EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF HAWAII

ANNUAL COMPREHENSIVE FINANCIAL REPORT

FOR THE FISCAL YEAR ENDED JUNE 30, 2022

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FOR THE FISCAL YEAR ENDED JUNE 30, 2022

Prepared by the Staff of the:
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THOMAS WILLIAMS, Executive Director
KANOE MARGOL, Deputy Executive Director
HOWARD HODEL, Acting Chief Investment Officer

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Employees' Retirement System

of the State of Hawaii

INTRODUCTORY SECTION

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Letter of Transmittal

JOSH GREEN, M.D.
GOVERNOR

THOMAS WILLIAMS
EXECUTIVE DIRECTOR

KANOE MARGOL
DEPUTY EXECUTIVE DIRECTOR

STATE OF HAWAII
EMPLOYEES' RETIREMENT SYSTEM

October 19, 2023

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

Dear Board Members:

We present the Annual Comprehensive Financial Report (ACFR) of the Employees' Retirement System for the fiscal year ended June 30, 2022. 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, 2022 the ERS' total membership of 152,127 was comprised of 64,234 active members, 53,990 retirees and beneficiaries 9,031 inactive vested members and 24,872 inactive non-vested members. This compares to 127,255 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

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The ERS provides a report of the Social Security Contribution Fund for the State of Hawaii (Contribution Fund) as part of Other Information. The Social Security contributions (employer and amounts withheld from employees) are remitted directly to the Internal Revenue Service (IRS) by the State.

MAJOR ACCOMPLISHMENTS AND INITIATIVES IN FY 2022

The ERS is "positioned for the long term" as our board, staff and other stakeholders continued to work in FY 2022 on ERS's strategic plan long-term goals that guides our every activity—from customer service to cyber-security and business continuity, to legislation and investments. While fiscal year 2022 was a challenging time in our history we are now as strongly positioned to achieve our goals as we have been in many years. The ERS continues to make progress on our long term financial and operational goals with assistance from processes and procedures put in place, and more importantly with cooperation and assistance from our partners – our members, employers, board of trustees, employees, and other stakeholders.

Significantly, our near- and long-term investment performance ranks among the best of peer public pension plans. During FY 2022 the Employees' Retirement System portfolio earned a 4.0% investment returns, with the fiduciary net position remaining at $21.9 billion as of June 30, 2022. The ERS returns for FY 2022 are impressive by any measure—whether it is versus our policy benchmark, a traditional 60% stock/40% bond portfolio, our 7% annualized long-term target, or in comparison to our peer group of public pension plans. For example, our 4.0% one-year return exceeded our policy benchmark by 5%, a 60/40 stock/bond portfolio by 19%, and the median peer pension plan by 11%. The multi-year numbers, moreover, demonstrate that the investment team has consistently produced returns for our investment portfolio well in excess of the ERS benchmark as well as the ERS's 7% percent annualized long-term return target, especially over the past three years that have resulted in an annualized return of 5.3%, 3.1%, 2.1% over the 1, 3, and 5 year periods over the Policy Benchmark returns, respectively.

Since 2014, the ERS utilizes two high-level strategic classes (Broad Growth and Diversifying Strategies) for allocating assets and managing risk within the total portfolio. Both of these strategic classes contain sub-components that in-turn utilize asset classes and/or specific strategies for implementation. The Broad Growth class utilizes three sub-components (Public Growth, Private Growth, and Real Assets) which are ultimately invested in public equity, options-based equity, credit fixed income, private real assets, and private equity. The Diversifying Strategies class is designed to be uncorrelated to the Broad Growth class and it utilizes three sub-components (Liquid Defensive, Liquid Diversifying, and Illiquid Diversifying). The Diversifying Strategies class utilizes a multitude of asset classes and strategies, including US treasury and agency bonds, inflation-linked treasury bonds, systematic trend following, alternative risk premia, global macro, insurance-linked securities, relative value strategies, and niche private assets, among others. The ERS may also hold opportunities and other investments if they are determined to be additive to the portfolio's risk/return posture. Please refer to the *Investment Section* for more information on ERS's investments.

While our Investment Team deserves and receives a good amount of recognition for generating its above-average investment returns, year in and out, it's our Retirement Benefits, Accounting, Information Services and Staff Support Services branches that serve as the structural foundation for our organization and are responsible for overall service delivery. Our successful operations depend on these units, which interface with many of our members, and represent the invisible players who work behind the scenes.

Our members' need for service has never been greater. We respond to ever increasing numbers of requests for information, counsel, estimates and retirement applications. We have been working intently with employers to improve the accuracy and timeliness of information submittal necessary to calculate and pay benefits.

The 2022 legislature approved our hire of two additional investment staff as well as an investment accounting position. Our request to acquire a high-value analytic tool was also approved. Our reputation and track record, combined with our strategic investment policy and plan, will serve to recruit and retain the high-performing staff required to maintain our progress toward full funding. Further, the continued funding of employer contributions from our participating employers - the Governor, State Legislature, and County employers –strengthens our path to full funding while concurrently lowering the risk posed by deep and prolonged downturns in the domestic and global markets.

There was no significant legislation passed during the 2022 Legislative Session that impacted the ERS. We are thankful for the support of the Governor, Legislature, and department to help ERS achieve its funding and operational goals.

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. Capital assets are recorded at cost less accumulated depreciation.

The *Management Discussion and Analysis* (MD&A) in the Financial Section provides an overview and analysis on the ERS and financial statements. This letter of transmittal is intended to complement the MD&A and should be read in conjunction with it. 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, in October 2014 ERS first adopted the risk-based, functional framework for allocating capital within the investment portfolio. This framework, with updates effective July 1, 2020, continues to use strategic/functional classes that in-turn utilize underlying asset classes and strategies that ERS was largely implemented in several phases through June 30, 2022. 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 https://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, 2022 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 $165 million in a challenging FY2022. This translates to an investment return of approximately 4.0% 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, 2022 report of the Fund's valuation our actuaries, Gabriel Roeder Smith & Company noted that that our unfunded actuarial accrued liability (UAAL) for funding purposes decreased to $13.5 billion from $14.2 billion on June 30, 2021 based on the pre-2015 GASB reporting standards. Under the current market-based GASB standards effective in FY 2015, the Net Pension Liability increased to $13.0 billion on June 30, 2022 from $12.2 billion on June 30, 2021. On the market basis, this represents a decrease in funded position to 62.3% for FY 2022 from 64.3% for FY 2021. The ERS full funding period remained at 24 years as of June 30, 2022 and June 30, 2021, primarily from the deferred investment gains of FY 2021 under the 4-year smoothing methodology used by ERS.

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 Eide Bailly 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 are 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

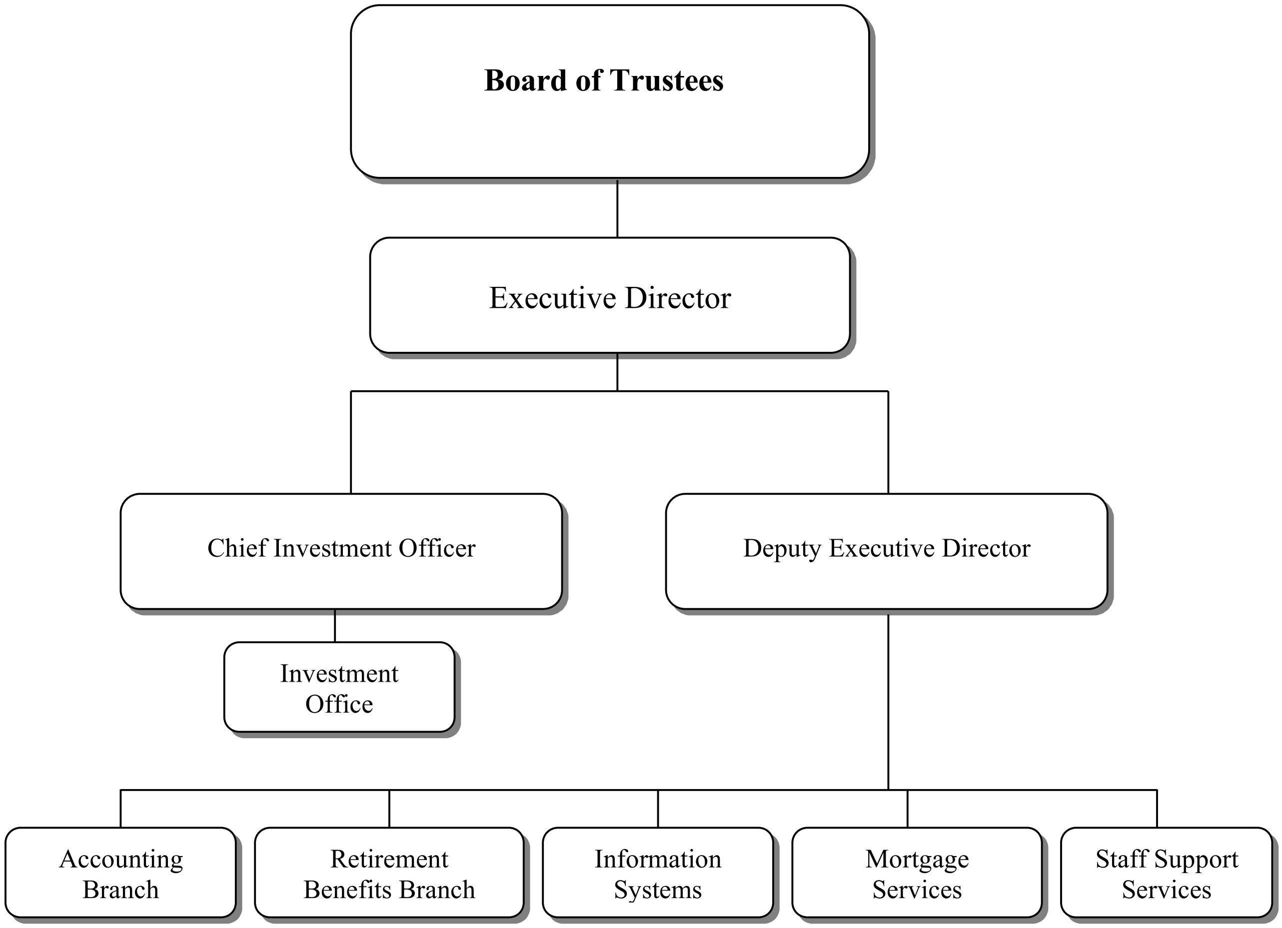
Board of Trustees

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 Genevieve Ley, Board Vice-Chair	January 2, 2018	January 1, 2024
Mr. Emmit A. Kane, Board Chair	January 2, 2020	January 1, 2026
Mr. Bennett Yap	January 2, 2020	January 1, 2026
Dr. Catherine Chan	January 2, 2022	January 1, 2028
Appointed:		
Mr. Vincent Barfield	January 2, 2017	January 1, 2023
Mr. Lance Mizumoto	July 27, 2021	January 1, 2026
Ex-Officio:		
Ms. Craig K. Hirai	December 16, 2019	January 1, 2023

Organizational Structure



Executive Director	Thomas Williams
Deputy Executive Director	Kanoe Margol
Chief Investment Officer	Howard Hodel (Acting)

Actuary
Gabriel, Roeder, Smith and Company

Auditors
State of Hawaii, Office of the Auditor
Eide Bailly 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

** The *Investment Section* of this ACFR contains a list of investment professionals on pages 116-119; a schedule investment fees on page 122; and a schedule of broker commissions on pages 123-128.

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, 2022, 5,342 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, 2022, the Hybrid Class had 49,413 members or about 76.9% 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, 2022, there were 9,479 active employees in the Noncontributory Class, which represents over 14.8% 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; ***or*** Age 55 and 30 years credited service	Age 55 and 5 years credited service	Age 62 and 5 years credited service; ***or*** 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%

* 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.

	Noncontributory	**Contributory**	**Hybrid**
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, ***or*** 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, ***or*** 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; ***or*** 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; ***or*** 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*** Option 2 (100% Joint and Survivor) lifetime pension if member was eligible for retirement at the time of death and one beneficiary designated; ***or*** 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; ***or*** 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*** Option 2 (100% Joint Survivor) lifetime pension if member was eligible for retirement at the time of death, and one beneficiary designated; ***or*** 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]

	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 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.

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; ***or*** Age 55 and 30 years credited service	Age 60 and 10 years credited service	Age 65 and 10 years credited service; ***or*** 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.

	Noncontributory	**Contributory**	**Hybrid**
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]

	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	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	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*** 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; ***or*** 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*** Option 2 (100% Joint and Survivor) lifetime pension if member was eligible for retirement at the time of death and one beneficiary designated; ***or*** 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 120%) plus return of non-Hybrid contributions and accrued interest; ***or*** 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*** Option 2 (100% Joint Survivor) lifetime pension if member was eligible for retirement at the time of death, and one beneficiary designated; ***or*** If less than 10 years of service, return of member's contributions and accrued interest.

[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)] 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)

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

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.

Legislative Highlights 2022

The following legislation (Acts) passed during the 2022 Legislative Session (including Special Sessions) and approved by the Governor that impacts the ERS For more information on the 2022 Legislative Session, please refer to the capitol website at https://www.capitol.hawaii.gov/.

Act 248 (HB1600) State Budget

Provides funding and badly need authorization of three (3) positions for the ERS; two (2) additional investment officers and one (1) accountant. These positions will help ERS implement and monitor its investment strategies and operations to achieve improvement in the long-term funding of ERS.
Effective: July 6, 2022

Act 115(SB514) Mandatory Tax Refund; Emergency and Budget Reserve Fund; Pension Accumulation Fund; Constitution; Appropriations

In accordance with article VII, section 6, of the Hawaii State Constitution, there is appropriated out of the general revenues of the State of Hawaii the sum of $300,000,000 or so much thereof as may be necessary for fiscal year 2022-2023 for deposit into the pension accumulation fund established under section 88—114, Hawaii Revised Statutes. If funded, these funds will help improve the funded status of the ERS.
Effective: June 1, 2022

Employees' Retirement System

of the State of Hawaii

Submitted by

THE AUDITOR
STATE OF HAWAII

FINANCIAL SECTION

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Independent Auditor's Report

CPAs & BUSINESS ADVISORS

The Auditor
State of Hawaii

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

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of the Employees' Retirement System of the State of Hawaii (the ERS) as of and for the year ended June 30, 2022, and the related notes to the financial statements, which collectively comprise the ERS' basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the respective fiduciary net position of the Employees' Retirement System of the State of Hawaii, as of June 30, 2022, and the respective changes in fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States (Government Auditing Standards). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the ERS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Financial Statements

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

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Independent Auditors' Report

The Auditor
State of Hawaii:

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

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the ERS' ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit .
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit 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 ERS' internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the ERS' ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control–related matters that we identified during the aud.

The Auditor
State of Hawaii:

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

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and the schedule of changes in the employers' net pension liability and related ratios, schedule of the employers' net pension liability, and schedule of investment returns (collectively the required supplementary information) be presented to supplement the basic financial statements. Such information is the responsibility of management and, 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 GAAS, 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.

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 identified as Schedule 1 through Schedule 3 in the table of contents is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The 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 GAAS. In our opinion, the supplementary information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Independent Auditors' Report (continued)

The Auditor
State of Hawaii:

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

Other Information

Management is responsible for the other information included in the annual report. The other information comprises Schedule 4, as identified in the table of contents, and the introductory, investment, actuarial and statistical sections but does not include the basic financial statements and our auditor's report thereon. Our opinion on the basic financial statements does not cover the other information, and we do not express an opinion or any form of assurance thereon.

In connection with our audit of the basic financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the basic financial statements, or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated October 18, 2023, 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 solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the ERS' 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.

Eide Bailly LLP

Boise, Idaho
October 18, 2023

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, 2022. 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 (ACFR). For more detailed information pertaining to the ERS' financial activities, the reader should also review the actual financial statements, including the notes and supplementary information.

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 reports on the federal Social Security employer contributions for the State in the Social Security Contribution Fund (Contribution Fund) in Other Information at the end of this section.

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. 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, 2022, and the related statement of changes in fiduciary net position during the fiscal year from July 1, 2021 to June 30, 2022 (FY 2022). 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 FY 2022 statement of fiduciary net position includes reclassification of how certain assets are reported as of June 30, 2022. The FY 2021 summary presentation in this section reflect this reclassification.
- 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 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.
- Other information includes a report on employer social security contribution amounts for the State that are paid directly to the Internal Revenue Service. This information is separate from the financial information of the Pension Trust Fund.

Financial Highlights

- The fiduciary net position remained relatively constant at $21.9 billion as of June 30, 2022, resulting in a decrease in funded status during the fiscal year to 62.8%. The ERS's fiduciary net position for pension benefits was $21.9 billion, for a 64.3% funded status as of June 30, 2021.

- The ERS investment return (net and gross of fees, and contains lagged and non-lagged components) was 4.0% for the 2022 fiscal year compared to 26.6% for the 2021 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 ACFR). The investment program underperformed its actuarial and investment goal of 7.0% that was effective June 30, 2022 Under GASB Statement No. 67, *Financial Reporting for Pension Plans* – an amendment of GASB Statement No. 25, the annual money-weighted return on ERS' pension plan investments, net of pension plan investment expense, was 0.8% and 26.9% for FY 2022 and FY 2021, 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. Following the completion of the 2019 Asset Liability Study the Board adopted a new long-term strategic allocation policy that established two major asset classes of broad growth and diversifying strategies (rather than four Broad Growth, Principal Protection, Real Return and Crisis Risk Offset) that was completed during the 2022 fiscal year. Please refer to Note F1 later in Notes to Financial Statements and the Investment Section of this ACFR for more detailed information on the asset allocation policy.

- During 2022 and 2021, there was no significant legislation passed that significantly affects the operations or provisions of the pension trust.
- Total pension liability as of June 30, 2022 increased to $34.9 billion from $34.1 billion on June 30, 2021, while the corresponding net pension liability increased to $13.0 billion as of June 30, 2022 from $12.2 billion as of June 30, 2021. Covered payroll for the ERS decreased in FY 2022 to $4.5 billion compared to FY 2021 to $4.7 billion for a 3.9% decrease.

- The fiduciary net position as a percentage of total pension liability decreased to 62.8% from 64.3% as of June 30, 2022 and June 30, 2021, respectively, while the funded ratio on an actuarial basis increased to 61.2% from 58.3%, respectively. 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 decreased by a total of $47.0 million during FY 2022, or 3.0% from FY 2021. The decrease is primarily from the decrease in covered payroll resulting in a decrease in the number of active members. This was offset by 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 $87.4 million, or 5.3% in FY 2022 from FY 2021. Pension benefits continues to increase due to 2.6% more retirees and beneficiaries (53,990 in 2022 compared to 52,618 in 2021), an increase in the average pension benefit for new retirees, and the annual 2.5% postretirement increase paid to most retirees.
- Administrative expenses decreased by $1.6 million to $17.5 million in FY 2022 from $19.1 million in FY 2021. The decrease in administrative expenses is primarily the result of a decrease in depreciation of computer systems, and to a lesser extent a decrease in legal, auditing, accounting, and information technology related charges. These were offset by an increase in the employee fringe benefit assessment, and medical board related expenses. Administrative expenses for all years were within the ERS' budgeted amounts.

Analysis of Fiduciary Net Position

Summary of Fiduciary Net Position
June 30, 2022 and 2021
(Dollars in millions)

	2022	2021	FY 2022 % change
Assets:			
Cash and cash equivalents and short-term investments	$ 1,008.3	$ 1,977.6	(49.0) %
Receivables	155.9	164.8	(5.4)
Investments	20,821.5	19,926.1	4.5
Invested securities lending collateral	735.9	1,003.7	(26.7)
Equipment	5.0	6.0	(16.7)
Total assets	22,726.6	23,078.2	(1.5)
Liabilities			
Securities lending liability	735.9	1,003.7	(26.7)
Investment accounts and other payables	135.9	138.7	(2.0)
Total liabilities	871.8	1,142.4	(23.7)
Fiduciary net position	$ 21,854.8	$ 21,935.8	(0.4)

Summary of Changes in Fiduciary Net Position
June 30, 2022 and 2021
(Dollars in millions)

	2022	2021	FY 2022 % change
Additions:			
Contributions	$ 1,535.2	$ 1,582.2	(3.0) %
Net investment income	164.6	4,662.2	(96.5)
Total additions	1,699.8	6,244.4	(72.8)
Deductions:			
Retirement benefit payments	1,738.8	1,651.4	5.3
Refund of contributions	24.5	23.6	3.8
Administrative expenses	17.5	19.1	(8.4)
Total deductions	1,780.8	1,694.1	5.1
Increase/(decrease) in fiduciary net position	$ (81.0)	$ 4,550.3	(101.8)
Fiduciary net position			
Beginning	21,935.8	17,385.5	
Ending	$ 21,854.8	$ 21,935.8	

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 FY 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. Since 2016 the ERS has been transitioning towards these new targets. Following the 2019 Asset Liability Study that was completed in FY 2020, the Board adopted a new long-term strategic allocation policy. As part of the long-term strategic policy, the portfolio transitioned to two major asset classes (rather than four). Prevailing classes and sub-classes were remapped to the two major strategic classes where applicable. As expected, the ERS transitioned into adopting its long-term strategic allocation plan starting July 1, 2022. A subsequent asset liability study was completed in FY 2023 that will impact the strategic allocation over time.

The asset distribution of the ERS' investment securities for the pension trust, excluding pending trade settlements and securities lending collateral, at June 30, 2022 and 2021 are presented below at fair value (reflecting the change in classification of assets as of June 30, 2022 discussed above). 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. Please refer to the Investment Section of the ACFR for a discussion on the risk-based methodology, asset allocation plan targets, and investments by investment strategy.

Asset Class
June 30, 2022 and 2021
(Dollars in millions)

		2022	%		2021	%
Short term investments and cash	$	1,008.3	4.6 %	$	1,977.6	9.0 %
Equity securities		5,360.4	24.6		7,352.7	33.6
Fixed income		3,263.0	14.9		4,287.7	19.6
Real assets		3,372.2	15.4		1,798.7	8.2
Alternative investments		8,825.9	40.5		6,487.0	29.6
Total investment assets		21,829.8	100.0		21,903.7	100.0

The rate of return (gross of fees time-weighted rate of returns) on the ERS investment portfolio was 4.0% from the challenging investment markets in FY 2022 underperforming the overall ERS investment target of 7.0%. Diversifying Strategies asset class outperformed with a return of 11.4% during the fiscal year, while the Broad Growth asset class return was a return of 0.9%. This compares to an overall return on the portfolio of 26.6% in FY 2021. Total net investment income was $164.6 million in FY 2022 compared to $4,662.2 million in FY 2021.

The ERS had positive returns of 11.4% in the diversifying strategies lead by liquid defensive (+17.3%), liquid diversifying (+6.7%), and illiquid diversifying (+2.7%) segments. In comparison, the broad growth retuned returns of 0.9% comprised of positive returns in private growth (+29.7%) and real assets (+18.0%) offset by negative returns in public growth (-13.3%). 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 ACFR.

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 investment management fees paid to external investment advisor firms that oversee the ERS' investment portfolio.

Total investment management fees earned by external investment advisors increased in FY 2022 from FY 2021 due to long-term risk-based asset investment strategy with a larger percentage of assets in private markets that earn higher fees than the public securities markets. Investment advisor fees include incentive fees for superior investment returns by the manager above their corresponding benchmark, while maintaining an acceptable level of investment risk. Incentive fees for certain investment managers are recognized on the accrual basis of accounting for 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 fees the managers offer their clients for investment accounts with similar investment mandates and similar account size.

Contributions

Contributions from employers and employees totaled $1,535.2 million and $1,582.2 million in FY 2022 FY 2021, respectively. During FY 2022, total contributions decreased by $47.0 million, or 3.0%, primarily from a decrease in the number of active employees and corresponding decrease in covered payroll that contributions are assessed on.

Pension Plan Benefits and Expenses

Pension benefit payments continue to be the primary deduction of the ERS with payments increasing to $1,738.8 in FY 2022 from $1,651.4 million in FY 2021. 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 increased to $24.5 million in FY 2022 from $23.6 million in FY 2021.

Administrative expenses decreased to $17.5 million in FY 2022 from $19.1 million in FY 2021 due primarily from the decrease in equipment depreciation expense and to a lesser extent a smaller decrease in legal, accounting and computer maintenance related expenses. This was partially offset by a slight increase in employee fringe benefit assessment.

Pension Plan Changes

There was no significant legislation passed in 2022 and 2021 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 ACFR.

Actuarial Valuations and Measurement of Net Pension Liability

The funding status decreased during FY 2022 on the fiduciary net position (market asset basis) to 61.2% as of June 30, 2022 from to 64.3% as June 30, 2021, as a result of the sizeable decrease in covered payroll for active members that contributions are assessed on and the decrease in investment returns.

During a challenging investment environment of FY 2022, the ERS's investment portfolio earned 4.0% based on the market value of assets. This compares to rate of return for the actuarial value of 0.8% in FY 2022, which is different than the market return calculation due to the smoothing methodology used in the determination of the actuarial value of assets.

The total pension liability for fiscal year ended June 30, 2022 is based on the actuarial valuation performed as of June 30, 2022 and a measurement date of June 30, 2022.

Per the valuation as of June 30, 2022, the ERS's total pension liability was $34.8 billion, covered payroll totaled $4.5 billion, and the ERS's fiduciary net position of $21.9 billion resulting in a net pension liability of $12.9 billion. The June 30, 2021 valuation results include the ERS's total pension liability of $34.1 billion, covered payroll totaled $4.7 billion, and the ERS' fiduciary net position was $21.9 billion resulting in a net pension liability of $12.2 billion. The ERS' fiduciary net position as a percentage of total pension liability was 62.8% and 64.3% on June 30, 2022 and 2021, resulting in the net pension liability as a percentage of covered payrolls of 289.2% and 261.5%, respectively. The increase in pension liabilities is the result of overall payroll growth and individual salary increases.

Based on the results of the actuarial valuation as of June 30, 2022, including existing statutory employer contribution rates, the ERS actuary determined that the funding period for paying off the unfunded actuarial accrued liability (UAAL) of the ERS Pension Trust remained unchanged at 24 years from June 30, 2021. 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 ACFR contains for more information on changes to the Actuarial Assumptions.

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

Statement of Fiduciary Net Position

June 30, 2022

Assets	
Cash and cash equivalents and short-term investments	
Cash and cash equivalents	$ 99,095,482
Short-term investments	909,222,390
	1,008,317,872
Receivables	
Accounts receivable and others	2,622,869
Investment sales proceeds	39,940,051
Accrued investment income	28,852,378
Employer and member contributions	84,468,296
	155,883,594
Investments, at fair value	
Equity securities	5,360,412,415
Fixed income securities	3,262,952,343
Real assets investments	3,372,222,912
Alternative investments	8,825,905,906
	20,821,493,576
Other	
Invested securities lending collateral	735,926,602
Equipment, at cost, net of depreciation	4,984,223
	740,910,825
Total assets	22,726,605,867
Liabilities	
Accounts and other payables	111,219,287
Payable for securities purchased	24,645,946
Securities lending collateral	735,926,602
Total liabilities	871,791,835
Fiduciary net position restricted for pensions	$ 21,854,814,032

See accompanying notes to financial statements

Financial Statements (continued)

Statement of Changes in Fiduciary Net Position

Year ended June 30, 2022

Additions		
Contributions		
Employers contributions	$	1,242,139,095
Members contributions		293,027,560
Total contributions		1,535,166,655
Investment income		
From investing activities:		
Net depreciation in fair value of investments		(409,456,733)
Interest on fixed income securities		129,062,358
Dividends on equity securities		118,701,094
Income on real asset investments		101,363,262
Interest on short-term investments		824,820
Alternative investment income		432,926,112
Miscellaneous		463,087
		373,884,000
Less investment expenses		212,785,041
Net investment income from investing activities		161,098,959
From securities lending activities:		
Securities lending income		4,836,033
Less: securities lending expenses, net		1,375,957
Net investment income from securities lending		3,460,076
Total net investment income		164,559,035
Total additions, net		1,699,725,690
Deductions		
Benefit payments		1,738,751,492
Refunds of member contributions		24,454,256
Administrative expenses		17,497,621
Total deductions		1,780,703,369
Net decrease in fiduciary net position		(80,977,679)
Fiduciary net position restricted for pensions		
Beginning of year		21,935,791,711
End of year	$	21,854,814,032

See accompanying notes to financial statements.

Notes to Financial Statements

June 30, 2022

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.

Note A – Description of the ERS (continued)

1. General (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.

Note A – Description of the ERS (continued)

1. General (continued)

Employer, pensioner, and employee membership data as of March 31, 2022 are as follows:

Employers:	
State	1
County	4
Total employers	5
Pensioners and beneficiaries currently receiving benefits:	
Pensioners currently receiving benefits:	
Police and firefighters	4,231
All other employees	44,682
Total pensioners	48,913
Beneficiaries currently receiving benefits:	
Police and firefighters	389
All other employees	4,688
Total beneficiaries	5,077
Total pensioners and beneficiaries	53,990
Terminated vested members entitled to benefits but not yet receiving benefits:	
Police and firefighters	242
All other employees	8,789
Total terminated vested members	9,031
Inactive members	
Police and firefighters	969
All other employees	23,903
Total inactive members	24,872
Total terminated vested and inactive members	33,903
Active members:	
Vested:	
Police and firefighters	3,007
All other employees	31,580
Total vested members	34,587
Nonvested:	
Police and firefighters	1,863
All other employees	27,784
Total nonvested members	29,647
Total active members	64,234
Total membership	152,127

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 three 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 8, 2022 as recommended by Gabriel, Roeder, Smith and Company (GRS) (from the experience study as of June 30, 2021, with most of the assumptions based on the period from July 1, 2016, through June 30, 2021) 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 Firefighters 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 Firefighters 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 the 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 Firefighters increased 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 increased 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.

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 Firefighters employees) are required to be Contributory members.

Note A – Description of the ERS (continued)

3. Class Descriptions and Funding Policy (continued)

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.).

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.

Note A – Description of the ERS (continued)

3. Class Descriptions and Funding Policy (continued)

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.

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 and are covered by Social Security. 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.

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.

Note B – Social Security Contribution Fund (Other Information)

The Social Security Contribution Fund (Contribution Fund), reported in Other Information Schedule 4, 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. At June 30, 2022, the ERS held no amounts in the Contribution Fund as all employer contribution amounts from the State 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 other governments, and/or other funds. The fiduciary fund types used by the ERS are a Pension Trust 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.

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 Cash Equivalents and Investments

The ERS' investment policy for cash and cash equivalents 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, *Fair Value Measurement and Application*.

Cash and cash equivalents, and investments 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 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.

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, 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.

Note C – Summary of Accounting Policies (continued)

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, 2021, with most of the assumptions based on the period from July 1, 2016, through June 30, 2021.

9. Recently Issued Accounting Policies

In May 2020, GASB issued Statement No. 96, *Subscription-based Information Technology Arrangements (SBITAs)* (Statement No. 96). Statement No. 96 defines a SBITA; establishes criteria for identifying when a SBITA results in a right-to-use subscription asset—an intangible asset—and a corresponding subscription liability; provides the capitalization criteria for outlays other than subscription payments; including implementation costs; and requires note disclosures regarding a SBITA. To the extent relevant, the standards for SBITAs are based on the standards established in Statement No. 87, *Leases*, as amended. The requirements of this Statement No. 96 are effective for fiscal years beginning after June 15, 2022. 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 as of June 30, 2022 are as follows:

		2022
Pension Accumulation Reserve	$	18,333,677,177
Annuity Savings Reserve		3,506,654,625
Expense Reserve		14,482,230
Total fiduciary net position	$	21,854,814,032

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.

Note E – Contributions (continued)

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.

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 are limited to investment grade, short-term marketable securities.

The investment decisions are further dictated by the Investment Policy Statement, 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 with 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.

Note F – Deposit and Investment Disclosures (continued)

1. Investment Policy (continued)

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.

At the end of the fiscal year, June 30, 2022, the ERS was strategically invested in the following classes:

	Strategic Allocation (functional/risk-based classes)
Broad Growth	67.5%
Diversifying Strategies	32.5%
Total	100%

During FY 2022, the Broad Growth strategic asset class includes sub-asset classes or components of Public Growth (Traditional Equity, Stabilized Equity, and Global Credit), Private Growth, and Real Assets (Core Real Estate, Non-Core Real Estate, Other Real Assets, Infrastructure, Timber and Agriculture). The Diversifying Strategies asset class includes Illiquid Diversifying (Idiosyncratic Return Capture, and Insurance Linked), Liquid Defensive (Systematic Trend Following, Defensive Return Capture and Treasury Agency Duration Capture), and Liquid Diversifying (Relative Value Arbitrage and Alternative Return Capture Strategies). The ERS may also hold Opportunities and Other Investments.

As a result of the formal asset-liability study that began in fiscal year 2019 and was completed in fiscal year 2020, the Board adopted a new long-term strategic allocation policy. As part of this new long-term strategic policy, the portfolio transitioned to two major strategic classes (rather than four). Prevailing classes and sub-classes were remapped to the two major strategic classes where applicable. As planned, the final allocations across the new long-term strategic allocation policy was largely completed by the end of the 2022 fiscal year, and the transition into adoption of the new long-term strategic allocation began on July 1, 2022. A subsequent asset study was completed in FY 2023 that will impact the strategic allocation over time.

The ERS utilizes two high-level strategic classes (Broad Growth and Diversifying Strategies) for allocating assets and managing risk within the total portfolio. Both of these strategic classes contain sub-components that in-turn utilize asset classes and/or specific strategies for implementation. The Broad Growth class utilizes three sub-components (Public Growth, Private Growth, and Real Assets) which are ultimately invested in public equity, options-based equity, credit fixed income, private real assets, and private equity. The Diversifying Strategies class is designed to be uncorrelated to the Broad Growth class and it utilizes three sub-components (Liquid Defensive, Liquid Diversifying, and Illiquid Diversifying). The Diversifying Strategies class utilizes a multitude of asset classes and strategies, including US treasury and agency bonds, inflation-linked treasury bonds, systematic trend following, alternative risk premia, global macro, insurance-linked securities, relative value strategies, and niche private assets, among others. The ERS may also hold opportunities and other investments if they are determined to be additive to the portfolio's risk/return posture.

Note F – Deposit and Investment Disclosures (continued)

1. Investment Policy (continued)

The Board manages the expected return/risk posture of the Plan as part of the formal asset-liability studies that are completed every three-to-five years. Based on the 2021 asset-liability study the Total Fund was repositioned to achieve a long-term report of approximately 7.0% with an annualized volatility of approximately 9.4%-11.4% (dependent on modeling approach) over a horizon of 20-30 years. It is expected that a new asset-liability study will commence in the 2023 fiscal year. ERS will strategically invest in the following strategic asset classes:

Strategic Allocation (risk-based classes)	Strategic Class Weights	Expected Long-term Geometric Average Return[1]	Expected Volatility
Broad Growth	62.5%	8.0%	15.8%
Diversifying Strategies	37.5%	5.1%	8.5%
Total Portfolio	100.0%	7.2%	10.7%

[1] Uses an expected inflation of 2.1%

The implementation plan for long-term strategic policy established in 2020 is expected to be completed by the end of the FY 2022 as follows.

Implementation Plan for Long-term Strategic Policy				
	(6/30/2020)	7/1/2020	Long-Term 7/1/2021	Long-Term 7/1/2022
Broad Growth	68%	72%	67.5%	65%
Principal Protection	8%	--	--	--
Real Return	8%	--	--	--
Crisis Risk Offset	16%	--	--	--
Diversifying Strategies	--	28%	32.5%	35%
Total Portfolio	100%	100%	100%	100%

Rate of Return

For the year ended June 30, 2022, the annual money-weighted return on pension plan investments, net of pension plan investment expense, was 0.8%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

2. Deposits

Cash and cash equivalents 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.

Note F – Deposit and Investment Disclosures (continued)

2. Deposits (continued)

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, 2022, the carrying amount of deposits totaled approximately $99,095,482 and the corresponding bank balance was $106,454,881, all of which was exposed to custodial credit risk.

3. Investments and Fair Value

The following table shows the investments of the ERS by investment type as of June 30, 2022.

Investments at fair value		
Cash and cash equivalents and short-term instruments		
Cash and cash equivalents	$	99,095,482
Short-term bills and notes		441,351,385
Pooled and others		467,870,219
Fixed income securities		
U.S. Treasury bonds and notes		754,136,759
U.S. government agencies bonds		16,806,837
U.S. government agency mortgage backed		150,260,517
U.S. government-sponsored agency mortgage backed		12,547,247
U.S. corporate bonds		40,456,633
Non-U.S. corporate bonds		756,860
Convertible and Others		287,668,471
Fixed income funds		1,998,139,629
Derivatives		
Forwards - Cash and short-term instruments		786
Futures - Debt securities		2,179,390
Options - Equities		(24,193,131)
Equities		
Common stock		4,157,708,423
Preferred shares and other		67,233,310
Equity funds		1,159,663,813
Real assets		3,372,222,912
Alternative investments		8,825,905,906
Total investments	$	21,829,811,448
Short-term instruments for securities lending collateral pool	$	735,926,602

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.

<u>Fair Value Hierarchy Levels</u>
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. Short-term investments and fixed income securities classified as Level 1 include U.S. Treasuries. Derivative securities classified in Level 1 include certain options and futures which are valued using prices quoted in active markets for those securities.

Short-term investments, preferred shares, 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.

Note F – Deposit and Investment Disclosures (continued)

3. Investments and Fair Value (continued)

Preferred shares and common stock are classified in level 3 are private investments, thinly traded securities, 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 Asset- Real Estate (direct investment) classified as level 3 are individual properties 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). 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 the Net Asset Value (NAV)

Investments measured at NAV are not required to be categorized in the fair value hierarchy levels. The fair value of investments in certain fixed income funds, equity funds, real assets and alternative investments are based on the investments' net asset value (NAV) per share (or its equivalent).

Short-Term Investment Funds, Equity Funds (not publicly traded), and Fixed Income (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 of the investments include a review of compliance with the investment company's valuation policies.

Real asset 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.

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, 2022.

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

		Fair Value Measurement Using		
	Total	Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by Fair Value Level 6/30/2022				
Short-term investments				
Short-term bills and notes	$ 441,351,385	$ 440,351,385	$ 1,000,000	$ -
Equity securities				
Common stocks	4,157,708,423	4,157,707,661	-	762
Preferred shares and other	67,233,310	62,090,347	5,100,123	42,840
Total equity securities	4,224,941,733	4,219,798,008	5,100,123	43,602
Fixed income securities				
U.S. Treasury bonds and notes	754,136,759	754,136,759	-	-
U.S. government agencies bonds	16,806,837	-	16,806,837	-
U.S. government agency mortgage backed	150,260,517	-	150,260,517	-
U.S. government-sponsored agency mortgage	12,547,247	-	12,547,247	-
U.S. corporate bonds	40,456,633	-	40,456,633	-
Non-U.S. corporate bonds	756,860	-	756,860	-
Convertible and Others	287,668,471	-	287,668,471	-
Total fixed income securities	1,262,633,324	754,136,759	508,496,565	-
Real asset - real estate (direct investment)	61,500,000	-	-	61,500,000
Total investments (excluding derivatives), measured by fair value level	$ 2,586,766,648	$ 1,508,273,518	$ 1,016,993,130	$ 61,500,000
Investment Derivative Instruments				
Currency purchases forwards	$ 786	$ -	$ -	$ 786
Index fixed income futures	2,179,390	2,179,390	-	-
Options	(24,193,131)	(6,299,773)	(17,893,358)	-
Total investment derivative instruments	$ (22,012,955)	$ (4,120,383)	$ (17,893,358)	$ 786

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)

	Total	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)
Invested Securities Lending Collateral				
Short-term instruments				
Repurchase agreements	$ 191,750,674	$ -	$ 191,750,674	$ -
Global corporate notes	544,175,928	-	544,175,928	-
Total invested securities lending collateral	$ 735,926,602	$ -	$ 735,926,602	$ -

Investments Measured at Net Asset Value (NAV)	
Short-term investments	$ 467,870,219
Equity securities	1,159,663,813
Fixed income	1,998,139,629
Real assets - real estate	2,078,441,837
Real assets - other	1,232,281,075
Alternative investments - diversify strategy	4,866,526,300
Alternative investments - other	3,959,379,606
Total investments measured at NAV	$15,762,302,479

	June 30, 2022	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period (Days)
Short-term investments (a)	$ 467,870,219	$ -	Daily	1 day
Equity securities (b)	1,159,663,813	-	Daily	2 days
Fixed income (c)	1,998,139,629	313,891,000	Various	Various
Real assets - real estate (d)	2,078,441,837	680,260,000	Not eligible	n/a
Real assets - other (d)	1,232,281,075	448,666,000	Not eligible	n/a
Alternative investments - traditional (e)	3,959,379,606	1,852,552,000	Not eligible	n/a
Alternative investments - div. strategies (f)	4,866,526,300	-	Daily	1-2 days
Total investments measured at NAV	$ 15,762,302,479	$ 3,295,369,000		

Note F – Deposits and Investment Disclosures (continued)

3. Investments and Fair Value (continued)

(a) Short-term investments primarily consist of three pooled funds to invest excess cash at the ERS' custodian, The Bank of New York Mellon. 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.

(b) Equity securities consist of three funds, including 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) Fixed income consists of ten private market limited partnerships or limited liability companies to capitalize in multiple strategies that target investments on a global basis including, but not limited to, obligations of leveraged, financially troubled, or liquidating businesses or entities, bank loans, high yield bonds, securitized credit (including debt issued by asset-backed security offerings), derivatives (such as swap agreements), etc. 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.

(d) Real assets (real estate and other) limited partnerships, limited liability companies, or corporations, that are deemed to be investments, include 64 funds that primarily invest in U.S. real estate and 12 that invest in other real assets such as infrastructure, agriculture or other assets. 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.

(e) Alternative investments - traditional consist of 227 limited partnerships or limited liability companies that invest in venture capital, growth equity, corporate finance/buyout, special situations, mezzanine debt, distressed debt, co/direct investments or specialty 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. Redemptions are controlled by the general partner/investment manager.

Note F – Deposits and Investment Disclosures (continued)

3. Investments and Fair Value (continued)

(f) Alternative investments – diversifying strategies consists of 18 limited partnerships or limited liability companies to provide stability, diversification, and liquidity complements to the Broad Growth strategic class that produce uncorrelated returns during both crisis and non-crisis periods for Broad Growth assets. These investments focus on capital efficiency and employ certain financial mechanisms to target specific levels of volatility (e.g., derivatives-based leverage). This approach emphasizes capital efficiency thereby enabling the relatively small capital base of the DS strategic class to offset a meaningful level of volatility inherent in the Broad Growth strategic class. The most significant element of NAV is the fair value of the investment holdings. These holdings are valued 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. The ERS determines when redemptions and/or contributions are made.

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 Postion
Assets					
Short-term investments	$ 441,351,385	$ 467,870,219	$ 786	$ -	$ 909,222,390
Equity securities	4,224,941,733	1,159,663,813	(24,193,131)	-	5,360,412,415
Fixed income securities	1,262,633,324	1,998,139,629	2,179,390	-	3,262,952,343
Real asset investments	61,500,000	3,310,722,912	-	-	3,372,222,912
Alternative investments	-	8,825,905,906	-	-	8,825,905,906
Invested securities lending collateral	-	-	-	735,926,602	735,926,602
	$ 5,990,426,442	$15,762,302,479	$ (22,012,955)	$ 735,926,602	$ 22,466,642,568

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 Credit Portfolio consists of investment strategies and assets that are largely exposed and/or susceptible to various collateral types (corporate cash flows, mortgages, various credit receivables, etc.) that produce relatively high levels of income. These investments may be traded in public markets or sourced through private issuance. Such investments typically contain relatively lower levels of risk and exhibit lower volatility than other Broad Growth components but do have exposure to growth-related characteristics. In addition, periodic income will likely be a material portion of the Credit Portfolio's investment return. The overall objectives of the Diversifying Strategy strategic class are to provide stability, diversification, and liquidity complements to the Broad Growth strategic class. This class can help diversify the Broad Growth Class during challenging periods, such as material equity market drawdowns. Individual investment managers have specific investment policy guidelines, limits, and/or requirements for their portfolio, that may include limits on, but not limited to, security type, sectors, currency, duration, credit rating and issue amounts.

The ERS may invest, across the Broad Growth and Diversifying Strategies asset classes, in directly held securities, Partnerships/Fund of Ones or commingled funds which invest in liquid and less liquid corporate credit across the capital structure as well as opportunistically provide private financing. Investment instruments and/or strategies include but are not limited to the purchase and/or origination of investment grade, broadly syndicated high yield bonds, broadly syndicated leveraged loans, narrowly syndicated private debt ("club deals"), collateralized loan obligations ("CLO") debt and equity, municipal securities, capital solutions and convertibles. Other investment instruments and/or strategies include but are not limited to U.S. Treasuries and government-backed, high-quality, very liquid agencies, the purchase and/or origination of legacy non-agency residential mortgage-backed securities, asset backed securities, agency risk transfer, FNMA/Freddie preferred equity, non-qualified mortgage, origination, re-performing loans, credit tenant leases ,bridge financings, and other types. Derivatives may be used for managing interest rate, volatility, term structure, country, currency, sector exposures, etc. as authorized by their mandate.

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, 2022 is below. Securities below investment grade of Baa and non-rated issues (average rating by S&P, Moody's and/or Fitch) amounted to $257,470,838 or 20.4% of directly held fixed income investments (excluding funds). All short-term investments, not held in a pooled investment, are rated A1/P1or better.

Credit Ratings - Average rating by S&P, Moodys and Fitch as of June 30, 2022

Ratings	US Govt Agency	US Govt sponsored-agency mortgage-backed	US corporate bonds	Non-US corporate bonds	Convertible & others	Total
AAA	$ 16,806,837	$ 150,159,660	$ 222,660	$ -	$ -	$ 167,189,157
AA1	-	100,857	1,153,859	-	-	1,254,716
AA2	-	-	243,439	-	-	243,439
AA3	-	-	1,378,060	-	-	1,378,060
A1	-	-	5,654,762	256,424	-	5,911,186
A2	-	-	8,325,515	-	-	8,325,515
A3	-	-	6,683,943	-	-	6,683,943
BAA1	-	-	6,096,421	498,550	6,637,340	13,232,311
BAA2	-	-	9,348,762	-	4,636,581	13,985,343
BAA3	-	-	1,349,212	-	18,925,598	20,274,810
BA1	-	-	-	-	2,150,935	2,150,935
BA2	-	-	-	-	16,440,242	16,440,242
B2	-	-	-	-	4,644,008	4,644,008
Not rated	-	-	-	1,886	234,233,767	234,235,653
	$ 16,806,837	$ 150,260,517	$ 40,456,633	$ 756,860	$ 287,668,471	495,949,318
US Treasury Bonds and Notes						754,136,759
US Government agency - Government National Mortgage Association (GNMAs) mortgage-backed						12,547,247
Subtotal directly held investments						1,262,633,324
Fixed income funds						1,998,139,629
Derivatives (debt securities)						2,179,390
Total fixed income securities in Investments						$ 3,262,952,343

Note F – Deposits and Investment Disclosures (continued)

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 $99,095,482 in cash and securities exposed to custodial credit risk as of June 30, 2022.

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, 2022, 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.

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Note F – Deposits and Investment Disclosures (continued)

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, 2022, 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 and fixed income funds)

		Fair Value	Weighted Modified Duration (years)
Fixed Income Securities			
U.S. Treasury bonds and notes	$	754,136,759	8.9
U.S. government agencies bonds		16,806,837	2.8
U.S. government agency mortgage-backed		150,260,517	6.0
U.S. government-sponsored agency mortgage-backed		12,547,247	5.9
U.S. corporate bonds		40,456,633	4.2
Non-U.S. corporate bonds		756,860	2.4
Convertible and Others		287,668,471	4.2
Total	$	1,262,633,324	7.2

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 F10.

The following table summarizes the ERS' exposure to foreign currency risk in U.S. dollars as of June 30, 2022. (Securities denominated in U.S. dollars are not presented.)

	Cash and Short Term Instruments	Derivatives	Equities	Grand Total
Australian dollar	$ 171,336	$ (58,219)	$ 46,726,112	$ 46,839,229
Brazilian real	128,860	(124,442)	22,729,461	22,733,879
Canadian dollar	(15,704)	(740,882)	107,711,725	106,955,139
Chilean peso	-	-	3,275,645	3,275,645
Chinese Yuan Renminbi	-	-	4,533,028	4,533,028
Colombian peso	33,899	-	234,607	268,506
Czech koruna	13,326	-	2,914,829	2,928,155
Danish krone	20,021	3,911	11,506,707	11,530,639
Euro currency unit	455,565	(1,986,881)	333,720,042	332,188,726
Hong Kong dollar	489,324	(525,450)	126,097,115	126,060,989
Hungarian forint	-	-	2,958,163	2,958,163
Indian Rupee	2,119	-	101,857,836	101,859,955
Indonesian rupiah	42,852	(36,040)	3,936,680	3,943,492
Israeli shekel	60,295	-	3,253,757	3,314,052
Japanese yen	(43,634)	(326,495)	206,974,945	206,604,816
Malaysian ringgit	-	-	7,070,584	7,070,584
Mexican peso	37,610	-	6,269,086	6,306,696
New Taiwan dollar	662,272	-	100,996,200	101,658,472
New Zealand dollar	42,527	-	2,489,294	2,531,821
Norwegian krone	35,225	(36,979)	7,231,720	7,229,966
Philippine peso	5,307	(5,306)	3,565,417	3,565,418
Polish zloty	46,287	-	712,264	758,551
Pound sterling	488,856	2,811,081	231,082,115	234,382,052
Russian ruble	77,207	-	638,143	715,350
Singapore dollar	63,189	-	7,540,915	7,604,104
South African rand	10,687	-	8,709,105	8,719,792
South Korean won	892	-	27,495,234	27,496,126
Swedish krona	101,081	(854,108)	32,450,896	31,697,869
Swiss franc	309,001	739,515	94,435,602	95,484,118
Thai baht	-	-	7,871,839	7,871,839
Turkish lira	3,117	(29,533)	615,594	589,178
Total	$ 3,241,517	$ (1,169,828)	$ 1,517,604,660	$ 1,519,676,349

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, 2022 was 132 days.

At June 30, 2022, 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	$ 381,469,936	$ 53,474,872	$ 423,475,694
U.S. equities	303,307,672	14,411,681	310,702,322
International equities	51,148,994	158,965,922	183,074,998
	$ 735,926,602	$ 226,852,475	$ 917,253,014

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, as discussed below.

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, 2022 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.

Note F – Deposits and Investment Disclosures (continued)

10. Derivative Financial Instruments (continued)

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, 2022 with the related maturity information:

Asset categories		Notional values	Market value	Maturity (Range from)
Forwards	Currency purchases	$ -	$ 786	0.0 yrs
Futures	Interest rate contracts	592,821,122	2,179,390	0.3 yrs
Options	Options	-	(24,193,131)	0.0 yrs to 0.2 yrs
	Grand Total	$ 592,821,122	$ (22,012,955)	

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.

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/(depreciation) 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, 2022.

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. 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. 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. Gains and losses from swaps are determined on market values and are included in the net appreciation/(depreciation) in fair value of securities in the Statement of Changes in Fiduciary Net Position.

Derivatives, such as interest rate swaps, total return swaps, and credit default swaps, are a tool or instrument used to manage 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.

Note F – Deposits and Investment Disclosures (continued)

10. Derivative Financial Instruments (continued)

On June 30, 2022, credit ratings of the counterparty for ERS' investments in derivatives were as follows:

Counterparty	S&P's Rating	Fair Value
Exchange traded derivatives	n/a	$ (22,012,955)
Total		$ (22,012,955)

Note G – Pension Liability

1. Net Pension Liability

The components of the net pension liability of the ERS at June 30, 2022 were as follows:

Total Pension Liability	$34,822,778,620
Plan Fiduciary Net Position	21,854,814,032
Net Pension Liability	$12,967,964,588
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	62.8%
Net Pension Liability as a Percentage of Covered Payroll	289.2%

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.*

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, 2022. 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, 2021, with most of the assumptions based on the period from July 1, 2016, through June 30, 2021.

Summary of Actuarial Valuation as of June 30, 2022 follows:

Valuation date	June 30, 2022
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 Firefighters	5.00% to 6.00%
- General Employees	3.75% to 6.75%
- Teachers	3.75% to 6.75%
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%

Note G – Pension Liability (continued)

2. Summary of Actuarial Assumptions (continued)

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

Pre-retirement mortality rates are:

Multiples of the Pub-2010 mortality table for active employees based on the occupation of the member as follows:

	General Employees	Teachers	Police and Firefighters
Type	Male & Female	Male & Female	Male & Female
Ordinary	94%	92%	80%
% of Ordinary Chosing Annuity	41%	52%	24%
Duty Related	6%	8%	20%

Note G – Pension Liability (continued)

2. Summary of Actuarial Assumptions (continued)

Post-Retirement Mortality rates are:

Healthy Retirees: The 2022 Public Retirees of Hawaii mortality tables. The rates are projected on a fully generational basis by the long-term rates of scale UMP (which is the immediate convergence to the ultimate rates of MP-2021) from the year 2022 and with multiplier and setbacks based on plan and group experience. The following are sample rates of the base table as of 2022 with the corresponding multipliers:

Healthy Annuitant Mortality Rates Before Projection (Multiplier Applied)

	General Employees		Teachers		Police and Firefighters	
Age	Males	Females	Males	Females	Males	Females
50	0.2094%	0.1276%	0.1698%	0.0951%	0.2421%	0.1130%
55	0.3215%	0.1687%	0.2883%	0.1596%	0.3473%	0.1633%
60	0.5570%	0.3095%	0.4672%	0.2467%	0.6179%	0.2799%
65	0.8041%	0.4488%	0.7256%	0.4063%	0.8426%	0.4283%
70	1.2621%	0.7066%	1.0762%	0.6015%	1.4172%	0.6565%
75	2.0700%	1.0964%	1.7879%	0.9358%	2.3227%	1.0121%
80	3.5996%	2.1275%	3.0429%	1.6565%	4.1824%	1.8863%
85	6.5891%	4.1569%	5.5564%	3.2698%	7.6513%	3.6977%
90	11.9340%	8.3647%	10.1056%	6.5007%	13.6689%	7.3991%
Multiplier	102%	98%	97%	101%	93%	100%
Setback	---	-1	1	1	-2	---

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

	Year of Retirement				
Gender	2025	2030	2035	2040	2045
		General Retirees			
Male	22.8	23.2	23.5	23.9	24.2
Female	26.3	26.6	26.9	27.2	27.5
		Teachers			
Male	24.1	24.5	24.9	25.2	25.5
Female	28.0	28.3	28.6	28.9	29.2
		Police and Firefighters			
Male	21.8	22.1	22.4	22.8	23.1
Female	27.1	27.4	27.7	28.0	28.3

Disabled retirees: Base Table for healthy retiree's occupation, set forward 3 years, generational projection using the UMP projection table from the year 2022. Minimum mortality rate of 3.5% for males and 2.5% for females.

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 as of June 30, 2022, are summarized in the following table (a new asset/liability study for the ERS is to be completed in FY 2023):

Classes	Strategic class weights	Long-term expected geometric rate of return	Volatility
Broad growth:			
Private Equity	13.5%	11.0%	28.0%
Global Equity	20.0%	8.5%	18.0%
Low Volatility Equity	4.0%	7.8%	14.0%
Global Options	4.0%	6.4%	13.0%
Credit	6.0%	7.7%	12.5%
Core Real Estate	6.0%	6.4%	12.0%
Non-Core Real Estate	4.5%	9.5%	23.5%
Timber/Agriculture/Infrastructure	5.0%	8.3%	12.4%
Diversifying Strategies:			
TIPs	2.0%	3.3%	7.0%
Global Macro	4.0%	5.4%	15.0%
Reinsurance	4.0%	6.4%	12.0%
Alternative Risk Premia	8.0%	5.4%	10.0%
Long Treasuries	5.0%	3.8%	12.0%
Intermediate Government	4.0%	3.2%	3.0%
Systematic Trend Following	10.0%	6.2%	18.0%

Note G – Pension Liability (continued)

2. Summary of Actuarial Assumptions (continued)

The ERS utilizes two high-level strategic classes (Broad Growth and Diversifying Strategies) for allocating assets and managing risk within the total portfolio. Both of these strategic classes contain sub-components that in-turn utilize asset classes and/or specific strategies for implementation. The Broad Growth class utilizes three sub-components (Public Growth, Private Growth, and Real Assets) which are ultimately invested in public equity, options-based equity, credit fixed income, private real assets, and private equity. The Diversifying Strategies class is designed to be uncorrelated to the Broad Growth class and it utilizes three sub-components (Liquid Defensive, Liquid Diversifying, and Illiquid Diversifying). The Diversifying Strategies class utilizes a multitude of asset classes and strategies, including US treasury and agency bonds, inflation-linked treasury bonds, systematic trend following, alternative risk premia, global macro, insurance-linked securities, relative value strategies, and niche private assets, among others. The ERS may also hold opportunities and other investments if they are determined to be additive to the portfolio's risk/return posture.

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%)
$17,561,685,932	$12,967,964,588	$9,165,239,778

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, 2022. 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 $3,295,369,000 as of June 30, 2022, consisting of $313,891,000 in fixed income, $1,128,926,000 in real asset investments, and $1,852,552,000 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.

Required Supplementary Information - Unaudited

Schedule of Changes in the Employers' Net Pension Liability and Related Ratios

Fiscal Years Ended June 30, 2022, 2021, 2020, 2019, 2018, 2017, 2016, 2015 and 2014 *

	2014	2015	2016	2017	2018	2019	2020	2021	2022
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	$626,699,489	$642,140,242	$613,550,345
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	2,164,804,653	2,252,271,074	2,349,503,644
3. Changes of benefit terms	-	-	-	-	-	-	-	-	-
4. Difference between expected and actual experienceof the Total Pension Liability	66,400,876	(192,816,757)	297,534,219	61,179,390	124,753,379	221,473,495	71,837,371	228,048,119	(361,275,093)
5. Changes of assumptions	-	261,213,541	2,915,922,677	-	-	60,320,037	-	-	(154,960,000)
6. Benefit payments, including refunds									(1,738,751,492)
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)	(1,568,033,354)	(1,675,049,807)	(24,454,256)
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	$1,295,308,159	$1,447,409,628	$683,613,148
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	31,396,447,685	32,691,755,844	34,139,165,472
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	$32,691,755,844	$34,139,165,472	$34,822,778,620
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	$1,098,589,013	$1,281,558,696	$1,242,139,095
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	284,142,994	299,473,128	292,422,087
2. Contributions – employee	1,306,327	1,595,560	1,721,893	1,492,316	2,133,901	2,458,908	3,255,037	1,153,318	605,473
3. Net investment income	2,175,479,960	556,436,475	(169,368,110)	1,934,512,507	1,225,572,599	932,696,412	358,282,664	4,662,225,761	164,559,035
4. Benefit payments, including refunds									(1,738,751,492)
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)	(1,568,033,354)	(1,675,049,807)	(24,454,256)
5. Pension Plan Administrative Expense	(12,626,030)	(14,032,964)	(13,960,587)	(14,986,159)	(15,784,490)	(13,798,866)	(17,782,865)	(19,049,861)	(17,497,621)
6. Other	-	-	-	-	-	-	-	-	-
7. Net change in plan fiduciary net position	$1,891,187,353	$302,449,253	($435,485,639)	$1,628,345,389	$900,083,667	$628,619,014	$158,453,489	$4,550,311,235	($80,977,679)
8. Fiduciary net position – beginning	12,311,827,950	14,203,015,303	14,505,464,556	14,069,978,917	15,698,324,306	16,598,407,973	17,227,026,987	17,385,480,476	21,935,791,711
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	$17,385,480,476	$21,935,791,711	$21,854,814,032
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	$15,306,275,368	$12,203,373,761	$12,967,964,588
D. Fiduciary net position as a percentage of the total pension liability	63.92%	62.42%	51.28%	54.80%	55.48%	54.87%	53.18%	64.25%	62.76%
E. Covered 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	$4,481,443,808	$4,667,346,006	$4,483,686,505
F. Net pension liability as a percentage of covered payroll	209.38%	218.57%	325.11%	305.18%	312.94%	323.78%	341.55%	261.46%	289.23%

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

See Notes to Required Supplementary Information.

Schedule of the Employers' Net Pension Liability
Fiscal Year Ended June 30, 2014 to June 30, 2022*

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%
2020	$32,691,755,844	$17,385,480,476	$15,306,275,368	53.18%	$4,481,443,808	341.55%
2021	$34,139,165,472	$21,935,791,711	$12,203,373,761	64.25%	$4,667,346,006	261.46%
2022	$34,822,778,620	$21,854,814,032	$12,967,964,588	62.76%	$4,483,686,505	289.23%

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

See Notes to Required Supplementary Information.

Required Supplementary Information - Unaudited

Schedule of Investment Returns
2014 to 2022 *

For fiscal year ended June 30,:	Annual Money-Rate of Return
2014	17.9%
2015	4.0%
2016	-1.2%
2017	13.7%
2018	7.8%
2019	5.7%
2020	2.1%
2021	26.9%
2022	0.8%

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

See Notes to Required Supplementary Information.

June 30, 2022

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, 2021 to June 30, 2022, based on the 2021 Experience Study:

- The administrative expenses assumption was increased from 0.35% to 0.40 %.
- The general wage inflation assumption represents the average increase in wages in the general economy and is used to index salaries for each cohort of new entrants in projections. The general productivity component of the general wage inflation assumption for General Employees and Teachers decreased from 1.00% to 0.50%, that now yields a nominal assumption of 3.00%. There was no change to the assumption for Police and Firefighters employees.
- The assumed salary increase schedules increased for all employees. These 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. The schedules of assumed salary increase, that are the same, for General Employees and Teachers increased to 4.66%, from 4.41% for General Employees and from 4.37% for Teachers; while Police and Firefighters Employees schedules increased to 5.78% from 5.57%.
- Pre-retirement mortality rates increased for Police and Firefighters Employees.
- Retiree mortality is updated to the 2022 Public Retirees of Hawaii mortality tables. The rates are projected on a fully generational basis by the long-term rates of scale UMP from the year 2022 and with multiplier and setbacks based on plan and group experience.
    - While there no change to the assumption that mortality rates will continue to improve in the future using a fully generational approach, the improvement scale used to project future improvement is updated to the ultimate values of the most recently published Scale MP2021. Further adjustments are applied to this set of base tables based on occupation (General Employees, Teachers, and Public Safety).

Note B – Significant Factors Affecting Trends in Actuarial Information

2022 Changes in Actuarial Assumptions

The following changes were made to the actuarial assumptions as of June 30, 2021 to June 30, 2022:

- The administrative expenses assumption was increased from 0.35% to 0.40 %.
- The general wage inflation assumption represents the average increase in wages in the general economy and is used to index salaries for each cohort of new entrants in projections. The general productivity component of the general wage inflation assumption for General Employees and Teachers decreased from 1.00% to 0.50%, that now yields a nominal assumption of 3.00%. There was no change to the assumption for Police and Firefighters employees.

Note B – Significant Factors Affecting Trends in Actuarial Information (Continued)

2022 Changes in Actuarial Assumptions (continued)

- The assumed salary increase schedules increased for all employees. These 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. The schedules of assumed salary increase, that are the same, for General Employees and Teachers increased to 4.66%, from 4.41% for General Employees and from 4.37% for Teachers; while Police and Firefighters Employees schedules increased to 5.78% from 5.57%.
- Pre-retirement mortality rates increased for Police and Firefighters Employees.
- Retiree mortality is updated to the 2022 Public Retirees of Hawaii mortality tables. The rates are projected on a fully generational basis by the long-term rates of scale UMP from the year 2022 and with multiplier and setbacks based on plan and group experience.
    - While there no change to the assumption that mortality rates will continue to improve in the future using a fully generational approach, the improvement scale used to project future improvement is updated to the ultimate values of the most recently published Scale MP2021. Further adjustments are applied to this set of base tables based on occupation (General Employees, Teachers, and Public Safety).

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 Firefighters 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 Firefighters 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 %

Note B – Significant Factors Affecting Trends in Actuarial Information (Continued)

2016 Changes in Actuarial Assumptions

- 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 and Firefighters. The service based component generally increased for most General Employees, decreased for most Teachers, and remain unchanged for most Police and Firefighters. The overall impact decreased assumed salary rate increase rates for all General Employees and Teachers, while remaining unchanged for almost all Police and Firefighters.
- 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 Firefighters 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 and Firefighters 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.

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 and Firefighters. 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.

Other Supplementary Information

Schedule 1

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

Year ended June 30, 2022

	2022			
	Pension Accumulation Reserves	**Annuity Savings Reserves**	**Expense Reserves**	**Total**
Additions				
Appropriations and contributions:				
Employers	$ 1,242,139,095	$ -	$ -	$ 1,242,139,095
Members	-	293,027,560	-	293,027,560
Net investment income	164,559,035	-	-	164,559,035
Total additions	1,406,698,130	293,027,560	-	1,699,725,690
Deductions				
Benefit payments	1,738,751,492	-	-	1,738,751,492
Refunds of member contributions	-	24,454,256	-	24,454,256
Administrative expenses	-	-	17,497,621	17,497,621
Total deductions	1,738,751,492	24,454,256	17,497,621	1,780,703,369
Other changes in net position restricted for pension benefits:				
Transfer due to retirement of members	228,003,601	(228,003,601)	-	-
Transfer of interest allocation	(128,230,778)	128,230,778	-	-
Transfer to pay administrative expenses	(18,954,519)	-	18,954,519	-
Return of unrequired funds due to savings in administrative expenses	10,370,073	-	(10,370,073)	-
	91,188,377	(99,772,823)	8,584,446	-
Net increase/(decrease)	(240,864,985)	168,800,481	(8,913,175)	(80,977,679)
Fiduciary net position restricted for pensions:				
Beginning of year	18,574,542,162	3,337,854,144	23,395,405	21,935,791,711
End of year	$ 18,333,677,177	$ 3,506,654,625	$ 14,482,230	$ 21,854,814,032

See accompanying independent auditor's report.

Other Supplementary Information (continued)

Schedule 2

Schedule of Administrative Expenses

Year ended June 30, 2022

		2022
Personnel services		
Salaries and wages	$	7,365,517
Fringe benefits		3,848,782
Net change in unused vacation credits		71,857
Total personnel services		11,286,156
Professional services		
Actuarial		191,899
Auditing and tax consulting		500,590
Disability hearing expenses		28,711
Legal services		569,898
Medical		410,816
Other services		88,141
Total professional services		1,790,055
Communication		
Postage		234,986
Printing and binding		56,476
Telephone		86,741
Travel		40,753
Total communication		418,956
Rentals		
Rental of equipment		88,381
Rental of premises		33,643
Total rentals		122,024
Other		
Armored car service		1,077
Computer and office automation systems		87,450
Repairs and maintenance		2,580,845
Stationery and office supplies		33,194
Miscellaneous		98,561
Total other		2,801,127
Depreciation		1,079,303
	$	17,497,621

See accompanying independent auditor's report.

Other Supplementary Information (continued)

Schedule 3

Schedule of Investment Expenses

Year ended June 30, 2022

		2022
Real estate and alternative investment expenses		
Operating expenses	$	33,242,751
Total real estate and alternative investment expenses		33,242,751
Investment expenses		
Investment manager/advisor fees		105,520,189
Bank custodian fees		326,784
Other investment expenses		73,695,317
Total investment expenses		179,542,290
Securities lending expenses		
Borrower rebates		792,204
Management fees		583,753
Total securities lending expenses		1,375,957
	$	214,160,998

See accompanying independent auditor's report.

Schedule 4

Social Security Contribution Fund

Statement of Changes in Assets and Liabilities

Year ended June 30, 2022

	2022			
	Beginning Balance	**Additions**	**Deductions**	**Ending Balance**
Assets				
Receivable from employers	$ -	$ 248,589,427	$ 248,589,427	$ -
Total assets	$ -	$ 248,589,427	$ 248,589,427	$ -
Liabilities				
Due to employers	$ -	$ 248,589,427	$ 248,589,427	$ -
Total liabilities	$ -	$ 248,589,427	$ 248,589,427	$ -

See accompanying independent auditor’s report.

Employees' Retirement System

of the State of Hawaii

INVESTMENT SECTION

Letter from Chief Investment Officer

DAVID Y. IGE
GOVERNOR

THOMAS WILLIAMS
EXECUTIVE DIRECTOR

KANOE MARGOL
DEPUTY EXECUTIVE DIRECTOR

STATE OF HAWAII
EMPLOYEES' RETIREMENT SYSTEM

October 19, 2023

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 ("ACFR") for the fiscal year ending June 30, 2022.

- ERS's Fiduciary net position was valued at $21.9 billion as of June 30, 2022
    - The ERS investment portfolio outperformed its one-year, three-year, five-year, and seven-year Policy Benchmark returns by an annualized 5.3%, 3.1%, 2.1% and 1.7%, respectively.[1] The portfolio's return for the fiscal year was 4.0%,[2] while the Policy Benchmark[3] only returned -1.3%. As of the end of the fiscal year, the ERS investment portfolio exceeded its long-term 7.0% target rate of return by 1.0% on an inception-to-date basis.
    - Versus peer public defined benefit plans with assets greater than $1 billion, the ERS investment portfolio performance was at the top of the peer group for one year and in the top decile over the past three, five and ten years. For the current fiscal year, the ERS return exceeded the median peer return by about 11% and on a risk-adjusted basis by about 9%. This is a meaningful improvement to the below median peer ranking, prior to the transition of the investment strategy to a risk-based approach and the expansion of the ERS investment team in 2014.
    - Understanding the Board of Trustees' investment policy is critical to understanding the performance of the investment portfolio. The ERS Board of Trustees' asset allocation policy is designed to be "risk aware". As such, the construction of the portfolio has a dual mandate to achieve the 7.0% target return while minimizing risk.

[1] Outperformance is based on a mix of gross and net, lagged and non-lagged return.
[2] A mix of gross and net returns, lagged and non-lagged.
[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)

To that end, our five-year Sharpe Ratio[4] was 1.1 compared to the median peer public defined benefit plan of 0.6. Our annualized standard deviation was 7.2% over this period compared to the median peer plan of 9.9%. We have continued to exceed our target return while taking lower levels of risk than peer.

- The ERS investment portfolio has two strategic risk classes—broad growth and diversifying strategies. These two classes are designed to be complementary and achieve our dual mandate with broad growth providing capital appreciation and income, and diversifying strategies providing the risk mitigation and alpha generation. Broad growth represented roughly 70% of the total portfolio capital while diversifying strategies represented roughly 30% during fiscal year 2022. Over time, these complementary investments have contributed to a much more stable return profile.

    - Broad growth consists of investment strategies that are exposed to changes in global economic growth and corporate profitability. Within this class there are three major components: public growth, real assets, and private growth.
    - Public growth consists of three subcomponents.
        - Traditional equity is largely global public equity and includes both active and passive investments.
        - Stabilized equity invests in strategies that are like traditional growth but with lower expected levels of volatility, such as convertible bonds, options-based strategies, or low-volatility factor equity strategies.
        - Global credit is comprised of high yield debt, leveraged loans, asset-backed securities and investment grade corporate bonds whether traded in public or private markets.
    - Real assets consist of such private investments as core real estate, non-core real estate, infrastructure, timber, and agriculture, that are tied to growth risk but may also provide diversification and inflation protection.
    - Private growth consists of higher-risk, higher-returning growth-oriented investments that rely on private markets to raise investment capital (e.g., private equity, venture capital, distressed debt, etcetera).
- Diversifying strategies consists of investments strategies that diversify away from growth risk and reduce overall portfolio volatility while earning a positive return. Within this class there are three major components: liquid defensive strategies, liquid diversifying strategies and illiquid diversifying strategies.
    - Liquid defensive strategies include Treasury/agency duration capture, systematic trend following, defensive macro, long volatility, and tail hedging strategies.
    - Liquid diversifying strategies consist of alternative return capture strategies, including systematic and discretionary macro, relative value, and arbitrage strategies.
    - Illiquid diversifying strategies consist of insurance-linked and idiosyncratic return capture strategies, including niche co-investments, litigation finance and special situations that are uncorrelated to, and do not overlap with, broad growth strategies.

[4] The Sharpe ratio is a performance measure adjusted for risk—in this case represented by standard deviation. The Sharpe Ratio is calculated by deducting the risk-free rate (T-bills) from the average annualized return of an investment and dividing by its standard deviation.

For fiscal year 2022 diversifying strategies contributed about 3.4% to the total portfolio's 4.0% return with an absolute return of +11.4%, while broad growth contributed about 0.6% with an absolute return of +0.9%. This represented extremely positive results under very challenging market conditions during the last half of the fiscal year. Within broad growth, the major components exhibited mixed performance with positive contributions coming from private growth (roughly +5%) and real assets (roughly +2%) and public growth detracting (roughly -6%) from the ERS total return. Within diversifying strategies, liquid defensive contributed roughly 2.5% and the combined liquid and illiquid diversifying strategies contributed roughly 1% to the ERS total return. From an absolute return standpoint private growth had the highest fiscal year return among major components (+29.6%), far outpacing its benchmark by 21.3%, followed by real assets (+18.0%), liquid defensive (+17.3%), liquid diversifying (+6.7%), illiquid diversifying (+2.1%), and public growth (-13.3%). Broad growth and diversifying strategies contributed about equally to the 5.3% total portfolio outperformance versus the Policy Portfolio for the fiscal year, as private growth and liquid defensive far outpaced their benchmarks by 21.3% and 14.6%, respectively.

- Private growth (i.e., private equity and venture capital) posted a 29.6% fiscal year return[5], outperforming its benchmark by 21.3%[6]. While the 1-year outperformance is impressive, private equity investments are made primarily for long-term capital appreciation. That said, longer term results were equally impressive with outperformance across the 3-year, 5-year, 7-year and since inception timeframes of 10.51%, 8.77%, 7.78% and 6.06%, respectively. The outperformance of private equity continues to fuel demand for an asset that is already in high demand, especially for top-performing, high-conviction managers. This demand increased competition amongst investors who all seek access to high conviction managers. Going forward, it is important to maintain our pacing plan developed in 2015-16 with a fairly steady allocation each year to private growth. The pacing plan allocation for calendar year 2023 is $600 million to $700 million, as approved in July 2022 by the ERS Board of Trustees.

- Real assets had strong absolute returns and positive performance in all sub-components. Real assets returned +18.0% for the fiscal year, underperforming its benchmark return (+22.9%) by -4.9%. Core real estate returned +28.4%, outperforming its benchmark return (+27.3%) by +1.2%. Non-core real estate returned +22.9%, underperforming its benchmark return (+28.5%) by -5.6%. Real estate's strong positive absolute returns were attributed to core real estate's outsized appreciation, driven by strong revenue and pricing growth at the apartment, industrial, and storage properties, and income returns that also exceeded the benchmark. Infrastructure returned +5.5%, underperforming its benchmark return (+13.4%) by -7.9%. Although the unusually high inflation in fiscal year 2022 drove the CPI-based benchmark considerably higher than recent history, infrastructure has significantly outperformed this benchmark over the longer 3-year and 5-year periods. Timber returned +12.0%, outperforming its benchmark return (+11.8%) by +0.2%. Timber has also outperformed its benchmark over longer periods. Agriculture and Other Real Assets categories were added more recently and did not have a full 1-year performance history as of June 30, 2022.

[5] Standard industry practice is that Private Equity performance has a 1 quarter lag because updates to financial statements take roughly 2- 3 months after each quarter end.
[6] The benchmark is the MSCI ACWI IMI +2%.

Letter from Chief Investment Officer (continued)

- Public growth returned -13.3%, underperforming its benchmark (-11.6%) by -1.7%. Within public growth, traditional equity returned -16.7% versus its benchmark (-16.5%) for the fiscal year, while stabilized equity posted a return of -11.8% against its benchmark (-6.0%). The underperformance within stabilized equity was primarily attributable to the options-based strategies, which significantly underperformed the benchmark. Global credit returned 0.85% for the fiscal year, outperforming its benchmark (-5.8%) by 6.6%. At fiscal year-end, global credit was 5.9% of total ERS assets and was comprised of approximately 45% public credit and 55% private credit strategies. During the year, private credit returned 5.3% and outperformed its benchmark (-1.5%) by 6.8%. Public credit was negative for the fiscal year, -3.3%, but outperformed its benchmark (-9.9%) by 6.6%.

- The diversifying strategies class returned 11.4% for the fiscal year, performing extremely well, exceeding its 2.7% benchmark return by 8.7%, while still being in its build-out stage. Within diversifying strategies all three underlying components exhibited positive portfolio returns. Liquid defensive strategies returned 17.3% in the fiscal year, despite a significant drag of -10.1% from the duration strategies, and its profits were utilized to meet ERS liquidity needs (i.e., fund benefit payments and meet broad growth capital calls) without the need to liquidate public growth assets in the last half of the fiscal year when both public equity and fixed income markets were volatile and experiencing severe valuation losses. Liquid diversifying returned 6.7% for the fiscal year, exceeding its benchmark by 4.1%, and serving to reduce the volatility of the ERS portfolio with anti-correlating returns to public growth. Illiquid diversifying, while posting a positive 2.1% return, unperformed its benchmark by 1.1%. Most importantly, the correlation between broad growth and diversifying strategies was -0.13 for the fiscal year, which reduced the volatility of the ERS total portfolio from 15% to 7%, calculated using daily return data.

ECONOMIC & CAPITAL MARKET CONDITIONS

First Quarter of 2022 Fiscal Year. Global equity markets started the fiscal year with two months of strong performance, peaking in early September and reaching several new highs in the process. This represented a mostly steady, although somewhat volatile, climb from the March 23, 2020 COVID-19 lockdown low as optimism continued based on strong economic growth in developed economies, accommodative central banks, and the Biden administration's highly stimulative fiscal policies, tempered by high volatility in Chinese stocks, global supply constraints, probable tax increases from the Biden administration, rising U.S. inflation, and government lockdowns to deal with COVID-19 virus outbreaks particularly in Japan, Brazil, India and parts of the U.S. as the delta variant spread quickly across the globe. The July/August rally in equities was uneven with U.S. large caps leading the advance, while small caps and international equities lagged. In September global equity markets fell (down 4%) for the first time since January after reaching new highs at the beginning of the month, as optimism waned amid worsening corporate earnings forecasts, rising U.S. inflation, global supply chain problems, numerous issues with the Chinese economy and markets, lingering and fluctuating COVID-19 constraints across the globe, and concerns and uncertainty over the costly proposed U.S. fiscal programs of the Biden administration and rapidly rising government debt, tempered by still accommodative central banks. The drop in equities was broad based during September with U.S. large cap stocks and NASDAQ down 5%, U.S. small caps down 3%, and international stocks down 3%, resulting in a small loss for global equities during the quarter. Dispersion, correlations and volatilities were all at normal levels, up from the relatively low levels of previous months.

The U.S. Federal Reserve remained on its course of keeping short-term interest rates low, targeting average inflation of two percent over time, and allowing money supply to continue rising, despite rising inflation. Longer-dated U.S. Treasury yields increased by about 17 bps in September, as the U.S. Treasury curve sloped up from 4 bps for the three-month Treasury bill to 2.08% for the 30-year Treasury, all well below then current inflation. The shape of the yield curve indicated that the market expected the Fed to keep rates at historical lows for the next 12 months and then begin a series of 25 bp rate increases.

Letter from Chief Investment Officer (continued)

Second Quarter of 2022 Fiscal Year. In October global equity markets rose 5% regaining September's losses and reaching a new high in early November, as optimism returned amid stronger than expected quarterly corporate earnings reports, prospects for scaled back U.S. infrastructure programs, and still accommodative central banks, despite rising U.S. inflation, global supply chain problems, lingering and fluctuating COVID-19 constraints across the globe, and rapidly rising U.S. government debt. The rise in equities was broad based during October with U.S. large cap stocks and NASDAQ up 7%, U.S. small caps up 4%, and international stocks up 3%. Equity dispersion was mostly above historical averages, especially in the U.S., while volatility was average, and correlations were low during the month, versus the average levels for all three metrics during the previous month. After reaching a new high in early November, a choppy but range bound equity markets ensued during the remainder of the quarter, as the markets digested prospects for strong growth in corporate earnings and high consumer demand, despite the rapid spread of the Omicron Covid variant across the world, continuing high inflation rates in many countries, energy shortages, lingering global supply chain problems, imminent Fed tightening and tapering expectations for 2022, scaled back U.S. infrastructure programs, rapidly rising U.S. government debt, and the threat of higher corporate tax rates. During the last two months of the quarter, the rise in equities was concentrated in U.S. large cap stocks with the S&P 500 up nearly 4% (peaking in late December) and the NASDAQ up 1%, while U.S. small caps fell 2% and international stocks fell about 1%. Equity dispersion globally remained above historical averages, especially in the U.S., while volatility was average, and correlations were low; China continued to be a "noisy" market with very high dispersion among stock returns.

In the final half of the quarter, the U.S. Federal Reserve signaled that it was making a course correction away from its expansionary monetary policies, as it plans to raise short-term rates by 25 bps about three times during 2022 and speed up the transition to tapering; the shape of the yield curve at quarter-end indicated that the market believed tightening would begin in about three months. The U.S. Treasury yield curve "bear" flattened since the end of October with the 2-year Treasury yield rising 25 bps to 73 bps, and both the 10-year and 30-year Treasury yields falling 3 bps to 1.52%, and 1.90%, respectively, all well below then current inflation. As a result of very accommodative U.S. monetary actions and fiscal stimulus ($6 trillion so far), money supply continued to rise, and with interest rates so low, there was no financial incentive to hold this cash. After widening in November, both investment-grade and high-yield credit spreads tightened in December to very tight levels relative to history, also offering little incentive to invest.

After rising about 5% in October, commodity indexes receded during the final two months of the quarter, while the U.S. dollar rose about 2% versus a basket of non-US currencies during the quarter.

Third Quarter of 2022 Fiscal Year. Global capital markets exhibited elevated volatility levels, rapidly rising interest rates, and equity market corrections during the quarter, representing a sharp turning point from the previous 21 months of risk-on conditions, as central banks announced and then began taking tightening steps to combat strong and persistent inflationary pressures (inflation annualizing over 8% in the U.S.), Russia invaded Ukraine in February, and the U.S economy contracted 1.4% during the first quarter, unsettling global capital markets. Globally, economies faced numerous headwinds from the various macro risks that carried over from 2021 as well, including energy and labor shortages, sharply higher commodity prices, lingering global supply chain problems, scaled-back fiscal spending programs, rapidly rising government debt, and the threat of higher U.S corporate and personal tax rates. By the end of March, many economists were predicting a global recession in 2023. Global equity markets fell 5.5% during the quarter, despite strong company earnings and the transition from pandemic to endemic Covid with the relaxation of most pandemic-related restrictions.

The U.S. Federal Reserve made a course correction away from its expansionary monetary policies, indicating that it planned to raise the Fed Funds rate to about 2.75% over the next year or so, and in March implemented its first 25 bp rate hike. As a result, the U.S. Treasury yield curve rose sharply by the end of March with the 2-year yield rising 155 bps to 2.28%, the ten-year yield up 80 bps to 2.32% and the 30-year yield up 54 bps to 2.44% during the quarter, but all still well below then current inflation. Both investment-grade and high-yield credit spreads widened during the quarter. In Europe, the German 10-year yield climbed out of negative territory, rising to 31 bps while the U.K. 10-year yield rose 40 bps hitting 1.61% by the end of March as European inflation reached record levels and markets expected hawkish policies from their central banks.

Commodity indexes climbed through the quarter led by higher energy prices due to the Russia - Ukraine war and reduced production in the U.S., while the U.S. dollar rose about 2% versus a basket of non-US currencies.

Fourth Quarter of 2022 Fiscal Year. Inflation continued to climb during the final quarter of fiscal year 2022 and despite the low unemployment rate, recessionary fears abounded as the Federal Reserve raised the fed funds rate 75 bps in June following a 50 bp increase in May. The fed funds rate-range reached 1.50% - 1.75%, with the market anticipating another 75 bp increase in July and a level over 3% by calendar year end. Volatility remained elevated across global equities and bonds as global growth concerns mounted alongside ongoing inflation risks. Global equities suffered a sharp 16% selloff during the quarter, closing the first half of 2022 down 20%. Real US GDP declined for the second consecutive quarter, marking what is by some definitions a technical recession. For the quarter, growth stocks outperformed value and US outperformed non-US markets.

The U.S. aggregate bond index dropped by nearly 5% in the quarter. Yields on the 2-year, 10-year and 30-year Treasurys rose by 64 bps, 66 bps and 70 bps, respectively to finish the fiscal year at 2.92%, 2.98% and 3.14%.

Commodity prices declined about 2% for the quarter as the higher likelihood of a recession weighed on demand outlook, particularly for energy, while the US dollar strengthened about 6.5% against a basket of non-U.S. currencies.

Letter from Chief Investment Officer (continued)

<u>Full Fiscal Year 2022 vs. Fiscal Year 2021.</u> After a phenomenal fiscal year 2021 for capital markets with global equities up 41 percent (about five times its average annual return of eight percent), high yield credit instruments up about 14% due to spread tightening, many commodities rebounding sharply, and a stronger U.S. dollar, fiscal year 2022 was just the opposite, particularly the second half. During those final six months, global equities were down about 20% and the U.S. aggregate bond index was down over 10%. U.S. Treasury yields rose and the curve flattened with the 2-year Treasury yield rising 219 bps and the 30-year Treasury yield rising 124 bps resulting in long Treasury bonds losing 15% percent of their value during the fiscal year. After a period of unprecedented stimulative fiscal programs (over $20 trillion globally since the onset of COVID-19) and accommodative monetary policies broadly across the developed economies that strongly supported the capital markets in fiscal year 2021, fiscal year 2022's rapid unwinding of easy and cheap liquidity hit the capital markets very hard, erasing much of the FY2021 gains. The ERS portfolio was well positioned for the downturn, finishing the fiscal year with a 4.0% positive return and a near top of public plan peer group ranking.

PORTFOLIO RESTRUCTURING ACTIVITY

Fiscal year 2022 continued the progress of refining, streamlining, and diversifying the portfolio. We continued to execute the pacing plan approved by the Board of Trustees as result of the 2019 Asset Liability Study conducted by ERS Investment Staff and the General Consultant, Meketa Investment Group.

Highlights of portfolio-level changes throughout Fiscal Year 2022 are:

- <u>Real Assets</u>: At fiscal year-end real assets comprised 15.1% of ERS assets. Staff committed roughly $1.4 billion (9 funds) of additional capital to the real assets program. This includes commitments of roughly $420 million (2 funds) to core real estate, $200 million (4 funds) to non-core real estate, $0 million (0 funds) to infrastructure, $200 million (2 funds) to agriculture, and $600 million (1 fund) to a custom real assets fund-of-one. This is in line with our long-term target allocation and annual strategic/pacing plan.

- <u>Public Growth (Traditional Equity, Stabilized Equity and Global Credit)</u>: At fiscal year-end, global credit comprised 5.9% of total ERS assets. During the fiscal year, ERS investment staff committed $150 million, $100 million, and $50 million to three new managers in the global credit portfolio. Traditional equity and stabilized equity components comprised 20.5% and 8.1% of total assets respectively. During the year, a commitment of $200 million was allocated to a China A-shares strategy within traditional equity.

Letter from Chief Investment Officer (continued)

- Private Growth (Private Equity and Venture Capital): At fiscal year-end private growth comprised 18.6% of ERS assets. The significant outperformance for private growth relative to its benchmark and the total portfolio has increased the actual allocation to be over its 13.5% target allocation. The allocation is, however, still within the policy range of 5.0% to 25.0%. ERS consultant, Hamilton Lane, maintains discretion over the pacing of this portfolio, and will seek to maintain a steady allocation to private equity though robust pacing plan modeling. Modeling indicates that with a fairly steady pacing, the ERS is expected to remain within its current policy range. The purpose of a pacing plan has many benefits; two primary benefits are: 1) to ensure that ERS prudently achieves and maintains its targeted risk allocation to private growth, and 2) to reduce risk by seeking to reduce cash flow volatility. A pacing plan helps establish a mature portfolio whereby cash inflows from investment returns help to offset cash outflows.

- Diversifying Strategies: Diversifying strategies rose from $5.3 billion to $6.5 billion during the fiscal year 2022 due to $0.6 billion of additional capital and another $0.6 billion rebalancing of profits from existing liquid defensive and diversifying accounts to fund the onboarding of eight new managers. No accounts were closed during the fiscal year. With only three new managers in the onboarding pipeline at the end of the fiscal year, investment staff was nearing completion of the transition from a Crisis Risk Offset approach to a broader mandate that incorporates sources of return that are largely uncorrelated to growth risk as well as anti-correlating strategies to growth risk. The transition is expected to be completed in the first quarter of fiscal year 2023 with diversifying strategies growing from 14% to 35% of ERS asset between the beginning of fiscal year 2021 and the end of fiscal year 2023.

Letter from Chief Investment Officer (continued)

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 in fiscal year 2046. To accomplish this, ERS is diversifying the risks in the portfolio; increasing the proportion of return that comes from income (particularly in credit) rather than capital gains; refining processes for securitizing uninvested cash; rebalancing strategies; managing risks; transitioning capital that leads 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 years 2014, 2019, and 2022 have 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, improve operational processes, and increase returns.

The changes already made and being planned should 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 about a 25% drawdown in a scenario similar to the Global Financial Crisis of 2008-2009, a significant improvement from the 35% decline of the ERS portfolio during that crisis. Furthermore, as designed, the diversifying/defensive strategies and stabilized growth strategies have reduced risk and trimmed losses during the three equity market corrections that have occurred since they were implemented.

- The capital allocation among the strategic risk classes on June 30, 2022 was slightly overweight broad growth (+0.6%) and underweight diversifying strategies (-2.9%).[7] The overlay accounted for 0.4% of the portfolio, and the ERS operating account (used to fund new investments and pay benefits and other cash needs) was 1.6% of plan assets. The overlay program assisted the portfolio in staying closer to policy targets without forcing capital into the markets. From a risk allocation standpoint, growth risk accounted for about 85% of the volatility in the portfolio, up from about 80% the prior fiscal year.

- In November 2019, the Board of Trustees approved a new strategic allocation that made modest changes to the portfolio, mostly by more efficiently recharacterizing asset classes and expanding the asset classes within diversifying strategies in order to add more defensive positions to the portfolio (see chart below). The intent of the long-term strategic allocation update is to keep ERS closer to its progress on the funding path. In July 2020 as part of this reorganization, the principal protection and opportunistic investments strategic risk classes were folded into diversifying strategies. Also in July 2020, real return was reorganized into real assets and folded into broad growth.

[7] Total sums to 97.7%. ERS Operating Account and the Overlay account for 2.0% while Closing Accounts and Transition Accounts account for the remaining 0.3%.

Long-Term Strategic Allocation

STRATEGIC CLASS	COMPONENT	PRIOR LONG-TERM ALLOCATION	CURRENT LONG-TERM ALLOCATION
BROAD GROWTH	**PRIVATE GROWTH**	**28.3%**	**18.2%**
	TRADITIONAL GROWTH	**22.3%**	**21.6%**
	STABILIZED GROWTH	**22.3%**	**10.9%**
	REAL ASSETS	**N/A**	**14.3%**
DIVERSIFYING STRATEGIES		**27.0%**	**35.0%**

Office Development

The 2022 fiscal year was the eighth complete year for the investment team in the investment office. In January 2021 the Investment Officer-Risk was promoted to Deputy Chief Investment Officer ("DCIO"). The team consists of one DCIO, five Investment Officers, one Investment Specialist, one Chief Investment Officer ("CIO"), an Operations Assistant and an Administrative Assistant. In July 2018 the Board of Trustees completed its search for a new CIO. CIO Elizabeth Burton joined the ERS officially in October 2018, and fiscal year 2022 marked the beginning of her fourth year as CIO. In fiscal year 2021 CIO Burton successfully completed another part of her 2019 business plan by securing approval for a new Governance model that complements the new investment strategies. A new governance matrix was approved by the Board of Trustees that delegates greater responsibility to investment staff and has resulted in capturing market inefficiencies in a timelier basis than in previous years. In fiscal year 2022, an additional investment officer was hired to focus on operations and liquid defensive strategies. Ms. Burton resigned from her CIO position effective June 30, 2022 and the ERS Board of Trustees appointed DCIO Howard Hodel to serve as the Acting CIO until a new CIO is hired. It is expected that the actions taken during the next few years will continue to strengthen the investment office with respect to talent, tools, and governance support to increase the potential for the pension plan to remain a sustainable program.

Letter from Chief Investment Officer (continued)

OUTLOOK

While both equity and fixed income markets have already undergone a steep sell off during the last half of the 2022 fiscal year, more trouble likely lies ahead and it's difficult to determine how the major factors driving global economies will manifest themselves in asset values. Inflation is high, a determined Federal Reserve is embarking on an aggressive series of interest rate hikes to combat inflation, U.S. fiscal policy is very stimulative resulting in significant monetary supply growth, the U.S. economy has experienced two quarters of negative economic growth, and unemployment is dropping as most countries have emerged from Covid lockdowns, with the notable exception of China. There also remain a significant number of social, military, environmental and political risks on the global horizon that can cause shocks and stresses in global financial and commodity markets.

In our last two ACFR's we noted that the role of fixed income in asset allocation was concerning, as bond yields hovered near zero and it appeared that inflation would spike as global economies came out of their Covid lockdowns. This manifested itself in the last half of fiscal year 2022 and the ERS portfolio was well prepared as the overall interest rate duration was significantly reduced in early 2020 and again in early 2022. With the build out of the diversifying strategies strategic risk class nearing completion with the broadening of both defensive and diversifying strategies, the focus on increasing the level of income by expanding investments in real assets and floating-rate private credits via direct lending, we are constructing a portfolio that we believe can weather a variety of scenarios – including inflation, which we have so far successfully been navigating. By increasing our exposure to these strategies, furthermore, we should be able to maintain value in a variety of rate environments.

As we cannot predict the future, we continue to believe that prudently building a diversified portfolio is our best hedge against uncertain market outcomes. Although we have continued to increase our exposure to illiquid assets to increase our exposure to the illiquidity premium, we continue to maintain a very liquid portfolio, which was an advantage for us the last three years and should continue to be an advantage to us moving forward.

We plan to add additional staff to the investment office in fiscal year 2023 with the State approving two new investment officer positions and an investment accountant position in the ERS accounting branch in June 2022; top investment staff priorities include diversifying strategies and investment operations. The investment office remains lean in terms of staff and will continue to seek the resources necessary to execute on the Board of Trustees asset allocation plan, particularly considering impending market turbulence, the risk of continued inflation, higher interest rates, geopolitical and social unrest, and in general a potentially challenging real return environment for institutional portfolios. Out of necessity for the specific needs of our Plan, the investment staff, with the oversight of the Trustees and assistance of the three ERS consultants and the diversifying strategies platform manager, 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 investment staff to redeploy ERS capital to these opportunities. We have a sophisticated, intricate plan that requires sophisticated tools and analysis for proper execution.

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

Respectfully yours,

Howard Hodel

Howard M. Hodel
Deputy Chief Investment Officer

Letter from Investment Consultant

MEKETA 45 CELEBRATING A MILESTONE YEARS

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Portland, OR 97210

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July 21, 2023

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, 2022, as requested by the Government Financial Officers' Association (GFOA).

Hawaii ERS - Total Fund Performance

The total assets of the Retirement System were approximately $21.9 billion as of June 30, 2022, an decrease of roughly $-81.0 million for the fiscal year. The ERS Total Fund generated positive relative returns in most parts of the portfolio.

The investment return for the Total Fund, expressed as a time-weighted total rate of return, was +4.0% for the 2022 fiscal year compared to the benchmark's return of (-1.3%) and the Investment Metrics Public Defined Benefit (DB) Plans Greater than $1 billion database (which includes the previously utilized BNY Mellon Total Public Funds >$1B Database) peer median return of (-7.5%), ranking in the top percentile of this peer group for the fiscal year.

For the three-year period ending June 30, 2022, the Total Fund returned +10.1% per annum versus the benchmark's return of +7.0% and the Investment Metrics Public DB Plans Greater than $1 billion database peer median return of +6.4%.

For the trailing five-year period ending June 30, 2022, the Total Fund returned +8.8% per annum versus the benchmark's return of +6.7% and the Investment Metrics Public DB Plans Greater than $1 billion database peer median return of +7.0%.

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The Total Fund's returns over all examined periods were consistent with the global capital markets. In particular, the Total Fund's returns for the fiscal year 2022 were primarily driven by the private markets and defensive/diversifying strategies within the portfolio given the volatile conditions in this period. The ERS has deliberately constructed a more risk-focused, diversified, and globally oriented portfolio compared to peers. Considering the market environment of recent years, the ERS's peer-relative performance is entirely in-line with expectations.

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. There were slight revisions to the naming conventions of the classes and their components during the 2021 fiscal year as well. Based on these changes, the verbiage below highlights the performance of the ERS's risk-based strategic classes.

As calculated by BNY Mellon, the ERS's custodial bank, the Broad Growth strategic class produced a +0.9% return for the fiscal year versus the Broad Growth benchmark's return of (-3.3%). At fiscal year-end, the Broad Growth class utilized three components: 1) Public Growth, 2) Private Growth, and 3) Real Assets. The Public Growth component generated a (-13.3%) return, the Private Growth component produced a +29.6% return, and the Real Assets component generated a +18.0% return for the fiscal year.

The Diversifying Strategies strategic class produced an +11.4% return for the fiscal year versus the Diversifying Strategies benchmark's return of +2.7%. At fiscal year-end, the Diversifying Strategies class contained three components: 1) Illiquid Diversifying, 2) Liquid Defensive, and 3) Liquid Diversifying. The Illiquid Diversifying component generated a +2.1% return, the Liquid Defensive component produced a +17.3% return, and the Liquid Diversifying component generated a +6.7% return for the fiscal year.

The major strategic classes above utilize a variety of underlying asset classes and strategies. The performance tables in the Investment Results section of this letter provide additional granularity with respect to the various strategic classes and their underlying components and sub-components.

Furthermore, as a result of the 2019 Asset-Liability Study that was finalized in the 2020 fiscal year, it was expected that the ERS's implementation of its long-term strategic allocation would be largely completed by the end of the 2022 fiscal year. As expected, the Total Fund transitioned into adopting its long-term strategic allocation starting July 1, 2022. A subsequent asset-liability study was completed in fiscal year 2023 that will impact the strategic allocation over time.

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Market Conditions

We entered the 2022 fiscal year in an environment of improvements related to COVID-19, supportive monetary policy, relatively low interest rates, and the belief that inflation would be transitory. As the year progressed it became clear that as supply chain issues lingered inflation was going to remain high. The inflation picture was further complicated by the war in Ukraine and China's strict policies related to the virus, as well as relatively strong demand here in the US driven by policy support. With inflation levels at multi-decade highs, the US central bank, and others, were forced to aggressively start increasing interest rates. This led to one of the worst starts to a calendar year on record and weighed heavily on the overall fiscal year results.

Related to COVID-19, there was a global push for vaccine development and distribution, as well as advances in therapeutics. This led to increased optimism that there was a path to normal life and a return to typical economic patterns that we had not seen since early 2020. Despite these improvements there were pockets of disruption related to the virus during the fiscal year with various outbreaks reintroducing restrictions. Here in the US, the Omicron variant led to a massive spike in cases toward the end of 2021 and into 2022.

While COVID-19 was still present worldwide, it evolved into a less virulent form and much of the world has learned to live with it. Many restrictions on travel were removed and spending patterns among individuals and businesses adjusted to reflect that. Early in the pandemic, much of consumer spending in the US was on real estate, home renovation, and other goods to make living and for some working solely at home more comfortable. As the global economy reopened, spending patterns shifted to reflect preferences for travel and leisure.

One exception to the reopening of the global economy has been China. The Chinese government continued the "COVID Zero" policy instituted early in the pandemic that includes mass testing, restrictions on mobility, and the closure of commercial and manufacturing centers. The policy also weighed on the resolution of supply chain issues and contributed to inflation globally.

At the beginning of the 2022 fiscal year (July 2021), CPI stood at 5.4%. At the time, many market commentators and the Federal Reserve were labeling increases in inflation as "transitory," a result of pandemic-induced supply chain issues and accumulated savings over a year of stay-at-home orders. The Federal Reserve declined to act at the time, citing elevated unemployment levels and an incomplete recovery. Capital markets started to digest the high inflation numbers, with the Bloomberg Commodity index increasing 6.6% and the Bloomberg TIPS index returning 1.8% in the third calendar year quarter of 2021. Ultimately for the July-September period, US equity markets were slightly positive. Developed equity markets outside the US were slightly negative (in US dollar terms), while the MSCI Emerging Markets index declined (-8.1%) for the period driven by concerns in China related to the property market and the government's crackdown on the technology sector. Rates stayed largely unchanged through September in the US as investors waited for clarity on the path of the economy and monetary policy.

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It was also late in 2021 that news of a new COVID-19 variant of concern, Omicron, were beginning to come out of South Africa. Early reports were that it was significantly more transmissible and possibly less virulent. Depending on the region of the world, restrictions were reintroduced, exacerbating supply chain issues. Additionally, high natural gas prices were threatening the economic recovery in Europe and troubles related to China's overleveraged property sector and crackdown on the technology sector continued to rattle markets.

By December of 2021, CPI had increased to 7.0%, well above trend and at risk of becoming entrenched in consumer expectations. It was at this time that the Federal Reserve acknowledged that increases in inflation may not be "transitory" and gave indications that price increases were broadening out to goods and services not directly related to pandemic dislocations. The change in tone from the Federal Reserve did not significantly affect capital markets in the fourth quarter of 2021, as many asset classes were still positive. The S&P 500 returned 11.0% for the September to December quarter, with developed market equities registering lower (+2.7%) but positive returns, and emerging market equities declining (-1.3%). The broad US bond market was flat, while TIPS (+2.4%) benefited from increasing inflation concerns.

In early 2022, market participants in the US started to digest the hawkish pivot of the Federal Reserve in December given inflation pressures were not easing. US and non-US equity markets posted negative returns in January, with non-US equities generally outperforming US equities. Rates began to increase across the US yield curve, but the curve also began to flatten, given policy expectations. Bond markets also posted negative returns on concerns of higher interest rates in the inflationary environment, marking an unusual positive correlation between the two asset classes.

Russia invaded the Ukraine the last week of February and the West responded with sweeping sanctions that exceeded market expectations. Restricting access to foreign reserves was key, leading to Russia's central bank dramatically increasing policy rates (9.5% to 20%) to try to protect the currency. Food and energy prices added to inflation pressures in Europe and the US, pushing interest rates higher. During the first calendar quarter of 2022, all major asset classes declined except for commodities. Value stocks in the US significantly outperformed growth stocks, given higher rates and a preference by many investors for companies presumably better able to weather the tightening financial conditions. An increase in inflation expectations, and the pricing in of higher policy rates, proved to be a challenging headwind for nearly all bond indices. The broad US bond market experienced one of its worst quarters on record, down (-5.9%).

The Federal Reserve began lifting interest rates in the last quarter of the fiscal year. It started with a 25 basis point hike in April and followed that with a 50 basis point increase in early May. In June, reacting to a CPI reading of 8.6%, the Federal Reserve hiked rates by 75 basis points, which was the largest one-time increase since 1994. A similar increase took place in July 2022 with further increases expected into 2023. All major equity indices suffered steep declines in June weighing on overall second quarter 2022 results, with the S&P 500 hitting bear market territory by the end of the second calendar quarter. Emerging markets proved slightly more resilient than developed markets on a partial.re-opening in China from pandemic-related lockdowns. The global bond selloff continued, as inflation fears, and policy expectations weighed on all major global bond markets.

Letter from Investment Consultant (continued)

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Over the full fiscal year, US stocks outperformed other regions, with the S&P 500 returning (-10.6%) for the year, compared to the MSCI EAFE at (-17.8%), and a decline of (-25.3%) for the MSCI Emerging Market index. Despite positive performance in June, the MSCI China index declined the most among major regions with a full fiscal year return of (-31.8%). Within fixed income, higher inflation and higher rates led the Bloomberg TIPS index to decrease 5.1% over the full fiscal year, while the Bloomberg Aggregate index declined by 10.3%. Economic growth in the US fell in the first and second calendar quarters of 2022, at (-1.6%) and (-0.9%), respectively. Europe's economic output moderated but was still positive in the first two quarters of 2022. Japan's economic growth was slightly negative to begin 2022, while China's GDP remained positive but below the prior trend. Inflation remained stubbornly high, with CPI increasing 8.6% in the US over the fiscal year, the highest reading since 1981. The Eurozone matched the US with an 8.6% inflation print for the fiscal year ending in June.

Sincerely,

Colin Bebee, CFA
Managing Principal

Mika Malone, CAIA
Managing Principal

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July 21, 2023
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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 2022

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 Plan. Although pure speculation is to be avoided, the Board recognizes that a return in-line with the actuarial rate 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 Plan.

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 2019 that was completed during fiscal year 2020. As a result of the 2019 Asset-Liability Study, the Board adopted a new longterm strategic allocation policy which included evolving policy targets designed to efficiently transition the Plan to the new long-term strategic allocation over time. In addition, the strategic class framework has experienced modest naming convention changes. The ERS's implementation of the new long-term strategic allocation was largely completed by the end of the 2022 fiscal year.

Strategic Allocation Policy (as of 6/30/2022)[1]

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

Strategic Allocation[2]
(functional/risk-based classes)

Broad Growth	**67.5%**
Diversifying Strategies	**32.5%**
Opportunities	**0%**
Other	**0%**
Total	**100%**

[1] The above strategic allocation is supported by a multitude of underlying sub-asset class (see supporting pages).
[2] Actual allocations varied.

Report on Investment Activity by Investment Consultant (continued)

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Long-Term Strategic Allocation Policy

As a result of the formal asset-liability study that began in fiscal year 2019 and was completed in fiscal year 2020, the Board adopted a new long-term strategic allocation policy. As part of this new long-term strategic policy, the portfolio transitioned to two major strategic classes (rather than four). Prevailing classes and sub-classes were remapped to the two major strategic classes where applicable. As expected, the implementation and allocations across the new long-term strategic allocation policy were largely completed by the end of the 2022 fiscal year.

Expected Annualized Return and Risk

The Board manages the expected return/risk posture of the Plan as part of the formal asset-liability studies that are completed every three-to-five years. Based on the most recent asset-liability study, the Total Fund was repositioned to achieve a long-term return of approximately 7.0% with an annualized volatility of approximately 9.4%-11.4% (dependent on modeling approach) over a horizon of 20-30 years. A new asset-liability study was completed in the 2023 fiscal year and will be reflected in subsequent reports.

Evolving Strategic Allocation Policy

Implementation Plan for Long-term Strategic Policy				
	6/30/2020	7/1/2020	Long-Term 7/1/2021	Long-Term 7/1/2022
Broad Growth	68%	72%	67.5%	65%
Principal Protection	8%	--	--	--
Real Return	8%	--	--	--
Crisis Risk Offset	16%	--	--	--
Diversifying Strategies	--	28%	32.5%	35%
Total Portfolio	***100%***	***100%***	***100%***	***100%***

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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 and/or specialized 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

Historically, the full Employees' Retirement System of the State of Hawaii Investment Policy, Guidelines, and Procedures Manual ("Manual") described, in detail, acceptable investment practices, manager reporting requirements, manager performance guidelines, distribution of brokerage commissions, and securities lending guidelines, among other items. Material revisions to the Manual occurred during each of the last ten fiscal years and will continue to transpire throughout the evolution of the Plan.

Subsequent to the end of the 2020 fiscal year, a major revision occurred to this document, and it has been reconstituted as an Investment Policy Statement ("IPS"). This modification occurred in order to update the document to align with industry best practices and to better reflect the current governance structure of the system's investment portfolio. A current version of the IPS 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, 2022 (Risk-based Classes):

	Performance - Year Ended June 30,					3 Years Ended	5 Years Ended
	2022	2021	2020	2019	2018	6/2022	6/2022
Broad Growth [1]	**0.9%**	**34.8%**	**(-0.4%)**	**6.1%**	**9.8%**	**10.7%**	**9.6%**
Broad Growth Benchmark[2]	*(-3.3%)*	*31.5%*	*(1.8%)*	*4. 8%*	*9.5%*	*7.7%*	*7.5%*
Diversifying Strategies [1]	**11.4%**	**1.8%**	**6.6%**	**6.8%**	**4.2%**	**6.5%**	**6.1%**
Diversifying Strategies Benchmark[3]	*2.7%*	*4.1%*	*5.5%*	*5.0%*	*2.6%*	*4.1%*	*4.0%*
Other [1]	---	---	---	---	---	---	---
Total Fund	**4.0%**	**26.6%**	**1.3%**	**6.0%**	**7.8%**	**10.1%**	**8.8%**
Total Fund Policy Benchmark[4]	*(-1.3%)*	*23.3%*	*0.6%*	*4.7%*	*7.7%*	*7.0%*	*6. 7%*
Median Fund[1]	*(-7.5%)*	*27.4%*	*1.2%*	*5.4%*	*8.7%*	*6.4%*	*7.0%*

The following notes pertain to the table on this page.

[1] **Notes on Composites and Peer Universe**: Per BNY Mellon data, the **Broad Growth** composite was incepted 10/01/2014, and contains lagged and non-lagged components. The **Diversified Strategies** composite was incepted 04/01/2017. Performance prior to 07/01/2020 largely represents that of the **Crisis Risk Offset** composite. Class-specific performance is not provided or is not meaningful for **Other**, but their accounts roll-up to the **Total Fund** market value and performance. Universe data provided by Investment Metrics and BNY Mellon. Total Fund universe is the Public Defined Benefit Plans Greater than $1 Billion.

[2] **Broad Growth Benchmark** is composed of 45% MSCI ACWI IMI Index, 45% Stabilized Growth Benchmark, and 10% Private Growth Benchmark from 07/01/2016 through 12/31/2017; 43% MSCI ACWI IMI Index, 43% Stabilized Growth Benchmark, and 14% Private Growth Benchmark from 01/01/2018 through 06/30/2020; 70% Public Growth Benchmark, 16% Private Growth Benchmark, and 14% Real Assets Benchmark from 07/01/2020 through 06/30/2021; 66% Public Growth Benchmark, 20% Private Growth Benchmark, and 14% Real Assets Benchmark thereafter.

Stabilized Growth Benchmark is composed of 17% CBOE S&P 500 Buy Write Index, 17% CBOE S&P 500 Put Write Index, 17% MSCI ACWI Minimum Volatility Index, 15% NCREIF Blended Benchmark , 8.5% Bloomberg Global Credit Index (Hedged), 8.5% MSCI ACWI ex US Index, 8.5% 90-Day T-Bill Index, 5.7% Bloomberg Global High Yield Index (Hedged), and 2.8% S&P LSTA Leveraged Loan Index since 07/01/2016.

NCREIF Blended Benchmark is NCREIF Property Index (Quarter Lag) through 12/31/2017 and NCREIF ODCE Index (Quarter Lag) thereafter.

Please refer to the following pages for Public Growth Benchmark, Private Growth Benchmark, and Real Assets Benchmark definitions .

[3] **Diversifying Strategies Benchmark** is composed of 55.5% Liquid Defensive Benchmark and 44.5% Liquid Diversifying Benchmark from 04/01/2017 through 06/30/2020; 50% Liquid Defensive Benchmark, 40% Liquid Diversifying Benchmark, and 10% Illiquid Diversifying Benchmark thereafter.

Please refer to the following pages for Liquid Defensive Benchmark, Liquid Diversifying Benchmark, and Illiquid Diversifying Benchmark definitions.

[4] **Total Fund Policy Benchmark** is composed of 76% Broad Growth Benchmark, 10% Crisis Risk Offset Benchmark, 9% Principal Protection Benchmark, and 5% CPI +3% from 04/01/2017 through 12/31/2017; 72% Broad Growth Benchmark, 13% Crisis Risk Offset Benchmark, 8% Principal Protection Benchmark, and 7% CPI +3% from 01/01/2018 through 12/31/2018; 68% Broad Growth Benchmark, 16% Crisis Risk Offset Benchmark, 8% Principal Protection Benchmark, and 8% CPI +3% from 01/01/2019 through 6/30/2020; 72% Broad Growth Benchmark and 28% Diversifying Strategies Benchmark from 07/01/2020 through 06/30/2021; 67.5% Broad Growth Benchmark and 32.5% Diversifying Strategies Benchmark thereafter.

Principal Protection Benchmark is composed of 100% Bloomberg Global Intermediate ex Credit (Hedged) through 12/31/2017; 55% Bloomberg US Intermediate ex Credit and 45% Bloomberg Global Intermediate ex Credit (Hedged) thereafter.

Crisis Risk Offset Benchmark is composed of 25% Bloomberg US Treasury Long Index, 45% MLM Global Index 15V, and 30% 90-Day T-Bill +5% through 03/31/2019; 25% Bloomberg US Treasury Long Index, 45% MLM Global Index 15V, and 30% 90-Day T-Bill +2.5% thereafter.

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Investment Results as of June 30, 2022 (Risk-Based Classes – Sub-Components):

	Performance - Year Ended June 30,					3 Years Ended	5 Years Ended
	2022	2021	2020	2019	2018	6/2022	6/2022
Broad Growth[1]	**0.9%**	**34.8%**	**(-0.4%)**	**6.1%**	**9.8%**	**10.7%**	**9.6%**
Broad Growth Benchmark[2]	*(-3.3%)*	*31.5%*	*(-1.8%)*	*4.8%*	*9.5%*	*7.7%*	*7.5%*
Public Growth	**(-13.3%)**	**33.8%**	**(-0.3%)**	**4.6%**	**9.1%**	**4.9%**	**5.7%**
Public Growth Benchmark[3]	*(-11.6%)*	*31.8%*	*0.9%*	*5.4%*	*10.3%*	*5.5%*	*6.4%*
Traditional Equity	**(-16.7%)**	**42.9%**	**1.8%**	**4. 8%**	**12.5%**	**6.6%**	**7.4%**
MSCI ACWI IMI Index	*(-16.5%)*	*40.9%*	*1.2%*	*4.6%*	*11.1%*	*6.0%*	*6.7%*
Stabilized Equity	**(-11.8%)**	**23.8%**	**(-2.3%)**	**3.8%**	**6.2%**	**2.2%**	**3.3%**
Stabilized Equity Benchmark[4]	*(-6.0%)*	*23.3%*	*(-5.1%)*	*5.5%*	*6.3%*	*3.2%*	*4.3%*
Global Credit	**0.8%**	**22.0%**	**(-1.0%)**	**8.2%**	**0.7%**	**6.8%**	**5.8%**
Global Credit Benchmark[5]	*(-5.8%)*	*13.8%*	*2.1%*	*8.3%*	*1.5%*	*3.2%*	*3.9%*
Private Growth[1]	**29.7%**	**55.5%**	**(-0.6%)**	**16.6%**	**16.6%**	**26.1%**	**22.2%**
Private Growth Benchmark[6]	*8.3%*	*59.6%*	*(-10.7%)*	*3.9%*	*17.0%*	*15.6%*	*13.4%*
Real Assets[1]	**18.0%**	**13.3%**	**2.9%**	**6.7%**	**8.5%**	**11.2%**	**9.8%**
Real Assets Benchmark[7]	*22.9%*	*2.6%*	---	---	---	---	---
Core Real Estate	**283%**	**18.0%**	**2.3%**	**4.1%**	**6.2%**	**15.7%**	**11.3%**
NCREIF ODCE (Qtr Lag)	*27.3%*	*1.5%*	*3.9%*	*6.6%*	*7.1%*	*10.3%*	*8.9%*
Non-Core Real Estate	**22.9%**	**12.0%**	**2.4%**	**9.5%**	**10.8%**	**12.1%**	**11.3%**
NCREIF ODCE +1% (Qtr Lag)	*28.5%*	*2.5%*	*5.0%*	*7.6 %*	*8.2%*	*11.4%*	*10.0%*
Infrastructure	**8.4%**	**20.9%**	**19.5%**	**17.4%**	**10.3%**	**16.1%**	**15.2%**
CPI + 4%	*13.3%*	*9.7%*	*4.8%*	*5.9%*	*7.1%*	*9.2%*	*8.1%*
Agriculture	**---**	**---**	**---**	**---**	**---**	**---**	**---**
NCREIF Farmland (Qtr Lag)	---	---	---	---	---	---	---
Timber	**12.0%**	**(-2.2%)**	**(-0.7%)**	**3.8%**	**9.6%**	**2.8%**	**4.4%**
NCREIF Timberland (Qtr Lag)	*11.8%*	*1.5%*	*1.3%*	*2.4%*	*3.9%*	*4.7%*	*41%*
Other Real Assets[1]	---	---	---	---	---	---	---

The following notes pertain to the table on this page.

1 **Notes on Composites:** Per BNY Mellon data, the Broad Growth composite was incepted 10/01/2014, and contains lagged and non-lagged components. **Private Growth** and **Real Assets** composites contain lagged components. **Agriculture** composite was incepted 10/01/2021; **Other Real Assets** composite was incepted 04/01/2022. Changes to composite constructions between fiscal year reports may result in updates to historical data over time at the composite level.

2 Please refer to the preceding page for the **Broad Growth Benchmark** definition.

3 **Public Growth Benchmark** is composed of 82% MSCI ACWI IMI Index, 7.2% CBOE S&P 500 Buy Write Index, 5.4% Bloomberg Global Credit Index (Hedged), 3.6% Bloomberg Global High Yield Index (Hedged), and 1.8% S&P LSTA Leveraged Loans Index through 06/30/2020; 55.5% MSCI ACWI IMI Index, 20% Options-Based Equity Benchmark, 15.5% Global Credit Benchmark, and 9% MSCI ACWI Minimum Volatility Index from 07/01/2020 through 06/30/2021; 55.5% MSCI ACWI IMI Index, 16% Options-Based Equity Benchmark, 15.5% Global Credit Benchmark, 9% MSCI ACWI Minimum Volatility Index, and 4% ICE BofA All US Convertibles Index thereafter.
Options-Based Equity Benchmark is composed of 33.3% CBOE S&P 500 Buy Write Index, 33.3% CBOE S&P 500 Buy Write Index, 16.7% MSCI ACWI ex US Index, and 16.7% 90-Day T-Bill Index from 10/31/2016 through 06/30/2020; 50% CBOE S&P 500 Put Write Index, 35% CBOE MSCI EAFE Put Write Index (PXEA), and 15% CBOE MSCI Emerging Markets Put Write Index (PXEF) thereafter.

4 **Stabilized Equity Benchmark** is composed of 66.7% Options-Based Equity Benchmark and 33.3% MSCI ACWI Minimum Volatility Index through 06/30/2020; 69% Options-Based Equity Benchmark and 31% MSCI ACWI Minimum Volatility Index from 07/01/2020 through 04/30/2021; 55% Options-Based Equity Benchmark, 31% MSCI ACWI Minimum Volatility Index, and 14% ICE BofA All US Convertibles Index thereafter.

5 **Global Cred Benchmark** is composed of 37.5% Bloomberg Global High Yield Index (Hedged) +1% (Month Lag), 37.5% S&P LSTA Leveraged Loan Index +1% (Month Lagged), 12.5% Bloomberg Global High Yield Index (Hedged), and 12.5% S&P LSTA Leveraged Loan Index from 07/01/2020 through 06/30/2021; 25% Bloomberg Global High Yield Index (Hedged), 25% S&P LSTA Lev Loan 100 Index, 12.5% Bloomberg Global High Yield Index (Hedged) +1% (Month Lag), 12.5% S&P LSTA Lev Loan 100 Index +1% (Month Lag), 12.5% Bloomberg Global High Yield Index (Hedged) +1% (Quarter Lag), and 12.5% S&P LSTA Lev Loan 100 Index +1% (Quarter Lag) thereafter.

6 **Private Growth Benchmark** is MSCI ACWI IMI Index (Quarter Lag) +2% since 10/01/2014.

7 **Real Assets Benchmark** began on 07/01/2020 as part of the long-term strategic allocation policy change. It is composed of 40% NCREIF ODCE Index (Quarter Lag), 35% NCREIF ODCE Index +1% (Quarter Lag), 12.5% NCREIF Timberland Index (Quarter Lag), 5% NCRIEF Farmland Index (Quarter Lag), and 7.5% CPI +4% from 07/01/2020 through 06/30/2021; 39% NCREIF ODCE Index (Quarter Lag), 31% NCREIF ODCE Index +1% (Quarter Lag), 12% NCREIF Timberland Index (Quarter Lag), 8% NCRIEF Farmland Index (Quarter Lag), and 10% CPI +4% thereafter.

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Investment Results as of June 30, 2022 (Risk-Based Classes – Sub-Components) [continued]:

	Performance - Year Ended June 30,					3 Years Ended	5 Years Ended
	2022	2021	2020	2019	2018	6/2022	6/2022
Diversifying Strategies[1]	**11.4%**	**1.8%**	**6.6%**	**6.8%**	**4.2%**	**6.5%**	**6.1%**
Diversifying Strategies Benchmark[2]	*2.7%*	*4.1%*	*5.5%*	*5.0%*	*2.6%*	*4.1%*	*4.0%*
Illiquid Diversifying[3]	**2.1%**	**4.9%**	**---**	**---**	**---**	**---**	**---**
Illiquid Diversifying Benchmark[2]	*3.1%*	*4.4%*	---	---	---	---	---
Idiosyncratic Return Capture[1]	**3.8%**	**2.4%**	**---**	**---**	**---**	**---**	**---**
90 Day T-Bill +3.5%	*3.7%*	*3.6%*	---	---	---	---	---
Insurance Linked[1]	**1.2%**	**7.7%**	**---**	**---**	**---**	**---**	**---**
Swiss RE Global Catastrophe Bond Hedge	*2.6%*	*5.9%*	---	---	---	---	---
Liquid Defensive[1]	**17.3%**	**1.1%**	**10.7%**	**4.3%**	**0.3%**	**9.5%**	**6.5%**
Liquid Defensive Benchmark[3]	*2.7%*	*5.2%*	*6.3%*	*3.4%*	*(-0.5%)*	*4.7%*	*3.4%*
Defensive Return Capture[1]	**22.6%**	**(-32.3%)**	**---**	**---**	**---**	**---**	**---**
90 Day T-Bill +2.5%	*2.7%*	*2.6%*	---	---	---	---	---
Systematic Trend Following[1]	**38.2%**	**20.9%**	**1.7%**	**0.2%**	**1.7%**	**19.3%**	**11.6%**
MLM Global Index LT 15V	*23.6%*	*22.9%*	*(-6.0%)*	*(-2.1%)*	*(-0.9%)*	*12.6%*	*6.7%*
Treasury Agency Duration Capture[1]	**(-10.1%)**	**(-3.3%)**	**25.1%**	**11.9%**	**(-2.4%)**	**2.8%**	**3.5%**
Treasury Agency Duration Benchmark[4]	*(-13.1%)*	*(-5.6%)*	*25.4%*	*12.3%*	*(-0.1%)*	*0.9%*	*2.9%*
Liquid Diversifying[1]	**6.7%**	**4.1%**	**4.1%**	**(0.61%)**	**15.39%**	**3.36%**	**7.68%**
Liquid Diversifying Benchmark[6]	*2.67%*	*2.60%*	*4.17%*	*6.78%*	*6.43%*	*3.14%*	*4.52%*
Alternative Return Capture[1]	**16.78%**	**4.20%**	**(-0.6%)**	**15.4%**	**13.6%**	**6.6%**	**9.7%**
90-Day T-Bill + 2.5%	*2.7%*	*2.6%*	*4.2%*	*6.8%*	*6.5%*	*3.1%*	*4.5%*
Relative Value Arbitrage[1]	**(-1.9%)**	**---**	**---**	**---**	**---**	**---**	**---**
90 Day T-Bill +2.5%	*2.7%*	---	---	---	---	---	---

The following notes pertain to the table on this page.

[1] **Notes on Composites:** Per BNY Mellon data, the **Diversifying Strategies, Liquid Defensive, Systematic Trend Following, Treasury Agency Duration Capture, Liquid Diversifying, and Alternative Return Capture** were incepted 04/01/2017. Performance of **Diversifying Strategies** prior to 07/01/2020 represents that of the **Crisis Risk Offset** composite. Performance of Treasury Agency Duration Capture prior to 07/01/2020 represents that of Treasury Duration Capture composite. Illiquid Diversifying, Idiosyncratic Return Capture, Insurance Linked, and Defensive Return Capture were incepted 07/01/2020. Relative Value Arbitrage was incepted 11/01/2020. Changes to composite constructions between fiscal year reports may result in updates to historical data over time at the composite level.

[2] Please refer to the preceding page for the **Broad Growth Benchmark** definition.

[3] **Illiquid Diversifying Benchmark** is composed of 65% 90-Day T-Bill +3.5% and 35% Swiss RE Global Catastrophe Bond Index (Hedged) from 07/01/2020 through 06/30/2021; 50% 90-Day T-Bill +3.5% and 50% Swiss RE Global Catastrophe Bond Index (Hedged) thereafter.

[4] **Liquid Defensive Benchmark** is composed of 40% MLM Global Index 15V, 30% Bloomberg US Treasury Long Index, and 30% Bloomberg US Intermediate Aggregate ex Credit Index from 07/01/2020 through 06/30/2021; 35% MLM Global Index 15V, 20% 90-Day T-Bill +2.5%, 15% Bloomberg US Treasury Long Index, 15% Bloomberg US Intermediate Aggregate ex Credit Index, and 15% Bloomberg US TIPS 5+ Year Index thereafter.

[5] **Treasury Agency Duration Benchmark** is Bloomberg US Treasury Long Index prior to 06/30/2020; 50% Bloomberg US Treasury Long Index and 50% Bloomberg US Intermediate Aggregate ex Credit Index thereafter.

[6] **Liquid Diversifying Benchmark** is 90-Day T-Bill +2.5% since 07/01/2020.

Investment Managers

BROAD GROWTH

PRIVATE GROWTH

Hamilton Lane
Landmark
Stafford Partners

PUBLIC GROWTH
– GLOBAL CREDIT
Carval Credit
HPS Credit
Lafayette Square USA
Oak Hill Advisors
Pacific Investment Management Company
Silver Rock Credit

PUBLIC GROWTH
– TRADITIONAL EQUITY
Alliance Bernstein
Blackrock
Hillhouse
Legal and General Investment Management
Longview
Wasatch
Wellington

PUBLIC GROWTH
- STABILIZED EQUITY
Gateway
Lord Abbett
Neuberger Berman
Robeco
TOBAM

REAL ASSETS
- CORE REAL ESTATE
Heitman Capital Management
Invesco Realty Advisors
Prime Properties

REAL ASSETS
- NON-CORE REAL ESTATE
Angelo Gordon
Almanac
Blacksand Capital
Blackrock
Blackstone Realty
CB Richard Ellis
Cerebus
DRA
EJF
Fortress Japan
GLP Capital
Kayne Anderson
Kohlberg Kravis Roberts
LaSalle Investment Management
Lone Star
Mesa West Capital
Prudential
Starwood
Torchlight

REAL ASSETS
- TIMBER
Hancock Timber Resource Group

Continued on next page

Investment Professionals (continued)

INVESTMENT MANAGERS *(CONTINUED)*

BROAD GROWTH *(CONTINUED)*

REAL ASSETS
- AGRICULTURE
PGIM Agricultural Investments
UBS Realty Investors

REAL ASSETS
- OTHER REAL ASSETS
Morgan Stanley

REAL ASSETS
- INFASTRUCTURE
I Squared
IFM Investors (US) Advisor
Kohlberg Kravis Roberts

Continued on next page

Investment Professionals (continued)

INVESTMENT MANAGERS *(CONTINUED)*

DIVERSIFYING STRATEGIES

LIQUID DEFENSIVE
– DEFENSIVE RETURN CAPTURE
AHL
P E Global
Saba
36 South Capital

LIQUID DEFENSIVE
– SYSTEMATIC TREND FOLLOWING
AlphaSimplex
Aspect Capital
Crabel Capital Management
Mount Lucas Management

LIQUID DEFENSIVE
– TREASURY AGENCY DURATION CAPTURE
Bank of Hawaii
First Hawaiian Bank
Sun Life Capital

ILLIQUID DIVERSIFYING
– INSURANCE LINKED
Nephila
Pillar ENSO

LIQUID DIVERSIFYING
– ALTERNALATIVE RETURN CAPTURE
Brevan Howard
Credit Suisse
Graham Capital Management
Lombard Odier

LIQUID DIVERSIFYING
– RELATIVE VALUE ARBITRAGE
Aequim
Aristesia
Monashee
Shaolin
UBS O’Connor

ILLIQUID DIVERSIFYING
– IDIOSYNCRATIC RETURN CAPTURE
Blackstone
Cloverlay
MY Alpha Management
Parabellum Partners
Petershill

OTHER
Parametric

Continued on next page

Investment Professionals (continued)

Investment Managers (Continued)

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

List of Assets Directly Held (by fair value)*

as of June 30, 2022 (excludes investments in pooled vehicles, investment companies, limited partnerships, limited liability companies, and index funds)

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

	Par / Shares	Security	Coupon	Maturity	Average Issue Rating	Fair Value
Domestic Fixed Income						
1	90,800,000	U S TREASURY NOTE	0.125%	9/15/2023	AAA	$ 87,806,324
2	74,000,000	U S TREASURY NOTE	1.625%	12/15/2022	AAA	73,737,300
3	65,500,000	U S TREASURY NOTE	0.250%	6/15/2023	AAA	63,859,880
4	54,715,000	U S TREASURY NOTE	2.750%	8/15/2047	AAA	49,290,555
5	35,400,000	U S TREASURY NOTE	1.500%	9/15/2022	AAA	35,387,610
6	42,300,000	U S TREASURY NOTE	2.250%	8/15/2049	AAA	34,996,482
7	40,510,000	U S TREASURY BOND	2.500%	2/15/2045	AAA	34,585,413
8	29,375,000	U S TREASURY NOTE	2.250%	8/15/2046	AAA	23,864,838
9	23,500,000	U S TREASURY BOND	0.125%	12/15/2023	AAA	22,564,700
10	31,400,000	U S TREASURY BOND	1.125%	8/15/2040	AAA	21,825,512
International Fixed Income						
		NONE				
Domestic Equities						
1	487,192	MICROSOFT CORP				$ 125,125,522
2	27,066	ALPHABET INC				59,205,522
3	367,653	APPLE INC				50,265,519
4	92,795	UNITEDHEALTH GROUP INC				47,662,296
5	193,192	VISA INC				38,037,572
6	397,531	MEDTRONIC PLC				35,678,408
7	130,162	AON PLC				35,102,088
8	71,586	ELEVANCE HEALTH INC				34,545,973
9	219,708	MARSH & MCLENNAN COS INC				34,109,667
10	141,045	L3HARRIS TECHNOLOGIES INC				34,090,577
International Equities						
1	453,104	SANOFI				$ 45,636,025
2	1,652,996	COMPASS GROUP PLC				33,725,680
3	313,368	WOLTERS KLUWER NV				30,323,635
4	82,406	ROCHE HOLDING AG				27,419,890
5	625,285	DIAGEO PLC				26,809,818
6	289,184	HEINEKEN NV				26,302,485
7	650,927	ASAHI GROUP HOLDINGS LTD				21,297,490
8	793,181	SHELL PLC				20,556,366
9	375,985	VOLTRONIC POWER TECHNOLOGY COR				18,272,262
10	2,321,870	AU SMALL FINANCE BANK LTD				17,396,569

Investment Schedules (continued)

Investments Summary

- excludes cash and cash equivalents and short-term investments

(Dollar values expressed in thousands)		Fair Value as of June 30, 2022	Percentage
Equity securities			
Common stock	$	4,157,708	19.97%
Equity funds		1,159,664	5.57%
Convertible and equities		43,040	0.21%
		5,360,412	25.75%
Fixed income securities			
US treasury / government / agencies		770,944	3.70%
US mortgage-backed		162,808	0.78%
US corporate		40,457	0.19%
Non-US corporate		757	0.00%
Fixed income funds		1,998,140	9.60%
Convertible and other fixed income		289,846	1.39%
		3,262,952	15.66%
Others			
Real estate investments		3,372,223	16.20%
Alternative investments		8,825,906	42.39%
		12,198,129	58.59%
Total, investments at fair value	$	20,821,493	100.00%

Investment Schedules (continued)

Schedule of Investment Fees
by Asset Class Allocation

(Dollar values expressed in thousands)

	Fair value as of June 30, 2022	Total FY 2022 Investment Fees	Basis Points
Broad Growth			
Public Growth Equity			
Traditional Equity	$ 4,511,094	$ 18,229	40 bp
Stabilized Equity	1,790,475	4,162	23
Global Credit	1,294,588	8,509	66
Private Growth	4,089,649	2,055	5
Real Assets			
Agriculture	32,167	179	56
Core Real Estate	1,189,613	19,045	160
Non-Core Real Estate	924,548	-	-
Infrastructure	411,306	-	-
Other Real Assets	576,428	116	2
Timber	189,763	1,584	83
	15,009,631	53,879	36
Diversifying Strategies			
Illiquid Diversifying			
Idiosyncratic Return	511,092	6,464	126
Insurance Linked	428,552	4,838	113
Liquid Defensive			
Defensive Return Capture	921,025	6,349	69
Systematic Trend Following	1,427,397	5,751	40
Treasury Agency Duration	708,819	593	8
Liquid Diversifying			
Alteranative Return	1,181,799	7,703	65
Relative Value Arbitrage	1,335,349	17,739	133
	6,514,033	49,437	76
Other	514,403	609	12
Subtotal on investments	22,038,067	103,925	47
Other Investment Services			
Custodian fees	-	327	n/a
Investment consultant fees	-	1,595	n/a
Total including consultant and custodian	$ 22,038,067	$ 105,847	48

Investment Schedules (continued)

Schedule of Broker Commissions

The following is a list of brokers who received commissions from equity trades for securities directly held during Fiscal Year 2022.

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission Dollar Amount	Commission Per Share
ABN AMRO CLEARING BANK N.V, AMSTERDAM	105,938	$ 4,182,317	$ 1,540	$ 0.015
ALLEN & COMPANY LLC, JERSEY CITY	119,913	18,089,070	3,306	0.028
AMBIT CAPITAL PRIVATE LTD, MUMBAI	203,194	17,684,985	35,489	0.175
AXOS CLEARING LLC, OMAHA	2,734,300	709,506	355	0.000
BAIRD, ROBERT W & CO INC, MILWAUKEE	14,531	1,813,267	375	0.026
BANCO BTG PACTUAL SA, RIO DE JANEIRO	58,986	107,986	76	0.001
BANCO SANTANDER, NEW YORK	677,900	3,311,935	4,977	0.007
BANK OF NEW YORK MELLON NEW YORK	293	14,443	3	0.010
BANQUE PARIBAS, PARIS	357,604	10,145,679	5,693	0.016
BARCLAYS BANK IRELAND PLC, DUBLIN	12,947,860	28,385,631	5,681	0.000
BARCLAYS CAPITAL INC./LE, NEW JERSEY	136,825	13,644,908	1,258	0.009
BARCLAYS CAPITAL LE, NEW YORK	820,085	48,995,742	18,853	0.023
BARCLAYS CAPITAL, LONDON (BARCGB33)	642,260	30,677,476	9,346	0.015
BARCLAYS CAPITAL, NEW YORK	10,961	748,863	206	0.019
BARRENJOEY MARKETS PTY LIMITED, SYDNEY	7,038	118,769	167	0.024
BERENBERG GOSSLER & CIE, HAMBURG	45,547	2,346,248	1,854	0.041
BERNSTEIN SANFORD C & CO, NEW YORK	733,142	70,598,997	6,190	0.008
BMO CAPITAL MARKETS CORP, NEW YORK	182,009	13,731,832	4,836	0.027
BNP PARIBAS ARBITRAGE, PARIS	48,009	40,047	24	0.000
BNP PARIBAS PEREGRINE SEC LTD, HONG KONG	48,803	711,878	235	0.005
BNP PARIBAS PRIME BROKERAGE,INC,NEW YORK	258,456	27,061,991	1,649	0.006
BNP PARIBAS SEC SRVS SA, SINGAPORE	471,958	16,949,335	5,396	0.011
BNP PARIBAS SEC SVCS, LONDON (PARBGB2L)	2,550	44,510	9	0.004
BNP PARIBAS SECS SERVS, SYDNEY	479,483	943,206	221	0.000
BNP PARIBAS SECURITIES SVCS, HONG KONG	4,836,708	4,531,176	4,000	0.001
BNY CONVERGEX EXECUTION SOL, NEW YORK	76,562	2,567,418	888	0.012
BOFA SECURITIES EUROPE S.A., PARIS	10,363,538	60,733,205	14,627	0.001
BOFA SECURITIES, INC, NEW YORK	1,038,890	20,212,039	13,513	0.013
BRADESCO S.A. CTVM, SAO PAULO	197,462	1,329,765	579	0.003
BTIG LLC, NEW YORK	359,969	27,895,189	11,483	0.032
CALYON SECURITIES, NEW YORK	223,400	2,788,422	768	0.003
CANTOR FITZGERALD & CO INC, NEW YORK	35,809	883,764	1,160	0.032
CIBC WORLD MKTS INC, TORONTO (WGDB)	118,033	7,633,611	666	0.006
CITADEL SECURITIES INSTL LLC, CHICAGO	4,396	979,962	22	0.005
Amounts carried forward	38,362,412	440,613,172	155,445	

Investment Schedules (continued)

Schedule of Broker Commissions (continued)

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission Dollar Amount	Commission Per Share
Amounts brought forward	38,362,412	$ 440,613,172	$ 155,445	
CITATION GROUP BCC CLRG, NEW YORK	143,203	15,328,883	716	$ 0.005
CITIBANK, ATHENS GREECE	3,010	484,356	133	0.044
CITIGROUP GBL MKTS AUSTRALIA PTY, SYDNEY	3,939	64,181	18	0.005
CITIGROUP GBL MKTS INC, NEW YORK	1,655,175	11,803,073	3,800	0.002
CITIGROUP GBL MKTS INC, TAIPEI	1,840,000	3,284,698	1,217	0.001
CITIGROUP GBL MKTS INDIA, MUMBAI	104,922	2,107,113	1,883	0.018
CITIGROUP GLOBAL MARKETS (EFP), NEW YORK	680	15,489	12	0.018
CITIGROUP GLOBAL MARKETS EURO, FRANKFURT	964,685	35,109,277	11,437	0.012
CITIGROUP GLOBAL MARKETS INC., NEW YORK	658,473	4,222,570	3,121	0.005
CITIGROUP GLOBAL MARKETS LTD, LONDON	2,552,156	16,145,923	4,050	0.002
CITIGROUP GLOBAL MARKETS, INC., NEW YORK	725,720	71,902,249	11,139	0.015
CLSA AUSTRALIA PTY LTD, SYDNEY	317,795	5,230,572	1,046	0.003
CLSA INDIA LTD, MUMBAI	40,220	869,555	1,417	0.035
CONVERGEX EXECUTION SOLUTION, NEW YORK	182,095	39,576,821	1,366	0.008
COWEN AND CO LLC, NEW YORK	1,097,404	107,922,451	11,245	0.010
COWEN AND COMPANY LLC, NEW YORK	5,600	168,063	42	0.008
CREDIT LYONNAIS SEC, SEOUL	58,312	2,698,822	1,816	0.031
CREDIT LYONNAIS SECS (ASIA), HONG KONG	2,918,623	8,433,911	2,111	0.001
CREDIT LYONNAIS SECS ASIA LTD, TAIPEI	198,340	363,782	110	0.001
CREDIT LYONNAIS SECS, SINGAPORE	585,806	11,544,661	2,925	0.005
CREDIT SUISSE (EUROPE), LONDON	2,989	430,212	121	0.040
CREDIT SUISSE (EUROPE), SEOUL	16,257	1,466,960	440	0.027
CREDIT SUISSE (HK) LIMITED, HONG KONG	672,000	591,424	432	0.001
CREDIT SUISSE (HK) SECS LTD, HONG KONG	88,900	348,247	96	0.001
CREDIT SUISSE INTERNATIONAL, LONDON	25,041	30,284	30	0.001
CREDIT SUISSE, LONDON (CSFPGB2L)	2,794,150	57,594,367	14,949	0.005
CREDIT SUISSE, MUMBAI	34,411	742,993	633	0.018
CREDIT SUISSE, NEW YORK (CSUS)	3,366,381	196,481,362	54,127	0.016
CREDIT SUISSE, SAO PAULO	213,300	832,741	1,043	0.005
CREDIT SUISSE, TAIPEI	497,000	2,486,491	745	0.001
DAIWA SEC SMBC SINGAPORE LTD, SINGAPORE	23,025	505,206	759	0.033
DAIWA SECS (HK) LTD, HONG KONG	105,000	1,090,975	546	0.005
DAIWA SECS AMER INC, NEW YORK	224,481	2,551,362	3,448	0.015
DAVY STOCKBROKERS, DUBLIN	13,746	2,170,784	2,391	0.174
DEUTSCHE BK INTL EQ, LONDN (DEUTGB22EEQ)	18,000	497,736	100	0.006
DSP MERRILL LYNCH LTD, MUMBAI	797,175	9,443,668	5,177	0.006
ENAM SECURITIES PVT LTD, MUMBAI	87,250	8,754,728	17,568	0.201
EXANE, NEW YORK	7,465	1,493,674	411	0.055
EXANE, PARIS (EXANFRPP)	1,905,127	30,331,426	7,651	0.004
FIDELITY CAPITAL MARKETS, NEW YORK	193,673	22,606,642	1,356	0.007
FX- MORGAN STANLEY INTL	510	53,076	16	0.031
GOLDMAN SACHS & CO, NY	10,653,954	283,327,139	63,002	0.006
Amounts carried forward	74,158,405	1,401,721,119	390,090	

Investment Schedules (continued)

Schedule of Broker Commissions (continued)

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission Dollar Amount	Commission Per Share
Amounts brought forward	74,158,405	$ 1,401,721,119	$ 390,090	
GOLDMAN SACHS (ASIA) LLC, TAIPEI	44,000	982,730	271	$ 0.006
GOLDMAN SACHS (INDIA), MUMBAI	39,648	1,061,775	1,187	0.030
GOLDMAN SACHS AUSTRALIA PTY LTD,MELBOURN	1,511	25,136	7	0.005
GOLDMAN SACHS BANK EUROPE SE, FRANKFURT	252,832	3,261,624	489	0.002
GOLDMAN SACHS DO BRASIL, SAO PAULO	650,000	2,223,838	3,700	0.006
GOLDMAN SACHS INTL, LONDON	203,684	11,379,389	815	0.004
GOLDMAN SACHS INTL, LONDON (GSILGB2X)	2,336,650	31,693,173	11,001	0.005
GOODBODY STOCKBROKERS, DUBLIN	20,029	1,105,298	897	0.045
GUGGENHEIM CAPITAL MARKETS LLC, NEW YORK	7,252	1,519,864	145	0.020
HAITONG INTL SEC CO LTD, HONG KONG	78,800	60,939	55	0.001
HONG KONG & SHANGHAI BKG CORP, HONG KONG	1,000	53,664	11	0.011
HSBC BANK PLC (ALDGATE BRH)(05E), LONDON	263,954	17,362	13	0.000
HSBC BANK PLC (MIDLAND BK)(JAC), LONDON	311,234	2,297,050	1,214	0.004
HSBC SECS INC, NEW YORK	31,700	1,423,621	1,699	0.054
HSBC SECURITIES (USA) INC, NEW YORK	67,606	7,888,034	566	0.008
ICBC FINCL SVCS, NEW YORK	1,988	480,105	20	0.010
ICICI BROKERAGE SERVICES LTD, MUMBAI	106,432	4,368,303	6,030	0.057
INSTINET AUSTRALIA CLEARING SERV, SYDNEY	118,801	830,270	166	0.001
INSTINET CLEARING SER INC, NEW YORK	80,131	8,280,178	711	0.009
INSTINET CORP, NEW YORK	690,208	52,082,743	5,638	0.008
INSTINET EUROPE LIMITED, LONDON	1,944,183	34,704,164	21,676	0.011
INSTINET PACIFIC LTD, HONG KONG	670,750	5,120,312	1,351	0.002
INSTINET, HONG KONG	448	21,469	4	0.009
INSTINET, SINGAPORE	7,860	93,619	19	0.002
INVESTMENT TECH GROUP INC, NEW YORK	180	11,252	1	0.006
INVESTMENT TECHNOLOGY GROUP LTD,DUBLIN	1,140,454	23,303,411	8,484	0.007
ISI GROUP INC, NEW YORK	51,227	2,758,782	1,258	0.025
ITG AUSTRALIA LTD, MELBOURNE	402,076	6,747,068	2,513	0.006
ITG INC, NEW YORK	3,061	406,705	46	0.015
J P MORGAN SEC LTD/STOCK LENDING, LONDON	72,456	2,546,477	640	0.009
J P MORGAN SEC, SYDNEY	56,050	1,073,847	1,064	0.019
J P MORGAN SECS LTD, LONDON	1,069,825	37,508,575	17,508	0.016
J.P MORGAN SECURITIES INC, NEW YORK	785,218	105,791,149	16,012	0.020
J.P. MORGAN SECURITIES LLC, NEW YORK	1,123,554	104,546,332	13,171	0.012
J.P. MORGAN SECURITIES, HONG KONG	4,201,952	9,688,259	2,527	0.001
J.P.MORGAN AG, FRANKFURT	2,316,677	28,397,353	5,510	0.002
JANE STREET EXECUTION SERVICES, NEW YORK	132,171	4,865,219	2,584	0.020
JANNEY MONTGOMERY SCOTT, PHILADELPHIA	600	23,838	12	0.020
JEFFERIES & CO INC, NEW YORK	1,837,998	92,830,358	17,373	0.009
JEFFERIES & CO LTD, LONDON	1,366,940	15,078,990	3,927	0.003
JEFFERIES AUSTRALIA PTY LIMITED, SYDNEY	3,445	59,843	16	0.005
JEFFERIES HONG KONG LIMITED, HONG KONG	679,246	9,899,829	4,088	0.006
Amounts carried forward	97,332,236	2,018,233,066	544,509	

Schedule of Broker Commissions (continued)

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission Dollar Amount	Commission Per Share
Amounts brought forward	97,332,236	$ 2,018,233,066	$ 544,509	
JEFFERIES INDIA PRIVATE LTD, MUMBAI	74,805	2,488,654	2,941	$ 0.039
JM FIN INSTL SEC PRIVATE LTD, MUMBAI	58,097	3,451,382	5,191	0.089
JM MORGAN STANLEY SECURITIES, MUMBAI	2,348,972	16,098,682	9,225	0.004
JMP SECURITIES, SAN FRANCISCO	8,793	266,358	176	0.020
JONESTRADING INST SVCS LLC, NEW YORK	30,749	2,526,841	689	0.022
JP MORGAN INDIA PRIVATE LTD, MUMBAI	40,455	1,051,167	884	0.022
JP MORGAN SECS (FAR EAST) LTD, SEOUL	34,218	2,221,766	842	0.025
JP MORGAN SECS (TAIWAN) LTD, TAIWAN	137,128	609,617	214	0.002
JPMORGAN SECURITIES INC, NEW YORK	359,535	10,924,677	2,237	0.006
KEB SALOMON SMITH BARNEY SECS, SEOUL	23,389	1,127,942	448	0.019
KEEFE BRUYETTE + WOODS INC, NEW YORK	21,978	625,588	659	0.030
KEPLER EQUITIES, PARIS	55,883	1,758,395	749	0.013
KEYBANC CAPITAL MARKETS INC, NEW YORK	142,553	6,441,859	3,890	0.027
KIM ENG SEC LTD, HONG KONG	11,000	1,311,292	2,636	0.240
KNIGHT EQUITY MARKETS LP, NEW YORK	1,400	172,929	11	0.008
KOTAK SECURITIES,MUMBAI	228,147	15,315,394	30,734	0.135
LIBERUM CAPITAL INC, NEW YORK	84,705	355,711	320	0.004
LIQUIDNET ASIA LTD, HONG KONG	2,007,000	3,894,069	2,182	0.001
LIQUIDNET CANADA INC, TORONTO	11,780	130,763	182	0.015
LIQUIDNET EUROPE LIMITED, LONDON	792,434	7,822,787	3,625	0.005
LIQUIDNET INC, NEW YORK	239,925	31,373,383	2,342	0.010
LOOP CAPITAL MARKETS, JERSEY CITY	91,077	7,109,999	639	0.007
LUMINEX TRADING AND ANALYTICS, BOSTON	140,652	13,085,931	703	0.005
MACQUARIE BANK LIMITED, SYDNEY	9,504	144,165	39	0.004
MACQUARIE BANK LTD, HONG KONG	226,177	8,946,859	16,836	0.074
MACQUARIE SECS (INDIA) PVT LTD, MUMBAI	118,862	4,191,401	6,290	0.053
MACQUARIE SECURITIES LTD, SEOUL	2,500	271,700	75	0.030
MACQUARIES SECURITIES AUSTRALIA, SYDNEY	1,018,098	7,387,084	4,004	0.004
MERRILL LYNCH & CO INC ATLAS GLOBAL, NY	13,699	104,159	156	0.011
MERRILL LYNCH GILTS LTD, LONDON	653,650	27,592,850	7,383	0.011
MERRILL LYNCH INTL LONDON EQUITIES	4,796,569	87,378,188	36,781	0.008
MERRILL LYNCH PIERCE FENNER SMITH INC NY	4,167,916	346,090,634	49,807	0.012
MERRILL LYNCH PIERCE FENNER, TAIWAN	16,000	529,694	146	0.009
MERRILL LYNCH PIERCE FENNER, WILMINGTON	45,900	89,551	204	0.004
MERRILL LYNCH PROFESSIONAL CLRG, PURCHAS	79,893	2,903,305	2,397	0.030
MERRILL LYNCH, SYDNEY	108,202	341,356	513	0.005
MIRAE ASSET SECURITIES, SEOUL	31,197	755,650	208	0.007
MIZUHO SECURITIES USA INC. NEW YORK	84,477	3,477,264	3,661	0.043
MKM PARTNERS LLC, GREENWICH	2,800	122,283	111	0.040
MORGAN INTL/MSBAG, NEW YORK	813,345	54,207,395	10,844	0.013
MORGAN STANLEY & CO INTL LTD, SEOUL	173,408	11,355,075	5,250	0.030
MORGAN STANLEY & CO INTL LTD, TAPEI	3,711,000	11,186,266	4,876	0.001
Amounts carried forward	120,350,108	2,715,473,131	765,609	

Investment Schedules (continued)

Schedule of Broker Commissions (continued)

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission Dollar Amount	Commission Per Share
Amounts brought forward	120,350,108	$ 2,715,473,131	$ 765,609	
MORGAN STANLEY & CO, LONDON (MSLNGB2X)	844,617	38,768,293	10,222	$ 0.012
MORGAN STANLEY AND CO., LLC, NEW YORK	7,691,711	267,444,477	69,094	0.009
MORGAN STANLEY ASIA LTD, HONG KONG	29,800	111,927	56	0.002
MORGAN STANLEY EUROPE SE, FRANKFURT	26,664,507	59,588,604	12,253	0.000
NATIONAL FINL SVCS CORP, NEW YORK	11,214	1,127,918	56	0.005
NBCN INC, TORONTO (NBCS)	621	57,274	4	0.006
NEEDHAM & CO, NEW YORK	78,061	16,000,339	1,561	0.020
NEEDHAM AND CO LLC, NEW YORK	15,900	941,861	318	0.020
NESBITT BURNS, TORONTO (NTDT)	153,802	8,131,918	855	0.006
NOMURA FINANCIAL & INVESTMENT, SEOUL	549	43,757	13	0.024
NOMURA FINL ADV & SEC PVT, MUMBIA	32,027	626,033	565	0.018
NUVAMA WEALTH MANAGEMENT LTD, MUMBAI	76,212	6,229,823	12,288	0.161
ODDO ET CIE, PARIS	1,749	301,351	453	0.259
OPPENHEIMER & CO INC, NEW YORK	73,938	3,465,471	2,405	0.033
PAREL, PARIS	9,742	681,722	136	0.014
PAREL, PUTEAUX	82,551	4,312,838	1,875	0.023
PEEL HUNT LLP, LONDON	14,317	963,836	675	0.047
PENSERRA SECURITIES, NEW YORK	32,892	6,114,320	188	0.006
PERSHING LLC, JERSEY CITY	1,118,393	80,462,139	19,387	0.017
PERSHING SECURITIES LTD, LONDON	1,458,738	18,318,230	9,123	0.006
PIPER JAFFRAY & CO., JERSEY CITY	22,111	1,292,435	918	0.042
RAYMOND JAMES & ASSOC INC, ST PETERSBURG	58,664	9,443,776	1,373	0.023
RBC CAPITAL MARKETS GMBH, FRANKFURT	113,352	2,464,984	1,494	0.013
RBC CAPITAL MARKETS LLC, NEW YORK	672,479	56,151,223	9,479	0.014
RBC DOMINION SECS INC, TORONTO (DOMA)	24,166	1,356,278	257	0.011
REDBURN PARTNERS LLP, LONDON	199,731	788,199	352	0.002
RENAISSANCE CAPITAL LTD, LONDON	82,563	103,132	72	0.001
RENAISSANCE SECS (CYPRUS) LTD, NICOSIA	48,720	146,014	146	0.003
ROYAL BANK OF CANADA EUROPE LTD, LONDON	174,165	2,133,040	433	0.002
S G WARBURG, SEOUL	35,227	3,151,881	1,380	0.039
SANFORD C BERNSTEIN & CO INC, LONDON	43,678	897,906	1,349	0.031
SBK BROOKS INVESTMENT CORP, CLEVELAND	2,235	14,770	11	0.005
SCOTIA CAPITAL (USA) INC, NEW YORK	85,613	9,316,672	610	0.007
SCOTIA CAPITAL INC, NEW YORK	784	16,131	10	0.013
SCOTIA CAPITAL MKTS, TORONTO	160,410	4,445,589	3,618	0.023
SG SECURITIES, HONG KONG	31,994	359,184	72	0.002
SKANDINAVISKA ENSKILDA BANKEN, LONDON	240,145	5,040,898	5,410	0.023
SKANDINAVISKA ENSKILDA BANKEN, STOCKHOLM	57,651	1,287,708	1,418	0.025
SMBC SECURITIES, INC NEW YORK	600	100,683	101	0.168
SOCIETE GENERALE, PARIS	56,950	2,329,851	1,012	0.018
STATE STREET GLOBAL MARKETS LLC, BOSTON	1,856	66,052	19	0.010
STIFEL NICOLAUS	123,002	10,511,301	2,610	0.021
Amounts carried forward	160,977,545	3,340,582,969	939,280	

Schedule of Broker Commissions (continued)

Brokerage Firms	Shares Traded	Dollar Volume of Trades	Commission Dollar Amount	Commission Per Share
Amounts brought forward	160,977,545	$ 3,340,582,969	$ 939,280	
STUART FRANKEL & CO. INC, JERSEY CITY	37,521	6,185,291	375	$ 0.010
SUNTRUST CAPITAL MARKETS INC, NEW YORK	86,737	4,008,262	3,604	0.042
SVENSKA HANDELSBANKEN, STOCKHOLM	82,380	5,046,028	1,063	0.013
TORONTO DOMINION SEC, TORONTO	63,819	4,270,446	355	0.006
UBS AG LONDON BRANCH, LONDON	54,101	2,305,549	642	0.012
UBS EQUITIES, LONDON	1,801,955	27,997,959	19,356	0.011
UBS EUROPE SE, FRANKFURT AM MAIN	21,178,732	78,192,610	16,088	0.001
UBS SECURITIES CANADA, TORONTO (BWIT)	110,974	10,882,858	411	0.004
UBS SECURITIES LLC, STAMFORD	2,917,032	164,616,897	28,780	0.010
UBS WARBURG ASIA LTD, HONG KONG	3,407,492	23,725,473	7,805	0.002
UBS WARBURG AUSTRALIA EQUITIES, SYDNEY	8,506	266,311	59	0.007
UBS WARBURG SEC,TAIWAN	10,505,000	16,875,585	8,022	0.001
VIRTU AMERICAS LLC, JERSEY CITY	71	6,750	1	0.014
VIRTU AMERICAS LLC, NEW YORK	215,568	31,782,889	1,252	0.006
WARBURG DILLON READ SEC, MUMBAI	186,106	1,739,108	876	0.005
WELLS FARGO SECURITIES LLC, CHARLOTTE	499,924	44,024,406	3,477	0.007
WELLS FARGO SECURITIES, LLC, NEW YORK	123,402	3,807,689	4,631	0.038
WILLIAMS CAPITAL GROUP LP, JERSEY CITY	57,050	4,169,573	681	0.012
Total trades	202,313,915	$ 3,770,486,653	$ 1,036,758	$ 0.005

Employees' Retirement System

of the State of Hawaii

ACTUARIAL SECTION

GASB STATEMENT NO. 67 REPORT

GRS
P: 469.524.0000 | www.grsconsulting.com

March 24, 2023

The 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 and 68. 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 Nos. 67 and 68 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 ACFR.

- 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 that the discount rate at Meaturement 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.
- Actuarial components of Governmental Accounting and Standards Board (GASB) 67 requirements.

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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.

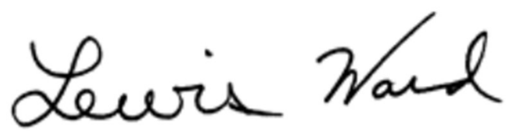
This report complements the actuarial valuation report, issued on August 22, 2023, that was provided to ERS and should be considered in conjunction with that report. Please see the significant actuarial valuation report information as of June 30, 2022 (located later in this section of the ERS' ACFR) 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 GASB Statement No. 67 report and actuarial valuation report, as of June 30, 2022, are 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
Pension Market Leader & Actuary

GABRIEL, ROEDER, SMITH & COMPANY

GASB STATEMENT NO. 67 REPORT (continued)

EXECUTIVE SUMMARY ***
as of June 30, 2022

	2022	2021
Actuarial Valuation Date	June 30, 2022	June 30, 2021
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	June 30, 2022	June 30, 2021
Membership		
Number of		
- Retirees and beneficiaries	53,990	52,618
- Inactive, nonretired members **	33,903	31,237
- Active members	64,234	65,561
- Total	152,127	149,416
Reported Payroll for Fiscal Year	$4,483,686,505	$4,667,346,006
Net Pension Liability		
Total Pension Liability	$34,822,778,620	$34,139,165,472
Plan Fiduciary Net Position	21,854,814,032	21,935,791,711
Net Pension Liability	$12,967,964,588	$12,203,373,761
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	62.76%	64.25%
Net Pension Liability as a Percentage of Covered Payroll	289.23%	261.46%
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*	3.69%	1.92%
Last year ending June 30 in the 2022 to 2121 projection period for which projected benefit payments are fully funded (and 2021 to 2120)	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 30, 2022 and June 30, 2021. 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, 2022 Actuarial Valuation Report information that follows this section beginning on page 133.

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 ACFR. 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, 2022 and a measurement date of June 30, 2022.

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 3.69% (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%.

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August 22, 2023

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, 2022

We certify that the information contained in the 2022 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, 2022. 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 and consultants. 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.

This report was prepared at the request of the Board and is intended for use by the ERS and those designated or approved by the Board. This report may be provided to parties other than the ERS only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report. (The entire GASB Statement No. 67 report and actuarial valuation report, as of June 30, 2022, are available on the ERS website at ers.ehawaii.gov.)

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.)

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Letter from the Actuary (continued)

Board of Trustees
August 22, 2023
Page 2

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

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 costs of the ERS and to amortize the unfunded actuarial accrued liability (UAAL) over a reasonable amount of time, which will ensure benefit security and intergenerational equity. 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.

Progress toward realization of financing objectives

We have determined that the funding period for paying off the UAAL of the ERS (in aggregate) is 24 years. This is the same as the prior year's funding period of 24 years. Normally, we would expect the funding period to decrease by one each year if all assumptions are exactly met. Therefore, this year's funding period is one year more than expected. Given that the System experienced actuarial gains on both its assets and its liabilities, this result may seem somewhat surprising. However, one of the reasons for the liability gains was a sizeable decrease in the covered payroll of the System. Since the contributions to the System are a fixed percentage of payroll, a decrease in the covered payroll implies a smaller contribution stream in future years, which means smaller payments towards the unfunded liabilities of the System. Hence, even though the total unfunded liabilities decreased from last year, the period over which the unfunded liabilities are to be paid off remained the same (24 years). Because this period is less than 30 years, the minimum objectives set in State statute are currently being realized. In addition, when the current contribution rates were passed by the Legislature in 2017, it was expected that the funding period would be 24 years as of the 2022 valuation, thus ERS remains on track to achieve full funding in the same timeframe as originally set.

The 2017 Legislature passed legislation that made significant changes to the future employer contribution rates. The employer contribution rate for Police and Fire employees increased to 41% for FY2021, and the employer contribution rate for All Other Employees increased to 24% for FY2021. This was the final phase of the increase in the employer contribution rates. The funding period assumes that these contribution rates will remain in effect throughout the 24 year funding period. Under current law, the contribution rates are expected to stay at these levels until the ERS is fully funded. These increases have improved the outlook of ERS. As long as the contributions are made, the ERS's funded status should improve and the ERS should be able to absorb moderate adverse experience without a need to further increase the contribution rates.

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 61.2% which is a large increase over the 58.3% funded ratio in the previous valuation. The funded ratio improved due to sizeable actuarial gains on both the liabilities and assets of the System.

Gabriel Roeder Smith & Company

Letter from the Actuary (continued)

Board of Trustees
August 22, 2023
Page 3

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 would instead assume that all amortization payments in the future will be the same percentage of pay as in the current year.

The actuarial accrued liability (AAL), the unfunded actuarial accrued liability (UAAL), and the determination of the resulting funding period illustrate the progress toward the realization of financing objectives. The ERS had a liability experience gain which was caused by individual salary increases being less than expected by the assumptions. ERS also experienced an aggregate decrease in its liabilities due to the change in actuarial assumptions. On the asset side, ERS experienced an actuarial gain even though the returns on a market value basis were less than assumed. This result was due to the continued recognition of a portion of the prior year's investment gain. In addition to these changes, the ERS currently experiences negative amortization (interest on the UAAL is greater than the contributions towards the elimination of the UAAL). However, each of the changes described above were all greater than the negative amortization, and actually resulted in a large decrease in the UAAL. As a result, the UAAL decreased (in dollars) based on this actuarial valuation as of June 30, 2022 and ERS's underfunded status as measured by the UAAL is now $13.505 billion. This was the second year in a row the UAAL declined and as a reminder last year was the first year the UAAL had decreased since 2007.

Because of the very favorable investment performance in FY2021, the current year's shortfall of investment income was completely offset, and additional deferred gains were recognized to create a gain on the actuarial value of assets. Furthermore, ERS is still deferring $537 million in investment gains, compared with $2,026 million in deferred investment gains last year. If there are no significant investment losses or other actuarial losses, the funded status of the ERS would be expected to increase both in the near future and over the long term. Thus, given the plan's current and future 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 2026, and then begin to decrease,
5. The unfunded actuarial accrued liability will be fully amortized after 24 years, and
6. In the absence of benefit improvements and in consistent financial markets, the funded ratio should increase steadily until it reaches 100%.

Letter from the Actuary (continued)

Board of Trustees
August 22, 2023
Page 4

However, it is important to again note that these statements are based on the actual experience meeting the current assumptions. 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 ERS and the expectation on when the ERS will reach a 100% funded level.

This valuation assumed the continuing ability of the plan sponsors to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

Benefit provisions and Legislative changes

This is the tenth 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 ACFR for more details on the benefit provisions for members of the ERS.

Assumptions and methods

The actuarial assumptions used were adopted by the Board in August of 2022 based on the recommendations provided by an Experience Study performed by GRS. The actuarial assumptions and methods have been updated since the prior valuation.

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

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.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

Gabriel Roeder Smith & Company

Letter from the Actuary (continued)

Board of Trustees
August 22, 2023
Page 5

Data

Member data for retired, active, and inactive participants was supplied as of March 31, 2022, 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 (ACFR). Information with respect to years prior to 2000 was supplied by ERS.

Tables and schedules in the Actuarial Section of the ACFR 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

Executive Summary

The following table summarizes the key results of the June 30, 2022 actuarial valuation of the Employees' Retirement System of the State of Hawaii (ERS).

Item	**2022**	**2021**
Membership		
• Number of		
- Active members	64,234	65,561
- Retirees and beneficiaries	53,990	52,618
- Inactive, vested	9,031	9,011
- Total	127,255	127,190
• Covered payroll for active members	$4,537 million	$4,622 million
• Actual benefit payments and refunds	$1,763 million	$1,675 million
Assets		
• Actuarial (smoothed) value	$21,318 million	$19,910 million
• Market value	$21,855 million	$21,936 million
• Return on actuarial value	8.4%	10.8%
• Return on market value	0.8%	26.9%
• Employer contributions during fiscal year	$1,242 million	$1,282 million
• External cash flow %	(1.1%)	(0.5%)
Actuarial Information		
• Total normal cost % (employee + employer)	14.60%	14.06%
• Unfunded actuarial accrued liability (UAAL)	$13,505 million	$14,229 million
• Funded ratio (based on smoothed assets)	61.2%	58.3%
• Funded ratio (based on market assets)	62.8%	64.3%
• Funding period (years) *	24	24
• Employer contribution rate % of projected payroll for FY beginning July 1		
Police and Firefighters	41.00%	41.00%
All Other Employees	24.00%	24.00%

* 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.

Actuarial Certification Statement

		Police and Firefighters June 30, 2022	All Other Employees June 30, 2022	All Employees June 30, 2022
1. Gross normal cost as a percentage of pay		27.31%	12.96%	14.60%
2. Present value of future benefits				
a. Active employees	$	4,075,348,827	16,030,544,741	20,105,893,568
b. Inactive members		66,876,228	1,009,112,261	1,075,988,489
c. Pensioners and beneficiaries		4,039,032,899	15,594,745,465	19,633,778,364
d. Total	$	8,181,257,954	32,634,402,467	40,815,660,421
3. Present value of future employee and employer contributions				
a. Present value of future normal costs	$	1,341,850,634	4,651,031,167	5,992,881,801
b. Present value of future employee contributions		686,362,784	2,343,631,009	3,029,993,793
c. Present value of future employer normal cost (Item 3a - Item 3b)	$	655,487,850	2,307,400,158	2,962,888,008
4. Actuarial accrued liability (Item 2d - Item 3a)	$	6,839,407,320	27,983,371,300	34,822,778,620
5. Actuarial value of assets				
a. Annuity Savings Fund	$	1,396,172,825	2,110,481,800	3,506,654,625
b. Pension Accumulation Fund		3,216,548,235	14,594,632,793	17,811,181,028
c. Total	$	4,612,721,060	16,705,114,593	21,317,835,653
6. Unfunded actuarial accrued liability	$	2,226,686,260	11,278,256,707	13,504,942,967
7. Adequacy of contribution rates				
a. Statutory Contribution Rate for Fiscal Year 2023		41.00%	24.00%	25.92%
B. Funding period in years as of June 30, 2022 *		23	24	24

*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, 2022 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 in August of 2022 based on the actuary's actuarial experience investigation report for the period ending June 30, 2021. 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

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions

The determination of the accrued liability and an actuarially determined contribution (or funding period) requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and an actuarially determined contribution (or funding period) that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;

2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;

3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;

4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;

5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;

6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)

The effects of certain trends in experience can generally be anticipated. For example if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

ERS SPECIFIC RELATIONSHIP TO CERTAIN RISKS

While ERS has various levels of exposure to all of the risks listed above, in our opinion the three that warrant the most observation for the ERS Board specifically are assumption change risk and affordability risk.

Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are adjusted to be different than the current assumptions. For example, declines in interest rates or increases in earnings multiples over time may result in a change in the assumed rates of return used in the valuation. A healthier workforce may result in changes in employee behavior such that retirement rates are adjusted to reflect employees working longer. And the difference in changing an assumption versus the other experience related risks listed above is instead of the loss slowly building over time, there is the immediate recognition of the change. Over the past decade, the changing of assumptions has increased the liabilities of ERS more than any other source. While those changes were warranted and put ERS on a stronger path going forward, it did cause a set back in many of the actuarial measurements and at least gives the appearance of a weaker System. We do not currently anticipate any significant changes to assumptions in the future and will continue to communicate with the Board if any issues beginning to show.

Affordability Risk is the simple fact that the contributions into ERS are quite large and in order to achieve the benefit security desired by the Board and the beneficiaries of ERS, they must remain high for quite a number of years. State Law requires the actuarial contribution occur and there has been no requests or attempts to lower the amounts, but it will always be a risk a future decision maker does attempt to do so.

Risk in continued contraction in the headcount of active members. As seen in this valuation, the contributions into ERS are directly tied to the covered payroll of the active membership and the projection of that payroll is used in determining the funding period. If the headcount were to continue to decline, it would be difficult for the amount of future revenue to meet the current expectations and thus it would likely take more than 24 years to fully amortize the UAAL.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Several generally accepted plan maturity measures are described below and are followed by a table showing a 10-year history of the measurements for ERS.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher/lower or increasing/decreasing level of this maturity measure generally indicates a higher/lower or increasing/decreasing volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll (5 to 2 ratio), a change in liability 2% other than assumed would equal 5% of payroll. A higher/lower or increasing/decreasing level of this maturity measure generally indicates a higher/lower or increasing/decreasing volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

DURATION OF ACTUARIAL ACCRUED LIABILITY

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)

ADDITIONAL RISK ASSESSMENT

Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. While a robust measurement of additional risk assessment is outside the scope of the annual actuarial valuation, some scenario tests and sensitivity tests are included in the valuation summary PowerPoint presentation presented to the Board at the Board's January Board Meeting (is available on the ERS website at: https://ers.ehawaii.gov/resources/financials).

In addition, an annual stress test as prescribed by state law is conducted each year. Please see the stress test report dated December 19,2022, which was conducted in conjunction with this valuation (is available on the ERS website at: https://ers.ehawaii.gov/resources/reports-to-legislature).

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Ratio of the market value of assets to payroll	4.74	4.59	3.75	3.81	3.79	3.68	3.30	3.48	3.56	3.16
Ratio of actuarial accrued liability to payroll	7.55	7.14	7.06	6.95	6.82	6.72	6.44	5.57	5.57	5.44
Ratio of actives to retirees and beneficiaries	1.19	1.25	1.30	1.33	1.36	1.40	1.48	1.52	1.56	1.58
Ratio of net cash flow to market value of assets	-1.1%	-0.5%	-1.1%	-1.8%	-2.0%	-2.0%	-1.9%	-1.8%	-2.0%	-2.5%
Duration of the actuarial accrued liability*	14.88	14.95	15.03	15.11	NA	NA	NA	NA	NA	NA

*Duration measure not available prior to 2019

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Summary of 2022 Actuarial Valuation

Exhibit 1
Development of Employer Cost

		Police and Firefighters June 30, 2022	All Other Employees June 30, 2022	All Employees June 30, 2022
1.	Projected FY 2023 payroll for contribution purposes	$ 521,695,052	$ 4,092,295,884	$ 4,613,990,936
2.	Gross normal cost (Exhibit 3)	27.31%	12.96%	14.60%
3.	Employer normal cost rate (Exhibit 3)	14.56%	7.17%	8.01%
4.	Present value future benefits (Exhibit 2)	$ 8,181,257,954	$ 32,634,402,467	$ 40,815,660,421
5.	Present value future employer normal cost	$ 655,487,850	$ 2,307,400,158	$ 2,962,888,008
6.	Present value future employee contributions	$ 686,362,784	$ 2,343,631,009	$ 3,029,993,793
7.	Actuarial accrued liability (Item 4 - Item 5 - Item 6)	$ 6,839,407,320	$ 27,983,371,300	$ 34,822,778,620
8.	Actuarial value of assets	$ 4,612,721,060	$ 16,705,114,593	$ 21,317,835,653
9.	Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	$ 2,226,686,260	$ 11,771,976,606	$ 13,998,662,866
10.	Funding period *	23	24	24

		Police and Firefighters June 30, 2021	All Other Employees June 30, 2021	All Employees June 30, 2021
1.	Projected FY 2022 payroll for contribution purposes	$ 546,561,229	$ 4,237,217,252	$ 4,783,778,481
2.	Gross normal cost (Exhibit 3)	26.20%	12.43%	14.06%
3.	Employer normal cost rate (Exhibit 3)	13.53%	6.77%	7.57%
4.	Present value future benefits (Exhibit 2)	$ 8,015,085,569	$ 31,745,500,517	$ 39,760,586,086
5.	Present value future employer normal cost	$ 632,420,589	$ 2,110,765,000	$ 2,743,185,589
6.	Present value future employee contributions	$ 690,224,720	$ 2,188,010,305	$ 2,878,235,025
7.	Actuarial accrued liability (Item 4 - Item 5 - Item 6)	$ 6,692,440,260	$ 27,446,725,212	$ 34,139,165,472
8.	Actuarial value of assets	$ 4,235,042,948	$ 15,674,748,606	$ 19,909,791,554
9.	Unfunded actuarial accrued liability (UAAL) (Item 7 - Item 8)	$ 2,457,397,312	$ 11,771,976,606	$ 14,229,373,918
10.	Funding period *	25	23	24

*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 2022 Actuarial Valuation (continued)

Exhibit 2
Actuarial Present Value of Future Benefits

	Police and Firefighters June 30, 2022	All Other Employees June 30, 2022	All Employees June 30, 2022
1. Active members			
a. Service retirement benefits	$ 3,936,986,502	$ 14,869,296,751	$ 18,806,283,253
b. Termination benefits	83,650,920	676,018,881	759,669,801
c. Survivor benefits	16,513,834	125,525,955	142,039,789
d. Disability retirement benefits	38,197,571	359,403,154	397,600,725
e. Total	$ 4,075,348,827	$ 16,030,244,741	$ 20,105,593,568
2. Retired members			
a. Service retirement	$ 3,786,345,877	$ 14,383,298,870	$ 18,169,644,747
b. Disability retirement	40,176,603	310,853,955	351,030,558
c. Beneficiaries	212,510,419	900,592,640	1,113,103,059
d. Total	$ 4,039,032,899	$ 15,594,745,465	$ 19,633,778,364
3. Inactive members			
a. Vested terminations	$ 59,848,063	$ 862,323,648	$ 922,171,711
b. Nonvested terminations	7,028,165	146,788,613	153,816,778
c. Total	$ 66,876,228	$ 1,009,112,261	$ 1,075,988,489
4. Total actuarial present value of future benefits	$ 8,181,257,954	$ 32,634,102,467	$ 40,815,360,421

	Police and Firefighters June 30, 2021	All Other Employees June 30, 2021	All Employees June 30, 2021
1. Active members			
a. Service retirement benefits	$ 4,020,768,692	$ 14,442,539,151	$ 18,463,307,843
b. Termination benefits	114,583,361	894,962,859	1,009,546,220
c. Survivor benefits	19,443,388	132,779,833	152,223,221
d. Disability retirement benefits	34,683,588	333,180,582	367,864,170
e. Total	$ 4,189,479,029	$ 15,803,462,425	$ 19,992,941,454
2. Retired members			
a. Service retirement	$ 3,524,781,804	$ 13,813,731,206	$ 17,338,513,010
b. Disability retirement	38,704,179	295,335,436	334,039,615
c. Beneficiaries	198,983,126	857,387,074	1,056,370,200
d. Total	$ 3,762,469,109	$ 14,966,453,716	$ 18,728,922,825
3. Inactive members			
a. Vested terminations	$ 56,109,266	$ 828,795,763	$ 884,905,029
b. Nonvested terminations	7,028,165	146,788,613	153,816,778
c. Total	$ 63,137,431	$ 975,584,376	$ 1,038,721,807
4. Total actuarial present value of future benefits	$ 8,015,085,569	$ 31,745,500,517	$ 39,760,586,086

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Summary of 2022 Actuarial Valuation (continued)

Exhibit 3
Analysis of Normal Cost

	Police and Firefighters June 30, 2022	All Other Employees June 30, 2022	All Employees June 30, 2022
1. Normal cost as a percent of pay			
a. Service retirement benefits	24.53%	9.92%	11.59%
b. Deferred termination benefits	0.88%	0.63%	0.66%
c. Refunds	0.84%	1.36%	1.30%
d. Disability retirement benefits	0.48%	0.52%	0.52%
e. Survivor benefits	0.18%	0.13%	0.13%
f. Administrative expenses	0.40%	0.40%	0.40%
g. Total	27.31%	12.96%	14.60%
2. Employee contribution rate	12.75%	5.79%	6.59%
3. Effective employer normal cost rate (Item 1g – Item 2)	14.56%	7.17%	8.01%

	Police and Firefighters June 30, 2021	All Other Employees June 30, 2021	All Employees June 30, 2021
1. Normal cost as a percent of pay			
a. Service retirement benefits	23.19%	9.17%	10.82%
b. Deferred termination benefits	1.17%	0.82%	0.86%
c. Refunds	0.88%	1.49%	1.42%
d. Disability retirement benefits	0.42%	0.47%	0.47%
e. Survivor benefits	0.19%	0.13%	0.14%
f. Administrative expenses	0.35%	0.35%	0.35%
g. Total	26.20%	12.43%	14.06%
2. Employee contribution rate	12.67%	5.66%	6.49%
3. Effective employer normal cost rate (Item 1g – Item 2)	13.53%	6.77%	7.57%

Summary of 2022 Actuarial Valuation (continued)

Exhibit 4
Development of Actuarial Value of Assets

1. Actuarial value of assets, beginning of year	$	19,909,791,554
2. Net new investments		
a. Contributions	$	1,535,166,655
b. Benefits paid and Refunds	$	(1,763,205,748)
c. Administrative expenses	$	(17,497,621)
d. Subtotal	$	(245,536,714)
3. Market value of assets at end of year	$	21,854,814,032
4. Expected return on actuarial value of assets	$	1,385,091,624
5. Expected actuarial value of assets, end of year	$	21,049,346,464
6. Excess/(shortfall) return (Item 3-Item 5)	$	805,467,568

7. Development of amounts to be recognized as of June 30, 2021:

Fiscal Year End	Remaining Deferrals of Excess (Shortfall) of Investment Income	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2019	-	-	-	1	-	-
2020	-	-	-	2	-	-
2021	2,026,000,157	(1,220,532,589)	805,467,568	3	268,489,189	536,978,379
2022	(1,220,532,589)	1,220,532,589		4	-	-
Total	$ 805,467,568	$ -	$ 805,467,568		$ 268,489,189	$ 536,978,379

8. Actuarial value of assets as of June 30, 2021 (Item 3 - Item 7)	$	21,317,835,653
9. Ratio of actuarial value to market value		97.5%
10. Asset gain/(loss) for year (Item 8 - Item 5)	$	268,489,189

Gabriel Roeder Smith & Company

Summary of 2022 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 accured liability (UAAL), as of June 30, 2021	$	2,457,397,312	$	11,771,976,606	$	14,229,373,918
2. Normal cost for the year (employer and employee)	$	133,956,404	$	497,091,562	$	631,047,966
3. Less: contributions and assessments for the year	$	(323,185,122)	$	(1,211,981,533)	$	(1,535,166,655)
4. Interest at 7.00%						
a. On UAAL	$	172,017,812	$	824,038,362	$	996,056,174
b. On normal cost		4,688,474		17,398,205		22,086,679
c. On contributions		(11,311,479)		(42,419,354)		(53,730,833)
d. Total	$	165,394,807	$	799,017,213	$	964,412,020
5. Expected UAAL as of June 30, 2022 (Sum of Items 1– 4)	$	2,433,563,401	$	11,856,103,848	$	14,289,667,249
6. Actual UAAL as of June 30, 2022	$	2,226,686,260	$	11,278,256,707	$	13,504,942,967
7. Total gain (loss) for the year (Item 5 – Item 6)	$	206,877,141	$	577,847,141	$	784,724,282
B. Source of gains and losses						
8. Asset gain (loss) for the year (Exhibit 6)	$	58,095,285	$	210,393,904	$	268,489,189
9. Gain (loss) due to change in payment timing		(16,640,000)		171,600,000		154,960,000
10. Other liability gain (loss)	$	165,421,856	$	195,853,237	$	361,275,093
11. Change in benefit provisions		-		-		-
12. Total gain (loss) for the year	$	206,877,141	$	577,847,141	$	784,724,282

Summary of 2022 Actuarial Valuation (continued)

Exhibit 6
Investment Experience Gain or Loss

Item	June 30, 2022	June 30, 2021
1. Actuarial assets, beginning of year	$ 19,909,791,554	$ 18,084,382,899
2. Total contributions during year	$ 1,535,166,655	$ 1,582,185,142
3. Benefits and refunds paid	$ (1,763,205,748)	$ (1,675,049,807)
4. Administrative expenses paid	$ (17,497,621)	$ (19,049,861)
5. Assumed net investment income at 7.00%		
a. Beginning of year assets	$ 1,393,685,409	$ 1,265,906,803
b. Contributions	$ 53,730,833	$ 55,376,480
c. Benefits and refunds paid	$ (61,712,201)	$ (58,626,743)
d. Benefits and refunds paid	$ (612,417)	$ (666,745)
e. Total	$ 1,385,091,624	$ 1,261,989,795
6. Expected actuarial assets, end of year (Sum of Items 1 through 5)	$ 21,049,346,464	$ 19,234,458,168
7. Actual actuarial assets, end of year	$ 21,317,835,653	$ 19,909,791,554
8. Asset gain (loss) for year (Item 7– Item 6)	$ 268,489,189	$ 675,333,386
9. Asset gain (loss) as a percent of actuarial value of assets, end of year (Item 8 / Item 7)	1.26%	3.39%

Gabriel Roeder Smith & Company

Summary of 2022 Actuarial Valuation (continued)

Exhibit 7
Projection Results Based on June 30, 2022 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)
2022	25.92%	4,614	1,196	34,823	21,318	$ 13,505	61.2%
2023	25.92%	4,726	1,225	36,043	22,450	$ 13,593	62.3%
2024	25.92%	4,852	1,258	37,257	23,601	$ 13,656	63.3%
2025	25.91%	4,983	1,291	38,469	24,778	$ 13,691	64.4%
2026	25.90%	5,120	1,326	39,675	25,982	$ 13,693	65.5%
2027	25.90%	5,262	1,363	40,879	27,218	$ 13,661	66.6%
2028	25.89%	5,408	1,400	42,077	28,487	$ 13,590	67.7%
2029	25.88%	5,560	1,439	43,271	29,796	$ 13,475	68.9%
2030	25.88%	5,717	1,480	44,462	31,147	$ 13,315	70.1%
2031	25.88%	5,880	1,522	45,648	32,546	$ 13,102	71.3%
2032	25.88%	6,049	1,565	46,829	33,997	$ 12,832	72.6%
2033	25.88%	6,223	1,610	48,006	35,505	$ 12,501	74.0%
2034	25.88%	6,404	1,657	49,177	37,077	$ 12,100	75.4%
2035	25.88%	6,590	1,705	50,347	38,721	$ 11,626	76.9%
2036	25.88%	6,783	1,755	51,513	40,443	$ 11,070	78.5%
2037	25.88%	6,983	1,807	52,679	42,252	$ 10,427	80.2%
2038	25.88%	7,191	1,861	53,848	44,160	$ 9,688	82.0%
2039	25.88%	7,407	1,917	55,021	46,176	$ 8,845	83.9%
2040	25.88%	7,632	1,975	56,205	48,314	$ 7,891	86.0%
2041	25.88%	7,865	2,035	57,402	50,589	$ 6,813	88.1%
2042	25.88%	8,107	2,098	58,618	53,014	$ 5,604	90.4%
2043	25.88%	8,357	2,163	59,857	55,605	$ 4,252	92.9%
2044	25.88%	8,616	2,230	61,124	58,378	$ 2,746	95.5%
2045	25.88%	8,883	2,299	62,423	61,349	$ 1,074	98.3%
2046	25.88%	9,159	2,370	63,758	64,536	$ (778)	101.2%
2047	25.88%	9,445	2,444	65,135	67,958	$ (2,823)	104.3%
2048	25.88%	9,740	2,520	66,560	71,636	$ (5,076)	107.6%
2049	25.88%	10,043	2,599	68,036	75,591	$ (7,555)	111.1%
2050	25.88%	10,355	2,680	69,567	79,841	$ (10,274)	114.8%
2051	25.88%	10,675	2,763	71,154	84,409	$ (13,255)	118.6%

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

Summary of 2022 Actuarial Valuation (continued)

Exhibit 8
Highlights of Last Five Annual Actuarial Valuations
2018 through 2022

Item	Valuation Date: June 30				
	2018	2019	2020	2021	2022
Number of active members	66,271	66,383	66,750	65,561	64,234
Number of inactive members	9,249	9,321	9,204	9,011	9,031
Number of pensioners	44,305	45,440	46,486	47,724	48,913
Number of beneficiaries	4,264	4,445	4,667	4,894	5,077
Average monthly contributory member pension amount	$ 2,994	$ 3,136	$ 3,293	$ 3,458	$ 3,632
Average monthly noncontributory member pension amount	$ 1,702	$ 1,736	$ 1,773	$ 1,813	$ 1,861
Average monthly hybrid member pension amount	$ 2,238	$ 2,285	$ 2,345	$ 2,416	$ 2,495
Average monthly beneficiary amount	$ 1,515	$ 1,558	$ 1,610	$ 1,668	$ 1,713
Total actuarial value of assets ($millions)	$ 16,513	$ 17,322	$ 18,084	$ 19,910	$ 21,318
Unfunded actuarial accrued liability ($millions)	$ 13,404.7	$ 14,074.3	$ 14,607.4	$ 14,229.4	$ 13,504.9
Funding Period (in years) (1)	25	26	26	24	24

Item	Fiscal Year				
(Dollar amounts in millions (2))	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Employer contributions (2)	$ 847.6	$ 922.6	$ 1,098.6	$ 1,281.6	$ 1,242.1

(1) Beginning with the 2011 valuation, the funding period was determined using and 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, 2016, the employer contribution rate was 25.0% for Police and Fire, 17.0% for All Others.
Beginning July 1, 2017, the employer contribution rate was 28.0% for Police and Fire, 18.0% for All Others.
Beginning July 1, 2018, the employer contribution rate was 31.0% for Police and Fire, 19.0% for All Others.
Beginning July 1, 2019 the employer contribution rate was 36.0% for Police and Fire, 22.0% for All Others.
Beginning July 1, 2020, the employer contribution rate was 41.0% for Police and Fire, 24.0% for All Others.

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Summary of Actuarial Methods and Assumptions

Basis for assumption setting: The actuarial assumptions were adopted by the Board on August 8, 2022. Rationale for the recommendations are in the most recent experience study dated June 14, 2022.

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)

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 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
20-24	227	$67,764
25-29	439	66,966
30-34	312	65,420
35-39	126	65,675
40-44	41	67,596
45-49	17	70,072
50-54	6	105,373
55-59	8	89,074
Total	1,176	$66,933

It is assumed that 90% of new hires will be male.

Summary of Actuarial Methods and Assumptions (continued)

New Entrant Profile for All Other Employees		
Entry Age	# of Employees	Average Salary
15-19	14	$45,787
20-24	1,596	48,406
25-29	3,466	50,905
30-34	2,988	53,401
35-39	2,575	54,097
40-44	2,171	53,636
45-49	1,765	53,337
50-54	1,417	53,082
55-59	1,190	53,376
60-64	623	56,006
65-69	89	58,920
Total	17,894	$52,680

It is assumed that 40% of new hires will be male and Teachers replace Teachers and Non-Teachers replace Non-Teachers.

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: (used to index each year's group of new entrants in the open group projection) 3.50% per annum for Police and Fire Employees and 3.00% per annum for General Employees and Teachers.

Summary of Actuarial Methods and Assumptions (continued)

3. Salary increase rates: As shown below

	General Employees		Teachers	
Years of Service	Service-related Component	Total Rate Including 2.50% Inflation Component and 1.25% Productivity Component	Service-Related Component	Total Rate Including 2.50% Inflation Component and 1.25% Productivity Component
1	3.00%	6.75%	3.00%	6.75%
2	3.00%	6.75%	3.00%	6.75%
3	2.00%	5.75%	2.00%	5.75%
4	1.50%	5.25%	1.50%	5.25%
5	1.50%	5.25%	1.50%	5.25%
6	1.25%	5.00%	1.25%	5.00%
7	1.25%	5.00%	1.25%	5.00%
8	1.00%	4.75%	1.00%	4.75%
9	1.00%	4.75%	1.00%	4.75%
10	1.00%	4.75%	1.00%	4.75%
11	0.75%	4.50%	0.75%	4.50%
12	0.75%	4.50%	0.75%	4.50%
13	0.50%	4.25%	0.50%	4.25%
14	0.50%	4.25%	0.50%	4.25%
15	0.50%	4.25%	0.50%	4.25%
16	0.50%	4.25%	0.50%	4.25%
17	0.50%	4.25%	0.50%	4.25%
18	0.50%	4.25%	0.50%	4.25%
19	0.50%	4.25%	0.50%	4.25%
20	0.25%	4.00%	0.25%	4.00%
21	0.25%	4.00%	0.25%	4.00%
22	0.25%	4.00%	0.25%	4.00%
23	0.25%	4.00%	0.25%	4.00%
24	0.25%	4.00%	0.25%	4.00%
25 or more	0.00%	3.75%	0.00%	3.75%

Summary of Actuarial Methods and Assumptions (continued)

3. Salary increase rates (continued):

	Police & Firefighters	
Years of Service	Service-related Component	Total Annual Rate of Increase Including 2.50% Inflation Component and 2.50% General Increase Rate
1	1.00%	6.00%
2	1.00%	6.00%
3	1.00%	6.00%
4	1.00%	6.00%
5	1.00%	6.00%
6	1.00%	6.00%
7	1.00%	6.00%
8	1.00%	6.00%
9	1.00%	6.00%
10	1.00%	6.00%
11	1.00%	6.00%
12	1.00%	6.00%
13	1.00%	6.00%
14	1.00%	6.00%
15	1.00%	6.00%
16	0.75%	5.75%
17	0.75%	5.75%
18	0.75%	5.75%
19	0.50%	5.50%
20	0.50%	5.50%
21	0.50%	5.50%
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)

B. Demographic Assumptions

1. Mortality rates

Active Members: Multiples of the Pub-2010, Employee 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%	80%
% of Ordinary Chosing Annuity	41%	52%	24%
Duty Related	6%	8%	20%

Healthy Retirees: The 2022 Public Retirees of Hawaii mortality tables. The rates are projected on a fully generational basis by the long-term rates of scale UMP from the year 2022 and with multiplier and setbacks based on plan and group experience. The following are sample rates of the base table as of 2022 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	0.2094%	0.1276%	0.1698%	0.0951%	0.2421%	0.1130%
55	0.3215%	0.1687%	0.2883%	0.1596%	0.3473%	0.1633%
60	0.5570%	0.3095%	0.4672%	0.2467%	0.6179%	0.2799%
65	0.8041%	0.4488%	0.7256%	0.4063%	0.8426%	0.4283%
70	1.2621%	0.7066%	1.0762%	0.6015%	1.4172%	0.6565%
75	2.0700%	1.0964%	1.7879%	0.9358%	2.3227%	1.0121%
80	3.5996%	2.1275%	3.0429%	1.6565%	4.1824%	1.8863%
85	6.5891%	4.1569%	5.5564%	3.2698%	7.6513%	3.6977%
90	11.9340%	8.3647%	10.1056%	6.5007%	13.6689%	7.3991%
Multiplier	102%	98%	97%	101%	93%	100%
Setback	0	-1	1	1	-2	0

Summary of Actuarial Methods and Assumptions (continued)

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	2030	2035	2040	2045
			Year of Retirement		
			General Retirees		
Male	22.8	23.2	23.5	23.9	24.2
Female	26.3	26.6	26.9	27.2	27.5
			Teachers		
Male	24.1	24.5	24.9	25.2	25.5
Female	28.0	28.3	28.6	28.9	29.2
			Police and Fire		
Male	21.8	22.1	22.4	22.8	23.1
Female	27.1	27.4	27.7	28.0	28.3

Disabled retirees: Base Table for healthy retiree's occupation, set forward 3 years, generational projection using the UMP projection table from the year 2022. 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:

	General Employees	Teachers	Police & Fire
Type	Male & Female	Male & Female	Male & Female
Ordinary	200%	100%	50%
Accidental	60%	8%	120%

Summary of Actuarial Methods and Assumptions (continued)

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:

	Expected Terminations per 1000 Lives (Male & Female)		
Years of Service	General Employees	Teachers	Police & Fire
0	177.2	0.0	140.0
1	142.2	197.9	52.4
2	114.2	165.2	41.3
3	92.0	134.8	34.8
4	74.8	108.2	30.2
5	61.7	86.3	26.6
6	51.9	69.4	23.7
7	44.7	57.3	21.3
8	39.6	49.4	19.1
9	35.8	44.5	17.2
10	32.8	41.0	15.6
11	30.3	35.8	10.6
12	27.9	32.4	10.0
13	22.6	29.1	9.4
14	19.8	26.1	8.8
15	17.7	23.2	8.2
16	16.1	20.6	7.6
17	14.8	18.1	7.0
18	13.7	15.8	6.4
19	12.8	13.6	5.8
20	11.9	11.7	5.2
21	11.1	10.0	4.6
22	10.2	8.4	4.0
23	9.3	7.0	3.4
24	8.3	5.8	2.8
25	7.1	4.8	0.0
26	6.0	4.0	0.0
27	4.7	3.3	0.0
28	3.5	2.8	0.0
29	2.4	2.6	0.0
30 and more	0.0	0.0	0.0

Summary of Actuarial Methods and Assumptions (continued)

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

Contributory Members

	Expected Retirements per 100 Lives								
	General Employees				Teachers				Police & Fire
	Unreduced Retirement		Reduced Retirement		Unreduced Retirement		Reduced Retirement		Unreduced Retirement
Age	Male	Female	Male	Female	Male	Female	Male	Female	Male & Female
45	0	0	0	0	0	0	0	0	15.5
46	0	0	0	0	0	0	0	0	15.5
47	0	0	0	0	0	0	0	0	15.5
48	0	0	0	0	0	0	0	0	15.5
49	0	0	0	0	0	0	0	0	15.5
50	0	0	0	0	0	0	1	0	18.0
51	0	0	2	1	0	0	1	1	18.0
52	0	0	2	1	0	0	1	1	18.0
53	0	0	2	1	0	0	2	2	18.0
54	0	0	3	2	0	0	3	3	18.0
55	25	20			20	18			22.0
56	25	20			15	16			22.0
57	16	13			15	16			22.0
58	16	13			15	16			24.0
59	13	13			15	16			27.0
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)

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	2	2	10	10	2	2
59	10	11	15	11	2	2	10	20	3	3
60	10	14	15	14	4	4	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 prior to age 55 are 15% for male and 11% for female.

Summary of Actuarial Methods and Assumptions (continued)

Hybrid Members

	Expected Retirements per 100 Lives							
	General Employees				Teachers			
	Unreduced Retirement		Reduced Retirement		Unreduced Retirement		Reduced Retirement	
Age	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	2	2	13	12	2	2
59	16	13	2	2	13	12	3	3
60	14	13	4	4	14	14	3	5
61	14	15	4	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: For the 25&out group with membership dates before July 1, 2012, the retirement rates prior to age 55 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)

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	3.25%
Teachers	3.75%
Police and Fire	5.00%

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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)

VIII. Dates of Adoption of Assumptions and Methods

The actuarial assumptions and methods were adopted by the Board of Trustees on August 8, 2022 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 June 14, 2022 for a more extensive discussion of the changes in the actuarial assumptions and the rationale for the current assumptions.

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 is 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.

Summary of Plan Changes (continued)

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.

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%

Summary of Actuarial Methods and Assumptions (continued)

Summary of Plan Changes (continued)

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.

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 10years 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.

Summary of Plan Changes (continued)

Act 152, 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.

Act 153, 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 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
2013 to 2022

- Retirement System Membership **
  - 2022 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 2012-2013 to 2021-2022 **

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

Summary of ERS Funding

The ERS is governed by Chapter 88, Hawaii Revised Statutes (HRS), plus the administrative rules, policies, and procedures of the Board of Trustees. The ERS is funded by investment earnings, employer contributions, and member contributions. (Refer to the Investment Section for more information on investment policies and procedures.)

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 costs (which pays the current year's cost) of the ERS and to amortize the unfunded actuarial accrued liability (UAAL) over a reasonable amount of time, which will ensure benefit security and intergenerational equity.

As required by Law the ERS performs an actuarial investigation of the experience at least once every 3 (three) years, and an annual actuarial valuation of the assets and liabilities of the funds of the pension trust. 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. Since the State statutes governing the ERS establish the employee and employer contribution rates, the actuarial valuation determines the number of years required to amortize (or fund) the UAAL.

The actuary uses the entry age normal cost funding method in valuations as required by Law. The Board of Trustees adopts economic, mortality, service, and other assumptions, factors, and tables as deemed appropriate and necessary, based on the actuarial investigation and actuary recommendation.

Employer contribution rates are subject to adjustment (per HRS§88-122(e)(1)) when the funding period is in excess of 30 years, or there is no unfunded accrued liability. The actuary through the Board recommends based on the actuarial investigation, the appropriate adjustments to the employer contribution rates discussed above.

Ten-Year Actuarial Schedules (continued)

Retirement System Membership **
2013 to 2022

March 31,	Active Members	Terminated Vested Members	Inactive Nonvested Members (a)	Pensioners & Beneficiaries	Total Membership
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
2020	66,750	9,204	20,985	51,153	148,092
2021	65,561	9,011	22,226	52,618	149,416
2022	64,234	9,031	24,872	53,990	152,127

** 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)

2022 Membership Data

	Police and Firefighters		All Other Employees		All Employees	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
1. Active members						
a. Number	4,870	4,897	59,364	60,664	64,234	65,561
b. Total payroll	$ 504,053,191	$ 528,078,482	$4,033,103,615	$4,093,929,713	$4537,156,806	$4,622,008,195
c. Average salary	$ 103,502	$ 107,837	$ 67,939	$ 67,485	$ 70,635	$ 70,499
d. Average age	42.1	42.3	48.5	48.5	48.0	48.0
e. Average service	13.7	13.9	13.1	13.1	13.2	13.2
2. Inactive members						
a. Number	242	239	8,789	8,772	9,031	9,011
b. Total annual deferred benefits	$ 5,794,515	$ 5,552,300	$ 103,824,257	$ 99,765,972	$ 109,618,772	$ 105,318,272
c. Average annual deferred benefit	$ 23,944	$ 23,231	$ 11,813	$ 11,373	$ 12,138	$ 11,688
3. Service retirees						
a. Number	4,103	3,977	43,064	41,998	47,167	45,975
b. Total annual benefits	$ 278,238,588	$ 258,146,590	$1,264,013,343	$1,202,295,261	$1,542,251,931	$1,460,441,851
c. Average annual benefit	$ 67,813	$ 64,910	$ 29,352	$ 28,627	$ 32,698	$ 31,766
4. Disabled retirees						
a. Number	128	128	1,618	1,621	1,746	1,749
b. Total annual benefits	$ 3,528,613	$ 3,433,775	$ 25,629,578	$ 24,677,949	$ 29,158,191	$ 28,111,724
c. Average annual benefit	$ 27,567	$ 26,826	$ 15,840	$ 15,224	$ 16,700	$ 16,073
5. Beneficiaries						
a. Number	389	376	4,688	4,518	5,077	4,894
b. Total annual benefits	$ 17,660,517	$ 16,649,880	$ 86,687,801	$ 81,296,984	$ 104,348,318	$ 97,946,864
c. Average annual benefit	$ 45,400	$ 44,282	$ 18,491	$ 17,994	$ 20553	$ 20,014

(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). As of June 30, 2020, there were 20,985 (788 Police and firefighters plus 20,197 All other employees). As of June 30, 2021, there were 21,226 (869 Police and firefighters plus 21,357 All other employees). As of June 30, 2022, there were 24,872 (969 Police and firefighters plus 23,903 All other employees).

Historical Summary of Active Member Data

Year Ending June 30,	Active Members		Covered Payroll		Average Salary			
	Number	Percent Change	Amount in $ Millions	Percent Change	$ Amount	Percent Change	Average Age	Average Service
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	13.1
2020	66,750	0.6%	4,523.4	3.0%	67,766	2.4%	47.9	13.1
2021	65,561	-1.8%	4,622.0	2.2%	70,499	4.0%	48.0	13.2
2022	64,234	-2.0%	4,537.2	-1.8%	70,635	0.2%	48.0	13.2

Ten-Year Actuarial Schedules (continued)

Pensioners, Average Annual Pension and Active Member/Pensioner Comparison**

2013 to 2022

March 31,	Number of Pensioners	Average Annual Pension (1)	Ratio of Active Members per Pensioner
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
2020	46,486	$30,312	1.4
2021	47,724	$31,766	1.4
2022	48,913	$32,127	1.3

** Schedule compiled by ERS Staff from actuary reports.

(1) Pension amount includes base pension plus 2.5% (if membership date is before July 1, 2012) or 1.5% (if membership date is after June 30, 2012) post-retirement increases (excludes other bonuses and cost-of-living adjustments).

Number of Retirants and Beneficiaries**

2013 to 2022

As of Mar 31,	Added	Average Added to Rolls	Removed	Average Removed from Rolls	Total	Average Pension	% Chg
Retirants							
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%
2020	2,430	$29,555	1,384	$23,269	46,486	$30,312	2.80%
2021	2,608	$31,438	1,370	$25,041	47,724	$31,191	2.90%
2022	2,636	$32,304	1,447	$24,946	48,913	$32,127	3.00%
Beneficiaries							
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%
2020	373	$21,025	151	$15,493	4,667	$19,316	3.30%
2021	381	$23,159	154	$16,835	4,894	$20,014	3.61%
2022	364	$22,702	181	$19,702	5,077	$20,553	2.69%

** Schedule compiled by ERS staff from actuary reports.

Ten-Year Actuarial Schedules (continued)

Solvency Test**

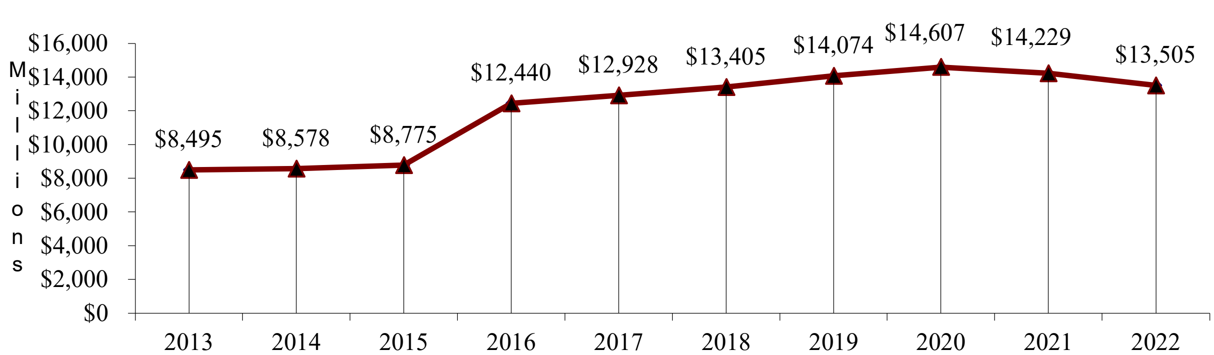
2013 to 2022

June 30,	Actuarial Accrued Liabilities (AAL) Active Member Contributions (1)	Retirees, Beneficiaries, and Inactive Vested Members (2)	Active and Inactive Members Employer Financed Portion (3)	Actuarial Value of Assets (4)	Cumulative Portion of Actuarial Accrued Liabilities Covered by Assets Column (1) (5)	Column (2) (6)	Column (3) (7)
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%
2020	2,231.4	17,720.9	12,739.5	18,084.4	100%	89%	0.0%
2021	2,243.2	18,728.9	13,167.0	19,909.8	100%	94%	0.0%
2022	2,249.4	19,633.8	12,939.6	21,317.8	100%	97%	0.0%

(Amounts in $millions)

** Schedule compiled by ERS Staff from actuary reports

Unfunded Actuarial Accrued Liability FY 2013-2022



Ten-Year Actuarial Schedules (continued)

Employer Contribution Rates as a Percentage of Payroll **

2013 to 2022

Actuarial Valuation as of June 30,	Police and Firefighters			All Other Employees			All Active Employees		
	Normal Cost Rate	Amortization Percent	Total Employer Rate	Normal Cost Rate	Amortization Percent	Total Employer Rate	Normal Cost Rate	Amortization Percent	Total Employer Rate
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%
2020 *	13.78%	22.22%	36.00%	6.90%	15.10%	22.00%	7.73%	15.88%	23.61%
2021 *	13.53%	27.47%	41.00%	6.77%	17.23%	24.00%	7.57%	18.37%	25.94%
2022 *	14.56%	26.44%	41.00%	7.17%	16.83%	24.00%	8.01%	17.91%	25.92%

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 actuary reports.

Ten-Year Actuarial Schedules (continued)

Employer Appropriations to Pension Accumulation Fund**

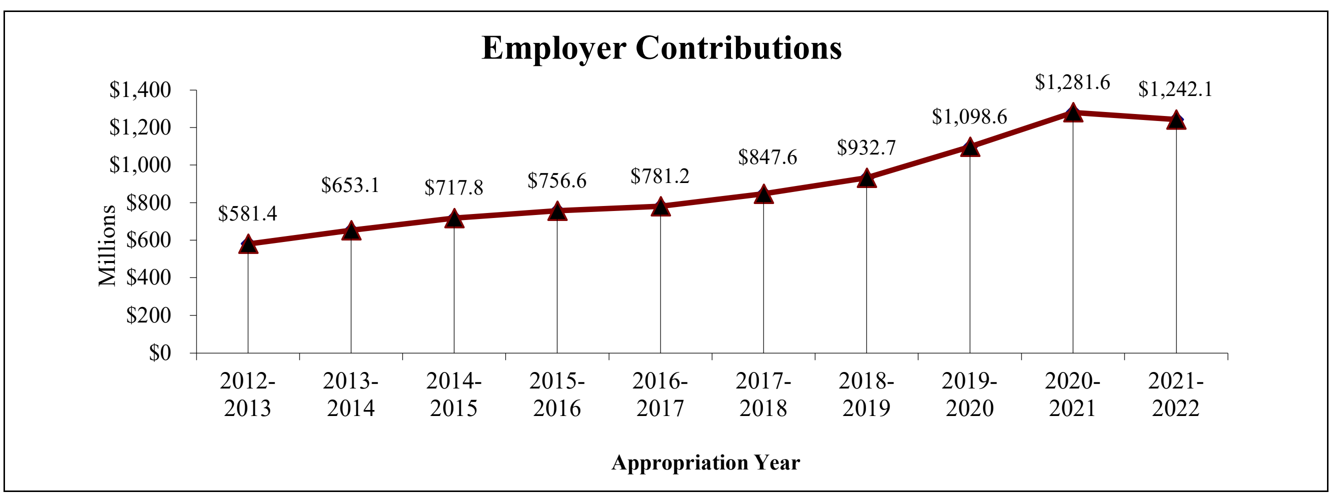
	Investment Yield Rate	
Fiscal Year	Assumed for Actuarial Valuation	Actuarial Investment Return
2012-2013	7.75%	6.67%
2013-2014	7.75%	9.23%
2014-2015	7.65%	7.85%
2015-2016	7.00%	5.59%
2016-2017	7.00%	6.92%
2017-2018	7.00%	7.18%
2018-2019	7.00%	6.81%
2019-2020	7.00%	5.59%
2020-2021	7.00%	10.75%
2021-2022	7.00%	8.40%

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).

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	100.1%	Wisconsin	100.0%
90% to 99%	6	New York	99.6%	Washington	95.0%
		Nebraska	98.4%	Utah	93.1%
		Tennessee	97.3%	North Carolina	90.2%
80% to 89%	14	Iowa	89.1%	Oklahoma	82.5%
		Minnesota	88.5%	Florida	82.4%
		Delaware	88.2%	Arkansas	82.0%
		Oregon	86.4%	Virginia	81.4%
		Maine	85.3%	Missouri	81.1%
		West Virginia	84.8%	Ohio	80.7%
		Idaho	82.6%	Texas	80.0%
70% to 79%	11	Georgia	79.2%	Montana	73.6%
		California	79.1%	Kansas	71.6%
		Maryland	77.5%	Alaska	71.4%
		Wyoming	77.2%	Arizona	70.6%
		Nevada	74.7%	Indiana	70.3%
		Louisiana	73.9%		
60% to 69%	12	North Dakota	68.7%	Massachusetts	65.1%
		Colorado	68.6%	Vermont	64.7%
		New Mexico	66.7%	Rhode Island	64.4%
		Alabama	66.5%	Pennsylvania	64.3%
		Michigan	66.0%	Mississippi	61.3%
		New Hampshire	65.6%	**Hawaii**	61.2%
Less than 60%	5	South Carolina	57.9%	New Jersey	52.6%
		Connecticut	53.8%	Kentucky	48.4%
		Illinois	53.8%		

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.

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,:	2013	2014 **	2015	2016	2017
Additions					
Employer Contributions	$ 581,447,213	$ 653,127,697	$ 717,792,981	$ 756,558,222	$ 781,244,218
Member contributions	185,837,186	206,127,337	223,505,419	236,801,861	250,704,067
Investment income (net of expense)	1,331,208,154	2,175,479,961	556,436,475	(169,368,110)	1,934,512,507
Total additions to plan net position	2,098,492,553	3,034,734,995	1,497,734,875	823,991,973	2,966,460,792
Deductions					
Benefits	1,060,561,148	1,122,445,642	1,170,744,770	1,232,589,353	1,306,788,954
Refunds	7,204,411	8,475,969	10,507,888	12,927,672	16,340,290
Administrative expenses	11,941,446	12,626,030	14,032,964	13,960,587	14,986,159
Total deductions from plan net position	1,079,707,005	1,143,547,641	1,195,285,622	1,259,477,612	1,338,115,403
Net increase (decrease) in net position	1,018,785,548	1,891,187,354	302,449,253	(435,485,639)	1,628,345,389
Net position restricted for pension benefits					
Beginning of year	11,293,042,401	12,311,827,949	14,203,015,303	14,505,464,556	14,069,978,917
End of year	$ 12,311,827,949	$ 14,203,015,303	$14,505,464,556	$14,069,978,917	$ 15,698,324,306

Fiscal Year Ended June 30,:	2018	2019	2020	2021	2022
Additions					
Employer Contributions	$ 847,595,466	$ 922,635,334	$ 1,098,589,013	$ 1,281,558,696	$ 1,242,139,095
Member contributions	259,427,934	273,223,578	287,398,031	300,626,446	293,027,560
Investment income (net of expense)	1,225,572,599	932,696,412	358,282,664	4,662,225,761	164,559,035
Total additions to plan net position	2,332,595,999	2,128,555,324	1,744,269,708	6,244,410,903	1,699,725,690
Deductions					
Benefits	1,395,881,342	1,469,634,809	1,545,589,761	1,651,431,372	1,738,751,492
Refunds	20,846,500	16,502,635	22,443,593	23,618,435	24,454,256
Administrative expenses	15,784,490	13,798,866	17,782,865	19,049,861	17,497,621
Total deductions from plan net position	1,432,512,332	1,499,936,310	1,585,816,219	1,694,099,668	1,780,703,369
Net increase (decrease) in net position	900,083,667	628,619,014	158,453,489	4,550,311,235	(80,977,679)
Net position restricted for pension benefits					
Beginning of year	15,698,324,306	16,598,407,973	17,227,026,987	17,385,480,476	21,935,791,711
End of year	$ 16,598,407,973	$ 17,227,026,987	$ 17,385,480,476	$ 21,935,791,711	$ 21,854,814,032

** 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

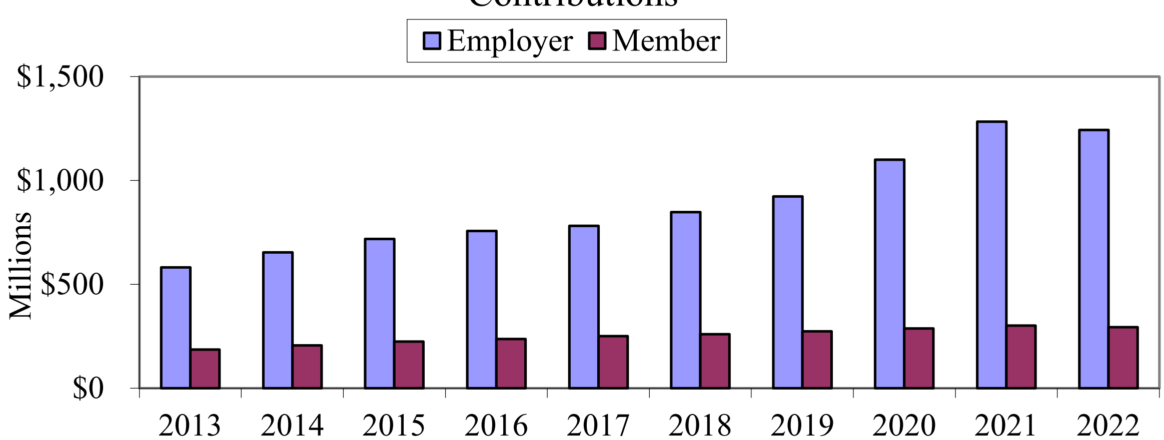
Schedule of Employer Contributions
(In thousands)

Fiscal year ended June 30,:		Statutory Contributions	Covered Employee Payroll	Contributions as a Percentage of Covered Payroll
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%
2020		1,098,589	4,481,444	24.5%
2021		1,281,559	4,667,346	27.5%
2022		1,242,139	4,483,687	27.7%

Employer Contribution Rates as a Percentage of Payroll **

Fiscal Year		Police & Firefighters	All Other Employees	Composite Rate
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%
2020		36.00%	22.00%	23.61%
2021		41.00%	24.00%	25.94%
2022		41.00%	24.00%	25.92%

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

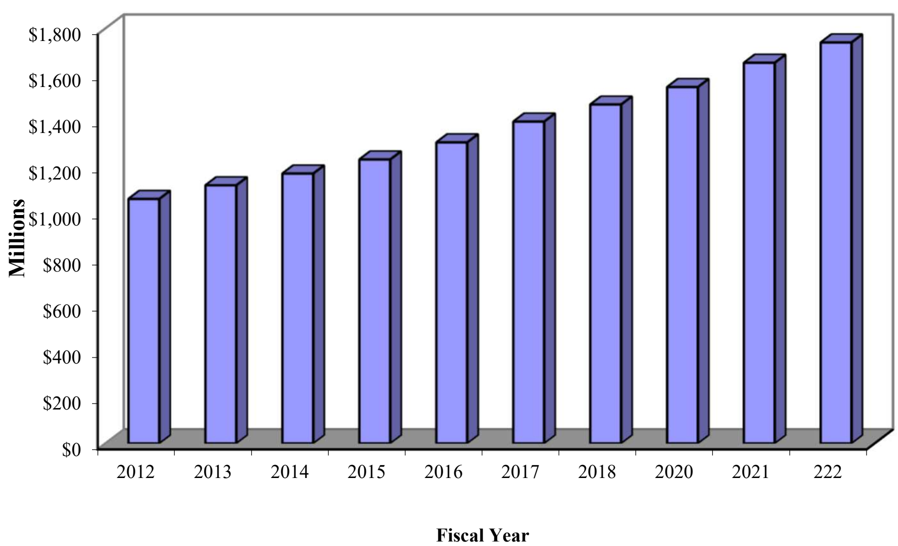
Last Ten Fiscal Years

Fiscal Year Ended June 30,:	2013	2014	2015	2016	2017
Recurring benefit payments					
Service	$ 963,894,245	$ 1,016,912,124	$ 1,058,688,356	$ 1,111,416,262	$ 1,175,380,410
Disability	18,987,509	19,835,520	20,732,259	21,437,486	22,303,070
Death	45,948,656	53,324,252	59,238,051	65,568,232	71,889,117
subtotal	1,028,830,410	1,090,071,896	1,138,658,666	1,198,421,980	1,269,572,597
Refund Option payments (one-time)	31,730,738	32,373,746	32,086,104	34,167,373	37,216,357
Total benefit payments	$ 1,060,561,148	$ 1,122,445,642	$ 1,170,744,770	$1,232,589,353	$ 1,306,788,954

Fiscal Year Ended June 30,:	2018	2019	2020	2021	2022
Recurring benefit payments					
Service	$ 1,241,819,373	$ 1,306,624,918	$ 1,373,747,686	$ 1,449,789,546	$ 1,535,941,473
Disability	23,739,337	25,035,782	26,793,410	28,111,724	29,158,191
Death	77,507,539	83,117,245	90,145,618	97,946,864	104,348,318
subtotal	1,343,066,249	1,414,777,945	1,490,686,714	1,575,848,134	1,669,447,982
Refund Option payments (one-time)	52,815,093	54,856,864	54,903,047	75,583,238	69,303,510
Total benefit payments	$ 1,395,881,342	$ 1,469,634,809	$ 1,545,589,761	$ 1,651,431,372	$ 1,738,751,492

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

Benefit Payments



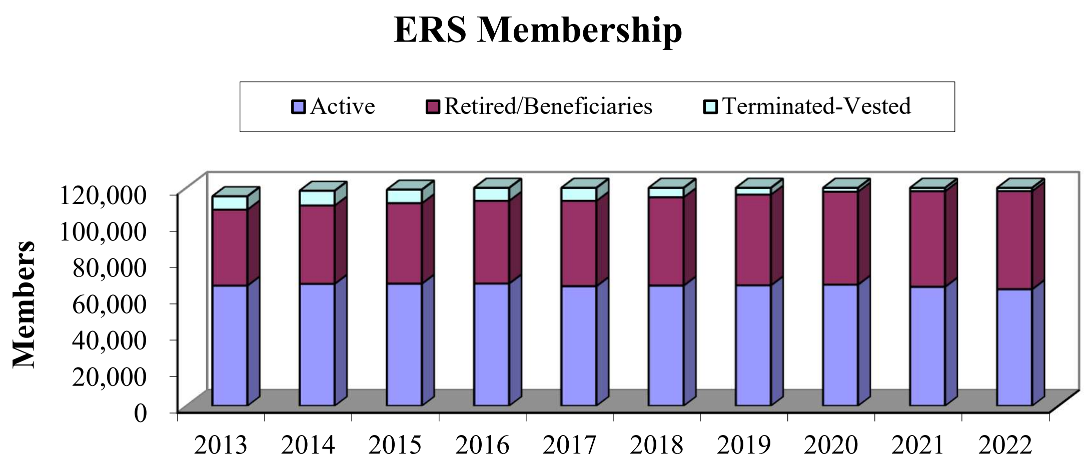
Participating Employers and Membership in ERS

Last Ten Fiscal Years

ERS Membership

As of March 31,:	Active	Retired/ Beneficiaries	Terminated- Vested	Inactive- Non-Vested	Totals
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
2020	66,750	51,153	9,204	20,985	148,092
2021	65,561	52,618	9,011	22,226	149,416
2022	64,234	53,990	9,031	24,872	152,127

** For FYE June 30, 2014, ERS implemented GASB Statement No. 67



Participating Employers and Active Members

As of March 31,:	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
State of Hawaii	51,176	51,875	51,791	51,723	50,288	50,719	50,788	51,008	49,852	48,753
City & County of Honlulu	8,457	8,625	8,727	8,807	8,740	8,709	8,713	8,757	8,739	8,518
- Board of Water Supply	532	551	558	558	572	570	581	574	576	557
Hawaii County	2,446	2,489	2,550	2,596	2,561	2,553	2,579	2,649	2,647	2,650
Kauai County	1,227	1,244	1,234	1,244	1,246	1,247	1,248	1,276	1,260	1,269
Maui County	2,388	2,422	2,450	2,449	2,504	2,473	2,474	2,486	2,487	2,487
Total	66,226	67,206	67,310	67,377	65,911	66,271	66,383	66,750	65,561	64,234

Benefit Payments by Retirement Type and Option

As of March 31, 2022

Retired Contributory Members

Monthly Benefit	Number of Recipients	Type of Retirement * 1	2	3	4	5	Retirement Option Max	Opt. 1	Opt. 2	Opt. 3	Opt. 4	Opt. 5	Other
$ 1 - 500	840	617	12	6	1	204	172	152	141	49	153	173	-
500 - 1,000	1,392	1,010	49	12	11	310	146	84	109	55	567	428	3
1,000 - 1,500	1,525	1,154	29	47	12	283	181	86	137	55	641	423	2
1,500 - 2,000	1,728	1,372	15	45	10	286	172	60	125	64	838	465	4
2,000 - 2,500	1,631	1,381	8	30	7	205	125	54	132	40	753	524	3
2,500 - 3,000	1,883	1,668	3	25	7	180	155	49	110	49	812	703	5
3,000 - 3,500	1,995	1,812	4	14	9	156	174	44	124	57	938	652	6
3,500 - 4,000	1,820	1,675	1	12	5	127	183	49	93	54	1,022	415	4
4,000 - 4,500	1,453	1,351	-	12	2	88	176	37	91	65	839	245	-
4,500 - 5,000	1,062	1,001	-	8	2	51	159	33	85	48	607	128	2
5,000	4,142	3,972	-	3	9	158	528	99	443	257	2,480	334	1
	19,471	17,013	121	214	75	2,048	2,171	747	1,590	793	9,650	4,490	30

Retired Hybrid Members

Monthly Benefit	Number of Recipients	Type of Retirement * 1	2	3	4	5	Retirement Option Max	Opt. 1	Opt. 2	Opt. 3	Opt. 4	Opt. 5	Other
$ 1 - 500	730	637	4	1	26	62	296	83	162	96	41	52	-
500 - 1,000	2,326	2,069	71	12	62	112	839	173	529	263	263	259	-
1,000 - 1,500	2,360	2,041	115	58	33	113	836	121	559	271	312	261	-
1,500 - 2,000	1,829	1,609	82	41	16	81	609	111	461	209	253	186	-
2,000 - 2,500	1,529	1,400	44	17	16	52	482	82	402	229	226	107	1
2,500 - 3,000	1,344	1,275	26	5	14	24	462	74	326	196	190	94	2
3,000 - 3,500	1,235	1,190	15	5	6	19	452	61	281	199	162	80	-
3,500 - 4,000	1,024	997	2	1	9	15	356	50	239	190	130	59	-
4,000 - 4,500	761	749	-	-	2	10	305	38	150	139	89	40	-
4,500 - 5,000	494	486	2	1	3	2	179	26	125	95	43	26	-
5,000	1,208	1,180	2	-	6	20	-	-	-	-	-	-	-
	14,840	13,633	363	141	193	510	4,816	819	3,234	1,887	1,709	1,164	3

Retired Noncontributory Members

Monthly Benefit	Number of Recipients	Type of Retirement * 1	2	3	4	5	Retirement Option Max	Opt. A	Opt. B	Opt. C	Other
$ 1 - 500	2,359	1,578	98	44	128	511	900	580	657	103	119
500 - 1,000	4,587	3,576	288	45	95	583	2,149	924	1,242	195	77
1,000 - 1,500	3,247	2,662	156	75	35	319	1,503	669	889	165	21
1,500 - 2,000	2,355	2,018	95	32	20	190	1,044	489	716	102	4
2,000 - 2,500	1,883	1,705	34	5	11	128	869	404	496	114	-
2,500 - 3,000	1,877	1,765	18	5	6	83	1,004	352	391	129	1
3,000 - 3,500	1,387	1,325	4	-	8	50	809	277	231	70	-
3,500 - 4,000	829	787	5	2	7	28	480	158	157	34	-
4,000 - 4,500	468	449	-	-	1	18	272	98	78	20	-
4,500 - 5,000	278	264	1	-	1	12	155	61	56	6	-
5,000	409	392	-	-	4	13	218	93	85	13	-
	19,679	16,521	699	208	316	1,935	9,403	4,105	4,998	951	222

* 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

As of March 31,		Years of Credited Service 0-9	10-14	15-19	20-24	25-29	30-34	35+	All
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
2020	Average Monthly Benefit	$637	$768	$1,233	$1,674	$3,029	$3,515	$4,144	$2,567
	Number of Active Retirants	1,614	5,407	5,014	5,922	9,266	11,339	6,194	44,756
2021	Average Monthly Benefit	$658	$795	$1,278	$1,718	$3,126	$3,604	$4,260	$2,641
	Number of Active Retirants	1,625	5,581	5,214	6,033	9,411	11,725	6,386	45,975
2022	Average Monthly Benefit	$691	$826	$1,326	$1,762	$3,235	$3,691	$4,387	$2,722
	Number of Active Retirants	1,634	5,725	5,386	6,158	9,582	12,133	6,549	47,167

Retirees and Beneficiaries

(Recurring Benefit Payments)

Tabulated by Fiscal Year that Payments Started as of March 31, 2022

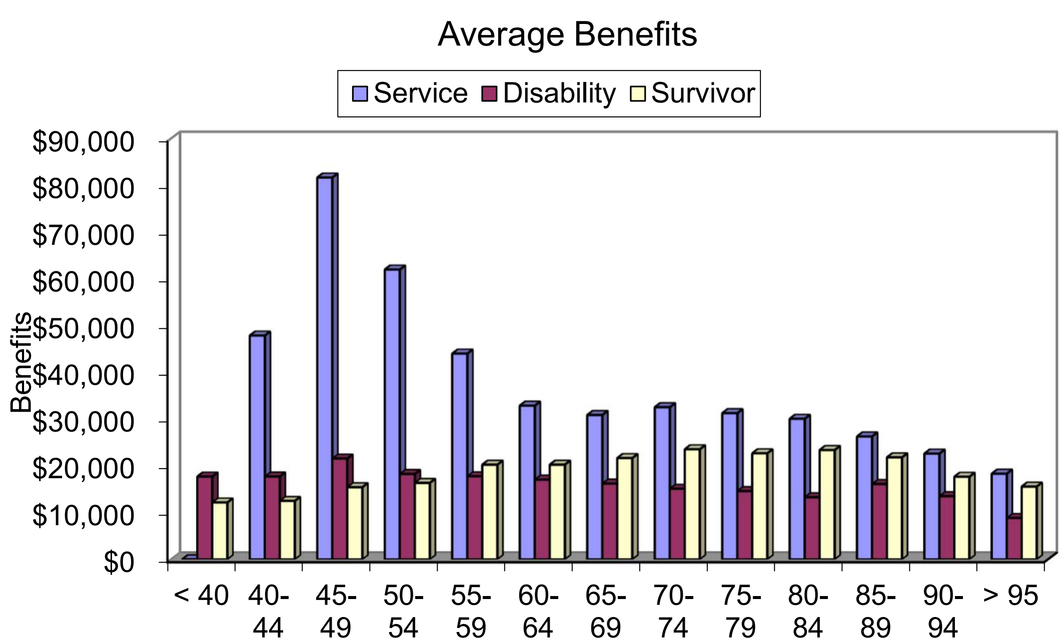
Valuation Year	Number	Total Annual Benefits	Monthly Average Benefit
1959	1	$ 4,658	$388
1962	1	6,200	$517
1964	1	13,196	$1,100
1967	2	25,237	$1,052
1968	2	21,249	$885
1969	1	7,265	$605
1970	2	15,562	$648
1971	2	23,016	$959
1972	4	40,938	$853
1973	5	45,973	$766
1974	7	88,316	$1,051
1975	7	76,333	$909
1976	12	149,548	$1,039
1977	19	255,264	$1,120
1978	23	361,504	$1,310
1979	35	554,025	$1,319
1980	58	1,028,847	$1,478
1981	79	1,384,912	$1,461
1982	104	1,811,043	$1,451
1983	111	2,378,074	$1,785
1984	155	3,140,377	$1,688
1985	202	4,575,100	$1,887
1986	261	6,529,381	$2,085
1987	457	11,747,365	$2,142
1988	278	5,757,649	$1,726
1989	361	8,695,601	$2,007
1990	435	11,862,158	$2,272
1991	533	14,313,388	$2,238
1992	536	15,738,546	$2,447
1993	589	19,053,291	$2,696
1994	616	$ 18,959,585	$2,565
1995	1,293	47,673,388	$3,073
1996	1,352	47,721,329	$2,941
1997	491	12,781,514	$2,169
1998	509	13,831,124	$2,264
1999	777	23,419,649	$2,512
2000	998	31,232,088	$2,608
2001	1,191	37,085,936	$2,595
2002	1,023	32,219,408	$2,625
2003	1,369	47,113,884	$2,868
2004	1,342	43,268,268	$2,687
2005	1,433	47,460,300	$2,760
2006	1,434	44,463,386	$2,584
2007	1,563	47,846,152	$2,551
2008	1,541	45,785,791	$2,476
2009	1,475	43,948,504	$2,483
2010	2,153	75,883,506	$2,937
2011	1,981	70,760,603	$2,977
2012	1,936	61,152,434	$2,632
2013	1,946	57,846,072	$2,477
2014	2,040	59,272,127	$2,421
2015	2,301	64,932,076	$2,352
2016	2,363	66,891,104	$2,359
2017	2,525	77,049,200	$2,543
2018	2,869	92,022,832	$2,673
2019	2,637	81,653,605	$2,580
2020	2,682	85,168,175	$2,646
2021	2,913	96,020,723	$2,747
2022	2,954	92,591,697	$2,612
Total	53,990	$ 1,675,758,476	$2,587

Total Benefits Payable

(Recurring Benefit Payments)

Tabulated by Attained Ages of Benefit Recipients as of March 31, 2022

Attained Ages	Service Retirement No.	Service Retirement Annual Benefits	Disability Retirement No.	Disability Retirement Annual Benefits	Survivors and Beneficiaries No.	Survivors and Beneficiaries Annual Benefits	Total No.	Total Annual Benefits
Under 20	-	-	-	-	46	430,573	46	430,573
20-24	-	-	-	-	21	201,146	21	201,146
25-29	-	-	1	17,971	48	690,366	49	708,337
30-34	-	-	1	9,031	61	846,592	62	855,623
35-39	-	-	9	167,573	102	1,209,488	111	1,377,061
40-44	7	334,982	21	371,864	141	1,760,439	169	2,467,285
45-49	190	15,514,034	68	1,464,831	186	2,867,938	444	19,846,803
50-54	1,010	62,592,514	139	2,536,835	252	4,118,375	1,401	69,247,724
55-59	2,909	127,989,446	324	5,752,260	347	7,020,377	3,580	140,762,083
60-64	7,361	241,913,557	380	6,477,111	562	11,373,924	8,303	259,764,592
65-69	10,561	325,935,643	351	5,683,193	700	15,157,410	11,612	346,776,246
70-74	10,348	336,667,820	240	3,622,353	814	19,151,372	11,402	359,441,545
75-79	6,672	208,547,539	127	1,852,779	665	15,075,600	7,464	225,475,918
80-84	4,139	124,392,023	39	517,387	508	11,869,200	4,686	136,778,610
85-89	2,637	69,291,283	30	483,008	394	8,591,263	3,061	78,365,554
90-94	1,085	24,531,387	13	175,491	194	3,424,387	1,292	28,131,265
95-99	228	4,268,853	3	26,504	33	467,885	264	4,763,242
100 & over	20	272,850	-	-	3	91,983	23	364,833
Total	47,167	$ 1,542,251,931	1,746	$ 29,158,191	5,077	$ 104,348,318	53,990	$ 1,675,758,440



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