drawdown relative to a year ago, when it traded at $61.14. Natural resource stocks and commodities, on account of uncertainty regarding supply gluts, especially in the oil market, and the uncertainty regarding the recovery of demand, produced weak total returns

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April 15, 2021

despite strong fourth quarter performance to close out the year. The S&P Global Natural Resources Index returned 21.9% in Q4 but a paltry 0.7% for the 1-year, while the Bloomberg Commodity Index returned 10.2% in Q4 and -3.1% for the 1-year. One of the hardest hit asset classes in markets in 2020 has been real estate, where fears regarding utilization rates in commercial real estate have prevented the asset class from participating in the recovery to the same extent as other asset classes. The MSCI U.S. REIT Index returned -7.6%.

Elsewhere, an increasingly robust acceleration in money supply growth, widening fiscal deficits on account of unprecedented stimulus measures, and an environment of stagnating growth expectations manifesting in a collapse in real yields, resulted in a significant increase in demand for physical gold. Over the course of the calendar year, the price of gold increased from $1,520.55 per ounce at the start of 2020 to $1,898.36 an increase of 24.5%.

2021 Outlook

After the elections in November 2020, a degree of political uncertainty persisted through January 2021. After the January Capitol protests and swearing in of the Biden administration, markets repriced their positive outlook for the US economy. COVID vaccinations proceeded ahead of consensus and by the time President Biden was sworn into office, over one million COVID vaccinations had been administered. Economic forecasts for the US economy have been revised sharply higher for 2021 and 2022. However, some economic uncertainties could prove challenging. These include:

1) Uncertainty regarding new virus variants and vaccine deployment challenges, and ultimately needing to re-deploy lockdown policies.

    - A number of countries, including the US, whose policies allowed for greater flexibility in social distancing experienced spikes in infections, and cases of new virus variants that appear to be more transmissible. Additionally, supply dynamics and logistical challenges with the vaccine are driving a slower pace of inoculation than expected. This confluence of challenges could move governments to re-impose distancing measures which would likely depress employment and economic growth.

2) Consumers permanently, or for an extended period, changing economic behaviors.

    - The COVID-19 pandemic resulted in an immediate change to societal norms that could last beyond the actual virus. Changing consumer spending and work-environment preferences could limit large events including concerts and sports, dining out, travel, and leisure activities. As consumers make up a large portion of developed economy GDPs, this could drive many companies to failure, with lasting impacts on the economy. Stimulus checks and unemployment benefits may fall off quickly by the end of the summer so that consumer demand may not prove to be long-lived.

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3) Persistently high unemployment due to a significant number of companies not surviving the downturn.

- Persistently high unemployment due to the failure of companies (and potentially entire sectors) and changing consumer preferences could hurt the growth of economies and, subsequently, government spending on mandatory and discretionary services going forward.

4) Markets have quickly integrated positive economic forecasts into their forward guidance, but after such a strong period of economic growth some companies may find it difficult to sustain high rates of return.

5) The Biden Administration's American Jobs Plan and proposed corporate tax reform could have unintended consequences, igniting higher rate of inflation through fiscal spending while lowering corporate profits.

- The $2.7 trillion infrastructure plan may overheat the US economy that may grow above 6.0% in 2021. Some economists argue that the fiscal stimulus would harm the economy and force the Federal Reserve to either raise rates too soon or let inflation run above the 2.0% target.
- The corporate tax reform seeks to raise the statutory rate to 28.0% and implement a minimum 15.0% tax on book revenues. While the Administration plans a 15-year implementation period, the tax reform seeks to double the current corporate tax revenue collected.

6) Virus-related fears affecting globalization.

- Appetite for globalization was waning before the pandemic, as seen in the increase in populist and anti-trade sentiment over the last few years. This has been perhaps most evident in the trade wars initiated by the prior US administration against a number of its trading partners, including China and Europe. With an increase in rhetoric regarding other countries not doing enough to limit the spread of the virus outside their borders, as well as restrictions on transportation and sanitation concerns, many countries could elect to advance policies that limit trade and globalization.

OCERS 2020 Performance

OCERS' portfolio returned 11.4% in 2020, outperforming both the Policy Index's trailing 12-month return of 10.1% and the System's 7.0% required actuarial rate of return. Emerging Market Equity had the strongest absolute performance of all asset classes, returning 24.6%, while the Real Return asset class had the weakest 2019 performance of -14.6%, as energy assets were down.

Over the trailing three- and five-year periods, the OCERS portfolio returned 7.8% and 9.3% on average annually. For the trailing three years, OCERS was in the top quartile compared to peers[1], and over the trailing five years, OCERS was in the 30th percentile compared to peers.

If you have any questions, please contact us at (760) 795-3450.

SPM/LBW/SBS/jls

[1] Based on InvestorForce peer rankings: Defined Benefit Public Funds over $1 billion in assets.

Investment Returns

The table below details the annualized rates of return for the different asset categories over various time periods ended December 31, 2020. The returns for each asset class represent the composite returns of all the manager portfolios within the asset class. All returns are net of fees, which is a change from the reporting in prior years when only indirect or at source fees were deducted from the returns being presented. The method of computation of investment returns is time-weighted approximation.

	1 Year	3 Year	5 Year
Global Public Equity (%)	19.14	10.56	13.05
MSCI ACWI IMI (1) (%)	16.25	9.99	12.21
Private Equity (%)	16.15	14.69	13.28
Cambridge Private Equity Lagged (%)	12.62	12.76	12.87
Core Fixed Income (%)	9.12	5.81	6.21
Fixed Income Custom Index (2) (%)	8.80	5.67	4.63
Credit (%)	5.89	4.39	6.68
Credit Custom Index (3) (%)	5.54	5.16	6.95
Real Assets (%)	-6.01	0.50	N/A
Real Assets Custom Index (4) (%)	-6.21	0.86	N/A
Risk Mitigation (%)	3.55	5.48	N/A
Risk Mitigation Custom Index (5) (%)	3.22	3.27	N/A
Unique Strategies (%)	N/A	N/A	N/A
Short Term Investments (%)	0.51	1.67	1.36
Cash Overlay (%)	12.30	6.20	7.99
91-day Treasury Bill (%)	0.67	1.61	1.20
Total Fund (%)	**11.38**	**7.81**	**9.26**
Composite Policy Benchmark (6) (%)	**10.14**	**7.58**	**9.07**

(1) 100% MSCI AC World Net USD Index through 12/31/2018, and 100% MSCI ACWI IMI Net Index thereafter

(2) Fixed Income Custom Index = 100% Bloomberg Barclays Capital Universal Index through 12/31/2017, 60% Bloomberg Barclays U.S. Aggregate Index + 20% Bloomberg Barclays U.S. Universal Index + 20% Bloomberg Barclays U.S. TIPS Index through 6/30/2020, 18% Bloomberg Barclays U.S. TIPS Index + 82% Bloomberg Barclays U.S. Universal Index thereafter

(3) Credit Custom Index = 50% Merrill Lynch High Yield Constrained Index + 50% Credit Suisse Levered Loan Index through 12/31/2017, 40% Bloomberg Barclays U.S. High Yield Index + 40% Credit Suisse Levered Loan Index + 13% JPMorgan GBI-EM Global Diversified Un-hedged Index + 7% JPMorgan EM Bond Index through 6/30/2020, 35% Bloomberg Barclays U.S. High Yield Index + 21.6% Credit Suisse Levered Loan Index + 14.4% Credit Suisse Western European Levered Loan Index +14.5% JPMorgan GBI-EM Global Diversified Un-hedged Index + 14.5% JPMorgan EM Bond Index thereafter

(4) Real Assets Custom Index = 45% NCREIF ODCE Index + 36% Cambridge Private Equity Energy Lagged + 13% Cambridge Infrastructure Index + 6% NCREIF Farmland Index through 6/30/2020, 58% NCREIF ODCE Index + 17% Cambridge Private Equity Energy Lagged + 25% Cambridge Infrastructure Index thereafter

(5) Risk Mitigation Custom Index = 50% HFRI Macro: Systematic Diversified CTA + 50% Bloomberg Barclays Long Term U.S. Treasury Index through 9/30/2019, 33.33% Bloomberg Barclays Long Term U.S. Treasury Index + 33.33% HFRI Macro: Systematic Diversified CTA + 33.33% SG Trend Index through 12/31/2019, 25% Bloomberg Barclays Long Term U.S. Treasury Index + 25% HFRI Macro: Systematic Diversified CTA + 25% SG Trend Index + 25% SG Multi Alternative Risk Premia through 6/30/2020, 25% Bloomberg Barclays Long Term U.S. Treasury Index + 25% HFRI Macro Total Index + 25% SG Trend Index + 25% SG Multi Alternative Risk Premia thereafter

(6) Policy Benchmark = 45.9% MSCI ACWI IMI Index[1] + 11.1% Cambridge Private Equity 1-Quarter Lag Index + 13.1% Fixed Income Custom Index[2] + 8.2% Credit Custom Index[3] + 11.6% Real Assets Custom Index[4] + 10.2% Risk Mitigation Custom Index[5]

As of January 1, 2018, OCERS' Policy Benchmark changed from being policy target weighted to being weighted based on the monthly actual asset class weights.

N/A - Represents new investment category and custom index in 2017; data not available.

Statement of Investment Objectives and Policies

General

The primary goal of the Orange County Employees Retirement System's investment program is to provide Plan participants with retirement benefits as required by the County Employees Retirement Law of 1937. This goal is accomplished through Employers' and Plan participants' contributions and the implementation of a carefully planned and monitored long-term investment program. The Board of Retirement (with the participation of the Investment Committee, staff and advisors) has exclusive control of all investments of the Plan and is responsible for the establishment of investment objectives, strategies and policies.

The Board of Retirement is authorized to invest in any form or type of investment deemed prudent in the informed opinion of the Board. The Investment Committee has adopted an Investment Policy Statement that provides a frame work for the management of OCERS' investments. This purpose of the Investment Policy Statement is to assist the Investment Committee in effectively supervising, monitoring, and evaluating the investment of the System's assets.

Investment Objectives

OCERS' goal is to meet the promised retirement benefits due its members. OCERS invests the assets of the system solely for the benefit of plan participants and beneficiaries while minimizing employer contributions and investment and administration costs. The long-term performance objective for the portfolio is to exceed the actuarially assumed rate of return net of fees and expenses, with a secondary objective of exceeding the return on an appropriate designated benchmark over a complete economic cycle and relevant longer periods, also net of fees and expenses.

Strategic Asset Allocation Policy and Maintenance

A pension fund's strategic asset allocation policy, implemented in a consistent and timely manner, is generally recognized to have the most impact on a fund's investment performance. The asset allocation policy determines a fund's optimal long-term asset class mix (target allocation). This policy is expected to achieve a specific set of investment goals, such as risk and return objectives. The policy also established ranges for the targeted levels around which asset levels are permitted to fluctuate. Fluctuations outside the permitted range act as triggers for reallocating assets to ensure adherence to targeted weights.

Program Administration and Manager Structure

For each major asset class, the System shall diversify assets by employing managers with demonstrated skill in their particular areas of expertise. The System will retain managers who utilize varied investment approaches and allocate assets in a manner that is consistent with the overall investment plan. For example, the sum of all domestic equity managers should exhibit characteristics that are similar, but not necessarily identical, to the overall equity market. When asset fluctuation causes the asset class to exhibit characteristics that are dissimilar from the plan, Investment Team shall direct cash flows to or from the various managers so that actual characteristics are consistent with the plan.

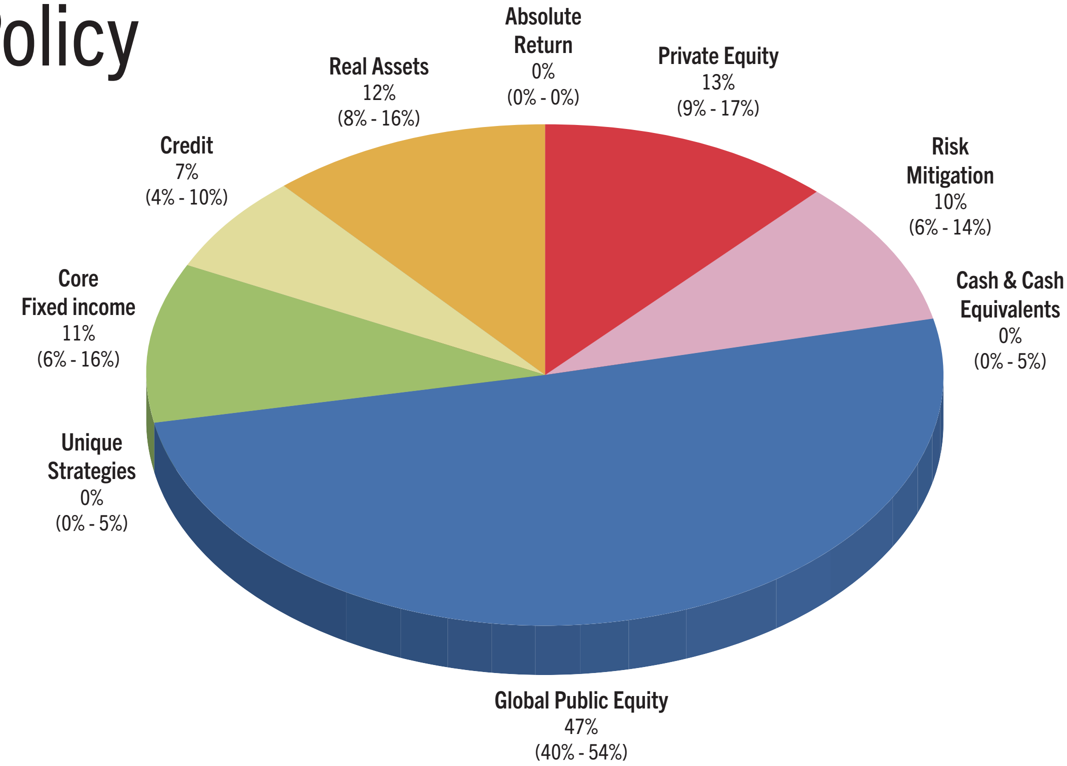
Use of Proxies

OCERS utilizes the services of Institutional Shareholder Services (ISS) to vote public equity proxies on OCERS' behalf. ISS is solely responsible for voting all proxies for securities, consistent with the ISS Benchmark Policy, as approved by the Investment Committee. If the ISS Benchmark Policy does not contain recommended voting guidelines for the subject of the proxy vote, ISS will contact OCERS for guidance prior to casting the vote to ensure proxy votes are in accordance with OCERS' guidelines to protect and enhance returns on behalf of plan participants.

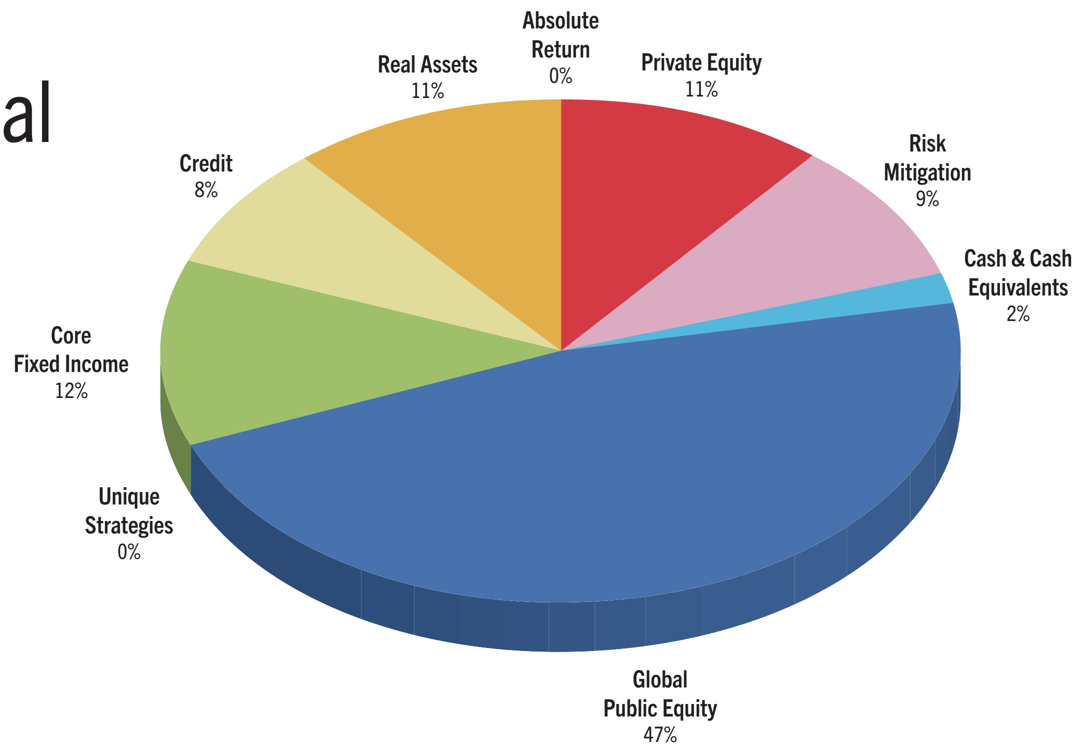
Asset Diversification

December 31, 2020

Policy

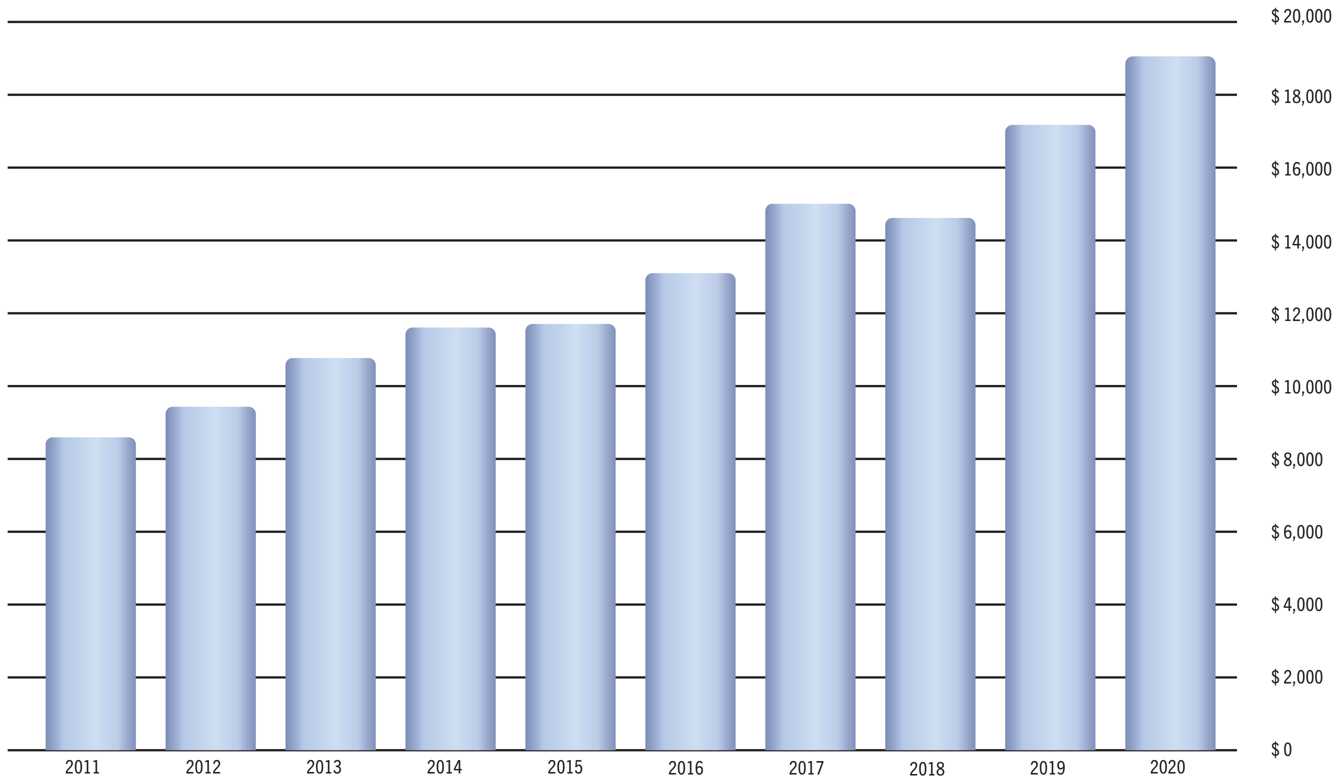


Actual



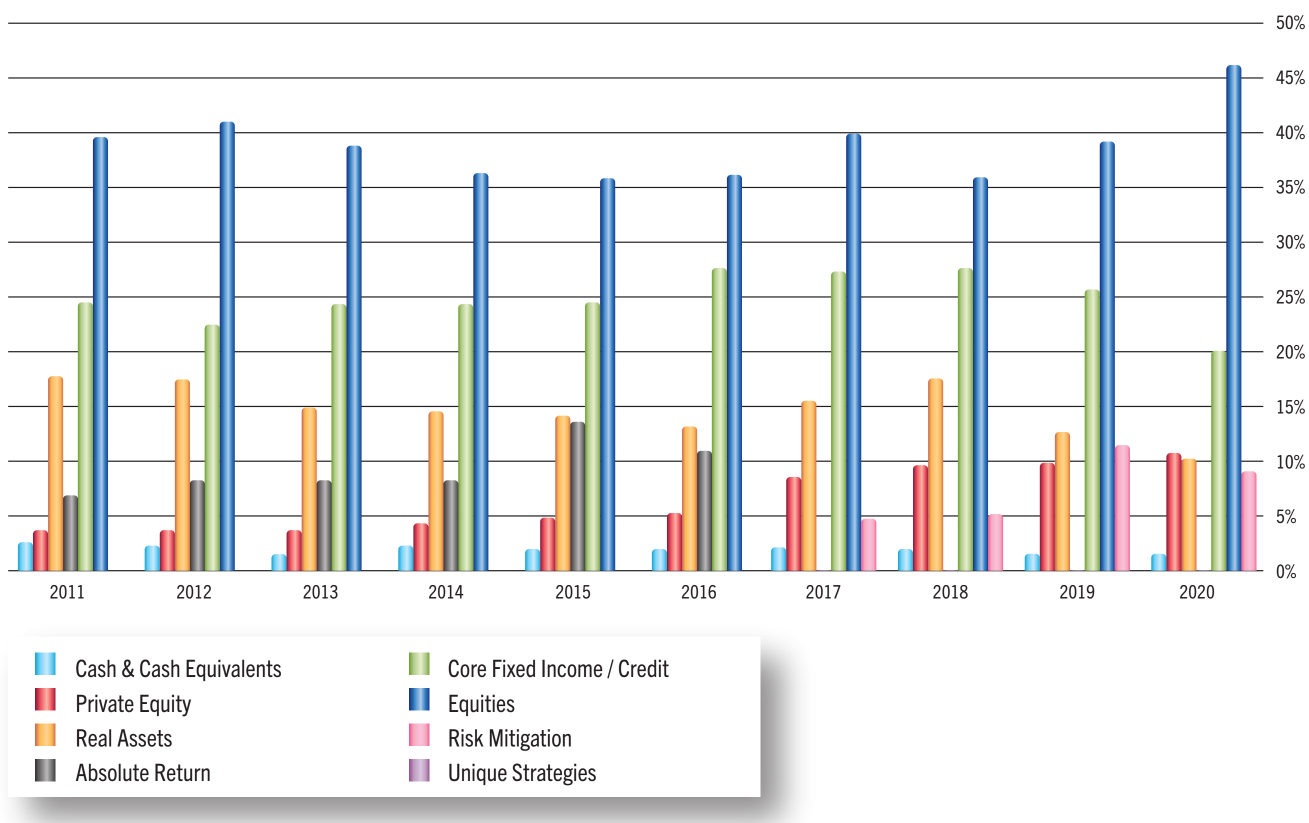
Growth of System Net Investments at Fair Value

For the Ten Years Ended December 31, 2020
(in Millions of Dollars)



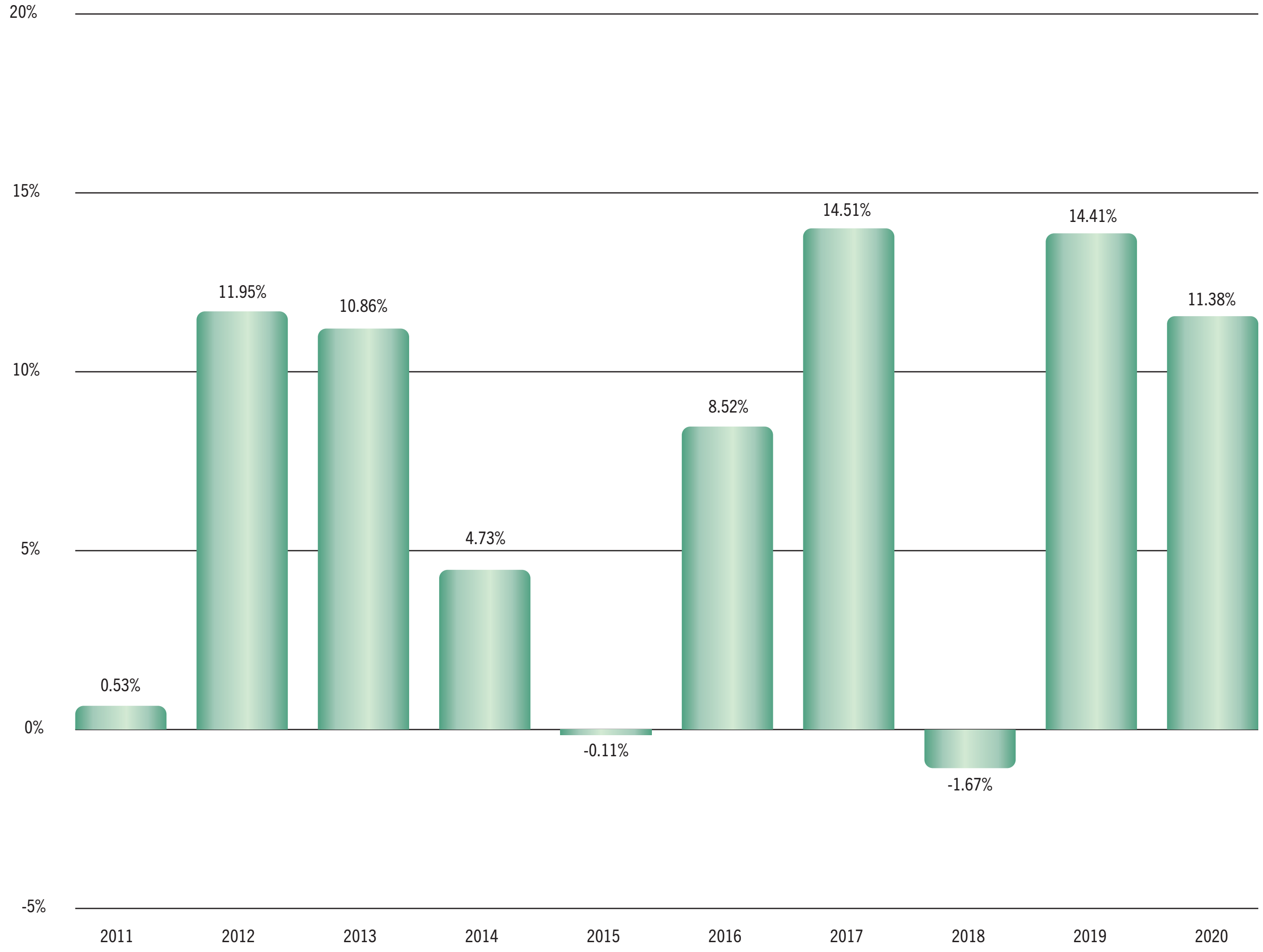
Historical Asset Allocation

December 2011 - December 2020
(Actual)



History of Performance - Net

December 2011 - December 2020
(Actual)



As of 2016, all History of Performance rates of returns have been recalculated from the prior years' reporting to report net of all fees. In prior years, the rates of returns in the above schedule included indirect or at source fees, but excluded other direct fees.

Schedule of Commissions

For the Year Ended December 31, 2020
(Amounts in Thousands)

Broker Name	Number of Shares Traded	Commission per Share (in cents)	Total Commission
Arion Bank	761	0.79	$ 6
Bank of America Securities, Inc.	593	2.53	15
Barclays Capital	931	1.07	10
Citigroup Global Markets, Inc.	963	1.04	10
Credit Lyonnais Securities	1,784	0.39	7
Credit Suisse Securities	13,487	0.16	22
Deutsche Bank	5,142	0.10	5
Goldman Sachs	19,026	0.26	50
HSBC	686	1.17	8
Instinet	993	0.81	8
Investment Technology Group, Ltd.	1,921	1.20	23
J.P. Morgan Securities	13,219	0.21	28
Jefferies	1,749	1.32	23
Liquidnet	2,499	1.16	29
MacQuarie	1,524	0.46	7
Merrill Lynch & Company, Inc.	12,622	0.14	18
Morgan Stanley & Company, Inc.	14,967	0.13	20
National Financial Services Corp.	603	2.16	13
Pershing	1,222	2.05	25
RBC	597	2.01	12
Redburn (Europe) Limited	858	0.35	3
UBS	10,826	0.19	21
Other*	5,442	1.25	68
Total	**112,415**	**0.38**	**$ 431**

* Other includes 60 additional firms that comprise approximately 16% of total commissions and approximately 5% of the total number of shares traded. The average commission per share is 1.25 cents.

Commission Recapture Program

OCERS implemented a direct brokerage program where investment managers can trade with specific brokerage firms for the purpose of reducing trading commissions. The brokerage firms utilized for these services are Abel Noser, Capital Institutional Services, Cowen Execution Services Limited, and State Street Bank.

Schedule of Investment Expenses and Investment Summary

For the Year Ended December 31, 2020
(Dollars in Thousands)

Type of Investment Expenses	Assets Under Management at Fair Value	Percentage	Fees
Investment Management Fees*			
Investments at Fair Value:			
Global Public Equity	$ 8,982,043	48%	$ 14,345
Core Fixed Income	2,381,374	12%	2,683
Credit	1,545,445	8%	11,477
Real Assets	2,065,857	11%	23,192
Absolute Return	480	0%	6
Private Equity	2,353,755	12%	22,280
Risk Mitigation	1,782,656	9%	14,083
Unique Strategies	55,283	0%	-
Total Investments at Fair Value	**19,166,893**		**88,066**
Short-Term Investments[1]	38,422	0%	272
Total Investment Management Fees	**$ 19,205,315**	**100%**	**88,338**
Other Fund Expenses[2]			**14,638**
Other Investment Expenses			
Consulting/Research Fees			1,930
Investment Department Expenses			2,332
Legal Services			538
Custodian Services			580
Investment Service Providers			19
Total Other Investment Expenses			**5,399**
Securities Lending Activity			
Securities Lending Fees			212
Rebate Fees			692
Total Securities Lending Activity			**904**
Custodial Fund - OCTA Investment Fees and Expenses			**3**
Total Investment Expenses			**$ 109,282**

[1] Short-Term Investments are categorized as Cash and Cash Equivalents in the Statement of Fiduciary Net Position.

[2] These costs include, but are not limited to, foreign income tax and other indirect flow-through investment expenses such as organizational expenses in limited partnership structures.

Schedule of Largest Equity Holdings

(by Fair Value) [1, 2]

As of December 31, 2020
(Amounts in Thousands)

Common Stock	Shares	Fair Value
ASML HOLDING NV	39	$19,084
OCADO GROUP PLC	608	19,014
ENEL SPA	1,140	11,545
KEYENCE CORP	19	10,550
TOKYO ELECTRON LTD	28	10,302
QUAKER CHEMICAL CORP	41	10,301
NOVO NORDISK A/S B	137	9,620
LVMH MOET HENNESSY LOUIS VUI	14	8,746
NESTLE SA REG	69	8,174
ROCHE HOLDING AG GENUSSCHEIN	23	7,926

Schedule of Largest Fixed Income Holdings

(by Fair Value) [1]

As of December 31, 2020
(Amounts in Thousands)

Asset	CPN/ Maturity	Fair Value
US TREASURY N/B	0.9% / 11-15-2030	$49,770
SWU015017 IRS BRL R F 3.36000	3.4% / 01-03-2022	18,943
US TREASURY N/B	1.9% / 08-31-2022	17,701
BWU016SX1 IRS GBP R V 12MSONIA	1.0% / 06-16-2026	15,310
SWPC0IJA6 CDS USD R F 1.00000	1.0% / 12-20-2024	14,332
US TREASURY N/B	2.3% / 08-15-2027	13,506
US TREASURY N/B	1.5% / 02-15-2030	13,383
FNMA TBA 30 YR 2.5	2.5% / 02-12-2051	12,770
FNMA POOL CA6238	2.5% / 07-01-2050	12,478
US TREASURY N/B	0.3% / 04-15-2023	12,430

[1] A complete list of portfolio holdings is available for review at the OCERS' office.
[2] The holding schedules pertain to holdings of individual securities; they do not reflect OCERS' investments in commingled funds.

List of Investment Managers

As of December 31, 2020

Absolute Return

Perry Capital

Cash Overlay

Parametric

Credit

Alcentra Clareant European Direct Lending
Arcmont Asset Management
Ashmore Investment Advisors
Beach Point Capital Management
Caspian Capital Advisors
Crescent Capital Group
Cross Ocean Partners
CarVal Investors
Hayfin Capital Management
Loomis, Sayles & Company, L.P.
Monroe Capital
NXT Capital
Owl Rock Technology Finance Corp
Pacific Investment Management Company
Pharo Management
Silver Rock Financial
Strategic Value Partners
Tennenbaum Capital Partners
Wellington Trust Company, NA

Core Fixed Income

BlackRock Institutional Trust Company
Dodge & Cox
Longfellow Investment Management Co.
Pacific Investment Management Company
Schroder Investment Management North America, Inc.

Global Public Equity

Acadian Asset Management
AQR Capital Management, LLC
Artisan Partners
BlackRock Institutional Trust Company
Capital Guardian Trust Company
City of London
Eagle Asset Management
Fidelity Institutional Asset Management
Franklin Templeton Investments

Global Public Equity (cont.)

GQG Partners
Highfields Capital
J.P. Morgan Asset Management
Mondrian Investment Partners, Ltd.
Systematic Financial Management
William Blair & Co.

Private Equity

Abbott Capital
Accel-KKR
Adams Street Partners
Advent International Global Private Equity
Alcentra Clareant European Direct Lending
Cinven
Clearlake Capital Partners
DBL Partners
EQT Ventures
General Catalyst
Genstar Capital
GGV Capital
H.I.G. Capital
HarbourVest Partners, LLC
Harvest Partners
Healthquest Capital
Hellman & Friedman
Hg
Insight Partners
Mesirow Financial Private Equity
Monroe Capital
Oak HC/FT Partners
OCP Asia
Pantheon Ventures
Park Square Capital
Spark Capital
Stone Point Capital
Thoma Bravo, LLC
Vista Equity Partners
Vitruvian Partners

Real Assets

AEW Capital Management
Almanac Realty Investors
Angelo, Gordon & Co.
Argo Infrastructure Partners

Real Assets (cont.)

BlackRock Institutional Trust Company
Blackstone
Brigade Capital Management
BTG Pactual
CB Richard Ellis Investors
Cerberus Real Estate GP
Clarion Partners
EIG Global Energy Partners
EnCap Investments, L.P.
EnerVest, Ltd.
Global Infrastructure Partners
Grain Management
Hancock Agricultural Investment Group
Hancock Timber Resource Group
J.P. Morgan Asset Management
Jamestown
LBA Logistics
Kayne Anderson Capital Advisors
Morgan Stanley
Oaktree Capital Management
Pacific Investment Management Company
Stonepeak Infrastructure Partners
Tennenbaum Capital Partners
True North Management Group
UBS Farmland Investors, LLC
Warwick Group
Waterton Associates
Westbrook Partners

Risk Mitigation

Alpha Simplex Group, LLC
Alpstone Capital
AQR Capital Management, LLC
Brevan Howard - DG Partners
BlackRock Institutional Trust Company
Bridgewater Associates, Inc.
D.E. Shaw Group
Graham Capital Management, L.P.
Pacific Investment Management Company
Systematica Investments
Two Sigma Investments

Unique Strategies

Blackstone
Waterfront Capital Partners

ORANGE COUNTY

OCERS

EMPLOYEES RETIREMENT SYSTEM

75TH

ANNIVERSARY 1945-2020

Section

ACTUARIAL

Pandemic Prevention

Stop the Spread!

As cases in Orange County and throughout California continued to rise, how to prevent the spread of the virus became the focus. California developed a four tiered system with three metrics to be measured to determine the spread by county; the case rate per 100,000, the positivity rate and the health equity quartile. The tier signified the risk level by county and its ability to be open for business.

Preventive measures included signage noting to stop the spread of the virus by social distancing, washing your hands, wearing face masks inside buildings and whenever within 6 feet of other individuals outside your household.

Businesses installed plexiglass dividers between employees and customers, hand sanitizer and disposable mask stations at building entrances, and placed dots on the floor to signify 6 feet for social distancing.

Actuary's Certification Letter

Segal

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Senior Vice President & Actuary
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Vice President & Actuary
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San Francisco, CA 94105-6147
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April 30, 2021

Board of Retirement
Orange County Employees Retirement System
2223 Wellington Avenue
Santa Ana, CA 92701-3101

**Re: Orange County Employees Retirement System (OCERS)
Certification for Pension Plan as of December 31, 2019**

Dear Members of the Board:

Segal prepared the December 31, 2019 annual actuarial valuation of the Orange County Employees Retirement System (OCERS). We certify that the valuation was performed in accordance with generally accepted actuarial principles and practices and OCERS' funding policy that was last reviewed and adopted by the Board in 2014 and reaffirmed in 2017. In particular, it is our understanding that the assumptions and methods used for funding purposes meet the parameters set by Actuarial Standards of Practice (ASOPs). A discussion of the assumptions and methods used in the separate December 31, 2020 actuarial valuation for financial reporting purposes under Governmental Accounting Standards Board (GASB) Statement No. 67 is presented at the end of this letter.

December 31, 2019 Actuarial Valuation for Funding Purposes

Actuarial valuations are performed on an annual basis with the last valuation completed as of December 31, 2019. The actuarial calculations presented in the valuation report have been made on a basis consistent with our understanding of the historical funding methods used in determination of the liability for statutory retirement benefits.

The December 31, 2019 actuarial valuation is based on the plan of benefits verified by OCERS and on participant and financial data provided by OCERS. Segal conducted an examination of all participant data for reasonableness and we concluded that it was reasonable and consistent with the prior year's data. Summaries of the employee data used in performing the actuarial valuations over the past several years are provided in our valuation report.

We did not audit the System's financial statements. For actuarial valuation purposes, Plan assets are valued at actuarial value. Under this method, the assets used to determine employer contribution rates take into account market value by recognizing the differences between the actual and expected return on market value over a five-year period. The development of the

Board of Retirement
Orange County Employees Retirement System
April 30, 2021
Page 2

actuarial value as of December 31, 2019 is provided in the Development of Actuarial and Valuation Value of Assets.

One funding objective of the Plan is to establish rates, which, over time, will remain level as a percentage of payroll unless Plan benefit provisions are changed. Actuarial funding is based on the Entry Age Cost Method. Under this method, the employer contribution rate provides for current cost (normal cost) plus a level percentage of payroll to amortize any unfunded actuarial accrued liability (UAAL). One of the funding objectives of the System is to reduce that UAAL to zero over a declining period. Effective December 31, 2013, the outstanding balance of the UAAL from the December 31, 2012 valuation was combined and reamortized over a declining 20-year period. Any changes in UAAL due to actuarial gains or losses or due to changes in assumptions or methods will be amortized over separate 20-year periods. Any changes in UAAL due to plan amendments will be amortized over separate 15-year periods and any change in UAAL due to early retirement incentive programs will be amortized over a separate period of up to 5 years. The progress being made toward the realization of the funding objectives through December 31, 2019 is illustrated in the Schedule of Funding Progress.

Segal prepared all of the supporting schedules in the actuarial section of the System's Comprehensive Annual Financial Report (Annual Report) based on the results of the December 31, 2019 actuarial valuation for funding purposes. A listing of the supporting schedules related to the statutory retirement plan benefits that Segal prepared for inclusion in the actuarial section of the System's Annual Report is provided below. OCERS' staff prepared the remaining trend data schedules in the statistical section.

Actuarial Section (Based on December 31, 2019 Funding Valuation)

1. Schedule of Funding Progress
2. History of Employer Contribution Rates
3. Summary of Active Membership
4. Summary of Retired Membership
5. Development of Actuarial and Valuation Value of Assets
6. Schedule of Funded Liabilities by Type
7. Actuarial Methods and Assumptions
8. Summary of Major Plan Provisions
9. Experience Analysis

The valuation assumptions used in this valuation were included in the Actuarial Section. The results of this valuation were prepared using the actuarial assumptions and methods developed in the triennial actuarial experience study as of December 31, 2016. All of the assumptions recommended in the study, including the alternative 7.00% interest return and 2.75% inflation assumptions, were adopted by the Board. Actuarial valuations are performed on an annual basis and the experience analysis is performed every three years. The most recent actuarial

Segal

Board of Retirement
Orange County Employees Retirement System
April 30, 2021
Page 3

experience study as of December 31, 2019 has been adopted by the Board and all adopted changes in assumptions will be reflected in the December 31, 2020 valuation.

In the December 31, 2019 valuation, the ratio of the valuation value of assets to actuarial accrued liabilities increased from 72.4% to 73.2%. The aggregate employer rate (average of the County and all special districts rates combined) has changed from 39.48% of payroll to 41.49% of payroll. The aggregate member's rate has changed from 12.29% of payroll to 12.31% of payroll.

In the December 31, 2019 valuation, the actuarial value of assets excluded $479.2 million in unrecognized investment gains, which represented 2.9% of the market value of assets. If these deferred investment gains were recognized immediately in the actuarial value of assets, the funded percentage would increase from 73.2% to 75.4% and the aggregate employer contribution rate, expressed as a percent of payroll would decrease from 41.49% to about 39.7%.

To the best of our knowledge, the December 31, 2019 funding valuation report is complete and accurate and in our opinion presents the Plan's current funding information.

December 31, 2020 GASB Statement 67 Actuarial Valuation for Financial Reporting Purposes

Segal prepared the December 31, 2020 GASB Statement 67 actuarial valuation for financial reporting purposes. The valuation was performed in order to comply with GASB Statement 67 and we certify that the assumptions and methods used for financial reporting purposes meet the parameters set by ASOPs and our understanding of generally accepted accounting principles (GAAP) applicable in the United States of America as promulgated by the GASB. The GASB rules only redefine pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes.

When measuring pension liability, GASB uses the same actuarial cost method (Entry Age method) and the same type of discount rate (expected return on assets) as OCERS uses for funding. The Net Pension Liabilities (NPLs) measured as of December 31, 2020 and December 31, 2019 have been determined by rolling forward the Total Pension Liabilities (TPLs) for the statutory Retirement Plan benefits as of December 31, 2019 and December 31, 2018, respectively. In addition, any changes in actuarial assumptions or plan provisions that occurred between the valuation date and the measurement date have been reflected.

Segal

Actuary's Certification Letter

(Continued)

Board of Retirement
Orange County Employees Retirement System
April 30, 2021
Page 4

Note number 8 to the Basic Financial Statements and the Required Supplementary Information included in the Financial Section of the Annual Report were prepared by the System based on the results of the GASB Statement No. 67 actuarial valuation as of December 31, 2020 prepared by Segal.

The undersigned are Members of the American Academy of Actuaries and meet the qualification requirements to render the actuarial opinion contained herein.

Sincerely,

Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President & Actuary

Andy Yeung, ASA, MAAA, FCA, EA
Vice President & Actuary

JY/hy
Enclosures

Segal

Schedule of Funding Progress

(Dollars in Thousands)

Valuation Date	Actuarial Accrued Liability	Valuation Value of Assets	Unfunded Actuarial Accrued Liability	Ratio of Assets to Actuarial Accrued Liability	Projected Covered Payroll	Ratio of Unfunded Actuarial Accrued Liability to Projected Covered Payroll
12/31/10	$ 12,425,873	$ 8,672,592	$ 3,753,281	69.79%	$ 1,579,239	237.66%
12/31/11	13,522,978	9,064,355	4,458,623	67.03%	1,619,474	275.31%
12/31/12	15,144,888	9,469,208	5,675,680	62.52%	1,609,600	352.55%
12/31/13	15,785,042	10,417,125	5,367,917	65.99%	1,604,496	334.55%
12/31/14	16,413,124	11,449,911	4,963,213	69.76%	1,648,160	301.14%
12/31/15	17,050,357	12,228,009	4,822,348	71.72%	1,633,112	295.29%
12/31/16	17,933,461	13,102,978	4,830,483	73.06%	1,759,831	274.49%
12/31/17	19,635,427	14,197,125	5,438,302	72.30%	1,811,877	300.15%
12/31/18	20,703,349	14,994,420	5,708,929	72.43%	1,875,370	304.42%
12/31/19	21,916,730	16,036,869	5,879,861	73.17%	1,952,534	301.14%

Notes:

- **There were no assumption or plan changes in the 12/31/19 valuation.**
- **There were no assumptions or plan changes in the 12/31/18 valuation.**
- **The 12/31/17 valuation included the following assumptions changes:**
  Changes in investment return, inflation, mortality, disability, termination, retirement, salary scale, and additional cash-out assumptions in the December 31, 2016 triennial experience study increased the UAAL by $854 million.

- **The 12/31/16 valuation included the following change:**
  O.C. Law Library was separated from O.C. Sanitation District in Rate Group #3 and put into their own Rate Group (Rate Group #12) after the valuation as of December 31, 2015.

- **The 12/31/15 valuation included the following benefit changes:**
  City of San Juan Capistrano adopted an optional 1.62% of final average salary at age 65 for members hired on or after July 1, 2016.

  Effective January 1, 2015, new OCTA members were placed in CalPEPRA Plan U (2.50% of final average salary at age 67).

Schedule of Funding Progress

(continued)

- **The 12/31/14 valuation included the following changes:**

  <u>Assumption Changes:</u>

  Changes in inflation, mortality, disability, termination, retirement, salary scale, and additional cashout assumptions in the December 31, 2013 triennial experience study decreased the UAAL by $122 million.

  <u>Method Change:</u>

  The cashout assumptions are now used in developing basic member contribution rates for employees in the legacy plans (impact is only on Normal Cost).

- **The 12/31/13 valuation included the following method change:**

  The outstanding balance of the December 31, 2012 UAAL was combined and re-amortized over a 20-year period.

- **The 12/31/12 valuation included the following changes:**

  <u>Assumption Changes:</u>

  Changes in investment return, inflation, and across the board salary increase assumptions in the December 31, 2012 review of economic assumptions report increased the UAAL by $935 million.

- <u>Benefit Changes:</u>

  Members with membership date on or after January 1, 2013 were placed in CalPEPRA tiers (1.62% of final average salary at age 65, 2.50% of final average salary at age 67 and 2.70% of final average salary at age 57).

- **The 12/31/11 valuation included the following changes:**

  <u>Assumption Changes:</u>

  Changes in mortality, disability, termination, retirement, salary scale, and additional cashout assumptions in the December 31, 2010 triennial experience study increased the UAAL by $364 million.

  <u>Benefit Changes:</u>

  City of San Juan Capistrano adopted a 2.0% of final average salary at age 57 for members hired on or after July 1, 2012.

  Certain employees previously employed at the City of Santa Ana became employees of OCFA General and OCFA Safety eligible for benefits under 2.0% of final average salary at age 55 and 3.0% of final average salary at age 50, respectively.

- **The 12/31/10 valuation included the following benefit changes:**

  LAFCO adopted an optional 1.62% of final average salary at age 65 for members hired on or after July 1, 2010.

  County Managers unit adopted an optional 1.62% of final average salary at age 65 for members hired on or after August 17, 2010.

  Sanitation District adopted a 1.64% of final average salary at age 57 for members within Supervisors and Professional unit hired on or after October 1, 2010.

  OCFA adopted a 3.00% of final average salary at age 55 for Safety members within the Executive Management unit hired on or after July 1, 2011 and for all Safety members hired on or after July 1, 2012.

  OCFA adopted a 2.00% of final average salary at age 55 for General members hired on or after July 1, 2011.

Schedule of Funding Progress

(continued)

The assets exclude amounts in the County Investment Account and prepaid employer contributions. For years ending December 31, 2016, December 31, 2017, and December 31, 2019, the assets also exclude amounts in the O.C. Sanitation District UAAL Deferred Account.

Valuation Date	Amount Excluded from Assets		
	County Investment Account	Prepaid Employer Contributions	O.C. Sanitation District UAAL Deferred Account
12/31/10	$ 108,531,000	$ 29,545,000	$ -
12/31/11	97,767,000	162,873,000	-
12/31/12	103,261,000	177,632,000	-
12/31/13	109,254,000	172,348,000	-
12/31/14	109,103,000	207,829,000	-
12/31/15	108,789,000	227,166,000	-
12/31/16	117,723,000	222,524,000	34,067,000
12/31/17	134,417,000	244,552,000	14,871,000
12/31/18	131,890,000	246,133,000	-
12/31/19	150,416,000	259,285,000	12,057,000

For informational purposes only, we have also developed the funded ratio determined using the historical market value of assets after adjustment for amounts in the County Investment Account, prepaid employer contributions, amounts in the O.C. Sanitation District UAAL Deferred Account, unclaimed member reserve and Medicare Medical Insurance Reserve.

Valuation Date	Funded Ratio based on Net Market Value of Assets
12/31/10	67.25%
12/31/11	62.60%
12/31/12	63.17%
12/31/13	67.65%
12/31/14	69.63%
12/31/15	67.73%
12/31/16	70.58%
12/31/17	74.62%
12/31/18	69.31%
12/31/19	75.36%

History of Employer Contribution Rates

Employer Contribution Rate (% of pay)

Valuation Date	General (Non-OCTA, Non-OCSD)	General (1.62% @ 65, Non-OCTA)	General (2.7% @ 55)	General (2.0% @ 57)	General (OCTA)	General (2.5% @ 55, OCSD)
12/31/10[1]	NC 8.59%	NC 5.10%	NC 11.55%		NC 10.96%	NC 10.92%
	UAAL 8.26	UAAL 16.84	UAAL 16.84	N/A	UAAL 10.00	UAAL 16.55
	Total 16.85%	**Total 21.94%**	**Total 28.39%**		**Total 20.96%**	**Total 27.47%**
12/31/11	NC 8.55%	NC 4.91%	NC 12.03%	NC 10.99%	NC 10.57%	NC 11.29%
	UAAL 10.39	UAAL 20.98	UAAL 20.98	UAAL 20.98	UAAL 13.08	UAAL 20.66
	Total 18.94%	**Total 25.89%**	**Total 33.01%**	**Total 31.97%**	**Total 23.65%**	**Total 31.95%**
12/31/12	NC 9.68%	NC 5.56%	NC 13.69%	NC 12.10%	NC 11.83%	NC 12.88%
	UAAL 12.91	UAAL 25.85	UAAL 25.85	UAAL 25.85	UAAL 16.48	UAAL 25.60
	Total 22.59%	**Total 31.41%**	**Total 39.54%**	**Total 37.95%**	**Total 28.31%**	**Total 38.48%**
With 2-Year Phase-In	**21.04%**	**29.84%**	**37.45%**	**35.96%**	**26.62%**	**36.57%**
12/31/13[2]	NC 9.82%	NC 5.61%	NC 13.66%	NC 12.46%	NC 11.81%	NC 12.89%
	UAAL 11.34	UAAL 23.72	UAAL 23.72	UAAL 23.72	UAAL 15.22	UAAL[3] 21.87
	Total 21.16%	**Total 29.33%**	**Total 37.38%**	**Total 36.18%**	**Total 27.03%**	**Total 34.76%**
12/31/14	NC 9.67%	NC 5.49%	NC 13.22%	NC 10.54%	NC 10.78%	NC 12.40%
	UAAL[5] 8.62	UAAL 21.72	UAAL 21.72	UAAL 21.72	UAAL 14.40	UAAL[6] 6.26
	Total 18.29%	**Total 27.21%**	**Total 34.94%**	**Total 32.26%**	**Total 25.18%**	**Total 18.66%**
With 3-Year Phase-In	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
12/31/15	NC 9.58%	NC 5.46%	NC 13.19%	NC 11.40%	NC 10.70%	NC 12.33%
	UAAL[7] 9.22	UAAL 22.45	UAAL 22.45	UAAL 22.45	UAAL 15.52	UAAL[8] 1.42
	Total 18.80%	**Total 27.91%**	**Total 35.64%**	**Total 33.85%**	**Total 26.22%**	**Total 13.75%**
With 3-Year Phase-In	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
12/31/16	NC 9.51%	NC 5.53%	NC 13.19%	NC 10.35%	NC 10.76%	NC 12.28%
	UAAL[9] 7.25	UAAL 21.72	UAAL[10] 21.72	UAAL 21.72	UAAL 14.76	UAAL 0.00
	Total 16.76%	**Total 27.25%**	**Total 34.91%**	**Total 32.07%**	**Total 25.52%**	**Total 12.28%**
12/31/17	NC 10.73%	NC 6.21%	NC 14.39%	NC 11.51%	NC 12.10%	NC 13.30%
	UAAL[13] 9.58	UAAL 25.05	UAAL[14] 25.05	UAAL 25.05	UAAL 18.26	UAAL 0.00
	Total 20.31%	**Total 31.26%**	**Total 39.44%**	**Total 36.56%**	**Total 30.36%**	**Total 13.30%**
With 3-Year Phase-In	**18.62%**	**28.88%**	**37.06%**	**34.18%**	**28.04%**	**N/A**
12/31/18	NC 10.73%	NC 6.23%	NC 14.36%	NC 12.13%	NC 12.03%	NC 13.24%
	UAAL[15] 9.40	UAAL 26.24	UAAL[16] 26.24	UAAL 26.24	UAAL 19.76	UAAL[17] 0.86
	Total 20.13%	**Total 32.47%**	**Total 40.60%**	**Total 38.37%**	**Total 31.79%**	**Total 14.10%**
With 3-Year Phase-In	**19.28%**	**31.28%**	**39.41%**	**37.18%**	**30.63%**	**N/A**
12/31/19	NC 10.68%	NC 6.10%	NC 14.34%	NC 12.61%	NC 11.97%	NC 13.22%
	UAAL[19] 5.16	UAAL 27.38	UAAL[20] 27.38	UAAL 27.38	UAAL 19.54	UAAL 0.00
	Total 15.84%	**Total 33.48%**	**Total 41.72%**	**Total 39.99%**	**Total 31.51%**	**Total 13.22%**

History of Employer Contribution Rates

(continued)

Employer Contribution Rate (% of pay)

Valuation Date	General (1.64% @ 57, OCSD)	General (2.0% @ 55, TCA)	General (2.0% @ 55, Cemetery, future service)	General (2.7% @ 55, OCFA)	General (2.0% @ 55, OCFA)	General (2.5% @ 55, Law Library)
12/31/10[1]	NC 10.14%	NC 12.56%	NC 10.90%	NC 11.85%	NC 11.11%	NC 10.92%
	UAAL 16.55	UAAL 8.41	UAAL 6.86	UAAL 16.14	UAAL 16.14	UAAL 16.55
	Total 26.69%	**Total 20.97%**	**Total 17.76%**	**Total 27.99%**	**Total 27.25%**	**Total 27.47%**
12/31/11	NC 10.11%	NC 13.11%	NC 10.80%	NC 12.18%	NC 14.35%	NC 11.29%
	UAAL 20.66	UAAL 9.11	UAAL 8.23	UAAL 20.43	UAAL 20.43	UAAL 20.66
	Total 30.77%	**Total 22.22%**	**Total 19.03%**	**Total 32.61%**	**Total 34.78%**	**Total 31.95%**
12/31/12	NC 11.02%	NC 14.20%	NC 12.34%	NC 13.92%	NC 14.01%	NC 12.88%
	UAAL 25.60	UAAL 12.97	UAAL 12.28	UAAL 24.76	UAAL 24.76	UAAL 25.60
	Total 36.62%	**Total 27.17%**	**Total 24.62%**	**Total 38.68%**	**Total 38.77%**	**Total 38.48%**
With 2-Year Phase-In	**34.87%**	**25.71%**	**22.99%**	**36.70%**	**36.99%**	**36.57%**
12/31/13[2]	NC 10.53%	NC 14.13%	NC 12.33%	NC 14.06%	NC 14.15%	NC 12.89%
	UAAL[3] 21.87	UAAL 12.28	UAAL[4] 9.87	UAAL 23.34	UAAL 23.34	UAAL 21.87
	Total 32.40%	**Total 26.41%**	**Total 22.20%**	**Total 37.40%**	**Total 37.49%**	**Total 34.76%**
12/31/14	NC 10.30%	NC 13.59%	NC 11.79%	NC 13.53%	NC 12.47%	NC 12.40%
	UAAL[6] 6.26	UAAL 12.78	UAAL 0.00	UAAL 20.28	UAAL 20.28	UAAL 20.21
	Total 16.56%	**Total 26.37%**	**Total 11.79%**	**Total 33.81%**	**Total 32.75%**	**Total 32.61%**
With 3-Year Phase-In	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
12/31/15	NC 10.30%	NC 13.44%	NC 11.33%	NC 13.44%	NC 12.72%	NC 12.33%
	UAAL[8] 1.42	UAAL 13.79	UAAL 0.00	UAAL 20.53	UAAL 20.53	UAAL[11] 22.08
	Total 11.72%	**Total 27.23%**	**Total 11.33%**	**Total 33.97%**	**Total 33.25%**	**Total 34.41%**
With 3-Year Phase-In	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
12/31/16	NC 10.21%	NC 13.30%	NC 11.09%	NC 13.61%	NC 12.64%	NC 13.32%
	UAAL 0.00	UAAL 11.46	UAAL 0.00	UAAL 18.35	UAAL 18.35	UAAL[12] 9.69
	Total 10.21%	**Total 24.76%**	**Total 11.09%**	**Total 31.96%**	**Total 30.99%**	**Total 23.01%**
12/31/17	NC 11.25%	NC 14.51%	NC 11.98%	NC 14.72%	NC 13.46%	NC 14.11%
	UAAL 0.00	UAAL 12.74	UAAL 1.44	UAAL 17.62	UAAL 17.62	UAAL 0.00
	Total 11.25%	**Total 27.25%**	**Total 13.42%**	**Total 32.34%**	**Total 31.08%**	**Total 14.11%**
With 3-Year Phase-In	**N/A**	**26.00%**	**12.46%**	**30.46%**	**29.20%**	**N/A**
12/31/18	NC 11.11%	NC 14.51%	NC 12.05%	NC 14.71%	NC 13.50%	NC 14.28%
	UAAL[17] 0.86	UAAL[18] 15.29	UAAL 0.22	UAAL 15.90	UAAL 15.90	UAAL 1.77
	Total 11.97%	**Total 29.80%**	**Total 12.27%**	**Total 30.61%**	**Total 29.40%**	**Total 16.05%**
With 3-Year Phase-In	**N/A**	**29.17%**	**12.05%**	**29.67%**	**28.46%**	**N/A**
12/31/19	NC 11.23%	NC 14.23%	NC 11.62%	NC 14.75%	NC 13.68%	NC 14.20%
	UAAL 0.00	UAAL 0.39	UAAL 3.01	UAAL 14.06	UAAL 14.06	UAAL 0.19
	Total 11.23%	**Total 14.62%**	**Total 14.63%**	**Total 28.81%**	**Total 27.74%**	**Total 14.39%**

History of Employer Contribution Rates

(continued)

Employer Contribution Rate (% of pay)

Valuation Date		Safety Law Enforcement (3% @ 50)	Safety Law Enforcement (3% @ 55)	Safety Fire Authority (3% @ 50)	Safety Fire Authority (3% @ 55)	Safety Probation
12/31/10[1]	NC	21.05%	20.38%	21.54%	18.30%	20.07%
	UAAL	26.40	26.40	23.92	23.92	16.22
	Total	**47.45%**	**46.78%**	**45.46%**	**42.22%**	**36.29%**
12/31/11	NC	21.48%	21.47%	23.49%	18.58%	19.31%
	UAAL	29.38	29.38	19.66	19.66	17.26
	Total	**50.86%**	**50.85%**	**43.15%**	**38.24%**	**36.57%**
12/31/12	NC	24.24%	24.20%	26.16%	21.12%	21.26%
	UAAL	36.71	36.71	26.84	26.84	21.91
	Total	**60.95%**	**60.91%**	**53.00%**	**47.96%**	**43.17%**
With 2-Year Phase-In		**57.27%**	**57.37%**	**49.83%**	**44.85%**	**40.52%**
12/31/13[2]	NC	24.23%	22.58%	25.86%	21.70%	21.00%
	UAAL	32.47	32.47	24.14	24.14	19.72
	Total	**56.70%**	**55.05%**	**50.00%**	**45.84%**	**40.72%**
12/31/14	NC	25.79%	23.55%	27.05%	22.38%	22.17%
	UAAL	37.46	37.46	24.42	24.42	25.01
	Total	**63.25%**	**61.01%**	**51.47%**	**46.80%**	**47.18%**
With 3-Year Phase-In		**58.92%**	**56.88%**	**48.60%**	**43.93%**	**42.84%**
12/31/15	NC	25.56%	23.24%	26.87%	22.10%	21.92%
	UAAL	39.16	39.16	23.81	23.81	25.32
	Total	**64.72%**	**62.40%**	**50.68%**	**45.91%**	**47.24%**
With 3-Year Phase-In		**62.55%**	**60.34%**	**49.24%**	**44.47%**	**45.07%**
12/31/16	NC	25.63%	23.00%	26.84%	21.86%	21.87%
	UAAL	38.19	38.19	22.27	22.27	26.06
	Total	**63.82%**	**61.19%**	**49.11%**	**44.13%**	**47.93%**
12/31/17	NC	26.69%	23.69%	27.24%	21.97%	23.71%
	UAAL	41.07	41.07	23.09	23.09	33.00
	Total	**67.76%**	**64.76%**	**50.33%**	**45.06%**	**56.71%**
With 3-Year Phase-In		**64.05%**	**61.05%**	**48.04%**	**42.77%**	**52.45%**
12/31/18	NC	26.64%	23.48%	26.97%	21.83%	23.45%
	UAAL	42.56	42.56	24.99	24.99	34.41
	Total	**69.20%**	**66.04%**	**51.96%**	**46.82%**	**57.86%**
With 3-Year Phase-In		**67.35%**	**64.19%**	**50.81%**	**45.67%**	**55.73%**
12/31/19	NC	26.57%	23.58%	27.48%	25.77%	23.25%
	UAAL	43.65	43.65	23.79	23.79	36.92
	Total	**70.22%**	**67.23%**	**51.27%**	**49.56%**	**60.17%**

History of Employer Contribution Rates

(continued)

Employer Contribution Rate (% of pay)

Valuation Date	CalPEPRA Rate Group #1 2.5% @ 67	CalPEPRA Rate Group #2 1.62% @ 65 (Plan T)	CalPEPRA Rate Group #2 2.5% @ 67	CalPEPRA Rate Group #2 1.62% @ 67 (Plan W)	CalPEPRA Rate Group #3 2.5% @ 67	CalPEPRA Rate Group #5 2.5% @ 67
12/31/11	NC 8.06% UAAL 10.39 **Total 18.45%**	NC 6.20% UAAL 20.98 **Total 27.18%**	NC 8.26% UAAL 20.98 **Total 29.24%**	N/A	NC 8.70% UAAL 20.66 **Total 29.36%**	N/A
12/31/12 With 2-Year Phase-In	NC 8.68% UAAL 12.91 **Total 21.59%** **20.33%**	NC 6.78% UAAL 25.85 **Total 32.63%** **31.10%**	NC 7.44% UAAL 25.85 **Total 33.29%** **32.05%**	N/A	NC 9.38% UAAL 25.60 **Total 34.98%** **33.52%**	N/A
12/31/13[2]	NC 9.39% UAAL 11.34 **Total 20.73%**	NC 6.70% UAAL 23.72 **Total 30.42%**	NC 8.56% UAAL 23.72 **Total 32.28%**	N/A	NC 9.66% UAAL[3] 21.87 **Total 31.53%**	N/A
12/31/14 With 3-Year Phase-In	NC 8.87% UAAL[5] 8.62 **Total 17.49%** **N/A**	NC 6.61% UAAL 21.72 **Total 28.33%** **N/A**	NC 8.33% UAAL 21.72 **Total 30.05%** **N/A**	N/A	NC 9.00% UAAL[6] 6.26 **Total 15.26%** **N/A**	NC 10.04% UAAL 14.40 **Total 24.44%** **N/A**
12/31/15 With 3-Year Phase-In	NC 8.92% UAAL[7] 9.22 **Total 18.14%** **N/A**	NC 6.56% UAAL 22.45 **Total 29.01%** **N/A**	NC 8.35% UAAL 22.45 **Total 30.80%** **N/A**	NC 6.68% UAAL 22.45 **Total 29.13%** **N/A**	NC 9.25% UAAL[8] 1.42 **Total 10.67%** **N/A**	NC 10.12% UAAL 15.52 **Total 25.64%** **N/A**
12/31/16	NC 8.63% UAAL[9] 7.25 **Total 15.88%**	NC 6.58% UAAL 21.72 **Total 28.30%**	NC 8.28% UAAL[10] 21.72 **Total 30.00%**	NC 6.68% UAAL 21.72 **Total 28.40%**	NC 9.27% UAAL 0.00 **Total 9.27%**	NC 10.25% UAAL 14.76 **Total 25.01%**
12/31/17 With 3-Year Phase-In	NC 9.93% UAAL[13] 9.58 **Total 19.51%** **17.82%**	NC 7.11% UAAL 25.05 **Total 32.16%** **29.78%**	NC 8.78% UAAL[14] 25.05 **Total 33.83%** **31.45%**	NC 8.56% UAAL 25.05 **Total 33.61%** **31.23%**	NC 10.37% UAAL 0.00 **Total 10.37%** **N/A**	NC 11.32% UAAL 18.26 **Total 29.58%** **27.26%**
12/31/18 With 3-Year Phase-In	NC 9.93% UAAL[15] 9.40 **Total 19.33%** **18.48%**	NC 7.12% UAAL 26.24 **Total 33.36%** **32.17%**	NC 8.78% UAAL[16] 26.24 **Total 35.02%** **33.83%**	NC 8.73% UAAL 26.24 **Total 34.97%** **33.78%**	NC 10.02% UAAL[17] 0.86 **Total 10.88%** **N/A**	NC 11.32% UAAL 19.76 **Total 31.08%** **29.92%**
12/31/19	NC 10.05% UAAL[19] 5.16 **Total 15.21%**	NC 7.14% UAAL 27.38 **Total 34.52%**	NC 8.81% UAAL[20] 27.38 **Total 36.19%**	NC 8.54% UAAL 27.38 **Total 35.92%**	NC 9.88% UAAL 0.00 **Total 9.88%**	NC 11.59% UAAL 19.54 **Total 31.13%**

(1) The UAAL established as a result of reallocating contributions and benefit payments among Rate Groups is amortized over a 24-year period.

(2) The outstanding balance of the December 31, 2012 UAAL has been combined and re-amortized over a period of 20 years.

(3) This is the UAAL rate for O.C. Sanitation District for FY 15-16 before reflecting the additional UAAL contributions made during calendar year 2014.

(4) This is the UAAL rate for O.C. Cemetery District for FY 15-16 before reflecting the additional UAAL contributions made during calendar year 2014.

(5) The net UAAL contribution rates for County and O.C. IHSS Public Authority (i.e., excluding U.C.I and Department of Education) is 5.67% as of December 31, 2014.

(6) This is the UAAL rate for O.C. Sanitation District for FY 16-17 before reflecting the additional UAAL contributions made during calendar year 2015.

(7) The net UAAL contribution rates for County and O.C. IHSS Public Authority (i.e., excluding U.C.I and Department of Education) is 5.57% as of December 31, 2015.

(8) This is the UAAL rate for O.C. Sanitation District for FY 17-18 before reflecting the additional UAAL contributions made during calendar year 2016.

(9) The net UAAL contribution rates for County and O.C. IHSS Public Authority (i.e., excluding U.C.I and Department of Education) is 4.18% as of December 31, 2016.

(10) This is the UAAL rate for O.C. Children and Families Commission for FY 18-19 before reflecting the additional UAAL contributions made during calendar year 2017.

(11) This is the UAAL rate for Law Library for FY 17-18 before reflecting the additional UAAL contributions made during calendar year 2016.

History of Employer Contribution Rates

(continued)

Employer Contribution Rate (% of pay)

Valuation Date		CalPEPRA Rate Group #9 2.5% @ 67	CalPEPRA Rate Group #10 2.5% @ 67	CalPEPRA Rate Group #11 2.5% @ 67	CalPEPRA Rate Group #12 2.5% @ 67	CalPEPRA Rate Group #6 2.7% @ 57	CalPEPRA Rate Group #7 2.7% @ 57	CalPEPRA Rate Group #8 2.7% @ 57
12/31/11	NC	10.36%	7.84%	7.95%	8.70%	12.23%	15.55%	15.23%
	UAAL	9.11	20.43	8.23	20.66	17.26	29.38	19.66
	Total	**19.47%**	**28.27%**	**16.18%**	**29.36%**	**29.49%**	**44.93%**	**34.89%**
12/31/12	NC	10.97%	8.50%	8.66%	9.38%	13.91%	17.05%	16.41%
	UAAL	12.97	24.76	12.28	25.60	21.91	36.71	26.84
	Total	**23.94%**	**33.26%**	**20.94%**	**34.98%**	**35.82%**	**53.76%**	**43.25%**
With 2-Year Phase-In		**22.87%**	**31.81%**	**19.63%**	**33.52%**	**33.40%**	**50.61%**	**40.96%**
12/31/13[2]	NC	11.40%	9.71%	8.66%	9.66%	13.95%	19.17%	16.85%
	UAAL	12.28	23.34	UAAL[4] 9.87	21.87	19.72	32.47	24.14
	Total	**23.68%**	**33.05%**	**18.53%**	**31.53%**	**33.67%**	**51.64%**	**40.99%**
12/31/14	NC	9.85%	9.63%	11.81%	9.00%	15.25%	20.10%	15.71%
	UAAL	12.78	20.28	0.00	20.21	25.01	37.46	24.42
	Total	**22.63%**	**29.91%**	**11.81%**	**29.21%**	**40.26%**	**57.56%**	**40.13%**
With 3-Year Phase-In		**N/A**	**N/A**	**N/A**	**N/A**	**36.02%**	**54.01%**	**38.08%**
12/31/15	NC	10.57%	8.81%	12.23%	9.25%	15.00%	20.04%	15.30%
	UAAL	13.79	20.53	0.00	UAAL[11] 22.08	25.32	39.16	23.81
	Total	**24.36%**	**29.34%**	**12.23%**	**31.33%**	**40.32%**	**59.20%**	**39.11%**
With 3-Year Phase-In		**N/A**	**N/A**	**N/A**	**N/A**	**38.20%**	**57.42%**	**38.09%**
12/31/16	NC	10.40%	8.99%	9.98%	7.59%	15.24%	19.39%	14.84%
	UAAL	11.46	18.35	0.00	UAAL[12] 9.69	26.06	38.19	22.27
	Total	**21.86%**	**27.34%**	**9.98%**	**17.28%**	**41.30%**	**57.58%**	**37.11%**
12/31/17	NC	11.02%	10.41%	12.03%	9.36%	16.63%	19.29%	15.44%
	UAAL	12.74	17.62	1.44	0.00	33.00	41.07	23.09
	Total	**23.76%**	**28.03%**	**13.47%**	**9.36%**	**49.63%**	**60.36%**	**38.53%**
With 3-Year Phase-In		**22.51%**	**26.15%**	**12.51%**	**N/A**	**45.37%**	**56.65%**	**36.24%**
12/31/18	NC	11.13%	10.16%	12.33%	10.32%	16.76%	19.04%	15.27%
	UAAL	UAAL[18] 15.29	15.90	0.22	1.77	34.41	42.56	24.99
	Total	**26.42%**	**26.06%**	**12.55%**	**12.09%**	**51.17%**	**61.60%**	**40.26%**
With 3-Year Phase-In		**25.79%**	**25.12%**	**12.33%**	**N/A**	**49.04%**	**59.75%**	**39.11%**
12/31/19	NC	11.14%	10.05%	12.25%	10.37%	16.82%	18.46%	15.66%
	UAAL	0.39	14.06	3.01	0.19	36.92	43.65	23.79
	Total	**11.53%**	**24.11%**	**15.26%**	**10.56%**	**53.74%**	**62.11%**	**39.45%**

(12) This is the UAAL rate for Law Library for FY 18-19 before reflecting the additional UAAL contributions made during calendar year 2017.

(13) The net UAAL contribution rates for County and O.C. IHSS Public Authority (i.e., excluding U.C.I., Department of Education and Cypress Recreation and Parks) is 6.09% (or 4.61% after the three-year phase-in) as of December 31, 2017.

(14) The net UAAL contribution rates for O.C. Children and Families Commission is 3.13% (or 1.04% after the three-year phase-in) as of December 31, 2017.

(15) The net UAAL contribution rates for County and O.C. IHSS Public Authority (i.e., excluding U.C.I., Department of Education and Cypress Recreation and Parks) is 5.80% (or 5.06% after the three-year phase-in) as of December 31, 2018.

(16) The net UAAL contribution rates for O.C. Children and Families Commission is 4.30% (or 3.26% after the three-year phase-in) as of December 31, 2018.

(17) This is the UAAL rate for O.C. Sanitation District for FY 20-21 before reflecting the additional UAAL contributions made during calendar year 2019.

(18) This is the UAAL rate for Transportation Corridor Agency for FY 20-21 before reflecting the additional UAAL contributions made during calendar year 2019.

(19) This is the "net" UAAL contribution rate for County and IHSS Public Authority without reflecting the UAAL contributions required for Vector Control, Cypress Parks and Recreation, U.C.I. and DOE.

(20) The net UAAL contribution rates for O.C. Children and Families Commission is 5.36% as of December 31, 2019.

Summary of Active Membership

Valuation Date	Number	Annual Salary	Annual Average Salary	Increase in Average Salary (%)
12/31/10				
General	18,155	$ 1,232,657,000	$ 67,896	1.81
Safety	3,587	346,582,000	96,622	0.93
Total	**21,742**	**$ 1,579,239,000**	**$ 72,635**	**1.57**
12/31/11				
General	17,717	$ 1,249,064,000	$ 70,501	3.84
Safety	3,704	370,410,000	100,003	3.50
Total	**21,421**	**$ 1,619,474,000**	**$ 75,602**	**4.08**
12/31/12				
General	17,529	$ 1,238,958,000	$ 70,680	0.25
Safety	3,727	370,643,000	99,448	-0.55
Total	**21,256**	**$ 1,609,601,000**	**$ 75,725**	**0.16**
12/31/13				
General	17,547	$ 1,227,153,000	$ 69,935	-1.05
Safety	3,821	377,343,000	98,755	-0.70
Total	**21,368**	**$ 1,604,496,000**	**$ 75,089**	**-0.84**
12/31/14				
General	17,705	$ 1,267,582,000	$ 71,595	2.37
Safety	3,754	380,578,000	101,379	2.66
Total	**21,459**	**$ 1,648,160,000**	**$ 76,805**	**2.29**
12/31/15				
General	17,839	$ 1,254,521,000	$ 70,325	-1.77
Safety	3,686	378,590,000	102,710	1.31
Total	**21,525**	**$ 1,633,111,000**	**$ 75,870**	**-1.22**
12/31/16				
General	18,072	$ 1,353,363,000	$ 74,887	6.49
Safety	3,674	406,470,000	110,634	7.71
Total	**21,746**	**$ 1,759,833,000**	**$ 80,927**	**6.67**
12/31/17				
General	17,941	$ 1,385,356,000	$ 77,217	3.11
Safety	3,780	426,523,000	112,837	1.99
Total	**21,721**	**$ 1,811,879,000**	**$ 83,416**	**3.08**
12/31/18				
General	18,150	$ 1,432,041,000	$ 78,900	2.18
Safety	3,779	443,331,000	117,314	3.97
Total	**21,929**	**$ 1,875,372,000**	**$ 85,520**	**2.52**
12/31/19				
General	18,356	$ 1,481,966,000	$ 80,735	2.33
Safety	3,901	470,568,000	120,628	2.82
Total	**22,257**	**$ 1,952,534,000**	**$ 87,727**	**2.58**

Excludes Deferred and Pending members.

Summary of Retired Membership

Plan Year Ending	At Beginning of Year	Added to Rolls		Removed from Rolls		At End of Year	Annual Allowance (in 000's)	% Increase in Annual Allowance	Average Monthly Allowance
		Number	Annual Allowance (in 000's)[1]	Number	Annual Allowance (in 000's)				
2010	12,243	851	$ 46,736	(332)	$ (8,334)	12,762	$ 457,655	9.16	$ 2,988
2011	12,762	888	45,913	(361)	(9,371)	13,289	494,197	7.98	3,099
2012	13,289	1,026	58,344	(368)	(9,036)	13,947	543,505	9.98	3,247
2013	13,947	911	52,319	(353)	(9,958)	14,505	585,866	7.79	3,366
2014	14,505	995	52,838	(331)	(9,812)	15,169	628,892	7.34	3,455
2015	15,169	1,053	58,679	(412)	(12,077)	15,810	675,494	7.41	3,560
2016	15,810	989	51,759	(430)	(12,895)	16,369	714,358	5.75	3,637
2017	16,369	1,039	62,374	(461)	(15,155)	16,947	761,577	6.61	3,745
2018	16,947	1,155	82,438	(428)	(14,191)	17,674	829,824	8.96	3,913
2019	17,674	1,207	86,521	(461)	(15,215)	18,420	901,130	8.59	4,077

Note: Annual allowances exclude RMBR and STAR COLA.

[1] Includes COLA granted during the plan year.

Development of Actuarial and Valuation Value of Assets

As of December 31, 2019

Plan Year Ending	Total Actual Market Return (net)	Expected Market Return (net)	Investment Gain/ (Loss)	Deferred Factor	Deferred Return
2015	$ (51,601,000)	$ 833,757,000	$ (885,358,000)	-	$ -
2016	1,010,548,000	840,469,000	170,079,000	0.2	34,016,000
2017	1,878,172,000	920,426,000	957,746,000	0.4	383,098,000
2018	(361,321,000)	1,026,583,000	(1,387,904,000)	0.6	(832,742,000)
2019	2,123,258,000	1,004,779,000	1,118,479,000	0.8	894,783,000

(1)	Total Deferred Return	$	479,155,000
(2)	Net Market Value of Assets (Excludes $150,416,000 in County Investment Account, $259,285,000 in Prepaid Employer Contributions and $12,057,000[1] in O.C. Sanitation District UAAL Deferred Account)	$	16,516,108,000[2]
(3)	Actuarial Value of Assets (2) – (1)	$	16,036,953,000[3]
(4)	Non-valuation Reserves		
	(a) Unclaimed member deposit	$	-
	(b) Medicare medical insurance reserve		84,000
	(c) Subtotal	$	84,000
(5)	Valuation Value of Assets (3) – (4)(c)	$	16,036,869,000
(6)	Deferred Return Recognized in Each of the Next 4 Years		
	(a) Amount recognized on 12/31/2020	$	171,680,000
	(b) Amount recognized on 12/31/2021		137,664,000
	(c) Amount recognized on 12/31/2022		(53,885,000)
	(d) Amount recognized on 12/31/2023		223,696,000
	(e) Subtotal (may not total exactly due to rounding)	$	479,155,000

(1) After reflecting asset transfer of $18,631,000 from O.C. Sanitation District UAAL Deferred Account to valuation assets as of December 31, 2019.
(2) Based on the preliminary unaudited financial statement provided by OCERS for the December 31, 2019 valuation.
(3) Ratio of Actuarial Value of Assets to Net Market Value of Assets is 97.1% ((3) ÷ (2)).

Schedule of Funded Liabilities by Type

(Dollars in Thousands)

Valuation Date	(1) Active Member Contributions	(2) Liability for Inactive Participants	(3) Liability for Active Members (Employer Financed Portion)	Valuation Value of Assets	Portion of Accrued Liability Covered by Valuation Assets (%) (1)	(2)	(3)
12/31/10	$ 1,680,401	$ 6,107,350	$ 4,638,122	$ 8,672,592	100	100	19.08
12/31/11	1,829,406	6,881,152	4,812,420	9,064,355	100	100	7.35
12/31/12	1,967,117	7,919,478	5,258,293	9,469,208	100	94.73	0.00
12/31/13	2,126,182	8,502,269	5,156,591	10,417,125	100	97.51	0.00
12/31/14	2,298,744	9,017,874	5,096,506	11,449,911	100	100	2.62
12/31/15	2,488,757	9,696,776	4,864,824	12,228,009	100	100	0.87
12/31/16	2,654,599	10,109,528	5,169,334	13,102,978	100	100	6.56
12/31/17	2,815,839	11,121,965	5,697,623	14,197,125	100	100	4.55
12/31/18	2,980,108	12,018,354	5,704,887	14,994,420	100	99.97	0.00
12/31/19	3,116,707	13,131,453	5,668,570	16,036,869	100	98.39	0.00

Actuarial Methods and Assumptions

Economic Assumptions

The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the January 1, 2014 through December 31, 2016 Actuarial Experience Study dated August 14, 2017 and PowerPoint presentation dated October 16, 2017. Unless otherwise noted, all actuarial assumptions and methods shown below apply to members for all tiers. These assumptions were adopted by the Board.

Net Investment Return: 7.00%; net of investment expenses and administrative expenses.

Member Contribution Crediting Rate: 5.00%, compounded semi-annually.

Consumer Price Index: Increase of 2.75% per year, retiree COLA increases due to CPI subject to a 3.0% maximum change per year.

Payroll Growth: Inflation of 2.75% per year plus "across the board" real salary increases of 0.50% per year.

Increase in Section 7522.10 Compensation Limit: Increase of 2.75% per year from the valuation date.

Individual Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 2.75% per year, plus "across the board" real salary increases of 0.50% per year, plus the following merit and promotion increases:		
Years of Service	**General**	**Safety**
Less than 1	9.00	14.00
1	7.25	10.00
2	6.00	7.75
3	5.00	6.00
4	4.00	5.50
5	3.50	4.50
6	2.50	3.75
7	2.25	3.25
8	1.75	2.50
9	1.50	2.25
10	1.50	1.75
11	1.50	1.75
12	1.50	1.75
13	1.50	1.75
14	1.50	1.75
15	1.50	1.75
16	1.00	1.50
17	1.00	1.50
18	1.00	1.50
19	1.00	1.50
20 & over	1.00	1.50

In addition to the individual salary increase assumptions, we have applied an average of two hours of additional salary annually for leap-year salary adjustment.

Actuarial Methods and Assumptions

(continued)

Demographic Assumptions

Post - Retirement Mortality Rates:

Healthy:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally with the two-dimensional MP-2016 projection scale.
	For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set back four years, projected generationally with the two-dimensional MP-2016 projection scale.
Disabled:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set forward five years, projected generationally with the two-dimensional MP-2016 projection scale.
	For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally with the two-dimensional MP-2016 projection scale.
Beneficiaries:	Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who is receiving a service (non-disability) retirement.

The RP-2014 mortality tables and adjustments as shown above reflect the mortality experience as of the measurement date. The generational projection is a provision for future mortality improvement.

Employee Contribution Rates:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 40% male and 60% female.
	For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016 set back four years, weighted 80% male and 20% female.
Optional Forms of Benefits:	For General Service Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 40% male and 60% female.
	For Safety Service Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016 set back four years, weighted 80% male and 20% female.
	For General Disabled Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016 set forward five years, weighted 40% male and 60% female.
	For Safety Disabled Retirees: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 80% male and 20% female.
	For General Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 60% male and 40% female.
	For Safety Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females), projected 20 years with the two-dimensional mortality improvement scale MP-2016, weighted 20% male and 80% female.
Pre-Retirement Mortality Rates:	For General and Safety Members: Headcount-Weighted RP-2014 Employee Mortality Table times 80%, projected generationally with the two-dimensional MP-2016 projection scale.

Actuarial Methods and Assumptions

(continued)

Termination Rates Before Retirement

Mortality Rates (General and Safety)

Age	Rate (%) Mortality (General and Safety)	
	Male	Female
25	0.05	0.02
30	0.05	0.02
35	0.05	0.03
40	0.06	0.04
45	0.10	0.07
50	0.17	0.11
55	0.27	0.17
60	0.45	0.24
65	0.78	0.36
70	1.27	0.59

Note that generational projections beyond the base year (2014) are not reflected in the above mortality rates. All General pre-retirement deaths are assumed to be non-service connected. For Safety, 90% of pre-retirement deaths are assumed to be non-service connected. The other 10% are assumed to be service connected.

Disability Incidence Rates

Age	Rate (%) Disability			
	General All Other [1]	General OCTA [2]	Safety - Law & Fire [3]	Safety - Probation [4]
20	0.00	0.00	0.00	0.00
25	0.00	0.00	0.01	0.03
30	0.01	0.03	0.04	0.08
35	0.03	0.20	0.14	0.10
40	0.08	0.36	0.23	0.13
45	0.13	0.43	0.40	0.21
50	0.18	0.48	1.10	0.28
55	0.23	0.65	2.40	0.42
60	0.31	1.26	4.80	0.20

[1] 60% of General All Other disabilities are assumed to be service connected disabilities. The other 40% are assumed to be non-service connected.

[2] 65% of General OCTA disabilities are assumed to be service connected disabilities. The other 35% are assumed to be non-service connected.

[3] 100% of Safety Law Enforcement and Fire disabilities are assumed to be service connected disabilities.

[4] 75% of Safety Probation disabilities are assumed to be service connected disabilities. The other 25% are assumed to be non-service connected.

Actuarial Methods and Assumptions

(continued)

Termination Rates Before Retirement

(continued)

Termination Rates

Years of Service	Rate (%) Termination			
	General All Other	General OCTA	Safety - Law & Fire	Safety - Probation
Less than 1	11.00	17.50	4.50	14.00
1	7.50	11.00	2.50	13.00
2	6.50	9.00	2.00	10.00
3	5.00	8.50	1.50	5.00
4	4.50	7.50	1.25	4.00
5	4.25	7.00	1.00	3.50
6	3.75	4.50	0.95	2.75
7	3.25	4.00	0.90	2.00
8	3.00	3.50	0.85	2.00
9	2.75	3.00	0.80	1.75
10	2.50	3.00	0.75	1.75
11	2.00	3.00	0.65	1.50
12	2.00	3.00	0.60	1.25
13	1.75	2.50	0.55	1.00
14	1.50	2.50	0.50	0.75
15	1.40	2.50	0.45	0.75
16	1.30	2.00	0.40	0.75
17	1.20	1.80	0.35	0.25
18	1.10	1.60	0.30	0.25
19	1.00	1.40	0.25	0.25
20 & over	0.90	1.20	0.20	0.25

Election for Withdrawal of Contributions Rates

Years of Service	Rate (%) Election for Withdrawal of Contributions			
	General All Other	General OCTA	Safety - Law & Fire	Safety - Probation
Less than 5	35.0	40.0	20.0	25.0
5-9	30.0	35.0	20.0	25.0
10-14	25.0	30.0	20.0	25.0
15 & over	20.0	20.0	20.0	25.0

Actuarial Methods and Assumptions

(continued)

Retirement Rates

Age	Rate (%)							
	General			Safety				
	Enhanced	Non-Enhanced [1]	SJC	Law (3% @ 50) [2]	Law (3% @ 55) [2]	Fire (3% @ 50)	Fire (3% @ 55)	Probation [2]
48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	30.0	25.0	0.0	12.0	0.0	2.0	0.0	0.0
50	2.5	2.0	3.0	18.0	11.5	5.0	8.0	3.3
51	2.0	2.0	3.0	18.0	12.0	7.0	10.0	3.3
52	2.5	2.0	3.0	17.0	12.7	9.5	11.0	4.3
53	2.5	2.8	3.0	17.0	17.9	10.5	12.0	4.3
54	5.5	2.8	3.0	22.0	18.8	15.0	14.0	7.0
55	15.0	3.3	4.0	22.0	30.7	18.0	24.0	12.0
56	10.0	3.5	5.0	20.0	20.0	20.0	23.0	12.0
57	10.0	5.5	6.0	20.0	20.0	21.0	27.0	18.0
58	11.0	5.5	7.0	20.0	25.0	28.0	27.0	18.0
59	11.0	6.5	9.0	26.0	30.0	28.0	36.0	18.0
60	12.0	9.3	11.0	35.0	40.0	30.0	40.0	20.0
61	12.0	12.0	13.0	35.0	40.0	30.0	40.0	20.0
62	14.0	16.0	15.0	40.0	40.0	35.0	40.0	25.0
63	16.0	16.0	15.0	40.0	40.0	35.0	40.0	40.0
64	16.0	18.0	20.0	40.0	40.0	35.0	40.0	40.0
65	22.0	22.0	20.0	100.0	100.0	100.0	100.0	100.0
66	22.0	28.0	24.0	100.0	100.0	100.0	100.0	100.0
67	23.0	24.0	24.0	100.0	100.0	100.0	100.0	100.0
68	23.0	24.0	24.0	100.0	100.0	100.0	100.0	100.0
69	23.0	20.0	24.0	100.0	100.0	100.0	100.0	100.0
70	25.0	20.0	50.0	100.0	100.0	100.0	100.0	100.0
71	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
72	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
73	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
74	25.0	25.0	50.0	100.0	100.0	100.0	100.0	100.0
75	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) These assumptions are also used for the CalPEPRA 1.62% @ 65 formula (Plan T and Plan W).

(2) Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

Actuarial Methods and Assumptions

(continued)

Retirement Rates

(continued)

Age	Rate (%)			
	CalPEPRA			
	General Formula	Safety Formula – Probation [1]	Safety Formula – Law [1]	Safety Formula – Fire
50	0.0	2.5	11.0	6.0
51	0.0	2.5	11.5	7.0
52	4.0	3.0	12.0	9.0
53	1.5	3.0	16.0	10.0
54	1.5	5.5	17.0	11.5
55	2.5	10.0	28.0	21.0
56	3.5	10.0	18.0	20.0
57	5.5	15.0	17.5	22.0
58	7.5	20.0	22.0	25.0
59	7.5	20.0	26.0	30.0
60	7.5	40.0	40.0	40.0
61	7.5	40.0	40.0	40.0
62	14.0	40.0	40.0	40.0
63	14.0	40.0	40.0	40.0
64	14.0	40.0	40.0	40.0
65	18.0	100.0	100.0	100.0
66	22.0	100.0	100.0	100.0
67	23.0	100.0	100.0	100.0
68	23.0	100.0	100.0	100.0
69	23.0	100.0	100.0	100.0
70	25.0	100.0	100.0	100.0
71	25.0	100.0	100.0	100.0
72	25.0	100.0	100.0	100.0
73	25.0	100.0	100.0	100.0
74	25.0	100.0	100.0	100.0
75	100.0	100.0	100.0	100.0

(1) Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

Actuarial Methods and Assumptions

(continued)

Retirement Age and Benefit for Deferred Vested Members: For current deferred vested members, we make the following retirement age assumptions:

General Age:	59
Safety Age:	53

We assume that 15% of future General and 25% of future Safety deferred vested members will continue to work for a reciprocal employer. For reciprocals, we assume 4.25% compensation increases for General and 4.75% for Safety per annum.

Liability Calculation for Current Deferred Vested Members: Liability for a current deferred vested member is calculated based on salary (adjusted with the additional cashout assumptions for non-CalPEPRA members), service, and eligibility for reciprocal benefit as provided by the Retirement System. For those members without salary information that have 3 or more years of service, we used an average salary. For those members without salary information that have less than 3 years of service or for those members without service information, we assumed a refund of account balance.

Future Benefit Accruals: 1.0 year of service per year of employment. There is no assumption to anticipate conversion of unused sick leave at retirement.

Unknown Data for Members: Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Percent Married: 75% of male members and 55% of female members are assumed to be married at retirement or time of pre-retirement death.

Age of Spouse: Female (or male) three years younger (or older) than spouse.

Additional Cashout Assumptions:

Non-CalPEPRA Formulas Additional compensation amounts are expected to be received during a member's final average earnings period. The percentages used in this valuation are:

	Final One Year Salary	Final Three Year Salary
General Members	3.00%	2.80%
Safety - Probation	3.80%	3.40%
Safety - Law	5.20%	4.60%
Safety - Fire	2.00%	1.70%

The additional cashout assumptions are the same for service and disability retirements.

CalPEPRA Formulas None

Actuarial Methods and Assumptions

(continued)

Actuarial Value of Assets: Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and the expected return on a market value basis, and is recognized over a five-year period.

Valuation Value of Assets: The Valuation Value of Assets is the Actuarial Value of Assets reduced by the value of the non-valuation reserves.

Actuarial Cost Method: Entry Age Actuarial Cost Method. Entry Age is the current age minus Vesting Credit. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salaries, with Normal Cost determined as a level percentage of individual salary, as if the current benefit accrual rate had always been in effect. Effective December 31, 2013, the outstanding balance of the UAAL from the December 31, 2012 valuation was combined and re-amortized over a declining 20-year period. Any changes in UAAL due to actuarial gains or losses or due to changes in assumptions or methods will be amortized over separate 20-year periods. Any changes in UAAL due to plan amendments will be amortized over separate 15-year periods and any change in UAAL due to early retirement incentive programs will be amortized over a separate period of up to 5 years.

Please note that for Probation members who have prior benefit service in another OCERS plan, the normal cost rate for the current plan is calculated assuming their Entry Age is the date they entered service with their current plan.

Summary of Major Plan Provisions

This section summarizes the major provisions of OCERS included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Membership Eligibility:	Membership with OCERS begins with the day of employment in an eligible position by the County or a participating employer.
Non-CalPEPRA General Plans:	
2.5% @ 55 Plans	*(Orange County Sanitation District(1) and Law Library(2))*
Plan G	General members hired before September 21, 1979.
Plan H	General members hired on or after September 21, 1979.
	(1) Sanitation District members within Supervisors and Professional unit hired on or after October 1, 2010 are in Plan B
	(2) Improvement is prospective only for service after June 23, 2005.
2.7% @ 55 Plans	*(City of San Juan Capistrano, Orange County Employees except bargaining unit AFSCME members, Orange County Superior Court, Orange County Local Agency Formation Commission(3), Orange County Employees Retirement System(4), Children and Family Commission(5) and Orange County Fire Authority)*
Plan I	General members hired before September 21, 1979.
Plan J	General members hired on or after September 21, 1979.
	(3) Improvement is prospective only for service after June 23, 2005.
	(4) Improvement for management employees is prospective only for service after June 30, 2005.
	(5) Improvement is prospective only for service after December 22, 2005.
2.0% @ 55 Plans	*(Transportation Corridor Agency, Cemetery District(6) and General OCFA employees effective July 1, 2011)*
Plan M	General members hired before September 21, 1979.
Plan N	General members hired on or after September 21, 1979.
	(6) Improvement is prospective only for service after December 7, 2007.
1.62% @ 65 Plans	*(Orange County Employees, Orange County Superior Court, Orange County Local Agency Formation Commission and Orange County Managers Unit)*
Plan O	County OCEA members and Superior Court members rehired on or after May 7, 2010, LAFCO members rehired on or after July 1, 2010 and County Managers unit members rehired on or after August 17, 2010 and not electing to rejoin Plan I.
Plan P	County OCEA members and Superior Court members hired on or after May 7, 2010, LAFCO members hired on or after July 1, 2010 and County Managers unit members hired on or after August 17, 2010 and not electing Plan J.
2.0% @ 57 Plan	*(City of San Juan Capistrano)*
Plan S	*General members hired on or after July 1, 2012.*
All Other General Employers:	
Plan A	General members hired before September 21, 1979.
Plan B	General members hired on or after September 21, 1979 and Sanitation District members within Supervisors and Professional unit hired on or after October 1, 2010.

Summary of Major Plan Provisions

(continued)

Membership Eligibility: (continued)

Non-CalPEPRA Safety Plans:

3% @ 50 Plans	*(Law Enforcement, Fire Authority and Probation)*
Plan E	Safety members hired before September 21, 1979.
Plan F	Safety members hired on or after September 21, 1979 and before April 9, 2010 for Law Enforcement, before July 1, 2011 for Safety employees of OCFA Executive Management, and before July 1, 2012 for other OCFA Safety employees.
3% @ 55 Plans	*(Law Enforcement and Fire Authority)*
Plan Q	Safety Law Enforcement members rehired on or after April 9, 2010, Safety employees of OCFA Executive Management rehired on or after July 1, 2011, and other OCFA Safety employees rehired on or after July 1, 2012 and previously in Plan E.
Plan R	Safety Law Enforcement members hired on or after April 9, 2010, Safety employees of OCFA Executive Management hired on or after July 1, 2011, and other OCFA Safety employees hired on or after July 1, 2012.

CalPEPRA General Plans:

1.62% @ 65 Plan	*(Orange County Employees except County Attorneys, Orange County Employees Retirement System except Management Employees, Children and Family Commission, Local Agency Formation Commission, and Orange County Superior Court)*
Plan T	General members with membership dates on or after January 1, 2013.
2.5% @ 67 Plan	*(All Other General Employers, Orange County Attorneys, Orange County Employees Retirement System Management Employees)*
Plan U	General Non-Orange County Transportation Authority members with membership dates on or after January 1, 2013 and Orange County Transportation Authority members with membership dates on or after January 1, 2015.
1.62% @ 65 Plan	*(City of San Juan Capistrano)*
Plan W	General members with membership dates on or after January 1, 2016 and not electing Plan U.

CalPEPRA Safety Plans:

2.7% @ 57 Plan	*(Law Enforcement, Fire Authority and Probation Members)*
Plan V	Safety members with membership dates on or after January 1, 2013.

Summary of Major Plan Provisions

(continued)

Final Compensation for Benefit Determination:

Plans A, E, G, I, M, O and Q	Highest consecutive twelve months of compensation earnable. (§31462.1) (FAS1)
Plans B, F, H, J, N, P, R and S	Highest consecutive thirty-six months of compensation earnable. (§31462) (FAS3)
Plan T	Highest consecutive thirty-six months of pensionable compensation. (§7522.32 and §7522.34) (FAS3)
Plans U, V and W	Highest consecutive thirty-six months of pensionable compensation. (§7522.10(c), §7522.32 and §7522.34) (FAS3)

Service: Years of service. (Yrs)

Service Retirement Eligibility:

Plans A, B, G, H, I, J, M, N, O, P, S, T, and W	Age 50 with 10 years of service, or age 70 regardless of service, or after 30 years, regardless of age. (§31672) All part-time employees over age 55 with 10 years of employment may retire with 5 years of service.
Plan U	Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service. (§31672.3)
Plans E, F, Q and R	Age 50 with 10 years of service, or after 20 years, regardless of age. (§31663.25) All part-time employees over age 55 with 10 years of employment may retire with 5 years of service.
Plan V	Age 50 with 5 years of service (§7522.20(d)) or age 70 regardless of service. (§31672.3)

Summary of Major Plan Provisions

(continued)

Benefit Formula: General Plans

2.5% @ 55	Retirement Age	Benefit Formula
Plan G (§31676.18)	50	(2.00% x FAS1 x Yrs)
Tier 1	55	(2.50% x FAS1 x Yrs)
	60	(2.50% x FAS1 x Yrs)
	62	(2.62% x FAS1 x Yrs)[1]
	65 or later	(2.62% x FAS1 x Yrs)[1]
Plan H (§31676.18)	50	(2.00% x FAS3 x Yrs)
Tier 2	55	(2.50% x FAS3 x Yrs)
	60	(2.50% x FAS3 x Yrs)
	62	(2.50% x FAS3 x Yrs)
	65 or later	(2.50% x FAS3 x Yrs)

[1] Reflects benefit factors from Plan A as they provide a better benefit than those under 2.5% @ 55.

2.7% @ 55	Retirement Age	Benefit Formula
Plan I (§31676.19)	50	(2.00% x FAS1 x Yrs)
Tier 1	55	(2.70% x FAS1 x Yrs)
	60	(2.70% x FAS1 x Yrs)
	62	(2.70% x FAS1 x Yrs)
	65 or later	(2.70% x FAS1 x Yrs)
Plan J (§31676.19)	50	(2.00% x FAS3 x Yrs)
Tier 2	55	(2.70% x FAS3 x Yrs)
	60	(2.70% x FAS3 x Yrs)
	62	(2.70% x FAS3 x Yrs)
	65 or later	(2.70% x FAS3 x Yrs)

2.0% @ 55	Retirement Age	Benefit Formula
Plan M (§31676.16)	50	(1.43% x FAS1 x Yrs)
Tier 1	55	(2.00% x FAS1 x Yrs)
	60	(2.34% x FAS1 x Yrs)[1]
	62	(2.62% x FAS1 x Yrs)[1]
	65 or later	(2.62% x FAS1 x Yrs)[1]
Plan N (§31676.16)	50	(1.43% x FAS3 x Yrs)
Tier 2	55	(2.00% x FAS3 x Yrs)
	60	(2.26% x FAS3 x Yrs)
	62	(2.37% x FAS3 x Yrs)
	65 or later	(2.43% x FAS3 x Yrs)[2]

[1] Reflects benefit factors from Plan A as they provide a better benefit than those under 2.0% @ 55.

[2] Reflects benefit factors from Plan B as they provide a better benefit than those under 2.0% @ 55.

Summary of Major Plan Provisions

(continued)

Benefit Formula: General Plans (continued)

1.62% @ 65	Retirement Age	Benefit Formula
Plan O (§31676.01)	50	(0.79% x FAS1 x Yrs)
Tier 1	55	(0.99% x FAS1 x Yrs)
	60	(1.28% x FAS1 x Yrs)
	62	(1.39% x FAS1 x Yrs)
	65 or later	(1.62% x FAS1 x Yrs)
Plan P, Plan T and Plan W (§31676.01)	50	(0.79% x FAS3 x Yrs)
Tier 2	55	(0.99% x FAS3 x Yrs)
	60	(1.28% x FAS3 x Yrs)
	62	(1.39% x FAS3 x Yrs)
	65 or later	(1.62% x FAS3 x Yrs)

2.0% @ 57	Retirement Age	Benefit Formula
Plan S (§31676.12)	50	(1.34% x FAS3 x Yrs)
Tier 2	55	(1.77% x FAS3 x Yrs)
	60	(2.34% x FAS3 x Yrs)
	62	(2.62% x FAS3 x Yrs)
	65 or later	(2.62% x FAS3 x Yrs)

All Other General Members	Retirement Age	Benefit Formula
Plan A (§31676.12)	50	(1.34% x FAS1 x Yrs)
Tier 1	55	(1.77% x FAS1 x Yrs)
	60	(2.34% x FAS1 x Yrs)
	62	(2.62% x FAS1 x Yrs)
	65 or later	(2.62% x FAS1 x Yrs)
Plan B (§31676.1)	50	(1.18% x FAS3 x Yrs)
Tier 2	55	(1.49% x FAS3 x Yrs)
	60	(1.92% x FAS3 x Yrs)
	62	(2.09% x FAS3 x Yrs)
	65 or later	(2.43% x FAS3 x Yrs)
Plan U (§7522.20(a))	52	(1.00% x FAS3 x Yrs)
	55	(1.30% x FAS3 x Yrs)
	60	(1.80% x FAS3 x Yrs)
	62	(2.00% x FAS3 x Yrs)
	65	(2.30% x FAS3 x Yrs)
	67 or later	(2.50% x FAS3 x Yrs)

Summary of Major Plan Provisions

(continued)

Benefit Formula: Safety Plans

3.0% @ 50	Retirement Age	Benefit Formula
Plan E (§31664.1)	50	(3.00% x FAS1 x Yrs)
Tier 1	55	(3.00% x FAS1 x Yrs)
	60 or later	(3.00% x FAS1 x Yrs)
Plan F (§31664.1)	50	(3.00% x FAS3 x Yrs)
Tier 2	55	(3.00% x FAS3 x Yrs)
	60 or later	(3.00% x FAS3 x Yrs)

3.0% @ 55	Retirement Age	Benefit Formula
Plan Q (§31664.2)	50	(2.29% x FAS1 x Yrs)
Tier 1	55	(3.00% x FAS1 x Yrs)
	60 or later	(3.00% x FAS1 x Yrs)
Plan R (§31664.2)	50	(2.29% x FAS3 x Yrs)
Tier 2	55	(3.00% x FAS3 x Yrs)
	60 or later	(3.00% x FAS3 x Yrs)
Plan V (§7522.25(d))	50	(2.00% x FAS3 x Yrs)
	55	(2.50% x FAS3 x Yrs)
	57 or later	(2.70% x FAS3 x Yrs)

Summary of Major Plan Provisions

(continued)

Maximum Benefit:

Plans A, B, E, F, G, H, I, J, M, N, O, P, Q, R, S, T and W	100% of Highest Average Compensation. (§31676.01, §31676.1, §31676.12, §31676.16, §31676.18, §31676.19, §31664.1, §31664.2)
Plans U and V	None

Ordinary Disability:

General Plans:

Plans A, B, G, H, I, J, M, N, O, P, S, T, U and W

Eligibility	Five years of service. (§31720)
Benefit Formula	Plans A, G, I, M, and O: 1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 62, but the total benefit cannot be more than one-third of Final Compensation. (§31727.1) Plans B, H, J, N, P, S, T, U and W: 1.5% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65, but the total benefit cannot be more than one-third of Final Compensation. (§31727)

Safety Plans:

Plans E, F, Q, R and V

Eligibility	Five years of service. (§31720)
Benefit Formula	1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 55, but the total benefit cannot be more than one-third of Final Compensation (§31727.2) For all members, 100% of the service retirement benefit will be paid, if greater.

Line-of-Duty Disability:

All Members:

Eligibility	No age or service requirements. (§31720)
Benefit Formula	50% of the Final Compensation or 100% of Service Retirement benefit, if greater. (§31727.4)

Pre-Retirement Death

All Members:

Eligibility	None
Benefit	Refund of employee contributions with interest plus one month's compensation for each year of service to a maximum of six month's compensation. (§31781) A lump sum benefit in the amount of $1,000 is payable upon death of a member (with 10 years of service) to his/her eligible beneficiary. (§31790)
Death in line of duty	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor-children. (§31787) Or

Vested Members:

Eligibility	Five years of service.
Benefit	60% of the greater of Service or Ordinary Disability Retirement benefit payable to eligible surviving spouse (§31765.1, §31781.1), in lieu of §31781.

Summary of Major Plan Provisions
(continued)

Death After Retirement:

All Members:

Service or Ordinary Disability Retirement	60% of member's unmodified allowance continued to eligible spouse. (§31760.1) A lump sum benefit in the amount of $1,000 is payable upon death of a member (with 10 years of service) to his/her eligible beneficiary. (§31790) An eligible spouse is a surviving spouse who was married to or registered with the member one year prior to the effective retirement date. Certain surviving spouses or domestic partners may also be eligible if marriage or domestic partnership was at least two years prior to the date of death and the surviving spouse or domestic partner has attained age 55. (§31760.1)
Line-of-Duty Disability	100% of member's allowance continued to eligible spouse. (§31786) A lump sum benefit in the amount of $1,000 is payable upon death of a member (with 10 years of service) to his/her eligible beneficiary. (§31790)

Withdrawal Benefits:

Less than Five Years of Service	Refund of accumulated employee contributions with interest or earned benefit at age 70 (§31628). Effective January 1, 2003, a member may also elect to leave their contributions on deposit in the retirement fund. (§31629.5)
Five or More Years of Service	If contributions left on deposit, a member is entitled to earned benefits commencing at any time after eligible to retire. (§31700)

Post-retirement Cost-of-Living Benefits:

Future changes based on Consumer Price Index to a maximum of 3% per year, excess "banked." (§31870.1)

Supplemental Benefit:

Non-vested supplemental COLA and medical benefits are also paid by the System to eligible retirees and survivors. These benefits have been excluded from this valuation.

Member Contributions:

Non-CalPEPRA General Plans:

Plan A	
Basic	Provide for an average annuity at age 60 equal to 1/200 of FAS1. (§31621.5)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.
Plan B	
Basic	Provide for an average annuity at age 60 equal to 1/120 of FAS3. (§31621)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.
Plans G, H, I and J	
Basic	Provide for an average annuity at age 55 equal to 1/100 of FAS3 (FAS1 for Plans G and I). (§31621.8)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.
Plans M, N, O and P	
Basic	Provide for an average annuity payable at age 60 equal to 1/120 of FAS3 (FAS1 for Plans M and O). (§31621)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.
Plan S	
Basic	Provide for an average annuity at age 60 equal to 1/100 of FAS3. (§31621.2)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.

Summary of Major Plan Provisions

(continued)

Member Contributions: (continued)

Non-CalPEPRA Safety Plans:	
Plans E and Q	
Basic	Provide for an average annuity at age 50 equal to 1/200 FAS1. (§31639.5)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.
Plans F and R	
Basic	Provide for an average annuity at age 50 equal to 1/100 of FAS3. (§31639.25)
Cost-of-Living	Provide for 50% of future Cost-of-Living costs.
CalPEPRA Plans:	
Plans T, U, V and W	50% of total Normal Cost rate.
Other Information:	Non-CalPEPRA Safety members with 30 or more years of service are exempt from paying members contributions. The same applies for General members hired on or before March 7, 1973.

Note: The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the System should find the plan summary not in accordance with the actual provisions, the System should alert the actuary so that both can be sure the proper provisions are valued.

Experience Analysis

(2010 - 2019)
(Dollars in Thousands)

Gains & Losses in Actuarial Accrued Liabilities During Years Ended December 31, Resulting from Differences Between Assumed Experience & Actual Experience					
	Gains (or Losses) Per Year				
Type of Activity	**2010**	**2011**	**2012**	**2013**	**2014**
Retirements	$ -	$ -	$ -	$ -	$ -
Pay Increases	215,936	154,946	244,750	294,326	125,746
COLA Increases	-	-	-	-	153,484
Investment Income	(224,044)	(388,935)	(387,808)	176,930	9,570
Other	63,174	(38,159)	(19,979)	30,354	(4,476)
Gain (or Loss) During Year From Experience	**$ 55,066**	**$ (272,148)**	**$ (163,037)**	**$ 501,610**	**$ 284,324**
Nonrecurring Items:					
Method and Procedure Changes	-	-	-	-	-
Plan Amendments and Assumption Changes	-	(363,842)	(934,619)	-	122,171
Correction to Include All Premium Pay Items	-	-	-	-	-
Composite Gain (or Loss) During Year	**$ 55,066**	**$ (635,990)**	**$ (1,097,656)**	**$ 501,610**	**$ 406,495**

Gains & Losses in Actuarial Accrued Liabilities During Years Ended December 31, Resulting from Differences Between Assumed Experience & Actual Experience					
	Gains (or Losses) Per Year				
Type of Activity	**2015**	**2016**	**2017**	**2018**	**2019**
Retirements	$ (62,070)	$ -	$ -	$ -	$ -
Pay Increases	282,696	(204,603)	66,399	71,908	52,716
COLA Increases	119,367	186,039	95,796	(24,279)	(131,220)
Investment Income	(229,138)	(113,103)	24,401	(255,908)	(50,514)
Other	10,056	(4,119)	5,316	(143,172)	(161,090)
Gain (or Loss) During Year From Experience	**$ 120,911**	**$ (135,786)**	**$ 191,912**	**$ (351,451)**	**$ (290,108)**
Nonrecurring Items:					
Method of Procedure Changes	-	92,587[1]	-	-	-
Plan Amendments and Assumption Changes	-	-	(853,538)	-	-
Correction to Include All Premium Pay Items	-	-	-	-	-
Composite Gain (or Loss) During Year	**$ 120,911**	**$ (43,199)**	**$ (661,626)**	**$ (351,451)**	**$ (290,108)**

(1) Includes leap year salary adjustment, revised benefit and eligibility service credits from pension administration system and automatic continuance benefit for child beneficiary.

Section

STATISTICAL

Testing & Vaccination
First Responders

First Responders

As cases throughout Orange County continued to rise, COVID-19 testing sites were opened and staffed by medical and safety professionals. Individuals could be tested for the virus at local parks, other public locations and other testing facilities.

By December 2020, more than 2.2 million cases had been recorded in California, and over 157,000 in Orange County.

Hospitals became overwhelmed with COVID-19 patients. The supply of ventilators for patients was extremely low and the capacity of intensive care units was of great concern. After the emergency approval of the COVID-19 vaccines in December 2020, obtaining vaccines for these first responders was a top priority.

As the vaccination supply for the County increased, mass vaccination sites were established and staffed by medical and safety teams to distribute the vaccines. Appointments could be made online, and individuals over the age of 65 were deemed to have priority.

Statistical Section Review

The Statistical Section of the Comprehensive Annual Financial Report provides additional information in order to promote a more comprehensive understanding of the financial statements, note disclosures and supplemental information.

The Governmental Accounting Standards Board (GASB) established five categories of information to be provided in the Statistical Section: Financial Trends, Revenues, Expenses, Demographic and Economic, and Operating Information.

Information of financial trends, revenues and expenses for the last ten years is presented in the Schedules of Changes in Fiduciary Net Position, Schedule and Graph of Fiduciary Revenue by Source, and Schedule and Graph of Expenses by Type.

Schedule of Changes in Fiduciary Net Position - Pension Trust Fund

2011 – 2020
(Dollars in Thousands)

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Additions										
Employer Contributions	$ 387,585	$ 406,805	$ 427,095	$ 625,520	$ 571,298	$ 567,196	$ 572,104	$ 580,905	$ 653,793	$ 659,807
Employee Contributions	183,820	191,215	209,301	232,656	249,271	258,297	262,294	270,070	279,373	279,384
Investment Income/(Loss)	48,753	1,002,763	1,151,193	497,760	(11,903)	1,060,040	1,938,025	(326,145)	2,182,666	2,172,339
Net Securities Lending	1,703	2,007	1,454	1,435	1,030	1,203	1,610	1,517	1,142	845
Total Additions	**$ 621,861**	**$ 1,602,790**	**$ 1,789,043**	**$ 1,357,371**	**$ 809,696**	**$ 1,886,736**	**$ 2,774,033**	**$ 526,347**	**$ 3,116,974**	**$ 3,112,375**
Deductions										
Benefits	$ 493,749	$ 541,154	$ 586,284	$ 630,678	$ 675,963	$ 717,976	$ 764,344	$ 828,278	$ 900,902	$ 973,325
Administrative Expenses	12,828	14,209	11,705	11,905	12,521	16,870	17,002	18,284	19,171	20,428
Total Deductions	**$ 506,577**	**$ 555,363**	**$ 597,989**	**$ 642,583**	**$ 688,484**	**$ 734,846**	**$ 781,346**	**$ 846,562**	**$ 920,073**	**$ 993,753**
Changes in Fiduciary Net Position	**$ 115,284**	**$ 1,047,427**	**$ 1,191,054**	**$ 714,788**	**$ 121,212**	**$ 1,151,890**	**$ 1,992,687**	**$ (320,215)**	**$ 2,196,901**	**$ 2,118,622**

Schedule of Changes in Fiduciary Net Position - Health Care Fund - County

2011 – 2020
(Dollars in Thousands)

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Additions										
Employer Contributions	$ 39,694	$ 27,395	$ 66,057	$ 64,852	$ 36,557	$ 42,411	$ 59,864	$ 52,520	$ 54,788	$ 41,559
Investment Income/(Loss)	(641)	10,308	13,702	7,374	(698)	16,902	34,087	(5,888)	43,523	40,706
Net Securities Lending	18	21	20	25	18	21	32	31	25	19
Total Additions	$ 39,071	$ 37,724	$ 79,779	$ 72,251	$ 35,877	$ 59,334	$ 93,983	$ 46,663	$ 98,336	$ 82,284
Deductions										
Benefits	$ 26,250	$ 27,089	$ 28,293	$ 29,299	$ 30,107	$ 30,818	$ 32,042	$ 33,290	$ 35,012	$ 36,784
Administrative Expenses	18	19	20	20	22	22	22	20	20	22
Total Deductions	$ 26,268	$ 27,108	$ 28,313	$ 29,319	$ 30,129	$ 30,840	$ 32,064	$ 33,310	$ 35,032	$ 36,806
Changes in Fiduciary Net Position	$ 12,803	$ 10,616	$ 51,466	$ 42,932	$ 5,748	$ 28,494	$ 61,919	$ 13,353	$ 63,304	$ 45,478

Schedule of Changes in Fiduciary Net Position - Health Care Fund - OCFA

2011 – 2020
(Dollars in Thousands)

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Additions										
Employer Contributions	$ 3,660	$ 3,590	$ 18,349	$ 2,667	$ 2,624	$ 2,414	$ 2,380	$ 4,536	$ 2,111	$ 1,976
Investment Income/(Loss)	(7)	1,736	1,963	1,583	(99)	2,845	5,113	(725)	5,288	4,140
Net Securities Lending	3	3	4	5	3	3	4	4	3	2
Total Additions	$ 3,656	$ 5,329	$ 20,316	$ 4,255	$ 2,528	$ 5,262	$ 7,497	$ 3,815	$ 7,402	$ 6,118
Deductions										
Benefits	$ 2,649	$ 2,804	$ 2,550	$ 3,138	$ 3,448	$ 3,867	$ 3,978	$ 5,077	$ 5,018	$ 5,539
Administrative Expenses	9	9	14	22	22	22	27	30	21	22
Total Deductions	$ 2,658	$ 2,813	$ 2,564	$ 3,160	$ 3,470	$ 3,889	$ 4,005	$ 5,107	$ 5,039	$ 5,561
Changes in Fiduciary Net Position	$ 998	$ 2,516	$ 17,752	$ 1,095	$ (942)	$ 1,373	$ 3,492	$ (1,292)	$ 2,363	$ 557

Schedule of Changes in Fiduciary Net Position - Custodial Fund - OCTA

2011 – 2020
(Dollars in Thousands)

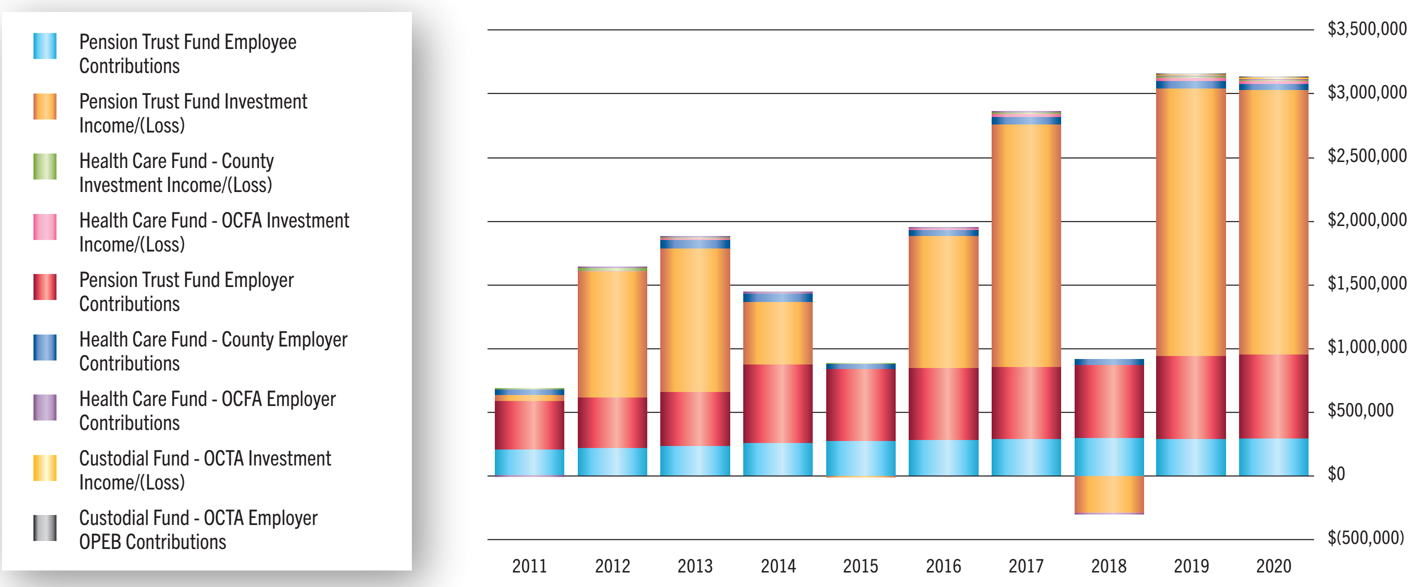
Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Additions										
Employer OPEB Contributions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$ 613	$ 613
Investment Income/(Loss)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,250	2,350
Total Additions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,863	$ 2,963
Deductions										
Employer OPEB Payments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$ 1,318	$ 1,383
Administrative Expenses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	22
Total Deductions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,338	$ 1,405
Changes in Fiduciary Net Position	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,525	$ 1,558

N/A: Detailed information not available. This is a 10-year schedule. Information in this schedule is not available prior to 2019 due to the implementation of GASB 84. Additional years will be added to this schedule in future fiscal years until 10 years of data is presented.

Schedule and Graph of Fiduciary Revenues by Source

2011 – 2020
(Dollars in Thousands)

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pension Trust Fund										
Employee Contributions	$ 183,820	$ 191,215	$ 209,301	$ 232,656	$ 249,271	$ 258,297	$ 262,294	$ 270,070	$ 279,373	$ 279,384
Employer Contributions	387,585	406,805	427,095	625,520	571,298	567,196	572,104	580,905	653,793	659,807
Investment Income/(Loss)[1, 2]	50,456	1,004,770	1,152,647	499,195	(10,873)	1,061,243	1,939,635	(324,628)	2,183,808	2,173,184
Health Care Fund - County										
Employer Contributions	39,694	27,395	66,057	64,852	36,557	42,411	59,864	52,520	54,788	41,559
Investment Income/(Loss)[1, 2]	(623)	10,329	13,722	7,399	(680)	16,923	34,119	(5,857)	43,548	40,725
Health Care Fund - OCFA										
Employer Contributions	3,660	3,590	18,349	2,667	2,624	2,414	2,380	4,536	2,111	1,976
Investment Income/(Loss)[1, 2]	(4)	1,739	1,967	1,588	(96)	2,848	5,117	(721)	5,291	4,142
Custodial Fund - OCTA										
Employer OPEB Contributions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	613	613
Investment Income/(Loss)[1, 2]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,250	2,350
Total	$ 664,588	$ 1,645,843	$ 1,889,138	$ 1,433,877	$ 848,101	$ 1,951,332	$ 2,875,513	$ 576,825	$ 3,226,575	$ 3,203,740



N/A: Detailed information not available.

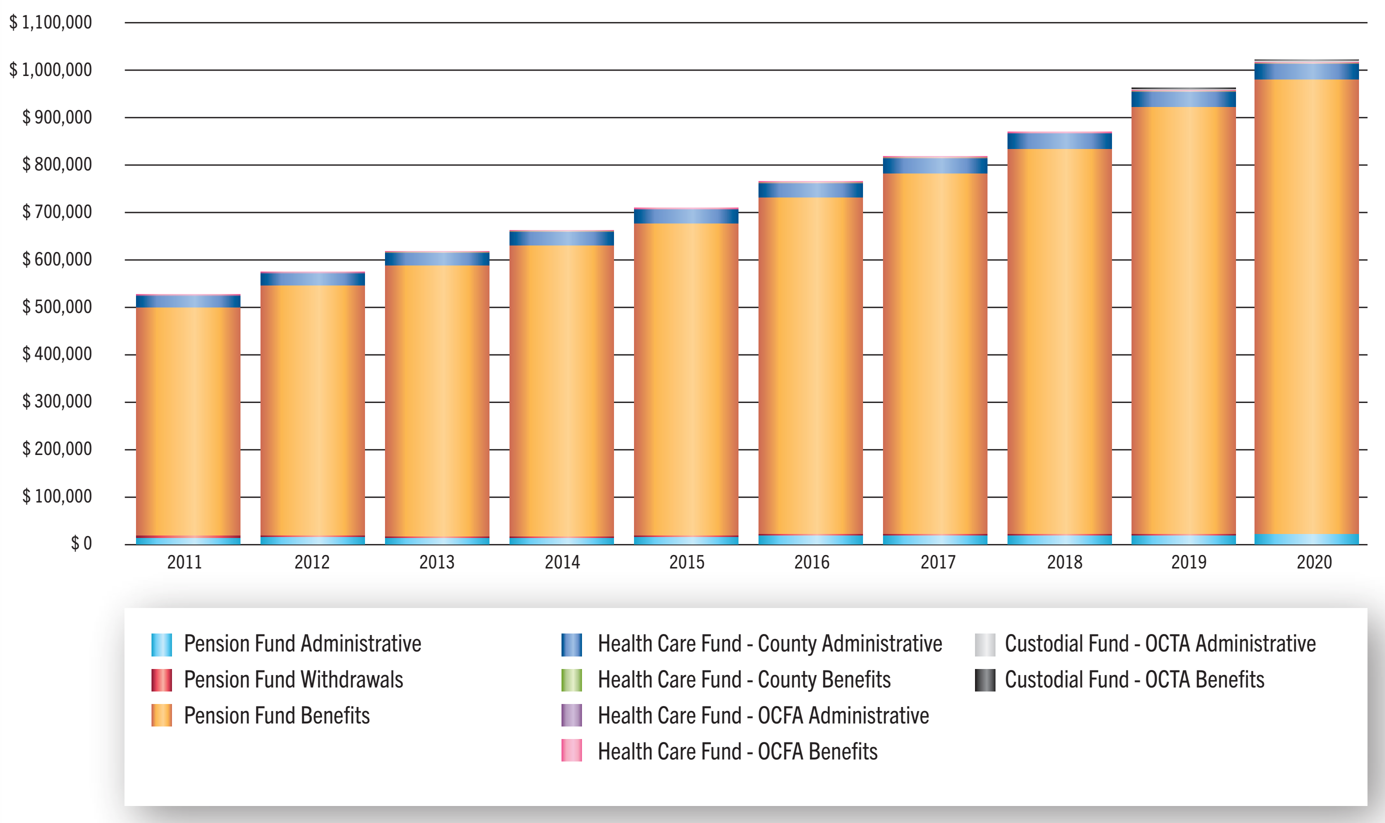
[1] Investment Income/(Loss) includes net appreciation/(depreciation) less investment manager fees, security lending fees and commission recapture.

[2] Beginning in 2013, Investment Income/(Loss) includes net appreciation/(depreciation) less investment manager fees, investment department expenses, security lending fees and commission recapture.

Schedule and Graph of Expenses by Type

2011 – 2020
(Dollars in Thousands)

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pension Trust Fund										
Administrative	$ 12,828	$ 14,209	$ 11,705	$ 11,905	$ 12,521	$ 16,870	$ 17,002	$ 18,284	$ 19,171	$ 20,428
Withdrawals										
Separation	6,833	8,078	7,516	9,843	10,764	9,411	9,294	10,681	9,458	6,883
Death	2,041	2,019	2,348	1,887	1,093	4,232	4,572	3,252	3,791	4,664
Benefits	484,875	531,057	576,420	618,948	664,106	704,333	750,478	814,345	887,653	961,778
Health Care Fund - County										
Administrative	18	19	20	20	22	22	22	20	20	22
Benefits	26,250	27,089	28,293	29,299	30,107	30,818	32,042	33,290	35,012	36,784
Health Care Fund - OCFA										
Administrative	9	9	14	22	22	22	27	30	21	22
Benefits	2,649	2,804	2,550	3,138	3,448	3,867	3,978	5,077	5,018	5,539
Custodial Fund - OCTA										
Administrative	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,318	1,383
Benefits	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	22
Total	$ 535,503	$ 585,284	$ 628,866	$ 675,062	$ 722,083	$ 769,575	$ 817,415	$ 884,979	$ 961,482	$ 1,037,525

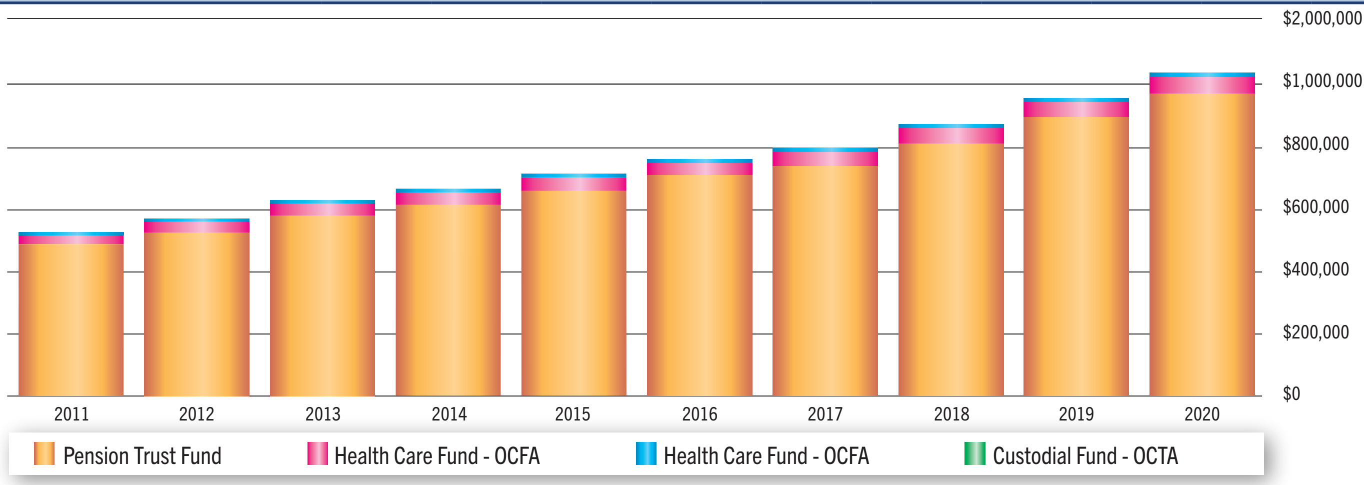


N/A: Detailed information not available.

Schedule and Graph of Benefit Expenses by Type

2011 – 2020
(Dollars in Thousands)

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pension Trust Fund										
Participant Benefits										
Service Retiree Payroll										
General	N/A	N/A	N/A	N/A	$ 446,534	$ 475,838	$ 502,396	$ 545,028	$ 593,394	$ 644,351
Safety	N/A	N/A	N/A	N/A	158,247	167,723	180,747	199,029	218,482	238,671
Service Retiree Payroll	N/A	N/A	N/A	N/A	604,781	643,561	683,143	744,057	811,876	883,022
Disability Retiree Payroll										
General	N/A	N/A	N/A	N/A	25,298	25,891	29,462	29,177	31,474	30,831
Safety	N/A	N/A	N/A	N/A	33,503	34,497	37,179	40,541	43,653	46,993
Disability Retiree Payroll	N/A	N/A	N/A	N/A	58,801	60,388	66,641	69,718	75,127	77,824
Total Participant Benefits										
General	N/A	N/A	N/A	N/A	471,832	501,729	531,858	574,205	624,868	675,182
Safety	N/A	N/A	N/A	N/A	191,750	202,220	217,926	239,570	262,135	285,664
Total Participant Benefits	$ 484,012	$ 530,269	$ 575,633	$ 618,233	663,582	703,949	749,784	813,775	887,003	960,846
Membership Withdrawals and Refunds										
General Membership	N/A	N/A	N/A	N/A	N/A	12,778	13,063	12,288	12,536	10,693
Safety Membership	N/A	N/A	N/A	N/A	N/A	865	803	1,645	713	854
Total Withdrawals and Refunds	8,874	10,097	9,864	11,730	11,857	13,643	13,866	13,933	13,249	11,547
Death Benefits										
Total Death Benefits	863	788	787	715	524	384	694	570	650	932
Total Pension Trust Fund	493,749	541,154	586,284	630,678	675,963	717,976	764,344	828,278	900,902	973,325
Health Care Fund - County										
Health Care	26,250	27,089	28,293	29,299	30,107	30,818	32,042	33,290	35,012	36,784
Health Care Fund - OCFA										
Health Care	2,649	2,804	2,550	3,138	3,448	3,867	3,978	5,077	5,018	5,539
Custodial Fund - OCTA										
Employer OPEB Payments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,318	1,383
Total	$ 522,648	$ 571,047	$ 617,127	$ 663,115	$ 709,518	$ 752,661	$ 800,364	$ 866,645	$ 942,250	$1,017,031

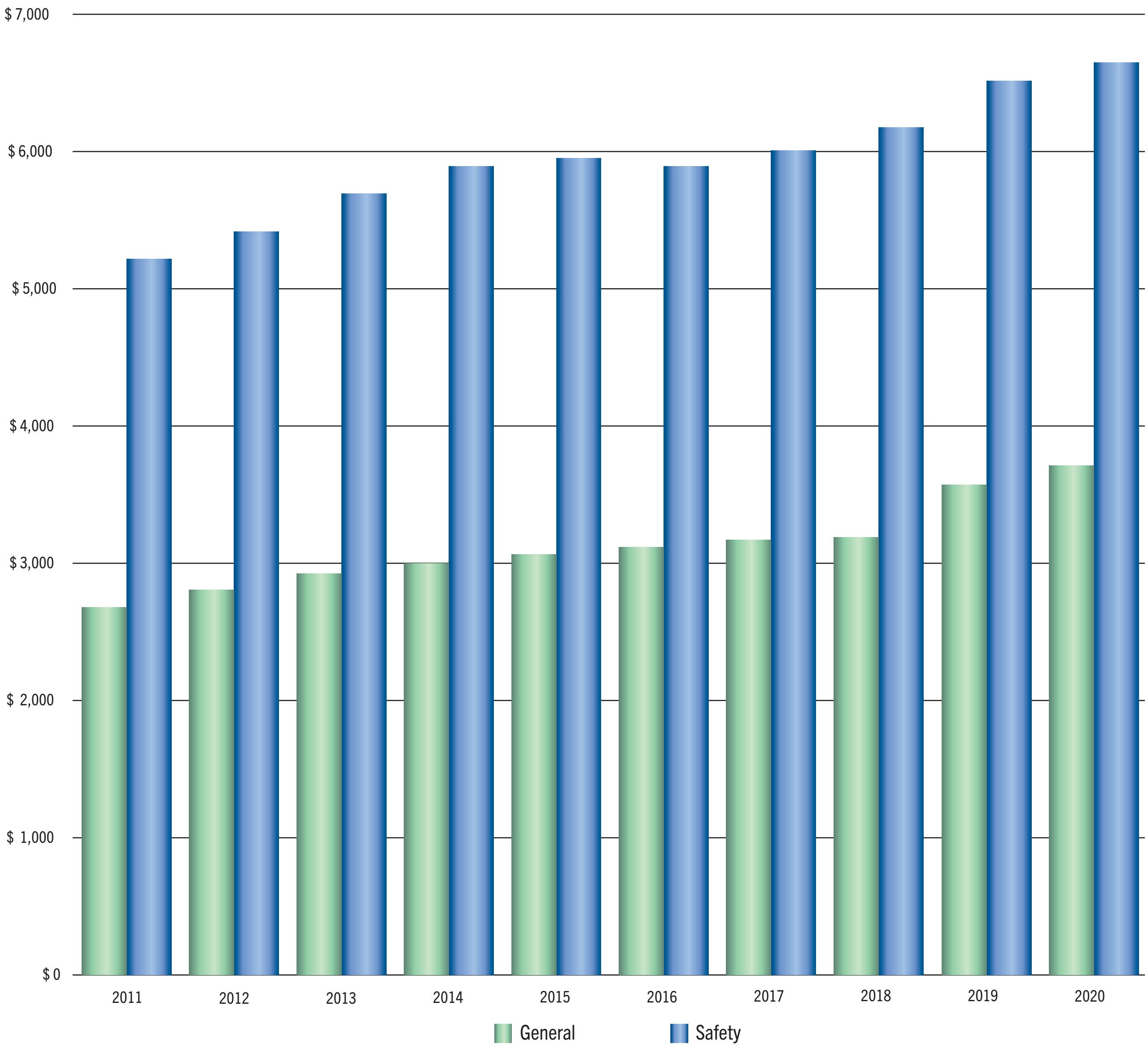


N/A: Detailed information not available.

Schedule and Graph of Average Monthly Pension Check

2011 – 2020

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General	$ 2,714	$ 2,836	$ 2,924	$ 2,991	$ 3,103	$ 3,142	$ 3,244	$ 3,372	$ 3,520	$ 3,686
Safety	$ 5,297	$ 5,516	$ 5,679	$ 5,914	$ 5,974	$ 5,917	$ 6,017	$ 6,245	$ 6,499	$ 6,680



Source: OCERS' Pension Administration System Solution

Schedule of Average Pension Benefit Payments by Years of Service

	Years of Service						
Service Retirement Effective Dates	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30 & Over**
Period 1/1/11-12/31/11							
Average Monthly Pension Benefits	$ 678	$ 1,057	$ 1,689	$ 3,054	$ 4,257	$ 5,910	$ 6,766
Monthly Final Average Salary	$ 4,843	$ 5,825	$ 5,475	$ 6,497	$ 7,314	$ 7,874	$ 7,650
Number of Retired Members	16	55	111	86	120	123	155
Period 1/1/12-12/31/12							
Average Monthly Pension Benefits	$ 647	$ 1,142	$ 1,701	$ 2,957	$ 4,058	$ 5,802	$ 7,015
Monthly Final Average Salary	$ 5,988	$ 5,398	$ 5,672	$ 6,347	$ 6,759	$ 7,702	$ 7,750
Number of Retired Members	20	71	128	88	187	145	172
Period 1/1/13-12/31/13							
Average Monthly Pension Benefits	$ 435	$ 1,166	$ 2,039	$ 2,946	$ 3,794	$ 6,409	$ 7,732
Monthly Final Average Salary	$ 8,199	$ 6,347	$ 6,458	$ 6,492	$ 6,431	$ 8,432	$ 8,482
Number of Retired Members	29	55	139	82	161	147	131
Period 1/1/14-12/31/14							
Average Monthly Pension Benefits	$ 421	$ 1,152	$ 1,925	$ 3,188	$ 4,117	$ 6,444	$ 6,719
Monthly Final Average Salary	$ 8,176	$ 6,955	$ 6,301	$ 6,961	$ 7,003	$ 8,463	$ 7,349
Number of Retired Members	23	45	146	96	143	192	138
Period 1/1/15-12/31/15							
Average Monthly Pension Benefits	$ 582	$ 1,263	$ 1,755	$ 2,850	$ 3,895	$ 5,679	$ 7,235
Monthly Final Average Salary	$ 8,802	$ 6,888	$ 5,970	$ 6,673	$ 6,800	$ 7,893	$ 8,352
Number of Retired Members	22	63	128	119	110	200	182
Period 1/1/16-12/31/16							
Average Monthly Pension Benefits	$ 427	$ 1,244	$ 2,135	$ 2,886	$ 4,272	$ 5,549	$ 6,782
Monthly Final Average Salary	$ 8,298	$ 6,907	$ 6,911	$ 6,580	$ 7,383	$ 7,651	$ 7,762
Number of Retired Members	24	56	121	120	113	195	163
Period 1/1/17-12/31/17							
Average Monthly Pension Benefits	$ 541	$ 1,215	$ 2,073	$ 3,062	$ 4,513	$ 5,851	$ 7,069
Monthly Final Average Salary	$ 7,952	$ 6,800	$ 6,844	$ 6,810	$ 7,743	$ 7,975	$ 7,931
Number of Retired Members	21	47	122	147	112	190	153
Period 1/1/18-12/31/18							
Average Monthly Pension Benefits	$ 554	$ 1,190	$ 1,943	$ 2,879	$ 4,681	$ 6,074	$ 7,439
Monthly Final Average Salary	$ 10,584	$ 7,287	$ 6,904	$ 6,859	$ 8,134	$ 8,246	$ 8,561
Number of Retired Members	23	62	125	144	127	205	208
Period 1/1/19-12/31/19							
Average Monthly Pension Benefits	$ 367	$ 1,424	$ 2,332	$ 3,073	$ 4,831	$ 6,475	$ 7,324
Monthly Final Average Salary	$ 7,568	$ 8,243	$ 7,509	$ 6,985	$ 8,088	$ 8,591	$ 8,249
Number of Retired Members	31	54	121	150	135	249	191
Period 1/1/20-12/31/20							
Average Monthly Pension Benefits	$ 536	$ 1,475	$ 2,149	$ 3,422	$ 4,697	$ 6,151	$ 6,825
Monthly Final Average Salary	$ 9,267	$ 8,556	$ 6,784	$ 7,473	$ 8,046	$ 8,340	$ 7,917
Number of Retired Members	29	59	128	166	237	281	288

Source: OCERS' Pension Administration System Solution

Schedule of Pension Benefit Recipients by Type of Benefit

December 31, 2020

Monthly Benefit	Normal Retirement for Age and Service	Survivor Payment - Normal Retirement	Service-Connected Disability Retirement	Nonservice-Connected Disability Retirement	Survivor Payment - Disability Retirement	DRO (Domestic Relations Order Payees)	Active Deaths	Total
$1-500	551	119	3	2	14	80	11	780
$501-1,000	969	240	1	19	29	113	72	1,443
$1,001-1,500	1,255	226	7	53	31	104	77	1,753
$1,501-2,000	1,163	157	62	71	28	81	62	1,624
$2,001-2,500	1,147	131	164	38	18	64	28	1,590
$2,501-3,000	1,101	121	236	13	37	30	14	1,552
$3,001-3,500	1,049	87	165	22	27	40	6	1,396
$3,501-4,000	930	74	99	4	14	25	6	1,152
$4,001-4,500	825	44	85	6	22	12	7	1,001
$4,501-5,000	753	43	117	2	14	7	7	943
$5,001-5,500	716	47	54	1	11	6	6	841
$5,501-6,000	606	29	38	3	3	7	1	687
$6,001-6,500	558	20	34	1	6	1	3	623
$6,501-7,000	491	19	21	1	1	1	-	534
Over $7,000	3,225	45	203	-	21	2	4	3,500
Total	15,339	1,402	1,289	236	276	573	304	19,419

Definition of Terms

Eligible Spouse: A member's spouse is considered eligible if the member has been legally married for at least one year at the time of retirement and remains married throughout the member's retirement. Eligible Spouse also includes Qualified Domestic Partner registered in accordance with applicable Family Law provisions.

Eligible Child: An eligible child is an unmarried child under the age of 18, or under the age of 22 if a full-time student. This includes adopted children. Eligible Child can also include a stepchild living or domiciled with the member at the time of the member's death for purposes of an active member Nonservice-connected or Service-connected death benefit only.

Source: OCERS' Pension Administration System Solution

Schedule of Pension Benefit Recipients by Option Selected

December 31, 2020

Monthly Benefit	UM	OP1	OP2	OP3	OP4	DB	UMC	O2C	O3C	O4C	SCDC	NSCDC	LSRC	AN	Total
$1-500	513	1	26	3	3	80	117	8	8	-	1	9	1	10	780
$501-1,000	931	1	52	1	4	113	245	19	4	2	11	44	16	-	1,443
$1,001-1,500	1,270	1	41	2	1	104	248	9	-	2	2	64	9	-	1,753
$1,501-2,000	1,249	1	40	4	2	81	175	13	3	-	1	50	5	-	1,624
$2,001-2,500	1,308	-	31	2	8	64	137	15	1	1	-	19	4	-	1,590
$2,501-3,000	1,322	-	20	3	5	30	150	10	-	-	2	10	-	-	1,552
$3,001-3,500	1,205	-	26	3	2	40	108	5	1	-	2	4	-	-	1,396
$3,501-4,000	1,008	1	15	2	7	25	75	14	-	1	1	1	2	-	1,152
$4,001-4,500	888	1	14	1	12	12	64	6	-	-	1	1	1	-	1,001
$4,501-5,000	848	-	18	3	3	7	58	3	-	-	1	2	-	-	943
$5,001-5,500	744	-	18	-	9	6	54	7	-	-	1	2	-	-	841
$5,501-6,000	629	-	13	2	3	7	26	6	1	-	-	-	-	-	687
$6,001-6,500	581	1	6	-	5	1	26	2	-	-	1	-	-	-	623
$6,501-7,000	495	-	10	-	8	1	16	4	-	-	-	-	-	-	534
Over $7,000	3,359	2	36	2	29	2	57	11	-	-	-	1	1	-	3,500
Total	16,350	9	366	28	101	573	1,556	132	18	6	24	207	39	10	19,419

Definition of Options:

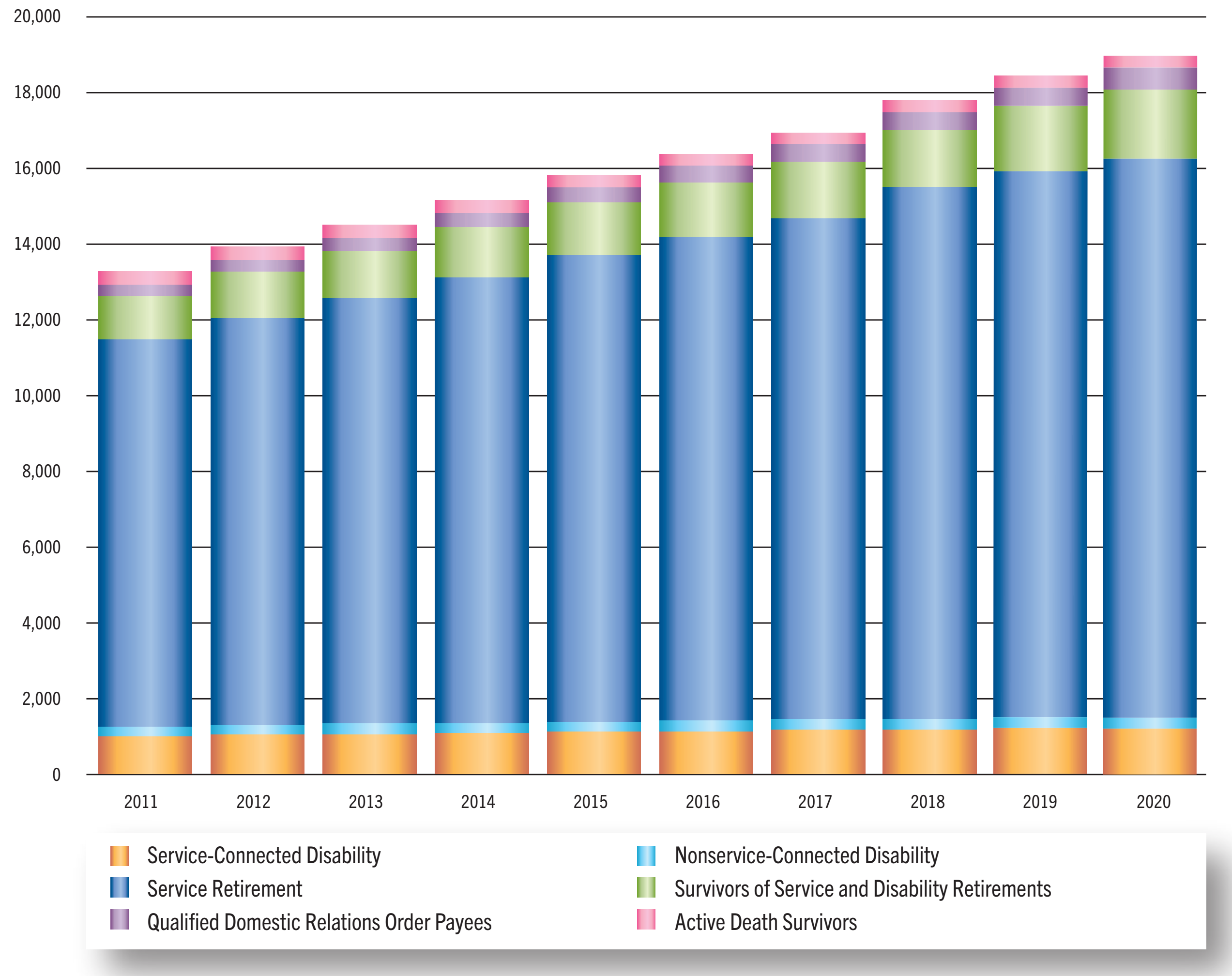
UM: Unmodified -- Maximum retirement allowance
OP1: Option 1 -- Reduced retirement allowance, at death of retiree beneficiary receives remaining balance on account
OP2: Option 2 -- Reduced retirement allowance
OP3: Option 3 -- Reduced retirement allowance
OP4: Option 4 -- Reduced retirement allowance
DB: DRO benefit -- Benefit as provided in Domestic Relations Order
UMC: Unmodified continuance -- Beneficiary receives 60% of maximum retirement allowance
O2C: Option 2 continuance -- Beneficiary receives same monthly allowance
O3C: Option 3 continuance -- Beneficiary receives 50% of monthly allowance
O4C: Option 4 continuance -- Multiple beneficiaries receive allowance as previously approved
SCDC: SCD continuance -- Service Connected Disability
NSCDC: NSCD continuance -- Non Service Connected Disability
LSRC: Lump sum and reduced continuance
AN: Annuity

Source: OCERS' Pension Administration System Solution

Schedule and Graph of Pension Benefit Recipients

2011 – 2020

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Service-Connected Disability	1,032	1,059	1,072	1,098	1,131	1,161	1,185	1,232	1,261	1,289
Nonservice-Connected Disability	259	260	263	265	271	257	261	250	244	236
Service Retirement	10,189	10,739	11,226	11,760	12,278	12,768	13,240	13,827	14,448	15,339
Survivors of Service and Disability Retirements	1,160	1,221	1,261	1,336	1,423	1,448	1,496	1,559	1,631	1,678
Qualified Domestic Relations Order Payees	289	314	340	366	399	426	455	495	530	573
Active Death Survivors	360	354	343	344	308	309	310	311	306	304
Total	13,289	13,947	14,505	15,169	15,810	16,369	16,947	17,674	18,420	19,419



Source: OCERS' Pension Administration System Solution

Schedule of Average Retirement Age

2011 – 2020

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General	60.65	60.42	61.32	60.79	59.37	59.44	60.79	61.30	61.14	61.02
Safety	54.56	54.33	54.80	54.06	53.51	53.58	55.09	55.15	54.53	54.15

Schedule of Average Years of Service at Retirement

2011 – 2020

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General	20.82	20.88	20.00	21.13	18.22	19.56	21.41	22.08	21.95	23.18
Safety	25.27	24.41	24.25	24.47	24.18	22.81	23.92	24.60	24.36	23.87

Schedule of Beneficiaries Receiving a Pension

2011 – 2020

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General	1,352	1,398	1,503	1,457	1,498	1,514	1,540	1,593	1,652	1,685
Safety	168	177	187	223	233	243	266	277	285	297
Total	1,520	1,575	1,690	1,680	1,731	1,757	1,806	1,870	1,937	1,982

Schedule of Active and Deferred Members

2011 – 2020

Years Ended December 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General										
Active	17,717	17,559	17,637	17,873	17,838	18,072	17,941	18,150	18,356	17,733
Deferred	3,998	3,980	4,205	4,380	4,668	4,940	5,341	5,547	6,004	6,280
Safety										
Active	3,704	3,730	3,731	3,587	3,687	3,674	3,780	3,779	3,901	3,826
Deferred	408	402	408	409	424	430	462	479	516	538
Total	25,827	25,671	25,981	26,249	26,617	27,116	27,524	27,955	28,777	28,377

Source: OCERS' Pension Administration System Solution

Schedule of Participating Employers - Pension Plan

2011 – 2020

Years Ended December 31		Total	Orange County	OCTA	OC Superior Court	OC Fire Authority	OC Sanitation District	City of San Juan Capistrano	Trans-portation Corridor Agencies	All Other Employers
2011	Number of Covered Employees	21,421	16,084	1,549	1,638	1,244	596	80	80	150
	Percentage to Total System	100.%	75.09%	7.23%	7.65%	5.81%	2.78%	0.37%	0.37%	0.70%
2012	Number of Covered Employees	21,289	16,118	1,509	1,569	1,195	596	80	74	148
	Percentage to Total System	100.%	75.70%	7.09%	7.37%	5.61%	2.80%	0.38%	0.35%	0.70%
2013	Number of Covered Employees	21,368	16,281	1,519	1,492	1,185	587	81	77	146
	Percentage to Total System	100%	76.19%	7.11%	6.98%	5.55%	2.75%	0.38%	0.36%	0.68%
2014	Number of Covered Employees	21,460	16,453	1,454	1,460	1,213	594	80	65	141
	Percentage to Total System	100%	76.67%	6.78%	6.80%	5.65%	2.77%	0.37%	0.30%	0.66%
2015	Number of Covered Employees	21,525	16,574	1,409	1,462	1,224	572	75	63	146
	Percentage to Total System	100%	77.00%	6.55%	6.79%	5.69%	2.66%	0.35%	0.29%	0.68%
2016	Number of Covered Employees	21,746	16,756	1,372	1,486	1,263	578	80	68	143
	Percentage to Total System	100%	77.05%	6.31%	6.83%	5.81%	2.66%	0.37%	0.31%	0.66%
2017	Number of Covered Employees	21,721	16,778	1,313	1,455	1,288	592	81	64	150
	Percentage to Total System	100%	77.24%	6.04%	6.70%	5.93%	2.73%	0.37%	0.29%	0.69%
2018	Number of Covered Employees	21,929	17,048	1,279	1,419	1,262	616	78	62	165
	Percentage to Total System	100%	77.75%	5.83%	6.47%	5.75%	2.81%	0.36%	0.28%	0.75%
2019	Number of Covered Employees	22,257	17,160	1,350	1,419	1,416	608	76	61	167
	Percentage to Total System	100%	77.10%	6.07%	6.38%	6.36%	2.73%	0.34%	0.27%	0.75%
2020	Number of Covered Employees	21,559	16,474	1,322	1,399	1,457	618	67	54	168
	Percentage to Total System	100%	76.42%	6.13%	6.48%	6.76%	2.87%	0.31%	0.25%	0.78%

Source: OCERS' Pension Administration System Solution

History of Actuarial Assumption Rates

For the Period January 1945 - December 2020

The table shown below is a comprehensive history of the change in interest rate assumption and the salary assumption rates corresponding to the Orange County Employees Retirement System since the inception of the System. These rates are adopted by the Retirement Board and used by the consulting actuary in the creation of the actuarial valuation of the System.

Specifically, the interest rate assumption estimates the rate at which the funds of the System's investment portfolio will realize earnings over many years into the future. The salary assumption rate estimates the relative increases in the salary of a member from the date of the valuation to the estimated date of separation of the member from active service.

Effective Date	Interest Rate	Salary Assumption Rate
1/1/45	2.50%	0.00%
7/1/62	3.50%	0.00%
12/31/65	4.00%	0.00%
7/1/69	4.50%	0.00%
6/30/70	5.00%	0.00%
8/31/73	5.75%	0.00%
7/1/75	6.00%	0.00%
7/1/81	7.25%	5.00%
7/1/89	7.50%	5.50%
7/1/91	8.00%	6.00%
7/1/96	8.00%	3.50%
7/1/00	8.00%	5.50%
7/1/03	7.50%	4.50%
12/31/04	7.75%	3.50%[1]
12/31/07	7.75%	3.50%[2]
12/31/11	7.75%	3.50%[3]
12/31/12	7.25%	3.25%[4]
12/31/14	7.25%	3.25%[4]
12/31/17	7.00%	3.25%[4]
12/31/20	7.00%	3.00%[4]

[1] Inflation per year plus merit and promotion increases ranging from 0.6% to 0.7%
[2] Inflation per year plus merit and promotion increases ranging from 1% to 10%
[3] Inflation per year plus 0.25% across-the-board real salary increases plus merit and promotion increases ranging from 1% to 14%
[4] Inflation per year plus 0.50% across-the-board real salary increase

Source: The Segal Company

Section

GLOSSARY

Recognition and Honor

With a global pandemic, the loss of lives will not be forgotten. By the end of 2020, the number of deaths in the County of Orange was nearing 2,000, with the first death recorded in March. The hardest hit population was the elderly. Severe outbreaks occurred in skilled nursing, assisted living and other care facilities. Family members were unable to be with their loved ones during this time, making the loss so much harder.

Grandparents were not the only ones lost to this virus. Doctors, nurses, and other front line workers who tried to save patients succumbed to the virus, as well as parents, brothers, sisters, wives, husbands, and children. The effects of this virus affected everyone, and will be remembered for many years.

Many tributes were planned throughout Orange County to honor California's first responders on the front line of the pandemic, as well as essential workers including a flyover conducted by the U.S. Air Force Thunderbirds on May 15, 2020.

As all begin to move forward, new knowledge has been learned and better habits developed in hopes to prevent another global pandemic.

We honor and remember those on the front lines of the COVID-19 pandemic in addition to those who have passed away from COVID-19 since the pandemic began.

It has been a year like no other.

Glossary of Terms

Accrual Basis
The recording of the financial effects on a government of transactions and other events and circumstances that have financial consequences for the government in the periods in which those transactions, events and circumstances occur, rather than only in the periods in which cash is received or paid by the government.

Accumulated Plan Benefits
Benefits attributable under the provisions of a pension plan to employees for services rendered to the benefit information date.

Actuarial Accrued Liability
The actuarial accrued liability, as determined by a particular cost method, equals the total present value of benefits that is attributable to past service credit.

Actuarial Assumptions
Assumptions used in the actuarial valuation process as to the occurrence of future events affecting pension costs, such as mortality, withdrawal, disablement and retirement; changes in compensation and national pension benefits; rates of investments earnings and asset appreciation or depreciation: procedures used to determine the actuarial value of assets; characteristics of future entrants for open group actuarial cost methods and other relevant items.

Actuarial Determined Contribution
A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

Actuarial Gain (Loss)
A measure of the difference between actuarial and expected experience based upon a set of actuarial assumptions. Examples include higher than expected salaries increases (loss) and a higher return on fund assets than anticipated (gain).

Actuarial Present Value
The discounted value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of actuarial assumptions.

Amortization
1. The portion of the cost of a limited-life or intangible asset charged as an expense during a particular period.

2. The reduction of debt by regular payments of principal and interest sufficient to retire the debt by maturity.

Comprehensive Annual Financial Report (Annual Report)
The Annual Report is the official annual report of a governmental entity. It includes the basic financial statements and their related notes prepared in conformity with GAAP. It also includes supporting schedules necessary to demonstrate compliance with finance-related legal and contractual provisions, required supplementary information, extensive introductory material and a detailed statistical section.

Cost-sharing Multiple-employer Defined Benefit Pension Plan (cost-sharing pension plan)
A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Glossary of Terms

(Continued)

Discount Rate

The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's fiduciary net position is projected (under the requirements of GASB Statement No. 67) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.

2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

Entry Age Actuarial Cost Method

A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on the level basis over the earnings or services of the individual between entry age and assumed exit age(s).

Independent Auditor's Report

In the context of a financial audit, a statement by the auditor describing the scope of the audit and the auditing standards applied in the examination, and setting forth the auditor's opinion on the fairness of presentation of the basic financial statements in conformity with generally accepted accounting principles (GAAP).

Money-weighted Rate of Return

A method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Net Pension Liability

The liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.

Normal Cost

The ongoing annual cost allocated to the system by a particular actuarial cost method for providing benefits (future cost). Normal cost payments are made during the working lifetime of the member.

Pension Contribution

The amount paid into a pension plan by an employer (and/or employee), pursuant to the terms of the plan, state law, actuarial calculations or some other basis for determinations.

Pension Trust Fund

A fund used to account for public employee retirement benefits. Pension trust funds use the accrual basis of accounting and have a capital maintenance focus.

Total Pension Liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service in conformity with the requirements of GASB Statement No. 67.

Unfunded Actuarial Accrued Liability (UAAL)

The excess of the actuarial accrued liability over the actuarial value of assets represents the unfunded actuarial accrued liability.

UAAL Amortization Payment

The UAAL amortization payment is the portion of pension contributions, which is designed to pay off (amortize) the UAAL in a systematic fashion. Equivalently, it is a series of periodic payments required to pay off a debt.

ORANGE COUNTY

OCERS

EMPLOYEES RETIREMENT SYSTEM

75TH

ANNIVERSARY 1945-2020

2020

An Anniversary Like No Other

2020

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