KPMG

EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF HAWAII

Financial Statements

June 30, 2016

(With Independent Auditors' Report Thereon)

Submitted by

THE AUDITOR
STATE OF HAWAII

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

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KPMG LLP
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Independent Auditors' Report

The Auditor
The State of Hawaii:

Report on the Financial Statements

We have audited the accompanying financial statements of the Employees' Retirement System of the State of Hawaii (the ERS) as of and for the year ended June 30, 2016 and the related notes to the financial statements, which collectively comprise the ERS' basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditors' Responsibility

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

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Employees' Retirement System of the State of Hawaii as of June 30, 2016, and the changes in fiduciary net position for the year then ended, in conformity with U.S. generally accepted accounting principles.

Emphasis of Matter

As discussed in note C(1) to the financial statements, in 2016, the ERS adopted Governmental Accounting Standards Board Statement No. 72, *Fair Value Measurement and Application*. Our opinion is not modified with respect to this matter.

Other Matters

Required Supplementary Information

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3 through 10 and the required supplementary information, including the schedules of changes in the employers' net pension liability and related ratios, employers' net pension liability, employer contributions, and investment returns, on pages 47 through 55 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Supplementary Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the ERS' basic financial statements. The supplementary information including the combining schedule of changes in fiduciary net position, social security contribution fund – statement of changes in assets and liabilities, and schedules of administrative expenses and investment expenses in schedules 1 through 4 for the year ended June 30, 2016 is presented for purposes of additional analysis, and is not a required part of the basic financial statements. The combining schedule of changes in fiduciary net position, social security contribution fund – statement of changes in assets and liabilities, and schedules of administrative expenses and investment expenses are the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the combining schedule of changes in fiduciary net position, social security contribution fund – statement of changes in assets and liabilities, schedules of administrative expenses and investment expenses are fairly stated in all material respects in relation to the basic financial statements taken as a whole.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated November 29, 2017, on our consideration of the ERS' internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the ERS' internal control over financial reporting and compliance.

KPMG LLP

Honolulu, Hawaii
November 29, 2017

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, 2016. The MD&A is presented as a narrative overview and analysis. For more detailed information pertaining to the ERS' financial activities, the reader should also review the actual financial statements, including the notes and supplementary schedules.

Overview of the Financial Statements

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

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

The ERS adopted Governmental Accounting Standards Board (GASB) Statement No. 72, *Fair Value Measurement and Application*, in 2016, which addresses accounting and reporting issues related to fair value measurements. This statement requires disclosures to be made about fair value measurements, the level of fair value hierarchy, and valuation techniques, which can be found in note F(3), *Investments*.

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, 2016, and the related statement of changes in fiduciary net position during the fiscal year from July 1, 2015 to June 30, 2016 (FY 2016). These provide a snapshot of the resources available at the end of the fiscal year and a summary of changes in resources available to pay pension benefits to members, retirees, and beneficiaries.

The related notes to financial statements are an integral part of the basic financial statements and include detailed information that is essential to a full understanding of the data provided in the basic financial statements.

The Required Supplementary Schedules of Changes in the Employers' Net Pension Liability and Related Ratios, Employers' Net Pension Liability, Employer Contributions and Investment Returns, and the related Notes to Required Supplementary Information, are required to be presented to supplement the basic financial statements for placing the financial statements in an appropriate operational, economic, or historical context.

The remaining supplementary information is 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 funds established by legislation, and the operating and investment related expenses of the ERS.

Financial Highlights

The fiduciary net position restricted for pension benefits (or net assets) decreased during FY 2016 to $14.1 billion resulting in a decline of the funded status of ERS to 51.3% as of June 30, 2016. This represents a decrease of $0.4 billion, 2.8%, from the fiduciary net position restricted for pension benefits of $14.5 billion as of June 30, 2015.

The ERS investment return (gross of fees) was -0.80% for the 2016 fiscal year compared to a moderate 4.20% return during the 2015 fiscal year, using the time-weighted rate of return methodologies that are generally accepted by the Global Investment Performance Standards. The investment program underperformed its actuarial and investment goal of 7.65% that was effective for the one-year period beginning July 1, 2015 (FY 2016; and subsequently reduced to 7.00% effective June 30, 2016). 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 -1.20% and 4.00% for FY 2016 and FY 2015, respectively.

Effective October 1, 2014, the Board of Trustees of the System approved the adoption of a change in its asset allocation policy from the asset-class policy to a new risk-based asset allocation framework within the categories of Broad Growth, Principal Protection, Real Estate, and Real Return, which is expected to be implemented through 2020. The results of operations for these FY 2016 financial statements are prepared on the historical asset-based investment strategy since fixed income is the only asset class that has transitioned to the new risk-based strategy as of June 30, 2016. Please refer to note F(1) for more detailed information on the asset allocation policy.

There was no legislation implemented in 2016 that significantly impacts the pension trust.

The Board of Trustees implemented new actuarial assumptions effective June 30, 2016 (based on the five-year experience study from 2010 to 2015) that significantly impacts the ERS valuation and net pension liability as of June 30, 2016. The main changes that impact the ERS are a decrease in the investment return assumption from 7.65% to 7.00% effective June 30, 2016 and an increase in life expectancy, adding an explicit assumption for continued future mortality improvement (generational approach).

Total pension liability as of June 30, 2016 increased to $27.4 billion from June 30, 2015 that was $23.2 billion, while the corresponding net pension liability was $13.4 billion and $8.7 billion, for June 30, 2016 and 2015, respectively. Covered payroll for the ERS increased in FY 2016 to $4.1 billion from the FY 2015 total of $4.0 billion, a 2.5% increase.

The fiduciary net position as a percentage of total pension liability was 51.3% and 62.4% as of June 30, 2016 and June 30, 2015, respectively, while the funded ratio on an actuarial basis decreased to 54.7% from 62.2%, 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.

(Continued)

Contributions from members and employers increased by a total of $52.1 million or 5.5% during FY 2016. Most of the increase is due to an increase in required contribution rates paid by the employers for all employee groups, and to a lesser extent an increase in member contributions with more active members being required to contribute, and an increase in new employees contributing at higher contribution rates.

Total retirement benefit payments increased by $61.9 million, or 5.3%, to $1,232.6 million in FY 2016 from $1,170.7 million in FY 2015. Pension benefits continues to increase due to 2.8% more retirees and beneficiaries (45,506 in 2016 versus 44,283 in 2015), an increase in the average pension benefit for new retirees, and the annual 2.5% postretirement increase.

Administrative expenses remained relatively unchanged at $14.0 million in FY 2016 and FY 2015. Administrative expenses for all years were within the ERS' budgeted amounts.

Analysis of Fiduciary Net Position Restricted for Pension Trust

Summary of Fiduciary Net Position

June 30, 2016 and 2015

(Dollars in millions)

		2016	2015	FY 2016 percentage change
Assets:				
Cash and cash equivalents and short-term investments	$	524.1	656.5	(20.2)%
Receivables		331.7	213.5	55.4
Investments		13,636.5	14,145.3	(3.6)
Invested securities lending collateral		1,268.7	1,232.8	2.9
Equipment		6.3	8.3	(24.1)
Total assets		15,767.3	16,256.4	(3.0)
Liabilities:				
Securities lending liability		1,268.7	1,232.8	2.9
Investment accounts and other payables		428.6	518.1	(17.3)
Total liabilities		1,697.3	1,750.9	(3.1)
Fiduciary net position restricted for pensions	$	14,070.0	14,505.5	(3.0)%

(Continued)

Summary of Changes in Fiduciary Net Position

June 30, 2016 and 2015

(Dollars in millions)

		2016	2015	FY 2016 percentage change
Additions:				
Contributions	$	993.4	941.3	5.5 %
Net investment (loss) income		(169.4)	556.4	(130.4)
Total additions		824.0	1,497.7	(45.0)
Deductions:				
Pension benefit payments		1,232.6	1,170.7	5.3
Refund of contributions		12.9	10.5	22.9
Administrative expenses		14.0	14.0	—
Total deductions		1,259.5	1,195.2	5.4
(Decrease) increase fiduciary in net position	$	(435.5)	302.5	(244.0)%

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.

The rate of return (gross of fees time-weighted rate of returns) on the ERS investment portfolio during FY 2016 was -0.8% resulting from losses in public equity markets and the underperformance of most other asset classes, except real estate, compared to 4.2% in FY 2015. Total net investment loss was -$169.4 in FY 2016 compared to total net investment income of $556.4 in FY 2015.

Negative investment returns for FY 2016 were caused by losses in international equity of -10.5% and domestic equity of -1.9% and the underperformance of most other asset classes. Real estate was the only asset-type allocation that exceeded the 7.65% actuarial investment rate target benchmark for FY 2016 with returns of 15.1%. Other asset classes with positive returns that did not exceed the actuarial benchmark include real return at 5.3%, private equity at 5.2%, diversified fixed income at 4.4%, covered calls at 3.6%, and international fixed income at 1.8%.

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.

(Continued)

The asset distribution of the ERS' investment securities for the pension trust, excluding pending trade settlements and securities lending collateral, at June 30, 2016 and 2015 is presented below at fair value. Investment balances between the asset classes will change over time based on market sectors' performance and our rebalancing efforts to maintain asset allocation targets. Changes will also occur for financial reporting since certain real estate and alternative investments are reported on the consolidated method of accounting using the value of the underlying investments since ERS is the majority owner of the business organization.

Investments in short-term securities and cash are generally held by external investment managers for liquidity to settle pending trades and investments, and should not exceed 5%–10% of the investments for certain managers based on their investment mandate. These amounts reported on the financial statements also include cash requirements used by ERS to fund pension benefits and transition amounts between individual investments. Fluctuations will occur based on the trading activity and timing of the settlements. The changes during FY 2016 are mainly due to losses in the public market equities and, to a lesser extent, asset rebalancing.

Investment Asset Class

June 30, 2016 and 2015

(Dollars in millions)

	2016	Percentage	2015	Percentage
Short-term investments and cash	$ 524.1	3.7 %	$ 656.5	4.4 %
Equity securities	8,541.9	60.3	9,261.5	62.6
Fixed income	3,117.1	22.0	2,807.1	19.0
Real estate	967.1	6.8	1,188.5	8.0
Alternative investments	1,010.4	7.1	888.2	6.0
Total investment assets	14,160.6	100.0 %	14,801.8	100.0 %
Less loans on real estate and alternative investments	170.2		247.4	
Total	$ 13,990.4		$ 14,554.4	

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

Total investment management fees earned by external investment advisers decreased approximately 30.3% during FY 2016 compared to FY 2015 primarily due to a decrease in incentive fees accrued during FY 2016 for excess returns earned by real estate managers on the separately managed accounts. The real estate investment managers may receive an incentive fee for superior investment returns by the manager above their corresponding benchmark, while maintaining an acceptable level of investment risk. Incentive fees are recognized on the accrual basis of accounting for the increase or decrease of the change in real estate values during the year, and are only paid upon the sale of the asset if the asset has "excess earnings" when the real estate asset is actually sold. The ERS requires external managers to provide the ERS with a "most favored nations" contract clause that guarantees the ERS with the lowest management fees the managers offer their clients for investment accounts with similar investment mandates and similar account size.

During FY 2016, the ERS was transitioning from a portfolio asset allocation return-based process to a risk-based process that makes use of strategic/functional classes that in turn utilize underlying asset classes and strategies approved by the Board of Trustees in FY 2015. 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.

Following the completion of an Asset-Liability Study in FY 2016 (that was started during FY 2015) the ERS adopted a new long-term strategic allocation policy that includes evolving policy targets designed to efficiently transition the Plan to the new long-term strategic allocation over time through June 30, 2020. The transition of the investment allocation is discussed in note F(1), *Investment Policy*.

Contributions

Contributions from employers and employees totaled $993.4 million and $941.3 million in FY 2016 and FY 2015, respectively. During FY 2016, total contributions increased by $52.1 million, or 5.5%, with the continued implementation of legislation passed in 2011 and 2012 that raised employer contribution rates for all employee groups and increased contribution rates for new members. The increase in contributions is mainly due to an increase in employer contribution rates effective July 1, 2015, and to a lesser extent, an increase in covered payroll and an increase in the percentage of active members required to make during the year.

Pension Plan Benefits and Expenses

Pension benefit payments continue to be the primary expense of the ERS with payments increasing to $1,232.6 million in FY 2016 from $1,170.7 million in FY 2015. The pension benefit's increase can be 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 members increased slightly during the year.

Administrative expenses remained relatively flat (a slight decrease) in FY 2016 compared to FY 2015. Increases in computer system maintenance and personnel-related costs were offset by a decrease in professional services.

Pension Plan Changes

There was no significant legislation passed in 2016 that affects pension plan provisions. Pension plan changes, including legislative and Board of Trustees' actions, are summarized in the notes to the financial statements.

Actuarial Valuations and Measurement of Net Pension Liability

The recent investment return environments, compounded with new actuarial assumptions effective with the June 30, 2016 valuation, have materially changed the outlook for ERS. The actual FY 2016 investments underperformed the fiscal year 7.65% investment return assumption (effective July 1, 2015) on a market basis and a smoothed basis, and liabilities grew faster than expected due to salary increases being larger than the fiscal-year expectations. The Board of Trustees adopted new actuarial assumptions effective with the June 30, 2016 valuation based on the actuarial experience study from July 1, 2010 to June 30, 2015. The main changes in new actuarial assumptions adopted by the Board of Trustees effective with the June 30, 2016 valuation compared to the June 30, 2015 valuation include:

- Decrease investment return assumption from 7.65% to 7.00% effective June 30, 2016
- Increase in life expectancy, adding an explicit assumption for continued future mortality improvement (generational approach).

The total pension liability for fiscal year ended June 30, 2016 is based on the actuarial valuation performed as of June 30, 2016 and a measurement date of June 30, 2016.

Per the valuation as of June 30, 2016, the ERS' total pension liability was $27.4 billion, covered payroll totaled $4.1 billion, and the ERS' fiduciary net position was $14.1 billion resulting in a net pension liability of $13.4 billion. The June 30, 2015 valuation results include the ERS' total pension liability of $23.2 billion, covered payroll at $4.0 billion, and the ERS' fiduciary net position of $14.5 billion, resulting in a net pension liability of $8.7 billion. The ERS' fiduciary net position as a percentage of total pension liability was 51.30% and 62.40% on June 30, 2016 and 2015, respectively, resulting in the net pension liability as a percentage of covered payrolls of 325.10% and 218.60%, respectively. Most of the increase in pension liabilities is based on reducing the investment return assumption to 7.00% effective with the June 30, 2016 valuation, followed by increasing life expectancy (mortality assumption), and, to a lesser extent, overall payroll growth and individual salary increases.

Based on the results of the actuarial valuation as of June 30, 2016, including existing statutory employer contribution rates, the ERS actuary determined the funding period for paying off the unfunded actuarial accrued liability of the ERS Pension Trust is 66 years. Because this period exceeds 30 years, the objectives set in Hawaii Revised Statutes (HRS) are currently not being realized. HRS §88-122(e)(1) states that the employer contribution rates are subject to adjustment when the funding period is in excess of 30 years.

Future Events Affecting the ERS (effective after June 30, 2016)

Increase in statutory employer contribution rates – future state and counties employer contributions are expected to increase pursuant to a phased-in contribution rate increase over four years beginning July 1, 2017. Per Act 17 (SLH 2017), the rate for Police and Fire employees increases to 28.00% on July 1, 2017; 31.00% on July 1, 2018; 36.00% on July 1, 2019; and 41.00% on July 1, 2020, and the rate for All Other Employees increases to 18.00% on July 1, 2017; 19.00% on July 1, 2018; 22.00% on July 1, 2019; and 24.00% on July 1, 2020. These employer contribution rates are applied to the total covered payroll in each respective category to determine the required employer contributions, and are not incorporated in the ERS' June 30, 2016 actuary valuation.

Requests for Information

This financial report is designed to provide a general overview of the ERS' 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.

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

Statement of Fiduciary Net Position

June 30, 2016

Assets:		
Cash and cash equivalents and short-term investments:		
Cash and cash equivalents	$	71,906,104
Short-term investments		452,234,648
		524,140,752
Receivables:		
Accounts receivable and others		5,546,300
Investment sales proceeds		197,451,653
Accrued investment income		49,758,195
Employer and member contributions		78,921,403
		331,677,551
Investments, at fair value:		
Equity securities		8,541,857,929
Fixed-income securities		3,117,134,649
Real estate investments		967,131,489
Alternative investments		1,010,360,689
		13,636,484,756
Other:		
Invested securities lending collateral		1,268,719,491
Equipment, at cost, net of depreciation		6,287,484
		1,275,006,975
Total assets		15,767,310,034
Liabilities:		
Accounts and other payables		46,683,310
Payable for securities purchased		211,762,793
Securities lending collateral		1,268,719,491
Notes payable		170,165,523
Total liabilities		1,697,331,117
Commitments and contingencies		
Fiduciary net position restricted for pensions	$	14,069,978,917

See accompanying notes to financial statements.

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

Statement of Changes in Fiduciary Net Position

Year ended June 30, 2016

Additions:	
Contributions:	
Employers contributions	$ 756,558,222
Members contributions	236,801,861
Total contributions	993,360,083
Investment loss:	
From investing activities:	
Net depreciation in fair value of investments	(526,781,374)
Interest on fixed-income securities	111,375,783
Dividends on equity securities	148,730,385
Income on real estate investments	90,598,348
Interest on short-term investments	467,823
Alternative investment income	85,051,373
Miscellaneous	575,897
	(89,981,765)
Less investment expenses	87,271,479
Net investment loss from investing activities	(177,253,244)
From securities lending activities:	
Securities lending income	9,060,237
Less securities lending expenses, net	1,175,103
Net investment income from securities lending activities	7,885,134
Total net investment loss	(169,368,110)
Total additions, net	823,991,973
Deductions:	
Benefit payments	1,232,589,353
Refunds of member contributions	12,927,672
Administrative expenses	13,960,587
Total deductions	1,259,477,612
Net decrease in fiduciary net position	(435,485,639)
Fiduciary net position restricted for pensions:	
Beginning of year	14,505,464,556
End of year	$ 14,069,978,917

See accompanying notes to financial statements.

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 (IRC). 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 IRC. The ERS' current favorable determination letter as a qualified plan received from the Internal Revenue Service expires (IRS) on January 31, 2019. 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 IRS. 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 IRC.

Effective July 20, 2016, Act 1 (SSLH 2016) provided either a severance payment or a special early retirement benefit to certain members. In August 2016, the ERS obtained a temporary restraining order delaying the implementation of Act 1 and requested a private letter ruling from the IRS regarding a critical tax qualification issue since the IRC does not permit governmental defined-benefit pension plans like the ERS to offer employees a choice between a "cash or deferred arrangement." In March 2017, ERS received a private letter ruling confirming that the election would constitute a "cash or deferred arrangement" if Act 1 was enacted. As of May 18, 2017, there is no impact to ERS regarding this issue with the passage of Act 18 (SLH 2017) that repeals Act 1 retroactive to July 20, 2016, its effective date.

The ERS Pension Trust comprises three pension classes for membership purposes and is considered to be a single plan for accounting purposes since 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 with three membership classes known as contributory, hybrid, and noncontributory members.

Generally, all full-time employees of the 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 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 members based on employment group and membership date while there are two benefit structures for hybrid members based on their membership date, as discussed below. Noncontributory members have one benefit structure.

Employer, pensioner, and employee membership data as of March 31, 2016 is as follows:

Employers:	
State	1
County	4
Total employers	5
Pensioners and beneficiaries currently receiving benefits:	
Pensioners currently receiving benefits:	
Police and firefighters	3,466
All others employees	38,188
Total pensioners	41,654
Beneficiaries currently receiving benefits:	
Police and firefighters	285
All others employees	3,567
Total beneficiaries	3,852
Total pensioners and beneficiaries	45,506
Terminated vested members entitled to benefits but not yet receiving benefits:	
Police and firefighters	366
All others employees	7,375
Total terminated vested members	7,741
Inactive members:	
Police and firefighters	599
All other employees	13,955
Total inactive members	14,554
Total terminated vested and inactive members	22,295

Active members:	
Vested:	
Police and firefighters	4,221
All other employees	45,265
Total vested members	49,486
Nonvested:	
Police and firefighters	866
All other employees	17,025
Total nonvested members	17,891
Total active members	67,377
Total membership	135,178

(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 retirees of the ERS and the other three members of the Board are appointed by the Governor. Decisions are made with the concurring vote of five members of the Board. The Board appoints the Executive Director and Chief Investment Officer and engages actuarial and other services required to transact the business of the ERS.

(3) Class Descriptions and Funding Policy

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

The statutory employer contribution rate includes the normal cost and accrued liability contribution and is determined separately for two groups of employees: (a) police officers and firefighters, and (b) all other employees. Employer contribution rates are subject to adjustment in certain situations based on the plan's funded status or actuarial investigations. The ERS performs an actuarial investigation of the experience at least once every five years, plus an annual actuarial valuation of the assets and liabilities of the funds of the pension trust. The

Board 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 the Board on December 12, 2016 as recommended by Gabriel, Roeder, Smith and Company (GRS) (from the 2015 Experience Study for the five-year period from June 30, 2010 through June 30, 2015) while the investment return assumption was adopted beginning with the 2016 valuation.

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

Per Act 17 (SLH 2017), future employer contributions 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 officers and firefighter employees increases to 28.00% on July 1, 2017; 31.00% on July 1, 2018; 36.00% on July 1, 2019; and 41.00% on July 1, 2020 and the rate for All Other Employees increases to 18.00% on July 1, 2017; 19.00% on July 1, 2018; 22.00% on July 1, 2019; and 24.00% on July 1, 2020. These future rate increases are not incorporated in the ERS' June 30, 2016 actuary valuation.

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 nonbase 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" nonbase 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, and who are covered by Social Security, were generally required to be noncontributory members. Qualified contributory and noncontributory members were given the option to change to the Hybrid member 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 officers and firefighter employees) are required to be Contributory members.

The three membership classes provide a monthly retirement allowance (maximum allowance) equal to the benefit multiplier percentage (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 2½% 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 2½% of the original retirement allowance without a ceiling (2½% of the original retirement allowance the first year, 5% the second year, 7½% the third year, etc.). For new members hired after June 30, 2012, the postretirement annuity increase was decreased to 1½% per year of the original retirement allowance without a ceiling (1½% of the original retirement allowance the first year, 3% the second year, 4½% 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.

All contributions, benefits, and eligibility requirements are governed by Chapter 88 of the HRS. 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 five years of credited service or at any age with 25 years of credited service, provided the last five 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 14.20% 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 five years of credited service. Contributory members may retire with full benefits at age 55 and five 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 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.

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%. Members in the hybrid plan 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%. Members in the hybrid plan are covered by Social Security.

Noncontributory

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

(Continued)

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. Under all three membership classes, there is no age requirement to qualify for disability benefits.

Ordinary death benefits for contributory and noncontributory members require at least 1 year and 10 years of service, respectively. Ordinary death benefits for hybrid members require 5 years of service if hired prior to July 1, 2012, or 10 years of service if hired after June 30, 2012. There is no years of service requirement 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 through the contributory, hybrid, or noncontributory membership classes. 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.

(5) Other Post Employment Benefits

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 HRS § 87 A-33, 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 10 or more years of credited service.

Under HRS § 87 A-34, 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 10 years of credited service.

Under HRS § 87 A-35 and HRS § 87 A-33(a)(6), 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 10 and 15 years of credited service; (b) 75% of the base monthly contribution if the employee retired with between 15 and 25 years of credited service; and (c) 100% of the base monthly contribution if the employee retired with 25 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 10 and 15 years of credited service; (b) 75% of the base monthly contribution for a self-only plan if the employee retired with between 15 and 25 years of credited service; and (c) 100% of the base monthly contribution for a self-only plan if the employee retired with 25 or more years of credited service.

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

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

Note B – Social Security Contribution Fund

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

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

All other non-State governmental agencies remit Social Security contributions directly to the IRS. Social Security contributions withheld from employees are remitted directly to the IRS by the employers. The Contribution Fund is considered an agency fund for financial reporting purpose. At June 30, 2016, the ERS held no amounts in the Contribution Fund as all amounts deposited into the Contribution Fund were paid directly to the IRS.

Note C – Summary of Accounting Policies

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

(1) Basis of Accounting

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

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

The ERS adopted GASB Statement No. 72, *Fair Value Measurement and Application*, in fiscal year 2016, which addresses accounting and reporting issues related to fair value measurements. 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. This statement requires disclosures to be made about fair value measurements, the level of fair value hierarchy, and valuation techniques, that can be found in note C(2), *Method Used to Value Cash and Investments* and note F(3), *Investments*.

(2) Method Used to Value Cash and Investments

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

Cash, investments, and notes payable in the Pension Trust are reported at fair value. Unrealized gains and losses are included as investment income in the statement of changes in fiduciary net position. The investments of the Pension Trust Fund and Contribution Fund (the Retirement Funds) are valued on a monthly basis.

(3) Revenue Recognition

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

Employer and member 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 to the funds of the Pension Trust Fund, as follows:

a. Annuity Savings Reserve – Fixed at 4½% regular interest rate for employees hired before July 1, 2011 and 2% regular interest rate for employees hired after June 30, 2011

b. Expense Reserve – To be credited with all money to pay the administrative expenses of the ERS

c. Pension Accumulation Reserve – To be credited with any remaining investment earnings

(7) Risk Management

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

(8) Use of Estimates

In preparing financial statements in conformity with GAAP, 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 tend to be 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 for the period from July 1, 2010 through June 30, 2015.

(9) Recently Issued Accounting Standards

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

Note D – Description of Reserves

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

(1) Pension Accumulation Reserve

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 Reserve

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 Reserve

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

Fiduciary net position restricted for pensions as of June 30, 2016 is as follows:

Pension accumulation reserve	$ 11,585,911,670
Annuity savings reserve	2,474,556,296
Expense reserve	9,510,951
Total fiduciary net position restricted for pensions	$ 14,069,978,917

Note E – Contributions

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

Employer rates are set by statute based on the recommendation of the ERS actuary resulting from an experience study conducted every five years. Since July 1, 2005, employer contribution rates are a fixed percentage of compensation, including the normal cost plus amounts required to pay for the unfunded actuarial accrued liability. From July 1, 2005 to June 30, 2008, the required contribution rates for employers were 15.75% for their police officers and firefighters and 13.75% for all other employees. From July 1, 2008 to June 30, 2012, employers contributed 19.70% for their police officers and firefighters and 15.00% for all other employees. Effective July 1, 2012, the employer rate increased to 22.00% for their police officers and firefighters and 15.50% for all other employees. Effective July 1, 2013, the employer rate increased to 23.00% for their police officers and firefighters and 16.00% for all other employees. Effective July 1, 2014, the employer rate increased to 24.00% for their police officers and firefighters and 16.50% for all other employees. Effective July 1, 2015 the employer rate increased to 25.00% for their police officers and firefighters and 17.00% for all other employees.

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" nonbase 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 nonbase pay in their AFC 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 – Deposits and Investments Disclosures

(1) Investment Policy

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

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

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

The Board initiated a new asset-liability study during fiscal year 2015 that was completed during fiscal year 2016. As a result of the 2015 Asset-Liability Study, the Board adopted a new long-term strategic allocation policy that included evolving policy targets designed to efficiently transition the plan to the new long-term strategic allocation over time. The 2015 Asset-Liability Study, and the approved long-term strategic allocation, fully incorporated the new risk-based, functional allocation framework. The following table shows the high-level strategic allocation policy mapping, coupled with the actual ERS portfolio, that reflect the initial stages of decisions made during the 2015 Asset-Liability Study for the transition in methodologies that the ERS was strategically invested in during FY 2016.

Historical asset type asset allocation		Risk based asset allocation			
Prior asset classes	**Long-term strategic allocation**	**Broad growth**	**Principal protection**	**Real return**	**Real estate**
Domestic equity	30 %	30 %	— %	— %	— %
Non-US equity	26	26	—	—	—
Fixed income	20	8	12	—	—
Real estate	7	—	—	—	7
Private equity	7	7	—	—	—
Real return	5	—	—	5	—
Covered calls	5	5	—	—	—
	100 %	76 %	12 %	5 %	7 %

The ERS will strategically invest in the following classes:

Strategic allocation (risk-based classes)	Strategic class weights	Expected long-term geometric average strategic range	Expected long-term real return*	Expected annual standard deviation
Broad growth	63 %	8.35 %	6.10 %	14.65 %
Principal protection	7	2.20	(0.05)	3.50
Real return	10	6.15	3.90	9.80
Crisis risk offset	20	5.50	3.25	11.55
Total Portfolio	100 %			

* Uses an expected inflation of 2.25%

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

Implementation plan for long-term strategic policy

	Current (6/30/2016)	4/1/2017	1/1/2018	1/1/2019	1/1/2020	Long-term 7/1/2020
Broad growth	76 %	76 %	72 %	68 %	64 %	63 %
Principal protection	12	9	8	8	7	7
Real return	5	5	7	8	9	10
Real estate	7	—	—	—	—	—
Crisis risk offset	—	10	13	16	20	20
Opportunities	—	—	—	—	—	—
	100 %	100 %	100 %	100 %	100 %	100 %

Rate of Return

For the year ended June 30, 2016, the annual money-weighted return on pension plan investments, net of pension plan investment expense, was -1.2%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

(2) Deposits

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

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

At June 30, 2016, the carrying amount of deposits totaled approximately $71,906,104 and the corresponding bank balance was $76,430,330, all of which was exposed to custodial credit risk.

(3) Investments

The following table shows the investments of the ERS by investment type as of June 30, 2016.

Cash and short-term investments:		
Cash and cash equivalents	$	71,906,104
Short-term bills and notes		76,039,821
Pooled and others		339,412,137
Repurchase agreements		29,800,000
Fixed-income securities:		
U.S. Treasury bonds and notes		512,229,273
U.S. government agencies bonds		38,230,645
U.S. government agency mortgage backed		368,760,094
U.S. government-sponsored agency mortgage backed		6,399,657
Commercial mortgage-backed securities		14,619,204
U.S. corporate bonds		829,668,408
Non-U.S. government/agency bonds		950,797,859
Non-U.S. corporate bonds		369,271,078
Pooled and others		9,714,468
Derivatives:		
Forwards – cash and short-term investments		7,013,036
Forwards – debt securities		28,770,966
Options – cash and short-term instruments		(30,346)
Options – equities		(20,431,894)
Options – debt securities		300,153

(Continued)

Swaps – equity securities	$	91,345
Swaps – debt securities		(11,627,156)
Equities		8,562,198,478
Real estate		967,131,489
Alternative investments		1,010,360,689
Total investments	$	14,190,425,508
Short-term instruments for securities lending collateral pool	$	1,268,719,491

Investments are measured at fair value in accordance with GASB Statement No. 72. The ERS categorizes its fair value measurements within the fair value hierarchy established by GAAP. 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 gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements).

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

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

Fair Value Hierarchy Levels

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

Short-term, fixed-income securities, and invested securities lending collateral classified in Level 2 have nonproprietary 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. Fixed income securities classified in level 3 are mortgaged backed term loans and bonds where input data is sourced from instruments whose values are estimated, out of necessity, using unobservable inputs due to lack of comparable securities in the market place or are valued using discounted cash flows.

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

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

Investments Measured at the NAV

Short-term investment funds and pooled equity (not publicly traded) are reported on their respective NAV. Fair value 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. Annual audits of the pooled funds include a review of compliance with the investment company's valuation policies.

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

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

The following tables show the fair value hierarchy by investment type as of June 30, 2016.

Investments, derivative instruments, and invested securities lending collateral measured at fair value

		Fair value measurement using		
	Total	**Quoted prices in active markets for identical assets (Level 1)**	**Significant other observable inputs (Level 2)**	**Significant unobservable inputs (Level 3)**
Investments by fair value level 6/30/2016:				
Short-term investments:				
Short-term bills and notes	$ 76,039,821	—	76,039,821	—
Repurchase agreements	29,800,000	—	29,800,000	—
Total short-term investments	105,839,821	—	105,839,821	—
Equity securities:				
Common stocks	6,445,116,703	6,445,116,703	—	—
Preferred shares and other	232,611,652	190,862,150	41,749,502	—
Total equity securities	6,677,728,355	6,635,978,853	41,749,502	—
Fixed-income securities:				
U.S. Treasury bonds and notes	512,229,273	512,229,273	—	—
U.S. government agencies bonds	38,230,645	—	38,230,645	—
U.S. government agency mortgage backed	368,760,094	—	368,760,094	—
U.S. government-sponsored agency mortgage backed	6,399,657	—	6,399,657	—
Commercial mortgage-backed securities	14,619,204	—	14,619,204	—
U.S. corporate bonds	829,668,408	—	686,810,813	142,857,595
Non-U.S. government/agency bonds	950,797,859	—	950,797,859	—
Non-U.S. corporate bonds	369,271,078	—	351,572,772	17,698,306
Pooled and others	9,714,468	7,829,920	142,413	1,742,135
Total fixed-income securities	3,099,690,686	520,059,193	2,417,333,457	162,298,036
Real estate (direct investment)	724,863,418	—	—	724,863,418
Alternative investments (direct investment)	204,383,997	—	—	204,383,997
Invested securities lending collateral	1,268,719,491	—	1,268,719,491	—
Total assets at fair value level	12,081,225,768	7,156,038,046	3,833,642,271	1,091,545,451
Liabilities:				
Notes payable (on real estate-direct)	(170,165,523)	—	—	(170,165,523)
Total investments (excluding derivatives), net of notes payable measured by fair value level	$ 11,911,060,245	7,156,038,046	3,833,642,271	921,379,928

Investments, derivative instruments, and invested securities lending collateral measured at fair value

		Fair value measurement using		
	Total	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Investment derivative instruments:				
Currency purchases	$ 7,013,036	—	7,013,036	—
To Be Announced (TBAs)	28,770,966	—	28,770,966	—
Options	(20,431,894)	—	(20,431,894)	—
Options on debt securities	300,153	—	300,153	—
Options on currency	(30,346)	—	(30,346)	—
Credit default swaps	(360,261)	—	(360,261)	—
Currency swaps	(1,174,994)	—	(1,174,994)	—
Equity variance swaps	91,345	—	91,345	—
Inflation swaps	(10,512)	—	(10,512)	—
Interest rate swaps	(10,081,389)	—	(10,081,389)	—
Total investment derivative instruments	$ 4,086,104	—	4,086,104	—
Invested securities lending collateral:				
Short-term instruments:				
U.S. short-term funds	$ 2,338,061	—	2,338,061	—
Repurchase agreements	396,302,012	—	396,302,012	—
Global asset backed notes	179,860,592	—	179,860,592	—
Global corporate notes	690,218,826	—	690,218,826	—
Total invested securities lending collateral	$ 1,268,719,491	—	1,268,719,491	—

Investments measured at NAV:	
Short-term investments	$ 339,412,137
Equity securities	1,884,470,123
Real estate	242,268,071
Alternative investments	805,976,692
Total investments measured at NAV	$ 3,272,127,023

	June 30, 2016	Unfunded commitments	Redemption frequency (if currently eligible)	Redemption notice period (days)
Short-term investments (a)	$ 339,412,137	—	Daily	1 Day
Equity securities (b)	1,884,470,123	—	Daily	2 Days
Real estate (c)	242,268,071	354,288,000	Not eligible	N/A
Alternative investments (d)	805,976,692	848,213,000	Not eligible	N/A
Total investments measured at NAV	$ 3,272,127,023	1,202,501,000		

(a) Short-term investments primarily consist of two pooled funds to invest excess cash at the ERS' custodian, The Bank of New York Mellon plus 15 other accounts. NAV is based on the ERS' pro rata ownership percentage of the fund reported by the fund manager based on the fair value of the underlying assets that is determined by published market prices, or quotations from national security exchanges.

(b) Equity securities consist of one fund that invests based on the all country world index. NAV is based on the ERS' pro rata ownership percentage of the fund reported by the fund manager based on the fair value of the underlying assets that is determined by published market prices, or quotations from national security exchanges.

(c) Real estate consists of 28 limited partnerships or limited liability companies that primarily invest in U.S. real estate. The most significant element of NAV is the fair value of the investment holdings. These holdings are valued by the general partners using valuation assumptions based on both market and property specific inputs, which are not observable and involve a certain degree of expert judgment, and are generally audited annually.

(d) Alternative investments consist of 190 limited partnerships or limited liability companies that invest in venture capital, growth equity, corporate finance/buyout, special situations, mezzanine debt, distressed debt, or co/direct investments. The most significant element of NAV is the fair value of the investment holdings. These holdings are valued by the general partners using valuation assumptions based on both market and property specific inputs, which are not observable and involve a certain degree of expert judgment, and are generally audited annually.

Reconciliation of investment level disclosure to the statement of fiduciary net position

	Investments by fair value level	Investments measured by the NAV	Derivative investments by fair value level	Statement of fiduciary net position
Assets:				
Short-term investments	$ 105,839,821	339,412,137	6,982,690	452,234,648
Equity securities	6,677,728,355	1,884,470,123	(20,340,549)	8,541,857,929
Fixed-income securities	3,099,690,686	—	17,443,963	3,117,134,649
Real estate investments	724,863,418	242,268,071	—	967,131,489
Alternative investments	204,383,997	805,976,692	—	1,010,360,689
	$ 10,812,506,277	3,272,127,023	4,086,104	14,088,719,404
Liabilities:				
Notes payable	$ 170,165,523	—	—	170,165,523
	$ 170,165,523	—	—	170,165,523

(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 F(10) while policies related to credit risk for securities lending program are discussed in note F(9) below.

Risk-Based Asset Class

In the last quarter of FY 2015, the fixed income mandate was transitioned to the new risk-based asset allocation methodology. All fixed-income investment managers were retained as of June 30, 2016. Authorized security types are the same as the asset-type-based allocation guidelines. Investment managers were assigned to:

- Extended Global Credit component of the Broad Growth risk-based asset class, or
  - Benchmark: 50% BC Global Credit (Hedged) + 33.34% BC Global High Yield (Hedged) + 16.66% S&P LSTA Leveraged Loan
- Principal Protection risk-based asset class.
  - Benchmark: BC U.S. Intermediate Aggregate ex-Credit

Summary of concentration limits for debt securities are:

- Principal protection managers may invest in specific issue or issuer of 5% (without limit in supranationals, U.S. Treasuries, U.S. agencies, CMOs and asset-backed securities with minimum of AAA rating, sovereign debt, and equivalently rated agencies of Organization for Economic Cooperation and Development (OECD) governments). These managers are limited to (i) 10% in emerging markets (local currency and debt); (ii) 10% in private placements; (iii) 10% in preferred stocks and convered common stocks (common stock holdings not to exceed 180 days); (iv) 10% in non-U.S. Agency CMOs; and (v) 10% of Non-U.S. dollar denominated securities (excludes money market securities and money market futures.
- Extended Global Credit managers may invest in specific issue or issuer of 5% (without limit in supranationals, U.S. Treasuries, U.S. agencies, CMOs and asset-backed securities with minimum of AAA rating, sovereign debt, and equivalently rated agencies of OECD governments. They are limited to: (i) 10% in preferred stocks and converted common stocks (common stock holdings not to exceed 180 days); (iii) 75% in noninvestment grade / unrated; and (iv) in nonbenchmark markets up to 40% of nonbenchmark nongovernment supported and up to 40% of nonbenchmark government supported. Foreign currency is limited to (i) a 40% net foreign currency exposure (as measured by net amount of currency's outstanding long and short positions versus the U.S. dollar); and (ii) a 80% gross foreign currency exposure (as measured by absolute value of all country-level currency long and short currency positions versus the U.S. dollar)

(Continued)

A table of the ERS' fixed-income securities as of June 30, 2016 is below. Securities below investment grade of BAA and nonrated issues (average rating by S&P, Moody's, and/or Fitch) amounted to $683,768,178 or 21.9% of total fixed-income investments. All short-term investments, not held in a pooled investment, are rated A1/P1 or better.

Credit rating – average rating by S&P, Moodys, and Fitch, as of June 30, 2016

Ratings	U.S. govt agency	U.S. govt-sponsored agency mortgage backed	U.S. corporate bonds	Commercial mortgage-backed securities	Non-U.S. corporate bonds	Non-U.S. govt/agencies bonds	Pooled and others	Total
AAA	$ 38,230,645	368,339,917	8,911,237	11,564,094	35,776,503	292,509,851	—	755,332,247
AA1	—	420,177	1,647,337	—	—	54,265,701	—	56,333,215
AA2	—	—	—	37,039	27,616,196	172,042,512	—	199,695,747
AA3	—	—	7,448,371	—	23,773,696	15,488,582	—	46,710,649
A1	—	—	13,270,989	512,516	6,640,460	11,070,535	—	31,494,500
A2	—	—	35,395,898	284,758	24,484,367	66,882,669	—	127,047,692
A3	—	—	39,295,299	27,773	9,245,693	35,763,940	—	84,332,705
BAA1	—	—	51,069,265	1,027,069	25,945,694	144,262,867	—	222,304,895
BAA2	—	—	77,812,602	1,165,955	33,474,501	106,885,692	—	219,338,750
BAA3	—	—	124,790,664	—	26,718,509	3,194,005	—	154,703,178
BA1	—	—	37,227,024	—	21,937,442	—	—	59,164,466
BA2	—	—	77,719,544	—	28,684,628	2,810,451	—	109,214,623
BA3	—	—	95,382,290	—	22,107,258	—	—	117,489,548
B1	—	—	60,863,249	—	30,162,559	2,658,475	—	93,684,283
B2	—	—	82,149,065	—	16,077,235	—	—	98,226,300
B3	—	—	54,181,029	—	19,730,467	16,562,700	—	90,474,196
CAA1	—	—	21,639,678	—	11,592,365	—	—	33,232,043
CAA2	—	—	16,944,492	—	2,688,064	—	—	19,632,556
CAA3	—	—	4,126,700	—	42,000	—	—	4,168,700
CA	—	—	297,393	—	—	—	—	297,393
C	—	—	—	—	200,000	—	—	200,000
DEF	—	—	282,800	—	381,250	—	—	664,050
Not rates	—	—	19,213,482	—	1,992,191	26,399,879	9,714,468	57,320,020
	$ 38,230,645	368,760,094	829,668,408	14,619,204	369,271,078	950,797,859	9,714,468	2,581,061,756
					U.S. treasury notes and bonds			512,229,273
					Mortgage Association (GNMAs) mortgage backed			6,399,657
								$ 3,099,690,686
					Derivatives			17,443,963
						Total fixed income securities		$ 3,117,134,649

(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 $71,906,104 in cash and securities exposed to custodial credit risk.

(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, then the manager shall not hold more than the benchmark weight plus 2 percentage points.)

At June 30, 2016, there was no single issuer exposure within the ERS' portfolio that comprises over 5% of the overall portfolio, or an investment that exceeded the above manager guidelines, and therefore, there is no concentration of credit risk to report.

(7) Interest Rate Risk

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

Duration is a measure of a debt investment's exposure to fair value changes arising from changes in interest rates. It uses the present value of cash flows, weighted for those cash flows as a percentage of the investment's full price. At June 30, 2016, the table below shows fixed-income investment securities by investment type, amount, and the effective weighted duration for the ERS' total portfolio. Interest rate risk associated with swaps and other derivative instruments are discussed in the derivatives disclosure below:

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

	Fair value	Effective weighted duration (years)
Fixed income securities:		
U.S. Treasury bonds and notes	$ 512,229,273	7.5
U.S. government agencies bonds	38,230,645	1.9
U.S. government agency mortgage backed	368,760,094	2.0
U.S. government-sponsored agency mortgage backed	6,399,657	2.6
Commercial mortgage-backed securities	14,619,204	0.2
U.S. corporate bonds	829,668,408	5.8
Non-U.S. government/agency bonds	950,797,859	8.9
Non-U.S. corporate bonds	369,271,078	5.8
Pooled and others	9,714,468	n/a
Total	$ 3,099,690,686	5.1

(8) Foreign Currency Risk

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

The following table summarizes the ERS' exposure to foreign currency risk in U.S. dollars as of June 30, 2016: (Securities denominated in U.S. dollars are not presented.)

	Cash and short-term instruments	Debt securities	Derivatives	Equities	Alternative	Real estate	Grand total
Argentine peso	$ 1,895	—	—	—	—	—	1,895
Australian dollar	404,177	117,616,219	(1,447,585)	57,119,945	—	—	173,692,756
Brazilian real	309,242	2,024,776	(17,013)	70,412,240	—	—	72,729,245
Canadian dollar	1,046,523	26,898,283	(927,855)	88,222,261	—	—	115,239,212
Chilean peso	91,731	—	—	2,266,804	—	—	2,358,535
Chinese Yuan Renminbi	145	—	55,419	—	—	—	55,564
Colombian peso	70,948	—	—	1,485,505	—	—	1,556,453
Czech koruna	675	463,862	12,047	295,312	—	—	771,896
Danish krone	7,808	14,960,721	99,683	45,547,113	—	—	60,615,325
Egyptian pound	108,764	—	—	529,867	—	—	638,631
Euro	1,243,893	316,900,550	39,965,674	347,901,045	—	—	706,011,162
Hong Kong dollar	317,047	—	—	238,224,447	—	—	238,541,494
Hungarian forint	62,135	—	—	3,096,304	—	—	3,158,439
Indian rupee	—	—	(23,111)	—	—	—	(23,111)
Indonesian rupiah	591,751	2,472,628	—	17,981,811	—	—	21,046,190
Japanese yen	75,350,493	46,628,614	(13,090,140)	195,106,603	—	—	303,995,570
Malaysian ringgit	153,622	—	(9,053)	7,029,280	—	—	7,173,849
Mexican peso	(28,670)	1,699,959	(86,713)	20,785,054	—	—	22,369,630
New Taiwan dollar	1	—	(32,162)	83,539,394	—	—	83,507,233
New Zealand dollar	59,607	116,954,796	(2,855,588)	—	—	—	114,158,815
Norwegian krone	243	—	(8,110)	2,886,975	—	—	2,879,108
Philippine peso	51,939	—	—	2,073,392	—	—	2,125,331
Polish zloty	9,894	31,204,213	532,764	14,452,228	—	—	46,199,099
Pound sterling	312,325	204,679,216	41,979,469	313,056,805	—	—	560,027,815
Qatari riyal	14,737	—	—	833,547	—	—	848,284
Russian ruble (new)	51,768	—	91,161	13,440,822	—	—	13,583,751
Singapore dollar	1,512	—	(143,551)	12,116,877	—	—	11,974,838
South African rand	667,839	68,640,643	(2,049,915)	70,259,091	—	—	137,517,658
South Korean won	164,403	—	(1,269)	117,072,978	—	—	117,236,112
Swedish krona	(10,167)	4,227,799	126,914	5,751,031	—	—	10,095,577
Swiss franc	12,214	—	66,418	104,273,153	—	—	104,351,785
Thai baht	386	—	(172)	31,201,086	—	—	31,201,300
Turkish Lira	15,342	—	—	15,145,563	—	—	15,160,905
UAE dirham	26,505	—	—	4,187,910	—	—	4,214,415
Various countries	—	—	—	1,883,422,401	—	—	1,883,422,401
Total	$ 81,110,727	955,372,279	62,237,312	3,769,716,844	—	—	4,868,437,162

(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 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 dominated in U.S. dollars or whose primary trading market was located in the United States, 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 United States, 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 makes on behalf of the ERS. Also, the ERS and the borrowers maintains 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 C(2) and F(1). 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, 2016 was 146 days.

At June 30, 2016, 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**	**Collateral received** Cash	**Collateral received** Noncash
U.S. fixed income	$	422,531,304	323,702,552	114,422,937
U.S. equities		911,911,862	901,994,994	37,805,551
International equities		161,285,312	43,021,945	144,921,123
International fixed income		46,516,050	—	48,853,276
	$	1,542,244,528	1,268,719,491	346,002,887

(10) Derivative Financial Instruments

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

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

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

The tables below summarize the ERS' investments in derivative securities and contracts held at June 30, 2016 and their associated risks. The various risks associated with these investments are included in the tables expressed in terms of market values, summarized by the type of contract as follows: credit, equity, foreign exchange, interest, and other. Due to the level of risk associated with certain derivative investment securities, it is reasonably possible that changes in the values of investment securities will occur in the near term, and such changes could affect the amounts reported in the financial statements. ERS could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. ERS investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, posting collaterals, and exposure monitoring procedures.

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

The following table summarizes the ERS' investments in derivative securities and contracts held at June 30, 2016 with the related maturity information:

Asset categories		Notional values	Market value	Maturity (Range from)
Forwards	Currency purchases	$ —	7,013,036	0.0 year
	To be announced (TBA)	—	28,770,966	15 years to 30.1 years
	Total forwards	—	35,784,002	
Futures	Interest rate contracts	135,524,176	—	0.2 year to 2.0 years
	Futures total	135,524,176	—	
Options	Options	—	(20,431,894)	0.0 year to 4.2 years
	Options on debt securities	—	300,153	0.1 year to 0.7 year
	Options on currency	—	(30,346)	0.0 year to 0.7 year
	Options total	—	(20,162,087)	
Swaps	Credit default swaps	—	(360,261)	0.7 year to 30.5 years
	Currency swaps	—	(1,174,994)	2.2 years to 10.2 years
	Equity variance swaps	—	91,345	0.0 year to 0.8 years
	Inflation swaps	—	(10,512)	4.3 years to 4.9 years
	Interest rate swaps	—	(10,081,389)	0.6 year to 30.7 years
	Swaps total	—	(11,535,811)	
	Grand total	$ 135,524,176	4,086,104	

Forward Currency Exchange Contracts and 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.

Futures

Futures represent commitments to purchase (asset) or sell (liability) securities at a future date and at a specified price. Futures contracts are traded on organized exchanges (exchange traded) thereby minimizing the ERS' credit risk. The net change in the futures contracts value is settled daily in cash with the exchanges. Net gains or losses arising from the daily settlements are included in the net appreciation in fair value of securities in the statement of changes in net position. At June 30, 2016, the net notional value of futures contracts was $135,524,176.

Options

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

Swaps

Swaps represent an agreement between two or more parties to exchange sequences of cash flows over a period in the future. At June 30, 2016, the ERS had currency, equity variance, inflation, interest rate, and credit default swaps, as allowed by board policy. In the most common type of interest rate swap arrangement, one party agrees to pay fixed-interest payments on designated dates to a counterparty who, in turn, agrees to make return interest payments that float with some reference rate. Currency swaps allow an investor to exchange the principal and/or interest payments of a loan in one currency for equivalent amounts, in net present value terms, to another currency. Credit default swaps are the most common global credit market derivative that allows flexibility as an active portfolio management tool based on its ability to customize the exposure to corporate credit such as credit spreads and default risks. Credit default spreads and total return swaps are also used to gain access to global markets that do not have the transparency or efficiency of the U.S. credit markets. Variance swaps allow the investor to offset risks associated with the magnitude of movement of some underlying product (such as stock index price). Gains and losses from swaps are determined on market values and are included in the net appreciation in fair value of securities in the statement of changes in fiduciary net position.

Derivatives, such as interest rate swaps, inflation 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.

On June 30, 2016, credit ratings of the counterparty for ERS' investments in derivatives were as follows:

	Derivatives counterparty credit ratings – Moody's								
	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	N/A	Grand total
Bank of America Corp	$ —	—	—	—	24,882	—	—	—	24,882
Barclays PLC	—	—	—	—	—	(28,833)	—	—	(28,833)
BNP Paribas SA		34,920	—	—	—	—	—	—	34,920
Citigroup Inc	—	—	—	—	(367,841)	—	—	—	(367,841)
CME Group Inc/IL	(4,037,347)	—	—	—	—	—	—	—	(4,037,347)
Credit Suisse Group AG	—	—	—	—	—	61,937	—	—	61,937
Deutsche Bank AG	—	—	—	(8,701)	—	—	—	—	(8,701)
Goldman Sachs Group Inc/The	—	—	—	(790,287)	—	—	—	—	(790,287)
HSBC Holdings PLC	—	(65,805)	—	—	—	—	—	—	(65,805)
Intercontinental Exchange Inc	—	—	71,625	—	—	—	—	—	71,625
JP Morgan Chase & Co	—	—	—	(90,025)	—	—	—	—	(90,025)
London Stock Exchange Group PLC	—	—	—	—	(6,132,977)	—	—	—	(6,132,977)
Morgan Stanley	—	—	—	(94,652)	—	—	—	—	(94,652)
Societe Generale SA	—	—	(472)	—	—	—	—	—	(472)
USB Group AG	—	—	—	—	—	—	(16,781)	—	(16,781)
Foreign Currency Forwards	—	—	—	—	—	—	—	7,013,036	7,013,036
Exchange Traded – Swaps,									—
Options, and TBAs	—	—	—	—	—	—	—	8,513,425	8,513,425
Total	$ (4,037,347)	(30,885)	71,153	(983,665)	(6,475,936)	33,104	(16,781)	15,526,461	4,086,104

Note G – Pension Liability

(1) Net Pension Liability

The components of the net pension liability of the ERS at June 30, 2016 were as follows:

Total pension liability	$ 27,439,233,629
Plan fiduciary net position	14,069,978,917
Net pension liability	$ 13,369,254,712
Plan fiduciary net position as a percentage of total pension liability	51.3 %
Net pension liability as a percentage of covered payroll	325.1

Multiyear 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.

(2) Summary of Actuarial Assumptions

The total pension liability was determined using the provisions of Government Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans – an amendment of GASB Statement No. 25*, and GASB Statement No. 82, *Pension Issues – an amendment of GASB Statements No. 67, No. 68, and No. 73* actuarial valuation as of June 30, 2016. These GASB rules only define pension liability for financial reporting purposes. The actuarial assumptions were based on the results of an experience study for the period from July 1, 2010 through June 30, 2015. When measuring the total pension liability, GASB uses the same actuarial-cost method, all actuarial assumptions, and the same discount rate as the ERS uses for funding, which can be found in the Notes to Required Supplementary Information.

Summary of Actuarial Valuation as of June 30, 2016 is as follows:

Valuation date	June 30, 2016
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	3.50
Projected salary increases, including inflation at 2.50%	
Police officers and firefighters employees	5.00% to 7.00%
General employees	3.50% to 6.50%
Teachers	3.75% to 5.75%
Cost-of-living adjustments (COLAs)*	
Membership date prior to July 1, 2012	2.50 %
Membership date after June 30, 2012	1.50 %

* COLAs are not compounded; and are based on original pension amounts.

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

Preretirement mortality rates are:

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

	General employees	Teachers	Police officers and firefighter
	Male and Female	**Male and Female**	**Male and Female**
Ordinary	75 %	55 %	58 %
% of ordinary choosing annuity	41	52	24
Duty related	5	5	12

Postretirement mortality rates are:

Healthy Retirees: The 2016 Public Retirees of Hawaii mortality table, generational projection using the BB projection table from the year 2016 and with multipliers based on plan and group experience. The following are sample rates of the base table as of 2016 with the corresponding multipliers:

Healthy annuitant mortality rates before projection (multiplier applied)

	General employees		Teachers		Police officers and firefighter	
Age	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
50	0.1626 %	0.1140 %	0.1463 %	0.1012 %	0.1951 %	0.1140 %
55	0.3963	0.1937	0.3567	0.0172	0.4756	0.1937
60	0.6301	0.2735	0.5671	0.2428	0.7561	0.2735
65	0.9489	0.3532	0.8540	0.3136	1.1387	0.3532
70	1.3733	0.7404	1.2360	0.6574	1.6480	0.7404
75	2.1071	1.3116	1.8964	1.1645	2.5285	1.3116
80	3.6268	2.2573	3.2641	2.0041	4.3522	2.2573
85	6.6210	4.1830	5.9589	3.7138	7.9452	4.1830
90	12.1005	8.2371	10.8905	7.3133	14.5206	8.2371
Multiplier	100 %	107 %	90 %	95 %	120 %	107 %
Setback	—	—	—	—	—	—

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

Life expectancy for an age 65 retiree in years					
		Year of retirement			
	Gender	**2020**	**2025**	**2030**	**2035**
General retirees	Male	23.2	23.7	24.2	24.7
	Female	26.4	26.8	27.2	27.5
Teachers	Male	24.0	24.5	25.0	25.5
	Female	27.3	27.7	28.0	28.3
Police officers and firefighters	Male	21.8	22.3	22.8	23.3
	Female	26.4	26.8	27.2	27.5

Disabled retirees: Base table for healthy retiree's occupation, set forward five years, generational projection using the BB projection table from the year 2016. Minimum mortality rate of 3.5% for males and 2.5% for females.

The long-term expected geometric rate of returns on pension plan investments based on ERS' investment consultant, Pension Consulting Alliance, Inc.'s 2016 capital market projections for the target asset allocation as of June 30, 2016, are summarized in the following table:

Strategic allocation (risk-based classes)	Long-term expected geometric rate of return
Broad growth	8.35 %
Principal protection	2.20
Real return	6.15
Crisis risk offset	5.50

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.

(Continued)

(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 one-percentage-point lower (6.00%) or one–percentage-point higher (8.00%) than the current rate.

	1% Decrease (6.00%)	Current discount rate (7.00%)	1% Increase (8.00%)
$	17,153,325,506	13,369,254,712	10,238,060,621

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, 2016. 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 $1,202,501,000 as of June 30, 2016, consisting of $354,288,000 in real estate investments, and $848,213,000 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.

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

Required Supplementary Information – Unaudited

June 30, 2016

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

	2014	2015	2016
A. Total pension liability			
1. Service cost	$ 421,956,129	437,901,029	484,278,499
2. Interest on the total pension liability	1,618,917,776	1,693,252,684	1,748,619,873
3. Changes of benefit terms	—	—	—
4. Difference between expected and actual experience of the total pension liability	66,400,876	(192,816,757)	297,534,219
5. Changes of assumptions	—	261,213,541	2,915,922,677
6. Benefit payments, including refunds of employee contributions	(1,130,921,611)	(1,181,252,658)	(1,245,517,025)
7. Net change in total pension liability	976,353,170	1,018,297,839	4,200,838,243
8. Total pension liability – beginning	21,243,744,377	22,220,097,547	23,238,395,386
9. Total pension liability – ending	$ 22,220,097,547	23,238,395,386	27,439,233,629
B. Plan fiduciary net position			
1. Contributions – employer	$ 653,127,697	717,792,981	756,558,222
2. Contributions – picked-up employee contributions	204,821,010	221,909,859	235,079,968
3. Contributions – employee	1,306,327	1,595,560	1,721,893
4. Net investment income	2,175,479,961	556,436,475	(169,368,110)
5. Benefit payments, including refunds of employee contributions	(1,130,921,611)	(1,181,252,658)	(1,245,517,025)
6. Pension plan administrative expense	(12,626,030)	(14,032,964)	(13,960,587)
7. Other	—	—	—
8. Net change in plan fiduciary net position	1,891,187,354	302,449,253	(435,485,639)
9. Fiduciary net position – beginning	12,311,827,949	14,203,015,303	14,505,464,556
10. Fiduciary net position – ending	14,203,015,303	14,505,464,556	14,069,978,917
C. Net pension liability	$ 8,017,082,244	8,732,930,830	13,369,254,712
D. Fiduciary net position as a percentage of the total pension liability	63.92 %	62.42 %	51.28 %
E. Covered-employee payroll	$ 3,829,002,983	3,995,447,345	4,112,227,306
F. Net pension liability as a percentage of covered employee payroll	209.38 %	218.57 %	325.11 %

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

(Continued)

Schedule of the Employers' Net Pension Liability

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
2013	21,243,744,377	12,311,827,949	8,931,916,428	57.96 %	3,720,809,962	240.05 %
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

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

Schedule of Employer Contributions

(Amounts in thousands)

Fiscal year ended June 30	Statutory contributions	Covered employee payroll	Contributions as a percentage of covered payroll
2007	$ 454,494	3,340,488	13.61 %
2008	488,770	3,601,722	13.57
2009	578,672	3,838,000	15.08
2010	547,670	3,713,593	14.75
2011	538,692	3,731,383	14.44
2012	548,353	3,706,137	14.80
2013	581,447	3,720,810	15.63
2014	653,128	3,829,003	17.06
2015	717,793	3,995,447	17.97
2016	756,558	4,112,227	18.40

Note: All contributions shown reflect statutory employer-paid contributions only. Member contributions are excluded. Information provided by Gabriel, Roeder Smith and Company, the ERS' actuary.

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

Required Supplementary Information – Unaudited

June 30, 2016

Schedule of Investment Returns

For fiscal year ended June 30:	Annual money-weighted rate of return
2014	17.9 %
2015	4.0
2016	(1.2)

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

Note A – Description

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

There have been significant changes in the following actuarial assumptions (as of June 30, 2015 and June 30, 2016) based on the five-year experience study report dated July 5, 2016:

- Decrease in the investment return assumption from 7.65% to 7.00%
- Decrease in the mortality assumptions for longer life expectancy, expectancy, and adding an explicit assumption for continued future mortality improvement (generational approach)

Other meaningful changes include:

- Decrease in the inflation assumption from 3.00% to 2.50%
- Change in 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)
- Decrease in the wage inflation (or employer budget growth) assumption from 4.00% to 3.50%
- For Police officers and firefighters, increase in the real component (above inflation) of the ultimate salary scale from 2.00% to 2.50%, leaving the nominal assumption of 5.00% unchanged
- For Police officers and firefighters, decrease in the step-rate portion of the salary scale
- For Police officers and firefighters, increase in the probabilities of members becoming disabled for duty-related reasons
- Minor adjustments to the retirement, termination, and disability patterns for members consistent with experience and future expectations for active employees.

(Continued)

Methods and assumptions used in calculations of actuarially determined contributions

The actuarially determined contribution rates in the schedule of contributions are calculated as of June 30, 2016. The following significant actuarial methods and assumptions were used to determine contribution rates reported in that schedule.

Valuation date	June 30, 2016
Actuarial-cost method	Entry age normal
Amortization method	Level percent, open
Asset-valuation method	Four-year smoothed market
Assumed inflation rate	2.50 %
Investment rate of return	7.00% (including 2.50% for inflation and a 4.50% net real rate of return)
Cost-of-living adjustments (COLAs):	
COLAs are not compounded; they are based on original pension amount.	
– Membership date prior to July 1, 2012	2.50% (not compounded)
– Membership date after June 30, 2012	1.50% (not compounded)
Payroll growth rate assumption	3.50 %

Projected salary increases comprise of the following components:

	General employees	Teachers	Police officers and firefighters
Service component by year of credited service (a)	0.00% to 3.00%	0.00% to 2.00%	0.00% to 2.00%
General increase (b)	1.00	1.25	2.50
Inflation (c)	2.50	2.50	2.50
Total increase (a + b + c)	3.50% to 6.50%	3.75% to 5.75%	5.00% to 7.00%

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

	General employees		Teachers	
Years of service	Service-related component (a)	Total annual rate of increase (a + b + c)	Service-related component (a)	Total annual rate of increase (a + b + c)
1	3.00 %	6.50 %	2.00 %	5.75 %
2	3.00	6.50	1.75	5.50
3	2.00	5.50	1.75	5.50
4	1.50	5.00	1.50	5.25
5	1.50	5.00	1.00	4.75
6	1.25	4.75	1.00	4.75
7	1.25	4.75	0.75	4.50
8	1.00	4.50	0.75	4.50
9	1.00	4.50	0.50	4.25
10	1.00	4.50	0.50	4.25
11	0.75	4.25	0.50	4.25
12	0.75	4.25	0.25	4.25
13	0.50	4.00	0.25	4.00
14	0.50	4.00	0.25	4.00
15	0.50	4.00	0.25	4.00
16	0.50	4.00	0.25	4.00
17	0.50	4.00	0.25	4.00
18	0.50	4.00	0.25	4.00
19	0.50	4.00	0.25	4.00
20	0.25	3.75	0.25	4.00
21	0.25	3.75	0.25	4.00
22	0.25	3.75	0.25	4.00
23	0.25	3.75	0.25	4.00
24	0.25	3.75	0.25	4.00
25 or more	—	3.50	—	3.75

	Police officers and firefighters	
Years of service	Service-related component (a)	Total annual rate of increase (a + b + c)
1	2.00 %	7.00 %
2	2.00	7.00
3 or more	—	5.00

Mortality rates used in the valuation are:

Preretirement mortality rates:

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

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

	General employees	Teachers	Police officers and firefighters
	Male and Female	**Male and Female**	**Male and Female**
Ordinary	75 %	55 %	58 %
% of ordinary choosing annuity	41	52	24
Duty related	5	5	12

Postretirement mortality rates:

Healthy retirees:

The 2016 Public Retirees of Hawaii mortality table, generational projection using the BB projection table from the year 2016 and with multipliers based on plan and group experience

The following are sample rates of the base table as of 2016 with the corresponding multipliers:

Healthy annuitant mortality rates before projection (multiplier applied)

	General employees		Teachers		Police officers and firefighters	
Age	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
50	0.1626 %	0.1140 %	0.1463 %	0.1012 %	0.1951 %	0.1140 %
55	0.3963	0.1937	0.3567	0.1720	0.4756	0.1937
60	0.6301	0.2735	0.5671	0.2428	0.7561	0.2735
65	0.9489	0.3532	0.8540	0.3136	1.1387	0.3532
70	1.3733	0.7404	1.2360	0.6574	1.6480	0.7404
75	2.1071	1.3116	1.8964	1.1645	2.5285	1.3116
80	3.6268	2.2573	3.2641	2.0041	4.3522	2.2573
85	6.6210	4.1830	5.9589	3.7138	7.9452	4.1830
90	12.1005	8.2371	10.8905	7.3133	14.5206	8.2371
Multiplier	100 %	107 %	90 %	95 %	120 %	107 %
Setback	—	—	—	—	—	—

The following are 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	**2020**	**2025**	**2030**	**2035**
General retirees	Male	23.2	23.7	24.2	24.7
	Female	26.4	26.8	27.2	27.5
Teachers	Male	24.0	24.5	25.0	25.5
	Female	27.3	27.7	28.0	28.3
Police officers and firefighters	Male	21.8	22.3	22.8	23.3
	Female	26.4	26.8	27.2	27.5

Disabled Retirees:

Base table for healthy retiree's occupation, set forward five years, generational projection using the BB projection table from the year 2016. Minimum mortality rate of 3.5% for males and 2.5% for females.

Change of Assumptions

The 2016 changes in assumptions are discussed below in note B.

Note B – Significant Factors Affecting Trends in Actuarial Information

2016 Changes in Actuarial Assumptions

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

- The investment rate of return assumption was decreased from 7.65% to 7.00%.
- Change the investment return assumption from net of all expenses to net of only investment expenses, add explicit charge for administrative expenses (0.35% of pay)
- The inflation assumption was decreased from 3.00% to 2.50%.
- Decrease the wage inflation (or employer budget growth) assumption from 4.00% to 3.50%
- The inflation component of salary increase rates decreased for all groups. The salary increase rates were changed to reflect a smaller productivity component for teachers and Police officers and firefighters. The service-based component generally increased for most general employees, decreased for most teachers, and remain unchanged for most Police officers and firefighters. The overall impact decreased assumed salary rate increase rates for all general employees and teachers, while remaining unchanged for almost all Police officers 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 officers and firefighters from duty-related reasons, and for teachers from nonduty-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 and female by employee group. The rate of terminations for Police officers 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 officers 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.

Schedule 1

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

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

Year ended June 30, 2016

		Pension Accumulation Fund	Annuity Savings Fund	Expense Fund	Total
Additions:					
Appropriations and contributions:					
Employers	$	756,558,222	—	—	756,558,222
Members		—	236,801,861	—	236,801,861
Net investment loss		(169,368,110)	—	—	(169,368,110)
Total additions		587,190,112	236,801,861	—	823,991,973
Deductions:					
Benefit payments		1,232,589,353	—	—	1,232,589,353
Refunds of member contributions		—	12,927,672	—	12,927,672
Administrative expenses		—	—	13,960,587	13,960,587
Total deductions		1,232,589,353	12,927,672	13,960,587	1,259,477,612
Other changes in net position restricted for pension benefits:					
Transfer due to retirement of members		142,146,596	(142,146,596)	—	—
Transfer of interest allocation		(99,289,033)	99,289,033	—	—
Transfer to pay administrative expenses		(13,014,314)	—	13,014,314	—
Return of unrequited funds due to savings in administrative expenses		—	—	—	—
		29,843,249	(42,857,563)	13,014,314	—
Net increase (decrease)		(615,555,992)	181,016,626	(946,273)	(435,485,639)
Fiduciary net position restricted for pensions:					
Beginning of year		12,201,467,662	2,293,539,670	10,457,224	14,505,464,556
End of year	$	11,585,911,670	2,474,556,296	9,510,951	14,069,978,917

See accompanying independent auditors' report.

Schedule 2

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

Supplementary Information – Social Security Contribution Fund
Statement of Changes in Assets and Liabilities

Year ended June 30, 2016

Assets		**Beginning balance**	**Additions**	**Deductions**	**Ending balance**
Receivable from employers	$	—	226,044,003	226,044,003	—
Total assets	$	—	226,044,003	226,044,003	—
Liabilities					
Due to employers	$	—	226,044,003	226,044,003	—
Total liabilities	$	—	226,044,003	226,044,003	—

See accompanying independent auditors' report.

Schedule 3

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

Supplementary Information – Schedule of Administrative Expenses

Year ended June 30, 2016

Personnel services:		
Salaries and wages	$	5,772,656
Fringe benefits		2,505,747
Net change in unused vacation credits		19,528
Total personnel services		8,297,931
Professional services:		
Actuarial		102,500
Auditing and tax consulting		326,235
Disability hearing expenses		83,287
Legal services		510,267
Medical		363,109
Other services		77,395
Total professional services		1,462,793
Communication:		
Postage		218,286
Printing and binding		72,831
Telephone		94,249
Travel		84,586
Total communication		469,952
Rentals:		
Rental of equipment		96,876
Rental of premises		18,292
Total rentals		115,168
Other:		
Armored car service		7,227
Repairs and maintenance		1,505,629
Stationery and office supplies		22,546
Miscellaneous		69,129
Total other		1,604,531
Depreciation		2,010,212
	$	13,960,587

See accompanying independent auditors' report.

Schedule 4

EMPLOYEES' RETIREMENT SYSTEM
OF THE STATE OF HAWAII

Supplementary Information – Schedule of Investment Expenses

Year ended June 30, 2016

Real estate and alternative investment expenses:		
Operating expenses	$	41,554,924
Mortgage interest		7,632,088
Total real estate and alternative investment expenses		49,187,012
Investment expenses:		
Investment manager/advisor fees		36,014,296
Bank custodian fees		576,530
Other investment expenses		1,493,641
Total investment expenses		38,084,467
Securities lending expenses:		
Borrower rebates		100,435
Management fees		1,074,668
Total securities lending expenses		1,175,103
	$	88,446,582

See accompanying independent auditors' report.