

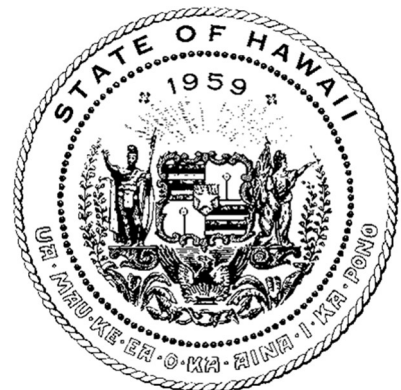
**EMPLOYEES'
RETIREMENT SYSTEM
OF THE
STATE OF HAWAII**

**COMPREHENSIVE
ANNUAL
FINANCIAL REPORT**

FOR THE FISCAL YEAR ENDED JUNE 30, 2019

Prepared by the Staff of the:
Employees' Retirement System of the State of Hawaii
201 Merchant Street, Suite 1400
Honolulu, Hawaii 96813
(808) 586-1735 • (808) 586-1650
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THOMAS WILLIAMS, Executive Director
KANOE MARGOL, Deputy Executive Director
ELIZABETH BURTON, Chief Investment Officer



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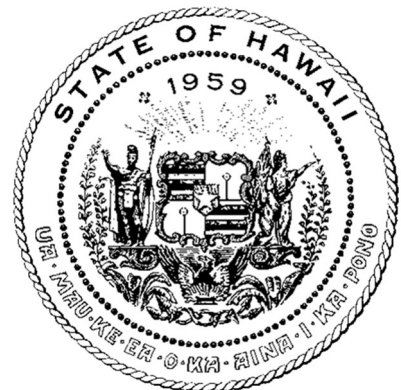


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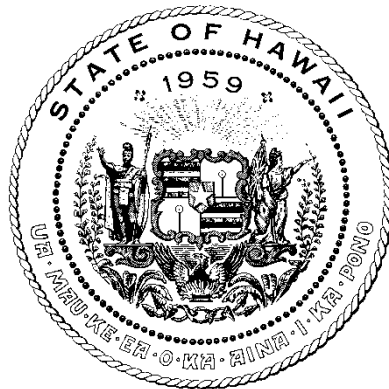
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Employees' Retirement System

of the State of Hawaii



**INTRODUCTORY
SECTION**

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*Letter of Transmittal*DAVID Y. IGE
GOVERNORTHOMAS WILLIAMS
EXECUTIVE DIRECTORKANOE MARGOL
DEPUTY EXECUTIVE DIRECTOR**STATE OF HAWAII**
EMPLOYEES' RETIREMENT SYSTEM

October 23, 2020

Board of Trustees
Employees' Retirement System of the State of Hawaii

Dear Board Members:

We present the Comprehensive Annual Financial Report (CAFR) of the Employees' Retirement System for the fiscal year ended June 30, 2019. Responsibility for both the accuracy of the data, as well as the completeness and fairness of the presentation, rests with the management of the ERS. We trust that you and the members of the ERS will find this report useful in understanding your retirement system.

BACKGROUND

The ERS was established by the Legislature in 1925 to administer a retirement, disability, and survivor benefits program for State and county employees including teachers, professors, police officers, firefighters, judiciary employees, judges, and elected officials. The ERS is a qualified defined benefit public pension plan covered under Section 401(a) of the Internal Revenue Code. Hawaii Revised Statutes Chapter 88 and Hawaii Administrative Rules Title 6, Chapters 20 – 29 contain the language governing the pension trust. The ERS covers all eligible full-time and part-time State and county employees in the State of Hawaii. The ERS uses the entry age normal funding method to determine its current and future costs and appropriateness of its funding requirements. Funding for benefit payments comes from employer and member contributions, and investments.

Members of the Pension Trust belong to either the Contributory, Hybrid (a contributory class), or Noncontributory Class. Contributory and Hybrid Members make employee contributions to the Pension Trust and employers make contributions for employees of all three classes. Since 2006 most new employees of participating employers in the Pension Trust are required to join the Hybrid Class, except for certain employee groups that are required to be members of the Contributory Class. New benefit structures were established in 2011 for new members hired after June 30, 2012.

On March 31, 2019 the ERS' total membership of 145,122 was comprised of 66,383 active members, 49,885 retirees and beneficiaries 9,321 inactive vested members and 18,612 inactive non-vested members. This compares to 125,589 under historical methodology used in the actuarial valuation that excludes inactive non-vested members. Participating employers include the State of Hawaii, City and County of Honolulu, and the counties of Hawaii, Maui, and Kauai.

Employees' Retirement System
of the State of Hawaii

City Financial Tower • 201 Merchant Street, Suite 1400 • Honolulu, Hawaii 96813-2980
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Letter of Transmittal (continued)

The ERS is also responsible for the custody of the Social Security Contribution Fund for the State of Hawaii. The Social Security contributions withheld from employees are remitted directly to the Internal Revenue Service by the State. As an agency type fund that is custodial in nature, the ERS has limited discretion in the management of this fund.

MAJOR ACCOMPLISHMENTS AND INITIATIVES IN FY 2019

As an intergenerational organization, the ERS seeks constant improvement in our goals and operations month to month or year to year. In ERS's on-going endeavor for more transparency, accountability and security, ERS continued the internal audit of ERS to identify areas in which ERS policies, procedures or controls are deficient, weak, or non-existent and to identify the potential impacts of such findings and make recommendations to address the deficiencies. Technically, we are upgrading our administrative system and migrating our data and digital infrastructure to the cloud. This represents a complex multi-year process that will further strengthen service delivery and information security.

Unlike the last few fiscal years, FY 2019 was less about transitioning the portfolio to the risk-based categorization adopted by the Board in October 2014 and more about refining the portfolio to meet the allocation through fiscal year 2020. The deliberate portfolio construction diversified the portfolio away from the public equity markets; our principal protection and real return portfolios were positive on both a calendar and fiscal year basis. Our crisis risk offset portfolio (which is designed for protection during an extreme negative equity shock, not sporadic negative volatility) was a performance detractor on balance but contributed positive to performance in the fourth quarter, offsetting some of the equity exposure. This helps provide ERS the ability to react to world events that affect the investment portfolio over the long-term to weather any potential economic downturns, achieve higher returns, pay lower fees, and overall help improve the pension plan's sustainability. The ERS ended the fiscal year with net assets at \$17.2 billion based on ERS' investment portfolio returns (combination of gross and net of fees, time weighted rate of return) 6.0% for the fiscal year. Although the ERS did not meet its long-term 7% target rate of return in FY 2019, it exceeded ERS's Policy Benchmark of 4.7% in the fiscal year and has earned 7.8% on an inception to date basis. This is discussed in more detail later in the *Investment Section*.

On September 14, 2018, the Employees' Retirement System of the State of Hawaii formally became a signatory to the United Nations-supported Principles for Responsible Investment (PRI), the leading international network of institutional investors committed to incorporating environmental, social and governance (ESG) factors in their investment decision-making.

On November 1, 2018, the Employees' Retirement System received a Public Pension Standards Award in recognition of meeting professional standards for plan funding and administration. The Public Pension Coordinating Council is a coalition of three associations: the National Association of State Retirement Administrators, the National Council on Teacher Retirement and the National Conference on Public Employee Retirement Systems representing a majority of public pension funds in the United States. The standards set by this council are intended to reflect minimum expectations for public retirement system management and administration, as well as serve as a benchmark by which all defined benefit public plans should be measured. To receive the Recognition, the retirement system must certify that it meets the requirements in five areas; Benefit Program; Actuarial Review; Audit Standards; Investment Standards and Communications.

Letter of Transmittal (continued)

We are thankful for the support on the following of the Governor, Legislature and department for bills that help improve ERS's ability to recover overpayment of benefits in the limited occurrence for the 2019 legislation session that included the following law that affect the ERS.

- Act 19 (HB2336): Relating to Employer Contributions to the Employees' Retirement System allows the State and Counties to pay employer contributions to the ERS in advance of the fiscal year in which the contributions are required and receive credit against future required payments. Future generations of taxpayers will benefit as the Plan increases its sustainability. Effective: July 1, 2018.

ACCOUNTING SYSTEM AND REPORTS

The accrual basis of accounting is used to record financial transactions. Expenses are recorded when the liability is incurred, and revenues are recorded in the accounting period in which they are earned and become measurable. Interest earned is accrued on a monthly basis. Accounts receivable at year end, in addition to accrued interest receivable, reflect accrued employer charges and investment proceeds due on sales that have not yet settled. Investments are recorded at fair value. Fixed assets are recorded at cost less accumulated depreciation.

The *Notes to the Financial Statements (Notes)* contain additional detailed information on the statutory provisions under which the ERS operates. In addition, the Notes include a summary of significant accounting policies, and provide explanatory information to help readers better understand the data contained in the financial statements.

The management of the ERS is responsible for and has implemented systems of internal accounting controls designed to provide reasonable assurances for the safeguarding of assets and the reliability of financial records. We believe that the internal accounting controls currently in place are adequate to meet the purpose for which they were intended. To the best of our knowledge and belief, the enclosed data, including the financial statements, supporting schedules and statistical tables is accurate in all material respects and is reported in a manner that fairly presents the financial position and results of the ERS' operations.

INVESTMENTS

The primary goal of the ERS investment strategy is the preservation of capital. The Board of Trustees seeks preservation of capital with a consistent, positive return for the investment portfolio. As discussed above, the ERS adopted a risk-based, functional framework for allocating capital within the investment portfolio. This framework makes use of strategic/functional classes that in-turn utilize underlying asset classes and strategies will be implemented in several phases through June 30, 2020. A summary of the ERS' long-term asset allocation strategy for the fiscal year may be found in the Investment Section of this report. The full Investment Policies, Guidelines, and Procedures Manual is available on the ERS website at <http://ers.ehawaii.gov>.

Professional investment managers have been retained to execute the Board's investment strategies and have full discretion within statutory provisions, Board policies and their respective guidelines. The investment managers retained by the Board as of June 30, 2019 are listed in the Investment Section

Net investment income, including dividends, interest, other investment earnings, and gains/losses on the sale of investments resulted in a gain of \$932.7 million in FY2019. This translates to an investment return of approximately 6.0% for the year, using rate of return methodologies that are generally accepted by the Global Investment Performance Standards (GIPS).

FUNDING AND ACTUARIAL OVERVIEW

In the June 30, 2019 report of the Fund's valuation our actuaries, Gabriel Roeder Smith & Company noted that that our unfunded actuarial accrued liability (UAAL) for funding purposes increased to \$14.0 billion from \$13.4 billion on June 30, 2018 based on the previous GASB reporting standards. Under the current market-based GASB standards effective in FY 2015, the Net Pension Liability increased to \$14.2 billion on June 30, 2019 from \$13.3 billion on June 30, 2018. On the market basis, this represents a decrease in funded position to 54.9% on for FY 2019 from 55.5% for FY 2018. The ERS full funding period increased to 26 years at June 30, 2019 from 25 years at June 30, 2018, primarily from the FY 2019 investment returns being below the 7% benchmark, liability loss due to higher than expected salary increases, and to a lesser extent, change in actuarial assumptions resulting from the 2018 Experience Study and the phase-in approach to increase future employer contribution rates.

PROFESSIONAL SERVICES

Professional consultants are appointed by the Board of Trustees to perform professional services that are essential to the effective and efficient operation of the ERS. Opinions from KPMG LLP, the auditors for the ERS, and the actuary, Gabriel, Roeder, Smith & Company, are included in this report. Meketa Group is the ERS' investment consultant, and their report on the ERS' investment program and performance results is also included in this report.

ACKNOWLEDGEMENTS

This report is from the collaborative efforts of the ERS staff and consultants to provide extensive and reliable information as a basis for making management decisions, determining compliance with legal provisions, and for determining responsible stewardship of the assets contributed by the ERS' members and their employers. This report will be provided to the Governor, legislators, State and county departments and other interested parties.

Aloha,

Thomas Williams

Thomas Williams
Executive Director

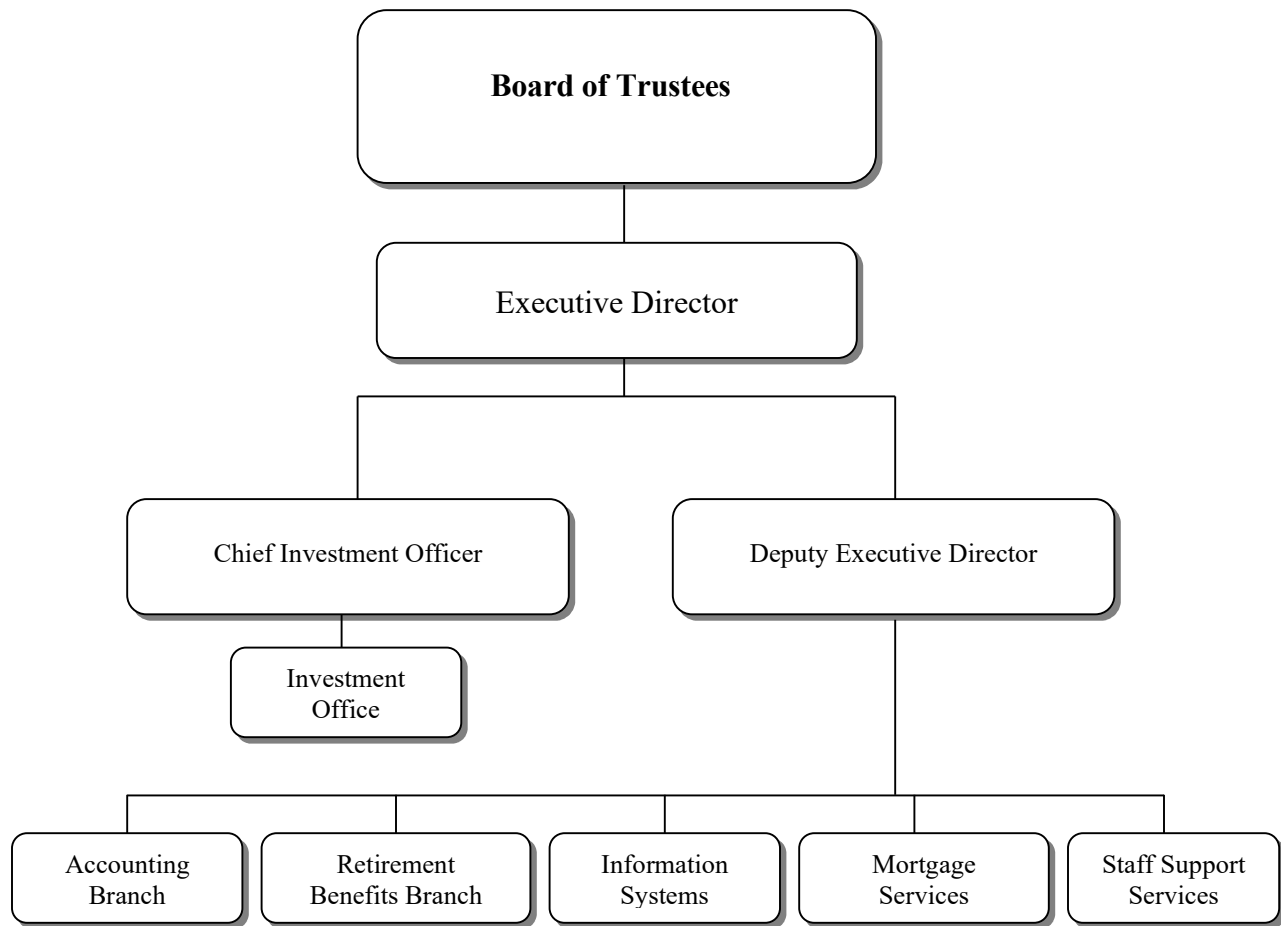
Board of Trustees

The Board of Trustees is the governing body of the Employees' Retirement System of the State of Hawaii, with certain areas of administrative control vested in the State Department of Budget and Finance.

Four of the eight members on the Board are elected by the membership: two general employees, a teacher and a retiree. Three members are citizens of the State, one of whom is an officer of a bank authorized to do business in the State or a person of similar experience, who are not employees and are appointed by the Governor. The State Director of Finance is an ex-officio member by statute.

	Date Current Term Began	Date Term Ends
Elected:		
Ms. Jackie Ferguson-Miyamoto	January 2, 2014	January 1, 2020
Mr. Emmitt A. Kane, Board Chair	January 2, 2014	January 1, 2020
Dr. Catherine Chan	January 2, 2016	January 1, 2022
Ms Genevieve Ley	January 2, 2018	January 1, 2024
Appointed:		
Mr. Wesley K. Machida.....	January 2, 2019	January 1, 2025
Mr. Jerry E. Rauckhorst.....	January 2, 2014	January 1, 2020
Mr. Vincent Barfield.....	January 2, 2017	January 1, 2023
Ex-Officio:		
Ms. Craig K. Hirai	December 16, 2019	January 1, 2023

Organizational Structure



Executive Director
Deputy Executive Director
Chief Investment Officer

Thomas Williams
 Kanoe Margol
 Elizabeth Burton

Actuary
 Gabriel, Roeder, Smith and Company

Auditors
 State of Hawaii, Office of the Auditor
 KPMG LLP

Legal Advisor
 Attorney General of the State of Hawaii

Medical Board
 Dr. Patricia L. Chinn, Chair
 Dr. Howman Lam, Member
 Dr. Gerald J. McKenna, Member

** A list of investment professionals is located in the *Investment Section* of this CAFR.

Plan Summary

The Employees' Retirement System (ERS) of the State of Hawaii was established by the Legislature in 1925 to provide retirement, disability and survivor benefits for State employees, teachers, professors, county employees, police officers, firefighters, judges and elected officials.

The ERS is a qualified defined benefit pension plan under Section 401(a) of the Internal Revenue Code. As such, the ERS is exempt from federal income taxation on its investment earnings. Since January 1, 1988, member contributions have been tax deferred under Section 414(h) of the Internal Revenue Code.

Members are covered by the provisions of the Contributory, Hybrid or Noncontributory retirement class. Except for employees in certain positions who are required to be Contributory members, most new employees from July 1, 2006 are enrolled as Hybrid Members.

Those in the Contributory Class are required to make contributions to the ERS and may also be covered by Social Security. Employees in the following occupational groups are required to be members of the Contributory Class: police officers, firefighters, judges, elected officials, legislative officers, attorney general investigators, narcotics enforcement investigators, and public safety investigations staff investigators. As of March 31, 2019, 5,538 active employees were enrolled in the Contributory Class, or about 8.3% of our active members.

On July 1, 2006, the Hybrid Class became effective pursuant to Act 179/2004. Members in the Hybrid Class (a contributory benefit structure) must also contribute to the ERS and are generally covered by Social Security. The Hybrid Class covers most employees hired from July 1, 2006, as well as certain employees hired before July 1, 2006 who elected to change to Hybrid Membership. The Hybrid membership will continue to increase going forward as most new employees hired from July 1, 2006 will be required to become a Hybrid member. As of March 31, 2019, the Hybrid Class had 48,878 members or about 73.6% of the ERS' active membership.

Noncontributory Members do not make contributions to the ERS and are covered by Social Security. The Noncontributory Class covers employees hired from July 1, 1984 to June 30, 2006, as well as employees hired before July 1, 1984 who elected to join the Noncontributory Class. As of March 31, 2018, there were 11,967 active employees in the Noncontributory Class, which represents over 18.0% of all active members on this date.

Most employees hired after June 30, 2012 fall under the new tier of benefits, contributions and vesting requirements as a result of legislation passed in 2011.

A summary of the general retirement benefits, including retirement options, for Contributory, Hybrid and Noncontributory members are on the following pages. For more detailed and current information on the contributions, benefits, eligibility and other plan details please visit the ERS website at <http://ers.ehawaii.gov/>.

Summary of Retirement Benefit Plan Provisions

Membership for employees hired prior to July 1, 2012 ^(a)			
	Noncontributory	Contributory	Hybrid
Employee Contributions	No employee contributions	7.8% of salary	6.0% of salary
Normal Retirement			
Eligibility	Age 62 and 10 years credited service; <i>or</i> Age 55 and 30 years credited service	Age 55 and 5 years credited service	Age 62 and 5 years credited service; <i>or</i> Age 55 and 30 years credited service
Benefit	1-1/4% of average final compensation* times years of credited service	2% of average final compensation* times years of credited service	2% of average final compensation* times years of credited service, with a split formula for Noncontributory service at 1-1/4%
<p>* Average final compensation (AFC) is an average of the highest salaries during any three years of credited service, excluding any salary paid in lieu of vacation or if ERS membership occurred prior to 1/1/71, AFC may be an average of the highest salaries during any five years of credited service including any salary paid in lieu of vacation.</p>			
Early Retirement			
Eligibility	Age 55 and 20 years credited service	Any age and 25 years credited service	Age 55 with 20 years credited service
Benefit	Maximum allowance reduced 6% per year under age 62	Maximum allowance reduced 5% per year under age 55 plus 4% per year under age 50	Maximum allowance reduced 5% per year under age 62
Deferred Vesting			
Eligibility	10 years credited service	5 years credited service and contributions left in the ERS	5 years credited service and contributions left in the ERS
Benefit	Accrued maximum allowance payable as early as age 55 or at age 65 with 10 but less than 20 years of credited service	Accrued maximum allowance payable at age 55	Accrued maximum allowance payable as early as age 55 or at age 62 with 5 but less than 20 years of credited service

^(a) Per Act 163/2012, SLH, the major changes to membership requirements, contribution amounts, and benefits structures for employees hired after June 30, 2012 are discussed on pages 17-21.

Summary of Retirement Benefit Plan Provisions (continued)
Membership for employees hired prior to July 1, 2012 (continued) ^(a)

	Noncontributory	Contributory	Hybrid
Annuity Savings Account			
Interest	Not applicable	4.5% per annum on employee contributions and accrued interest, <i>or</i> If hired after June 30, 2011, 2.0% per annum on employee contributions and accrued interest	4.5% per annum on employee contributions and accrued interest, <i>or</i> If hired after June 30, 2011, 2.0% per annum on employee contributions and accrued interest
Refund Eligibility	Not applicable	Contributions may be withdrawn upon retirement or termination of employment; upon refund, all service and any future retirement benefit will be forfeited	Contributions may be withdrawn upon retirement or termination of employment; upon refund, all service and any future retirement benefit will be forfeited
Refund Benefit			
- Terminates with less than 5 years credited service	Not applicable	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest
- Terminates with 5 or more years of credited service	Not applicable	Return of member's contributions and accrued interest	Return of member's Hybrid contributions and accrued interest, times 150%; plus any non-Hybrid contributions and accrued interest
Ordinary Disability			
Eligibility	10 years credited service	10 years credited service	10 years credited service
Benefit	1-1/4% of AFC times years of credited service, unreduced for age (Minimum is 12.5% of AFC)	1-3/4% of AFC times years of credited service, unreduced for age (Minimum is 30% of AFC)	2% of AFC times years of credited service, unreduced for age; split formula for Noncontributory service at 1-1/4% (Minimum is 25% of AFC)

^(a) Per Act 163/2012, SLH, the major changes to membership requirements, contribution amounts, and benefits structures for employees hired after June 30, 2012 are discussed on pages 17-21.

*Summary of Retirement Benefit Plan Provisions (continued)***Membership for employees hired prior to July 1, 2012 (continued) ^(a)**

	Noncontributory	Contributory	Hybrid
Service-Connected Disability			
Eligibility	Any age or credited service	Any age or credited service	Any age or credited service
Benefit	Lifetime pension of 35% of AFC ** For accidents occurring before July 1, 2004, accrued maximum allowance, but not less than 15% of AFC	Lifetime pension of 50% of AFC plus refund of member's contributions and accrued interest ** For accidents occurring before July 7, 1998, a different benefit is used	Lifetime pension of 35% of AFC plus refund of member's contributions and accrued interest
Ordinary Death			
Eligibility	Active employee at time of death with at least 10 years of credited service	Active employee at time of death with at least 1 year of service	Active employee at time of death with at least 5 years of service
Benefit	Surviving spouse/reciprocal beneficiary (until remarriage or reentry into a new reciprocal beneficiary relationship) and dependent children (up to age 18) receive a benefit equal to a percentage of member's accrued maximum allowance unreduced for age; <i>or</i> Option B (100% Joint and Survivor) lifetime pension for surviving spouse/reciprocal beneficiary if member was eligible for retirement at time of death.	Lump sum payment of member's contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; <i>or</i> Option 3 (50% Joint and Survivor) lifetime pension if member was not eligible for retirement at the time of death, credited with at least 10 years of service, and one beneficiary designated; <i>or</i> Option 2 (100% Joint and Survivor) lifetime pension if member was eligible for retirement at the time of death and one beneficiary designated; <i>or</i> If less than 1 year of service, return of member's contributions and accrued interest.	Lump sum payment of member's Hybrid contributions and accrued interest (times 150%) plus return of non-Hybrid contributions and accrued interest; <i>or</i> Option 3 (50% Joint Survivor) lifetime pension if member was not eligible for retirement at the time of death, credited with at least 10 years of service and one beneficiary designated; <i>or</i> Option 2 (100% Joint Survivor) lifetime pension if member was eligible for retirement at the time of death, and one beneficiary designated; <i>or</i> If less than 5 years of service, return of member's contributions and accrued interest.

^(a) Per Act 163/2012, SLH, the major changes to membership requirements, contribution amounts, and benefits structures for employees hired after June 30, 2012 are discussed on pages 17-21.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired prior to July 1, 2012 (continued) ^(a)

	<u>Noncontributory</u>	<u>Contributory</u>	<u>Hybrid</u>
Service-Connected Death			
Eligibility	Any age or service	Any age or service	Any age or service
Benefit	Surviving spouse/reciprocal beneficiary receives monthly benefit equal to 30% of AFC (until remarriage or re-entry into a new reciprocal beneficiary relationship); additional benefits payable to surviving dependent children (up to age 18). If there is no spouse/reciprocal beneficiary or dependent children, no benefit is payable.	Lump sum payment of member's contributions and accrued interest to designated beneficiary, plus monthly benefit of 50% of AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship). If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit. If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.	Lump sum payment of member's contributions and accrued interest to designated beneficiary, plus monthly benefit of 50% of AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship). If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit. If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.
Post Retirement Benefit - For all types of retirements (service, disability or death)	Each retiree's original retirement allowance is increased by 2.5% on each July 1 beginning the calendar year after retirement. This cumulative benefit is not compounded and increases each year by another 2.5% of the original retirement allowance without a ceiling (i.e., 2.5% of the original retirement allowance the first year, 5% the second year, 7.5% the third year, etc.).		

^(a) Per Act 163/2012, SLH, the major changes to membership requirements, contribution amounts, and benefits structures for employees hired after June 30, 2012 are discussed on pages 17-21.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired prior to July 1, 2012 (continued) ^(a)

The plan provisions summarized in the preceding pages apply to teachers and most State and County employees, hired before July 1, 2012. Special provisions applicable to other groups of employees, hired by July 1, 2012, are summarized in Item A to D below:

- A) Police officers, firefighters, investigators of the Department of the Attorney General, narcotic enforcement investigators, and public safety investigations staff investigators contribute 12.2% of their monthly salary to the ERS instead of 7.8%. These members may retire at age 55 with 5 years of credited service or at any age with 25 years of credited service and receive a retirement benefit of 2-1/2% of average final compensation (AFC) for each year of such service up to a maximum of 80% AFC, provided the last 5 years is credited service in any of these occupations.
- B) Judges, elected officials, and legislative officers may retire at age 55 with at least 5 years of credited service, or at any age with at least 10 years of credited service and receive a pension of 3-1/2% of AFC for each year of such service plus an annuity from their contributions allocable to the period of such service. This benefit cannot exceed 75% of the AFC. Judges hired after June 30, 1999 need 25 years of credited service in order to retire before age 55.
- C) Sewer workers in specified classifications and water safety officers may retire at any age if they are credited with 25 years of such service with the last 5 or more years in these occupations. Hybrid members in this job category are required to contribute 9.75% of their salary to the ERS.
- D) Emergency medical technicians (EMT) may retire at any age if they are credited with 30 years of such service with the last 5 or more years in these occupations effective June 30, 2003. The years of service to qualify for early retirement is gradually being reduced through June 30, 2008 when 25 years of EMT service will qualify these members for early retirement. Hybrid members in this job category are required to contribute 9.75% of their salary to the ERS.

^(a) Per Act 163/2012, SLH, the major changes to membership requirements, contribution amounts, and benefits structures for employees hired after June 30, 2012 are discussed on pages 17-21.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired after June 30, 2012 ^(b)

	Noncontributory	Contributory	Hybrid
Employee Contributions	No employee contributions	9.8% of salary	8.0% of salary
Normal Retirement			
Eligibility	Age 62 and 10 years credited service; <i>or</i> Age 55 and 30 years credited service	Age 60 and 10 years credited service	Age 65 and 10 years credited service; <i>or</i> Age 60 and 30 years credited service
Benefit	1-1/4% of average final compensation* times years of credited service	1.75% of average final compensation* times years of credited service	1.75% of average final compensation* times years of credited service, with a split formula for Noncontributory service at 1-1/4%
* Average final compensation (AFC) is an average of the highest salaries (limited to base pay and shortage differentials) during any five years of credited service, excluding any salary paid in lieu of vacation.			
Early Retirement			
Eligibility	Age 55 and 20 years credited service	Age 55 with 25 years credited service	Age 55 with 20 years credited service
Benefit	Maximum allowance reduced 6% per year under age 62	Maximum allowance reduced 5% per year under age 60 plus 4% per year under age 55	Maximum allowance reduced 5% per year under age 65
Deferred Vesting			
Eligibility	10 years credited service	10 years credited service and contributions left in the ERS	10 years credited service and contributions left in the ERS
Benefit	Accrued maximum allowance payable as early as age 55 or at age 65 with 10 but less than 20 years of credited service	Accrued maximum allowance payable at age 60, or at age 55 with 25 years of service with age reduction	Accrued maximum allowance payable as early at age 65 or at age 60 with 30 years of service, or at age 55 with 20-29 years of credited service with age reduction

^(b) Membership requirements, contribution amounts, and benefits structures for employees hired before July 1, 2012 are discussed on pages 12-16.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired after June 30, 2012 (continued)^(b)

	Noncontributory	Contributory	Hybrid
Annuity Savings Account			
Interest	Not applicable	2.0% per annum on employee contributions and accrued interest	2.0% per annum on employee contributions and accrued interest
Refund Eligibility	Not applicable	Contributions may be withdrawn upon retirement or termination of employment; upon refund, all service and any future retirement benefit will be forfeited	Contributions may be withdrawn upon retirement or termination of employment; upon refund, all service and any future retirement benefit will be forfeited
Refund Benefit			
- Terminates with less than 10 years credited service	Not applicable	Return of member's contributions and accrued interest	Return of member's contributions and accrued interest
- Terminates with 10 or more years of credited service	Not applicable	Return of member's contributions and accrued interest	Return of member's Hybrid contributions and accrued interest, times 120%; plus any non-Hybrid contributions and accrued interest
Ordinary Disability			
Eligibility	10 years credited service	10 years credited service	10 years credited service
Benefit	1-1/4% of AFC times years of credited service, unreduced for age (Minimum is 12.5% of AFC)	1-3/4% of AFC times years of credited service, unreduced for age (Minimum is 30% of AFC)	1-3/4% of AFC times years of credited service, unreduced for age (Minimum is 25% of AFC)

^(b) Membership requirements, contribution amounts, and benefits structures for employees hired before July 1, 2012 are discussed on pages 12-16.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired after June 30, 2012 (continued)^(b)

	<u>Noncontributory</u>	<u>Contributory</u>	<u>Hybrid</u>
Service-Connected Disability			
Eligibility	Any age or credited service	Any age or credited service	Any age or credited service
Benefit	Lifetime pension of 35% of AFC	Lifetime pension of 50% of AFC plus refund of member's contributions and accrued interest	Lifetime pension of 35% of AFC plus refund of member's contributions and accrued interest
Ordinary Death			
Eligibility	Active employee at time of death with at least 10 years of credited service	Active employee at time of death with at least 1 year of service	Active employee at time of death with at least 10 years of service
Benefit	<p>Surviving spouse/reciprocal beneficiary (until remarriage or reentry into a new reciprocal beneficiary relationship) and dependent children (up to age 18) receive a benefit equal to a percentage of member's accrued maximum allowance unreduced for age; or</p> <p>Option B (100% Joint and Survivor) lifetime pension for surviving spouse/reciprocal beneficiary if member was eligible for retirement at time of death.</p>	<p>Lump sum payment of member's contributions and accrued interest plus a percentage of the salary earned in the 12 months preceding death; or</p> <p>Option 3 (50% Joint and Survivor) lifetime pension if member was not eligible for retirement at the time of death, credited with at least 10 years of service, and one beneficiary designated; or</p> <p>Option 2 (100% Joint and Survivor) lifetime pension if member was eligible for retirement at the time of death and one beneficiary designated; or</p> <p>If less than 1 year of service, return of member's contributions and accrued interest.</p>	<p>Lump sum payment of member's Hybrid contributions and accrued interest (times 120%) plus return of non-Hybrid contributions and accrued interest; or</p> <p>Option 3 (50% Joint Survivor) lifetime pension if member was not eligible for retirement at the time of death, credited with at least 10 years of service and one beneficiary designated; or</p> <p>Option 2 (100% Joint Survivor) lifetime pension if member was eligible for retirement at the time of death, and one beneficiary designated; or</p> <p>If less than 10 years of service, return of member's contributions and accrued interest.</p>

^(b) Membership requirements, contribution amounts, and benefits structures for employees hired before July 1, 2012 are discussed on pages 12-16.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired after June 30, 2012 (continued)^(b)

	Noncontributory	Contributory	Hybrid
Service-Connected Death			
Eligibility	Any age or service	Any age or service	Any age or service
Benefit	Surviving spouse/reciprocal beneficiary receives monthly benefit equal to 30% of AFC (until remarriage or re-entry into a new reciprocal beneficiary relationship); additional benefits payable to surviving dependent children (up to age 18). If there is no spouse/reciprocal beneficiary or dependent children, no benefit is payable.	Lump sum payment of member's contributions and accrued interest to designated beneficiary, plus monthly benefit of 50% of AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship). If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit. If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.	Lump sum payment of member's contributions and accrued interest to designated beneficiary, plus monthly benefit of 50% of AFC to surviving spouse/reciprocal beneficiary (until remarriage or re-entry into a new reciprocal beneficiary relationship). If there is no surviving spouse or reciprocal beneficiary, surviving dependent children (up to age 18) or dependent parents shall be eligible for a monthly benefit. If there is no spouse/reciprocal beneficiary or dependent children/parents, the ordinary death benefit shall be payable to the designated beneficiary.
Post Retirement Benefit - For all types of retirements (service, disability or death)	Each retiree's original retirement allowance is increased by 1.5% on each July 1 beginning the calendar year after retirement. This cumulative benefit is not compounded and increases each year by another 1.5% of the original retirement allowance without a ceiling (i.e., 1.5% of the original retirement allowance the first year, 3% the second year, 4.5% the third year, etc.).		

^(b) Membership requirements, contribution amounts, and benefits structures for employees hired before July 1, 2012 are discussed on pages 12-16.

Summary of Retirement Benefit Plan Provisions (continued)

Membership for employees hired after June 30, 2012 (continued)^(b)

The plan provisions summarized in the preceding pages apply to teachers and most State and County employees, hired after June 30, 2012. Special provisions applicable to other groups of employees, hired after June 30, 2012, are summarized in Item A to D below:

- A) Police officers, firefighters, investigators of the Department of the Attorney General, narcotic enforcement investigators, and public safety investigations staff investigators contribute 14.2 % of their monthly salary to the ERS instead of 9.8%. These members may retire at age 60 with 10 years of credited service or at age 55 with 25 years of credited service and receive a retirement benefit of 2-1/4% of average final compensation (AFC) for each year of such service up to a maximum of 80% AFC, provided the last 5 years is credited service in any of these occupations.
- B) Judges may retire at age 60 with at least 10 years of credited service, or at age 55 with at least 25 years of credited service and receive a pension of 3% of AFC for each year of such service plus an annuity from their contributions allocable to the period of such service. Similarly, elected officials and legislative officers may retire at any age with 10 years of elected, legislative or mixed service and receive a pension of 3% of AFC for each year of service plus an annuity from their contributions allocable to the period of such service. These benefits cannot exceed 75% of the AFC.
- C) Contributory Class sewer workers in specified classifications, water safety officers and emergency medical technicians may retire at age 60 with 10 years of credited service or at age 55 with 25 years of such service with the last 5 or more years in these occupations.
- D) Hybrid Class sewer workers in specified classifications, water safety officers and emergency medical technicians may retire at age 65 with 10 years of credited service or at age 55 with 25 years of such service with the last 5 or more years in these occupations. They are required to contribute 11.75% instead of 8% of their salary to the ERS.

^(b) **M**embership requirements, contribution amounts, and benefits structures for employees hired before July 1, 2012 are discussed on pages 12-16.

Summary of Retirement Benefit Plan Provisions (continued)

Taxation of Benefits

All retirement benefits are subject to Federal income tax but are exempt from Hawaii State income tax. Certain occupational (work related) disability benefits are exempt from Federal income tax. Arrangements to initiate voluntary withholding of Federal income tax can be made at any time. The ERS provides retirees with a 1099-R tax form on or before January 31 of each year.

Additional Benefits

Retirees, their spouses and dependent children under age 19 are eligible to receive life insurance, medical, dental, vision, and prescription drug coverage from the Employer-Union Health Benefits Trust Fund (EUTF) if they were hired before July 1, 1996, and retire with at least 10 years of continuous credited service. If they were first hired after June 30, 1996, health benefits are available on a cost-sharing basis as long as the member retires with at least 10 years of continuous service. A dependent of a retiree who is a full-time student at an accredited college, university or technical school and who is 19 through 26 years old is also eligible for coverage. A retiree with a hire date after July 1, 2001 will only receive coverage for him or herself on a cost sharing basis.

Unused sick leave is excluded from credited service in determining health benefit coverage.

Retirees are responsible for premiums in excess of the amount of employer contributions. Retirees and their spouses are eligible to receive a reimbursement of the Medicare Part B medical insurance premium. More information is available on the EUTF's website at www.eutf.hawaii.gov.

Applying for Retirement

A service retirement application can be filed with the ERS 150 days but no less than 30 days prior to the effective date of retirement. Once the application has been filed, cancellation prior to the effective date of retirement is permitted; however, the law requires mandatory retirement upon the third application. Members may obtain retirement information and application forms at the following locations:

Oahu Office
City Financial Tower
201 Merchant Street, Suite 1400
Honolulu, HI 96813
Phone: (808) 586-1735
Fax: (808) 587-5766

Kauai Office
3060 Eiwa Street, Room 302
Lihue, Hawaii 96766
Phone: (808) 274-3010
Fax: (808) 241-3193

Hawaii Office
101 Aupuni Street, Suite 208
Hilo, Hawaii 96720
Phone: (808) 974-4076
Fax: (808) 974-4078

Maui Office
54 S. High Street, Room 218
Wailuku, Hawaii 96793
Phone: (808) 984-8181
Fax: (808) 984-8183

Molokai and Lanai
Toll-free to Oahu:
1-800-468-4644, ext 61735

Continental U.S. only
Toll free to Oahu
1-888-659-0708

*Summary of Retirement Benefit Plan Provisions (continued)***Counseling Service**

It is the policy of the ERS to render every possible service to its members; however, as thousands of inquiries are received and answered annually, in addition to the actual processing of claims and benefits, present staff and appropriations restrict this service to those members whose immediate welfare is dependent upon the prompt settlement of benefits. Members who are definite about retirement should contact the ERS to request formal retirement estimates. For members who are not planning immediate retirement and interested in their benefit status a retirement benefit calculator and other retirement information are available on the ERS' website at <http://ers.ehawaii.gov/>.

*Retirement Options***CONTRIBUTORY AND HYBRID MEMBERS**

Maximum Allowance: The member receives a lifetime maximum allowance; at death, the difference between the value of the member's contributions at the time of retirement and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.

Option One: The member receives a reduced lifetime allowance based on age; at death, the difference between the initial insurance reserve and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate. In lieu of the lump-sum balance, the beneficiary may elect to receive an allowance for life based on the value of the balance; provided that the allowance is not less than \$100 per month.

Option Two (100% Joint and Survivor): The member receives a reduced lifetime allowance based on ages of both the member and the sole beneficiary and at death; the same allowance is paid to the designated beneficiary for life. Should the designated beneficiary predecease the retiree, another beneficiary cannot be named and all payments will cease at the retiree's death. For retirements on or after December 1, 2004, should the beneficiary predecease the retiree, the retiree's reduced pension "pops up" or increases to the corresponding Maximum Allowance instead of remaining at the reduced amount.

Option Three (50% Joint and Survivor): This option is similar to Option Two. The member receives a reduced lifetime allowance which is higher than Option Two and is based on ages of both the member and the sole beneficiary; however, at death one-half of the allowance is paid to the designated beneficiary for life. Like Option Two, should the designated beneficiary predecease the retiree, another beneficiary cannot be named and all payments will cease at the retiree's death. For retirements on or after December 1, 2004, should the beneficiary predecease the retiree, the retiree's reduced pension "pops up" or increases to the corresponding Maximum Allowance instead of remaining at the reduced amount.

Option Four: This option allows the member to devise a plan that will provide a benefit according to the member's specifications. It requires certification by the Actuary and approval of the Board of Trustees. The following Option Four plans have been approved:

Combination of Options Five and Maximum Allowance: The member receives a reduced lifetime allowance and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid members are not allowed the 75% option); at death, the difference between the value of the member's contributions at the time of retirement and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.

Combination of Options Five and One: The member receives a reduced lifetime allowance and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid members are not allowed the 75% option); at death, the difference between the initial insurance reserve and the retirement allowance paid prior to death is paid to the designated beneficiary(ies) or estate.

Combination of Options Five and Two: The member receives a reduced lifetime allowance based on ages of both the member and the sole beneficiary, and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid members are not allowed the 75% option); at death, the same allowance is paid to the designated beneficiary for life. As in the case of Option Two, should the designated beneficiary predecease the retiree, another beneficiary cannot be named and all payments will cease at the retiree's death. For retirements on or after December 1, 2004, should the beneficiary predecease the retiree, the retiree's reduced pension "pops up" or increases to the corresponding Maximum Allowance instead of remaining at the reduced amount.

*Retirement Options (continued)***CONTRIBUTORY AND HYBRID MEMBERS (continued)**

Combination of Options Five and Three: The member receives a reduced lifetime allowance based on ages of both the member and the sole beneficiary, and is allowed to withdraw the pre-1987 nontaxable contributions, 50% of accumulated contributions, or 75% of accumulated contributions (Hybrid members are not allowed the 75% option); at death, one-half of the allowance is paid to the designated beneficiary for life. As in the case of Option Three, should the designated beneficiary predecease the retiree, another beneficiary cannot be named and all payments will cease at the retiree's death. For retirements on or after December 1, 2004, should the beneficiary predecease the retiree, the retiree's reduced pension "pops up" or increases to the corresponding Maximum Allowance instead of remaining at the reduced amount.

Option Five: The member receives a reduced lifetime allowance and is allowed to withdraw all accumulated contributions; at death, there is no further benefits payable.

Option Four and Option Five are restricted to those members with at least ten years of credited service excluding unused sick leave credit.

Regardless of the option selected, should death of the Contributory or Hybrid member occur during the first year of retirement, the designated beneficiary may elect to receive benefits as if death had occurred immediately prior to retirement in lieu of the death benefits described above.

NONCONTRIBUTORY MEMBERS

Maximum Allowance: The member receives a lifetime pension and at death, there is no further benefit payable.

Option A (50% Joint and Survivor): The member receives a reduced lifetime pension and at death, one-half of the pension is paid to the sole designated beneficiary for life. Should the designated beneficiary predecease the retiree, another beneficiary cannot be named and all payments will cease upon the retiree's death. For retirements on or after December 1, 2004, should the beneficiary predecease the retiree, the retiree's reduced pension "pops up" or increases to the corresponding Maximum Allowance instead of remaining at the reduced amount.

Option B (100% Joint and Survivor): The member receives a reduced lifetime pension and at death, the same pension is paid to the sole designated beneficiary for life. Like Option A, should the designated beneficiary predecease the retiree, another beneficiary cannot be named and all payments will cease upon the retiree's death. For retirements on or after December 1, 2004, should the beneficiary predecease the retiree, the retiree's reduced pension "pops up" or increases to the corresponding Maximum Allowance instead of remaining at the reduced amount.

Option C (Ten-Year Guarantee): The member receives a reduced lifetime pension. Should death occur within ten years of retirement, the same pension will be paid to the designated beneficiary, or otherwise to the retiree's estate for the balance of the ten-year period. Should the designated beneficiary predecease the retiree, another beneficiary can be named.

Regardless of the option selected, should death occur during the first year of retirement, the designated beneficiary may elect to receive benefits under Option B in lieu of the death benefits described above, provided that if the retiree would not have been permitted by applicable law or the rules of the Board to name the designated beneficiary under Option B, the designated beneficiary may elect to receive the death benefit under Option A.

The following Acts were passed by the 2019 Legislature and approved by the Governor. For more information on these and other legislation, you may visit the website at www.capitol.hawaii.gov.

Act 53 (HB981): Relating to Retirement Benefit Overpayments and Recovery to the Employees' Retirement System

This Act will strengthen the ERS's ability to recover overpayments by declaring overpayments to be debts due and owing to ERS, and clarifying that overpayments are legally collectable. This will facilitate rulemaking for maximum recovery, the filing of legal collection actions and liens against real property of overpaid recipients, and the filing of claims against the estate of a deceased recipient. The authority and enforcement proposed by Act 53 will strengthen ERS's ability to pursue and recover benefits that should be retained and protected for the rightful members and beneficiaries of the System. Effective: June 7, 2019

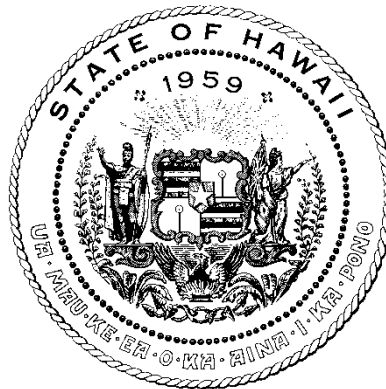


Employees' Retirement System

of the State of Hawaii

Submitted by

**THE AUDITOR
STATE OF HAWAII**



**FINANCIAL
SECTION**

Independent Auditors' Report

KPMG LLP
Suite 2100
1003 Bishop Street
Honolulu, HI 96813-6400

The Auditor
State of Hawaii:

Report on the Financial Statements

We have audited the accompanying financial statements of the Employees' Retirement System of the State of Hawaii (the ERS) as of and for the year ended June 30, 2019 and the related notes to the financial statements, which collectively comprise the ERS' 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 U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal controls 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 an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of 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 principles used and the reasonableness of significant estimates made by management, as well as evaluating the overall presentation of the financial statements.

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

Independent Auditors' Report (continued)

The Auditor
State of Hawaii:

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 Employees' Retirement System of the State of Hawaii as of June 30, 2019, and the changes in fiduciary net position for the year then ended, in conformity with U.S. generally accepted accounting principles.

Other Matters*Required Supplementary Information*

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 31 through 37 and required supplementary information including the schedule of changes in the employers' net pension liability and related ratios, employers' net pension liability, employer contributions and investment returns on pages 75 through 84 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Supplementary Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the ERS' basic financial statements. The supplementary information including the combining schedule of changes in fiduciary net position, social security contribution fund – statement of changes in assets and liabilities, schedules of administrative expenses and investment expenses, and the Introductory,

Independent Auditors' Report (continued)

The Auditor
State of Hawaii

Investment, Actuarial and Statistical sections are presented for purposes of additional analysis and are not a required part of the basic financial statements. The combining schedule of changes in fiduciary net position, social security contribution fund – statement of changes in assets and liabilities, and schedules of administrative expenses and investment expenses are 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 combining schedule of changes in fiduciary net position, social security contribution fund – statement of changes in assets and liabilities, and the schedules of administrative expenses and investment expenses and fairly stated in all material respects in relation to the basic financial statements taken as a whole.

The information contained in the Introductory, Investment, Actuarial, and Statistical sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on them.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated October 23, 2020 on our consideration of the ERS' internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the 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 ERS' internal control over financial reporting and compliance.

KPMG LLP

Honolulu, Hawaii
October 23, 2020

Management's Discussion and Analysis (Unaudited)

This Management's Discussion and Analysis (MD&A) of the Employees' Retirement System of the State of Hawaii (the ERS) provides highlights and comparisons of the financial position and performance of the ERS as of and for the year ended June 30, 2019. The MD&A is presented as a narrative overview and analysis in conjunction with the Letter of Transmittal, which is included in the Introductory Section of the ERS Comprehensive Annual Financial Report (CAFR). For more detailed information pertaining to the ERS' financial activities, the reader should also review the actual financial statements, including the notes and supplementary schedules.

Overview of the Financial Statements

The ERS is responsible for administering a defined-benefit pension plan for state government, local government, and public education employees in the State of Hawaii (the State). The ERS also oversees the short-term investments of the federal Social Security employer contributions for the State in the Social Security Contribution Fund (Contribution Fund).

The ERS' financial statements include fiduciary type funds that are used to account for resources held for the benefit of parties outside of the ERS. The primary fund is defined as a Pension Trust Fund as these assets are held for the benefit of its members and their beneficiaries for the payment of pension benefits, while the Contribution Fund is an agency type fund that is custodial in nature. Throughout this discussion and analysis, units of measure (i.e., billions, millions, and thousands) are approximate, being rounded up or down to the nearest tenth of the respective unit value.

This discussion and analysis is intended to serve as an introduction to the ERS' financial reporting, which comprises the following components:

- The two main basic financial statements include the statement of fiduciary net position as of June 30, 2019, and the related statement of changes in fiduciary net position during the fiscal year from July 1, 2018 to June 30, 2019 (FY 2019). These provide a snapshot of the resources available at the end of the fiscal year and a summary of changes in resources available to pay pension benefits to members, retirees, and beneficiaries.
- The related notes to financial statements are an integral part of the basic financial statements and include detailed information that is essential to a full understanding of the data provided in the basic financial statements.
- The Required Supplementary Schedules of Changes in the Employers' Net Pension Liability and Related Ratios, Employers' Net Pension Liability, Employer Contributions and Investment Returns, and the related Notes to Required Supplementary Information, are required to be presented to supplement the basic financial statements for placing the financial statements in an appropriate operational, economic, or historical context.

- The remaining supplementary information are derived from and relate directly to the underlying accounting and other records used to prepare the financial statements, and provides additional detailed information concerning the changes in operating reserves established by legislation, and the operating and investment related expenses of the ERS.

Financial Highlights

- While the fiduciary net position restricted for pension benefits (or net assets) increased during FY 2019 to \$17.2 billion the funded status of ERS decreased to 54.9% as of June 30, 2019. This represents an increase of \$0.6 billion, 3.6%, from the fiduciary net position restricted for pension benefits of \$16.6 billion as of June 30, 2018.
- The ERS investment return (net and gross of fees) was 6.0% for the 2019 fiscal year compared to a 7.9% return during the 2018 fiscal year, using the time-weighted rate of return methodologies that are generally accepted by the Global Investment Performance Standards (GIPS) (that is shown in the *Investment Section* of this CAFR). The investment program underperformed its actuarial and investment goal of 7.0% that was effective June 30, 2019. Under GASB Statement No. 67, Financial Reporting for Pension Plans – an amendment of GASB Statement No. 25, pension reporting standards, the annual money-weighted return on ERS' pension plan investments, net of pension plan investment expense, was 5.7% and 7.8% for FY 2019 and FY 2018, respectively.

Effective October 1, 2014, the Board of Trustees of the System approved the adoption of a change in its asset allocation policy from the asset-class policy to a new risk-based asset allocation framework within the categories of Broad Growth, Principal Protection, Real Estate and Real Return, that is expected to be implemented through 2020. This is the third year that the results of operations for these FY 2019 financial statements are prepared on the risk-based investment strategy since the portfolio was transitioned to the new policy during the 2017 fiscal year. Please refer to Note F1 later in Notes to Financial Statements and the Investment Section of this CAFR for more detailed information on the asset allocation policy.

- During 2019 and 2018, there was no significant legislation passed that significantly affects the operations or provisions of the pension trust. This was the second of four years that will have significant increases in employer contribution rates from 2017 legislation that is discussed below.
- Total pension liability as of June 30, 2019 increased to \$31.4 billion from \$29.9 billion as of June 30, 2018, while the corresponding net pension liability was \$14.2 billion and \$13.3 billion for June 30, 2019 and 2018, respectively. Covered payroll for the ERS increased in FY 2019 to \$4.4 billion from the FY 2018 total of \$4.3 billion, for a 2.3% increase.

Management's Discussion and Analysis (Unaudited continued)

- The fiduciary net position as a percentage of total pension liability was 54.9% and 55.5% as of June 30, 2019 and June 30, 2018, respectively, while the funded ratio on an actuarial basis continued to be 55.2% for the two years. The main difference between the two methods is under GASB Statement No. 67 for financial reporting purposes the fiduciary net position is based only on the market value of assets while under actuarial value for the net assets for funding purposes allows for a four-year market smoothing of assets of net appreciation.
- Contributions from members and employers increased by a total of \$88.9 million during FY 2019, or 8.0%. The increase is due to an increase in the statutory employer contribution rate, member pay increases, more active members being required to contribute, and new employees contributing at higher contribution rates. The historical summary of legislation impacting the ERS actuarial valuations is discussed in more detail in the "Summary of Plan Changes" in the Actuarial Section.
- Total retirement benefit payments increased by \$73.7 million, or 5.3%, to \$1,469.6 million in FY 2019 from \$1,395.9 million in FY 2018. Pension benefits continues to increase due to 2.7% more retirees and beneficiaries (49,885 in 2019 compared to 48,569 in 2018), an increase in the average pension benefit for new retirees, and the annual 2.5% postretirement increase.
- Administrative expenses decreased by \$2.0 million to \$13.8 million in FY 2019 from \$15.8 million in FY 2018. The decrease in administrative expenses is primarily the result of a decrease in one-time computer related charges during FY 2019. These costs were offset by an increase in payroll and fringe benefits, internal audit fees and legal expenses. Administrative expenses for all years were within the ERS' budgeted amounts.

Analysis of Fiduciary Net Position Restricted for Pension Trust

Summary of Fiduciary Net Position
June 30, 2019 and 2018
(Dollars in millions)

	2019	2018	FY 2019 % change
Assets:			
Cash and cash equivalents and short-term investments	\$ 2,319.2	\$ 2,697.2	(14.0) %
Receivables	222.3	214.4	3.7
Investments	15,120.6	13,970.9	8.2
Invested securities lending collateral	1,021.7	1,097.5	(6.9)
Equipment	6.6	5.5	20.0
Total assets	<u>18,690.4</u>	<u>17,985.5</u>	3.9
Liabilities			
Securities lending liability	1,021.7	1,097.5	(6.9)
Investment accounts and other payables	441.7	289.6	52.5
Total liabilities	<u>1,463.4</u>	<u>1,387.1</u>	5.5
Fiduciary net position restricted for pensions	<u>\$ 17,227.0</u>	<u>\$ 16,598.4</u>	3.8

Management's Discussion and Analysis (Unaudited continued)

Summary of Changes in Fiduciary Net Position

June 30, 2018 and 2017

(Dollars in millions)

	2019	2018	FY 2019 % change
Additions:			
Contributions	\$ 1,195.9	\$ 1,107.0	8.0 %
Net investment income	<u>932.7</u>	<u>1,225.6</u>	(23.9)
Total additions	<u>2,128.6</u>	<u>2,332.6</u>	(8.7)
Deductions:			
Retirement benefit payments	1,469.6	1,395.9	5.3
Refund of contributions	16.6	20.8	(20.2)
Administrative expenses	<u>13.8</u>	<u>15.8</u>	(12.7)
Total deductions	<u>1,500.0</u>	<u>1,432.5</u>	4.7
Increase in fiduciary net position	<u>\$ 628.6</u>	<u>\$ 900.1</u>	(30.2)

Investments, Investment Income, and Investment Expense

The ERS is a long-term investor and manages its pension assets with long-term objectives in mind. A primary element of the ERS' investment philosophy is diversification among various asset classes. The ERS makes estimates of long-term market returns and establishes an asset allocation strategy taking into account the risks associated with each asset class.

Investments for the risk-based allocation policy approved in 2015 based on the type of security for financial reporting are listed below. This framework shifts the portfolio asset allocation from a return-based process to a risk-based process that makes use of strategic/functional classes that in-turn utilize underlying asset classes and strategies. Each of these classes is designed to achieve a certain goal (e.g., Real Return class) and/or be exposed to a specific set of macroeconomic risks that are common among the different strategy types and/or assets within the class (e.g., Broad Growth class). As a result of this structure, each strategic class is expected to be exposed to a set of major and minor macroeconomic risks. During the 2018 fiscal year, the ERS completed the remapping of all of the prior asset classes to various risk-based, functional strategic classes and continued transitioning the portfolio during FY 2019. These amounts also include cash requirements used by ERS to fund pension benefits and transition amounts between individual investments.

The asset distribution of the ERS' investment securities for the pension trust, excluding pending trade settlements and securities lending collateral, at June 30, 2019 and 2018 is presented below at fair value. Fluctuations will occur based on the trading activity and timing of the settlements. Investment balances between the asset classes will change over time based on market sectors' performance and our rebalancing efforts to maintain asset allocation targets. Changes will also occur for financial reporting since certain real estate and alternative investments are reported on the consolidated method of accounting using the value of the underlying investments since ERS is the majority owner of the business organization. Please refer to the Investment Section of the CAFR for a discussion on the risk-based methodology, asset allocation plan targets, and investments by investment strategy.

Management's Discussion and Analysis (Unaudited continued)

		Asset Class			
		June 30, 2019 and 2018			
		(Dollars in millions)			
		2019	%	2018	%
Short term investments					
and cash	\$	2,319.2	13.3 %	\$ 2,697.2	16.2 %
Equity securities		7,252.4	41.6	7,300.8	43.8
Fixed income		4,740.4	27.2	4,096.6	24.6
Real estate		1,285.3	7.4	1,060.9	6.4
Alternative investments		1,842.5	10.5	1,512.6	9.0
Total investment assets		<u>17,439.8</u>	<u>100.0</u>	<u>16,668.1</u>	<u>100.0</u>
Less loans on real estate					
and alternative investments		142.8		111.5	
	\$	<u>17,297.0</u>		<u>\$ 16,556.6</u>	

The rate of return (gross of fees time-weighted rate of returns) on the ERS investment portfolio during FY 2019 was 6.0% lead by returns in private equity market and some of fixed income investment assets, while there was underperformance in the traditional growth stock markets and certain fixed income assets, down from 7.9% in FY 2018. Total net investment income was \$932.7 million in FY 2019 versus \$1,225.6 million in FY 2018.

The ERS earned positive returns for each asset class during the year: crisis risk offset (+6.9%), broad growth (+6.1%), real return (+6.3%), and principal protection (5.4%). The crisis risk offset program outperformed its benchmark by 8.6% on the strong performance within the alternative return capture segment (+15.4%). Within the broad growth class, the private growth strategies (up 14.9%) and traditional growth strategies (up 4.8%) sub-components outperformed its benchmark, while the stabilized growth strategies (up 4.5%) underperformed the respective sub-component benchmark. Real return posted a return of 6.3% exceeding its CPI+3% benchmark for the fiscal year by 1.6%. The principal protection portfolio underperformed its benchmark by -0.6%. A summary of investment returns (by sub-component of the risk-based allocation) is included within the *Report on Investment Activity by Investment Consultant* that is located in Investment Section of this CAFR.

The ERS participates in a securities lending program through its global custodian as a way to earn incremental income to enhance the investment portfolio yield.

Investment expenses includes (a) investment management fees paid to external investment advisor firms that oversee the ERS' investment portfolio and (b) operational activities of certain real estate and alternative investments since these assets are reported on the consolidated method of accounting using the activity of the underlying investments since ERS is the majority owner of the business organization.

Total investment management fees earned by external investment advisors decreased approximately 27.8% during FY 2019 compared to FY 2018 due to a performance fee earned in FY 2018 by an Alpha-Equity Manager for significant outperformance of their corresponding index for calendar year 2017. Investment advisor fees may fluctuate each year due to certain equity and real estate investment managers may receive an incentive fee for superior investment returns by the manager above their corresponding benchmark, while maintaining an acceptable level of investment risk. Incentive fees for real estate manager(s) are recognized on the accrual basis of accounting for the increase or decrease of the change in real estate values during the year, and are only paid upon the sale of the asset if the asset has "excess earnings" when the real estate asset is actually sold. The ERS requires external managers to provide the ERS with a "most favored nations" contract clause that guarantees the ERS with the lowest

Management's Discussion and Analysis (Unaudited continued)

management fees the managers offer their clients for investment accounts with similar investment mandates and similar account size.

Contributions

Contributions from employers and employees totaled \$1,195.9 million and \$1,107.0 million in FY 2019 and FY 2018, respectively. During FY 2019, total contributions increased by \$88.9 million, or 8.0%, mainly due to an increase in the statutory employer contribution rate, member pay increases, more active members being required to contribute, and new employees contributing at higher contribution rates. Employer contribution rates will continue to increase over the next two years as a result of 2017 legislation discussed below. Please refer to the Financial Section in the ERS 2019 and 2018 CAFR for more information.

Pension Plan Benefits and Expenses

Pension benefit payments continue to be the primary expense of the ERS with payments increasing to \$1,469.6 million in FY 2019 from \$1,395.9 million in FY 2018. The pension benefits increase is attributed to the continued net increase in the number of retirees being paid, higher pension benefits for recent retirees, and the annual postretirement increase for ERS' retirees.

Refunds to terminating Hybrid and Contributory Class members decreased from \$20.8 million in FY 2018 to \$16.5 million in FY 2019.

Administrative expenses decreased to \$13.8 million in FY 2019 from \$15.8 million in FY 2018 due to a decrease in one-time computer related costs during the year. Payroll related costs increased due to pay raises and an increase in the fringe benefit assessment. The decrease in computer system costs were offset by an increase in use of internal audit and legal services.

Pension Plan Changes

There was no significant legislation passed in 2019 and 2018 that affects pension plan provisions. Pension plan changes, including legislative and Board of Trustees' actions, are summarized in the Introductory Section and Actuarial Section of the CAFR.

Actuarial Valuations and Measurement of Net Pension Liability

The funding status decreased during FY 2019 on the fiduciary net position (market asset basis) 54.9% as June 30, 2019 from 55.5% as of June 30, 2018, as a result of investment returns being lower than benchmark, increase in liabilities faster than expected due to salary increases larger than current expectations, and to a lesser extent changes to the actuarial assumptions and the four-year phase-in of increased employer contribution rates.

While ERS had positive investment returns over the past two fiscal years, with the investment portfolio earning 6.0% in FY 2019 following 7.9% earned during FY 2018 based on the market value of assets, FY 2019 was less than the target rate of 7.0%. This compares to rate of return for the actuarial value was 6.8% in FY 2019, which is different than the market return due to the smoothing methodology used in the determination of the actuarial value of assets. combined with the second year of scheduled contribution rate increases (of a four-year phase in period), have continued to improve the financial outlook for ERS.

Management's Discussion and Analysis (Unaudited continued)

The total pension liability for fiscal year ended June 30, 2019 is based on the actuarial valuation performed as of June 30, 2018 and a measurement date of June 30, 2019.

Per the valuation as of June 30, 2019, the ERS' total pension liability was \$31.4 billion, covered payroll totaled \$4.4 billion, and the ERS' fiduciary net position was \$17.2 billion resulting in a net pension liability of \$14.2 billion. The June 30, 2018 valuation results include the ERS' total pension liability of \$29.9 billion, covered payroll at \$4.3 billion, and the ERS' fiduciary net position of \$16.6 billion resulting in a net pension liability of \$13.3 billion. The ERS' fiduciary net position as a percentage of total pension liability was 54.9% and 55.5% on June 30, 2019 and 2018, resulting in the net pension liability as a percentage of covered payrolls of 323.8% and 312.9%, respectively. The increase in pension liabilities is overall payroll growth and individual salary increases.

Based on the results of the actuarial valuation as of June 30, 2019, including existing statutory employer contribution rates, the ERS actuary determined the funding period for paying off the unfunded actuarial accrued liability (UAAL) of the ERS Pension Trust is 26 years. Because this period is less than the 30 years, the objectives set in Hawaii Revised Statutes (HRS) are currently being realized. (HRS§88-122(e)(1) state that the employer contribution rates are subject to adjustment when the funding period is in excess of 30 years.)

The actuarial assumptions, and changes to the assumptions are discussed later in the *Note G., Pension Liability* to the financial statements and in the Required Supplementary Information – Unaudited section. The Actuarial Section of this CAFR contains for more information on changes to the Actuarial Section.

Increase in Statutory Employer Contribution Rates – Future State and counties employer contributions are expected to increase pursuant to a phased-in contribution rate increase over four years beginning July 1, 2017. Per Act 17 (SLH 2017), the rate for Police and Fire employees increases to 28.00% on July 1, 2017; 31.00% on July 1, 2018; 36.00% on July 1, 2019; and 41.00% on July 1, 2020 and the rate for All Other Employees increases to 18.00% on July 1, 2017; 19.00% on July 1, 2018; 22.00% on July 1, 2019; and 24.00% on July 1, 2020. These employer contribution rates are applied to the total covered payroll in each respective category to determine the required employer contributions.

Requests for Information

This financial report is designed to provide a general overview of the Employees' Retirement System of the State of Hawaii's finances. For questions concerning any information in this report or for additional information, contact the Employees' Retirement System of the State of Hawaii, 201 Merchant Street, Suite 1400, Honolulu, Hawaii 96813.

Financial Statements

Combining Statement of Fiduciary Net Position

June 30, 2019

Assets

Cash and cash equivalents and short-term investments

Cash and cash equivalents	\$ 576,319,242
Short-term investments	1,742,871,248
	<u>2,319,190,490</u>

Receivables

Accounts receivable and others	4,548,592
Investment sales proceeds	115,157,638
Accrued investment income	52,743,120
Employer and member contributions	49,826,612
	<u>222,275,962</u>

Investments, at fair value

Equity securities	7,252,355,802
Fixed income securities	4,740,413,816
Real estate investments	1,285,347,317
Alternative investments	1,842,502,723
	<u>15,120,619,658</u>

Other

Invested securities lending collateral	1,021,730,729
Equipment, at cost, net of depreciation	6,617,009
	<u>1,028,347,738</u>

Total assets

18,690,433,848

Liabilities

Accounts and other payables	105,797,810
Payable for securities purchased	193,066,322
Securities lending collateral	1,021,730,729
Notes payable	142,812,000
	<u>1,463,406,861</u>

Total liabilities

1,463,406,861

Commitments and contingencies

Fiduciary net position restricted for pensions	\$ <u>17,227,026,987</u>
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See accompanying notes to financial statements

Financial Statements (continued)

Statement of Changes in Fiduciary Net Position

Year ended June 30, 2019

Additions		
Contributions		
Employers contributions	\$	922,635,334
Members contributions		<u>273,223,578</u>
Total contributions		1,195,858,912
Investment income		
From investing activities:		
Net appreciation in fair value of investments		498,552,514
Interest on fixed income securities		145,558,878
Dividends on equity securities		140,408,264
Income on real estate investments		63,098,256
Interest on short-term investments		4,440,172
Alternative investment income		148,127,104
Miscellaneous		<u>643,513</u>
		1,000,828,701
Less investment expenses		<u>73,925,220</u>
Net investment income from investing activities		926,903,481
From securities lending activities:		
Securities lending income		30,959,818
Less: securities lending expenses, net		<u>25,166,887</u>
Net investment income from securities lending		5,792,931
Total net investment income		<u>932,696,412</u>
Total additions, net		2,128,555,324
Deductions		
Benefit payments		1,469,634,809
Refunds of member contributions		16,502,635
Administrative expenses		<u>13,798,866</u>
Total deductions		<u>1,499,936,310</u>
Net increase in fiduciary net position		628,619,014
Fiduciary net position restricted for pensions		
Beginning of year		16,598,407,973
End of year	\$	<u><u>17,227,026,987</u></u>

See accompanying notes to financial statements.

June 30, 2019

Note A – Description of the ERS**1. General**

The Employees' Retirement System of the State of Hawaii (the ERS) began operations on January 1, 1926, having been established by the Territorial Legislature in the preceding year. The provisions of the ERS are contained in Chapter 88 of the Hawaii Revised Statutes (HRS) and applicable provisions of the federal Internal Revenue Code. The ERS is a cost-sharing, multiple-employer public employee retirement system established as a defined benefit pension plan to administer a pension benefits program for all State and county employees, including teachers, professors, police officers, firefighters, correction officers, judges, and elected officials.

The ERS is a qualified defined-benefit pension plan under Section 401(a) of the Internal Revenue Code. Since January 1, 1988, member contributions have been tax deferred under Section 414(h)(2) of the Internal Revenue Code, and Chapter 88 mandates that employers pick up the employee contributions. These contributions are classified as member contributions in the financial statements. As a public entity, the ERS is not required to file a federal income tax return with the Internal Revenue Service. As a defined-benefit pension plan, the ERS is required to withhold federal income tax from member and benefit recipient payments in accordance with the Internal Revenue Code.

Notes to Financial Statements (continued)

The ERS Pension Trust is comprised of three pension classes for membership purposes and considered to be a single plan for accounting purposes because all assets of the ERS may legally be used to pay the benefits of any of the ERS members or beneficiaries, as defined by the terms of the ERS. The ERS provides retirement, survivor, and disability benefits for three membership classes known as the contributory, hybrid, and noncontributory members.

Generally, all full-time employees of State and counties of Hawaii are required to be members of the ERS. Some positions of the State and counties of Hawaii are not eligible for ERS membership and may be covered by another separate retirement program. Membership of the plan and the benefits provided are based on the individual's employment group and ERS membership date. A member may belong to only one class based on their latest employment. A member may change classes in certain situations due to a change in their employment date or job classification. If a member earns service in different classes or benefit structures, the member's retirement benefit is bifurcated based on the applicable membership service earned (such as service credits and benefit multiplier percentage of such service).

The two major employment groups applicable to employer and member contribution rates, vesting requirements, and benefit provisions are (a) Police and Firefighters and (b) All Other Employees. There are four major benefit structures for contributory class members based on employment group and membership date while there are two benefit structures for hybrid class members based on their membership date as discussed below. The noncontributory class has one benefit structure.

Notes to Financial Statements (continued)
Note A – Description of the ERS (continued)**1. General (continued)**

Employer, pensioner, and employee membership data as of March 31, 2019 are as follows:

Employers:	
State	1
County	4
Total employers	<u>5</u>
Pensioners and beneficiaries currently receiving benefits:	
Pensioners currently receiving benefits:	
Police and firefighters	3,878
All other employees	41,562
Total pensioners	<u>45,440</u>
Beneficiaries currently receiving benefits:	
Police and firefighters	321
All other employees	4,124
Total beneficiaries	<u>4,445</u>
Total pensioners and beneficiaries	<u>49,885</u>
Terminated vested members entitled to benefits but not yet receiving benefits:	
Police and firefighters	387
All other employees	8,934
Total terminated vested members	<u>9,321</u>
Inactive members	
Police and firefighters	721
All other employees	18,812
Total inactive members	<u>19,533</u>
Total terminated vested and inactive members	<u>28,854</u>
Active members:	
Vested:	
Police and firefighters	4,008
All other employees	43,763
Total vested members	<u>47,771</u>
Nonvested:	
Police and firefighters	849
All other employees	17,763
Total nonvested members	<u>18,612</u>
Total active members	<u>66,383</u>
Total membership	<u>145,122</u>

*Notes to Financial Statements (continued)***Note A – Description of the ERS (continued)****2. The Financial Reporting Entity**

As required by U.S. generally accepted accounting principles, these financial statements present the ERS (the primary government) as a separate reporting entity from the State of Hawaii (the State). The ERS is not part of the State's financial reporting entity because it is a separate legal entity that is fiscally independent of the State. The ERS was established by Chapter 88 of the HRS and is governed by a Board of Trustees (the Board) as discussed below.

The Board administers the ERS on behalf of public employees of both the State and county governments. Except for limited administrative functions, the State does not have the power to supervise or control the Board in the exercise of its functions, duties, and powers. The Board consists of eight members. The State Director of Finance is a statutory member of the Board. Four members of the Board are elected by members and retirants of the ERS and the other three members of the Board are appointed by the Governor. Decisions are made with the concurring vote of five members of the Board. The Board appoints the Executive Director and Chief Investment Officer and engages actuarial and other services required to transact the business of the ERS.

3. Class Descriptions and Funding Policy

Members of the ERS are contributory, hybrid, or noncontributory members. All assets of the ERS (in the Pension Trust) may be used to pay benefits to any member of the ERS. Contribution rates are determined by state law as a percentage-of-payroll.

The statutory employer contribution rate includes the normal cost and accrued liability contribution and is determined separately for two groups of employees: (a) police officers and firefighters and (b) all other employees. Employer contribution rates are subject to adjustment in certain situations based on the plan's funded status or actuarial investigations. The ERS performs an actuarial investigation of the experience at least once every five years, plus an annual actuarial valuation of the assets and liabilities of the funds of the pension trust. The Board of Trustees adopts mortality, service, and other assumptions, factors, and tables as deemed appropriate and necessary, based on the actuarial investigation and actuary recommendation. Generally, actuarial assumptions and methods were adopted by Board of Trustees on August 12, 2019 as recommended by Gabriel, Roeder, Smith and Company (GRS) (from the experience study as of June 30, 2018, with most of the assumptions based on the period from July 1, 2013, through June 30, 2018) while the investment return assumption was adopted beginning with the 2016 valuation. See the Actuarial Section for all actuarial assumptions used.

Note A – Description of the ERS (continued)**3. Class Descriptions and Funding Policy (continued)**

Effective July 1, 2008, the statutory employer contribution rate for employees in the Police and Fire category increased from 15.75% to 19.70%, and the rate for employees in the All Other category increased from 13.75% to 15.00%. Per legislation passed in 2011, the rate for Police and Fire employees increased to 22.00% on July 1, 2012; 23.00% on July 1, 2013; 24.00% on July 1, 2014; and 25.00% on July 1, 2015 and the rate for All Other Employees increased to 15.50% effective July 1, 2012; 16.00% effective July 1 2013; 16.50% effective July 1, 2014; and 17.00% effective July 1, 2015. These employer contribution rates are applied to the total covered payroll in each respective category to determine the required employer contributions. Administration of the Pension Trust is financed through contributions from the employers and employees (if applicable) and investment earnings.

Per Act 17 (SLH 2017), employer contribution rates from State and counties are expected to increase pursuant to a phased-in contribution rate increase over four years beginning July 1, 2017. The rate for Police and Fire employees increased to 28.00% on July 1, 2017; and 31.00% on July 1, 2018; and increases to 36.00% on July 1, 2019; and 41.00% on July 1, 2020 and the rate for All Other Employees increased to 18.00% on July 1, 2017; and 19.00% on July 1, 2018; and increases to 22.00% on July 1, 2019; and 24.00% on July 1, 2020.

*Notes to Financial Statements (continued)***Note A – Description of the ERS (continued)****3. Class Descriptions and Funding Policy (continued)**

Effective July 1, 2012, employers may be required to make additional employer contributions to the ERS in certain situations. This legislation requires employers to pay additional contributions if a retiring employee, who was first employed prior to July 1, 2012 and who was last employed by the employer, has significant non-base pay increases included in their average final compensation. The additional contribution is equal to the actuarial present value of the additional benefits earned due to the “excessive” non-base pay increases.

Until June 30, 1984, all employees were required to be contributory members. Employees covered by Social Security on June 30, 1984 were given the option of changing to a noncontributory member or remain a contributory member. All new employees hired after June 30, 1984 and before July 1, 2006, who are covered by Social Security, were generally required to be noncontributory members. Qualified employees that were contributory or noncontributory members were given the option to change to Hybrid Class benefits structure effective July 1, 2006, or remain in their existing class. Starting July 1, 2006, all new employees covered by Social Security are required to be Hybrid Members, unless they are required to be Contributory members. Most employees not covered by Social Security (primarily Police and Fire employees) are required to be Contributory members.

The three membership classes provide a monthly retirement allowance (maximum allowance) equal to the benefit multiplier % (generally 1.25% or 2%), multiplied by the average final compensation (AFC), multiplied by years of credited service. The benefit multiplier decreased by 0.25% for new hybrid and contributory members hired after June 30, 2012. If a member earns service in a different benefit structure, the member’s retirement benefit is bifurcated based on the applicable membership service earned (such as service credits and benefit multiplier percentage of such service). In lieu of the maximum allowance, the member may elect to receive an actuarially equivalent alternate retirement option with a reduced lifetime allowance (such as survivor benefit).

The AFC is the average salary earned during the five highest paid years of service, including the payment of salary in lieu of vacation, or three highest paid years of service, excluding the payment of salary in lieu of vacation, if the employee became a member prior to January 1, 1971. The AFC for members hired on or after this date, and before July 1, 2012, is based on the three highest paid years of service excluding the payment of salary in lieu of vacation. For new members hired after June 30, 2012, the AFC is based on the five highest paid years of service excluding the payment of salary in lieu of vacation.

For postretirement increases, every retiree’s original retirement allowance is increased by 2.5% on each July 1 following the calendar year of retirement, if the retiree became an ERS member prior to July 1, 2012. This cumulative benefit is not compounded and increases each year by 2.5% of the original retirement allowance without a ceiling (2.5% of the original retirement allowance the first year, 5.0% the second year, 7.5% the third year, etc.). For new members hired after June 30, 2012, the postretirement annuity increase was decreased to 1.5% per year of the original retirement allowance without a ceiling (1.5% of the original retirement allowance the first year, 3.0% the second year, 4.5% the third year, etc.).

*Notes to Financial Statements (continued)***Note A – Description of the ERS (continued)****3. Class Descriptions and Funding Policy (continued)**

The following summarizes the provisions relevant to the largest employee groups of the respective membership class. Retirement benefits for certain groups, such as sewer workers, judges, and elected officials, vary from general employees.

All contributions, benefits, and eligibility requirements are governed by Chapter 88 of the Hawaii Revised Statutes. For a more detailed summary of benefits for employees and a description of special provisions to groups of employees, refer to the Summary of Retirement Benefit Plan Provisions contained in the *Introductory Section* of this report. All of the statutory member contributions discussed in this section are classified as “member contributions” with the adoption of GASB Statement No. 82, Pension Issues – an amendment of GASB Statements No. 67, No. 68, and No. 73.

Contributory

Police officers, firefighters, and certain other members that are not covered by Social Security first hired prior to July 1, 2012 contribute 12.2% of their salary and receive a retirement benefit using the benefit multiplier of 2.5% for qualified service, up to a maximum of 80% of AFC. These members may retire at age 55 with 5 years of credited service or at any age with 25 years of credited service, provided the last 5 years of credited service is any of the qualified occupations.

Police officers, firefighters and certain other members that are not covered by Social Security first hired after June 30, 2012 contribute 14.2% of their salary and receive a retirement benefit using the benefit multiplier of 2.25% for qualified service, up to a maximum of 80% of AFC. These members may retire at age 60 with 10 years of credited service or at age 55 with 25 years of credited service, provided the last 5 years of credited service is any of the qualified occupations.

All other employees hired prior to July 1, 2012 are required to contribute 7.8% of their salary and are fully vested for benefits upon receiving 5 years of credited service. Contributory members may retire with full benefits at age 55 and 5 years of credited service. They may take early retirement at any age with at least 25 years of credited service and receive benefits reduced 5% per year under age 55 plus 4% per year under age 50. The benefit multiplier is 2% for employees covered by Social Security.

All other employees in the contributory class hired after June 30, 2012 are required to contribute 9.8% of their salary and are fully vested for benefits upon receiving 10 years of credited service. These members may retire with full benefits at age 60 and 10 years of credited service. Members may take early retirement at age 55 with 25 years of credited service and receive benefits reduced by 5% per year under age 60. The benefit multiplier is 1.75% for employees covered by Social Security.

*Notes to Financial Statements (continued)***Note A – Description of the ERS (continued)****3. Class Descriptions and Funding Policy (continued)****Hybrid**

All other employees hired before July 1, 2012 are required to contribute 6% of their salary and are fully vested for benefits upon receiving 5 years of credited service. Employees may retire with full benefits at age 62 and 5 years of credited service or at age 55 and 30 years of credited service. Early retirement benefits are available at age 55 and 20 years of credited service with benefits reduced by 5% per year under age 62. The benefit multiplier used to calculate retirement benefits is 2%. Hybrid members are covered by Social Security.

All other employees hired after June 30, 2012 are required to contribute 8% of their salary and are fully vested for benefits upon receiving 10 years of credited service. Employees may retire with full benefits at age 65 and 10 years of credited service or at age 60 and 30 years of credited service. Early retirement is available at age 55 and 20 years of credited service with benefits reduced 5% per year under age 65. The benefit multiplier used to calculate retirement benefits is 1.75%. Hybrid members are covered by Social Security.

Noncontributory

All other employees are fully vested upon receiving 10 years of credited service. The employer is required to make all contributions for these members. Employees may retire with full benefits at age 62 years and 10 years of credited service or age 55 and 30 years of credited services. Early retirement is available at age 55 years and 20 years of credited service with benefits reduced by 6% per year under age 62. The benefit multiplier used to calculate retirement benefits is 1.25%.

Ordinary disability retirement benefits require a minimum of 10 years of service, whereas service-connected disability resulting from a job-related accident does not have any service requirement. There is no age requirement to qualify for disability benefits.

Ordinary death benefits for contributory and noncontributory members require at least one year and ten years of service, respectively. Ordinary death benefits for hybrid members require five years of service if hired prior to July 1, 2012 or ten years of service if hired after June 30, 2012. There is no service requirement to qualify for service-connected death benefits.

4. The ERS as Employer

As an employer, the ERS participates in its pension benefits program, through the State. The ERS provides benefits for all of its full-time employees as contributory, hybrid, or noncontributory membership. Contributions are calculated as part of the State's total contribution requirements and are reimbursed to the State's General Fund as part of the fringe benefit rate on the ERS' employees' actual salaries.

Note A – Description of the ERS (continued)**5. Other Post Employment Benefits (OPEB)**

In addition to the retirement benefits provided by the ERS Pension Trust, the participating employers, pursuant to HRS Chapter 87A, provide certain healthcare and life insurance benefits for State and county qualified employees and retirees. The Hawaii Employer-Union Health Benefits Trust Fund (EUTF) was established on July 1, 2003 to design, provide, and administer health benefits plans and a group life insurance benefits program for State and county employees and retirees.

Under Section 87A-33 of the HRS, the participating employers pay the EUTF a base monthly contribution for the health benefits plans of certain retired employees, including those who were hired before July 1, 1996 and retired after June 30, 1984, with ten or more years of credited service.

Under Section 87A-34 of the HRS, the participating employers pay the EUTF one-half of the base monthly contribution for the health benefits plans of retired employees who were hired before June 30, 1996, and retired after June 30, 1984, with fewer than ten years of credited service.

Under Sections 87A-35 and 87A-33(a)(6) of the HRS, the participating employers pay the EUTF for the health benefits plans of retired employees who were hired after June 30, 1996 but before July 1, 2001: (a) one-half of the base monthly contribution if the employee retired with between ten and fifteen years of credited service; (b) seventy-five percent of the base monthly contribution if the employee retired with between fifteen and twenty-five years of credited service; and (c) one hundred percent of the base monthly contribution if the employee retired with twenty-five or more years of credited service.

Under HRS § 87 A-36, the participating employers pay the EUTF for the health benefits plans of retired employees who were hired after June 30, 2001: (a) one-half of the base monthly contribution for a self-only plan if the employee retired with between ten and fifteen years of credited service; (b) seventy-five percent of the base monthly contribution for a self-only plan if the employee retired with between fifteen and twenty-five years of credited service; and (c) one hundred percent of the base monthly contribution for a self-only plan if the employee retired with twenty-five or more years of credited service.

Under Section 87A-37 of the HRS, the participating employers pay the EUTF a base monthly contribution (currently \$4.16) for each retired employee enrolled in the EUTF group life insurance plan.

The net assets of the EUTF are not included in the ERS plan net assets. The EUTF issues a financial report that includes financial statements and required supplementary information.

*Notes to Financial Statements (continued)***Note B – Social Security Contribution Fund**

The Social Security Contribution Fund (Contribution Fund) was established under Section 88-224 of the HRS for the following purposes:

1. To receive all federal Social Security employers' contributions from the State and interest and penalties on unpaid amounts;
2. To receive any appropriations to the Contribution Fund;
3. To pay amounts required to be paid to the Internal Revenue Service (IRS); and
4. To invest and collect income on resources held by the Contribution Fund.

All other non-State governmental agencies remit Social Security contributions directly to the IRS. Social Security contributions withheld from employees are remitted directly to the IRS by the employers. The Contribution Fund is considered an agency fund for financial reporting purpose. At June 30, 2019, the ERS held no amounts in the Contribution Fund as all amounts deposited into the Contribution Fund were paid directly to the IRS.

Note C – Summary of Significant Accounting Policies

A summary of the significant accounting policies consistently applied in the preparation of the accompanying financial statements follows:

1. Basis of Accounting

Fiduciary funds are used to account for assets held by the ERS in a trustee capacity or as an agent for individuals, private organizations, other governments, and/or other funds. The fiduciary fund types used by the ERS are a Pension Trust Fund and the Social Security Fund as an agency fund. Each of the fiduciary funds is considered a separate fiscal and accounting entity with a self-balancing set of accounts that comprise its assets, liabilities, equity, revenues and expenditures, or expenses, as appropriate. The accounting and reporting treatment applied to a fund is determined by its measurement focus. The Pension Trust Fund is accounted for on a flow of economic resources measurement focus. As an agency fund, the Contribution Fund is custodial in nature and does not measure results of operations.

The financial statements are prepared in conformity with U.S. generally accepted accounting principles (GAAP) using the accrual basis of accounting. Administrative expenses are financed exclusively with investment income.

Note C – Summary of Accounting Policies (continued)**2. Method Used to Value Cash and Investments**

The ERS' investment policy for cash and investments, including the legal authority, are discussed below in Note F. Notes C and F below include a comprehensive discussion on fair value including the disclosure requirements of fair value required by GASB Statement No. 72.

Cash, investments and notes payable in the Pension Trust are reported at fair value. The definition of fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Unrealized gains and losses are included as investment income in the statement of changes in fiduciary net position. The investments of the Pension Trust Fund and Contribution Fund (the Retirement Funds) are valued on a monthly basis.

3. Revenue Recognition

Interest and dividend income is recognized when earned. Capital gains and losses are recognized on a trade-date basis. Purchases and sales of investments are also recorded on a trade-date basis.

Employers and members contributions are recognized in the period in which the contributions are legally due.

4. Payment of Benefits

Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

5. Securities Lending

The ERS records collateral received under securities lending agreements where the ERS has the ability to spend, pledge, or sell the collateral without borrower default. Liabilities resulting from these transactions are also recorded. Additionally, costs associated with securities transactions, broker commissions paid, and lending agent management fees are reported as investment expenses in the accompanying financial statements. The statement of fiduciary net position does not include detailed holdings of securities lending collateral by investment classification.

*Notes to Financial Statements (continued)***Note C – Summary of Accounting Policies (continued)****6. Interest and Earnings Allocation**

Pursuant to Sections 88-21 and 88-107 of the HRS, the Board shall annually allocate interest and other earnings of the Pension Trust Fund to the funds of the Pension Trust Fund, as follows:

- a. Annuity Savings Reserve – Fixed at 4-1/2% regular interest rate for employees hired before July 1, 2011 and 2% regular interest rate for employees hired after June 30, 2011.
- b. Expense Reserve – To be credited with all money to pay the administrative expenses of the ERS.
- c. Pension Accumulation Reserve – To be credited with any remaining investment earnings.

7. Risk Management

The ERS reports liabilities, as discussed in note H, related to certain types of losses (including torts, theft of, damage to, or destruction of assets, errors or omissions, natural disasters, and injuries to employees) when it is probable that the losses have occurred and the amount of those losses can be reasonably estimated.

8. Use of Estimates

In preparing financial statements in conformity with accounting principles generally accepted in the United States, management is required to make estimates and assumptions that affect certain reported amounts and disclosures. Actual results could differ from those estimates.

Investments in limited partnerships and other alternative investments are illiquid and the underlying assets are generally not publicly traded companies. Because of the inherent uncertainty in valuing privately held securities, the fair value may differ from the values that would have been used had a ready market for such securities existed, and the difference can be material. Accordingly, the realized value received upon the sale of the asset may differ from the recorded fair value.

The total pension liability is based on calculations that incorporate various actuarial and other assumptions, including discount rate, mortality, investment rate of return, inflation and payroll growth. The actuarial assumptions were based on the results of an experience study as of June 30, 2018, with most of the assumptions based on the period from July 1, 2013, through June 30, 2018.

9. Recently Issued Accounting Policies

In January 2017, GASB issued Statement No. 84, Fiduciary Activities. Statement No. 84 establishes criteria for identifying fiduciary activities and guidance on reporting those activities. This Statement provides guidance on four fiduciary funds that should be reported, if applicable: pension (and other employee benefit) trust funds, investment trust funds, private-purpose trust funds, and custodial funds. GASB Statement No. 84 will be effective for periods beginning after December 15, 2018. ERS has not yet determined the impact of this standard on its financial statements and disclosures.

Note D – Description of Reserves

Section 88-109 of the HRS requires the establishment and maintenance of specific reserves within the ERS. The reserves in the Pension Trust Fund and their purposes are described hereunder:

1. Pension Accumulation Reserves

To accumulate contributions made by the State and counties (except member contributions “picked up” as employer contributions under pursuant to IRC Section 414(h)(2)), transfers of retired members’ contributions plus related interest income from the Annuity Savings Reserve and income from investments. All pension benefits, including the pensioners’ bonus, are paid through this reserve.

2. Annuity Savings Reserves

To accumulate members’ contributions (including member contributions “picked up” as employer contributions under pursuant to IRC Section 414(h)(2)) and related interest income. Upon a member’s retirement, the accumulated contributions and related interest income are transferred to the Pension Accumulation Reserve or refunded to the member upon termination.

3. Expense Reserves

To pay all the expenses necessary in connection with the administration and operation of the ERS, the Board estimates the amount of money necessary to be paid into the expense reserve for the ensuing biennium to provide for the expense of operation of the ERS, and pays that amount into the expense account from the investment earnings of the ERS, subject to review by the legislature and approval by the Governor.

Fiduciary net position restricted for pensions as of June 30, 2019 are as follows:

	<u>2019</u>
Pension Accumulation Reserve	\$ 14,237,290,660
Annuity Savings Reserve	2,969,087,157
Expense Reserve	<u>20,649,170</u>
Total fiduciary net position restricted for pensions	<u>\$ 17,227,026,987</u>

*Notes to Financial Statements (continued)***Note E – Contributions**

The ERS' funding policy provides for periodic employer contributions expressed as a percentage of annual covered payrolls. The funding method used to calculate the total employer contribution required is the entry age normal actuarial cost method. Employer contributions are governed by Chapter 88 of the HRS. The actuarially determined contribution rates may differ from the statutory contribution rates.

Employer rates are set by statute based on the recommendation of the ERS actuary resulting from an experience study conducted every five years. Since July 1, 2005, employer contribution rates are a fixed percentage of compensation, including the normal cost plus amounts required to pay for the unfunded actuarial accrued liability. See note A.3 Class Descriptions and Funding Policy for the effective statutory employer contribution rates.

The employer normal cost is the level percentage of payroll contribution required to pay all benefits. Actuarial gains and losses resulting from differences between actual and assumed experience are reflected in the employer unfunded accrued liability.

Effective July 1, 2012, the last employer is required to make "additional contributions" to the ERS for employees that first became ERS members before July 1, 2012 and retire after June 30, 2012, if the member has "excessive" non-base pay during the last 10 years of employment. The additional contributions are based on the increased costs of the actuarial equivalent increase in pension benefits the member will be paid in retirement compared to the pension benefits that would be paid if the member did not have excess non-base pay in their Average Final Compensation amount.

Member contributions rates are statutorily established in accordance with Chapter 88 of the HRS, and are discussed in note A.3, Class Descriptions and Funding Policy above. Since 1989, participating employers "pick up" ERS member contributions made by payroll deduction as "employer contributions" for tax purposes under IRC section 414(h)(2). These contributions are classified as member contributions being paid by the member for ERS purposes.

Notes to Financial Statements (continued)
Note F – Deposit and Investment Disclosures**1. Investment Policy**

Investments are governed pursuant to Sections 88-119 and 88-119.5 of the HRS. The Pension Trust Fund may invest in real estate loans and mortgages; preferred and common stocks; government obligations; corporate obligations; certain other debt obligations (such as obligations secured by collateral of certain other authorized securities listed here, obligations issued or guaranteed by certain development banks, and insurance company obligations); real property; alternative investments; and other securities and futures contracts. Investments in the Securities Lending Collateral Pool and the Contribution Fund are limited to investment grade, short-term marketable securities.

The investment decision is further dictated by internal investment policies and asset allocation established by the Board. As a long-term investor, the ERS has established through its investment policy that preservation of capital is the primary goal of the ERS. Preservation of capital is to be attained with a consistent, positive return for the fund by diversifying the investment portfolio. The ERS recognizes risk associated for individual securities or asset classes may be reduced through diversification. Investments will be prudent and consistent with the best investment practices, in accordance with the Board's asset allocation strategy, assigned investment mandate, and in compliance with Chapter 88, HRS, as amended.

Use of leverage is restricted to certain asset classes in order to enhance yields of approved investments and/or to facilitate diversification of the portfolio. The use of debt must result in positive leverage where cash flow is in excess of debt service. Plan assets are managed on a total return with the long-term objective of achieving and maintaining a fully funded status basis (when combined with receiving the required employer and member contribution requirements) for the benefits provided through the Pension Trust. As part of the investment policy, the Board reviews the asset allocation annually and should perform a formal asset allocation study at least every three years to verify or amend the targets.

The ERS will strategically invest in the following strategic asset classes:

Strategic Allocation (risk-based classes)	Strategic Class Weights	Expected Long-term Geometric Average Return	Expected Long-term Real Return¹	Expected Annual Standard Deviation
Broad Growth	63%	7.65%	5.40%	17.35%
Principal Protection	7%	3.00%	0.75%	4.00%
Real Return	10%	4.55%	2.30%	6.10%
Crisis Risk Offset	20%	5.15%	2.90%	9.45%
Total Portfolio	100%			

¹ Uses an expected inflation of 2.25%

The Broad Growth strategic asset class includes sub-asset classes or components of Active Public Equity, Passive Public Equity, Core Real Estate, Extended Global Credit, Low Volatility Equity, Options-based Equity, Non-Core Real Estate, and Private Equity. The Principal Protection asset class includes the Global Intermediate Fixed Income. The Real Return asset class includes components of Inflation-linked Fixed Income, Infrastructure, and Timber. The Crisis Risk Offset sub-asset classes are Alternative Return Capture Strategies, Trend Following Strategies, and Long Duration Fixed Income. The ERS may also hold Opportunities and Other Investments.

Notes to Financial Statements (continued)
Note F – Deposit and Investment Disclosures (continued)**1. Investment Policy (continued)**

It is expected that the ERS's implementation of the new long-term strategic allocation approved in FY 2016 will be completed by the end of the 2020 fiscal year as follows.

Implementation Plan for Long-term Strategic Policy			
	Beginning 6/30/2019	1/1/2020	Long-Term 7/1/2020
Broad Growth	68%	64%	63%
Principal Protection	8%	7%	7%
Real Return	8%	9%	10%
Crisis Risk Offset	16%	20%	20%
Opportunities	0%	0%	0%
Total Portfolio	100%	100%	100%

Rate of Return

For the year ended June 30, 2019, the annual money-weighted return on pension plan investments, net of pension plan investment expense, was 5.7%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

2. Deposits

Cash includes amounts in demand deposits for operations and invested funds held by ERS investment managers. The deposits are held in several financial institutions, including the custodian bank for processing investment transactions. Per State statute, deposits, held by banks located in the State, in excess of Federal Deposit Insurance Corporation (FDIC) coverage are guaranteed by securities pledged as collateral by the bank with the State Director of Finance. Uninsured and uncollateralized amounts are primarily cash held by the investment custodian for settlement of investment transactions. Deposits are presented in the basic financial statements at cost, which represent market or fair value.

Custodial Credit Risk for Deposits is the risk that in the event of a bank failure, the ERS' deposits may not be returned to them. The ERS has not adopted a formal policy specific to custodial credit risk. The ERS' policy is to deposit cash in excess of operating requirements in income producing investments to maximize investment income.

At June 30, 2019, the carrying amount of deposits totaled approximately \$576,319,242 and the corresponding bank balance was \$582,283,082, all of which was exposed to custodial credit risk

Notes to Financial Statements (continued)
Note F – Deposit and Investment Disclosures (continued)**3. Investments and fair value**

The following table shows the investments of the ERS by investment type as of June 30, 2019.

Investments at fair value

Cash and short-term instruments		
Cash and cash equivalents	\$	576,319,242
Short-term bills and notes		704,085,737
Pooled and others		1,056,233,044
Fixed income securities		
U.S. Treasury bonds and notes		2,931,912,777
U.S. government agencies bonds		14,594,330
U.S. government agency mortgage backed		277,327,627
U.S. government-sponsored agency mortgage backed		10,261,248
Commercial mortgage backed securities		3,850,064
U.S. corporate bonds		552,959,551
Non-U.S. government / agency bonds		689,503,292
Non-U.S. corporate bonds		197,699,357
Pooled and Others		6,427,753
Derivatives		
Forwards - Cash and short-term instruments		(17,429,624)
Forwards - Debt securities		15,636,586
Futures - Debt securities		51,796,637
Options - Cash and short-term instruments		(17,909)
Options - Equities		(37,762,380)
Options - Debt securities		19,335
Swaps - Equity securities		16,529
Swaps - Debt securities		(11,574,741)
Equities		7,290,101,653
Real estate		1,285,347,317
Alternative investments		1,842,502,723
Total investments	\$	<u>17,439,810,148</u>
Short-term instruments for securities lending collateral pool	\$	1,021,730,729

*Notes to Financial Statements (continued)***Note F – Deposit and Investment Disclosures (continued)****3. Investments and fair value (continued)**

Investments are measured at fair value. The ERS categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. Fair value is a market-based measurement of the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. A fair value measurement assumes that a transaction to sell an asset or transfer a liability takes place in either the principal market or most advantageous market (after taking into account transaction costs and transportation costs).

The fair value hierarchy categorizes the inputs to valuation techniques used to measure fair value into three levels. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and give the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements).

- Level 1—Unadjusted quoted prices for identical instruments in active markets.
- Level 2—Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable.
- Level 3—Valuations derived from valuation techniques in which significant inputs are unobservable.

If the fair value of an asset or a liability is measured using inputs from more than one level of the fair value hierarchy, the measurement is considered to be based on the lowest priority level input that is significant to the entire measurement. The categorization of investments within the hierarchy is based upon the pricing transparency of the instrument and should not be perceived as the particular investment's risk.

Fair value hierarchy levels

Equity securities classified in level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities based on published market prices, quotations from national security exchanges, and security pricing services as of each month-end closing of the New York Stock Exchange. Fixed income securities classified as Level 1 include U.S. Treasuries. Fixed income pooled funds classified in Level 1 of the hierarchical framework are mutual funds with instruments which trade on a national exchange and the fund's NAV is the basis for the fund's transactions. Derivative securities classified in Level 1 include certain options and futures are valued using prices quoted in active markets for those securities.

Short-term, fixed income securities, and invested securities lending collateral classified in level 2 have non-proprietary information that was readily available to market participants from multiple independent sources, which are known to be actively involved in the market. Pricing inputs may include market quotations, yields, maturities, call features and ratings. Derivative securities classified in level 2 are securities whose values are derived daily from associated traded securities.

*Notes to Financial Statements (continued)***Note F – Deposit and Investment Disclosures (continued)****3. Investments and fair value (continued)**

Fixed income securities classified in level 3 are mortgaged backed term loans and bonds where input data is sourced from instruments whose values are estimated, out of necessity, using unobservable inputs due to lack of comparable securities in the market place or are valued using discounted cash flows.

Real Estate (direct investment) and Alternative Investments (direct investment) Limited Partnerships and Limited Liability Companies classified as level 3 are considered to be directly held: The ERS has a controlling interest in certain real estate and alternative investment partnerships and limited liability companies. These investment companies provide quarterly valuations based on the most recent capital account balance to ERS management and are audited annually. Individual properties are valued internally by the investment companies at least annually, in accordance with standard industry practice, and are adjusted as frequently as quarterly if material market or operational changes have occurred. Properties are generally valued every one to three years by external third-party appraiser(s). These holdings are valued by the general partners in conjunction with management, investment advisors, and valuation specialists. The valuation techniques vary based on investment type and involve a certain degree of expert judgment. The fair value for these investments could differ significantly if a readily accessible market values for these assets existed. Annual audits of most partnerships and limited liability companies include a review of compliance with the investment company's valuation policies.

Notes payable are shown at estimated fair values. Notes payable, classified as level 3, consists of mortgage notes within the limited liability companies and limited partnerships of real estate (direct investment) that are secured by real estate of the respective company.

Investments measured at the net asset value (NAV)

Short-Term Investment Funds and Pooled Equity (not publicly traded) are reported on their respective net asset value (NAV). Fair value are based on the ERS' pro rata ownership percentage of the fund reported by the fund manager based on the fair value of the underlying assets that is determined by published market prices, or quotations from national security exchanges. Annual audits the pooled funds include a review of compliance with the investment company's valuation policies.

Real estate and alternative investments (pooled or commingled funds) measured at their respective NAV and are generally audited annually. The most significant element of NAV is the fair value of the investment holdings. These holdings are valued by the general partners using valuation assumptions based on both market and property specific inputs, which are not observable and involve a certain degree of expert judgment. The valuation techniques vary based on investment type and involve a certain degree of expert judgment. The fair value for these investments could differ significantly if a readily accessible market values for these assets existed.

Investments measured at NAV are not required to be categorized in the fair value hierarchy levels.

Notes to Financial Statements (continued)

Note F – Deposit and Investment Disclosures (continued)

3. Investments and fair value (continued)

The following table shows the fair value hierarchy by investment type as of June 30, 2019.

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

	<u>Total</u>	Fair Value Measurement Using		
		Active Markets	Significant Other	Significant
		for Identical	Observable Inputs	Unobservable
		Assets	(Level 2)	Inputs
		(Level 1)		(Level 3)
Investments by Fair Value Level 6/30/2019				
<i>Short-term investments</i>				
Short-term bills and notes	\$ 704,085,737	\$ 700,776,332	\$ 3,309,405	\$ -
<i>Equity securities</i>				
Common stocks	5,280,577,476	5,280,576,655	-	821
Preferred shares and other	589,034,476	584,004,035	4,987,601	42,840
Total equity securities	5,869,611,952	5,864,580,690	4,987,601	43,661
<i>Fixed income securities</i>				
U.S. Treasury bonds and notes	2,931,912,777	2,223,024,758	708,888,019	-
U.S. government agencies bonds	14,594,330	-	14,594,330	-
U.S. government agency mortgage backed	277,327,627	-	277,327,627	-
U.S. government-sponsored agency mortgage	10,261,248	-	10,261,248	-
Commercial mortgage backed securities	3,850,064	-	3,850,064	-
U.S. corporate bonds	552,959,551	-	457,648,401	95,311,150
Non-U.S. government / agency bonds	689,503,292	-	689,503,292	-
Non-U.S. corporate bonds	197,699,357	-	179,327,574	18,371,783
Pooled and Others	6,427,753	-	6,399,520	28,233
Total fixed income securities	4,684,535,999	2,223,024,758	2,347,800,075	113,711,166
<i>Real estate (direct investment)</i>	525,342,288	-	-	525,342,288
<i>Alternative investments (direct investment)</i>	184,871,070	-	-	184,871,070
Total assets at fair value level	\$ 11,968,447,046	\$ 8,788,381,780	\$ 2,356,097,081	\$ 823,968,185
<i>Liabilities</i>				
Notes payable (on real estate-direct)	\$ 142,812,000	\$ -	\$ -	\$ 142,812,000
Total investments (excluding derivatives), net of notes payable measured by fair value level	\$ 11,825,635,046	\$ 8,788,381,780	\$ 2,356,097,081	\$ 681,156,185
Investment derivative instruments				
Currency purchases forwards	\$ (17,429,624)	\$ -	\$ (17,429,624)	\$ -
To Be Announced (TBAs) forwards	15,636,586	-	15,636,586	-
Bond futures	52,938,492	52,938,492	-	-
Commodity futures	(6,285,790)	(6,285,790)	-	-
Currency futures	(5,438,943)	(5,438,943)	-	-
Index fixed income futures	1,208,779	1,208,779	-	-
Interest rate futures	9,374,099	9,374,099	-	-
Options	(37,762,380)	(6,258,955)	(31,503,425)	-
Options on currency	(17,909)	-	(17,909)	-
Options on debt securities	19,335	(49,593)	68,928	-
Credit default swaps	311,884	-	311,884	-
Total return swaps	(8,312,546)	-	(8,312,546)	-
Equity variance swaps	16,529	-	16,529	-
Interest rate swaps	(3,574,079)	-	(3,574,079)	-
Total investment derivative instruments	\$ 684,433	\$ 45,488,089	\$ (44,803,656)	\$ -

Notes to Financial Statements (continued)

Note F – Deposits and Investment Disclosures (continued)

3. Investments and fair value (continued)

Investments, Derivative Instruments and Invested Securities Lending Collateral Measured at Fair Value (continued)

		Fair Value Measurement Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	Total			
Invested securities lending collateral				
Short-term instruments				
Certificate of deposits	\$ 10,800,000	\$ -	\$ 10,800,000	\$ -
Repurchase agreements	547,040,146	-	547,040,146	-
Global asset backed notes	32,329,776	-	32,329,776	-
Global corporate notes	431,560,807	-	431,560,807	-
Total invested securities lending collateral	<u>\$ 1,021,730,729</u>	<u>\$ -</u>	<u>\$ 1,021,730,729</u>	<u>\$ -</u>

Investments and Derivative Instruments Measured at Fair Value (continued)

Investments measured at net asset value (NAV)

Short-term investments	\$ 1,056,233,044
Equity securities	1,420,489,701
Real estate	760,005,029
Alternative investments	1,657,631,653
Total investments measured at NAV	<u>4,894,359,427</u>

	June 30, 2019	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period (Days)
Short-term investments (a)	\$ 1,056,233,044	\$ -	Daily	1 day
Equity securities (b)	1,420,489,701	-	Daily	2 days
Real estate (c)	760,005,029	746,246,000	Not eligible	n/a
Alternative investments (d)	1,657,631,653	1,693,885,000	Not eligible	n/a
Total investments measured at NAV	<u>\$ 4,894,359,427</u>	<u>\$ 2,440,131,000</u>		

- (a) Short-term investments primarily consist of three pooled funds to invest excess cash at the ERS' custodian, The Bank of New York Mellon and about 20 other accounts. NAV is based on the ERS' pro rata ownership percentage of the fund reported by the fund manager based on the fair value of the underlying assets that is determined by published market prices, or quotations from national security exchanges.

Notes to Financial Statements (continued)

Note F – Deposits and Investment Disclosures (continued)

3. Investments and fair value (continued)

- (b) Equity securities consist of one fund that invests based on the all country world index. NAV is based on the ERS' pro rata ownership percentage of the fund reported by the fund manager based on the fair value of the underlying assets that is determined by published market prices, or quotations from national security exchanges.
- (c) Real estate consists of 43 limited partnerships or limited liability companies that primarily invest in U.S. real estate. The most significant element of NAV is the fair value of the investment holdings. These holdings are valued by the general partners using valuation assumptions based on both market and property specific inputs, which are not observable and involve a certain degree of expert judgment, and are generally audited annually.
- (d) Alternative investments consist of 206 limited partnerships or limited liability companies that invest in venture capital, growth equity, corporate finance/buyout, special situations, mezzanine debt, distressed debt, or co/direct investments. The most significant element of NAV is the fair value of the investment holdings. These holdings are valued by the general partners using valuation assumptions based on both market and property specific inputs, which are not observable and involve a certain degree of expert judgment, and are generally audited annually.

Reconciliation of Investment Level Disclosure to the Statement of Fiduciary Net Position

	Investments by Fair Value Level	Investments Measured by the NAV	Derivative Investments by Fair Value Level	Invested Securities Lending Collateral by Fair Value Level	Statement of Fiduciary Net Position
Assets					
Short-term investments	\$ 704,085,737	\$ 1,056,233,044	\$ (17,447,533)	\$ -	\$ 1,742,871,248
Equity securities	5,869,611,952	1,420,489,701	(37,745,851)	-	7,252,355,802
Fixed income securities	4,684,535,999	-	55,877,817	-	4,740,413,816
Real estate investments	525,342,288	760,005,029	-	-	1,285,347,317
Alternative investments	184,871,070	1,657,631,653	-	-	1,842,502,723
Invested securities lending collateral	-	-	-	1,021,730,729	1,021,730,729
	<u>\$ 11,968,447,046</u>	<u>\$ 4,894,359,427</u>	<u>\$ 684,433</u>	<u>\$ 1,021,730,729</u>	<u>\$ 17,885,221,635</u>
Liabilities					
Notes payable	\$ 142,812,000	\$ -	\$ -	\$ -	\$ 142,812,000
	<u>\$ 142,812,000</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 142,812,000</u>

Notes to Financial Statements (continued)
Note F – Deposits and Investment Disclosures (continued)**4. Credit Risk**

Credit risk is defined as the risk that an issuer or other counterparty to an investment will not fulfill its obligations. Information regarding ERS' credit risk on derivative investments is discussed below in derivative disclosures note F10 while policies related to credit risk for securities lending program are discussed in note F9 below.

Risk Based Asset Class - The fixed income mandate was transitioned to the new risk-based asset allocation methodology. Authorized security types are the same as the Asset-type based allocation guidelines. Investment managers were assigned to:

- Extended Global Credit component of the Broad Growth risk-based asset class, or
 - Benchmark: 50% BC Global Credit (Hedged) + 33.34% BC Global High Yield (Hedged) + 16.66% S&P LSTA Leveraged Loan
- Principal Protection risk-based asset class.
 - Benchmark: BC U.S. Intermediate Aggregate ex-Credit
- Summary of Concentration Limits for debt securities are:
 - Principal protection managers may invest in specific Issue or Issuer of 5% (without limit in supranationals, U.S. Treasuries, U.S. agencies, CMOs and asset-backed securities with minimum of AAA rating, sovereign debt and equivalently rated agencies of Organisation for Economic Co-operation and Development (OECD) governments). These managers are limited to (i) 10% in emerging markets (local currency and debt); (ii) 10% in private placements; (iii) 10% in preferred stocks and converted common stocks (common stock holdings not to exceed 180 days); (iv) 10% in non-U.S. Agency CMOs; and (v) 10% of Non-U.S. Dollar denominated securities (excludes money market securities and money market futures)
 - Extended Global Credit managers may invest in specific Issue or Issuer of 5% (without limit in supranationals, U.S. Treasuries, U.S. agencies, CMOs and asset-backed securities with minimum of AAA rating, sovereign debt and equivalently rated agencies of Organisation for Economic Co-operation and Development (OECD) governments). They are limited to: (i) 10% in preferred stocks and converted common stocks (common stock holdings not to exceed 180 days); (iii) 75% in non-investment grade / Unrated; (iv) in Non-Benchmark markets up to 40% of non-benchmark non-government supported and up to 40% of non-benchmark government supported. Foreign currency is limited to (i) a 40% net foreign currency exposure (as measured by net amount of currency's outstanding long and short positions versus the U.S. Dollar); and (ii) a 80% gross foreign currency exposure (as measured by absolute value of all country-level currency long and short currency positions versus the U.S. Dollar)

Notes to Financial Statements (continued)

Note F – Deposits and Investment Disclosures (continued)

4. Credit Risk (continued)

A table of the ERS' fixed income securities as of June 30, 2019 is below. Securities below investment grade of Baa and non-rated issues (average rating by S&P, Moody's and/or Fitch) amounted to \$538,198,549 or 11.4% of total fixed income investments. All short-term investments, not held in a pooled investment, are rated A1/P1 or better.

Credit Ratings - Average rating by S&P, Moodys and Fitch as of June 30, 2019

Ratings	US Govt Agency	US Govt sponsored- agency mortgage backed	US corporate bonds	Commercial mortgage backed securities	Non-US corporate bonds	Non US- govt/agencies bonds	Pooled & others	Total
AAA	\$ 6,593,810	\$ 274,220,858	\$ 807,428	\$ -	\$ -	\$ 165,299,924	\$ -	\$ 446,922,020
AA1	8,000,520	-	1,352,420	-	-	1,587,234	-	\$ 10,940,174
AA2	-	-	1,051,791	-	-	121,297,413	-	\$ 122,349,204
AA3	-	-	4,350,475	-	328,038	3,913,202	-	\$ 8,591,715
A1	-	-	5,473,046	-	5,791,293	65,290,302	-	\$ 76,554,641
A2	-	-	21,461,171	411,538	2,777,473	113,587,322	-	\$ 138,237,504
A3	-	-	27,845,012	-	13,005,978	26,821,223	-	\$ 67,672,213
BAA1	-	-	32,076,042	-	13,269,329	69,768,018	-	\$ 115,113,389
BAA2	-	-	51,876,410	-	19,320,817	9,089,534	-	\$ 80,286,761
BAA3	-	-	49,092,401	-	35,525,817	52,877,586	-	\$ 137,495,804
BA1	-	-	22,599,854	-	19,571,639	-	469,200	\$ 42,640,693
BA2	-	-	32,688,853	-	19,567,081	-	557,772	\$ 52,813,706
BA3	-	-	39,820,053	-	16,569,947	8,686,009	-	\$ 65,076,009
B1	-	-	62,690,430	-	7,820,808	2,880,305	2,452,306	\$ 75,843,849
B2	-	2,893,613	93,946,211	1,033,863	24,656,290	13,707,174	375,145	\$ 136,612,296
B3	-	-	61,834,056	2,404,663	10,309,146	3,451,858	-	\$ 77,999,723
CAA1	-	-	17,326,003	-	5,360,867	-	-	\$ 22,686,870
CAA2	-	-	10,022,101	-	2,443,690	-	-	\$ 12,465,791
CAA3	-	-	9,355,178	-	-	-	-	\$ 9,355,178
CA	-	-	499,652	-	-	-	-	\$ 499,652
DEF	-	-	589,500	-	-	-	-	\$ 589,500
Not rated	-	213,156	6,201,464	-	1,381,144	31,246,188	2,573,330	\$ 41,615,282
	<u>\$ 14,594,330</u>	<u>\$ 277,327,627</u>	<u>\$ 552,959,551</u>	<u>\$ 3,850,064</u>	<u>\$ 197,699,357</u>	<u>\$ 689,503,292</u>	<u>\$ 6,427,753</u>	<u>1,742,361,974</u>
US Treasury Bonds and Notes								2,931,912,777
US Government agency - Government National Mortgage Association (GNMAs) mortgage backed subtotal								<u>\$ 4,684,535,999</u>
Derivatives								<u>55,877,817</u>
Total fixed income securities in Investments								<u><u>\$ 4,740,413,816</u></u>

5. Custodial Credit Risk

Custodial credit risk for investments is the risk that, in the event of a failure of the counterparty, the ERS will not be able to recover the value of the investment or collateral securities that are in the possession of an outside party. All securities, except certain pooled funds, are registered in the name of the ERS and are held in the possession of the ERS' custodial bank, The Bank of New York Mellon. Pooled funds not held by the custodial bank, such as certain equity investments, are registered in the name of the ERS. The ERS had \$576,319,242 in cash and securities exposed to custodial credit risk as of June 30, 2019.

*Notes to Financial Statements (continued)***Note F – Deposits and Investment Disclosures (continued)****6. Concentrations of Credit Risk**

The ERS' debt securities managers are expected to maintain diversified portfolios by sector, quality, and maturity as discussed above in Credit Risk.

Equity securities shall be diversified by industry and in number. An investment manager may not hold more than 5% of an individual company's stock if that company's securities represent less than 3% of the investment manager's respective benchmark. (If those securities constitute more than 3% of the respective benchmark the manager shall not hold more than the benchmark weight plus 2 percentage points.)

At June 30, 2019, there was no single issuer exposure within the ERS' portfolio that comprises over 5% of the overall portfolio, or an investment that exceeded the above manager guidelines, and therefore, there is no concentration of credit risk to report.

7. Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. The ERS has not adopted a formal policy that limits investment maturities as a means of managing its exposure to fair value changes arising from changing interest rates. External investment managers are given full discretion within their operational guidelines and are expected to maintain a diversified portfolio between and within sectors, quality, and maturity.

Duration is a measure of a debt investment's exposure to fair value changes arising from changes in interest rates. It uses the present value of cash flows, weighted for those cash flows as a percentage of the investment's full price. At June 30, 2019, the table below shows fixed income investment securities by investment type, amount, and the effective weighted duration for the ERS' total portfolio. Interest rate risk associated with swaps and other derivative instruments are discussed in the derivatives disclosure below:

Effective duration of fixed income assets by security type (excluding derivatives)

		Fair Value	Weighted Modified Duration (years)
Fixed Income Securities			
U.S. Treasury bonds and notes	\$	2,931,912,777	6.2
U.S. government agencies bonds		14,594,330	6.0
U.S. government agency mortgage backed		277,327,627	22.2
U.S. government-sponsored agency mortgage backed		10,261,248	20.5
Commercial mortgage backed securities		3,850,064	15.8
U.S. corporate bonds		552,959,551	5.9
Non-U.S. government / agency bonds		689,503,292	8.0
Non-U.S. corporate bonds		197,699,357	8.5
Pooled and Others		6,427,753	10.1
Total	\$	<u><u>4,684,535,999</u></u>	7.6

Notes to Financial Statements (continued)

Note F – Deposits and Investment Disclosures (continued)

8. Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of an investment. The foreign currency risk exposure to the ERS arises from the international fixed income and international equity investment holdings. Board policy limits the use of foreign currency as a defensive measure to protect the portfolio value of non-U.S. equity and non-U.S. fixed income investments. External investment managers authorized to invest in these securities are given full discretion regarding their respective portfolio's foreign currency exposures, including using currency forward contracts, as established by their investment mandate. Cross-hedging is only allowed in non-U.S. fixed income portfolios. Counterparties for foreign currency derivatives must be rated A or equivalent. Derivatives investments are discussed in more detail in Note F.10.

The following table summarizes the ERS' exposure to foreign currency risk in U.S. dollars as of June 30, 2019. (Securities denominated in U.S. dollars are not presented.)

	Cash and Short Term Instruments	Debt Securities	Derivatives	Equities	Alternative	Real Estate	Grand Total
Argentine peso	\$ 700,083	\$ 1,074,480	\$ (717,108)	\$ -	\$ -	\$ -	\$ 1,057,455
Australian dollar	(81,472,136)	19,119,516	(152,109,603)	101,363,682	-	-	(113,098,541)
Brazilian real	191,596	6,507,058	(4,771,480)	67,808,997	-	-	69,736,171
Canadian dollar	(30,923,689)	7,259,597	42,370,735	170,827,063	-	-	189,533,706
Chilean peso	-	-	(30,402,894)	140,501	-	-	(30,262,393)
Chinese Yuan Renminbi	1,221,075	-	(42,211,909)	3,562,591	-	-	(37,428,243)
Colombian peso	-	-	6,831,495	3,514,445	-	-	10,345,940
Czech koruna	80,166	-	12,280,458	2,068,556	-	-	14,429,180
Danish krone	(192,495)	638,658	(289,721)	37,517,805	-	-	37,674,247
Egyptian pound	3,313,477	-	-	-	-	-	3,313,477
Euro currency unit	1,595,888	130,640,480	(162,308,919)	338,567,265	-	-	308,494,714
Hong Kong dollar	1,382,066	-	(632,121)	157,191,815	-	-	157,941,760
Hungarian forint	(25,759,641)	-	(9,488,092)	2,368,502	-	-	(32,879,231)
Indian Rupee	-	-	20,109,395	-	-	-	20,109,395
Indonesian rupiah	572,142	8,535,671	27,513,508	6,896,322	-	-	43,517,643
Israeli shekel	(13,940,968)	-	(26,608,047)	4,968,739	-	-	(35,580,276)
Japanese yen	89,020,837	9,500,537	(12,057,430)	323,660,179	-	-	410,124,123
Malaysian ringgit	978,698	-	90,573	19,271,564	-	-	20,340,835
Mexican peso	(8,066,460)	2,527,398	36,007,532	17,170,460	-	-	47,638,930
New Taiwan dollar	562,907	-	(14,000,910)	114,366,153	-	-	100,928,150
New Zealand dollar	(2,136,544)	1,587,234	(32,675,693)	15,514,096	-	-	(17,710,907)
Norwegian krone	(11,989,229)	52,133,775	(127,895,400)	27,791,432	-	-	(59,959,422)
Philippine peso	-	-	15,057,855	6,471,234	-	-	21,529,089
Polish zloty	(29,410,204)	79,632,394	(62,014,813)	5,125,364	-	-	(6,667,259)
Pound sterling	(20,364,344)	100,495,980	(141,292,614)	248,136,387	-	-	186,975,409
Russian ruble (new)	(9,060,736)	5,656,872	18,787,002	8,092,708	-	-	23,475,846
Singapore dollar	875,679	42,752,153	(53,883,955)	13,428,774	-	-	3,172,651
South African rand	(6,545,432)	59,066,970	(43,016,743)	27,914,782	-	-	37,419,577
South Korean won	1,430,407	-	(61,240,189)	42,957,211	-	-	(16,852,571)
Swedish krona	(77,110,491)	2,563,195	(125,577,735)	43,393,736	-	-	(156,731,295)
Swiss franc	33,566,793	-	(165,161,340)	70,362,244	-	-	(61,232,303)
Thai baht	990,749	-	12,923,334	25,340,831	-	-	39,254,914
Turkish lira	52,845	-	15,642,725	20,596,524	-	-	36,292,094
Urugayan peso	54,793	-	-	-	-	-	54,793
Various Countries	-	-	-	1,420,489,701	-	-	1,420,489,701
Total	\$ (180,382,168)	\$ 529,691,968	\$ (1,060,742,104)	\$ 3,346,879,663	\$ -	\$ -	\$ 2,635,447,359

Notes to Financial Statements (continued)

Note F – Deposits and Investment Disclosures (continued)**9. Securities Lending**

The ERS participates in a securities lending program administered by its bank custodian, The Bank of New York Mellon. Under this program, which is permissible under Chapter 88 of the HRS, certain equity and fixed-income securities of the ERS are lent to participating broker-dealers and banks (borrowers). In return, the ERS receives cash, securities issued or guaranteed by the U.S. government, securities issued or guaranteed by OECD (Organization for Economic Cooperation and Development) member states or their local authorities, Canadian Provincial debt, equity securities that are part of the U.S. and non U.S. indices, and/or letters of credit as collateral. The ERS does not have the ability to pledge or sell collateral securities absent of borrower default, thus only cash received as collateral is reported on the financial statements in accordance with accounting standards. Risk is mitigated by the investment policies and operational procedures regarding issuer, credit, exposure and rating limits utilized in the securities lending program. Borrowers are required to deliver collateral for each loan equal to: (a) in the case of loaned fixed-income securities and loaned equity securities denominated in U.S. dollars or whose primary trading market was located in the U.S., 102% of the market value of the loaned securities; and (b) in the case of loaned equity securities not denominated in U.S. dollars or whose primary trading market was not located in the U.S., 105% of the market value of the loaned securities. The collateral is marked to market daily. If the market value of the collateral falls below the minimum collateral requirements, additional collateral is provided. In addition, the bank custodian indemnifies the ERS by agreeing to purchase replacement securities or return cash collateral in the event the borrower fails to return the loaned security or fails to pay the ERS for income distributions by the securities' issuers while the securities are on loan.

The ERS does not impose any restrictions on the amount of loans the bank custodian made on behalf of the ERS. Also, the ERS and the borrowers maintain the right to terminate securities lending transactions on demand. The Bank of New York Mellon invests the cash collateral related to the ERS' loaned securities in a separate account, according to the ERS investment policies and procedures as discussed above in notes C2 and F1. As such, the maturities of the investments made with cash collateral generally do not match the maturities of the securities loans. The extent of such mismatch as of June 30, 2019 was 124 days.

At June 30, 2019, there was no credit risk exposure to borrowers since the ERS was collateralized as discussed above. The total securities on loan and collateral received are shown below.

Securities lent for collateral	Fair value of underlying securities	Cash	Noncash
U.S. fixed income	\$ 447,930,431	\$ 279,473,899	\$ 192,105,194
U.S. equities	663,439,848	653,227,972	26,242,735
International equities	286,119,175	87,274,021	226,592,186
International fixed income	71,972,523	1,754,837	76,228,472
	<u>\$ 1,469,461,977</u>	<u>\$ 1,021,730,729</u>	<u>\$ 521,168,587</u>

*Notes to Financial Statements (continued)***Note F – Deposits and Investment Disclosures (continued)****10. Derivative Financial Instruments**

Derivatives are instruments (securities or contracts) whose value is dependent on such things as stock or bond prices, interest rate levels, or currency exchange rates. These are financial arrangements between two parties whose payments are based on or “derived” from the performance of some agreed-upon benchmark. As with any investment, derivative contracts are subject to various types of credit and market risks. Notably, these would include the possible inability of the counterparty to meet the terms of the contract, changes in the market value of the underlying collateral, changes in the interest rate environment, and fluctuation in foreign currency rates. The ERS enters into various derivative investment contracts to hedge, for the minimization of transaction costs and as a means of implementing value added strategies to enhance returns as authorized by Board policy.

Generally, derivatives are subject both to market risk and counterparty risk. The derivatives utilized by the ERS typically have no greater risk than their physical counterparts, and in many cases are offset by exposures elsewhere in the portfolio. Counterparty risk, the risk that the “other party” to a contract will default, is managed by utilization of exchange-traded futures and options where practicable (in which case the futures exchange is the counterparty and guarantees performance) and by careful screening of counterparties where use of exchange-traded products is impractical or uneconomical. ERS investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, posting collateral, and exposure monitoring procedures. The ERS anticipates that counterparties will be able to satisfy their obligations under the contracts.

Derivative securities are priced and accounted for at their fair value. For exchange-traded securities such as futures and options, closing prices from the securities exchanges are used. Foreign exchange contracts are valued at the price at which the transaction could be settled by offset in the forwards markets.

The tables below summarize the ERS’ investments in derivative securities and contracts held at June 30, 2019 and their associated risks. The various risks associated with these investments are included in the tables expressed in terms of market values, summarized by the type of contract as follows: credit, equity, foreign exchange, interest, and other. Due to the level of risk associated with certain derivative investment securities, it is reasonably possible that changes in the values of investment securities will occur in the near term, and such changes could affect the amounts reported in the financial statements. ERS could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. ERS investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, posting collaterals, and exposure monitoring procedures.

The notional amount is the nominal or the underlying face amount that is used to calculate payments made on that instrument or contract. Changes in the market value of all derivative contracts are recorded as net appreciation (depreciation) in fair value of investments in the Statement of Changes in Fiduciary Net Position.

The following table summarizes the ERS’ investments in derivative securities and contracts held at June 30, 2019 with the related maturity information:

Notes to Financial Statements (continued)
Note F – Deposits and Investment Disclosures (continued)**10. Derivative Financial Instruments (continued)**

<u>Asset categories</u>		<u>Notional</u> <u>values</u>	<u>Market value</u>	<u>Maturity (Range from)</u>
Forwards	Currency purchases	\$ -	\$ (17,429,624)	0.0 yrs
	To Be Announced (TBAs)	-	15,636,586	30.1 yrs to 30.2 yrs
	Total forwards	-	(1,793,038)	
Futures	Bond contracts	5,107,068,881	52,938,492	0.3 yrs
	Commodity contracts	(3,028,970,040)	(6,285,790)	0.2 yrs to 1.5 yrs
	Currency contracts	(844,207,219)	(5,438,943)	0.1 yrs to 0.3 yrs
	Index contracts	681,220,262	1,208,779	0.1 yrs to 1.5 yrs
	Interest rate contracts	5,961,308,673	9,374,099	0.2 yrs to 3.0 yrs
	Futures total	7,876,420,557	51,796,637	
Options	Options	-	(37,762,380)	0.0 yrs to 0.2 yrs
	Options on debt securities	-	19,335	0.0 yrs to 0.7 yrs
	Options on currency	-	(17,909)	0.0 yrs to 0.3 yrs
	Options total	-	(37,760,954)	
Swaps	Credit default swaps	-	311,884	1.0 yrs to 42.2 yrs
	Total return swaps	-	(8,312,546)	0.2 yrs
	Equity variance swaps	-	16,529	0.0 yrs
	Interest rate swaps	-	(3,574,079)	1.3 yrs to 30.3 yrs
	Swaps total	-	(11,558,212)	
Grand Total		\$ 7,876,420,557	\$ 684,433	

Forward Currency Exchange Contracts and To-Be-Announced (TBA) Securities

The ERS enters into various forward currency exchange contracts to manage exposure to changes in foreign currency exchange rates and to facilitate the settlement of foreign security transactions. A forward contract is an agreement to buy or sell a specific amount of currency at a specific delivery or maturity date for an agreed-upon price. Risks associated with such contracts include movements in the value of the foreign currency relative to the U.S. dollar and the ability of the counterparty to perform in accordance with the terms of the contract.

The TBA market that ERS invests in as part of its toolkit to manage interest rates and liquidity includes the forward trading of mortgage-backed securities (MBS) issued by federal agencies and federally sponsored agencies (commonly known as pass-through securities issued by Freddie Mac, Fannie Mae, and Ginnie Mae). The TBA market is one of the most liquid, and consequently the most important secondary market for mortgage loans as one MBS pool can be considered to be interchangeable with another pool.

*Notes to Financial Statements (continued)***Note F – Deposits and Investment Disclosures (continued)****10. Derivative Financial Instruments (continued)****Futures**

Futures represent commitments to purchase (asset) or sell (liability) securities at a future date and at a specified price. Futures contracts are traded on organized exchanges (exchange traded) thereby minimizing the ERS' credit risk. The net change in the futures contracts value is settled daily in cash with the exchanges. Net gains or losses arising from the daily settlements are included in the net appreciation in fair value of securities in the Statement of Changes in Fiduciary Net Position. Refer to the table above for the net notional value of futures contracts at June 30, 2019.

Options

Options represent or give the buyers the right, but not the obligation, to buy or sell an asset at a preset price over a specified period. The option's price is usually a small percentage of the underlying asset's value. As a writer of financial options, the ERS receives a premium at the outset of the agreement and bears the risk of an unfavorable change in the price of the financial instrument underlying the option. As a purchaser of financial options, the ERS pays a premium at the outset of the agreement and the counterparty bears the risk of an unfavorable instrument underlying the option.

Swaps

Swaps represent an agreement between two or more parties to exchange sequences of cash flows over a period in the future. At June 30, 2019, the ERS had currency, equity variance, inflation, interest rate, and credit default swaps as allowed by Board policy. In the most common type of interest rate swap arrangement, one party agrees to pay fixed-interest payments on designated dates to a counterparty who, in turn, agrees to make return interest payments that float with some reference rate. Currency swaps allow an investor to exchange the principal and/or interest payments of a loan in one currency for equivalent amounts, in net present value terms, to another currency. Credit default swaps are the most common global credit market derivative that allows flexibility as an active portfolio management tool based on its ability to customize the exposure to corporate credit such as credit spreads and default risks. Credit default spreads and total return swaps are also used to gain access to global markets that do not have the transparency or efficiency of the U.S. credit markets. Variance swaps allow the investor to offset risks associated with the magnitude of movement of some underlying product (such as stock index price). Gains and losses from swaps are determined on market values and are included in the net appreciation in fair value of securities in the Statement of Changes in Fiduciary Net Position.

Derivatives, such as interest rate swaps, total return swaps, inflation swaps, and credit default swaps, are a tool or instrument used to manage inflation, interest rate, credit quality, and yield curve exposures of the investments. In certain situations, derivatives may result in a lower overall cost to the portfolio than owning individual securities underlying the derivatives. When evaluating securities, risk, and return are measured at the security and portfolio levels.

Notes to Financial Statements (continued)

Note F – Deposits and Investment Disclosures (continued)

10. Derivative Financial Instruments (continued)

On June 30, 2019, credit ratings of the counterparty for ERS' investments in derivatives were as follows:

Counterparty	S&P's Rating	Moody's Rating	Fair Value
Bank of America Corp	A-	A2	112,650
Bank of America Merrill Lynch	BBB+	A3	(5,137,366)
Barclays PLC	BBB	Baa3	(28,972)
BNP Paribas SA	A+	Aa3	14,970
Citibank NA	A+	Aa3	(1,787,264)
Citigroup Global Markets Inc.	BBB+	A3	(328,302)
Citigroup Inc	BBB+	A3	(22,664)
CME Group Inc	AA-	Aa3	(3,395,081)
Credit Suisse Group AG	BBB+	Not Rated	(134)
Credit Suisse Securities (USA) LLC	A+	Not Rated	19,374,450
Deutsche Bank AG	BBB+	A3	(121,541)
Deutsche Bank Securities Inc	BBB+	A3	3,044,045
Goldman Sachs & Co LLC	BBB+	A3	6,107,547
HSBC Holdings PLC	A	(blank)	(46,099)
Intercontinental Exchange Inc	A	A2	(131,054)
J. P. Morgan Securities LLC	A-	A2	(2,094,805)
JP Morgan	A-	A2	4,547,390
JPMorgan Chase & Co	A-	A2	95,193
London Stock Exchange Group PLC	A	A3	(148,514)
Morgan Stanley	BBB+	A3	10,598
Morgan Stanley & Co LLC	BBB+	A3	12,065,324
SG Americas Securities LLC	A	A1	(11,625,938)
UBS Securities LLC	A-	Not Rated	5,006,566
Exchange traded derivatives			(24,826,562)
Total			<u>\$ 684,437</u>

Note G – Pension Liability

1. Net Pension Liability

The components of the net pension liability of the ERS at June 30, 2019 were as follows:

Total Pension Liability	\$31,396,447,685
Plan Fiduciary Net Position	<u>17,227,026,987</u>
Net Pension Liability	<u>\$14,169,420,698</u>

Plan Fiduciary Net Position as a Percentage of Total Pension Liability	54.9%
Net Pension Liability as a Percentage of Covered Payroll	323.8%

Multi-year trend information regarding whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits can be found in the required supplementary information following the *Notes to the Financial Statements*.

Notes to Financial Statements (continued)
Note G – Pension Liability (continued)**2. Summary of Actuarial Assumptions**

The total pension liability was determined using the provisions of the GASB Statements No. 67 and No. 82 actuarial valuation as of June 30, 2019. These GASB rules only define pension liability for financial reporting purposes. The actuarial assumptions were based on the results of an experience study as of June 30, 2018, with most of the assumptions based on the period from July 1, 2013, through June 30, 2018. When measuring the total pension liability, GASB uses the same actuarial cost method, all actuarial assumptions, and the same discount rate as the ERS uses for funding which can be found in the Notes to Required Supplementary Information.

Summary of Actuarial Valuation as of June 30, 2019 follows:

Valuation date	June 30, 2019
Actuarial cost method	Entry Age Normal
Amortization method	Level percent, open
Actuarial assumptions:	
Inflation assumption	2.50%
Investment rate of return, including inflation at 2.50%	7.00%
Payroll growth rate:	3.50%
Projected salary increases, including inflation at 2.50%	
- Police and Fire Employees	5.00% to 7.00%
- General Employees	3.50% to 6.50%
- Teachers	3.75% to 5.75%
Cost of living adjustments (COLAs)	
- COLAs are not compounded; and are based on original pension amounts.	
- Membership date prior to July 1, 2012	2.5%
- Membership date after June 30, 2012	1.5%

Mortality rate assumptions include the effects of the retirement status of members.

Pre-retirement mortality rates are:

Multiples of the RP 2014 mortality table for active employees based on the occupation of the member as follows:

	General Employees	Teachers	Police and Fire
Type	Male & Female	Male & Female	Male & Female
Ordinary	94%	92%	83%
% of Ordinary	41%	52%	24%
Chosing Annuity			
Duty Related	6%	8%	17%

Notes to Financial Statements (continued)

Note G – Pension Liability (continued)

2. Summary of Actuarial Assumptions

Post-Retirement Mortality rates are:

Healthy Retirees: The 2019 Public Retirees of Hawaii mortality table, generational projection using the BB projection table from the year 2019 and with multipliers based on plan and group experience. The following are sample rates of the base table as of 2019 with the corresponding multipliers:

Healthy Annuitant Mortality Rates Before Projection (Multiplier Applied)						
	General Employees		Teachers		Police and Fire	
Age	Males	Females	Males	Females	Males	Females
50	0.2901%	0.2376%	0.2640%	0.1980%	0.3394%	0.2376%
55	0.4195%	0.3042%	0.3817%	0.2535%	0.4908%	0.3042%
60	0.5773%	0.3175%	0.5253%	0.2646%	0.6754%	0.3175%
65	0.8603%	0.3175%	0.7829%	0.2646%	1.0066%	0.3175%
70	1.2866%	0.7022%	1.1708%	0.5852%	1.5053%	0.7022%
75	2.0370%	1.3340%	1.8537%	1.1117%	2.3833%	1.3340%
80	3.4486%	2.2177%	3.1382%	1.8481%	4.0349%	2.2177%
85	6.2716%	3.9579%	5.7072%	3.2982%	7.3378%	3.9579%
90	11.8489%	7.7873%	10.7825%	6.4895%	13.8632%	7.7873%
Multiplier	100%	108%	91%	90%	117%	108%
Setback	---	---	---	---	---	---

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
Gender	2025	Year of Retirement		2040	2045
		2030	2035		
General Retirees					
Male	23.8	24.2	24.7	25.2	25.6
Female	26.8	27.2	27.5	27.9	28.2
Teachers					
Male	24.5	25.0	25.4	25.9	26.3
Female	28.2	28.5	28.8	29.1	29.5
Police and Fire					
Male	22.5	23.0	23.5	24.0	24.5
Female	26.8	27.2	27.5	27.9	28.2

Disabled retirees: Base Table for healthy retiree's occupation, set forward 5 years, generational projection using the BB projection table from the year 2019. Minimum mortality rate of 3.5% for males and 2.5% for females.

Notes to Financial Statements (continued)
Note G – Pension Liability (continued)**2. Summary of Actuarial Assumptions (continued)**

The long-term expected rate of return on pension plan investments was determined using a "top down approach" of the Client-Constrained Simulation-based Optimization Model (a statistical technique known as "re-sampling with replacement" that directly keys in on specific plan-level risk factors as stipulated by the ERS Board) in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are then combined to produce the long-term expected rate of return by weighting the expected future nominal rates of return (real returns + inflation) by the target asset allocation percentage. The rate of returns based on ERS's investment consultant, Meketa Investment Group, Inc.'s 2019 capital market projections for the target asset allocation as of June 30, 2019, are summarized in the following table:

Strategic Allocation (risk-based classes)	Long-term Expected geometric rate of return
Broad Growth	7.65%
Principal Protection	3.00%
Real Return	4.55%
Crisis Risk Offset	5.15%

Single Discount Rate

A single discount rate of 7.00% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.00%. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

3. Sensitivity of the Net Pension Liability to Changes in the Single Discount Rate

The following presents the ERS' net pension liability calculated using a single discount rate of 7.00%, as well as what the ERS' net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate.

1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
\$18,460,974,101	\$14,169,420,698	\$11,079,581,746

Note H – Risk Management

The ERS is exposed to various risks of loss related to torts; theft of, damage to, or destruction of assets; errors or omissions; natural disasters; and injuries to employees. As required by state law, the ERS participates in coverage with the State. The State retains various risks and insures certain excess layers with commercial insurance policies. The excess layers are consistent with the prior fiscal year. Settled claims for the State did not exceed the coverage provided by commercial insurance policies during the year ended June 30, 2019. Losses not covered by insurance are generally paid from legislative appropriations.

1. Torts

The ERS is involved in various litigation and claims, including claims regarding retirement benefits, the outcome of which cannot be presently determined. In the opinion of management, the outcome of these actions will not have a material adverse effect on the ERS' financial position.

2. Property and Liability Insurance

The ERS also purchased property and liability insurance for all real estate owned from outside carriers. During the past three fiscal years, no loss settlements exceeded insurance coverages.

3. Workers' Compensation Policy

The State has a self-insured workers' compensation policy. Workers' compensation claims are paid from legislative appropriations.

Note I – Commitments

In the normal course of business, the ERS enters into commitments with associated risks. The ERS adheres to the same credit policies, financial and administrative controls, and risk limiting and monitoring procedures for these commitments as for all investments.

The ERS has future financial commitments of up to \$2,790,131,000 as of June 30, 2019, consisting of \$350,000,000 in fixed income, \$746,246,000 in real estate investments, and \$1,693,885,000 in alternative investments.

Note J – Deferred Compensation Plan

The ERS does not sponsor a deferred compensation program. The ERS' employees are eligible to participate in the deferred compensation plan sponsored by the State. The State-sponsored plan was created in accordance with Internal Revenue Code Section 457. The plan, available to all ERS employees, permits them to defer a portion of their salaries. The deferred compensation is not available to the employees until termination, retirement, death, or an unforeseeable emergency. All compensation deferred under the plan is held in trust by a custodian for the exclusive benefit of participants and beneficiaries.

Schedule of Changes in the Employers' Net Pension Liability and Related Ratios
Fiscal Years Ended June 30, 2019, 2018, 2017, 2016, 2015 and 2014

	2014	2015	2016	2017	2018	2019
A. Total pension liability						
1. Service Cost	\$ 421,956,129	\$ 437,901,029	\$ 484,278,499	\$ 576,724,568	\$ 584,470,193	\$ 619,504,278
2. Interest on the Total Pension Liability	1,618,917,776	1,693,252,684	1,748,619,873	1,894,622,190	1,976,275,120	2,063,885,936
3. Changes of benefit terms	-	-	-	-	-	-
4. Difference between expected and actual experience of the Total Pension Liability	66,400,876	(192,816,757)	297,534,219	61,179,390	124,753,379	221,473,495
5. Changes of assumptions	-	261,213,541	2,915,922,677	-	-	60,320,037
6. Benefit payments, including refunds of employee contributions	(1,130,921,611)	(1,181,252,658)	(1,245,517,025)	(1,323,129,244)	(1,416,727,842)	(1,486,137,444)
7. Net change in total pension liability	\$ 976,353,170	\$ 1,018,297,839	\$ 4,200,838,243	\$ 1,209,396,904	\$ 1,268,770,850	\$ 1,479,046,302
8. Total pension liability – beginning	21,243,744,377	22,220,097,547	23,238,395,386	27,439,233,629	28,648,630,533	29,917,401,383
9. Total pension liability – ending	\$ 22,220,097,547	\$ 23,238,395,386	\$ 27,439,233,629	\$ 28,648,630,533	\$ 29,917,401,383	\$ 31,396,447,685
B. Plan fiduciary net position						
1. Contributions – employer	\$ 653,127,697	\$ 717,792,981	\$ 756,558,222	\$ 781,244,218	\$ 847,595,466	\$ 922,635,334
2. Contributions – employer (picked-up employee contributions)	204,821,010	221,909,859	235,079,968	249,211,751	257,294,033	270,764,670
2. Contributions – employee	1,306,327	1,595,560	1,721,893	1,492,316	2,133,901	2,458,908
3. Net investment income	2,175,479,961	556,436,475	(169,368,110)	1,934,512,507	1,225,572,599	932,696,412
4. Benefit payments, including refunds of employee contributions	(1,130,921,611)	(1,181,252,658)	(1,245,517,025)	(1,323,129,244)	(1,416,727,842)	(1,486,137,444)
5. Pension Plan Administrative Expense	(12,626,030)	(14,032,964)	(13,960,587)	(14,986,159)	(15,784,490)	(13,798,866)
6. Other	-	-	-	-	-	-
7. Net change in plan fiduciary net position	\$ 1,891,187,354	\$ 302,449,253	(\$ 435,485,639)	\$ 1,628,345,389	\$ 900,083,667	\$ 628,619,014
8. Fiduciary net position – beginning	12,311,827,949	14,203,015,303	14,505,464,556	14,069,978,917	15,698,324,306	16,598,407,973
9. Fiduciary net position – ending	\$ 14,203,015,303	\$ 14,505,464,556	\$ 14,069,978,917	\$ 15,698,324,306	\$ 16,598,407,973	\$ 17,227,026,987
C. Net pension liability	\$ 8,017,082,244	\$ 8,732,930,830	\$ 13,369,254,712	\$ 12,950,306,227	\$ 13,318,993,410	\$ 14,169,420,698
D. Fiduciary net position as a percentage of the total pension liability	63.92%	62.42%	51.28%	54.80%	55.48%	54.87%
E. Covered-employee payroll	\$ 3,829,002,983	\$ 3,995,447,345	\$ 4,112,227,306	\$ 4,243,521,876	\$ 4,256,052,840	\$ 4,376,216,753
F. Net pension liability as a percentage of covered employee payroll	209.38%	218.57%	325.11%	305.18%	312.94%	323.78%

* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

Required Supplementary Information - Unaudited

Schedule of the Employers' Net Pension Liability
Fiscal Year Ended June 30, 2014 to June 30, 2019*

Fiscal year ended June 30,:	Total Pension Liability	Fiduciary Net Position	Net Pension Liability	Fiduciary Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a Percentage of Covered Payroll
2014	\$22,220,097,547	\$14,203,015,303	\$8,017,082,244	63.92%	\$3,829,002,983	209.38%
2015	\$23,238,395,386	\$14,505,464,556	\$8,732,930,830	62.42%	\$3,995,447,345	218.57%
2016	\$27,439,233,629	\$14,069,978,917	\$13,369,254,712	51.28%	\$4,112,227,306	325.11%
2017	\$28,648,630,533	\$15,698,324,306	\$12,950,306,227	54.80%	\$4,243,521,876	305.18%
2018	\$29,917,401,383	\$16,598,407,973	\$13,318,993,410	55.48%	\$4,256,052,840	312.94%
2019	\$31,396,447,685	\$17,227,026,987	\$14,169,420,698	54.87%	\$4,376,216,753	323.78%

* Schedule is intended to show information for 10 years. Additional years will be included prospectively as data becomes available.

Required Supplementary Information - Unaudited

Schedule of Employer Contributions
2010 to 2019
(In thousands)

Fiscal year ended June 30,:	Statutory Contributions	Covered Employee Payroll	Contributions as a Percentage of Covered Payroll
<u>June 30,:</u>	<u>Contributions</u>	<u>Payroll</u>	<u>Payroll</u>
2010	\$547,670	\$3,713,593	14.7%
2011	538,692	3,731,383	14.4%
2012	548,353	3,706,137	14.8%
2013	581,447	3,720,810	15.6%
2014	653,128	3,829,003	17.1%
2015	717,793	3,995,447	18.0%
2016	756,558	4,112,227	18.4%
2017	781,244	4,243,522	18.4%
2018	847,595	4,256,053	19.9%
2019	922,635	4,376,217	21.1%

Notes: All contributions shown reflect statutory employer-paid contributions only. Employer contributions (picked-up employee/member contributions) and member contributions are excluded.

Schedule of Investment Returns
2014 to 2019

For fiscal year ended June 30,:	Annual Money- Rate of Return
<u>ended June 30,:</u>	<u>Rate of Return</u>
2014	17.9%
2015	4.0%
2016	-1.2%
2017	13.7%
2018	7.8%
2019	5.7%

* Schedule is intended to show information for 10 years. Additional years will be included prospectively as data becomes available.

June 30, 2019

Note A - Description

There have been no changes in benefit terms since the last valuation.

The following changes were made to the actuarial assumptions as of June 30, 2018 to June 30, 2019, based on the 2018 Experience Study:

- The assumed salary increase schedules include an ultimate component for general wage inflation that may add on additional increases for individual merit (which would include promotions) and then an additional component for step rates based on service. There were no changes for General Employees and Teachers. The overall impact increased for salary rate increase rates received for most Police and Fire over their career due to extending the 2-year step schedule to 25-years.
- Mortality rates generally decreased due to the continued improvements in using a fully generational approach and Scale BB (published by the Society of Actuaries), although mortality rates increased in certain age groups across all employment groups.
- The rates of disability of active employees increased for all General Employees and Teachers, and for Police and Fire from duty-related reasons.
- There were minor increases in the retirement rates for members in certain groups based on age, employment group and/or membership class.

Future employer contribution rates will increase due to legislation passed in 2017.

Per Act 17 (SLH 2017), future employer contributions from State and counties are expected to increase pursuant to a phased-in contribution rate increase over four years beginning July 1, 2017. The rate for Police and Fire employees increases to 28.00% on July 1, 2017; 31.00% on July 1, 2018; 36.00% on July 1, 2019; and 41.00% on July 1, 2020 and the rate for All Other Employees increases to 18.00% on July 1, 2017; 19.00% on July 1, 2018; 22.00% on July 1, 2019; and 24.00% on July 1, 2020.

Notes to Required Supplementary Information - Unaudited
Methods and Assumptions Used in Calculations of Actuarially Determined Contributions

The actuarially determined contribution rates in the schedule of contributions are calculated as of June 30, 2019. The following significant actuarial methods and assumptions were used to determine contribution rates reported in that schedule. Please refer to the Actuarial Section for additional information on actuarial assumptions.

Valuation date	June 30, 2019
Actuarial cost method	Entry Age Normal
Amortization method	Level percent, open
Asset valuation method	4-year smoothed market
Assumed inflation rate	2.5%
Investment rate of return	7.00% (including 2.5% for inflation and a 4.50% net real rate of return)
Cost-of-living adjustments (COLAs)	
- COLAs are not compounded; and are based on original pension amount.	
- Membership date prior to July 1, 2012	2.5% (not compounded)
- Membership date after June 30, 2012	1.5% (not compounded)
Payroll growth rate assumption	3.50%

Projected salary increases are comprised of the following components:

	<u>General Employees</u>	<u>Teachers</u>	<u>Police and Fire</u>
Service component by year of credited service (a)	0.0% to 3.0%	0.0% to 2.0%	0.0% to 2.0%
General increase (b)	1.0%	1.25%	2.5%
Inflation (c)	2.5%	2.5%	2.5%
Total increase (a + b + c)	<u>3.5% to 6.5%</u>	<u>3.75% to 5.75%</u>	<u>5.0% to 7.0%</u>

Notes to Required Supplementary Information - Unaudited

Detailed salary increase rates by years of service are shown below:

Years of Service	General Employees		Teachers		Police and Fire	
	Service-related Component (a)	Total Annual Rate of Increase (a + b + c)	Service-related Component (a)	Total Annual Rate of Increase (a + b + c)	Service-related Component (a)	Total Annual Rate of Increase (a + b + c)
1	3.00%	6.50%	2.00%	5.75%	2.00%	7.00%
2	3.00%	6.50%	1.75%	5.50%	2.00%	7.00%
3	2.00%	5.50%	1.75%	5.50%	1.00%	6.00%
4	1.50%	5.00%	1.50%	5.25%	1.00%	6.00%
5	1.50%	5.00%	1.00%	4.75%	1.00%	6.00%
6	1.25%	4.75%	1.00%	4.75%	0.75%	5.75%
7	1.25%	4.75%	0.75%	4.50%	0.75%	5.75%
8	1.00%	4.50%	0.75%	4.50%	0.75%	5.75%
9	1.00%	4.50%	0.50%	4.25%	0.50%	5.50%
10	1.00%	4.50%	0.50%	4.25%	0.50%	5.50%
11	0.75%	4.25%	0.50%	4.25%	0.50%	5.50%
12	0.75%	4.25%	0.50%	4.25%	0.50%	5.50%
13	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
14	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
15	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
16	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
17	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
18	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
19	0.50%	4.00%	0.25%	4.00%	0.25%	5.25%
20	0.25%	3.75%	0.25%	4.00%	0.25%	5.25%
21	0.25%	3.75%	0.25%	4.00%	0.25%	5.25%
22	0.25%	3.75%	0.25%	4.00%	0.25%	5.25%
23	0.25%	3.75%	0.25%	4.00%	0.25%	5.25%
24	0.25%	3.75%	0.25%	4.00%	0.25%	5.25%
25 or more	0.00%	3.50%	0.00%	3.75%	0.00%	5.00%

Notes to Required Supplementary Information - Unaudited

Mortality rates used in the valuation are:

Pre-retirement mortality rates are:

Multiples of the RP 2014 mortality table based on the occupation of the member.

The following factors are used in conjunction with the described above to derive the death rates:

Type	General Employees	Teachers	Police and Fire
	Male & Female	Male & Female	Male & Female
Ordinary	94%	92%	83%
% of Ordinary Choosing Annuity	41%	52%	24%
Duty Related	6%	8%	17%

Post-retirement mortality rates are:

Healthy Retirees:

The 2019 Public Retirees of Hawaii mortality table, generational projection using the BB projection table from the year 2019 and with multipliers based on plan and group experience.

The following are sample rates of the base table as of 2019 with the corresponding multipliers:

Healthy Annuitant Mortality Rates Before Projection (Multiplier Applied)						
Age	General Employees		Teachers		Police and Fire	
	Males	Females	Males	Females	Males	Females
50	0.2901%	0.2376%	0.2640%	0.1980%	0.3394%	0.2376%
55	0.4195%	0.3042%	0.3817%	0.2535%	0.4908%	0.3042%
60	0.5773%	0.3175%	0.5253%	0.2646%	0.6754%	0.3175%
65	0.8603%	0.3175%	0.7829%	0.2646%	1.0066%	0.3175%
70	1.2866%	0.7022%	1.1708%	0.5852%	1.5053%	0.7022%
75	2.0370%	1.3340%	1.8537%	1.1117%	2.3833%	1.3340%
80	3.4486%	2.2177%	3.1382%	1.8481%	4.0349%	2.2177%
85	6.2716%	3.9579%	5.7072%	3.2982%	7.3378%	3.9579%
90	11.8489%	7.7873%	10.7825%	6.4895%	13.8632%	7.7873%
Multiplier	100%	108%	91%	90%	117%	108%
Setback	0	0	0	0	0	0

Notes to Required Supplementary Information - Unaudited

The following are life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Gender	<u>Life Expectancy for an Age 65 Retiree in Years</u>				
	<u>Year of Retirement</u>				
	2025	2030	2035	2040	2045
	General Retirees				
Male	23.8	24.2	24.7	25.2	25.6
Female	26.8	27.2	27.5	27.9	28.2
	Teachers				
Male	24.5	25.0	25.4	25.9	26.3
Female	28.2	28.5	28.8	29.1	29.5
	Police and Fire				
Male	22.5	23.0	23.5	24.0	24.5
Female	26.8	27.2	27.5	27.9	28.2

Disabled Retirees:

Base Table for healthy retiree's occupation, set forward 5 years, generational projection using the BB projection table from the year 2019. Minimum mortality rate of 3.5% for males and 2.5% for females.

Change of Assumptions

2019 Changes in Actuarial Assumptions

The following changes were made to the actuarial assumptions as of June 30, 2018 to June 30, 2019:

- The assumed salary increase schedules include an ultimate component for general wage inflation that may add on additional increases for individual merit (which would include promotions) and then an additional component for step rates based on service. There were no changes for General Employees and Teachers. The overall impact increased for salary rate increase rates received for most Police and Fire over their career due to extending the 2-year step schedule to 25-years.
- Mortality rates generally decreased due to the continued improvements in using a fully generational approach and Scale BB (published by the Society of Actuaries), although mortality rates increased in certain age groups across all employment groups.
- The rates of disability of active employees increased for all General Employees and Teachers, and for Police and Fire from duty-related reasons.
- There were minor increases in the retirement rates for members in certain groups based on age, employment group and/or membership class.

Prior year trends including changes in assumptions are discussed below in Note B.

*Notes to Required Supplementary Information - Unaudited***Note B – Significant Factors Affecting Trends in Actuarial Information*****2019 Changes in Actuarial Assumptions***

The following changes were made to the actuarial assumptions as of June 30, 2018 to June 30, 2019:

- The assumed salary increase schedules continues to include an ultimate component for general wage inflation that may add on additional increases for individual merit (which would include promotions) and then an additional component for step rates based on service. There were no changes for General Employees and Teachers. The overall impact increased for salary rate increase rates received for most Police and Fire over their career due to extending the 2-year step schedule to 25-years.
- Mortality rates generally decreased due to the continued improvements in using a fully generational approach and Scale BB (published by the Society of Actuaries), although mortality rates increased in certain age groups across all employment groups.
- The rates of disability of active employees increased for all General Employees and Teachers, and for Police and Fire from duty-related reasons.
- There were minor increases in the retirement rates for members in certain groups based on age, employment group and/or membership class.

2016 Changes in Actuarial Assumptions

The following changes were made to the actuarial assumptions as of June 30, 2015 to June 30, 2016:

- The investment rate of return assumption was decreased from 7.65% to 7.00 %.
- Change the investment return assumption from net of all expenses to net of only investment expenses, add explicit charge for administrative expenses (0.35% of pay)
- The inflation assumption was decreased from 3.00% to 2.50 %
- Decrease the wage inflation (or employer budget growth) assumption from 4.00% to 3.50%
- The inflation component of salary increase rates decreased for all groups. The salary increase rates were changed to reflect a smaller productivity component for Teachers and Police & Fire. The service based component generally increased for most General Employees, decreased for most Teachers, and remain unchanged for most Police and Fire. The overall impact decreased assumed salary rate increase rates for all General Employees and Teachers, while remaining unchanged for almost all Police and Fire.
- The rates of mortality for active employees were decreased.
- The rates of mortality for healthy retirees and beneficiaries for most employee groups were decreased, adding an explicit assumption for continued future mortality improvement (generational approach).
- The rates of mortality for disabled retirees for most employee groups were decreased.
- The rates of disability of active employees increased for all General Employees, for Police and Fire from duty-related reasons and for Teachers from non-duty-related reasons.
- The rates of termination assumption for all employee groups was changed from separate male and female by employee group to a combined male & female by employee group. The rate of terminations for Police & Fire was increased. The rate of terminations for General Employees in the first six years of service decreased, and remains unchanged for other General Employees. After six years of service, the rates of termination generally increased Teachers, and remain unchanged for other Teachers.

*Notes to Required Supplementary Information - Unaudited****2015 Changes in Actuarial Assumptions***

The investment rate of return assumption was decreased from 7.75% as of June 30, 2014 to 7.65 % as of June 30, 2015.

2011 Changes in Plan Provisions Since 2010

The following changes were made to the actuarial assumptions:

- The investment rate of return assumption decreased from 8.00% to 7.75%.
- The salary increase rates were changed to reflect a larger productivity component for Police & Fire. Small changes also made to service-based components for all groups. The overall impact increased assumed salary increase rates for all employees.
- The rates of mortality for healthy retirees and beneficiaries for most employee groups were decreased.
- The rates of mortality for disabled retirees for most employee groups were increased.
- The rates of mortality for active employees for most employee groups were increased.
- The rates of disability for active employees for most general employees and teachers were decreased.
- The rates of retirement for most employees were increased.
- The rates of termination in the first six years of service for males generally increased, and remained mostly unchanged for females. After six years of service, the rates of termination generally increased for younger employees and decreased for employees from the age of 50.

Schedule 1

Combining Schedule of Changes in Fiduciary Net Position – All Trust Funds

Year ended June 30, 2019

	2019			
	Pension Accumulation Reserves	Annuity Savings Reserves	Expense Reserves	Total
Additions				
Appropriations and contributions:				
Employers	\$ 922,635,334	\$ -	\$ -	\$ 922,635,334
Members	-	273,223,578	-	273,223,578
Net investment income	932,696,412	-	-	932,696,412
Total additions	1,855,331,746	273,223,578	-	2,128,555,324
Deductions				
Benefit payments	1,469,634,809	-	-	1,469,634,809
Refunds of member contributions	-	16,502,635	-	16,502,635
Administrative expenses	-	-	13,798,866	13,798,866
Total deductions	1,469,634,809	16,502,635	13,798,866	1,499,936,310
Other changes in net position restricted for pension benefits:				
Transfer due to retirement of members	187,618,612	(187,618,612)	-	-
Transfer of interest allocation	(114,555,438)	114,555,438	-	-
Transfer to pay administrative expenses	(18,009,878)	-	18,009,878	-
Return of unrequired funds due to savings in administrative expenses	-	-	-	-
	55,053,296	(73,063,174)	18,009,878	-
Net increase	440,750,233	183,657,769	4,211,012	628,619,014
Fiduciary net position restricted for pensions:				
Beginning of year	13,796,540,427	2,785,429,388	16,438,158	16,598,407,973
End of year	\$ 14,237,290,660	\$ 2,969,087,157	\$ 20,649,170	\$ 17,227,026,987

See accompanying independent auditors' report.

Other Supplementary Information (continued)
Schedule 2

Social Security Contribution Fund

Statement of Changes in Assets and Liabilities

Year ended June 30, 2019

	2019			
	Beginning Balance	Additions	Deductions	Ending Balance
Assets				
Receivable from employers	\$ -	\$ 240,146,328	\$ 240,146,328	\$ -
Total assets	<u>\$ -</u>	<u>\$ 240,146,328</u>	<u>\$ 240,146,328</u>	<u>\$ -</u>
Liabilities				
Due to employers	\$ -	\$ 240,146,328	\$ 240,146,328	\$ -
Total liabilities	<u>\$ -</u>	<u>\$ 240,146,328</u>	<u>\$ 240,146,328</u>	<u>\$ -</u>

See accompanying independent auditors' report.

Schedule 3

Schedule of Administrative Expenses

Year ended June 30, 2019

	<u>2019</u>
Personnel services	
Salaries and wages	\$ 6,264,279
Fringe benefits	3,377,154
Net change in unused vacation credits	53,749
Total personnel services	<u>9,695,182</u>
Professional services	
Actuarial	129,100
Auditing and tax consulting	332,435
Disability hearing expenses	33,900
Legal services	548,265
Medical	330,363
Other services	37,101
Total professional services	<u>1,411,164</u>
Communication	
Postage	224,398
Printing and binding	58,949
Telephone	61,523
Travel	169,267
Total communication	<u>514,137</u>
Rentals	
Rental of equipment	92,209
Rental of premises	17,981
Total rentals	<u>110,190</u>
Other	
Armored car service	5,849
Computer and office automation systems	22,304
Repairs and maintenance	524,132
Stationery and office supplies	25,873
Miscellaneous	97,241
Total other	<u>675,399</u>
Depreciation	<u>1,392,794</u>
	<u>\$ 13,798,866</u>

See accompanying independent auditors' report.

Other Supplementary Information (continued)
Schedule 4

Schedule of Investment Expenses

Year ended June 30, 2019

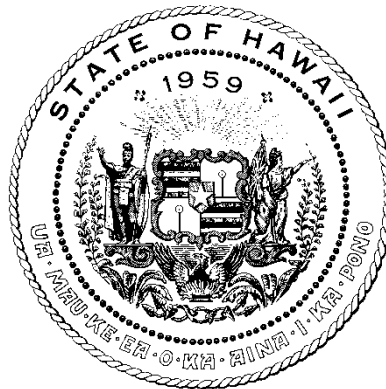
	<u>2019</u>
Real estate and alternative investment expenses	
Operating expenses	\$ 28,565,870
Mortgage interest	4,989,307
Total real estate and alternative investment expenses	<u>33,555,177</u>
Investment expenses	
Investment manager/advisor fees	\$ 40,787,445
Bank custodian fees	336,082
Other investment expenses	<u>(753,484)</u>
Total investment expenses	40,370,043
Securities lending expenses	
Borrower rebates	24,434,625
Management fees	<u>732,262</u>
Total securities lending expenses	25,166,887
	<u><u>\$ 99,092,107</u></u>

See accompanying independent auditors' report.



Employees' Retirement System

of the State of Hawaii



**INVESTMENT
SECTION**

*Letter from Chief Investment Officer*DAVID Y. IGE
GOVERNORTHOMAS WILLIAMS
EXECUTIVE DIRECTOR

KANOE MARGOL
DEPUTY EXECUTIVE DIRECTOR**STATE OF HAWAII**
EMPLOYEES' RETIREMENT SYSTEM

October 23, 2020

Board of Trustees
201 Merchant Street, Suite 1400
Honolulu, HI 96813

Dear Members of the Board:

I am pleased to present investment highlights and performance for the Investment Section of the Comprehensive Annual Financial Report ("CAFR") for the fiscal year ending June 30, 2019.

- ERS's Fiduciary net position was valued at \$17.2 billion as of June 30, 2019. The portfolio increased by \$0.7 billion over the fiscal year.
 - The ERS investment portfolio outperformed its one-year, three-year, and five-year Policy Benchmark returns by an annualized 1.4%, 1.1% and 0.8%, respectively.¹ The portfolio's return for the fiscal year was 6.0%,² while the Policy Benchmark³ only returned 4.7%. The ERS investment portfolio continued to exceed its long-term 7.0% target rate of return by 0.8% on an inception-to-date basis.
- The outperformance over the Policy Benchmark for the fiscal year was led by positive returns for each asset class: broad growth (+6.1%), principal protection (+5.4%), real return (+6.3%), and crisis risk offset (+6.8%).
 - On an asset class basis, broad growth contributed the most (118 basis points) to total portfolio outperformance over the policy benchmark, driven by strong performance in private growth (+14.9% versus +3.9% for the benchmark) and more specifically by private equity, which outperformed its benchmark by over 1,270 basis points—returning 16.6% versus its benchmark 3.9% return. Traditional growth posted a return of 4.8% exceeding its benchmark by 0.2%. Stabilized growth also generated a positive fiscal year return of 4.5% but underperformed its benchmark by 1.1%. The stabilized growth underperformance to its benchmark was primarily driven by the low-volatility, value-oriented equity component which posted a return of 4.9% versus its benchmark return of 13.0%.

¹ Outperformance is based on a mix of gross and net returns.

² A mix of gross and net returns.

³ The Policy Benchmark is the Total Investment Portfolio Evaluation Benchmark (see Section C of the Investment Policy Statement), a custom benchmark constructed to measure the target mix. It is based on Plan's broad benchmarks and evolving asset allocation targets.

Letter from Chief Investment Officer (continued)

- Crisis risk offset also contributed positively to total portfolio outperformance over the policy benchmark, driven primarily by strong performance within the alternative return capture segment (+ 15.4%) which outperformed its benchmark by 8.6%. The portfolio's investment in systematic trend following was also positive for the year (+0.2%) while its benchmark was negative, resulting in an outperformance of 2.3%. Treasury duration capture had a strong absolute performance for the year (+11.9%) however it underperformed its benchmark by 0.4%. Overall, crisis risk offset exceeded its benchmark by 2.5% contributing about 30 basis points of the total portfolio outperformance versus the policy benchmark.
- The principal protection portfolio (+5.4%) slightly underperformed its benchmark by 0.6%. The underperformance was primarily due to the overweight position in high grade corporate bonds.
- Real return posted a return of +6.3% exceeding its CPI⁴+3% benchmark for the fiscal year by 1.6%. Performance was driven by returns in global inflation-linked securities (GILS) (+6.9%), which slightly exceeded its benchmark by 0.3%. Timber returned +3.8%, which underperformed the aggregate real return class, but exceeded its NCREIF⁵ Timberland index by 1.4%. Infrastructure returned +13.6%, which exceeded its CPI + 4% benchmark by 7.9%, although a relatively smaller allocation resulted in lower impact on the aggregate real return class.
- The capital allocation among the risk classes on June 30, 2019 was close to the policy allocations with broad growth accounting for 71.7%, crisis risk offset 15.3%, principal protection 6.9%, real return 3.2%, and opportunities 0.2%. From a risk allocation standpoint, growth risk accounted for about 95% of the volatility in the portfolio.⁶

ECONOMIC & CAPITAL MARKET CONDITIONS

Markets began the 2019 fiscal year with reports of strong economic and corporate earnings growth in the U.S. and improving but low growth in the rest of the world. By late September, U.S. equities had hit all-time highs, volatility was suppressed, corporations and individuals were reaping the initial benefits of lower income taxes, and the only significant concerns were U.S. trade disputes with Canada, Mexico, Europe and China. Although on edge, the reaction of the markets was subdued optimism on trade disputes, bolstered by the September "USMCA" trade agreement between the U.S., Canada and Mexico, which would be approved and signed by all parties over the next year. Trade tensions with Europe also dissipated, leaving only China as the focal point of the Trump Administration's campaign to make the unfavorable (to the U.S.) trade terms with the U.S.'s major trading partners more equitable and allow access to markets more on par with what the U.S. allows. The Administration was simultaneously attempting to rein in China's unauthorized acquisition and use of proprietary foreign technology and other intellectual property—a very difficult undertaking given China's stated goal of technology supremacy. In light of the favorable global economic environment, major central banks were becoming less accommodating -- either raising rates, tapering their bond

⁴ Consumer Price Index – a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services (source: BLS).

⁵ National Council of Real Estate Investment Fiduciaries.

⁶ Total sums to 97.3%. Board of Trustees Discretionary Account and the Overlay account for the remaining 2.7%.

Letter from Chief Investment Officer (continued)

purchases or reducing their balance sheets, particularly the U.S. Fed, which in September raised the Fed Funds rate by 25 bps for the third time in 2018, signaled its intention to raise the rate again at its December meeting, and continued its slow and steady roll-off of its balance sheet. U.S. inflation was subdued, and unemployment was very low, while the economy was running near full capacity. Brexit concerns were mostly ignored by the markets during the quarter.

During the second quarter of the fiscal year, the markets became very concerned about deteriorating trade negotiations between the U.S. and China as both sides announced more tariffs on each other's exports into their countries. The two main points of contention were China's protectionism and its activities regarding the acquisition of foreign technology. Further unsettling the markets were the budget impasse between the Trump Administration and Democrats in Congress, resulting in a partial U.S. government shutdown, and the economic impact of Brexit as the approaching deadline loomed and then was delayed. U.S. large cap stocks were hit severely during the quarter, while small cap stocks, which generate most of their revenue domestically, fared much better but still suffered significant losses. During December volatility materially increased with the S&P 500 index experiencing several plus/minus two to five percent daily moves in an environment of high trading volumes and low market liquidity, particularly during the holiday season. Internationally, equity markets dropped even more than in the U.S., resulting in a 20 percent drawdown of global equity valuations between the high in late September and Christmas Eve. The day after Christmas, global equity markets began a strong and prolonged rally, with only one retreat in May 2019 that lasted through the rest of the fiscal year. As expected, the U.S. Fed increased the Fed Funds rate by 25 bps in December for the fourth time in 2018 to a target of 2.50%, but lowered its rate increase trajectory for 2019. This resulted in a yield curve steepening beyond five years but created a virtually flat yield curve at 2.50% out to five years, indicating no more rate increases and continued low inflation expectations for the next five years.

From the beginning of January 2019 to the end of April 2019 capital market sentiment turned back to "risk on". Equity markets were exuberant with global equities up about 16 percent, despite no resolution to the U.S. – China trade dispute and the Brexit deadline postponed as the U.K struggled to approve an exit agreement with the E.U. May 2019 saw a near correction of the stock market, as global equities dropped about 6 percent, but quickly bounced back in June 2019 recovering all the May losses. By the end of the fiscal year, several U.S. equity indexes were approaching all-time highs. U.S. Fed officials meanwhile delivered dovish comments, while other central banks expressed their commitment to provide accommodative monetary policy as conditions warrant to keep their economies from slipping into recession. Congress and the Trump Administration reached a budget compromise in early February, although bitter partisan politics continued in Washington, D.C. clouding the economic and political landscape. The shift in Fed policy in June to accommodative and the expectation of a 50 basis point decrease in the Fed Funds rate during the last of half of 2019 fueled the U.S. stock market rally. The ten-year Treasury finished the month at 2.00%, down 69 bps since the end of December 2018. The last half of the 2019 fiscal year was extremely favorable for equities and long-term bonds with both experiencing double digit returns, while trend followers, intermediate bonds and macro strategies experienced high single digit returns. Market risk indicators and the U.S. dollar were also strong during this six-month period.

Overall, the 2019 fiscal year was a time of transition from a global economic expansion to positive but slowing growth as trade tensions grew between the U.S. and China. Major central banks changed their

Letter from Chief Investment Officer (continued)

policies from tightening to accommodative to avert recession. The steep drawdown in equity markets between late September and late December dampened portfolio returns for the fiscal year. Numerous macro risks persisted – open conflicts in the Middle East with aggressive involvement by Russia and Iran, intermittent terrorist acts across the globe, stalled negotiations between the U.S. and North Korea on reaching a denuclearization agreement, the lingering trade dispute between China and the U.S., the delays in Brexit resolution, the absorption of migrants into the E.U., high unemployment in Southern E.U., negative interest rates in Europe and Japan, and slowing growth in China. Despite these many macro risks, the capital markets outlook for fiscal year 2020 is positive, although this is far from certain.

PORTFOLIO RESTRUCTURING ACTIVITY

Unlike the last few fiscal years, fiscal year 2019 was less about transitioning the portfolio (to the risk-based categorizations) and more about refining the portfolio. Highlights included:

- Increasing the crisis risk offset target allocation from 13% to 16% (actual allocations were 12.6% and 15.7%, respectively) from fiscal year 2018 to fiscal year 2019, adding three new investment managers and terminating two managers, finishing the fiscal year with ten managers.
- Committing additional capital to credit strategies including \$0.5 billion to a new liquid credit manager.
- Committing \$0.5 billion of additional capital to the private equity program. This is in line with increasing private equity from a 9.0% allocation to the long-term target allocation of 13.5% to private equity by 2022. This pacing is in line with the buildout of this risk category that was initiated in fiscal year 2016, one year after the Board approval of the new risk-based asset allocation, at which time the target allocation to private equity was 4%.
- Committing \$0.3 billion of capital to build out the real estate and infrastructure program.⁷
- Establishing an overlay account to securitize uninvested cash in late May. In its short time since inception the overlay added 8 basis points to 2019 fiscal year performance.

By the end of the fiscal year, the traditional growth component of the broad growth class restructuring was complete with the addition of a global active equity small capitalization manager. As of fiscal year-end, traditional growth represented 29% of the ERS Strategic Target Portfolio, while the stabilized growth component of the broad growth class represents about 30% of the ERS Strategic Target Portfolio. The credit component and core real estate component restructurings are still in progress. The private growth portfolio, which consists of private equity and non-core real estate, currently represents about 12% of the ERS portfolio and is expected to increase to 18% by 2021 in line with the historical and current pacing plans for private investments. The crisis risk offset portfolio and principal protection portfolio restructurings are complete, although crisis risk offset is expected to increase in size from 15% currently to 20% of the ERS Strategic Target Portfolio by the end of fiscal

⁷ Between July 1, 2018 and June 30, 2019, \$300 million in real estate investments were recommended for investment. Actual closing dates on commitments may be outside of that window.

Letter from Chief Investment Officer (continued)

year 2020. The real return portfolio restructuring is only 30% completed, as assets are targeted to grow from 3% to 10% of the ERS Strategic Target Portfolio in 2020, with additional investments in agriculture, commodities and infrastructure. The ERS Portfolio is now approximately 80% of the way from the complete remaking of the former traditional asset class portfolio into the new “risk aware” portfolio. This risk awareness means that the portfolio employs dynamic strategies such as those in the crisis risk offset portfolio that automatically adjust to changing market conditions by increasing exposure to risk assets when market conditions are favorable and reducing exposure to risk assets when market conditions are unfavorable. This restructuring along with ongoing professional management of the trust’s assets will greatly increase the potential for the overall pension plan to remain a sustainable program

PORTFOLIO ANALYSIS & CONCEPTUAL REDESIGN

The ERS investment staff continues to focus on (1) achieving the 7.0% target rate of return over the long term and (2) staying on the path toward the Plan becoming fully funded fiscal year 2045. To accomplish this, ERS is gradually diversifying the risks in the portfolio; increasing the proportion of return that comes from income rather than capital gains; refining processes for securitizing uninvested cash, rebalancing strategies, managing risks, and transitioning capital that lead to higher returns; acquiring research and market insights that lead to selecting better strategies and managers; negotiating favorable fee arrangements with managers and service providers; and cost-effectively expanding resources and internal investment staff who will take on responsibilities currently performed by higher cost external managers and service providers. The benefits of increasing investment staff in fiscal year 2014 has far outweighed the cost through significant improvements in manager selection, fee reductions from negotiations with managers and service providers, and improved capital utilization. Future staff additions will extend cost savings and increase returns. The changes already made and being planned will result in the portfolio being able to stay close to the full funding path over a wide range of market scenarios. For example, both stress and historical scenario testing indicate the portfolio would sustain only about half the losses as the ERS portfolio actually experienced in the 2008 to early 2009 financial crisis. As designed, furthermore, crisis risk offset strategies and stabilized growth strategies have reduced risk and trimmed losses during the equity market corrections that have occurred since they were implemented.

Office Development

The 2019 fiscal year was the fifth complete year for the investment team in the Investment Office. In addition, the ERS promoted one current Investment Specialist to Investment Officer, allocating one Investment Officer to real estate and one to private equity where before one person was tasked with overseeing all of real estate and private equity. The promotion and separation of duties has enabled each officer to conduct more thorough research and manager selection than previously possible due to bandwidth constraints.

The team now consists of four Investment Officers, one Investment Specialist, one Chief Investment Officer (CIO), and one Administrative Assistant. In July 2018 the Board of Trustees completed its search for a new Chief Investment Officer. CIO Burton joined the ERS officially in October 2018, creating and implementing a new business plan for the Investment Office that will allow the ERS to achieve its long-term risk and return goals; this plan will involve the Office taking on new responsibilities, hiring additional staff and acquiring necessary investment tools. It is expected that the actions taken during the next few years to build out the Investment Office will greatly increase the potential for the overall pension plan to remain a sustainable program.

*Letter from Chief Investment Officer (continued)***OUTLOOK**

The capital market outlook for 2019 is uncertain although not unfavorable. Although there is still a risk of a recession in the coming years, the first half of 2020 has the potential for gains in equity markets given global central bank easing and potential de-escalation of the U.S. - China trade war. While the Federal Reserve (“Fed”) cut interest rates in calendar year 2018, in calendar year 2019 the Fed cut rates three times, reversing nearly all of the 2018 increases. The minutes of the October 2019 Fed meeting indicated that most Fed governors believed the 2019 cuts would be enough to support moderate growth, a strong job market, and inflation rising beyond the 2 percent target level. While it is expected that the Fed will now pause, global central banks should continue to ease thereby stimulating both the U.S. and global economies and produce positive growth in 2020. In fixed income markets, easing recession fears should advance bond yields. On the positive side, in the U.S. we continue to experience low inflation and low unemployment despite slowing growth. On the negative, climbing wages and lower growth should result in downward margin and productivity pressure which, combined with trade pressures, could reduce business spending and hiring. Given this backdrop, we expect higher volatility particularly as the year progresses given the November U.S. presidential election.

Our portfolio, like most institutional portfolios, continues to be strongly tilted towards global economic growth (re: equities). However, in anticipation of a period of declining growth, we will be expanding our allocation to diversifiers (strategies lowly correlated to equity markets) and maintaining some “dry powder” to take advantage of opportunities that will provide positive returns during a difficult time for U.S. equities. We have a very liquid portfolio, which should be a source of competitive advantage versus peer institutions in a downturn or correction.

In fiscal year 2019 the investment office was able to secure some of the critical tools it needs to fulfill its responsibilities and capabilities. The office was also able to expand with a new Chief Investment Officer and an additional Investment Officer. Nevertheless, the investment office remains lean—in terms of both staff and systems—and will continue to seek the resources necessary to execute on its new asset allocation plan, particularly considering impending market turbulence and a challenging return environment for institutional portfolios. While we are an experienced and talented office, tools that can enhance our analysis and expand our efficiency will be crucial. The opportunity cost of not getting these resources remains significant—most likely in the hundreds of millions of dollars annually. Out of necessity for the specific needs of our Plan, the staff, with the oversight of the Trustees and assistance of the three ERS consultants, has constructed a “risk aware” portfolio that will be better able to withstand the episodic market downturns we are sure to face in the future. Our goal is also to position the ERS to take advantage of the valuation displacements that these crises create by allowing staff to redeploy ERS capital to these opportunities. We have a sophisticated, intricate plan that requires sophisticated tool and analysis for proper execution.

It is an honor to serve the members and beneficiaries of the System as your Chief Investment Officer. I would like to thank the Board of Trustees and staff for their support and dedication as we endeavor to manage the assets of the plan as prudently and efficiently as possible.

Respectfully yours,

Elizabeth T. Burton

Elizabeth T. Burton
Chief Investment Officer



MEMORANDUM

January 15, 2020

Board of Trustees
Employees' Retirement System of the State of Hawaii
City Financial Tower
201 Merchant Street, Suite 1400
Honolulu, HI 96813-2980

Dear Trustees:

Enclosed is our report on the investment activity for the Employees' Retirement System of the State of Hawaii ("ERS") for periods ending June 30, 2019, as requested by the Government Financial Officers' Association (GFOA).

Hawaii ERS - Total Fund Performance

The total assets of the Retirement System were approximately \$17.2 billion as of June 30, 2019, an increase of roughly \$690 million for the fiscal year. The ERS Total Fund generated positive absolute and relative returns throughout the majority of the portfolio. The investment return for the Total Fund, expressed as a time-weighted total rate of return, was +6.0% for the 2019 fiscal year compared to the benchmark's return of +4.7% and the Investment Metrics Public Funds Greater than \$1 Billion Database (which includes the previously utilized BNY Mellon >\$1B Database) peer median return of +5.9%. For the three-year period ending June 30, 2019, the Total Fund returned 9.1% per annum versus the benchmark's return of +8.0% and the Investment Metrics Public Funds Greater than \$1 Billion Database peer median return of +9.2%. For the trailing five-year period ending June 30, 2019, the Total Fund returned +6.1% per annum versus the benchmark's return of +5.3% and the Investment Metrics Public Funds Greater than \$1 Billion Database peer median return of +6.2%. The Total Fund's returns over all examined periods were consistent with the global capital markets, and in particular, were primarily driven by the public global equity markets.

Strategic Class Performance

In 2014, the ERS adopted a risk-based, functional framework for allocating capital within the Total Fund. This framework makes use of strategic/functional classes that in-turn utilize underlying asset classes and strategies. During the 2018 fiscal year, the ERS completed the remapping of all of the prior asset classes to various risk-based, functional strategic classes. Based on these changes, the verbiage below highlights the performance of the ERS's risk-based strategic classes.

M E K E T A I N V E S T M E N T G R O U P

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Letter from Investment Consultant (continued)

Memorandum
January 15, 2020
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As calculated by BNY Mellon, the ERS's custodial bank, the Broad Growth class produced a +6.1% return for the fiscal year versus the Broad Growth benchmark's return of +4.8%. The Broad Growth class utilizes three sub-components: 1) Traditional Growth, 2) Stabilized Growth, and 3) Private Growth. The Traditional Growth sub-component generated a +4.8% return for the fiscal year, the Stabilized Growth sub-component produced a +4.5% return for the fiscal year, and the Private Growth sub-component generated an +14.9% return for the fiscal year. The Principal Protection class produced a +5.4% return for the fiscal year. The Real Return class produced a return of +6.3% for the year ending June 30, 2019. The Crisis Risk Offset ("CRO") class produced a return of +6.8% for the fiscal year.

The four major strategic classes above utilize seventeen underlying sub-asset classes. These classes are (in order of size): Options-based Equity, Passive Public Equity, Active Public Equity, Private Equity, Global Intermediate Fixed Income, Low Volatility Equity, Trend Following Strategies, Alternative Return Capture Strategies, Extended Global Credit, Long Duration Fixed Income, Core Real Estate, Non-Core Real Estate, Inflation-linked Fixed Income, Other Investments, Timber, Infrastructure, and Opportunities. Performance of these various classes is provided in the Investment Results section of this letter.

Furthermore, as a result of the 2015 Asset-Liability Study that was finalized in the 2016 fiscal year, it is expected that the ERS's implementation of its long-term strategic allocation will be largely completed by the end of the 2020 fiscal year.

Market Conditions

While the start of fiscal 2019 may have been characterized by worries of rising interest rates globally, this theme quickly shifted throughout the year as increasing concerns of slowing global growth – made worse by trade tensions between the U.S. and China – prompted major central banks to consider more accommodative policies. In the U.S., the Federal Reserve held the federal funds rate steady at its June meeting, while signaling the potential for future interest rate cuts. The European Central Bank (ECB) also held rates steady with a potential for further reductions, and the Bank of Japan showed no signs of pulling back from its unprecedented monetary stimulus. Of all the central banks, the U.S. has the most room to lower rates, while Japan and Europe are already in negative territory. With growth revisions for 2019 and 2020 (IMF forecast of 3.2% and 3.5% respectively) down by 0.1%, key risks to monitor will not only be trade tensions between the U.S. and China, but declining growth in China, political uncertainty in Europe, and risks related to Brexit.

While global equities rebounded significantly from December lows to close out the June 2019 fiscal year, the past twelve months certainly saw heightened volatility. The VIX reached 36 in December before re-tracing to 25 and further retreating to around 15 by the June 30 fiscal year-end. Nonetheless, for much of the fiscal year, most markets embraced a "risk on" appetite.

U.S. equities, as represented by the Russell 3000 Index, closed out the fiscal year with an 8.98% return. Non-U.S. equity markets did not fare as well. Emerging markets delivered negative returns

Letter from Investment Consultant (continued)

Memorandum

January 15, 2020

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in the first half of the fiscal year, but reversed course in the second half, finishing the fiscal year with a 1.21% return. Trade tensions and a strong U.S. dollar continued to weigh on results. The MSCI EAFE Index, representing foreign developed markets, followed closely behind returning 1.08%. Overall growth has declined in Europe given the slowdown in Germany, uncertainties related to Brexit, and trade tensions.

The trend of U.S. growth stocks outperforming value stocks persisted throughout the year, with growth holding a 3.26% lead over value, as the Russell 3000 Growth Index closed out the year with a 10.60% return, versus 7.34% for the Russell 3000 Value Index.

Within fixed income, investment grade markets closed out the fiscal year on a strong note. Throughout the first half of fiscal year 2019, concerns over rising interest rates and inflation created headwinds. In the U.S., the Federal Reserve increased short-term interest rates to a range of 2.25% to 2.50% by December, but this hawkish stance turned dovish in the second half of the fiscal year as central banks abruptly shifted to a more accommodative policy by early January. Investment grade credit and high yield bonds rebounded alongside the equity markets as a result, with the high yield market posting one of the strongest returns in nearly 10 years (7.26% for the quarter ending March 31, 2019). Despite this, the deterioration of U.S. and China trade talks in May prompted a temporary drop in global equity prices and U.S. Treasury yields. The 3mo-10yr segment of the yield curve inverted for the second time in 2019, causing investors to question whether this might be a sign of worse to come. Historically, the yield curve has been relied on as a barometer of economic strength and as a potential recession indicator. Inversions in the yield curve have historically preceded recessions, with a few exceptions.

Over the fiscal year, the broad U.S. bond market, represented by the Bloomberg Barclays Aggregate Index, returned 7.87%, high yield bonds returned 7.48%, and TIPS returned 4.84%. Emerging market bonds (as represented by the JPM GBI-EM Global Diversified Index) posted an 8.99% return for the fiscal year.

Within other asset classes, natural resource stocks (S&P Global Natural Resources Index) returned -4.02%, commodities (Bloomberg Commodity Index) lost -6.75%, and REITs (MSCI U.S. REIT Index) gained 9.66%. WTI crude oil settled at \$58.72/barrel, down roughly 5% from the prior fiscal year-end levels, but well above the December 31 value of \$40.41. OPEC-led production cuts along with sanctions on Iran and Venezuela drove the higher prices, tempered by the slowing global economy.

Sincerely,



Neil Rue, CFA
Managing Principal



Colin Bebee, CFA
Principal

Report on Investment Activity by Investment Consultant (continued)

Memorandum
 March 27, 2019
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**Report on Investment Activity for the
 Employees' Retirement System of the State of Hawaii**
 Prepared by Meketa Investment Group, Inc.
 June 2019

Outline of Investment Policies

The primary goal of the Plan is the preservation of capital. The Board of Trustees seeks preservation of capital with a consistent, positive return for the Fund. Although pure speculation is to be avoided, the Board appreciates the fact that the Plan's target level of return is associated with a certain degree of risk. Risk to be assumed must be considered appropriate for the return anticipated and consistent with the total diversification of the Fund.

Strategic Allocation Policy

A formal asset-liability study is conducted every three-to-five years to verify or amend the Plan's policy targets. The targets are designed to achieve a certain level of return, and associated level of risk, that is aligned with the Plan's goals and objectives. The targets are evaluated on the basis of assets designated to each strategic class by the Board, rather than on a current invested position. The targets are pursued primarily by cash flow on a long-term basis and if significant changes occur within the economic and/or capital market environment according to the rebalancing guidelines. The targets are to be reviewed annually for reasonableness relative to significant economic and market changes. The Board of Trustees initiated a new asset-liability study during fiscal year 2015 that was completed during fiscal year 2016. As of the end of the 2019 fiscal year, the Board of Trustees is in the middle of a new asset-liability study. As a result of the 2015 Asset-Liability Study, the Board adopted a new long-term strategic allocation policy which included evolving policy targets designed to efficiently transition the Plan to the new long-term strategic allocation over time. It is expected that the ERS's implementation of the new long-term strategic allocation will be largely completed by the end of the 2020 fiscal year. The 2015 Asset-Liability Study, and the approved long-term strategic allocation, fully incorporated a risk-based, functional allocation framework.

Strategic Allocation Policy (as of 6/30/2019)

At the end of the fiscal year, the Plan was strategically invested in the following classes:

Strategic Allocation (functional/risk-based classes)	
Broad Growth	68%
Principal Protection	8%
Real Return	8%
Crisis Risk Offset	16%
 Total	 100%

The above strategic allocation is supported by seventeen underlying sub-asset class (see supporting pages).

Report on Investment Activity by Investment Consultant

Memorandum

January 15, 2020

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Long-Term Strategic Allocation Policy

As a result of the formal asset-liability study that began in fiscal year 2015 and was completed in fiscal year 2016, the Board adopted a new long-term strategic allocation policy. It is expected that final implementation and allocations across the new long-term strategic allocation policy will be largely completed by the end of the 2020 fiscal year.

Expected Annualized Return and Risk

Based on custom 2019 capital market assumptions, the target allocation classes are expected to achieve the long-term geometric average returns as shown in the following table. The annual nominal returns will vary on a year-by-year basis but are expected to approach the long-term annualized return expectations over time.

Long-Term Strategic Allocation Targets

The ERS will strategically invest in the following asset classes:

Strategic Allocation (risk-based classes)	Strategic Class Weights	Expected Long-term Geometric Average Return	Expected Long-term Real Return¹	Expected Annual Standard Deviation
Broad Growth	63%	7.65%	5.40%	17.35%
Principal Protection	7%	3.00%	0.75%	4.00%
Real Return	10%	4.55%	2.30%	6.10%
Crisis Risk Offset	20%	5.15%	2.90%	9.45%
Total Portfolio	100%			

¹ Uses an expected inflation of 2.25%

Evolving Strategic Allocation Policy

Implementation Plan for Long-term Strategic Policy			
	Current (6/30/2019)	1/1/2020	Long-Term 7/1/2020
Broad Growth	68%	64%	63%
Principal Protection	8%	7%	7%
Real Return	8%	9%	10%
Crisis Risk Offset	16%	20%	20%
Opportunities	0%	0%	0%
Total Portfolio	100%	100%	100%

Report on Investment Activity by Investment Consultant (continued)

Memorandum
March 27, 2019
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Manager Evaluation

Public markets managers are measured against relevant indices and/or their respective peer groups of managers. Market indices and peer group benchmarks (when applicable) are assigned to each manager and are intended to serve as a guide for the investment manager to understand the risk/reward posture of their portfolio. Private markets managers are measured against public market proxies, relevant peer groups, and/or specialized indices (when applicable). Managers have full discretion to manage the risk posture of their portfolios relative to their designated market index and may, with conviction and appropriate expertise, execute security strategies not reflected by their market index as long as they conform to the investment guidelines and the laws of the State of Hawaii.

Investment Practices

The full Employees' Retirement System of the State of Hawaii Investment Policy, Guidelines, and Procedures Manual (Manual) describes, in detail, acceptable investment practices, manager reporting requirements, manager performance guidelines, distribution of brokerage commissions, and securities lending guidelines. Material revisions to the Manual occurred during each of the last seven fiscal years and will continue to transpire throughout the evolution of the Plan. A current version of the Manual is located on the ERS's website.

All rates of return are calculated using methodologies that are generally in-line with the Global Investment Performance Standards (GIPS). All public markets manager returns are time-weighted rates of return based on daily or monthly custodial data. All private markets manager returns seek to accurately represent cash flows and appraisal values. The ERS's custodian bank is the primary entity responsible for performance reporting.

Report on Investment Activity by Investment Consultant (continued)

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Investment Results as of June 30, 2019 (Risk-based Classes):

	Performance - Year Ended June 30,					3 Years Ended	5 Years Ended
	2019	2018	2017	2016	2015	6/2019	6/2019
Broad Growth *	6.09%	9.76%	17.42%	(2.62%)	---	10.99%	---
Broad Growth Blended Index ¹	4.78%	9.50%	14.39%	(2.17%)	---	9.48%	---
Principal Protection	5.44%	0.94%	1.94%	3.11%	2.78%	2.75%	2.83%
Principal Protection Blended Index ²	6.04%	0.63%	-0.02%	4.24%	1.72%	2.18%	2.50%
Crisis Risk Offset**	6.83%	4.20%	---	---	---	---	---
Crisis Risk Offset Blended Index ³	4.38%	1.58%	---	---	---	---	---
Real Return	6.30%	6.63%	2.60%	5.33%	5.37%	5.16%	5.24%
CPI + 3%	4.71%	5.88%	4.70%	4.05%	3.17%	5.13%	4.53%
Total Fund	6.00%	7.85%	13.68%	(0.78%)	4.23%	9.13%	6.09%
Composite Benchmark ⁴	4.65%	7.67%	11.87%	(0.04%)	2.75%	8.02%	5.30%
Median Fund***	5.90%	8.68%	12.63%	0.43%	3.11%	9.20%	6.20%

* Per BNY Mellon data, the Broad Growth composite was inception 10/1/2014. Contains lagged and non-lagged components.

** Per BNY Mellon data, the Crisis Risk Offset composite was inception 4/1/2017.

*** Universe data provided by by Investment Metrics and/or BNY Mellon. Total Fund universe is the Public Funds > \$1 billion.

¹ 78.0% MSCI ACWI IMI ND, 6.8% CBOE BXM Index, 5.1% BBG BC Global Credit (hedged) Index, 3.4% BBG BC Global High Yield (hedged) Index, 1.7% S&P LSTA Leveraged Loan Index, and 5.0% MSCI ACWI IMI ND (quarter lagged) + 2% through 12/31/15;

77.0% MSCI ACWI IMI ND, 6.8% CBOE BXM Index, 5.1% BBG BC Global Credit (hedged) Index, 3.4% BBG BC Global High Yield (hedged) Index, 1.7% S&P LSTA Leveraged Loan Index, and 6.0% MSCI ACWI IMI ND (quarter lagged) + 2% through 6/30/16;

45.0% Stabilized Growth Blended Benchmark, 45.0% Traditional Growth Blended Benchmark, and 10.0% Private Growth Blended Benchmark through 12/31/17;

43.0% Stabilized Growth Blended Benchmark, 43.0% Traditional Growth Blended Benchmark, and 14.0% Private Growth Blended Benchmark through 12/31/18;

41.0% Stabilized Growth Blended Benchmark, 41.0% Traditional Growth Blended Benchmark, and 18.0% Private Growth Blended Benchmark thereafter.

² 100% BC Aggregate Index through 6/30/08;

85% BC US Universal Index and 15% Multiverse Non-US (hedged) Index through 9/30/14;

100% BC Global Intermediate Aggregate ex. Credit (hedged) Index through 12/31/17;

55% BBG BC US Intermediate Aggregate ex. Credit Index and 45% BBG BC Global Intermediate Aggregate ex. Credit (hedged) Index thereafter.

³ 30.0% 90-Day T-Bill +5%, 45.0% MLM Global Index LT 15V, and 25.0% BBG BC US Treasury Long Term Index through 3/31/19;

40% 90-Day T-Bill +2.5%, 35.0% MLM Global Index LT 15V, and 25.0% BBG BC US Treasury Long Term Index thereafter.

⁴ 34.9% S&P 500 Index, 4.5% S&P 400 Mid Cap Index, 4.5% Russell 2000 Index, 14.5% MSCI EAFE Free ND Index, 2.5% MSCI Emg Mkts ND Index, 7.5% NCREIF Property Index lagged, 3.6% Alternative Investments, 21.0% BC Aggregate Index, and 7.0% CG WGBI ex US Index through 12/31/08;

41.0% Russell 3000 Index, 14.5% MSCI EAFE Free ND Index, 2.5% MSCI Emg Mkts ND Index, 9.0% NCREIF Property Index lagged, 5.0% Alternative Investments, 21.0% BC Universal Index, and 7.0% BC Multiverse ex US Hedged Index through 6/30/11;

41.0% Russell 3000 Index, 14.5% MSCI World ex US ND Index, 2.5% MSCI Emg Mkts ND Index, 9.0% NCREIF Property Index lagged, 5.0% Alternative Investments, 21.0% BC Universal Index, and 7.0% BC Multiverse ex US Hedged Index through 9/30/11;

35.0% Russell 3000 Index, 18.0% MSCI World ex US ND Index, 3.0% MSCI Emg Mkts ND Index, 7.0% NCREIF Property Index lagged, 5.0% Private Equity, 5.0% Real Return, 18.0% BC Universal Index, 6.0% BC Multiverse ex US Hedged Index, and 3.0% CBOE BXM Index through 6/30/12;

30.0% Russell 3000 Index, 26.0% MSCI ACWI ex US ND Index, 7.0% NCREIF Property Index lagged, 6.0% Private Equity, 5.0% Real Return, 15.75% BC Universal Index, 5.25% BC Multiverse ex US Hedged Index, and 5.0% CBOE BXM Index through 6/30/13;

30.0% Russell 3000 Index, 26.0% MSCI ACWI ex US ND Index, 7.0% NCREIF Property Index lagged, 7.0% Private Equity, 5.0% Real Return, 15.0% BC Universal Index, 5.0% BC Multiverse ex US Hedged Index, and 5.0% CBOE BXM Index through 9/30/14;

76% Broad Growth Blended Benchmark, 12% BC Global Intermediate Aggregate ex. Credit (hedged) Index, 5% CPI + 3%, and 7% NCREIF Property Index (quarter lagged) through 6/30/16;

83.0% Broad Growth Blended Benchmark, 12.0% BC Global Intermediate Aggregate ex. Credit (hedged) Index, and 5.0% CPI + 3%, through 3/31/17;

76.0% Broad Growth Blended Benchmark, 9.0% Principal Protection Blended Benchmark, 5.0% CPI + 3%, and 10% Crisis Risk Offset Blended Benchmark through 12/31/17;

72.0% Broad Growth Blended Benchmark, 8.0% Principal Protection Blended Benchmark, 7.0% CPI + 3%, and 13% Crisis Risk Offset Blended Benchmark through 12/31/18;

68.0% Broad Growth Blended Benchmark, 8.0% Principal Protection Blended Benchmark, 8.0% CPI + 3%, and 16% Crisis Risk Offset Blended Benchmark thereafter.

Report on Investment Activity by Investment Consultant (continued)

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Investment Results as of June 30, 2019 (Risk-Based Classes – Sub-Components):

	Performance - Year Ended June 30,					3 Years Ended	5 Years Ended
	2019	2018	2017	2016	2015	6/2019	6/2019
Broad Growth*	6.09%	9.76%	17.42%	(2.62%)	---	10.99%	---
Broad Growth Blended Index ¹	4.78%	9.50%	14.39%	(2.17%)	---	9.48%	---
Traditional Growth	4.78%	12.46%	21.98%	(4.82%)	2.67%	12.86%	7.03%
Traditional Growth Blended Index ²	4.56%	11.14%	19.01%	(3.87%)	1.20%	11.42%	6.12%
Active Public Equity***	3.32%	12.50%	23.68%	---	---	12.86%	---
Active Public Equity Index ³	3.08%	11.67%	19.31%	---	---	11.15%	---
Median Fund***	6.09%	11.05%	19.77%	---	---	12.00%	---
Passive Public Equity****	6.07%	12.10%	19.87%	---	---	12.54%	---
MSCI ACWI ND	5.74%	10.73%	18.78%	---	---	11.62%	---
Median Fund***	6.09%	11.05%	19.77%	---	---	12.00%	---
Stabilized Growth*	4.48%	5.24%	10.85%	4.24%	---	6.82%	---
Stabilized Growth Blended Index ⁴	5.58%	5.60%	9.21%	4.56%	---	6.78%	---
Core Real Estate**	4.13%	6.19%	8.68%	14.86%	18.78%	6.32%	10.39%
NCREIF Blended Index ⁸	6.55%	7.11%	7.27%	11.84%	12.72%	7.00%	9.17%
Extended Global Credit*	8.18%	0.69%	8.06%	4.74%	---	5.58%	---
Ext Global Credit Blended Index ⁵	8.27%	1.53%	7.12%	4.83%	---	5.60%	---
Low Volatility Equity****	4.91%	8.99%	---	---	---	---	---
MSCI ACWI Min Volatility Index	13.00%	7.33%	---	---	---	---	---
Options-Based Equity*	3.39%	5.24%	12.19%	3.57%	---	6.87%	---
Options-Based Blended Index ⁶	1.85%	5.82%	11.51%	3.99%	---	6.07%	---
Private Growth	14.94%	15.36%	18.60%	5.17%	12.83%	16.29%	13.29%
Private Growth Blended Index ⁷	3.89%	17.03%	17.37%	(2.36%)	7.64%	12.58%	8.44%
Non-Core Real Estate**	9.55%	10.86%	12.09%	14.98%	18.91%	10.83%	13.23%
Private Growth Blended Index ⁷	3.89%	17.03%	17.37%	(2.36%)	7.64%	12.58%	8.44%
Private Equity**	16.55%	16.57%	20.29%	5.26%	12.70%	17.79%	14.16%
Private Growth Blended Index ⁷	3.89%	17.03%	17.37%	(2.36%)	7.64%	12.58%	8.44%

*Per BNY Mellon data, the composite was inception 10/1/2014. The Broad Growth and Stabilized Growth composites contain lagged and non-lagged components.

**Lagged one quarter.

*** Universe data provided by BNY Mellon.

****Per BNY Mellon data, the Active and Passive Public Equity composites were inception 7/1/2016 and the Low Volatility Equity composite was inception 9/1/2016.

¹ 78.0% MSCI ACWI IMI ND, 6.8% CBOE BXM Index, 5.1% BBG BC Global Credit (hedged) Index, 3.4% BBG BC Global High Yield (hedged) Index, 1.7% S&P LSTA Leveraged Loan Index, and 5.0% MSCI ACWI IMI ND (quarter lagged) + 2% through 12/31/15;

77.0% MSCI ACWI IMI ND, 6.8% CBOE BXM Index, 5.1% BBG BC Global Credit (hedged) Index, 3.4% BBG BC Global High Yield (hedged) Index, 1.7% S&P LSTA Leveraged Loan Index, and 6.0% MSCI ACWI IMI ND (quarter lagged) + 2% through 6/30/16;

45.0% Stabilized Growth Blended Benchmark, 45.0% Traditional Growth Blended Benchmark, and 10.0% Private Growth Blended Benchmark through 12/31/17;

43.0% Stabilized Growth Blended Benchmark, 43.0% Traditional Growth Blended Benchmark, and 14.0% Private Growth Blended Benchmark through 12/31/18

41.0% Stabilized Growth Blended Benchmark, 41.0% Traditional Growth Blended Benchmark, and 18.0% Private Growth Blended Benchmark thereafter.

² 62.5% Russell 3000 Index, 5.4% MSCI EM ND, and 32.1% MSCI ACWI ex US ND through 6/30/12;

53.6% Russell 3000 Index and 46.4% MSCI ACWI ex US ND through 9/30/14;

100% MSCI ACWI IMI ND thereafter.

³ 30.0% MSCI ACWI Small Cap ND and 70.0% MSCI ACWI ND.

⁴ 30.0% BBG BC Global Credit (hedged) Index, 10.0% S&P LSTA Leveraged Loan Index, 40.0% CBOE BXM Index, 20.0% BBG BC Global High Yield (hedged) Index through 6/30/16;

15.0% NCREIF Property Index (quarter lagged); 8.5% BBG BC Global Credit (hedged) Index, 2.8% S&P LSTA Leveraged Loan Index, 8.5% ICE ML 3-month Treasury Bill, 8.5% MSCI ACWI ex US ND, 17.0% CBOE BXM Index, 5.7% BBG BC Global High Yield (hedged) Index, 17.0% MSCI ACWI Minimum Volatility ND, and 17.0% CBOE Put-Write Index through 12/31/18; NCREIF Property Index (quarter lagged) replaced with NCREIF ODCE Net (quarter lagged) thereafter.

⁵ 50.0% BBG BC Global Credit (hedged) Index, 16.7% S&P LSTA Leveraged Loan Index, and 33.3% BBG BC Global High Yield (hedged) Index.

⁶ 100% CBOE BXM Index through 9/30/16; 6.7% ICE ML 3-month Treasury Bill, 16.7% MSCI ACWI ex US ND, 33.3% CBOE BXM Index, and 33.3% CBOE Put-Write Index thereafter.

⁷ 100.0% Russell 3000 (quarter lagged) +3.5% through 9/30/14; 100.0% MSCI ACWI IMI (quarter lagged) +2% thereafter.

⁸ 100.0% NCREIF Property Index (quarter lagged); through 12/31/18; NCREIF ODCE Net (quarter lagged) thereafter

Report on Investment Activity by Investment Consultant (continued)

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Investment Results as of June 30, 2019 (Risk-Based Classes – Sub-Components) [continued]:

	Performance - Year Ended June 30,					3 Years Ended	5 Years Ended
	2019	2018	2017	2016	2015	6/2019	6/2019
Principal Protection (Global Int. Fixed	5.44%	0.94%	1.94%	3.11%	2.78%	2.75%	2.83%
Principal Protection Blended Index ¹	6.04%	0.63%	-0.02%	4.24%	1.72%	2.18%	2.50%
Crisis Risk Offset*	6.83%	4.20%	---	---	---	---	---
Crisis Risk Offset Blended Index ²	4.38%	1.58%	---	---	---	---	---
Alternative Return Capture*	15.39%	13.62%	---	---	---	---	---
90-Day T-Bill + 5%	6.78%	6.43%	---	---	---	---	---
Systematic Trend Following*	0.20%	1.74%	---	---	---	---	---
MLM Global Index LT 15V	(2.10%)	(0.87%)	---	---	---	---	---
Long Duration Fixed Income*	11.94%	(2.36%)	---	---	---	---	---
BBg BC US Treasury Long Term	12.30%	(0.13%)	---	---	---	---	---
Real Return	6.30%	6.63%	2.60%	5.33%	5.37%	5.16%	5.24%
CPI + 3%	4.71%	5.88%	4.70%	4.05%	3.17%	5.13%	4.53%
Global Inflation-Linked Securities	6.91%	4.37%	2.20%	6.42%	3.10%	4.48%	4.58%
BBg BC World Govt Inflation-	6.63%	3.44%	1.93%	7.39%	3.34%	3.98%	4.53%
Infrastructure**	13.63%	10.26%	12.29%	11.13%	---	12.05%	---
CPI + 4%	5.73%	6.91%	5.71%	5.06%	---	6.15%	---
Timber**	3.76%	9.63%	2.66%	2.92%	11.12%	5.31%	5.96%
NCREIF Timberland Index**	2.38%	3.64%	2.90%	10.64%	9.77%	3.27%	4.63%
Opportunities**	3.21%	1.02%	6.04%	---	---	3.40%	---
Other³	(1.20%)	6.13%	6.29%	(1.19%)	0.18%	3.68%	1.98%

*Per BNY Mellon data, the Crisis Risk Offset composite was inception 4/1/2017.

**Lagged one quarter.

¹ 100% BBg BC Aggregate Index through 6/30/08;

85.0% BBg BC US Universal Index and 15.0% Multiverse Non-US (hedged) Index through 9/30/14;

100% BBg BC Global Intermediate Aggregate ex. Credit (hedged) Index through 12/31/17;

55% BBg BC US Intermediate Aggregate ex. Credit Index and 45% BBg BC Global Intermediate Aggregate ex. Credit (hedged) Index thereafter.

² 30.0% 90-Day T-Bill +5%, 45.0% MLM Global Index LT 15V, and 25.0% BBg BC US Treasury Long Term Index.

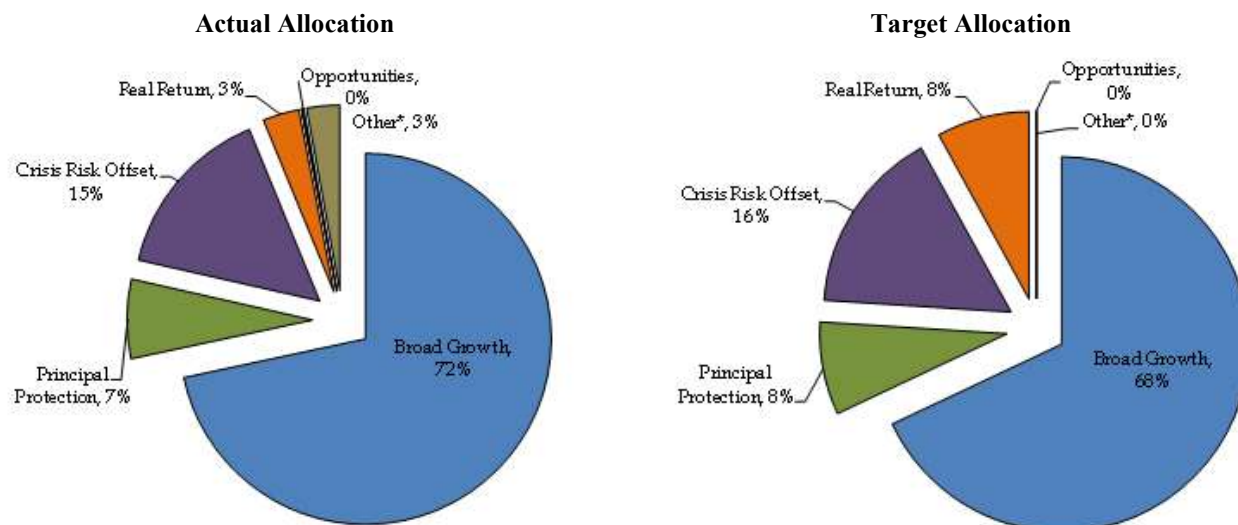
40.0% 90-Day T-Bill +2.5%, 35.0% MLM Global Index LT 15V, and 25.0% BBg BC US Treasury Long Term Index thereafter.

³ Previously 90-day T-Bill + 5% through 3/31/19.⁴ Includes Board of Trustees Discretionary Managed Assets and transition activity/accounts that were in-process at the end of the fiscal year.

Report on Investment Activity by Investment Consultant (continued)

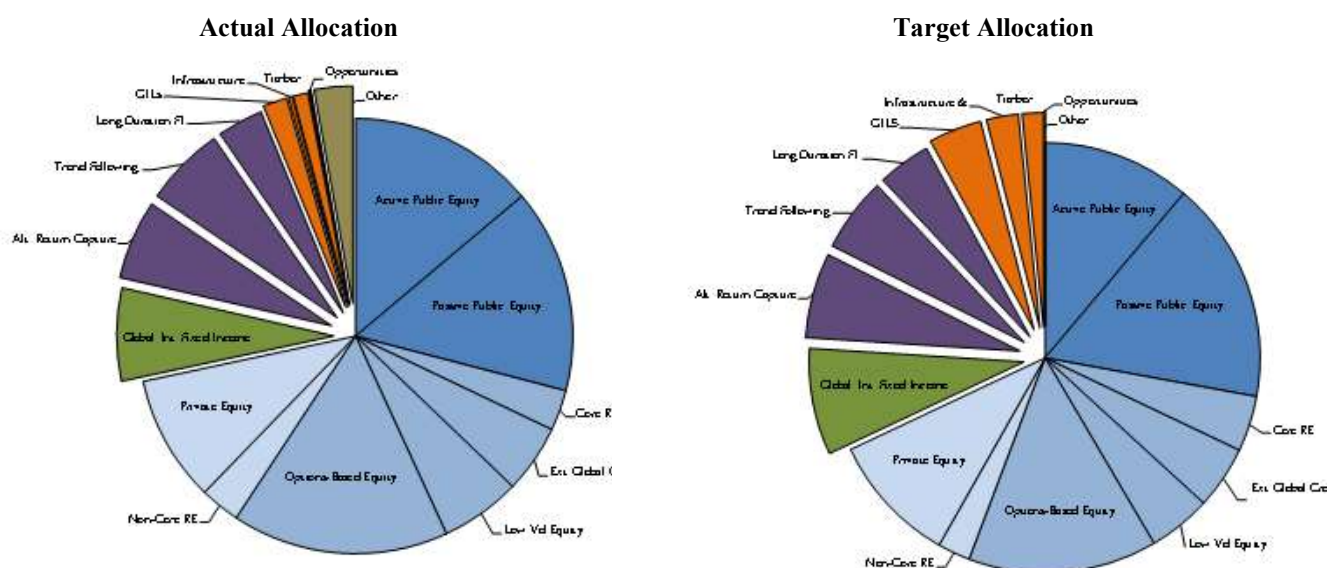
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Strategic Allocation as of June 30, 2019 (Risk-based Classes):



*Includes Board of Trustees Discretionary Managed Assets, and transition activity/accounts that were in-process at the end of the fiscal year

Strategic Allocation as of June 30, 2019 (Risk-based Classes - Sub-Components):



Investment Professionals
INVESTMENT MANAGERS**ACTIVE PUBLIC EQUITY (BROAD GROWTH)**

Longview
 Quantitative Management Associates (QMA)
 Wasatch
 Wellington

PASSIVE PUBLIC EQUITY (BROAD GROWTH)

Blackrock
 Legal and General Investment Management

CORE REAL ESTATE (BROAD GROWTH)

Cabot Industrial
 H/2
 Heitman Capital Management
 Invesco Realty Advisors

EXTENDED GLOBAL CREDIT (BROAD GROWTH)

HPS Credit
 Pacific Investment Management Company
 Tortoise Credit
 Western Asset Management Company

LOW VOLATILITY EQUITY (BROAD GROWTH)

Robeco
 TOBAM

GLOBAL INTERMEDIATE FIXED INCOME (PRINCIPAL PROTECTION)

Bank of Hawaii
 Eaton Vance
 First Hawaiian Bank

OPTIONS-BASED EQUITY (BROAD GROWTH)

AQR
 Gateway
 Neuberger Berman

NON-CORE REAL ESTATE (BROAD GROWTH)

Angelo Gordon
 Almanac
 Blacksand Capital
 Blackrock
 Blackstone Realty
 CB Richard Ellis
 Cerebus
 DRA
 Fortress Japan
 H/2
 Kayne Anderson
 Kohlberg Kravis Roberts
 LaSalle Investment Management
 Lone Star
 Mesa Capital
 Prudential
 Torchlight
 Starwood

PRIVATE EQUITY (BROAD GROWTH)

Hamilton Lane
 I Squared
 Landmark
 Stafford Partners

Continued on next page

INVESTMENT MANAGERS (CONTINUED)**INFLATION-LINKED FIXED INCOME (REAL RETURN)**

Blackrock

INFRASTRUCTURE (REAL RETURN)

Kohlberg Kravis Roberts

TIMBER (REAL RETURN)

Hancock Timber Resource Group

OPPORTUNITIES (OPPORTUNITIES)

Lowe Enterprises

OTHER

Parametric

ALTERNATIVE RETURN CAPTURE STRATEGIES (CRO)

ARP Americas

Bank of New York Mellon

Graham Capital Management

Lombard Odier

P E Global

TREND FOLLOWING STRATEGIES (CRO)

AlphaSimplex

Aspect Capital

Campbell & Company Investment Adviser

Crabel Capital Management

Mount Lucas Management

LONG DURATION FIXED INCOME (CRO)

Ryan Labs Asset Management

OTHER SERVICE PROVIDERS**INVESTMENT ADVISOR**

Meketa Investment Group

AON Hewitt

Hamilton Lane

CUSTODIAL BANK

Bank of New York Mellon

PLATFORM SERVICE MANAGER (CRO)

FRM Investment Management (USA) LLC

Investment Schedules

List of Assets Directly Held (by fair value)*

as of June 30, 2019 (excludes investments in pooled vehicles and index funds)

* A complete list of holdings is available for review upon request.

	<u>Par / Shares</u>	<u>Security</u>	<u>Coupon</u>	<u>Maturity</u>	<u>Average Issue Rating</u>	<u>Fair Value</u>
Domestic Fixed Income						
1	79,190,000	U.S. Treasury Note	1.625%	3/15/2020	AAA	\$ 78,957,973
2	74,000,000	U.S. Treasury Note	1.375%	12/15/2019	AAA	73,766,160
3	70,000,000	U.S. Treasury Note	1.500%	6/15/2020	AAA	69,691,300
4	70,000,000	U.S. Treasury Note	1.375%	9/15/2020	AAA	69,576,500
5	67,300,000	U.S. Treasury Note	1.875%	12/15/2020	AAA	67,331,631
6	60,300,000	U.S. Treasury Note	2.750%	9/15/2021	AAA	61,638,057
7	60,300,000	U.S. Treasury Note	2.625%	12/15/2021	AAA	61,621,173
8	60,300,000	U.S. Treasury Note	2.625%	6/15/2021	AAA	61,305,804
9	60,300,000	U.S. Treasury Note	2.375%	3/15/2021	AAA	60,881,895
10	54,500,000	U.S. Treasury Note	0.875%	9/15/2019	AAA	54,341,950
International Fixed Income						
1	98,432,000	Republic of Poland Government Bond	2.500%	7/25/2026	A2	26,842,912
2	223,798,000	Norway Government Bond 144A	1.500%	2/19/2026	AAA	26,526,065
3	98,500,000	Republic of Poland Government Bond	1.500%	4/25/2020	A2	26,436,415
4	96,830,000	Republic of Poland Government Bond	2.250%	4/25/2022	A2	26,353,067
5	35,870,000	Singapore Government Bond	1.250%	10/1/2021	-	26,278,861
6	208,650,000	Norway Government Bond 144A	3.750%	5/25/2021	AAA	25,607,710
7	343,000,000	European Investment Bank Regs	8.500%	9/17/2024	AAA	25,473,641
8	231,825,000	European Investment Bank	8.125%	12/21/2026	AAA	16,926,986
9	22,700,000	Singapore Government Bond	2.250%	8/1/2036	AAA	16,473,292
10	14,262,000	Italy Buoni Poliennali De 144A	2.450%	9/1/2033	BAA3	16,425,615
Domestic Equities						
1	1,516,228	Ishares CORE S&P 500 ETF				446,908,203
2	1,576,868	Vanguard FTSE Developed ETF				65,771,164
3	444,906	Microsoft Corp				59,599,608
4	260,720	Apple Inc				51,601,702
5	205,770	UnitedHealth Group Inc				50,209,938
6	26,013	Amazon.com Inc				49,258,997
7	740,155	Oracle Corp				42,166,630
8	875,466	Wells Fargo & Co				41,427,051
9	294,293	Johnson & Johnson				40,989,129
10	286,677	HCA Healthcare Inc				38,750,130
International Equities						
1	1,384,223	Compass Group PLC				33,243,291
2	196,036	Continental AG				28,624,576
3	271,683	Henkel Ag & Co KGAA				26,613,951
4	36,810,302	Lloyds Banking Group PLC				26,511,550
5	400,644	Whitbread PLC				23,603,253
6	266,086	Sanofi				23,002,152
7	555,879	Anglo American PLC				15,879,101
8	66,116	Roche Holding AG				18,624,369
9	3,866,600	Mitsubishi UFJ Financial Group				18,374,784
10	354,100	Nippon Telegraph & Telephone				16,488,952

*Investment Schedules (continued)***Investments Summary***- excludes cash and cash equivalents and short-term investments**(Dollar values expressed in thousands)*

	Fair Value as of	Percentage
	June 30, 2019	
Equity securities		
Common stock	\$ 5,280,577	34.92%
Pooled funds	1,420,490	9.39%
Preferred shares and others	551,289	3.65%
	<u>7,252,356</u>	<u>47.96%</u>
Fixed income securities		
US treasury / government / agencies	3,223,835	21.32%
US mortgage-backed	14,111	0.09%
US corporate	552,960	3.66%
Non-US government / agencies	689,503	4.56%
Non-US corporate	197,699	1.31%
Pooled and others	62,306	0.41%
	<u>4,740,414</u>	<u>31.35%</u>
Others		
Real estate investments	1,285,347	8.50%
Alternative investments	1,842,502	12.19%
	<u>3,127,849</u>	<u>20.69%</u>
Total, investments at fair value	\$ <u>15,120,619</u>	<u>100.00%</u>

*Investment Schedules (continued)***Schedule of Investment Fees***by Asset Class Allocation**(Dollar values expressed in thousands)*

	Fair value as of June 30, 2019	Total FY 2019 Investment Fees	Basis Points
Broad Growth			
Active Public Equity	\$ 2,384,584	\$ 9,842	41 bp
Passive Public Equity	2,603,657	278	1
Core Real Estate	520,596	1,892	36
Extended Global Credit	872,706	1,668	19
Low Volatility Equity	1,029,210	2,328	23
Options-based Equity	2,770,545	4,733	17
Non-Core Real Estate	512,579	-	-
Private Equity	1,615,825	1,362	8
	<u>12,309,702</u>	<u>22,103</u>	18
Principal Protection			
Intermediate Fixed Income	1,185,669	1,247	11
Crisis Risk Offset			
Alternative Return Capture Strategies	1,012,453	7,649	76
Trend Following Strategies	1,023,603	6,171	60
Long Duration Fixed Income	584,527	335	6
	<u>2,620,583</u>	<u>14,155</u>	54
Real Return			
Inflation-linked Fixed Income	309,702	148	5
Infrastructure	46,566	-	-
Timber	187,836	1,597	85
	<u>544,104</u>	<u>1,745</u>	
Opportunities	30,074	119	40
Other	489,393	-	-
	<u>17,179,525</u>	<u>39,369</u>	23
Other Investment Services			
Custodian fees		336	n/a
Investment consultant fees		1,419	n/a
	<u>17,179,525</u>	<u>41,124</u>	24
Total including consultant and custodian	\$ <u>17,179,525</u>	\$ <u>41,124</u>	

*Investment Schedules (continued)***Schedule of Broker Commissions**

The following is a list of brokers who received commissions from equity trades during Fiscal Year 2019.

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission	
			Dollar Amount	Per Share
ABG SEC AS (NORGE), FILIAL, STOCKHOLM	107,204	\$ 1,893,818	\$ 2,648	\$ 0.025
ALLEN & COMPANY LLC, JERSEY CITY	24,380	1,143,434	497	0.020
BAIRD, ROBERT W & CO INC, MILWAUKEE	395,718	39,291,047	7,102	0.018
BANCO BTG PACTUAL SA, RIO DE JANEIRO	30,812	223,747	224	0.007
BANCO ITAU, SAO PAULO	10,635	75,908	76	0.007
BANCO SANTANDER, NEW YORK	16,372	48,671	38	0.002
BANK OF NEW YORK/AIG INTL INC, ORLANDO	8,000	190,916	160	0.020
BANKINTER, MADRID	25,889	2,041,530	2,862	0.111
BANQUE PARIBAS, PARIS	545,375	8,664,344	2,713	0.005
BARCLAYS CAPITAL INC, NEW YORK	2,747	32,412	27	0.010
BARCLAYS CAPITAL INC./LE, NEW JERSEY	2,755,937	123,636,617	45,353	0.016
BARCLAYS CAPITAL SECS LTD, LONDON	39,474	1,776,148	355	0.009
BARCLAYS CAPITAL, LONDON (BARCGB33)	269,115	10,084,099	2,198	0.008
BERENBERG GOSSLER & CIE, HAMBURG	289,372	5,023,611	7,273	0.025
BERNSTEIN SANFORD C & CO, NEW YORK	5,143,343	232,031,014	24,991	0.005
BMO CAPITAL MARKETS CORP, NEW YORK	1,230,251	70,919,004	13,490	0.011
BNP PARIBAS PEREGRINE SEC LTD, HONG KONG	3,109,044	2,990,602	3,856	0.001
BNP PARIBAS PRIME BROKERAGE, JERSEY CITY	5,900	793,826	177	0.030
BNP PARIBAS SEC SRVS SA, SINGAPORE	2,303,709	11,439,609	10,509	0.005
BNP PARIBAS SECS SERVS, SYDNEY	17,300	67,085	48	0.003
BNP PARIBAS, JERSEY CITY	1,017	661,638	15	0.015
BNY CONVERGEX EXECUTION SOL, NEW YORK	477,743	296,682	410	0.001
BNY CONVERGEX, NEW YORK	153,698	8,790,936	2,936	0.019
BOCI SECURITIES LIMITED, HONG KONG	50,000	25,978	47	0.001
BOFA SECURITIES EUROPE S.A., PARIS	574,924	7,764,372	1,796	0.003
BOFA SECURITIES, INC, NEW YORK	18,392	185,103	236	0.013
BRADESCO S.A. CTVM, SAO PAULO	334,172	4,383,668	4,866	0.015
BRADESCO S/A CTVM, SAO PAULO	7,299	56,186	56	0.008
BTG PACTUAL CASA DE BOLSA, MEXICO CITY	12,321	35,685	22	0.002
BTIG LLC, NEW YORK	282,646	1,926,625	4,776	0.017
CACEIS BANK DEUTSCHLAND, GERMANY	1,170	68,776	96	0.082
CALYON SECURITIES, NEW YORK	5,007,000	1,933,165	2,684	0.001
CANACCORD GENUITY CORP, MONTREAL (CCAM)	11,515	434,777	132	0.011
CANADIAN DEPOSITORY, TORONTO	1,462,200	68,951,735	20,336	0.014
Amounts carried forward	24,724,674	607,882,768	163,005	

*Investment Schedules (continued)***Schedule of Broker Commissions (continued)**

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission	
			Dollar Amount	Per Share
Amounts brought forward	24,724,674	\$ 607,882,768	\$ 163,005	
CANTOR FITZGERALD & CO INC, NEW YORK	237,786	15,643,622	4,959	\$ 0.021
CARNEGIE SECS LTD, HELSINKI (CASFFIH1)	9,475	757,877	1,135	0.120
CHINA INTL CAP CORP HK SECS, HONG KONG	286,000	73,524	103	0.000
CIBC WORLD MKTS INC, TORONTO	32,063	1,832,307	168	0.005
CIBC WORLD MKTS INC, TORONTO (WGDB)	409,609	19,379,095	2,206	0.005
CIMB GK SECURITIES PTE LTD, SINGAPORE	14,600	21,033	19	0.001
CIMB SECURITIES (USA), INC, NEW YORK	287,900	228,935	378	0.001
CITIBANK NA, HONG KONG	11,790	37,932	15	0.001
CITIBANK NA, LONDON	14,657	433,050	87	0.006
CITIBANK NY (MER)	294,505	582,842	321	0.001
CITIGROUP GBL MKTS INC, NEW YORK	6,091,971	289,580,627	38,464	0.006
CITIGROUP GBL MKTS INC, TAIPEI	256,000	795,538	514	0.002
CITIGROUP GBL MKTS, LONDON	145	27,731	22	0.152
CITIGROUP GBL MKTS/SALOMON, NEW YORK	132,515,118	330,132,882	105,443	0.001
CITIGROUP GLOBAL MARKET LTD, LONDON	685,900	5,302,101	1,061	0.002
CITIGROUP GLOBAL MARKETS LTD, LONDON	31,713,566	262,427,752	75,680	0.002
CITIGROUP GLOBAL MARKETS, INC., NEW YORK	14,479,136	667,325,497	80,829	0.006
CLSA AUSTRALIA PTY LTD, SYDNEY	2,507,834	9,072,873	3,238	0.001
CLSA SINGAPORE PTE LTD (CHV), SINGAPORE	1,323,704	1,226,308	736	0.001
CORMARK SECURITIES INC., TORONTO	27,586	1,546,369	269	0.010
COWEN AND CO LLC, NEW YORK	4,404,856	319,959,841	61,520	0.014
COWEN AND COMPANY LLC, NEW YORK	9,225	1,516,090	138	0.015
CREDIT LYONNAIS SEC, SEOUL	88,106	3,743,751	1,195	0.014
CREDIT LYONNAIS SECS (ASIA), HONG KONG	6,279,080	7,645,231	3,138	0.000
CREDIT LYONNAIS SECS ASIA LTD, TAIPEI	1,117,000	2,219,186	715	0.001
CREDIT LYONNAIS SECS, SINGAPORE	4,325,848	30,011,991	8,106	0.002
CREDIT SUISSE (EUROPE), LONDON	39,370,856	200,536,454	54,140	0.001
CREDIT SUISSE (EUROPE), SEOUL	39,228	2,429,239	1,143	0.029
CREDIT SUISSE (HK) LIMITED, HONG KONG	22,700	87,548	140	0.006
CREDIT SUISSE SECURITIES CTM BIC, EUROPE	6,552	107,882	81	0.012
CREDIT SUISSE, NEW YORK (CSUS)	25,066,217	433,737,997	88,426	0.004
CREDIT SUISSE, TAIPEI	520,000	2,521,362	962	0.002
D CARNEGIE AB, STOCKHOLM	2,058	125,516	175	0.085
DAIWA SEC SMBC EUROPE LTD, LONDON	5,500	297,997	238	0.043
DAIWA SECS AMER INC, NEW YORK	448,686	7,142,860	10,001	0.022
DAVY STOCKBROKERS, DUBLIN	21,824	169,500	170	0.008
DEN DANSKE BANK, COPENHAGEN	18,015	634,364	754	0.042
DEN NORSKE CREDITBANK, OSLO	30,270	780,135	664	0.022
DEUTSCHE BANK AG, FRANKFURT	832,160	1,457,044	437	0.001
DEUTSCHE BK INTL EQ, LONDN (DEUTGB22EEQ)	30,817,696	18,143,466	6,555	0.000
DEUTSCHE BK SECS INC, NY (NWSCUS33)	14,842,222	330,075,242	53,634	0.004
DEUTSCHE MORGAN GRENFELL SEC, SYDNEY	149,925	317,612	600	0.004
Amounts carried forward	344,342,043	3,577,970,971	771,584	

*Investment Schedules (continued)***Schedule of Broker Commissions (continued)**

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission	
			Dollar Amount	Per Share
Amounts brought forward	344,342,043	\$ 3,577,970,971	\$ 771,584	
DEUTSCHE SEC ASIA LTD, HONG KONG	2,274,445	11,541,931	3,435	\$ 0.002
DIRECT TRADING, UNITED STATES	31,600	499,182	237	0.008
EXANE, PARIS (EXANFRPP)	577,260	17,264,044	3,690	0.006
FIDELITY CAPITAL MARKETS, NEW YORK	515,276	40,724,971	3,607	0.007
FIDELITY CLEARING CANADA ULC, TOR (FIDC)	1,616	124,145	24	0.015
FOKUS BANK, TRONDHEIM	3,202	255,094	255	0.080
FRIEDMAN, BILLINGS AND RAMSEY, NEW YORK	32,872	1,533,380	657	0.020
FX- INVESTMENT TECH GROUP LTD., DUBLIN	7,709	73,535	20	0.003
GOLDMAN SACHS & CO, NY	8,738,629	289,423,148	66,961	0.008
GOLDMAN SACHS INTL, LONDON (GSILGB2X)	12,373,258	113,500,376	27,639	0.002
GOLDMAN SACHS INTL, NY	295,171	16,391,968	2,458	0.008
GOODBODY STOCKBROKERS, DUBLIN	216	18,129	15	0.069
GUGGENHEIM CAPITAL MARKETS LLC, NEW YORK	128,486	1,193,850	2,235	0.017
GUGGENHEIM CAPITAL MKT LLC, JERSEY CITY	700	17,073	21	0.030
GUZMAN AND COMPANY, NEW YORK	972,142	54,647,731	3,889	0.004
HAITONG INTL SEC CO LTD, HONG KONG	12,500	137,846	28	0.002
HEIGHT SECURITIES LLC, JERSEY CITY	2,600	126,650	104	0.040
HONG KONG & SHANGHAI BKG CORP, HONG KONG	221,494	888,388	224	0.001
HSBC BANK PLC (MIDLAND BK)(JAC), LONDON	5,143,028	101,853,165	20,709	0.004
HSBC BROKERAGE (USA) INC., NEW YORK	70,138	3,382,583	1,849	0.026
HSBC SECS INC, NEW YORK	3,647,873	3,639,902	2,302	0.001
HSBC SECURITIES (USA) INC, NEW YORK	324,069	23,439,251	3,119	0.010
HYUNDAI SECURITIES, SEOUL	1,229	613,846	919	0.748
ICBC FINCL SVCS, NEW YORK	122,188	5,634,141	866	0.007
INSTINET AUSTRALIA CLEARING SERV, SYDNEY	133,068	1,446,558	311	0.002
INSTINET CLEARING SER INC, NEW YORK	133,084	10,535,947	1,021	0.008
INSTINET CORP, NEW YORK	2,334,382	83,599,453	13,585	0.006
INSTINET EUROPE LIMITED, LONDON	5,016,187	84,686,640	22,155	0.004
INSTINET PACIFIC LTD, HONG KONG	1,994,493	2,475,935	988	0.000
INTL TRADING INC, NEW YORK	10,725	150,410	322	0.030
INVESTEC SECURITIES (331), LONDON	123,833	920,789	922	0.007
INVESTMENT TECH GROUP INC, NEW YORK	1,094,058	59,918,431	9,851	0.009
INVESTMENT TECHNOLOGY GROUP LTD, DUBLIN	7,909,588	68,884,348	35,690	0.005
ISI GROUP INC, NEW YORK	311,534	10,199,749	3,645	0.012
ITG AUSTRALIA LTD, MELBOURNE	1,601,264	13,884,127	4,639	0.003
ITG CANADA CORP, TORONTO	230,755	4,228,727	1,517	0.007
ITG HONG KONG LIMITED, HONG KONG	308,300	94,982	52	0.000
ITG INC, NEW YORK	484,314	33,682,712	5,233	0.011
ITG INC, NY	108,200	382,401	230	0.002
J P MORGAN SEC LTD/STOCK LENDING, LONDON	647,485	22,900,200	7,920	0.012
J P MORGAN SEC, SYDNEY	1,188,834	10,940,493	2,971	0.002
J P MORGAN SECS LTD, LONDON	5,682,467	103,119,141	40,931	0.007
Amounts carried forward	409,152,315	4,776,946,343	1,068,830	

*Investment Schedules (continued)***Schedule of Broker Commissions (continued)**

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission	
			Dollar Amount	Per Share
Amounts brought forward	409,152,315	\$ 4,776,946,343	\$ 1,068,830	
J.P MORGAN SECURITIES INC, NEW YORK	1,034,216	56,106,076	13,620	\$ 0.013
J.P. MORGAN SECURITIES LLC, NEW YORK	5,193,089	339,566,014	39,284	0.008
J.P. MORGAN SECURITIES, HONG KONG	2,794,700	4,797,363	1,630	0.001
JANNEY MONTGOMERY SCOTT, PHILADELPHIA	9,600	558,864	192	0.020
JEFFERIES & CO INC, NEW YORK	2,921,722	165,646,997	26,382	0.009
JEFFERIES & CO LTD, LONDON	1,359,459	27,373,526	6,160	0.005
JONES & ASSOC, WESTLAKE VILLAGE	7,460	340,011	40	0.005
JONESTRADING INST SVCS LLC, NEW YORK	22,100	1,628,341	884	0.040
JP MORGAN SECS (FAR EAST) LTD, SEOUL	4,095	194,228	58	0.014
JP MORGAN SECS (TAIWAN) LTD, TAIWAN	2,310,000	6,966,899	4,806	0.002
JP MORGAN SECS, SINGAPORE	33,500	58,806	29	0.001
JPMORGAN SECURITIES INC, NEW YORK	1,479,379	9,406,450	9,450	0.006
KEB SALOMON SMITH BARNEY SECS, SEOUL	70,622	2,966,884	4,776	0.068
KEPLER EQUITIES, PARIS	55,427	1,352,331	270	0.005
KEYBANC CAPITAL MARKETS INC, NEW YORK	58,385	1,591,238	1,933	0.033
KOREA INVESTMENT AND SEC CO.LTD,SEOUL	352,550	6,122,037	8,142	0.023
LEERINK SWANN AND COMPANY, NEW YORK	11,900	147,866	238	0.020
LIQUIDNET ASIA LTD, HONG KONG	4,967,876	3,119,635	1,714	0.000
LIQUIDNET EUROPE LIMITED, LONDON	469,238	3,638,706	3,079	0.007
LIQUIDNET INC, NEW YORK	1,679,566	97,942,525	18,553	0.011
LOOP CAPITAL MARKETS, JERSEY CITY	41,578	1,613,056	291	0.007
LUMINEX TRADING AND ANALYTICS, BOSTON	488,114	41,507,937	2,169	0.004
MACQUARIE BANK LIMITED, SYDNEY	473,206	4,377,842	1,189	0.003
MACQUARIE BANK LTD, HONG KONG	10,061,639	38,860,476	39,265	0.004
MACQUARIE CAPITAL LTD, LONDON	86,945	2,646,290	2,484	0.029
MACQUARIE SECS (SINGAPORE), SINGAPORE	48,800	594,436	119	0.002
MACQUARIE SECURITIES LIMITED, HONG KONG	731,000	572,332	995	0.001
MACQUARIE SECURITIES LTD, SEOUL	734	43,575	13	0.018
MERRILL LYNCH (SINGAPORE) PTE LTD	36,000	465,489	93	0.003
MERRILL LYNCH GILTS LTD, LONDON	212,900	3,218,402	1,452	0.007
MERRILL LYNCH INTERNATIONAL, LONDON	2,912	63,739	30	0.010
MERRILL LYNCH INTL LONDON EQUITIES	55,491,479	163,336,576	42,412	0.001
MERRILL LYNCH PIERCE FENNER SMITH INC NY	5,450,376	378,731,943	51,947	0.010
MERRILL LYNCH PIERCE FENNER, WILMINGTON	433,890	2,393,774	3,453	0.008
MERRILL LYNCH PROFESSIONAL CLRG, PURCHAS	338,138	11,256,671	6,763	0.020
MIRAE ASSET SEC USA, NEW YORK	2,800	96,208	112	0.040
MIRAE ASSET SECURITIES, SEOUL	43,042	2,533,189	693	0.016
MITSUBISHI UFJ SECS INTL PLC, LONDON	900	17,393	14	0.016
MITSUBISHI UFJ SECURITIES, NEW YORK	99,350	2,740,145	2,354	0.024
MIZUHO INTERNATIONAL PLC, LONDON	12,500	222,921	168	0.013
MIZUHO SECURITIES USA INC, NEW YORK	30,743	1,203,795	615	0.020
MIZUHO SECURITIES USA INC. NEW YORK	178,600	229,030	280	0.002
Amounts carried forward	508,252,845	6,163,196,359	1,366,981	

*Investment Schedules (continued)***Schedule of Broker Commissions (continued)**

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission	
			Dollar Amount	Per Share
Amounts brought forward	508,252,845	\$ 6,163,196,359	\$ 1,366,981	
MIZUHO SECURITIES USA, INC., NEW YORK	108,600	1,081,434	3,461	\$ 0.032
MORGAN INTL/MSBAG, NEW YORK	10,080	317,638	64	0.006
MORGAN STANLEY & CO INC, NY	82,711,654	867,730,547	203,578	0.002
MORGAN STANLEY & CO INTL LTD, SEOUL	444,068	22,090,670	9,977	0.022
MORGAN STANLEY & CO INTL LTD, TAPEI	2,793,887	7,661,875	3,120	0.001
MORGAN STANLEY & CO, LONDON (MSLNGB2X)	62,058,589	229,931,368	54,571	0.001
MORGAN STANLEY AND CO INC, NEW YORK	997,285	3,434,305	1,030	0.001
MORGAN STANLEY EUROPE SE, FRANKFURT	1,017,784	11,757,682	2,589	0.003
MORGAN STANLEY, FRANKFURT	19,988,776	24,834,596	8,162	0.000
MORGAN STANLEY, LONDON	332	60,594	45	0.136
MORGAN STANLEY-INTERNATIONAL, BROOKLYN	4,042,253	174,893,403	34,980	0.009
NATIONAL FINL SVCS CORP, NEW YORK	464,191	25,731,366	3,389	0.007
NBCN INC, TORONTO (NBCS)	13,814	712,185	112	0.008
NESBITT BURNS, TORONTO (NTDT)	1,457,963	13,376,107	12,589	0.009
NOMURA FINANCIAL & INVESTMENT, SEOUL	4,041	141,653	43	0.011
NOMURA SECS INTL, LONDON	322,400	6,178,675	1,277	0.004
NORDEA BK PLC, HELSINKI (NDEAFIHH030)	344,532	6,587,284	1,476	0.004
ODDO ET CIE, PARIS	38,003	4,034,505	6,055	0.159
OLIVETREE SECURITIES LTD, LONDON	316,040	2,462,396	1,469	0.005
OPPENHEIMER & CO INC, NEW YORK	65,038	2,419,993	1,608	0.025
PAREL, PARIS	91,413	3,546,851	720	0.008
PERSHING LLC, JERSEY CITY	680,264	41,010,502	16,493	0.024
PERSHING SECURITIES LTD, LONDON	2,176	16,248	24	0.011
PIPER JAFFRAY & CO., JERSEY CITY	107,600	1,831,144	3,806	0.035
PULSE TRADING LLC, BOSTON	1,664	164,188	33	0.020
RAYMOND JAMES & ASSOC INC, ST PETERSBURG	36,551	3,397,741	1,388	0.038
RAYMOND JAMES LTD, TORONTO (MSLT)	2,160	44,713	32	0.015
RBC CAPITAL MARKETS LLC, NEW YORK	2,491,982	147,198,613	19,756	0.008
RBC DOMINION SECS INC, TORONTO (DOMA)	790,631	33,488,563	5,309	0.007
REDBURN PARTNERS LLP, LONDON	407,785	8,501,137	3,185	0.008
RENAISSANCE MACRO SEC, LLC, NEW YORK, NY	1,400	31,533	28	0.020
RF SECS CLEARING LP, TORONTO (GMPT)	11,108	607,113	59	0.005
ROYAL BANK OF CANADA EUROPE LTD, LONDON	461,684	13,056,208	4,655	0.010
S G WARBURG, SEOUL	656,978	22,272,029	9,454	0.014
SAMSUNG SECS, SEOUL	189	69,392	104	0.550
SANFORD C BERNSTEIN & CO INC, LONDON	5,285,216	19,606,841	5,984	0.001
SBC WARBURG, AUCKLAND	410,270	1,264,196	379	0.001
SCOTIA CAPITAL (USA) INC, NEW YORK	209,542	32,524	32	0.000
SCOTIA CAPITAL INC, NEW YORK	669,065	1,878,049	1,122	0.002
SCOTIA CAPITAL MKTS, TORONTO	292,682	10,668,748	2,846	0.010
SEAPORT GROUP SECURITIES, LLC, NEW YORK	1,300	92,220	26	0.020
SG AMERICAS SECURITIES LLC, NEW YORK	4,956,950	158,240,799	23,938	0.005
Amounts carried forward	703,020,785	8,035,653,987	1,815,949	

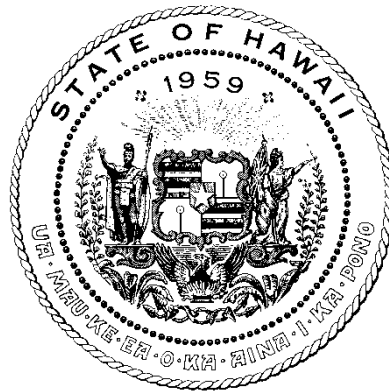
Schedule of Broker Commissions (continued)

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission	
			Dollar Amount	Per Share
Amounts brought forward	703,020,785	\$ 8,035,653,987	\$ 1,815,949	
SG SEC (LONDON) LTD, LONDON	31,873,279	87,043,415	27,031	\$ 0.001
SG SECURITIES, HONG KONG	37,845,170	85,496,940	30,320	0.001
SIDOTI AND COMPANY LLC, NEW YORK	20,077	971,515	402	0.020
SKANDINAVISKA ENSKILDA BANKEN, COPENHAGE	15,330	894,378	1,003	0.065
SKANDINAVISKA ENSKILDA BANKEN, LONDON	1,505	74,948	64	0.043
SMBC NIKKO SECURITIES LTD, WAN CHAI	144,900	2,814,795	603	0.004
SMBC SECURITIES, INC NEW YORK	46,400	983,113	983	0.021
SOCIETE GENERALE LONDON BRANCH, LONDON	4,299,303	33,967,038	20,320	0.005
SOCIETE GENERALE, PARIS	424,022	9,086,023	1,817	0.004
STATE STREET GLOBAL MARKETS LLC, BOSTON	1,386	89,923	28	0.020
STEPHENS INC, LITTLE ROCK	63,607	2,570,255	1,480	0.023
STIFEL NICOLAUS	139,402	4,584,708	2,799	0.020
SUNTRUST CAPITAL MARKETS INC, NEW YORK	17,577	453,376	569	0.032
SVENSKA HANDELSBANKEN, STOCKHOLM	25,562	459,232	184	0.007
TORONTO DOMINION SEC, TORONTO	371,571	19,378,156	2,152	0.006
UBS AG LONDON BRANCH, LONDON	226,765	11,452,330	3,755	0.017
UBS EQUITIES, LONDON	14,271,876	103,641,561	32,921	0.002
UBS EUROPE SE, FRANKFURT AM MAIN	1,817,535	17,511,609	5,209	0.003
UBS LTD, LONDON	620,200	1,193,190	598	0.001
UBS SECS SINGAPORE PTE LTD	2,920,800	6,813,065	2,045	0.001
UBS SECURITIES CANADA, TORONTO (BWIT)	239,555	8,262,179	1,369	0.006
UBS SECURITIES LLC, STAMFORD	23,845,050	645,142,577	111,542	0.005
UBS WARBURG ASIA LTD, HONG KONG	41,876,184	98,062,141	50,121	0.001
UBS WARBURG AUSTRALIA EQUITIES, SYDNEY	1,878,660	13,141,952	3,394	0.002
UBS WARBURG LLC, STAMFORD	877,900	5,888,383	1,872	0.002
UBS WARBURG SEC, TAIWAN	3,771,000	11,246,563	5,383	0.001
UBS WARBURG, LONDON	33,753,367	115,156,550	34,064	0.001
UNION BANK SWITZERLAND SECS, LONDON	737,219	4,503,380	731	0.001
VALEURS MOBILIERES, MONTREAL (VMDM)	12,410	807,009	99	0.008
VIRTU AMERICAS LLC, JERSEY CITY	47,206	4,795,990	437	0.009
WALL ST ACCESS, NEW YORK	18,100	1,131,310	72	0.004
WEDBUSH MORGAN SECS INC, LOS ANGELES	5,100	108,664	204	0.040
WEEDEN & CO, NEW YORK	800,516	58,765,468	5,897	0.007
WELLS FARGO SECURITIES LLC, CHARLOTTE	1,769,651	124,468,744	12,388	0.007
WELLS FARGO SECURITIES, LLC, NEW YORK	15,700	448,124	675	0.043
WILLIAM BLAIR & CO, CHICAGO	108,531	6,602,888	2,171	0.020
WILLIAMS CAPITAL GROUP LP, JERSEY CITY	49,205	3,944,979	911	0.019
XP INVESTIMENTOS CCTVM SA, RIO DE JANEIRO	65,200	335,553	202	0.003
OTHERS	6,805,473	4,783,742	2,237	0.000
Total trades	914,843,079	\$ 9,532,729,753	\$ 2,184,001	\$ 0.002



Employees' Retirement System

of the State of Hawaii



**ACTUARIAL
SECTION**

GASB STATEMENT NO. 67 REPORTP: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

February 5, 2020

Board of Trustees
Employees' Retirement System of
the State of Hawaii
City Financial Tower
201 Merchant St., Ste. 1400
Honolulu, HI 96813-2980

Dear Trustees:

This report provides information required by the Employees' Retirement System of the State of Hawaii ("ERS") in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans."

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement Nos. 67. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB No. 67 may produce significantly different results. This report may be provided to parties other than the ERS only in its entirety and only with the permission of ERS.

This report is based upon information, furnished to us by ERS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This information was checked for internal consistency, but it was not otherwise audited.

GRS provided the following information for the ERS to fulfill the GASB 67 reporting requirements that are included in the notes to the financial statements and the Required Supplementary Information located in the Financial Section of this CAFR.

- Single Discount Rate
- Required Discount Rate Sensitivity Information for the ERS providing the ratio of the Fiduciary Net Position to Total Pension Liability and the Net Pension Liability at a discount rate that is one percentage point lower and one percentage point higher than the discount rate at Measurement Date
- Service Cost; Interest; Changes of Benefit Terms; Differences between Expected and Actual Experience; Changes in Assumptions.
- Required Supplementary Information – Schedule of Changes in Net Pension Liability.
- Required Supplementary Information – Schedule of Net Pension Liability.
- Required Supplementary Information – Schedule of Employer Contributions
- Actuarial components of Governmental Accounting and Standards Board (GASB) 67 requirements.

GASB STATEMENT NO. 67 REPORT (continued)

Certain tables included in the Required Supplementary Information should include a 10-year history of information. As provided for in GASB No. 67, this historical information is only presented for the years in which the information was measured in conformity with the requirements of GASB No. 67. The historical information in this report will begin with the information presented for the fiscal year ending June 30, 2014.

This report complements the actuarial valuation report, issued on January 13, 2020, that was provided to ERS and should be considered in conjunction with that report. Please see the significant actuarial valuation report information as of June 30, 2019 (located later in this section of the ERS' CAFR) for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions. (The entire actuarial valuation report, as of June 30, 2019, is available on the ERS' website at ers.ehawaii.gov.)

To the best of our knowledge, this report is complete, accurate, and in accordance with generally recognized actuarial methods. One or more of the undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the Academy of Actuaries to render the actuarial opinion herein.

The signing actuaries are independent of the plan sponsor.

Respectfully submitted,



By

Lewis Ward
Consultant



By

Joseph P. Newton
FSA, EA, MAAA

GASB STATEMENT NO. 67 REPORT (continued)

EXECUTIVE SUMMARY ***

as of June 30, 2019

	<u>2019</u>	<u>2018</u>
Actuarial Valuation Date	June 30, 2019	June 30, 2018
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	June 30, 2019	June 30, 2018
Membership		
Number of		
- Retirees and beneficiaries	49,885	48,569
- Inactive, nonretired members **	28,854	27,068
- Active members	<u>66,383</u>	<u>66,271</u>
- Total	145,122	141,908
Reported Payroll for Fiscal Year	\$4,376,216,753	\$4,256,052,840
Net Pension Liability		
Total Pension Liability	\$31,396,447,685	\$ 29,917,401,383
Plan Fiduciary Net Position	<u>17,227,026,987</u>	<u>16,598,407,973</u>
Net Pension Liability	\$14,169,420,698	\$ 13,318,993,410
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	54.87%	55.48%
Net Pension Liability as a Percentage of Covered Payroll	323.78%	312.94%
Development of the Single Discount Rate		
Single Discount Rate	7.00%	7.00%
Long-Term Expected Rate of Return	7.00%	7.00%
Long-Term Municipal Bond Rate*	3.13%	3.62%
Last year ending June 30 in the 2019 to 2118 projection period for which projected benefit payments are fully funded (and 2019 to 2118)	None	None

*Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity's Index's "20-year Municipal GO AA Index" as of June 28, 2019 and June 29, 2018. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.

** Inactive, nonretired members for GASB 67 reporting includes terminated vested members entitled to benefits but not yet receiving benefits plus inactive members (that while currently not vested for benefits may become vested in the future should they return to service and fulfill the additional service and contribution requirements applicable to their respective membership). The inactive membership counts used in the previous reporting method under GASB Statement No. 25 only included terminated vested members.

*** This information should be considered with the June 30, 2019 Actuarial Valuation Report information that follows this section beginning on page 123.

GASB STATEMENT NO. 67 REPORT (continued)

Discussion on GASB Statement No. 67.

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, "Financial Reporting for Pension Plans," replaces the requirements of GASB Statement No. 25, "Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans," and GASB Statement No. 50, "Pension Disclosures." GASB Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability of employers and non-employer contributing entities for benefits provided through the pension plan.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are incorporated in the Financial Section of this CAFR. However, certain information, such as notes regarding accounting policies and investments, are not provided by GRS since the retirement system is responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 67 requires defined benefit pension plans to present two financial statements, notes of the plan's financial statements and required supplementary information (RSI):

- The *statement of fiduciary net position* presents the following items as of the end of the pension plan's reporting period, such as: assets; deferred inflows and outflows of resources; liabilities; and fiduciary net position (assets, plus deferred outflows, minus liabilities, minus deferred inflows).
- The *statement of changes in fiduciary net position* presents the following for the plan's reporting period: additions, such as contributions and investment income; deductions, such as benefit payments and expenses; and net increase or decrease in the fiduciary net position (the difference between additions and deductions).
- The notes of the plan's financial statements include: a description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs; the number and classes of employees covered by the benefit terms; the composition of the pension plan's Board and the authority under which benefit terms may be amended; a description of the plan's funding policy, which includes member and employer contribution requirements; the pension plan's investment policies; a description of how fair value is determined; concentrations of investments greater than or equal to 5%; annual money-weighted rate of return on pension plan investments; the portion of the present value of benefits to be provided through the pension plan to current active and inactive plan members; the pension plan's fiduciary net position; the net pension liability; the pension plan's fiduciary net position as a percentage of the total pension liability; significant assumptions and methods used to calculate the total pension liability; inputs to the discount rates; and certain information about mortality assumptions and the dates of experience studies.
- The RSI requires a 10-year fiscal history of: sources of changes in the net pension liability; information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy; and the annual money-weighted rate of return on pension plan investments for each year.

GASB STATEMENT NO. 67 REPORT (continued)

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2019 and a measurement date of June 30, 2019.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.00% the municipal bond rate is 3.13% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting single discount rate is 7.00%.

Letter from the ActuaryP: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

January 13, 2020

Board of Trustees
Employees' Retirement System of
the State of Hawaii
City Financial Tower
201 Merchant St., Ste. 1400
Honolulu, HI 96813-2980

Dear Trustees:

Subject: Actuarial Valuation as of June 30, 2019

We certify that the information contained in the 2019 actuarial valuation report is accurate and fairly presents the actuarial position of the Employees' Retirement System of the State of Hawaii (ERS) as of June 30, 2019. There have been no adjustments for events which occurred after this date.

All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, the results presented comply with the requirements of the Hawaii statutes and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries. One or more of them are an Enrolled Actuary and/or a Member of the American Academy of Actuaries. All are experienced in performing valuations for large public retirement systems.

Actuarial valuations

The primary purpose of the valuation report is to determine the adequacy of the current employer contribution rate through measuring the resulting funding period, to describe the current financial condition of ERS, and to analyze changes in ERS's condition. In addition, the report provides various summaries of the data. This report may not be appropriate for other purposes. The information required by ERS in connection with Governmental Accounting Standards Board Statement No. 67 (GASB No.67) will be provided in a separate report. (A summary of the GASB Statement No. 67 is presented immediately before this section.)

Valuations are prepared annually, as of June 30th of each year, the last day of ERS's plan year and fiscal year.

Letter from the Actuary (continued)

Board of Trustees
January 13, 2020
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Financing objectives

Contribution rates are established by Law that, over time, are intended to remain level as a percent of payroll. The employee and employer contribution rates have been set by Law and are intended to provide for the normal cost plus the level percentage of payroll required to amortize the unfunded actuarial accrued liability (UAAL) over a reasonable amount of time, which will ensure benefit security and intergenerational equity.

Progress toward realization of financing objectives

We have determined that the funding period for paying off the UAAL of the System (in aggregate) is 26 years. This is an increase from the prior year's funding period of 25 years. The increase is due to losses on both the liabilities and investments of the System. However, because this period is less than 30 years, the objectives set in State statute are currently being realized. (Hawaii Revised Statutes §88-122(e)(1) state that the employer contribution rates are subject to adjustment when the funding period is in excess of 30 years.)

The 2017 Legislature passed legislation in 2017 that made significant changes to the future employer contribution rates. This is the 3rd year of four scheduled increases. The employer contribution rate for Police and Fire employees are scheduled to increase to 36% in FY2020, and 41% for FY2021, and the employer contribution rate for All Other Employees are scheduled to increase to 22% in FY2020, and 24% for FY2021. Under current law, the contribution rates are expected to stay at these levels until the System is fully funded.

The 26 year funding period assumes all of the currently scheduled contribution increases occur and remain in effect throughout the period. It is imperative that the increases occur as scheduled to meet the current projected obligations of the System.

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. The funded status alone is not appropriate for assessing the need for future contributions nor assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. However, the trend (historical and projected) of the funded ratio is a strong metric to use for assessing the dependability of the current funding policy and its ability to accumulate assets to pay benefits when due. The funded ratio is currently 55.2% and is the same funded ratio as in the previous valuation. The funded ratio did not improve compared to last year due to actuarial losses on both investments and liabilities.

The 2011 Legislature made changes to the benefits and member contribution rates for employees hired after June 30, 2012. Because these changes result in significantly higher contributions towards the unfunded liability in the future than in the current year, we believe it is more appropriate to determine the funding period using an open group projection rather than a static mathematical formula, which assumes that all amortization payments in the future will be the same percentage of pay as in the current year.

The actuarial accrued liability, the unfunded actuarial accrued liability (UAAL), and the determination of the resulting funding period illustrate the progress toward the realization of financing objectives. New actuarial assumptions were adopted by the Board effective with this valuation. The new assumptions slightly increased the liabilities of the System. In addition, the System had a liability experience loss

Letter from the Actuary (continued)

Board of Trustees
January 13, 2020
Page 3

which was caused by individual salary increases being larger than expected by the assumptions. The System also experienced negative interest amortization as the higher scheduled contribution increases needed to produce last year's 25 year funding period are being phased into and will not be in full effect for two more years. As a result, the UAAL grew (in dollars) based on this actuarial valuation as of June 30, 2019 and ERS's underfunded status as measured by the UAAL is now \$14.074 billion.

Because of the less than favorable investment performance in FY2019, the System is now deferring \$95 million in investment losses, compared with \$86 million in deferred investment gains last year. If there are no significant investment gains or other actuarial gains, the funded status of the System would be expected to decrease in the near future before increasing over the long term.

Thus, given the plan's current contribution rates and the new tier of benefits, if all actuarial assumptions are met (including the assumption of the plan earning 7.00% on the actuarial valuation of assets), it is expected that:

1. The employer normal cost as a percentage of pay will decrease to the level of the newest tier as the old tier population declines and is replaced by new tier members,
2. The employer contribution will remain level throughout the amortization period,
3. Thus, the net amount available to amortize the UAAL will increase over time,
4. The unfunded actuarial accrued liability will increase in nominal dollars until the net amount for amortization is large enough to cover the interest charges, or approximately 2025, and then begin to decrease,
5. The unfunded actuarial accrued liability will be fully amortized after 26 years, and
6. In the absence of benefit improvements and in consistent financial markets, the funded ratio should increase steadily until it reaches 100%.

However, it is important to note that these statements are based on the current assumptions which could change in the future. Also, these statements depend upon the employers meeting the contribution requirements established by the 2017 Legislature. Future changes to the actuarial assumptions or future changes to reduce the contribution requirements could significantly change the outlook of the System and the expectation on when the System will reach a 100% funded level.

Benefit provisions and Legislative changes

This is the seventh valuation with members covered under the new benefit tier.

There have been no changes in the benefit provisions since the prior valuation. See the *Summary of Retirement Benefit Plan Provisions* in the Introductory Section of this CAFR for more details on the benefit provisions for members of the System. However, the Legislature passed Act 017 which contains significant increases to the employer contribution rates over a 4-year period. These increases have improved the outlook of ERS. As long as the contributions are made the System's funded status should improve and the System should be able to absorb moderate adverse experience without a need to further increase the contribution rates.

Letter from the Actuary (continued)

Board of Trustees
January 13, 2020
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Assumptions and methods

The actuarial assumptions used were adopted by the Board in August of 2019 based on the recommendations provided by an Experience Study performed by GRS.

Our Experience Study report dated July 30, 2019 provides details on the changes to the actuarial assumptions. A brief summary of the significant changes are shown below.

- Update the base mortality tables with client-specific mortality tables developing using the actual mortality experience of non-disabled retirees in ERS. Recommend to project the rates on a fully generational basis by Scale BB to account for future mortality improvements.
- Update pre-retirement mortality tables for active employees to the recently published Pub-2010 mortality tables for active employees, by job classification. We also recommend assuming mortality rates will continue to improve in the future using a fully generational approach and Scale BB.
- For Police and Fire Employees, extend the step-rate component of the salary increase assumption to 25 years.
- Minor adjustments to the retirement patterns for members consistent with experience and future expectations for active employees.
- Minor increases to the disability patterns for members consistent with experience and future expectations.

There was no change to the use of a 4-year smoothing technique to determine the actuarial value of assets, used for determining the funding period.

There was no change to the actuarial funding method. The Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the System. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year, and allocates costs among various generations of taxpayers in a reasonable manner. It is by far the most commonly used actuarial cost method for large public retirement systems.

Further detail on the assumptions and methods may be found in the *Summary of Actuarial Methods and Assumptions* in this section of this CAFR.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. Based on the scope of this engagement, we have not performed analysis on the potential range of future measurements based on other factors. The actuarial calculations are intended to provide information for rational decision making.

In our opinion, the assumptions are internally consistent and are reasonably based on the actual experience of ERS.

Letter from the Actuary (continued)

Board of Trustees
January 13, 2020
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Data

Member data for retired, active, and inactive participants was supplied as of March 31, 2019, by ERS's staff. We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data. Asset information was supplied by ERS's staff.

Responsibility for Tables and Schedules

The actuary is responsible for the information with respect to years after 1999 in the Required Supplementary Information, and the Notes to Required Supplementary Information in the Financial Section of the ERS's Comprehensive Annual Financial Report (CAFR). Information with respect to years prior to 2000 was supplied by ERS.

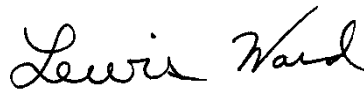
Tables and schedules in the Actuarial Section of the CAFR were generally prepared directly by the Actuary. However, certain of these tables were prepared by ERS utilizing information from this report. When the tables were prepared by ERS from our report, they are so noted.

The undersigned are independent actuaries and consultants. Mr. Newton is an Enrolled Actuary, a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

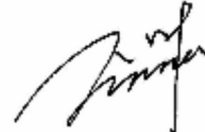
Sincerely,



Joe Newton, FSA, EA
Pension Market Leader & Actuary



Lewis Ward
Consultant



Linna Ye, ASA, MAAA
Actuary

Executive Summary

The following table summarizes the key results of the June 30, 2019 actuarial valuation of the Employees' Retirement System of the State of Hawaii (ERS).

Item	2019	2018
Membership		
• Number of		
- Active members	66,383	66,271
- Retirees and beneficiaries	49,885	48,569
- Inactive, vested	9,321	9,249
- Total	125,589	124,089
• Covered payroll for active members	\$4,393 million	\$4,257 million
• Actual benefit payments and refunds	\$1,486 million	\$1,417 million
Assets		
• Actuarial (smoothed) value	\$17,322 million	\$16,513 million
• Market value	\$17,227 million	\$16,598 million
• Return on actuarial value	6.8%	7.2%
• Return on market value	5.7%	7.9%
• Employer contributions during fiscal year	\$922,635,334	\$847,595,466
• External cash flow %	(1.8%)	(2.0%)
Actuarial Information		
• Total normal cost % (employee + employer)	14.13%	13.90%
• Unfunded actuarial accrued liability (UAAL)	\$14,074million	\$13,405 million
• Funded ratio (based on smoothed assets)	55.2%	55.2%
• Funded ratio (based on market assets)	54.9%	55.5%
• Funding period (years) *	26	25
• Employer contribution rate % of projected payroll ** For FY beginning July 1	23.61%	20.36%

* Funding Period based on actuarial value of assets, scheduled increases in employer contribution rates, and an open group projection reflecting changes in benefits and future member contribution rates.

** Weighted average of 36.00% Contribution Rate for Police and Firefighters and 22.0% Contribution Rate for All Other Employees for fiscal year beginning July 1, 2020.

Weighted average of 31.00% Contribution Rate for Police and Firefighters and 19.0% Contribution Rate for All Other Employees for fiscal year beginning July 1, 2019.

Actuarial Certification Statement

	Police and Firefighters June 30, 2019	All Other Employees June 30, 2019	All Employees June 30, 2019
1. Gross normal cost as a percentage of pay	26.55%	12.46%	14.13%
2. Present value of future benefits			
a. Active employees	\$ 4,020,605,574	14,872,551,828	18,893,157,402
b. Inactive members	77,767,297	896,010,093	973,777,390
c. Pensioners and beneficiaries	3,232,000,532	13,639,117,675	16,871,118,207
d. Total	\$ 7,330,373,403	29,407,679,596	36,738,052,999
3. Present value of future employee and employer contributions			
a. Present value of future normal costs	\$ 1,277,907,444	4,063,697,870	5,341,605,314
b. Present value of future employee contributions	640,268,219	1,944,215,103	2,584,483,322
c. Present value of future employer normal cost (Item 3a - Item 3b)	\$ 637,639,225	2,119,482,767	2,757,121,992
4. Actuarial accrued liability (Item 2d - Item 3a)	\$ 6,052,465,959	25,343,981,726	31,396,447,685
5. Actuarial value of assets			
a. Annuity Savings Fund	\$ 1,143,799,757	1,825,287,400	2,969,087,157
b. Pension Accumulation Fund	2,407,943,654	11,945,163,296	14,353,106,950
c. Total	\$ 3,551,743,411	13,770,450,696	17,322,194,107
6. Unfunded actuarial accrued liability	\$ 2,500,722,548	11,573,531,030	14,074,253,578
7. Adequacy of contribution rates			
a. Statutory Contribution Rate for Fiscal Year 2020	36.00%	22.00%	23.61%
B. Funding period in years as of June 30, 2019 *	28	25	26

*The Funding Period is calculated using an open group projection which reflects the impact of both the new employer contribution rates schedule and the benefits and member contribution rates for employees hired after June 30, 2012.

Actuarial Certification Statement (continued)

The actuarial valuation as of June 30, 2019 is based on the provisions of Chapter 88 of the Hawaii Revised Statutes, as amended. The assumptions used in the cost calculations were those adopted by the Board of Trustees on August 12, 2019 based on the actuary's actuarial experience investigation report for the period ending June 30, 2018. The actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures.

In our opinion, the comparison of the current contribution policies to ERS's liabilities were calculated in accordance with the provisions of Chapter 88 regarding the funding of the Employees' Retirement System on an actuarial reserve basis.

All of our work conforms with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of state law and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned is an independent actuary and consultant. Mr. Newton is an Enrolled Actuary, a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries. Finally, he is experienced in performing valuations for large public retirement systems.



Joseph P Newton,, FSA, EA, MAAA
Pension Market Leader & Actuary

Summary of 2018 Actuarial Valuation

Exhibit 1 Development of Employer Cost

	Police and Firefighters June 30, 2019	All Other Employees June 30, 2019	All Employees June 30, 2019
1. Projected FY 2018 payroll for contribution purposes	\$ 519,202,297	\$ 4,000,491,950	\$ 4,519,694,247
2. Gross normal cost (Exhibit 3)	26.55%	12.46%	14.13%
3. Employer normal cost rate (Exhibit 3)	14.02%	7.07%	7.89%
4. Present value future benefits (Exhibit 2)	\$ 7,330,373,403	\$ 29,407,679,596	\$ 36,738,052,999
5. Present value future employer normal cost	\$ 637,639,225	\$ 2,119,482,767	\$ 2,757,121,992
6. Present value future employee contributions	\$ 640,268,219	\$ 1,944,215,103	\$ 2,584,483,322
7. Actuarial accrued liability (Item 4 - Item 5 - Item 6)	\$ 6,052,465,959	\$ 25,343,981,726	\$ 31,396,447,685
8. Actuarial value of assets	\$ 3,551,743,411	\$ 13,770,450,696	\$ 17,322,194,107
9. Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	\$ 2,500,722,548	\$ 11,573,531,030	\$ 14,074,253,578
10. Funding period *	28	25	26

	Police and Firefighters June 30, 2018	All Other Employees June 30, 2018	All Employees June 30, 2018
1. Projected FY 2018 payroll for contribution purposes	\$ 497,115,143	\$ 3,886,572,864	\$ 4,383,688,007
2. Gross normal cost (Exhibit 3)	25.46%	12.38%	13.90%
3. Employer normal cost rate (Exhibit 3)	12.97%	7.14%	7.82%
4. Present value future benefits (Exhibit 2)	\$ 6,801,549,574	\$ 28,205,720,711	\$ 35,007,270,285
5. Present value future employer normal cost	\$ 563,348,694	\$ 2,101,341,524	\$ 2,664,690,218
6. Present value future employee contributions	\$ 600,305,287	\$ 1,824,873,397	\$ 2,425,178,684
7. Actuarial accrued liability (Item 4 - Item 5 - Item 6)	\$ 5,637,895,593	\$ 24,279,505,790	\$ 29,917,401,383
8. Actuarial value of assets	\$ 3,325,367,899	\$ 13,187,376,575	\$ 16,512,744,474
9. Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	\$ 2,312,527,694	\$ 11,092,129,215	\$ 13,404,656,909
10. Funding period *	26	25	25

*The Funding Period is calculated using an open group projection which reflects the impact of both the new employer contribution rates schedule and the benefits and member contribution rates for employees hired after June 30, 2012. Please refer to Exhibit 7 for the full projection.

Summary of 2019 Actuarial Valuation (continued)

Exhibit 2
Actuarial Present Value of Future Benefits

	Police and Firefighters June 30, 2019	All Other Employees June 30, 2019	All Employees June 30, 2019
1. Active members			
a. Service retirement benefits	\$ 3,859,043,305	\$ 13,596,788,804	\$ 17,455,832,109
b. Termination benefits	110,568,937	845,427,012	955,995,949
c. Survivor benefits	18,791,799	126,515,261	145,307,060
d. Disability retirement benefits	32,201,533	303,820,751	336,022,284
e. Total	\$ 4,020,605,574	\$ 14,872,551,828	\$ 18,893,157,402
2. Retired members			
a. Service retirement	\$ 3,040,786,559	\$ 12,614,610,560	\$ 15,655,397,119
b. Disability retirement	34,619,141	263,829,249	298,448,390
c. Beneficiaries	156,594,832	760,677,866	917,272,698
d. Total	\$ 3,232,000,532	\$ 13,639,117,675	\$ 16,871,118,207
3. Inactive members			
a. Vested terminations	\$ 72,308,757	\$ 783,113,393	\$ 855,422,150
b. Nonvested terminations	5,458,540	112,896,700	118,355,240
c. Total	\$ 77,767,297	\$ 896,010,093	\$ 973,777,390
4. Total actuarial present value of future benefits	\$ 7,330,373,403	\$ 29,407,679,596	\$ 36,738,052,999

	Police and Firefighters June 30, 2018	All Other Employees June 30, 2018	All Employees June 30, 2018
1. Active members			
a. Service retirement benefits	\$ 3,599,756,675	\$ 13,124,340,425	\$ 16,724,097,100
b. Termination benefits	106,097,780	827,255,506	933,353,286
c. Survivor benefits	19,768,611	145,139,966	164,908,577
d. Disability retirement benefits	24,500,169	249,572,843	274,073,012
e. Total	\$ 3,750,123,235	\$ 14,346,308,740	\$ 18,096,431,975
2. Retired members			
a. Service retirement	\$ 2,800,532,024	\$ 12,064,140,944	\$ 14,864,672,968
b. Disability retirement	30,563,426	251,324,987	281,888,413
c. Beneficiaries	148,023,718	714,262,701	862,286,419
d. Total	\$ 2,979,119,168	\$ 13,029,728,632	\$ 16,008,847,800
3. Inactive members			
a. Vested terminations	\$ 67,739,133	\$ 732,682,607	\$ 800,421,740
b. Nonvested terminations	4,568,038	97,000,732	101,568,770
c. Total	\$ 72,307,171	\$ 829,683,339	\$ 901,990,510
4. Total actuarial present value of future benefits	\$ 6,801,549,574	\$ 28,205,720,711	\$ 35,007,270,285

Summary of 2019 Actuarial Valuation (continued)

**Exhibit 3
Analysis of Normal Cost**

	Police and Firefighters June 30, 2019	All Other Employees June 30, 2019	All Employees June 30, 2019
1. Normal cost as a percent of pay			
a. Service retirement benefits	23.54%	9.24%	10.93%
b. Deferred termination benefits	1.19%	0.84%	0.88%
c. Refunds	0.87%	1.44%	1.37%
d. Disability retirement benefits	0.41%	0.46%	0.46%
e. Survivor benefits	0.19%	0.13%	0.14%
f. Administrative expenses	0.35%	0.35%	0.35%
g. Total	26.55%	12.46%	14.13%
2. Employee contribution rate	12.53%	5.39%	6.24%
3. Effective employer normal cost rate (Item 1g – Item 2)	14.02%	7.07%	7.89%

	Police and Firefighters June 30, 2018	All Other Employees June 30, 2018	All Employees June 30, 2018
1. Normal cost as a percent of pay			
a. Service retirement benefits	22.55%	9.23%	10.77%
b. Deferred termination benefits	1.15%	0.90%	0.93%
c. Refunds	0.90%	1.37%	1.32%
d. Disability retirement benefits	0.32%	0.38%	0.38%
e. Survivor benefits	0.19%	0.15%	0.15%
f. Administrative expenses	0.35%	0.35%	0.35%
g. Total	25.46%	12.38%	13.90%
2. Employee contribution rate	12.49%	5.24%	6.08%
3. Effective employer normal cost rate (Item 1g – Item 2)	12.97%	7.14%	7.82%

Summary of 2019 Actuarial Valuation (continued)

Exhibit 4
Development of Actuarial Value of Assets

2. Net new investments

a. Contributions	\$ 1,195,858,912
b. Benefits paid and Refunds	\$ (1,486,137,444)
c. Administrative expenses	<u>\$ (13,798,866)</u>
d. Subtotal	\$ (304,077,398)

3. Market value of assets at end of year \$ 17,227,026,9874. Expected return on actuarial value of assets \$ 1,145,249,4045. Expected actuarial value of assets, end of year \$ 17,353,916,4806. Excess/(shortfall) return (Item 3-Item 5) \$ (126,889,493)

7. Development of amounts to be recognized as of June 30, 2019:

Fiscal Year End	Remaining Deferrals of Excess (Shortfall) of Investment		Offsetting of Gains/(Losses)		Net Deferrals Remaining		Years Remaining	Recognized for this valuation	Remaining after this valuation
	Income								
	(1)		(2)		(3) = (1) + (2)	(4)	(5) = (3) / (4)		(6) = (3) - (5)
2016	\$ -	\$ -	\$ -	\$ -	\$ -	1	\$ -	\$ -	-
2017	-	-	-	-	-	2	-	-	-
2018	85,663,499	(85,663,499)			-	3	-	-	-
2019	(212,552,992)	85,663,499			(126,889,493)	4	(31,722,393)		(95,167,100)
Total	\$ (126,889,493)	\$ -			\$ (126,889,493)		\$ (31,722,393)	\$	(95,167,100)

8. Actuarial value of assets as of June 30, 2019 \$ 17,322,194,107
(Item 3 - Item 7)9. Ratio of actuarial value to market value 100.6%10. Asset gain/(loss) for year (Item 8 - Item 5) \$ (31,722,373)

Summary of 2019 Actuarial Valuation (continued)

Exhibit 5
Total Experience Gain or Loss

Item	Police and Firefighters	All Other Employees	All Employees
A. Calculation of total actuarial gain or loss			
1. Unfunded actuarial accrued liability (UAAL), as of June 30, 2018	\$ 2,312,527,694	\$ 11,092,129,215	\$ 13,404,656,909
2. Normal cost for the year (employer and employee)	\$ 138,167,980	\$ 495,135,164	\$ 633,303,144
3. Less: contributions and assessments for the year	\$ (240,295,205)	\$ (955,563,707)	\$ (1,195,858,912)
4. Interest at 7.00%			
a. On UAAL	\$ 161,876,939	\$ 776,449,045	\$ 938,325,984
b. On normal cost	4,835,879	17,329,731	22,165,610
c. On contributions	<u>(8,410,332)</u>	<u>(33,444,730)</u>	<u>(41,855,062)</u>
d. Total	\$ 158,302,486	\$ 760,334,046	\$ 918,636,532
5. Expected UAAL as of June 30, 2018 (Sum of Items 1–4)	\$ 2,368,702,955	\$ 11,392,034,718	\$ 13,760,737,673
6. Actual UAAL as of June 30, 2018	\$ 2,500,722,548	\$ 11,573,531,030	\$ 14,074,253,578
7. Total gain (loss) for the year (Item 5 – Item 6)	\$ (132,019,593)	\$ (181,496,312)	\$ (313,515,905)
B. Source of gains and losses			
8. Asset gain (loss) for the year (Exhibit 6)	\$ (6,504,357)	\$ (25,218,016)	\$ (31,722,373)
9. Gain (loss) due to change in payment timing	4,125,964	(64,446,001)	(60,320,037)
10. Other liability gain (loss)	\$ (129,641,200)	\$ (91,832,295)	\$ (221,473,495)
11. Change in benefit provisions	<u>-</u>	<u>-</u>	<u>-</u>
12. Total gain (loss) for the year	\$ (132,019,593)	\$ (181,496,312)	\$ (313,515,905)

Summary of 2019 Actuarial Valuation (continued)

Exhibit 6
Investment Experience Gain or Loss

Item	June 30, 2019	June 30, 2018
1. Actuarial assets, beginning of year	\$ 16,512,744,474	\$ 15,720,627,120
2. Total contributions during year	\$ 1,195,858,912	\$ 1,107,023,400
3. Benefits and refunds paid	\$ (1,486,137,444)	\$ (1,416,727,842)
4. Administrative expenses paid	\$ (13,798,866)	\$ (15,784,490)
5. Assumed net investment income at 7.00%		
a. Beginning of year assets	\$ 1,155,892,113	\$ 1,100,443,898
b. Contributions	\$ 41,855,062	\$ 38,745,819
c. Benefits and refunds paid	\$ (52,014,811)	\$ (49,585,474)
d. Benefits and refunds paid	\$ (482,960)	\$ (552,457)
e. Total	\$ 1,145,249,404	\$ 1,089,051,786
6. Expected actuarial assets, end of year (Sum of Items 1 through 5)	\$ 17,353,916,480	\$ 16,484,189,974
7. Actual actuarial assets, end of year	\$ 17,322,194,107	\$ 16,512,744,474
8. Asset gain (loss) for year (Item 7– Item 6)	\$ (31,722,373)	\$ 28,554,500
9. Asset gain (loss) as a percent of actuarial value of assets, end of year (Item 8 / Item 7)	(0.18%)	0.17%

Summary of 2019 Actuarial Valuation (continued)

Exhibit 7
Projection Results Based on June 30, 2019 Actuarial Valuation

Valuation as of June 30,	Employer Contribution Rate for Fiscal Year Following Valuation Date	Compensation (in Millions)	Employer Contributions (in Millions)	Actuarial Accrued Liability (AAL, in Millions)	Actuarial Value of Assets (AVA, in Millions)	Unfunded Actuarial Accrued Liability (UAAL, in Millions)	Funded Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2019	23.61%	\$ 4,520	\$ 1,067	\$ 31,396	\$ 17,322	\$ 14,074	55.2%
2020	25.89%	4,633	1,200	32,617	18,292	\$ 14,325	56.1%
2021	25.89%	4,761	1,233	33,838	19,384	\$ 14,454	57.3%
2022	25.89%	4,893	1,267	35,061	20,504	\$ 14,557	58.5%
2023	25.89%	5,033	1,303	36,285	21,654	\$ 14,631	59.7%
2024	25.89%	5,176	1,340	37,511	22,836	\$ 14,675	60.9%
2025	25.89%	5,326	1,379	38,734	24,052	\$ 14,682	62.1%
2026	25.89%	5,483	1,420	39,954	25,303	\$ 14,651	63.3%
2027	25.89%	5,647	1,462	41,171	26,595	\$ 14,576	64.6%
2028	25.89%	5,818	1,507	42,386	27,933	\$ 14,453	65.9%
2029	25.89%	5,998	1,553	43,598	29,321	\$ 14,277	67.3%
2030	25.89%	6,186	1,602	44,810	30,770	\$ 14,040	68.7%
2031	25.89%	6,382	1,653	46,024	32,284	\$ 13,740	70.1%
2032	25.89%	6,586	1,705	47,239	33,871	\$ 13,368	71.7%
2033	25.89%	6,798	1,760	48,457	35,539	\$ 12,918	73.3%
2034	25.89%	7,019	1,818	49,679	37,296	\$ 12,383	75.1%
2035	25.89%	7,249	1,877	50,908	39,154	\$ 11,754	76.9%
2036	25.89%	7,488	1,939	52,146	41,123	\$ 11,023	78.9%
2037	25.89%	7,737	2,003	53,395	43,215	\$ 10,180	80.9%
2038	25.89%	7,997	2,071	54,661	45,444	\$ 9,217	83.1%
2039	25.89%	8,269	2,141	55,948	47,826	\$ 8,122	85.5%
2040	25.89%	8,552	2,215	57,262	50,379	\$ 6,883	88.0%
2041	25.89%	8,848	2,291	58,609	53,120	\$ 5,489	90.6%
2042	25.89%	9,155	2,371	59,996	56,070	\$ 3,926	93.5%
2043	25.89%	9,474	2,453	61,429	59,249	\$ 2,180	96.5%
2044	25.89%	9,806	2,539	62,916	62,680	\$ 236	99.6%
2045	25.89%	10,150	2,628	64,463	66,385	\$ (1,922)	103.0%
2046	25.89%	10,507	2,721	66,075	70,388	\$ (4,313)	106.5%
2047	25.89%	10,877	2,817	67,761	74,714	\$ (6,953)	110.3%
2048	25.89%	11,260	2,916	69,526	79,390	\$ (9,864)	114.2%

Projection assumes all assumptions exactly met, including a 7.00% annual return on the current actuarial value of assets.

Summary of 2018 Actuarial Valuation (continued)

Exhibit 8
Highlights of Last Five Annual Actuarial Valuations
2015 through 2019

Item	Valuation Date: June 30				
	2015	2016	2017	2018	2019
Number of active members	67,310	67,377	65,911	66,271	66,383
Number of inactive members	7,413	7,741	9,241	9,249	9,321
Number of pensioners	40,657	41,654	42,857	44,305	45,440
Number of beneficiaries	3,626	3,852	4,070	4,264	4,445
Average monthly contributory plan pension amount	\$ 2,621	\$ 2,730	\$ 2,854	\$ 2,994	\$ 3,136
Average monthly noncontributory plan pension amount	\$ 1,611	\$ 1,637	\$ 1,669	\$ 1,702	\$ 1,736
Average monthly hybrid plan pension amount	\$ 2,114	\$ 2,139	\$ 2,178	\$ 2,238	\$ 2,285
Average monthly beneficiary amount	\$ 1,361	\$ 1,419	\$ 1,472	\$ 1,515	\$ 1,558
Total actuarial value of assets (\$millions)	\$ 14,464	\$ 14,999	\$ 15,721	\$ 16,513	\$ 17,322
Unfunded actuarial accrued liability (\$millions)	\$ 8,774.7	12,440. \$ 5	\$ 12,928.0	\$ 13,404.7	\$ 14,074.3
Funding Period (in years) ⁽¹⁾	26	66	26	25	26

Item	Fiscal Year				
	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
(Dollar amounts in millions ⁽²⁾)					
Employers contributions ⁽²⁾	\$ 717.8	\$ 756.6	\$ 781.2	\$ 847.6	\$ 922.6

⁽¹⁾ Beginning with the 2011 valuation, the funding period was determined using an open group projection. Prior valuations determined the remaining amortization based on the assumption that the amortization payment would remain constant as a percentage of pay.

⁽²⁾ Beginning July 1, 2014, the percentages increased to 24.0% for Police and Fire, 16.5% for All Others. Beginning July 1, 2015, the percentages increased to 25.0% for Police and Fire, 17.0% for All Others. Beginning July 1, 2016, the percentages increased to 25.0% for Police and Fire, 17.0% for All Others. Beginning July 1, 2017, the percentages increased to 28.0% for Police and Fire, 18.0% for All Others. Beginning July 1, 2018, the percentages increased to 31.0% for Police and Fire, 19.0% for All Others.

Summary of Actuarial Methods and Assumptions
(Adopted on August 12, 2019)

Basis for assumption setting: The actuarial assumptions were adopted by the Board on August 12, 2019. Rationale for the recommendations are in the most recent experience study dated July 30, 2019.

I. Valuation Date

The valuation date is June 30th of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The normal cost and actuarial accrued liability are determined using the Entry Age Actuarial Cost Method. The actuarial accrued liability is assigned to years prior to the valuation, and the normal cost is assigned to the year following the valuation. The remaining costs are assigned to future years. The normal cost and accrued liability are determined on an individual basis.

The normal cost is the level percentage of payroll contribution required to accumulate the needed funds to pay all expected benefits. This percentage of payroll is then applied to the total compensation for the prior year for all active members, and is then adjusted for the payroll growth assumption.

The actuarial accrued liability is the difference between the total present value of future benefits and the actuarial present value of future normal costs. The unfunded actuarial accrued liability (UAAL) is the excess of the actuarial accrued liability over the actuarial value of assets.

III. Funding of Unfunded Actuarial Accrued Liability

Since the State statutes governing the System establish the employee and employer contribution rates, the actuarial valuation determines the number of years required to amortize (or fund) the UAAL. Because of the legislated increases in future employer contribution rates and the new tier of benefits for employees hired after June 30, 2012, an open group projection of liabilities and assets was used to determine the length of time until the UAAL is eliminated. The open group projection assumed that the number of active members would remain static (i.e. each active employee who leaves employment due to termination, retirement, death or disability, would be replaced by exactly one new employee.

Because of this methodology for determining the funding period, any change in the unfunded actuarial accrued liability due to (i) actuarial gains and losses, (ii) changes in actuarial assumptions, or (iii) amendments, affects the funding period.

Please see Section V of this table for a description of the new entrant profile used in the open group projection.

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)

IV. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a four-year phase-in of actual investment return in excess of/(less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continue to be recognized on their original timeframe. The expected actuarial value of assets is calculated net of investment expenses, and the expected investment return is equal to the assumed investment return rate multiplied by the prior year's actuarial value of assets, adjusted for contributions, benefits paid, and refunds.

V. New Entrant Profile

For the purposes of determining the funding period, an open group projection is used which replaces on a one-to-one basis each active member who leaves employment with an average new hire. The average new hire is determined based on a new entrant profile, which is created from the valuation data by determining the entry age and entry pay for anyone with seven or less years of service as of the valuation date. Each group of new hires' salaries is assumed to grow at the General Wage Inflation of 3.50% over the salaries of the previous year's group.

The new entrant profile for members assumed to be hired during the year following the valuation date for the Police and Fire Employees and the All Other Employees are shown in the table below.

New Entrant Profile for Police and Fire Employees		
Entry Age	# of Employees	Average Salary
15-19	2	\$54,605
20-24	175	67,871
25-29	418	67,484
30-34	285	66,402
35-39	136	66,933
40-44	51	69,181
45-49	13	69,063
50-54	2	66,592
55-59	3	76,214
Total	1,085	67,290

It is assumed that 89.2% of new hires will be male.

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)

New Entrant Profile for All Other Employees		
Entry Age	# of Employees	Average Salary
15-19	17	\$38,029
20-24	1,490	46,860
25-29	3,976	50,043
30-34	3,265	52,785
35-39	2,730	53,415
40-44	2,190	52,444
45-49	1,877	52,641
50-54	1,576	52,497
55-59	1,216	53,769
60-64	633	55,860
65-69	88	63,781
Total	19,058	51,966

It is assumed that 41.8% of new hires will be male.

VI. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.00% per year, compounded annually, composed of an assumed 2.50% inflation rate and a 4.50% net real rate of return (net of investment expenses).
2. General Wage Inflation: 3.50% per annum.

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)

3. Salary increase rates: As shown below

Years of Service	General Employees		Teachers	
	Service-related Component	Total Rate Including 2.50% Inflation Component and 1.00% Productivity Component	Service-Related Component	Total Rate Including 2.50% Inflation Component and 1.25% Productivity Component
1	3.00%	6.50%	2.00%	5.75%
2	3.00%	6.50%	1.75%	5.50%
3	2.00%	5.50%	1.75%	5.50%
4	1.50%	5.00%	1.50%	5.25%
5	1.50%	5.00%	1.00%	4.75%
6	1.25%	4.75%	1.00%	4.75%
7	1.25%	4.75%	0.75%	4.50%
8	1.00%	4.50%	0.75%	4.50%
9	1.00%	4.50%	0.50%	4.25%
10	1.00%	4.50%	0.50%	4.25%
11	0.75%	4.25%	0.50%	4.25%
12	0.75%	4.25%	0.50%	4.25%
13	0.50%	4.00%	0.25%	4.00%
14	0.50%	4.00%	0.25%	4.00%
15	0.50%	4.00%	0.25%	4.00%
16	0.50%	4.00%	0.25%	4.00%
17	0.50%	4.00%	0.25%	4.00%
18	0.50%	4.00%	0.25%	4.00%
19	0.50%	4.00%	0.25%	4.00%
20	0.25%	3.75%	0.25%	4.00%
21	0.25%	3.75%	0.25%	4.00%
22	0.25%	3.75%	0.25%	4.00%
23	0.25%	3.75%	0.25%	4.00%
24	0.25%	3.75%	0.25%	4.00%
25 or more	0.00%	3.50%	0.00%	3.75%

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)

3. Salary increase rates (continued):

<hr/> Police & Firefighters <hr/>		
<u>Years of Service</u>	<u>Service-related Component</u>	<u>Total Annual Rate of Increase Including 2.50% Inflation Component and 2.50% General Increase Rate</u>
1	2.00%	7.00%
2	2.00%	7.00%
3	1.00%	6.00%
4	1.00%	6.00%
5	1.00%	6.00%
6	0.75%	5.75%
7	0.75%	5.75%
8	0.75%	5.75%
9	0.50%	5.50%
10	0.50%	5.50%
11	0.50%	5.50%
12	0.50%	5.50%
13	0.25%	5.25%
14	0.25%	5.25%
15	0.25%	5.25%
16	0.25%	5.25%
17	0.25%	5.25%
18	0.25%	5.25%
19	0.25%	5.25%
20	0.25%	5.25%
21	0.25%	5.25%
22	0.25%	5.25%
23	0.25%	5.25%
24	0.25%	5.25%
25 or more	0.00%	5.00%

Salary increases are assumed to occur once a year, on July 1. Therefore the pay used for the period between the valuation date and the first anniversary of the valuation date is equal to the reported pay for the prior year, annualized if necessary, and then increased by the salary increase assumption. To adjust the pays received as of March 31st to the June 30th valuation date, the reported pay for each member is increased by 1%.

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)
B. Demographic Assumptions**1. Mortality rates**

Active Members: Multiples of the RP 2014 mortality table for active employees based on the occupation of the member as follows:

<u>Type</u>	<u>General Employees</u>	<u>Teachers</u>	<u>Police and Fire</u>
	<u>Male & Female</u>	<u>Male & Female</u>	<u>Male & Female</u>
Ordinary	94%	92%	83%
% of Ordinary Chosing Annuity	41%	52%	24%
Duty Related	6%	8%	17%

Healthy Retirees: The 2019 Public Retirees of Hawaii mortality table, generational projection using the BB projection table from the year 2019 and with multipliers based on plan and group experience. The following are sample rates of the base table as of 2019 with the corresponding multipliers:

Healthy Annuitant Mortality Rates Before Projection (Multiplier Applied)						
<u>Age</u>	<u>General Employees</u>		<u>Teachers</u>		<u>Police and Fire</u>	
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
50	0.2901%	0.2376%	0.2640%	0.1980%	0.3394%	0.2376%
55	0.4195%	0.3042%	0.3817%	0.2535%	0.4908%	0.3042%
60	0.5773%	0.3175%	0.5253%	0.2646%	0.6754%	0.3175%
65	0.8603%	0.3175%	0.7829%	0.2646%	1.0066%	0.3175%
70	1.2866%	0.7022%	1.1708%	0.5852%	1.5053%	0.7022%
75	2.0370%	1.3340%	1.8537%	1.117%	2.3833%	1.3340%
80	3.4486%	2.2177%	3.1382%	1.8481%	4.0349%	2.2177%
85	6.2716%	3.9579%	5.7072%	3.2982%	7.3378%	3.9579%
90	11.8489%	7.7873%	10.7825%	6.4895%	13.8632%	7.7873%
Multiplier	100%	108%	91%	90%	117%	108%
Setback	0	0	0	0	0	0

Summary of Actuarial Methods and Assumptions (continued)

(Adopted on August 12, 2019)

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

<u>Life Expectancy for an Age 65 Retiree in Years</u>					
Gender	Year of Retirement				
	2025	2030	2035	2040	2045
<u>General Retirees</u>					
Male	23.8	24.2	24.7	25.2	25.6
Female	26.8	27.2	27.5	27.9	28.2
<u>Teachers</u>					
Male	24.5	25.0	25.4	25.9	26.3
Female	28.2	28.5	28.8	29.1	29.5
<u>Police and Fire</u>					
Male	22.5	23.0	23.5	24.0	24.5
Female	26.8	27.2	27.5	27.9	28.2

Disabled retirees: Base Table for healthy retiree's occupation, set forward 5 years, generational projection using the BB projection table from the year 2019. Minimum mortality rate of 3.5% for males and 2.5% for females.

2. Disability rates – The assumed total disability rates at select ages are multiples of the client specific table that follows:

Age	Male & Female
25	0.000%
30	0.001%
35	0.008%
40	0.026%
45	0.064%
50	0.146%
55	0.198%
60	0.217%

Note: The disability rates project the percentage of employees at each age that is assumed to become disabled before retiring. Multiples of the rates above are assumed to be ordinary disability or accidental disability, and varies by employee group as follows:

Type	General Employees	Teachers	Police & Fire
	Male & Female	Male & Female	Male & Female
Ordinary	240%	85%	70%
Accidental	40%	7%	100%

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)

3. Termination Rates - Same male and female rates, based solely on the member's service. Rates reflect terminations for causes other than death, disability or retirement. Employees eligible for retirement are assumed to have no probability of termination. Sample rates are shown below:

Years of Service	Expected Terminations per 1000 Lives (Male & Female)		
	General Employees	Teachers	Police & Fire
0	185.9	243.6	110.0
1	152.5	200.8	95.0
2	124.6	164.7	37.0
3	101.6	134.4	30.1
4	82.9	109.4	26.1
5	67.9	89.0	23.3
6	56.1	72.5	21.0
7	47.0	59.5	19.2
8	40.1	49.4	17.7
9	35.1	41.7	16.4
10	31.5	36.0	15.2
11	29.1	31.9	14.1
12	27.6	29.0	13.2
13	26.6	27.0	12.3
14	25.9	25.7	11.5
15	25.5	24.8	10.8
16	25.1	24.0	10.1
17	24.5	23.2	9.5
18	23.9	22.4	8.9
19	23.0	21.4	8.3
20	22.0	20.2	7.7
21	20.8	18.7	7.2
22	19.5	17.1	6.8
23	18.3	15.4	6.3
24	17.4	13.6	5.8
25	16.8	12.1	0.0
26	16.8	10.9	0.0
27	16.8	10.4	0.0
28	16.8	10.7	0.0
29	16.8	10.0	0.0
30 and more	0.0	0.0	0.0

Summary of Actuarial Methods and Assumptions (continued)

(Adopted on August 12, 2019)

4. Retirement rates - separate male and female rates, based on age. Sample rates are shown below:

Contributory Members

Expected Retirements per 100 Lives									
Age	General Employees				Teachers				Police & Fire
	Unreduced Retirement		Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement
	Male	Female	Male	Female	Male	Female	Male	Female	Male & Female
45	0	0	0	0	0	0	0	0	13.5
46	0	0	0	0	0	0	0	0	13.5
47	0	0	0	0	0	0	0	0	13.5
48	0	0	0	0	0	0	0	0	13.5
49	0	0	0	0	0	0	0	0	13.5
50	0	0	0	0	0	0	1	0	16.0
51	0	0	2	1	0	0	1	1	16.0
52	0	0	2	1	0	0	1	1	16.0
53	0	0	2	1	0	0	2	2	16.0
54	0	0	3	2	0	0	3	3	16.0
55	25	20	3	2	20	18			20.0
56	25	20			15	16			20.0
57	16	13			15	16			20.0
58	16	13			15	16			22.0
59	13	13			15	16			25.0
60	13	15			14	18			30.0
61	13	15			14	18			30.0
62	28	25			14	25			30.0
63	20	20			14	20			30.0
64	20	20			14	15			30.0
65	20	20			20	25			100.0
66	18	20			15	25			
67	18	20			15	20			
68	18	20			15	20			
69	18	20			15	20			
70	20	20			15	20			
71	20	20			15	20			
72	20	20			15	20			
73	20	20			15	20			
74	20	20			15	20			
75	100	100			100	100			

*Summary of Actuarial Methods and Assumptions (continued)**(Adopted on August 12, 2019)*Noncontributory Members

Expected Retirements per 100 Lives										
Age	General Employees						Teachers			
	Unreduced Retirement		25 & Out		Reduced Retirement		Unreduced Retirement		Reduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
55	20	11	15	11	1	1	10	13	1	2
56	18	11	23	11	1	1	10	7	1	2
57	13	11	18	11	1	1	10	8	1	2
58	10	11	15	11	1	1	10	10	2	2
59	10	11	15	11	2	2	10	20	3	3
60	10	14	15	14	3	3	10	11	5	5
61	11	18	16	18	4	4	10	16	7	5
62	20	20	25	20			16	25		
63	20	20	25	20			12	20		
64	12	20	17	20			10	15		
65	14	20	19	20			20	25		
66	20	20	25	20			15	25		
67	20	20	25	20			15	25		
68	20	20	25	20			15	25		
69	20	20	25	20			15	25		
70	20	20	25	20			15	25		
71	20	20	25	20			15	25		
72	20	20	25	20			15	25		
73	20	20	25	20			15	25		
74	20	20	25	20			15	25		
75	100	100	100	100			100	100		

Note: Retirement rates for the 25 & out group ages 50-54 are 10% for male and 11% for female.

Summary of Actuarial Methods and Assumptions (continued)
(Adopted on August 12, 2019)

Hybrid Members

Expected Retirements per 100 Lives								
Age	General Employees				Teachers			
	Unreduced Retirement		Reduced Retirement		Unreduced Retirement		Reduced Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
55	18	18	1	1	20	16	2	2
56	12	13	1	1	13	10	2	2
57	12	13	1	1	13	10	2	2
58	16	13	1	2	13	12	2	2
59	16	13	2	2	13	12	3	3
60	14	13	2	4	14	14	3	5
61	14	15	3	4	14	18	3	10
62	21	20			22	30		
63	18	20			14	20		
64	18	20			14	20		
65	21	20			20	25		
66	18	18			15	25		
67	18	18			15	25		
68	18	18			15	25		
69	18	18			15	25		
70	20	20			15	25		
71	20	20			15	25		
72	20	20			15	25		
73	20	20			15	25		
74	20	20			15	25		
75	100	100			100	100		

Note: Retirement rates for the 25 & out group ages 50-54 are 6% for both male and female.

For members hired after June 30, 2012 the retirement rates for members once they reach unreduced retirement eligibility are increased 10% (multiplicative) for each year the member is beyond the age the member would have been eligible under the Hybrid provisions for members hired prior to June 30, 2012.

Summary of Actuarial Methods and Assumptions (continued)

(Adopted on August 12, 2019)

C. Other Assumptions

1. Projected payroll for contributions: The aggregate projected payroll for the fiscal year following the valuation date is calculated by increasing the actual payroll paid during the previous fiscal year by the payroll growth rate and multiplying by the ratio of current active members to the average number of active members during the previous fiscal year.
2. Age difference: Male members are assumed to be four years older than their spouses, and female members are assumed to be four years younger than their spouses.
3. Marriage Assumption: While not implicitly used in the valuation, 100% of active members are assumed to be married when setting other benefit election and eligibility assumptions.
4. Percent electing annuity on death for contributory participants (when eligible): All of the spouses of married participants who die after becoming eligible for a retirement benefit are assumed to elect an annuity or a refund, whichever is more valuable at time of participant's death.
5. Payment Option: Future healthy retirees are assumed to choose the life only payment option. 50% of future disabled retirees are assumed to choose the 100% Joint and Survivor option.
6. Percent electing deferred termination benefit: vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.
7. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt when eligible for early retirement.
8. Administrative expenses: Administrative expenses are assumed to be 0.35% of active member payroll.
9. Reemployment, purchase of service, transfers: No recognition is made of (i) future member reimbursements upon reemployment, (ii) future purchase of additional service, or (iii) special transfer provisions.
10. Sick Leave: It is assumed that all members will have their benefit service increased by sick leave and the following loads will be applied by group:

General Employees	3.75%
Teachers	4.25%
Police and Fire	5.00%

*Summary of Actuarial Methods and Assumptions (continued)**(Adopted on August 12, 2019)*

11. COLA delay: It is assumed that the first COLA will be received 9 months after retirement. Teachers are assumed to receive COLA 12 months after retirement.
12. There will be no recoveries once disabled.
13. No surviving spouse will remarry and there will be no children's benefit.
14. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
15. Decrement timing: Retirements and terminations of Teachers are assumed to occur at the beginning of the year. All other decrements are assumed to occur mid-year.
16. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
17. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
18. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
19. Benefit Service: All members are assumed to accrue 1 year of service each year. Exact fractional service is used to determine the amount of benefit payable.
20. Police officers, firefighters, investigators of the Department of the Prosecuting Attorney and the Attorney General, narcotic enforcement investigators, and public safety investigators hired prior to June 30, 2012 are not assumed to retire at age 55 unless they have 10 years of service.

VII. Participant Data

Participant data was supplied in electronic files for (i) active members, (ii) inactive vested members, who are entitled to a future deferred benefit, (iii) members and beneficiaries receiving benefits.

Salary supplied for the current year was based on the actual pensionable earnings for the 12-month period ending the March preceding the valuation date. This pay was increased by 1% to reflect the three month difference from March to June. For members with less than one year of service, the base pay rate provided in the data was used.

*Summary of Actuarial Methods and Assumptions (continued)**(Adopted on August 12, 2019)**VIII. Dates of Adoption of Assumptions and Methods*

The actuarial assumptions and methods were adopted by the Board of Trustees on August 12, 2019 as recommended by Gabriel, Roeder, Smith & Company (GRS)

IX. Changes in Assumptions and Methods since Prior Valuation

The actuarial assumptions have been revised since the prior valuation. Please see our Experience Study report dated July 30, 2019 for a more extensive discussion of the changes in the actuarial assumptions and the rationale for the current assumptions.

*Summary of Actuarial Methods and Assumptions (continued)***Summary of Plan Changes****Act 65, effective July 1, 1999**

Requires judges who enter or re-enter service after June 30, 1999 to be at least 55 years old and five years of service or have 25 years of service to retire.

Act 100, effective June 30, 1999

Uses actuarial investment earnings in excess of a ten percent (10%) actuarial investment yield rate to reduce the employer's contribution requirements by \$147.0 million and \$50.6 million for fiscal years ending June 30, 2000 and 2001, respectively.

Act 284, effective June 30, 2001

Provide an increase in pension benefits for current retirees with military service who retired prior to July 2, 1989. A retirant who rendered honorable active military service could be granted up to 4 years of military service credits based upon his/her years of credited service under the ERS, not to exceed his/her actual years of military service. The years of military service credits granted are based on the following schedule:

- 0 years for retirants with less than 8 years of credited service
- Up to 2 years of retirants with 8 years or more of credited service
- Up to 3 years of retirants with 20 years or more of credited service
- Up to 4 years of retirants with 25 years or more of credited service

For each year of military service credits granted on the schedule above, the retirant will be provided a \$36.00 increase in his/her monthly pension or retirement allowance.

Act 199, effective June 30, 2003

Emergency Medical Technicians (EMTs) are allowed to retire with an unreduced benefit after 25 years of service regardless of age, of which the last five or more years prior to retirement must be in that capacity. This feature is phased in one year at a time, July 1, 2003 through June 30, 2008.

Act 177, effective July 1, 2004

This Act allows police officers with a permanent service-connected disability to retain the 2-1/2% benefit multiplier for each year of service as a police officer.

Act 179, effective July 1, 2004

This Act increased the Noncontributory service-connected disability formula to 35% of average final compensation. The Act also changed the methodology for crediting interest on contributions for terminated members so that interest continues to accrue until the date of refund. The Act adds a "pop-up" feature to the joint & survivor benefit options if the beneficiary pre-deceases the retiree.

This Act also created the new Hybrid Plan which became effective July 1, 2006.

*Summary of Actuarial Methods and Assumptions (continued)***Summary of Plan Changes (continued)****Act 181, effective July 1, 2004**

This Act establishes fixed employer contribution rates as a percentage of compensation effective July 1, 2005. Employers will contribute 15.75% for their police officers and firefighters and 13.75% for other employees.

Act 183, effective July 1, 2004

This Act amends the ERS statutes to comply with the federal tax limits on compensation retroactive to July 1, 1996.

Act 56, effective December 1, 2004

This Act amends the ERS statutes to allow the automatic cost-of-living-adjustment to be reflected when determining actuarial equivalent optional forms of payment.

Act 256, effective July 5, 2007

Legislation was enacted to remove the statutory salary increase assumption from the statutes and to grant the System's Board of Trustees the authority to set the salary increase assumption. As a result of that legislation, the Board has adopted effective with this valuation the salary increase assumption recommended by GRS as a result of the Experience Study performed in 2006.

Legislation was also enacted to increase the employer contribution rates to the System. Effective July 1, 2008, the employer contribution rate for Police and Fire employees will increase from 15.75% to 19.70% and the rate for All Other employees will increase from 13.75% to 15.00%

Act 163, effective June 23, 2011

Legislation was enacted that increased the future employer contribution rates to ERS. Employers of Police and Fire employees will contribute 22.0% of pay in FY 2013, 23.0% in FY 2014, 24.0% in FY 2015, and 25.0% in FY 2016 and beyond. Employers of All Other Employees will contribute 15.5% of pay in FY 2013, 16.0% in FY 2014, 16.5% in FY 2015, and 17.0% in FY 2016 and beyond.

Act 163 continued on next page

Summary of Actuarial Methods and Assumptions (continued)

Summary of Plan Changes (continued)

Act 163, effective June 23, 2011 (continued)

Legislation was enacted that made numerous changes to the benefits and member contribution rates for employees hired after June 30, 2012. Key changes are shown below:

Benefit Provision	Police & Fire Employees	All Other Employees
Benefit Multiplier	2.25%	1.75%
Normal Retirement	Age 55 with 25 years of service, or age 60 with 10 years of service	Age 60 with 30 years of service, or age 65 with 10 years of service
Post-Retirement Increase	1.5%	1.5%
Hybrid Match	N/A	120%
Average Final Compensation	Highest 5 annual base salaries	Highest 5 annual base salaries
Eligibility for Deferred Benefit	10 years of service	10 years of service
Member Contribution Rate	14.20%	8.00%

Similar changes were also made to the benefits of Judges, Legislative Officers, etc.

Similar changes were also made to those employees in the All Other Employees group who are eligible to retire at 25 years of service including the addition of a minimum age requirement (55).

Finally, legislation was enacted that set the investment return assumption for the June 30, 2011 valuation at 7.75% (the rate recommended in the Experience Study presented to the Board in December of 2010). In addition, the legislation granted ERS's Board the authority to set this assumption for valuations after 2011.

Act 152, effective June 26, 2012

Legislation was enacted to require employers to pay additional contributions if a retiring employee, who was first employed prior to July 1, 2012 and who was last employed by the employer, has significant non-base pay increases included in their average final compensation. The additional contribution is equal to the actuarial present value of the additional benefits earned due to the "excessive" non-base pay increases.

Act 153, effective June 26, 2012

Legislation was enacted to eliminate most types of non-base pay from the definition of compensation for employees hired after June 30, 2012. For the impacted employees, non-base pay compensation will be excluded in determining both the contributions made by and on behalf of these employees and the benefits they will earn in the System.

*Summary of Actuarial Methods and Assumptions (continued)***Act 017, effective July 1, 2017**

Legislation was enacted that increased the future employer contribution rates to ERS. Employers of Police and Fire employees will contribute 28% of pay in FY 2018, 31% in FY 2019, 36% in FY 2020, and 41% in FY 2021 and beyond. Employers of All Other Employees will contribute 18% of pay in FY 2018, 19% in FY 2019, 22% in FY 2020, and 24% in FY 2021 and beyond.

Ten-Year Actuarial Schedules (continued)

**Ten Year Actuarial Schedules
2010 to 2019**

- Retirement System Membership **
 - 2019 Membership Data *
- Historical Summary of Active Member Data *
- Pensioners, Average Annual Pension and Active Member/Pensioner Comparison **
- Number of Retirants and Beneficiaries **
- Solvency Test **
- Employer Contribution Rates as a Percentage of Payroll **
- Employer Appropriations to Pension Accumulation Fund, Appropriation Years 2009-2010 to 2018-2019 **

Note: * Prepared by Gabriel, Roeder, Smith & Company
 ** Compiled by ERS Staff from actuary reports, or other data.

**Retirement System Membership **
2010 to 2019**

March 31,	Active Members	Terminated Vested Members	Inactive Nonvested Members (a)	Pensioners & Beneficiaries	Total Membership
2010	65,890	6,895	n/a	38,441	111,226
2011	65,310	6,649	n/a	39,689	111,648
2012	65,599	6,909	n/a	40,774	113,282
2013	66,226	7,312	n/a	41,812	115,350
2014	67,206	8,105	11,247	43,087	129,645
2015	67,310	7,413	13,840	44,283	132,846
2016	67,377	7,741	14,554	45,506	135,178
2017	65,911	9,241	16,482	46,927	138,561
2018	66,271	9,249	17,819	48,569	141,908
2019	66,383	9,321	19,533	49,885	145,122

** Schedule compiled by ERS Staff from actuary reports.

(a) Number not reported in prior years, included in counts for GASB Statement No. 68 reporting.
 n/a = not available

*Ten-Year Actuarial Schedules (continued)***2019 Membership Data**

	Police and Firefighters		All Other Employees		All Employees	
	June 30, 2019	June 30, 2018	June 30, 2019	June 30, 2018	June 30, 2019	June 30, 2018
1. Active members						
a. Number	4,857	4,890	61,526	61,381	66,383	66,271
b. Total payroll	\$ 501,644,732	\$ 480,304,486	\$3,891,340,420	\$3,776,937,484	\$4,392,985,152	\$4,257,241,970
c. Average salary	\$ 103,283	\$ 98,222	\$ 63,247	\$ 61,533	\$ 66,176	\$ 64,240
d. Average age	42.7	42.7	48.4	48.3	47.9	47.9
e. Average service	14.4	14.4	13.0	13.1	13.1	13.2
2. Terminated vested members (a)						
a. Number	387	382	8,934	8,867	9,3219	9,249
b. Total annual deferred benefits	\$ 6,758,663	\$ 6,427,960	\$ 96,469,915	\$ 92,406,838	\$ 103,228,578	\$ 98,834,798
c. Average annual deferred benefit	\$ 17,464	\$ 16,827	\$ 10,798	\$ 10,421	\$ 11,075	\$ 10,686
3. Service retirees						
a. Number	3750	3,633	39,029	39,029	43,765	42,662
b. Total annual benefits	\$ 223,126,890	\$ 206,589,158	\$1,091,736,349	\$1,043,197,275	\$1,314,863,239	\$1,249,786,433
c. Average annual benefit	\$ 59,501	\$ 56,865	\$ 27,283	\$ 26,729	\$ 30,044	\$ 29,295
4. Disabled retirees						
a. Number	128	125	1,547	1,518	1,675	1,643
b. Total annual benefits	\$ 3,062,338	\$ 2,825,661	\$ 21,973,444	\$ 20,913,676	\$ 25,035,782	\$ 23,739,337
c. Average annual benefit	\$ 23,925	\$ 22,605	\$ 14,204	\$ 13,777	\$ 14,947	\$ 14,449
5. Beneficiaries						
a. Number	321	312	4,124	3,952	4,445	4,264
b. Total annual benefits	\$ 12,811,415	\$ 11,934,021	\$ 70,305,830	\$ 65,573,518	\$ 83,117,245	\$ 77,507,539
c. Average annual benefit	\$ 39,911	\$ 38,250	\$ 17,048	\$ 16,592	\$ 18,699	\$ 18,177

- (a) As of June 30, 2014 - Terminated vested members does not include 11, 247 Inactive members that may return to service and earn additional service credits to become vested (612 Police and firefighters plus 10,635 All other employees). As of June 30, 2015, there were 13,840 (568 Police and firefighters plus 13,272 All other employees). As of June 30, 2016, there were 14,554 (599 Police and firefighters plus 13,955 All other employees). As of June 30, 2017, there were 16,482 (641 Police and firefighters plus 15,841 All other employees). As of June 30, 2018, there were 17,819 (666 Police and firefighters plus 17,153 All other employees). As of June 30, 2019, there were 19,533 (721 Police and firefighters plus 18,812 All other employees).

Historical Summary of Active Member Data

Year Ending June 30,	Active Members		Covered Payroll		Average Salary		Average Age	Average Service
	Number	Percent Increase	Amount in \$ Millions	Percent Increase	\$ Amount	Percent Increase		
2010	65,890	-3.0%	3,713.6	-3.2%	56,360	-0.3%	47.1	13.2
2011	65,310	-0.9%	3,731.4	0.5%	57,133	1.4%	47.4	13.4
2012	65,599	0.4%	3,706.1	-0.7%	56,497	-1.1%	47.6	13.5
2013	66,226	1.0%	3,720.8	0.4%	56,184	-0.6%	47.7	13.5
2014	67,206	1.5%	3,871.0	4.0%	57,600	2.5%	47.8	13.5
2015	67,310	0.2%	3,952.6	2.1%	58,723	1.9%	47.8	13.2
2016	67,377	0.1%	4,118.4	4.2%	61,124	4.1%	47.9	13.3
2017	65,911	-2.2%	4,134.2	0.4%	62,723	2.6%	48.0	13.3
2018	66,271	0.5%	4,257.2	3.0%	64,240	2.4%	47.9	13.2
2019	66,383	0.2%	4,393.0	3.2%	66,176	3.0%	47.9	13.2

*Ten-Year Actuarial Schedules (continued)***Pensioners, Average Annual Pension and
Active Member/Pensioner Comparison****

2010 to 2019

March 31,	Number of Pensioners	Average Annual Pension (1)	Ratio of Active Members per Pensioner
2010	35,763	\$23,173	1.8
2011	36,871	\$24,160	1.8
2012	37,830	\$24,853	1.7
2013	38,741	\$25,485	1.7
2014	39,680	\$26,032	1.7
2015	40,657	\$26,671	1.7
2016	41,654	\$27,260	1.6
2017	42,857	\$27,946	1.5
2018	44,305	\$28,745	1.5
2019	45,440	\$29,847	1.5

** Schedule compiled by ERS Staff from actuary reports.

- (1) Pension amount includes base pension plus 2.5% post-retirement increases (excludes other bonuses and cost-of-living adjustments).

Number of Retirants and Beneficiaries**

2010 to 2019

As of Mar 31,	Added	Average Added to Rolls	Removed	Average Removed from Rolls	Total	Average Pension	% Chg
Retirants							
2010	2,316	\$25,153	982	\$16,362	35,763	\$23,173	3.74%
2011	2,056	\$27,808	948	\$18,154	36,871	\$24,160	4.26%
2012	1,987	\$24,680	1,028	\$17,958	37,830	\$24,853	2.87%
2013	1,994	\$23,503	1,083	\$18,144	38,741	\$25,485	2.54%
2014	2,027	\$22,585	1,088	\$19,456	39,680	\$26,032	2.15%
2015	2,229	\$22,997	1,252	\$19,820	40,657	\$26,671	2.45%
2016	2,237	\$23,785	1,240	\$20,694	41,654	\$27,260	2.21%
2017	2,402	\$28,043	1,199	\$21,286	42,857	\$27,946	2.52%
2018	2,709	\$28,712	1,261	\$21,995	44,305	\$28,745	2.86%
2019	2,448	\$28,248	1,313	\$23,323	45,440	\$29,487	2.58%
Beneficiaries							
2010	214	\$14,803	106	\$9,713	2,678	\$13,814	3.80%
2011	212	\$15,843	72	\$12,107	2,818	\$14,256	3.20%
2012	225	\$14,798	99	\$11,882	2,944	\$14,628	2.61%
2013	238	\$14,515	111	\$11,790	3,071	\$14,962	2.28%
2014	442	\$17,964	106	\$12,439	3,407	\$15,651	4.60%
2015	310	\$19,597	91	\$12,530	3,626	\$16,337	4.38%
2016	325	\$20,598	99	\$14,371	3,852	\$17,022	4.19%
2017	333	\$19,992	115	\$13,012	4,070	\$17,663	3.77%
2018	336	\$19,355	142	\$15,036	4,264	\$18,177	2.91%
2019	326	\$19,807	148	\$15,282	4,445	\$18,699	2.87%

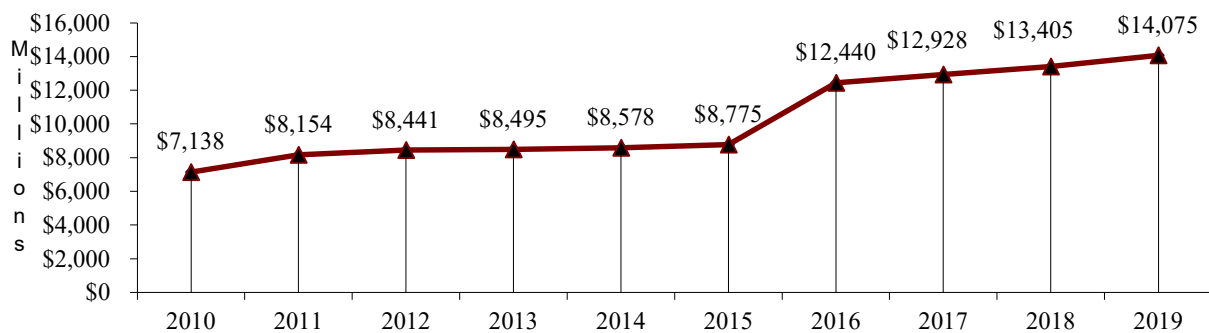
** Schedule compiled by ERS staff from actuary reports.

*Ten-Year Actuarial Schedules (continued)***Solvency Test****
2010 to 2019

June 30,	Actuarial Accrued Liabilities (AAL)				Cumulative Portion of Actuarial Accrued Liabilities Covered by Assets		
	Active Member Contributions	Retirees, Beneficiaries, and Inactive Vested Members	Active and Inactive Members Employer Financed Portion	Actuarial Value of Assets	Column (1)	Column (2)	Column (3)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2010	1,265.0	9,259.4	7,959.2	11,345.6	100%	100%	10.3%
2011	1,364.2	10,183.7	8,549.0	11,942.8	100%	100%	4.6%
2012	1,485.1	10,707.2	8,491.1	12,242.5	100%	100%	0.6%
2013	1,658.2	11,182.5	8,403.0	12,748.8	100%	99%	0.0%
2014	1,812.9	11,673.0	8,734.2	13,641.8	100%	100%	1.8%
2015	1,981.8	12,321.8	8,934.8	14,463.7	100%	100%	1.8%
2016	2,150.4	14,228.2	11,060.6	14,998.7	100%	90%	0.0%
2017	2,183.2	15,020.6	11,444.8	15,720.6	100%	90%	0.0%
2018	2,181.3	16,008.8	11,727.3	16,512.7	100%	90%	0.0%
2019	2,202.2	16,871.1	12,323.1	17,322.2	100%	90%	0.0%

(Amounts in \$millions)

** Schedule compiled by ERS Staff from actuary reports

Unfunded Actuarial Accrued Liability FY 2009-2018

*Ten-Year Actuarial Schedules (continued)***Employer Contribution Rates as a Percentage of Payroll ****
2010 to 2019

Actuarial Valuation as of June 30,	Police and Firefighters			All Other Employees			All Active Employees		
	Normal Cost Rate	Amorti- zation Percent	Total Employer Rate	Normal Cost Rate	Amorti- zation Percent	Total Employer Rate	Normal Cost Rate	Amorti- zation Percent	Total Employer Rate
2010	6.59%	13.11%	19.70%	5.78%	9.22%	15.00%	5.88%	9.59%	15.47%
2011	6.60%	13.10%	19.70%	5.79%	9.21%	15.00%	5.90%	9.59%	15.49%
2012	8.09%	11.01%	19.70%	5.78%	9.22%	15.00%	6.06%	9.46%	15.52%
2013	7.98%	14.02%	22.00%	5.69%	9.81%	15.50%	5.97%	10.14%	16.11%
2014 *	7.17%	14.83%	23.00%	5.34%	10.66%	16.00%	5.54%	11.22%	16.76%
2015 *	8.04%	15.96%	24.00%	5.76%	10.74%	16.50%	6.02%	11.26%	17.28%
2016 *	13.32%	11.68%	25.00%	7.57%	9.43%	17.00%	8.23%	9.66%	17.89%
2017 *	13.13%	11.87%	25.00%	7.33%	9.67%	17.00%	8.02%	9.89%	17.91%
2018 *	12.97%	15.03%	28.00%	7.14%	10.86%	18.00%	7.82%	11.34%	19.16%
2019 *	14.02%	16.98%	31.00%	7.07%	11.93%	19.00%	7.89%	12.47%	20.36%

Note: Effective with the June 30, 2004 valuation, the employer contribution rate is statutorily changed to a percentage of pay of 15.75% of actual pay for Police and Fire and 13.75% of actual pay for All Other Employees, per Act 181/2004 SLH. Effective July 1, 2008, the employer contribution rate increased to 19.70% of actual pay for Police and Fire and 15.00% of actual pay for All Other Employees, per Act 256/2006 SLH.

Per Act 163/2011 SLH, the statutory employer contribution rate for Police and Fire employees will be 22.00% in FY 2013, 23.00% in FY 2014, 24.00% in FY 2015 and 25.00% in FY 2016 and thereafter, and the rate for All Other Employees will be 15.50% in FY 2013, 16.00% in FY 2014, 16.50% in FY 2015 and 17.00% in FY 2016 and thereafter.

Per Act 017/2017 SLH, the statutory employer contribution rates for Police and Fire employees will be 28% of pay in FY 2018, 31% in FY 2019, 36% in FY 2020, and 41% in FY 2021 and thereafter, and the rate for All Other Employees will be 18% of pay in FY 2018, 19% in FY 2019, 22% in FY 2020, and 24% in FY 2021 and thereafter.

* This chart does not include the effects of GASB Statement No 67 (implemented by the ERS only for FY 2014) that requires member contributions “picked up” as employer contributions pursuant to IRC section 414(h)(2) to be reported as Employer Contributions. ERS implemented GASB Statement No. 82 in FY 2015 that excludes these amounts from Employer Contributions.

** Schedule compiled by ERS Staff from actuarial reports.

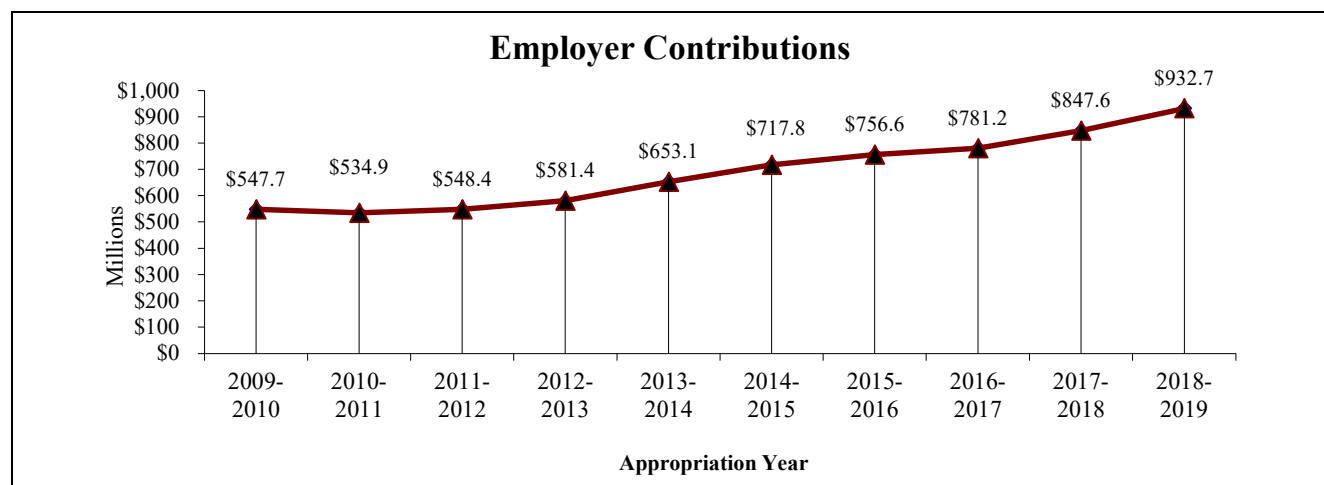
*Ten-Year Actuarial Schedules (continued)***Employer Appropriations to Pension Accumulation Fund****

Fiscal Year	Investment Yield Rate	
	Assumed for Actuarial Valuation	Actuarial Investment Return
2009-2010	8.0%	(0.42)%
2010-2011	7.75%	7.10%
2011-2012	7.75%	5.05%
2012-2013	7.75%	6.67%
2013-2014	7.75%	9.23%
2014-2015	7.65%	7.85%
2015-2016	7.00%	5.59%
2016-2017	7.00%	6.92%
2017-2018	7.00%	7.18%
2018-2019	7.00%	6.81%

- Notes: (1) Beginning with the valuation for fiscal year 1996-97 (appropriation fiscal year 1999-2000), the actuarial investment income is the sum of the expected net investment income based on the actuarial assumption of 8% and a four-year smoothing of the difference between the market value of assets at year-end and the expected actuarial value of assets. In prior years, the actuarial investment income was the sum of interest, dividends, and net realized gains less net realized losses and investment expenses.
- (2) Effective July 1, 2008, the employer contribution rate increased to 19.70% of actual pay for Police and Fire and 15.00% of actual pay for All Other Employees, per Act 256/2006 SLH. Pursuant to Act 163/2012 SLH, the employer rates increased over a four-year phase in period. The employer contribution rates for Police and Fire employees increased according to the following schedule: 22.00% in FY2013, 23.00% in FY 2014, and 24.00% in FY 2015, and 25.00% in FY 2016 and beyond. The employer contribution rates for All Other Employees increased according to the following schedule: 15.50% in FY2013, 16.00% in FY 2014, and 16.50% in FY 2015, and 17.00% in FY 2016 and beyond.

Pursuant to Act 017/2017 SLH, the employer rates increased over a four-year phase in period. The employer contribution rates for Police and Fire employees increased according to the following schedule: 25.00% in FY2018, 31.00% in FY 2019, 36.00% in FY 2020, and 41.00% in FY 2021 and beyond. The employer contribution rates for All Other Employees increased according to the following schedule: 18.00% in FY2018, 19.00% in FY 2019, 22.00% in FY 2020, and 24.00% in FY 2021 and beyond.

** Schedule compiled by ERS Staff from actuary reports.



*** This chart of Employer Contributions does not include Member contributions picked up as employer contributions per IRC section 414(h)(2) and Chapter 88, HRS (as required by GASB Statement No. 68 in FY 2014).

Ten-Year Actuarial Schedules (continued)
AGGREGATED FUNDED RATIOS FOR STATES

Funded Ratio	Aggregated Statewide Retirement Systems (all statewide systems for state employees, teachers, school employees, or municipal employees)			
100% or more	2	South Dakota	100.0%	Wisconsin 100.0%
90% to 99%	5	New York	96.7%	Idaho 91.6%
		Tennessee	94.4%	Nebraska 90.3%
		Washington	93.6%	
80% to 89%	10	Utah	87.8%	Oklahoma 82.3%
		Delaware	87.4%	Minnesota 81.9%
		North Carolina	86.0%	Iowa 81.8%
		Florida	83.9%	Missouri 80.3%
		Maine	83.2%	Oregon 80.1%
70% to 79%	10	Arkansas	79.5%	Ohio 75.7%
		West Virginia	78.8%	Nevada 75.1%
		Virginia	78.6%	Wyoming 74.2%
		Texas	78.4%	Maryland 72.8%
		Georgia	77.1%	Montana 71.4%
60% to 69%	14	Alabama	69.7%	Arizona 64.8%
		California	69.5%	New Hampshire 63.6%
		North Dakota	69.0%	Michigan 62.5%
		Louisiana	68.8%	Vermont 62.3%
		Alaska	68.4%	Indiana 62.0%
		Kansas	68.4%	Mississippi 61.8%
		New Mexico	66.9%	Colorado 58.7%
Less than 60%	9	Rhode Island	57.7%	New Jersey 54.1%
		Massachusetts	57.0%	Connecticut 48.9%
		Pennsylvania	56.3%	Illinois 48.7%
		South Carolina	55.5%	Kentucky 46.2%
		Hawaii	55.2%	

Source: Compiled from most recent Public Funds Survey by Gabriel, Roeder, Smith & Company

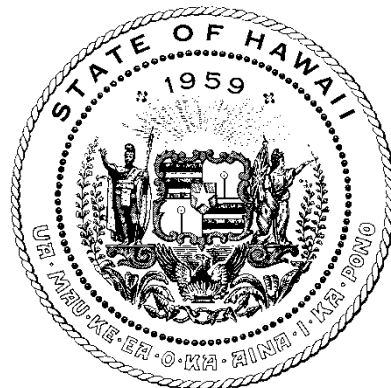
Note: Funded Ratios are shown for all 50 states. Multiple statewide retirement systems are aggregated together to produce the overall funded ratio for the state.

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Employees' Retirement System

of the State of Hawaii



**STATISTICAL
SECTION**

Summary

This section contains various statistical and historical data considered useful in evaluating the condition of the ERS. All non-accounting data is taken from ERS' internal sources except for that information which is derived from the actuarial valuations.

Changes in Fiduciary Net Position

Last Ten Fiscal Years

Fiscal Year Ended June 30,:	2010	2011	2012	2013	2014 **
Additions					
Employer Contributions	\$ 547,669,675	\$ 538,692,849	\$ 548,353,394	\$ 581,447,213	\$ 653,127,697
Member contributions	360,047,068	232,880,063	182,401,324	185,837,186	206,127,337
Investment income (net of expense)	1,026,461,210	2,040,061,555	(57,798,410)	1,331,208,154	2,175,479,961
Total additions to plan net assets	1,934,177,953	2,811,634,467	672,956,308	2,098,492,553	3,034,734,995
Deductions					
Benefits	905,315,348	960,219,432	1,015,447,668	1,060,561,148	1,122,445,642
Refunds	7,573,619	7,901,509	7,187,606	7,204,411	8,475,969
Administrative expenses	12,406,339	13,325,781	11,634,197	11,941,446	12,626,030
Total deductions from plan net assets	925,295,306	981,446,722	1,034,269,471	1,079,707,005	1,143,547,641
Net increase (decrease) in net position	1,008,882,647	1,830,187,745	(361,313,163)	1,018,785,548	1,891,187,354
Net position restricted for pension benefits					
Beginning of year	8,815,285,172	9,824,167,819	11,654,355,564	11,293,042,401	12,311,827,949
End of year	\$ 9,824,167,819	\$ 11,654,355,564	\$ 11,293,042,401	\$ 12,311,827,949	\$ 14,203,015,303
Fiscal Year Ended June 30,:	2015	2016	2017	2018	2019
Additions					
Employer Contributions	\$ 717,792,981	\$ 756,558,222	\$ 781,244,218	\$ 847,595,466	\$ 922,635,334
Member contributions	223,505,419	236,801,861	250,704,067	259,427,934	273,223,578
Investment income (net of expense)	556,436,475	(169,368,110)	1,934,512,507	1,225,572,599	932,696,412
Total additions to plan net assets	1,497,734,875	823,991,973	2,966,460,792	2,332,595,999	2,128,555,324
Deductions					
Benefits	1,170,744,770	1,232,589,353	1,306,788,954	1,395,881,342	1,469,634,809
Refunds	10,507,888	12,927,672	16,340,290	20,846,500	16,502,635
Administrative expenses	14,032,964	13,960,587	14,986,159	15,784,490	13,798,866
Total deductions from plan net assets	1,195,285,622	1,259,477,612	1,338,115,403	1,432,512,332	1,499,936,310
Net increase (decrease) in net position	302,449,253	(435,485,639)	1,628,345,389	900,083,667	628,619,014
Net position restricted for pension benefits					
Beginning of year	14,203,015,303	14,505,464,556	14,069,978,917	15,698,324,306	16,598,407,973
End of year	\$ 14,505,464,556	\$ 14,069,978,917	\$ 15,698,324,306	\$ 16,598,407,973	\$ 17,227,026,987

** For FYE June 30, 2014, ERS implemented GASB Statement No. 67 that requires Member Contributions "picked up" per Internal Revenue Code section 414(h)(2) as employer contributions to be classified for financial statement purposes as "Employer Contributions". This was subsequently changed effective with FYE June 30, 2015 with the implementation of GASB Statement No. 82.

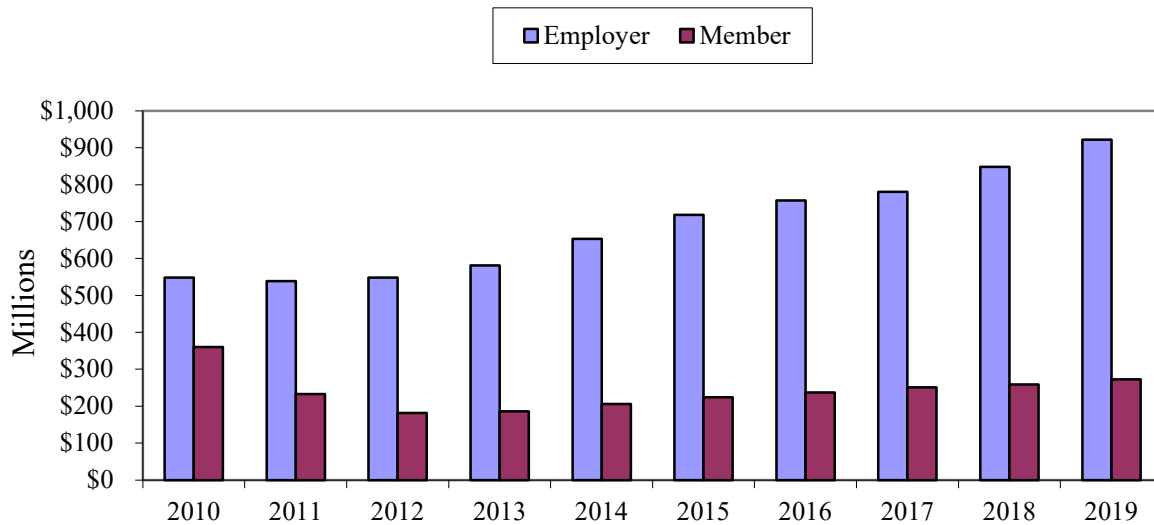
Contributions

Employer Contribution Rates as a Percentage of Payroll **

Fiscal Year	Police & Firefighters	All Other Employees	Composite Rate
2010	19.70%	15.00%	15.47%
2011	19.70%	15.00%	15.49%
2012	19.70%	15.00%	15.52%
2013	22.00%	15.50%	16.11%
2014	** 23.00%	16.00%	16.76%
2015	24.00%	16.50%	17.28%
2016	25.00%	17.00%	17.89%
2017	25.00%	17.00%	17.91%
2018	28.00%	18.00%	19.16%
2019	31.00%	19.00%	20.36%

** Excludes member contributions picked up as employer contributions per IRC section 414(h)(2) and Chapter 88, HRS for FY 2014.

Contributions **



*** Member contributions picked up as employer contributions per IRC section 414(h)(2) and Chapter 88, HRS are included in the Member Contributions for this chart, they are not included in Employer Contributions for FY 2014.

Deductions from Fiduciary Net Position for Benefit Payments by Type

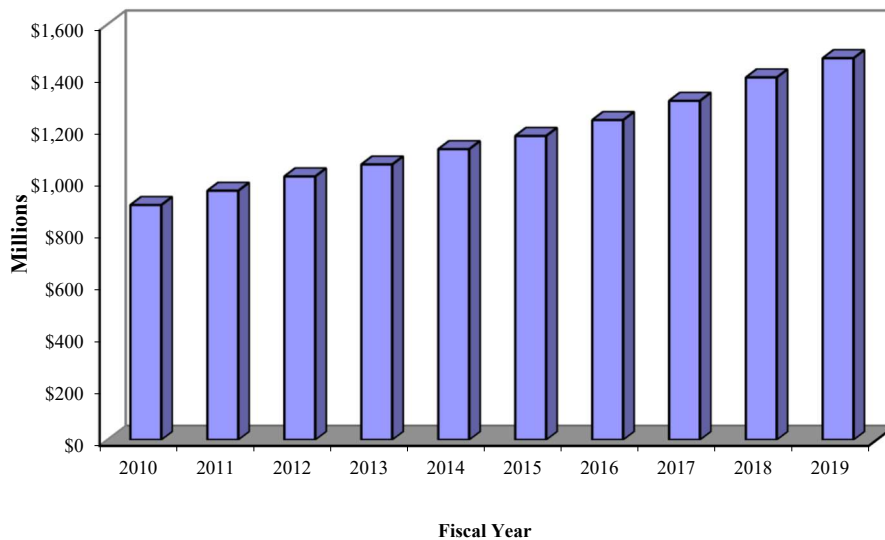
Last Ten Fiscal Years

Fiscal Year Ended June 30,:	2010	2011	2012	2013	2014
Recurring benefit payments					
Service	\$ 807,662,216	\$ 859,915,959	\$ 917,840,937	\$ 963,894,245	\$ 1,016,912,124
Disability	16,470,042	17,355,973	17,877,572	18,987,509	19,835,520
Death	36,993,685	40,173,678	43,053,039	45,948,656	53,324,252
subtotal	861,125,943	917,445,610	978,771,548	1,028,830,410	1,090,071,896
Refund Option payments (one-time)	44,189,405	42,773,822	36,676,120	31,730,738	32,373,746
Total benefit payments	<u>\$ 905,315,348</u>	<u>\$ 960,219,432</u>	<u>\$ 1,015,447,668</u>	<u>\$ 1,060,561,148</u>	<u>\$1,122,445,642</u>

Fiscal Year Ended June 30,:	2015	2016	2017	2018	2019
Recurring benefit payments					
Service	\$ 1,058,688,356	\$ 1,111,416,262	\$ 1,175,380,410	\$ 1,241,819,373	\$ 1,306,624,918
Disability	20,732,259	21,437,486	22,303,070	23,739,337	25,035,782
Death	59,238,051	65,568,232	71,889,117	77,507,539	83,117,245
subtotal	1,138,658,666	1,198,421,980	1,269,572,597	1,343,066,249	1,414,777,945
Refund Option payments (one-time)	32,086,104	34,167,373	37,216,357	52,815,093	54,856,864
Total benefit payments	<u>\$ 1,170,744,770</u>	<u>\$ 1,232,589,353</u>	<u>\$ 1,306,788,954</u>	<u>\$ 1,395,881,342</u>	<u>\$ 1,469,634,809</u>

** From FYE 6/30/2009, death benefits include payments to continuing beneficiaries.

Benefit Payments



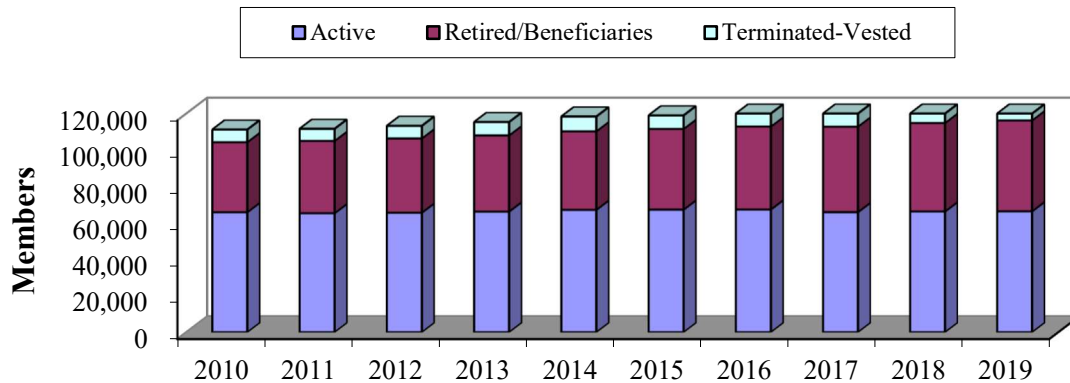
Participating Employers and Membership in ERS

Last Ten Fiscal Years

ERS Membership

As of March 31,:	Active	Retired/ Beneficiaries	Terminated- Vested	Inactive- Non-Vested	Totals
2010	65,890	38,441	6,895	na	111,226
2011	65,310	39,689	6,649	na	111,648
2012	65,599	40,774	6,909	na	113,282
2013	66,226	41,812	7,312	na	115,350
2014	67,206	43,087	8,105	11,247	129,645
2015	67,310	44,283	7,413	13,840	132,846
2016	67,377	45,506	7,741	14,554	135,178
2017	65,911	46,927	9,241	16,482	138,561
2018	66,271	48,569	9,249	17,819	141,908
2019	66,383	49,885	9,321	19,533	145,122

ERS Membership



Participating Employers and Active Members

As of March 31,:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
State of Hawaii	50,789	50,268	50,604	51,176	51,875	51,791	51,723	50,288	50,719	50,788
City & County of Honolulu	8,519	8,485	8,451	8,457	8,625	8,727	8,807	8,740	8,709	8,713
- Board of Water Supply	526	516	505	532	551	558	558	572	570	581
Hawaii County	2,501	2,459	2,427	2,446	2,489	2,550	2,596	2,561	2,553	2,579
Kauai County	1,129	1,158	1,201	1,227	1,244	1,234	1,244	1,246	1,247	1,248
Maui County	2,426	2,424	2,411	2,388	2,422	2,450	2,449	2,504	2,473	2,474
Total	65,890	65,310	65,599	66,226	67,206	67,310	67,377	65,911	66,271	66,383

Benefit Payments by Retirement Type and Option

As of March 31, 2019

Retired Contributory Members

Monthly Benefit	Number of Recipients	Type of Retirement *					Retirement Option						
		1	2	3	4	5	Max	Opt. 1	Opt. 2	Opt. 3	Opt. 4	Opt. 5	Other
\$ 1 - 500	1,152	866	21	10	1	254	220	204	167	63	217	280	1
500 - 1,000	1,850	1,397	67	23	14	349	207	119	142	61	727	590	4
1,000 - 1,500	1,978	1,572	33	63	12	298	216	111	140	60	847	601	3
1,500 - 2,000	2,118	1,783	17	50	11	257	199	87	147	66	968	644	7
2,000 - 2,500	1,997	1,753	11	37	7	189	149	60	129	40	894	720	5
2,500 - 3,000	2,296	2,114	4	20	7	151	192	52	108	49	1,004	885	6
3,000 - 3,500	2,256	2,111	3	13	7	122	193	66	128	58	1,094	712	5
3,500 - 4,000	1,839	1,717	-	12	4	106	194	49	89	65	1,067	372	3
4,000 - 4,500	1,412	1,341	-	8	1	62	199	42	87	61	799	224	-
4,500 - 5,000	1,028	982	-	3	2	41	146	26	79	56	583	137	1
5,000	3,123	3,012	-	-	7	104	412	76	311	195	1,882	247	-
	21,049	18,648	156	239	73	1,933	2,327	892	1,527	774	10,082	5,412	35

Retired Hybrid Members

Monthly Benefit	Number of Recipients	Type of Retirement *					Retirement Option						
		1	2	3	4	5	Max	Opt. 1	Opt. 2	Opt. 3	Opt. 4	Opt. 5	Other
\$ 1 - 500	695	630	5	-	27	33	298	80	153	87	29	48	-
500 - 1,000	1,935	1,723	74	9	45	84	722	132	477	227	200	177	-
1,000 - 1,500	1,832	1,596	105	32	27	72	642	101	440	203	237	209	-
1,500 - 2,000	1,331	1,190	64	17	12	48	437	80	350	174	175	114	1
2,000 - 2,500	1,149	1,063	31	5	14	36	380	67	286	176	163	75	2
2,500 - 3,000	1,039	997	22	-	9	11	382	60	235	172	126	63	1
3,000 - 3,500	869	833	5	5	10	16	334	36	208	139	113	39	-
3,500 - 4,000	644	638	-	-	3	3	255	35	114	136	67	37	-
4,000 - 4,500	443	438	1	-	-	4	174	29	95	83	40	22	-
4,500 - 5,000	297	289	1	-	3	4	97	15	79	72	24	10	-
5,000	698	684	-	-	2	12	247	38	153	149	82	29	-
	10,932	10,081	308	68	152	323	3,968	673	2,590	1,618	1,256	823	4

Retired Noncontributory Members

Monthly Benefit	Number of Recipients	Type of Retirement *					Retirement Option				
		1	2	3	4	5	Max	Opt. A	Opt. B	Opt. C	Other
\$ 1 - 500	2,494	1,681	123	52	141	497	993	555	708	115	140
500 - 1,000	4,383	3,436	308	52	91	496	2,079	820	1,144	199	70
1,000 - 1,500	3,059	2,549	159	58	34	259	1,414	582	733	135	23
1,500 - 2,000	2,003	1,753	78	17	9	146	866	390	553	97	3
2,000 - 2,500	1,730	1,573	31	5	10	111	842	341	392	112	1
2,500 - 3,000	1,654	1,573	11	2	6	62	967	301	239	123	-
3,000 - 3,500	1,125	1,080	5	1	4	35	649	186	167	52	-
3,500 - 4,000	664	639	1	1	6	17	342	120	92	19	-
4,000 - 4,500	332	313	-	-	1	18	174	62	48	9	-
4,500 - 5,000	188	181	-	-	1	6	111	38	29	5	-
5,000	272	258	-	-	5	9	123	52	52	7	-
	17,904	15,036	716	188	308	1,656	8,560	3,447	4,157	873	237

* Type of Retirement

- 1 – Normal retirement for age & service
- 2 – Ordinary disability retirement
- 3 – Occupational disability retirement
- 4 – Survivor payment – death in service
- 5 – Survivor payment – normal or disability retirement

Note: Refer to Plan Summary in the Introductory Section for descriptions of the types of retirements and benefit options selected by the members.

Average Monthly Service Pensions by Years of Credited Service

		<u>Years of Credited Service</u>							
	<u>As of March 31,</u>	<u>0-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30-34</u>	<u>35+</u>	<u>All</u>
2010	Average Monthly Benefit	\$336	\$563	\$948	\$1,356	\$2,289	\$2,750	\$3,097	\$1,975
	Number of Active Retirants	1,143	4,062	3,719	4,373	7,775	8,926	4,268	34,266
2011	Average Monthly Benefit	\$364	\$583	\$984	\$1,397	\$2,374	\$2,849	\$3,261	\$2,059
	Number of Active Retirants	1,221	4,106	3,843	4,526	7,920	9,176	4,567	35,359
2012	Average Monthly Benefit	\$388	\$603	\$1,012	\$1,424	\$2,446	\$2,934	\$3,361	\$2,117
	Number of Active Retirants	1,292	4,222	3,929	4,705	8,030	9,361	4,769	36,308
2013	Average Monthly Benefit	\$429	\$622	\$1,038	\$1,449	\$2,521	\$3,009	\$3,454	\$2,171
	Number of Active Retirants	1,371	4,303	4,018	4,906	8,134	9,544	4,902	37,178
2014	Average Monthly Benefit	\$451	\$642	\$1,061	\$1,473	\$2,574	\$3,082	\$3,531	\$2,216
	Number of Active Retirants	1,478	4,430	4,080	5,092	8,216	9,675	5,133	38,104
2015	Average Monthly Benefit	\$485	\$650	\$1,081	\$1,487	\$2,623	\$3,141	\$3,619	\$2,269
	Number of Active Retirants	1,305	4,547	4,221	5,319	8,344	10,009	5,318	39,063
2016	Average Monthly Benefit	\$522	\$667	\$1,111	\$1,519	\$2,680	\$3,210	\$3,725	\$2,318
	Number of Active Retirants	1,383	4,676	4,379	5,483	8,467	10,195	5,474	40,057
2017	Average Monthly Benefit	\$553	\$687	\$1,150	\$1,563	\$2,753	\$3,278	\$3,824	\$2,375
	Number of Active Retirants	1,450	4,854	4,515	5,629	8,688	10,457	5,655	41,248
2018	Average Monthly Benefit	\$589	\$713	\$1,182	\$1,608	\$2,848	\$3,366	\$3,929	\$2,441
	Number of Active Retirants	1,534	5,076	4,699	5,772	8,938	10,765	5,878	42,662
2019	Average Monthly Benefit	\$615	\$739	\$1,208	\$1,644	\$2,940	\$3,446	\$4,034	\$2,504
	Number of Active Retirants	1,577	5,247	4,884	5,868	9,110	11,048	6,031	43,765

Retirees and Beneficiaries

(Recurring Benefit Payments)

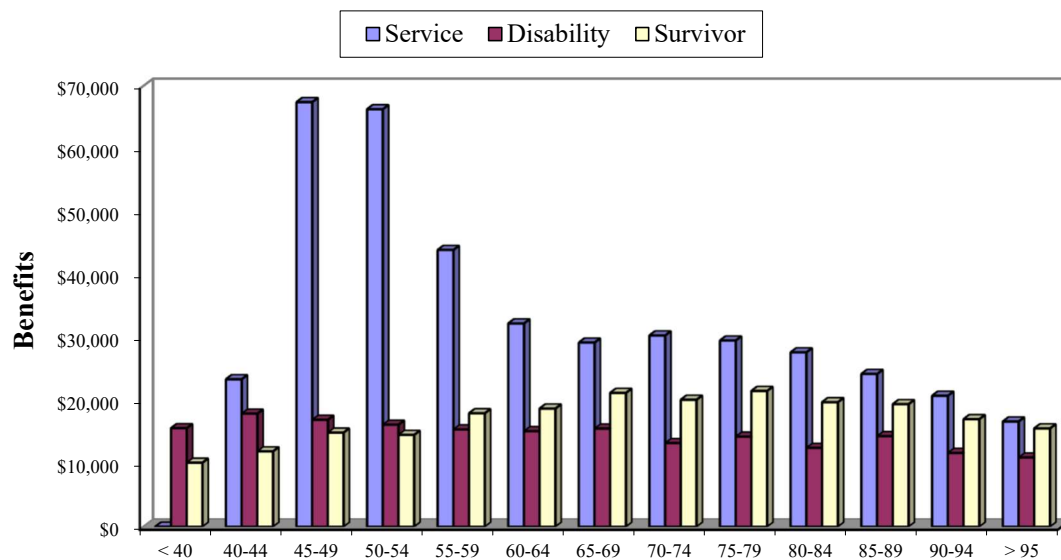
Tabulated by Fiscal Year that Payments Started as of March 31, 2019

Valuation Year	Number	Total Annual Benefits	Monthly Average Benefit	Valuation Year	Number	Total Annual Benefits	Monthly Average Benefit
1959	1	\$ 4,538	\$378	1991	680	\$ 17,196,996	\$2,107
1960	1	699	\$58	1992	676	18,360,973	\$2,263
1961	1	280	\$23	1993	711	21,541,720	\$2,525
1962	1	6,038	\$503	1994	756	21,964,718	\$2,421
1964	2	17,896	\$746	1995	1,498	52,537,366	\$2,923
1966	1	7,428	\$619	1996	1,534	51,338,750	\$2,789
1967	2	24,548	\$1,023	1997	564	14,165,570	\$2,093
1968	2	20,744	\$864	1998	602	15,394,146	\$2,131
1969	4	36,173	\$754	1999	882	24,735,201	\$2,337
1970	2	15,173	\$632	2000	1,104	32,474,239	\$2,451
1971	4	30,424	\$634	2001	1,309	38,040,173	\$2,422
1972	9	112,182	\$1,039	2002	1,112	32,636,323	\$2,446
1973	13	133,500	\$856	2003	1,469	47,332,929	\$2,685
1974	14	172,871	\$1,029	2004	1,440	43,417,400	\$2,513
1975	16	204,505	\$1,065	2005	1,534	47,065,853	\$2,557
1976	26	349,477	\$1,120	2006	1,531	44,611,438	\$2,428
1977	41	545,502	\$1,109	2007	1,672	47,770,373	\$2,381
1978	46	776,942	\$1,408	2008	1,656	45,554,371	\$2,292
1979	65	1,027,945	\$1,318	2009	1,575	43,451,035	\$2,299
1980	90	1,503,554	\$1,392	2010	2,261	74,147,815	\$2,733
1981	142	2,355,076	\$1,382	2011	2,078	69,282,064	\$2,778
1982	179	3,074,007	\$1,431	2012	2,026	59,524,594	\$2,448
1983	186	3,718,257	\$1,666	2013	2,049	56,206,172	\$2,286
1984	249	4,911,957	\$1,644	2014	2,127	57,363,378	\$2,247
1985	305	6,506,508	\$1,778	2015	2,407	62,965,431	\$2,180
1986	395	9,093,848	\$1,919	2016	2,465	64,555,245	\$2,182
1987	641	15,553,115	\$2,022	2017	2,633	74,190,319	\$2,348
1988	375	7,643,082	\$1,698	2018	2,948	87,288,128	\$2,467
1989	507	11,513,450	\$1,892	2019	2,700	74,352,563	\$2,295
1990	566	14,191,264	\$2,089				
Total					49,885	\$ 1,423,016,266	\$2,377

Total Benefits Payable
(Recurring Benefit Payments)
Tabulated by Attained Ages of Benefit Recipients as of March 31, 2019

Attained Ages	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20	-	-	-	-	47	\$ 266,508	47	\$ 266,508
20-24	-	-	-	-	12	129,544	12	129,544
25-29	-	-	-	-	36	358,277	36	358,277
30-34	-	-	-	\$ -	57	812,402	57	812,402
35-39	-	-	7	109,381	87	859,526	94	968,907
40-44	2	\$ 46,783	6	107,604	108	1,290,766	116	1,445,153
45-49	87	5,864,736	50	848,003	152	2,268,962	289	8,981,701
50-54	419	27,773,595	124	2,006,754	183	2,665,404	726	32,445,753
55-59	1,837	80,680,240	278	4,292,366	306	5,506,706	2,421	90,479,312
60-64	5,593	180,366,683	383	5,803,505	469	8,788,959	6,445	194,959,147
65-69	10,044	293,377,195	348	5,417,953	586	12,439,425	10,978	311,234,573
70-74	9,962	302,267,093	253	3,356,337	684	13,776,062	10,899	319,399,492
75-79	6,366	188,087,659	116	1,657,653	548	11,802,025	7,030	201,547,337
80-84	4,450	123,092,325	45	562,503	471	9,303,390	4,966	132,958,218
85-89	3,156	76,480,619	44	632,222	423	8,223,238	3,623	85,336,079
90-94	1,461	30,351,324	15	175,628	220	3,752,811	1,696	34,279,763
95-99	344	5,897,112	6	65,873	46	695,530	396	6,658,515
100 & over	44	577,875	-	-	10	177,710	54	755,585
Total	43,765	\$ 1,314,863,239	1,675	\$ 25,035,782	4,445	\$ 83,117,245	49,885	\$ 1,423,016,266

Average Benefits



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