

Employees' Retirement System of the State of Hawaii

GASB Statement No. 67 and 68 Accounting and
Financial Reporting for Pensions

June 30, 2017



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March 16, 2018

The Board of Trustees
Employees' Retirement System of
The State of Hawaii
City Financial Tower
201 Merchant St., Ste. 1400
Honolulu, HI 96813-9280

Dear Trustees:

This report provides information required by the Employees' Retirement System of the State of Hawaii ("ERS") in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans." Additionally, this report provides information required by the employers covered by ERS in connection with the GASB Statement No. 68, "Accounting and Financial Reporting for Pensions." The GASB 68 information shown was determined as of June 30, 2017, but it is intended that the employers covered by ERS will use this information in financial reporting for their fiscal years ending June 30, 2018.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement Nos. 67 and 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than the ERS only in its entirety and only with the permission of ERS.

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

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

Section E of the report details the calculation of the single discount rate and is not required to be included in your financial statements. However, this information may be requested by your auditors, therefore, we have included it in this report. It should be noted that we reflected the enactment of SB936.SD2.HD1.CD1 in the single discount rate determination. In particular we reflected the increasing employer contributions rates over the next four fiscal years.

Section F currently contains both the aggregate GASB No. 68 information on a plan wide level and the schedules with the individual employers' information.

This report complements the actuarial valuation report that was provided to ERS and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2017 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

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

The signing actuaries are independent of the plan sponsor.

Respectfully submitted,



By _____
Lewis Ward
Consultant



By _____
Joe Newton
FSA, EA, MAAA

SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2017

	2017
Actuarial Valuation Date	June 30, 2017
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	June 30, 2017
 Membership	
Number of	
- Retirees and Beneficiaries	46,927
- Inactive, Nonretired Members	25,723
- Active Members	65,911
- Total	138,561
Reported Payroll for Fiscal Year	\$ 4,243,521,876
 Net Pension Liability	
Total Pension Liability	\$ 28,648,630,533
Plan Fiduciary Net Position	15,698,324,306
Net Pension Liability	\$ 12,950,306,227
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	54.80%
Net Pension Liability as a Percentage of Covered Payroll	305.18%
 Development of the Single Discount Rate	
Single Discount Rate	7.00%
Long-Term Expected Rate of Return	7.00%
Long-Term Municipal Bond Rate*	3.56%
Last year ending June 30 in the 2017 to 2116 projection period for which projected benefit payments are fully funded	None

**Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity's Index's "20-year Municipal GO AA Index" as of June 30, 2017. In describing this index, Fidelity notes that the municipala curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.*

Discussion

Accounting Standard

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

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

Financial Statements

GASB Statement No. 67 requires defined benefit pension plans to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position.

The *statement of fiduciary net position* presents the following items as of the end of the pension plan’s reporting period, such as:

- assets;
- deferred inflows and outflows of resources;
- liabilities; and
- fiduciary net position (assets, plus deferred outflows, minus liabilities, minus deferred inflows).

The *statement of changes in fiduciary net position* presents the following for the plan’s reporting period:

- additions, such as contributions and investment income;
- deductions, such as benefit payments and expenses; and
- net increase or decrease in the fiduciary net position (the difference between additions and deductions).

Notes to Financial Statements

GASB Statement No. 67 also requires the notes of the plan's financial statements to include additional disclosure information. This disclosure information should include:

- a description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- the number and classes of employees covered by the benefit terms;
- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- a description of how fair value is determined;
- concentrations of investments greater than or equal to 5%;
- annual money-weighted rate of return on pension plan investments;
- the portion of the present value of benefits to be provided through the pension plan to current active and inactive plan members;
- the pension plan's fiduciary net position;
- the net pension liability;
- the pension plan's fiduciary net position as a percentage of the total pension liability;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Required Supplementary Information

Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll;
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy; and
- the annual money-weighted rate of return on pension plan investments for each year.

As shown above, you will need to include a determination of the annual money-weighted rate of return for your Notes to Financial Statements and Required Supplementary Information. Statement No. 67 requires that this information be determined using cash-flows with a frequency of not less than a monthly basis. We do not have the detailed financial information to determine this number. If you need our assistance please let us know.

Measurement of the Net Pension Liability

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

Timing of the Valuation

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

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2017 and a measurement date of June 30, 2017.

Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.00% the municipal bond rate is 3.56% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting single discount rate is 7.00%.

Effective Date and Transition

GASB Statements No. 67 is effective for a pension plan's fiscal years beginning after June 15, 2013, however, earlier application is encouraged by the GASB. GASB Statement No. 68 is effective for an employer's fiscal year beginning after June 30, 2014.

SECTION B

FINANCIAL STATEMENTS

Statement of Fiduciary Net Position as of June 30, 2017

	2017
Assets	
Cash and Deposits	\$ 2,390,108,075
Receivables	
Accounts receivable and others	\$ 5,686,729
Investment sales proceeds	190,816,066
Accrued investment income	43,320,022
Employer contributions	47,967,178
Member contributions	-
Other	-
Total Receivables	\$ 287,789,995
Investments	
Equity securities	\$ 7,190,541,977
Fixed income securities	3,930,555,468
Real estate investments	1,112,391,820
Alternative investments	1,259,025,683
Total Investments	\$ 13,492,514,948
Invested Securities Lending Collateral	\$ 1,039,906,540
Equipment at cost, net of depreciation	\$ 5,215,413
Total Assets	\$ 17,215,534,971
 Liabilities	
Payables	
Accounts and other payables	\$ 52,194,547
Payables for securities purchased	250,612,562
Securities lending collateral	1,039,906,540
Notes payable	174,497,016
Total Liabilities	\$ 1,517,210,665
 Net Position Restricted for Pensions	 \$ 15,698,324,306

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2017

	<u>Year Ending June 30, 2017</u>
Additions	
Contributions	
Non-Employer Contributing Entity	\$ -
Employer	781,244,218
Employer (picked-up employee contributions)	249,211,751
Employee	1,492,316
Other	-
Total Contributions	<u>\$ 1,031,948,285</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 1,590,362,450
Interest and Dividends	245,078,370
Less Investment Expense	(79,477,962)
Net Investment Income	<u>\$ 1,755,962,858</u>
Other	<u>\$ 178,549,649</u>
Total Additions	<u>\$ 2,966,460,792</u>
 Deductions	
Benefit payments, including refunds of employee contributions	\$ 1,323,129,244
Pension Plan Administrative Expense	14,986,159
Other	-
Total Deductions	<u>\$ 1,338,115,403</u>
 Net Increase in Net Position	 \$ 1,628,345,389
 Net Position Restricted for Pensions	
Beginning of Year	<u>\$ 14,069,978,917</u>
End of Year	<u>\$ 15,698,324,306</u>

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in the Net Pension Liability and Related Ratios

Fiscal Year Ended June 30, 2017

A. Total pension liability	
1. Service Cost	\$ 576,724,568
2. Interest on the Total Pension Liability	1,894,622,190
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the Total Pension Liability	61,179,390
5. Changes of assumptions	0
6. Benefit payments, including refunds of employee contributions	(1,323,129,244)
7. Net change in total pension liability	\$ 1,209,396,904
8. Total pension liability – beginning	27,439,233,629
9. Total pension liability – ending	<u><u>\$ 28,648,630,533</u></u>
B. Plan fiduciary net position	
1. Contributions – employer	\$ 781,244,218
2. Contributions – employer (picked-up employee contributions)	249,211,751
3. Contributions – employee	1,492,316
4. Net investment income	1,934,512,507
5. Benefit payments, including refunds of employee contributions	(1,323,129,244)
6. Pension Plan Administrative Expense	(14,986,159)
7. Other	-
8. Net change in plan fiduciary net position	\$ 1,628,345,389
9. Plan fiduciary net position – beginning	14,069,978,917
10. Plan fiduciary net position – ending	<u><u>\$ 15,698,324,306</u></u>
C. Net pension liability	<u><u>\$ 12,950,306,227</u></u>
D. Plan fiduciary net position as a percentage of the total pension liability	54.80%
E. Covered-employee payroll	\$ 4,243,521,876
F. Net pension liability as a percentage of covered employee payroll	305.18%

Schedules of Required Supplementary Information Schedule of the Employers' Net Pension Liability

Last 10 Fiscal Years (which may be built prospectively)

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2008						
2009						
2010						
2011						
2012						
2013	\$21,243,744,377	\$ 12,311,827,950	\$ 8,931,916,427	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%
2017	28,648,630,533	15,698,324,306	12,950,306,227	54.80%	4,243,521,876	305.18%

Schedules of Required Supplementary Information

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

Last 10 Fiscal Years (which may be built prospectively)

Fiscal year ending June 30,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Pension Liability										
Service Cost	\$ 576,724,568	\$ 484,278,499	\$ 437,901,029	\$ 421,956,129						
Interest on the Total Pension Liability	1,894,622,190	1,748,619,873	1,693,252,684	1,618,917,776						
Benefit Changes	-	-	-	-						
Difference between Expected and Actual Experience	61,179,390	297,534,219	(192,816,757)	66,400,876						
Assumption Changes	-	2,915,922,677	261,213,541	-						
Benefit Payments	(1,306,788,954)	(1,232,589,353)	(1,170,744,770)	(1,122,445,642)						
Refunds	(16,340,290)	(12,927,672)	(10,507,888)	(8,475,969)						
Net Change in Total Pension Liability	1,209,396,904	4,200,838,243	1,018,297,839	976,353,170						
Total Pension Liability - Beginning	27,439,233,629	23,238,395,386	22,220,097,547	21,243,744,377						
Total Pension Liability - Ending (a)	\$ 28,648,630,533	\$ 27,439,233,629	\$ 23,238,395,386	\$ 22,220,097,547						
Plan Fiduciary Net Position										
Employer Contributions	\$ 781,244,218	\$ 756,558,222	\$ 717,792,981	\$ 653,127,697						
Employer Contributions (picked-up employee contributions)	249,211,751	235,079,968	221,909,859	204,821,010						
Employee Contributions	1,492,316	1,721,893	1,595,560	1,306,327						
Pension Plan Net Investment Income	1,934,512,507	(169,368,110)	556,436,475	2,175,479,960						
Benefit Payments	(1,306,788,954)	(1,232,589,353)	(1,170,744,770)	(1,122,445,642)						
Refunds	(16,340,290)	(12,927,672)	(10,507,888)	(8,475,969)						
Pension Plan Administrative Expense	(14,986,159)	(13,960,587)	(14,032,964)	(12,626,030)						
Other	-	-	-	-						
Net Change in Plan Fiduciary Net Position	1,628,345,389	(435,485,639)	302,449,253	1,891,187,353						
Plan Fiduciary Net Position - Beginning	14,069,978,917	14,505,464,556	14,203,015,303	12,311,827,950						
Plan Fiduciary Net Position - Ending (b)	\$ 15,698,324,306	\$ 14,069,978,917	\$ 14,505,464,556	\$ 14,203,015,303						
Net Pension Liability - Ending (a) - (b)	12,950,306,227	13,369,254,712	8,732,930,830	8,017,082,244						
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	54.80 %	51.28 %	62.42 %	63.92 %						
Covered Employee Payroll	\$ 4,243,521,876	\$ 4,112,227,306	\$ 3,995,447,345	\$ 3,829,002,983						
Net Pension Liability as a Percentage of Covered Employee Payroll	305.18 %	325.11 %	218.57 %	209.38 %						
Notes to Schedule:										
N/A										

SECTION D

NOTES TO FINANCIAL STATEMENTS

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.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.00%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

1% Decrease	Current Single Discount Rate Assumption	1% Increase
6.00%	7.00%	8.00%
\$16,846,997,813	\$12,950,306,227	\$9,737,284,744

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	46,927
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	25,723
Active Plan Members	65,911
Total Plan Members	138,561

SECTION E

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a tax-exempt municipal bond rate is required, as described in the following paragraph.

The *single discount rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.00%; the municipal bond rate is 2.85% (based on the daily rate closest to but not later than the measurement date of the Fidelity “20-Year Municipal GO AA Index”); and the resulting single discount rate is 7.00%.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

As noted in the cover letter, in determining the single discount rate we reflected the enactment of SB936.SD2.HD1.CD1. In particular we reflected the increasing employer contributions rates over the next four fiscal years

Single Discount Rate Development

Projection of Contributions Beginning July 1, 2017

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Employer Contributions for Future Employees	Total Contributions
1	4,069,484,664	\$ 195,554,124	\$ 4,265,038,788	\$ 233,995,368	\$ 778,899,365	\$ 29,402,223	\$ 1,042,296,956
2	3,894,125,433	\$ 520,189,713	4,414,315,146	223,912,212	792,843,938	84,558,594	1,101,314,744
3	3,748,941,471	\$ 819,874,705	4,568,816,176	215,564,135	884,375,293	159,755,355	1,259,694,783
4	3,616,896,333	\$ 1,111,828,408	4,728,724,742	207,971,539	853,225,845	216,643,520	1,277,840,904
5	3,491,530,115	\$ 1,402,699,993	4,894,230,108	200,762,982	905,353,759	306,144,010	1,412,260,751
6	3,370,094,752	\$ 1,695,433,409	5,065,528,162	193,780,448	873,865,569	370,034,067	1,437,680,084
7	3,249,255,318	\$ 1,993,566,329	5,242,821,647	186,832,181	842,531,904	435,102,583	1,464,466,668
8	3,127,105,736	\$ 2,299,214,669	5,426,320,405	179,808,580	810,858,517	501,811,365	1,492,478,462
9	3,004,778,576	\$ 2,611,463,043	5,616,241,619	172,774,768	779,139,085	569,960,627	1,521,874,480
10	2,881,904,060	\$ 2,930,906,015	5,812,810,076	165,709,483	747,277,723	639,680,135	1,552,667,341
11	2,760,350,545	\$ 3,255,907,883	6,016,258,428	158,720,156	715,758,896	710,612,890	1,585,091,942
12	2,641,895,558	\$ 3,584,931,915	6,226,827,473	151,908,995	685,043,518	782,423,496	1,619,376,009
13	2,524,792,379	\$ 3,919,974,056	6,444,766,435	145,175,562	654,678,664	855,547,574	1,655,401,800
14	2,408,768,769	\$ 4,261,564,491	6,670,333,260	138,504,204	624,593,742	930,100,840	1,693,198,786
15	2,292,375,699	\$ 4,611,419,225	6,903,794,924	131,811,603	594,413,019	1,006,457,817	1,732,682,439
16	2,174,368,689	\$ 4,971,059,057	7,145,427,747	125,026,200	563,813,801	1,084,950,425	1,773,790,426
17	2,056,541,983	\$ 5,338,975,735	7,395,517,718	118,251,164	533,261,336	1,165,249,482	1,816,761,982
18	1,939,645,001	\$ 5,714,715,837	7,654,360,838	111,529,588	502,949,949	1,247,256,028	1,861,735,565
19	1,821,747,100	\$ 6,100,516,367	7,922,263,467	104,750,458	472,379,023	1,331,458,297	1,908,587,778
20	1,704,003,892	\$ 6,495,538,796	8,199,542,688	97,980,224	441,848,209	1,417,673,276	1,957,501,709
21	1,587,230,599	\$ 6,899,296,083	8,486,526,683	91,265,759	411,568,894	1,505,794,667	2,008,629,320
22	1,472,758,858	\$ 7,310,796,258	8,783,555,116	84,683,634	381,886,372	1,595,605,970	2,062,175,976
23	1,360,574,157	\$ 7,730,405,389	9,090,979,545	78,233,014	352,796,879	1,687,187,079	2,118,216,972
24	1,250,818,690	\$ 8,158,345,140	9,409,163,830	71,922,075	324,337,286	1,780,586,375	2,176,845,736
25	1,142,783,001	\$ 8,595,701,563	9,738,484,564	65,710,023	296,323,632	1,876,040,891	2,238,074,546
26	1,037,670,260	\$ 9,041,661,263	10,079,331,523	59,666,040	269,067,898	1,973,373,102	2,302,107,040
27	936,312,224	\$ 9,495,795,903	10,432,108,127	53,837,953	242,785,760	2,072,489,520	2,369,113,233
28	837,891,219	\$ 9,959,340,692	10,797,231,911	48,178,745	217,265,193	2,173,659,736	2,439,103,674
29	742,079,925	\$ 10,433,055,103	11,175,135,028	42,669,596	192,421,325	2,277,049,505	2,512,140,426
30	649,350,495	\$ 10,916,914,259	11,566,264,754	37,337,653	168,376,583	2,382,653,400	2,588,367,636
31	564,313,639	\$ 11,406,770,382	11,971,084,020	32,448,034	146,326,527	2,489,566,153	2,668,340,714
32	486,207,107	\$ 11,903,864,854	12,390,071,961	27,956,909	126,073,503	2,598,058,700	2,752,089,112
33	414,728,184	\$ 12,408,996,296	12,823,724,480	23,846,871	107,539,018	2,708,305,343	2,839,691,232
34	349,288,071	\$ 12,923,266,766	13,272,554,836	20,084,064	90,570,397	2,820,546,609	2,931,201,070
35	289,932,465	\$ 13,447,161,791	13,737,094,256	16,671,117	75,179,488	2,934,888,468	3,026,739,073
36	237,490,318	\$ 13,980,402,237	14,217,892,555	13,655,693	61,581,239	3,051,269,995	3,126,506,927
37	192,163,585	\$ 14,523,355,210	14,715,518,794	11,049,406	49,828,017	3,169,771,315	3,230,648,738
38	153,693,479	\$ 15,076,868,473	15,230,561,952	8,837,375	39,852,719	3,290,577,454	3,339,267,548
39	121,548,408	\$ 15,642,083,212	15,763,631,620	6,989,033	31,517,502	3,413,937,479	3,452,444,014
40	95,483,833	\$ 16,219,874,894	16,315,358,727	5,490,320	24,758,958	3,540,042,465	3,570,291,743
41	74,771,721	\$ 16,811,624,561	16,886,396,282	4,299,374	19,388,307	3,669,193,828	3,692,881,509
42	57,410,560	\$ 17,420,009,592	17,477,420,152	3,301,107	14,886,558	3,801,975,915	3,820,163,580
43	43,915,958	\$ 18,045,213,900	18,089,129,858	2,525,168	11,387,408	3,938,428,867	3,952,341,443
44	33,612,945	\$ 18,688,636,458	18,722,249,403	1,932,744	8,715,837	4,078,858,012	4,089,506,593
45	25,305,625	\$ 19,352,222,506	19,377,528,132	1,455,073	6,561,749	4,223,687,908	4,231,704,730
46	18,627,076	\$ 20,037,114,540	20,055,741,616	1,071,057	4,830,001	4,373,167,907	4,379,068,965
47	13,327,529	\$ 20,744,365,044	20,757,692,573	766,333	3,455,828	4,527,527,718	4,531,749,879
48	9,098,237	\$ 21,475,113,576	21,484,211,813	523,149	2,359,173	4,687,016,053	4,689,898,375
49	5,849,160	\$ 22,230,310,066	22,236,159,226	336,327	1,516,687	4,851,840,237	4,853,693,251
50	3,476,070	\$ 23,010,948,729	23,014,424,799	199,874	901,345	5,022,217,261	5,023,318,480

Single Discount Rate Development

Projection of Contributions Beginning July 1, 2017

(Continued)

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Employer Contributions from		Total Contributions
				Current Employees	Future Employees	
51	1,889,702	\$ 23,818,039,966	23,819,929,667	108,658	490,000	5,198,966,306
52	876,313	\$ 24,652,750,893	24,653,627,206	50,388	227,228	5,380,823,743
53	353,646	\$ 25,516,150,512	25,516,504,158	20,335	91,700	5,568,986,009
54	147,807	\$ 26,409,433,996	26,409,581,803	8,499	38,326	5,763,994,971
55	54,595	\$ 27,333,862,572	27,333,917,167	3,139	14,156	5,965,707,804
56	11,932	\$ 28,290,592,335	28,290,604,267	686	3,094	6,174,517,305
57	1,466	\$ 29,280,773,950	29,280,775,417	84	380	6,390,627,786
58	-	\$ 30,305,602,556	30,305,602,556	-	-	6,614,300,090
59	-	\$ 31,366,298,646	31,366,298,646	-	-	6,845,800,593
60	-	\$ 32,464,119,098	32,464,119,098	-	-	7,085,403,614
61	-	\$ 33,600,363,267	33,600,363,267	-	-	7,333,392,741
62	-	\$ 34,776,375,981	34,776,375,981	-	-	7,590,061,486
63	-	\$ 35,993,549,140	35,993,549,140	-	-	7,855,713,639
64	-	\$ 37,253,323,360	37,253,323,360	-	-	8,130,663,616
65	-	\$ 38,557,189,678	38,557,189,678	-	-	8,415,236,842
66	-	\$ 39,906,691,317	39,906,691,317	-	-	8,709,770,132
67	-	\$ 41,303,425,513	41,303,425,513	-	-	9,014,612,087
68	-	\$ 42,749,045,406	42,749,045,406	-	-	9,330,123,510
69	-	\$ 44,245,261,995	44,245,261,995	-	-	9,656,677,832
70	-	\$ 45,793,846,165	45,793,846,165	-	-	9,994,661,556
71	-	\$ 47,396,630,781	47,396,630,781	-	-	10,344,474,711
72	-	\$ 49,055,512,858	49,055,512,858	-	-	10,706,531,326
73	-	\$ 50,772,455,808	50,772,455,808	-	-	11,081,259,922
74	-	\$ 52,549,491,761	52,549,491,761	-	-	11,469,104,020
75	-	\$ 54,388,723,973	54,388,723,973	-	-	11,870,522,660
76	-	\$ 56,292,329,312	56,292,329,312	-	-	12,285,990,953
77	-	\$ 58,262,560,838	58,262,560,838	-	-	12,716,000,637
78	-	\$ 60,301,750,467	60,301,750,467	-	-	13,161,060,659
79	-	\$ 62,412,311,733	62,412,311,733	-	-	13,621,697,782
80	-	\$ 64,596,742,644	64,596,742,644	-	-	14,098,457,204
81	-	\$ 66,857,628,637	66,857,628,637	-	-	14,591,903,207
82	-	\$ 69,197,645,639	69,197,645,639	-	-	15,102,619,819
83	-	\$ 71,619,563,236	71,619,563,236	-	-	15,631,211,512
84	-	\$ 74,126,247,950	74,126,247,950	-	-	16,178,303,915
85	-	\$ 76,720,666,628	76,720,666,628	-	-	16,744,544,552
86	-	\$ 79,405,889,960	79,405,889,960	-	-	17,330,603,612
87	-	\$ 82,185,096,108	82,185,096,108	-	-	17,937,174,738
88	-	\$ 85,061,574,472	85,061,574,472	-	-	18,564,975,854
89	-	\$ 88,038,729,579	88,038,729,579	-	-	19,214,750,009
90	-	\$ 91,120,085,114	91,120,085,114	-	-	19,887,266,259
91	-	\$ 94,309,288,093	94,309,288,093	-	-	20,583,320,578
92	-	\$ 97,610,113,176	97,610,113,176	-	-	21,303,736,799
93	-	\$ 101,026,467,137	101,026,467,137	-	-	22,049,367,586
94	-	\$ 104,562,393,487	104,562,393,487	-	-	22,821,095,452
95	-	\$ 108,222,077,259	108,222,077,259	-	-	23,619,833,793
96	-	\$ 112,009,849,963	112,009,849,963	-	-	24,446,527,976
97	-	\$ 115,930,194,712	115,930,194,712	-	-	25,302,156,455
98	-	\$ 119,987,751,527	119,987,751,527	-	-	26,187,731,931
99	-	\$ 124,187,322,830	124,187,322,830	-	-	27,104,302,548
100	-	\$ 128,533,879,130	128,533,879,130	-	-	28,052,953,137

Single Discount Rate Development

Projection of Plan Fiduciary Net Position Beginning July 1, 2017

Year	Projected Beginning		Projected Total	Projected Benefit	Projected		Projected Ending Plan
	Plan Net Position	Contributions			Administrative	Investment	
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)	
1	\$ 15,698,324,306	\$ 1,042,296,956	\$ 1,641,170,103	\$ 15,510,675	\$ 1,077,742,956	\$ 16,161,683,440	
2	16,161,683,440	1,101,314,744	1,481,355,206	14,602,831	1,117,738,937	16,884,779,085	
3	16,884,779,085	1,259,694,783	1,564,170,891	13,921,399	1,170,979,101	17,737,360,677	
4	17,737,360,677	1,277,840,904	1,648,917,993	13,338,588	1,228,388,256	18,581,333,257	
5	18,581,333,257	1,412,260,751	1,734,184,465	12,821,502	1,289,175,400	19,535,763,441	
6	19,535,763,441	1,437,680,084	1,820,650,860	12,337,941	1,353,901,641	20,494,356,365	
7	20,494,356,365	1,464,466,668	1,909,265,865	11,875,357	1,418,891,668	21,456,573,479	
8	21,456,573,479	1,492,478,462	1,999,578,523	11,422,177	1,484,118,808	22,422,170,048	
9	22,422,170,048	1,521,874,480	2,090,802,443	10,969,978	1,549,598,750	23,391,870,857	
10	23,391,870,857	1,552,667,341	2,182,385,851	10,525,875	1,615,401,404	24,367,027,876	
11	24,367,027,876	1,585,091,942	2,274,264,267	10,082,672	1,681,631,955	25,349,404,834	
12	25,349,404,834	1,619,376,009	2,363,959,106	9,655,618	1,748,506,460	26,343,672,578	
13	26,343,672,578	1,655,401,800	2,452,428,695	9,241,906	1,816,314,949	27,353,718,727	
14	27,353,718,727	1,693,198,786	2,539,550,338	8,833,697	1,885,335,060	28,383,868,537	
15	28,383,868,537	1,732,682,439	2,626,016,677	8,428,672	1,955,842,900	29,437,948,528	
16	29,437,948,528	1,773,790,426	2,711,765,587	8,023,462	2,028,106,435	30,520,056,340	
17	30,520,056,340	1,816,761,982	2,794,959,270	7,616,238	2,102,484,029	31,636,726,843	
18	31,636,726,843	1,861,735,565	2,874,925,017	7,214,839	2,179,460,764	32,795,783,315	
19	32,795,783,315	1,908,587,778	2,953,047,820	6,815,683	2,259,532,491	34,004,040,083	
20	34,004,040,083	1,957,501,709	3,027,341,733	6,414,530	2,343,250,993	35,271,036,521	
21	35,271,036,521	2,008,629,320	3,097,291,299	6,014,728	2,431,306,873	36,607,666,687	
22	36,607,666,687	2,062,175,976	3,162,182,329	5,618,057	2,524,494,296	38,026,536,572	
23	38,026,536,572	2,118,216,972	3,221,984,904	5,227,489	2,623,699,198	39,541,240,349	
24	39,541,240,349	2,176,845,736	3,275,490,894	4,844,988	2,729,917,888	41,167,668,091	
25	41,167,668,091	2,238,074,546	3,323,083,898	4,469,315	2,844,249,937	42,922,439,361	
26	42,922,439,361	2,302,107,040	3,363,540,314	4,099,974	2,967,907,841	44,824,813,954	
27	44,824,813,954	2,369,113,233	3,396,744,057	3,739,224	3,102,249,552	46,895,693,457	
28	46,895,693,457	2,439,103,674	3,422,638,892	3,387,692	3,248,740,456	49,157,511,003	
29	49,157,511,003	2,512,140,426	3,441,927,915	3,043,288	3,408,928,888	51,633,609,114	
30	51,633,609,114	2,588,367,636	3,453,518,581	2,706,166	3,584,491,373	54,350,243,377	
31	54,350,243,377	2,668,340,714	3,454,939,763	2,383,301	3,777,369,698	57,338,630,725	
32	57,338,630,725	2,752,089,112	3,447,015,986	2,088,491	3,989,721,216	60,631,336,576	
33	60,631,336,576	2,839,691,232	3,429,889,607	1,811,572	4,223,823,656	64,263,150,284	
34	64,263,150,284	2,931,201,070	3,404,378,631	1,557,241	4,482,085,824	68,270,501,306	
35	68,270,501,306	3,026,739,073	3,370,834,853	1,318,594	4,767,050,059	72,692,136,990	
36	72,692,136,990	3,126,506,927	3,329,116,085	1,100,387	5,081,440,342	77,569,867,787	
37	77,569,867,787	3,230,648,738	3,279,321,809	905,725	5,428,184,836	82,948,473,827	
38	82,948,473,827	3,339,267,548	3,221,877,671	735,303	5,810,407,024	88,875,535,424	
39	88,875,535,424	3,452,444,014	3,157,030,232	590,585	6,231,431,769	95,401,790,391	
40	95,401,790,391	3,570,291,743	3,084,956,352	468,699	6,694,808,642	102,581,465,725	
41	102,581,465,725	3,692,881,509	3,006,218,825	370,060	7,204,316,587	110,472,074,937	
42	110,472,074,937	3,820,163,580	2,922,285,190	291,425	7,763,929,457	119,133,591,358	
43	119,133,591,358	3,952,341,443	2,832,830,901	224,378	8,377,863,842	128,630,741,364	
44	128,630,741,364	4,089,506,593	2,738,551,570	173,780	9,050,629,635	139,032,152,242	
45	139,032,152,242	4,231,704,730	2,640,433,377	133,554	9,786,998,595	150,410,288,637	
46	150,410,288,637	4,379,068,965	2,538,939,933	100,568	10,592,031,984	162,842,349,084	
47	162,842,349,084	4,531,749,879	2,434,482,825	74,078	11,471,124,743	176,410,666,802	
48	176,410,666,802	4,689,898,375	2,327,559,610	52,675	12,430,028,318	191,202,981,210	
49	191,202,981,210	4,853,693,251	2,218,547,266	36,057	13,474,877,661	207,312,968,799	
50	207,312,968,799	5,023,318,480	2,107,827,430	22,830	14,612,223,373	224,840,660,392	

Single Discount Rate Development

Projection of Plan Fiduciary Net Position Beginning July 1, 2017 (Continued)

Year	Projected Beginning	Projected Total	Projected Benefit	Projected	Projected Investment	Projected Ending Plan
	Plan Net Position	Contributions	Payments	Administrative Expenses	Earnings at 7.00%	Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	224,840,660,392	5,198,966,306	\$ 1,995,830,994	13,425	15,849,059,384	\$ 243,892,841,662
52	243,892,841,662	5,380,823,743	\$ 1,883,121,259	7,187	17,192,847,768	\$ 264,583,384,727
53	264,583,384,727	5,569,098,044	\$ 1,770,159,917	3,125	18,651,550,851	\$ 287,033,870,580
54	287,033,870,580	5,763,994,971	\$ 1,657,458,028	1,133	20,233,668,802	\$ 311,374,075,192
55	311,374,075,192	5,965,725,099	\$ 1,545,537,935	473	21,948,275,238	\$ 337,742,537,122
56	337,742,537,122	6,174,521,085	\$ 1,434,786,000	116	23,805,062,605	\$ 366,287,334,697
57	366,287,334,697	6,390,628,250	\$ 1,325,554,435	17	25,814,392,707	\$ 397,166,801,202
58	397,166,801,202	6,614,300,090	\$ 1,218,208,250	-	27,987,345,046	\$ 430,550,238,087
59	430,550,238,087	6,845,800,593	\$ 1,113,118,446	-	30,335,767,042	\$ 466,618,687,276
60	466,618,687,276	7,085,403,614	\$ 1,010,670,363	-	32,872,327,794	\$ 505,565,748,321
61	505,565,748,321	7,333,392,741	\$ 911,275,118	-	35,610,574,884	\$ 547,598,440,828
62	547,598,440,828	7,590,061,486	\$ 815,381,563	-	38,564,994,338	\$ 592,938,115,089
63	592,938,115,089	7,855,713,639	\$ 723,469,412	-	41,751,074,624	\$ 641,821,433,941
64	641,821,433,941	8,130,663,616	\$ 636,039,935	-	45,185,375,712	\$ 694,501,433,334
65	694,501,433,334	8,415,236,842	\$ 553,611,820	-	48,885,603,467	\$ 751,248,661,824
66	751,248,661,824	8,709,770,132	\$ 476,673,016	-	52,870,691,090	\$ 812,352,450,029
67	812,352,450,029	9,014,612,087	\$ 405,639,913	-	57,160,889,389	\$ 878,122,311,593
68	878,122,311,593	9,330,123,510	\$ 340,842,467	-	61,777,865,383	\$ 948,889,458,019
69	948,889,458,019	9,656,677,832	\$ 282,500,979	-	66,744,809,144	\$ 1,025,008,444,016
70	1,025,008,444,016	9,994,661,556	\$ 230,700,214	-	72,086,549,886	\$ 1,106,858,955,243
71	1,106,858,955,243	10,344,474,711	\$ 185,410,804	-	77,829,680,378	\$ 1,194,847,699,528
72	1,194,847,699,528	10,706,531,326	\$ 146,472,895	-	84,002,689,914	\$ 1,289,410,447,873
73	1,289,410,447,873	11,081,259,922	\$ 113,591,818	-	90,636,107,350	\$ 1,391,014,223,328
74	1,391,014,223,328	11,469,104,020	\$ 86,356,054	-	97,762,653,718	\$ 1,500,159,625,012
75	1,500,159,625,012	11,870,522,660	\$ 64,267,878	-	105,417,403,876	\$ 1,617,383,283,670
76	1,617,383,283,670	12,285,990,953	\$ 46,755,399	-	113,637,958,004	\$ 1,743,260,477,228
77	1,743,260,477,228	12,716,000,637	\$ 33,210,939	-	122,464,623,383	\$ 1,878,407,890,309
78	1,878,407,890,309	13,161,060,659	\$ 23,020,784	-	131,940,606,566	\$ 2,023,486,536,750
79	2,023,486,536,750	13,621,697,782	\$ 15,589,087	-	142,112,217,149	\$ 2,179,204,862,594
80	2,179,204,862,594	14,098,457,204	\$ 10,352,769	-	153,029,084,489	\$ 2,346,322,051,518
81	2,346,322,051,518	14,591,903,207	\$ 6,794,568	-	164,744,388,656	\$ 2,525,651,548,812
82	2,525,651,548,812	15,102,619,819	\$ 4,460,779	-	177,315,106,527	\$ 2,718,064,814,379
83	2,718,064,814,379	15,631,211,512	\$ 2,976,596	-	190,802,273,990	\$ 2,924,495,323,285
84	2,924,495,323,285	16,178,303,915	\$ 2,052,702	-	205,271,265,782	\$ 3,145,942,840,279
85	3,145,942,840,279	16,744,544,552	\$ 1,478,165	-	220,792,094,972	\$ 3,383,478,001,638
86	3,383,478,001,638	17,330,603,612	\$ 1,110,216	-	237,439,734,073	\$ 3,638,247,229,107
87	3,638,247,229,107	17,937,174,738	\$ 861,729	-	255,294,459,472	\$ 3,911,478,001,588
88	3,911,478,001,588	18,564,975,854	\$ 682,903	-	274,442,221,106	\$ 4,204,484,515,645
89	4,204,484,515,645	19,214,750,009	\$ 546,266	-	294,975,039,249	\$ 4,518,673,758,638
90	4,518,673,758,638	19,887,266,259	\$ 437,052	-	316,991,429,985	\$ 4,855,552,017,830
91	4,855,552,017,830	20,583,320,578	\$ 347,248	-	340,596,861,085	\$ 5,216,731,852,245
92	5,216,731,852,245	21,303,736,799	\$ 272,511	-	365,904,240,178	\$ 5,603,939,556,711
93	5,603,939,556,711	22,049,367,586	\$ 210,571	-	393,034,437,319	\$ 6,019,023,151,044
94	6,019,023,151,044	22,821,095,452	\$ 159,539	-	422,116,844,324	\$ 6,463,960,931,281
95	6,463,960,931,281	23,619,833,793	\$ 117,868	-	453,289,973,397	\$ 6,940,870,620,603
96	6,940,870,620,603	24,446,527,976	\$ 84,429	-	486,702,097,730	\$ 7,452,019,161,880
97	7,452,019,161,880	25,302,156,455	\$ 58,396	-	522,511,937,017	\$ 7,999,833,196,956
98	7,999,833,196,956	26,187,731,931	\$ 39,084	-	560,889,391,056	\$ 8,586,910,280,859
99	8,586,910,280,859	27,104,302,548	\$ 25,384	-	602,016,324,802	\$ 9,216,030,882,825
100	9,216,030,882,825	28,052,953,137	\$ 16,073	-	646,087,408,470	\$ 9,890,171,228,358

Single Discount Rate Development

Present Values of Projected Benefit Payments Beginning July 1, 2017

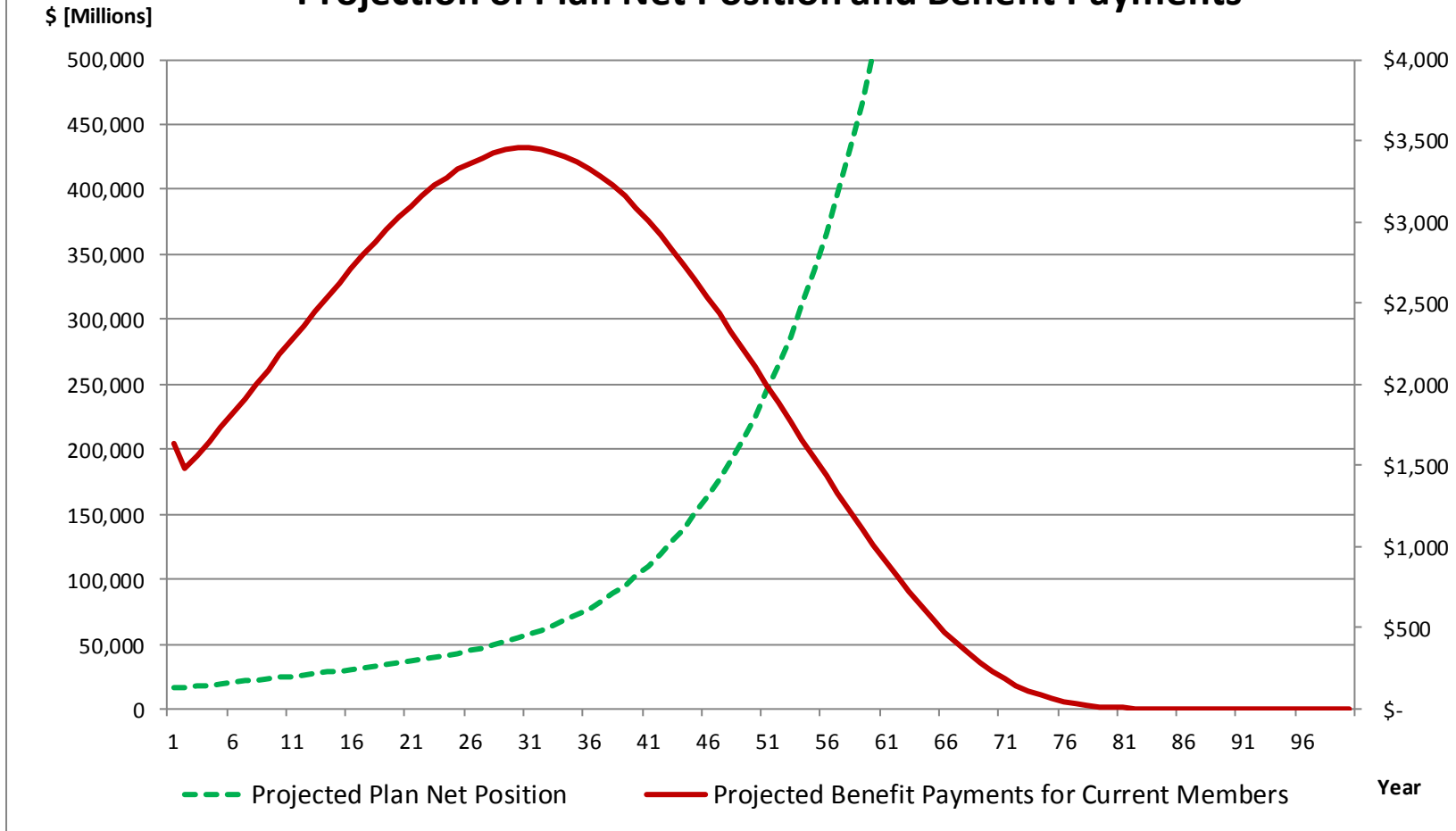
Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^{(a)-5}	(g)=(e)*vf ^{(a)-5}	(h)=((c)/(1+sdr) ^{(a)-5})
1	\$ 15,698,324,306	\$ 1,641,170,103	\$ 1,641,170,103	\$ -	\$ 1,586,579,024	\$ -	\$ 1,586,579,024
2	16,161,683,440	1,481,355,206	1,481,355,206	-	1,338,392,646	-	1,338,392,646
3	16,884,779,085	1,564,170,891	1,564,170,891	-	1,320,762,578	-	1,320,762,578
4	17,737,360,677	1,648,917,993	1,648,917,993	-	1,301,235,296	-	1,301,235,296
5	18,581,333,257	1,734,184,465	1,734,184,465	-	1,278,993,366	-	1,278,993,366
6	19,535,763,441	1,820,650,860	1,820,650,860	-	1,254,919,574	-	1,254,919,574
7	20,494,356,365	1,909,265,865	1,909,265,865	-	1,229,905,810	-	1,229,905,810
8	21,456,573,479	1,999,578,523	1,999,578,523	-	1,203,816,054	-	1,203,816,054
9	22,422,170,048	2,090,802,443	2,090,802,443	-	1,176,388,820	-	1,176,388,820
10	23,391,870,857	2,182,385,851	2,182,385,851	-	1,147,587,078	-	1,147,587,078
11	24,367,027,876	2,274,264,267	2,274,264,267	-	1,117,663,999	-	1,117,663,999
12	25,349,404,834	2,363,959,106	2,363,959,106	-	1,085,741,695	-	1,085,741,695
13	26,343,672,578	2,452,428,695	2,452,428,695	-	1,052,686,777	-	1,052,686,777
14	27,353,718,727	2,539,550,338	2,539,550,338	-	1,018,769,248	-	1,018,769,248
15	28,383,868,537	2,626,016,677	2,626,016,677	-	984,538,499	-	984,538,499
16	29,437,948,528	2,711,765,587	2,711,765,587	-	950,174,981	-	950,174,981
17	30,520,056,340	2,794,959,270	2,794,959,270	-	915,257,195	-	915,257,195
18	31,636,726,843	2,874,925,017	2,874,925,017	-	879,853,594	-	879,853,594
19	32,795,783,315	2,953,047,820	2,953,047,820	-	844,637,954	-	844,637,954
20	34,004,040,083	3,027,341,733	3,027,341,733	-	809,240,823	-	809,240,823
21	35,271,036,521	3,097,291,299	3,097,291,299	-	773,774,850	-	773,774,850
22	36,607,666,687	3,162,182,329	3,162,182,329	-	738,304,792	-	738,304,792
23	38,026,536,572	3,221,984,904	3,221,984,904	-	703,053,708	-	703,053,708
24	39,541,240,349	3,275,490,894	3,275,490,894	-	667,971,020	-	667,971,020
25	41,167,668,091	3,323,083,898	3,323,083,898	-	633,342,676	-	633,342,676
26	42,922,439,361	3,363,540,314	3,363,540,314	-	599,115,156	-	599,115,156
27	44,824,813,954	3,396,744,057	3,396,744,057	-	565,448,056	-	565,448,056
28	46,895,693,457	3,422,638,892	3,422,638,892	-	532,484,775	-	532,484,775
29	49,157,511,003	3,441,927,915	3,441,927,915	-	500,453,933	-	500,453,933
30	51,633,609,114	3,453,518,581	3,453,518,581	-	469,288,979	-	469,288,979
31	54,350,243,377	3,454,939,763	3,454,939,763	-	438,768,317	-	438,768,317
32	57,338,630,725	3,447,015,986	3,447,015,986	-	409,123,382	-	409,123,382
33	60,631,336,576	3,429,889,607	3,429,889,607	-	380,458,567	-	380,458,567
34	64,263,150,284	3,404,378,631	3,404,378,631	-	352,924,090	-	352,924,090
35	68,270,501,306	3,370,834,853	3,370,834,853	-	326,585,686	-	326,585,686
36	72,692,136,990	3,329,116,085	3,329,116,085	-	301,442,742	-	301,442,742
37	77,569,867,787	3,279,321,809	3,279,321,809	-	277,508,412	-	277,508,412
38	82,948,473,827	3,221,877,671	3,221,877,671	-	254,810,537	-	254,810,537
39	88,875,535,424	3,157,030,232	3,157,030,232	-	233,347,579	-	233,347,579
40	95,401,790,391	3,084,956,352	3,084,956,352	-	213,103,119	-	213,103,119
41	102,581,465,725	3,006,218,825	3,006,218,825	-	194,078,575	-	194,078,575
42	110,472,074,937	2,922,285,190	2,922,285,190	-	176,317,664	-	176,317,664
43	119,133,591,358	2,832,830,901	2,832,830,901	-	159,738,683	-	159,738,683
44	128,630,741,364	2,738,551,570	2,738,551,570	-	144,320,025	-	144,320,025
45	139,032,152,242	2,640,433,377	2,640,433,377	-	130,046,032	-	130,046,032
46	150,410,288,637	2,538,939,933	2,538,939,933	-	116,866,636	-	116,866,636
47	162,842,349,084	2,434,482,825	2,434,482,825	-	104,727,576	-	104,727,576
48	176,410,666,802	2,327,559,610	2,327,559,610	-	93,577,486	-	93,577,486
49	191,202,981,210	2,218,547,266	2,218,547,266	-	83,359,570	-	83,359,570
50	207,312,968,799	2,107,827,430	2,107,827,430	-	74,018,121	-	74,018,121

Single Discount Rate Development

PVs of Projected Benefit Payments Beginning July 1, 2017 (continued)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^{((a)-.5)}	(g)=(e)*vf ^{((a)-.5)}	(h)=(c)/((1+sdr) ^(a-.5))
51	\$ 224,840,660,392	\$ 1,995,830,994	\$ 1,995,830,994	\$ -	\$ 65,500,255	\$ -	\$ 65,500,255
52	243,892,841,662	1,883,121,259	1,883,121,259	-	57,758,211	-	57,758,211
53	264,583,384,727	1,770,159,917	1,770,159,917	-	50,741,602	-	50,741,602
54	287,033,870,580	1,657,458,028	1,657,458,028	-	44,402,808	-	44,402,808
55	311,374,075,192	1,545,537,935	1,545,537,935	-	38,695,796	-	38,695,796
56	337,742,537,122	1,434,786,000	1,434,786,000	-	33,572,793	-	33,572,793
57	366,287,334,697	1,325,554,435	1,325,554,435	-	28,987,725	-	28,987,725
58	397,166,801,202	1,218,208,250	1,218,208,250	-	24,897,419	-	24,897,419
59	430,550,238,087	1,113,118,446	1,113,118,446	-	21,261,328	-	21,261,328
60	466,618,687,276	1,010,670,363	1,010,670,363	-	18,041,588	-	18,041,588
61	505,565,748,321	911,275,118	911,275,118	-	15,203,058	-	15,203,058
62	547,598,440,828	815,381,563	815,381,563	-	12,713,308	-	12,713,308
63	592,938,115,089	723,469,412	723,469,412	-	10,542,268	-	10,542,268
64	641,821,433,941	636,039,935	636,039,935	-	8,661,927	-	8,661,927
65	694,501,433,334	553,611,820	553,611,820	-	7,046,147	-	7,046,147
66	751,248,661,824	476,673,016	476,673,016	-	5,670,001	-	5,670,001
67	812,352,450,029	405,639,913	405,639,913	-	4,509,407	-	4,509,407
68	878,122,311,593	340,842,467	340,842,467	-	3,541,186	-	3,541,186
69	948,889,458,019	282,500,979	282,500,979	-	2,743,034	-	2,743,034
70	1,025,008,444,016	230,700,214	230,700,214	-	2,093,512	-	2,093,512
71	1,106,858,955,243	185,410,804	185,410,804	-	1,572,457	-	1,572,457
72	1,194,847,699,528	146,472,895	146,472,895	-	1,160,960	-	1,160,960
73	1,289,410,447,873	113,591,818	113,591,818	-	841,440	-	841,440
74	1,391,014,223,328	86,356,054	86,356,054	-	597,840	-	597,840
75	1,500,159,625,012	64,267,878	64,267,878	-	415,817	-	415,817
76	1,617,383,283,670	46,755,399	46,755,399	-	282,720	-	282,720
77	1,743,260,477,228	33,210,939	33,210,939	-	187,682	-	187,682
78	1,878,407,890,309	23,020,784	23,020,784	-	121,584	-	121,584
79	2,023,486,536,750	15,589,087	15,589,087	-	76,947	-	76,947
80	2,179,204,862,594	10,352,769	10,352,769	-	47,758	-	47,758
81	2,346,322,051,518	6,794,568	6,794,568	-	29,293	-	29,293
82	2,525,651,548,812	4,460,779	4,460,779	-	17,974	-	17,974
83	2,718,064,814,379	2,976,596	2,976,596	-	11,209	-	11,209
84	2,924,495,323,285	2,052,702	2,052,702	-	7,224	-	7,224
85	3,145,942,840,279	1,478,165	1,478,165	-	4,862	-	4,862
86	3,383,478,001,638	1,110,216	1,110,216	-	3,413	-	3,413
87	3,638,247,229,107	861,729	861,729	-	2,476	-	2,476
88	3,911,478,001,588	682,903	682,903	-	1,833	-	1,833
89	4,204,484,515,645	546,266	546,266	-	1,371	-	1,371
90	4,518,673,758,638	437,052	437,052	-	1,025	-	1,025
91	4,855,552,017,830	347,248	347,248	-	761	-	761
92	5,216,731,852,245	272,511	272,511	-	558	-	558
93	5,603,939,556,711	210,571	210,571	-	403	-	403
94	6,019,023,151,044	159,539	159,539	-	285	-	285
95	6,463,960,931,281	117,868	117,868	-	197	-	197
96	6,940,870,620,603	84,429	84,429	-	132	-	132
97	7,452,019,161,880	58,396	58,396	-	85	-	85
98	7,999,833,196,956	39,084	39,084	-	53	-	53
99	8,586,910,280,859	25,384	25,384	-	32	-	32
100	9,216,030,882,825	16,073	16,073	-	19	-	19
Totals					\$ 33,607,477,538	\$ -	\$ 33,607,477,538

Projection of Plan Net Position and Benefit Payments



SECTION F

GASB No. 68 INFORMATION

GASB No. 68 Disclosure Information

This section of the report shows the GASB No. 68 information for the employers covered by ERS. Pages F-1, F-2 and F-3 show the aggregate pension expense and Deferred Outflows and (Inflows) of resources for the employers with employees covered by ERS. Pages F-4 through F-6 show the disclosure information for the individual employers that need to be incorporated into the employers' financial statements.

Page F-4 shows the employers their proportionate share of the Net Pension Liability and Pension Expense. Page F-5 shows the employers their deferred inflows and outflows by component. Page F-6 shows the employers the deferred outflows and inflows of resources to be recognized in future years' pension expense.

Pension Expense

The table below shows the aggregate Pension Expense for the ERS employers for the fiscal year ending June 30, 2016. Pension Expense for each employer is determined on a proportionate share basis and is shown on page F-4.

A. Expense

1. Service Cost	\$ 576,724,568
2. Interest on the Total Pension Liability	1,894,622,190
3. Current-Period Benefit Changes	0
4. Employee Contributions (made negative for addition here)	(250,704,067)
5. Projected Earnings on Plan Investments (made negative for addition here)	(974,182,675)
6. Pension Plan Administrative Expense	14,986,159
7. Other Changes in Plan Fiduciary Net Position	0
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	592,370,865
9. Recognition of Outflow (Inflow) of Resources due to Assets	(77,869,420)
10. Total Pension Expense	\$ 1,775,947,621

Recognition of Deferred Outflows and Inflows of Resources

According to paragraph 33 of GASB No. 68, *differences between expected and actual experience and changes in assumptions* are recognized in pension expense using a systematic and rational method over a closed period equal to the average of the expected remaining service lives of all employees that are provided with pensions through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.

At the beginning of the 2017 fiscal year, the expected remaining service lives of all employees was 765,702 years. Additionally, the plan membership (active employees and inactive employees) was 135,178. As a result, the average of the expected remaining service lives for purposes of recognizing the applicable deferred outflows and inflows of resources established in the 2017 fiscal year is 5.6644 years.

Additionally, *differences between projected and actual earnings on pension plan investments* should be recognized in pension expense using a systematic and rational method over a closed five-year period.

For this purpose, the deferred outflows and inflows of resources are recognized in the pension expense as a level dollar amount over the closed period identified above.

The current year's Deferred Outflows and (Inflows) are shown below. The aggregate Deferred Outflows and (Inflows) for the current and prior reporting periods is shown on the following page. The amounts by employer are shown on pages F-5 and F-6.

Statement of Outflows and Inflows Arising from Current Reporting Period for Fiscal Year Ending June 30, 2017

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ 61,179,390
2. Assumption Changes (gains) or losses	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	5.6644
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the Difference between expected and actual experience of the Total Pension Liability	\$ 10,800,684
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ -
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 10,800,684
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the Difference between expected and actual experience of the Total Pension Liability	\$ 50,378,706
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$ -
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$ 50,378,706

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (960,329,832)
2. Recognition period for Assets {in years}	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$ (192,065,967)
3. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (768,263,865)

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods for Fiscal Year Ending June 30, 2017

A. Outflows and Inflows of Resources due to Liabilities and Assets to be recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. due to Liabilities	\$ 644,954,651	\$ 52,583,786	\$ 592,370,865
2. due to Assets	\$ 360,662,473	\$ 438,531,893	\$ (77,869,420)
3. Total	\$ 1,005,617,124	\$ 491,115,679	\$ 514,501,446

B. Outflows and Inflows of Resources by Source to be recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 91,535,002	\$ 52,583,786	\$ 38,951,216
2. Assumption Changes	553,419,649	-	553,419,649
3. Net Difference between projected and actual earnings on pension plan investments	360,662,473	438,531,893	(77,869,420)
4. Total	\$ 1,005,617,124	\$ 491,115,679	\$ 514,501,446

C. Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 304,048,213	\$ 126,886,562	\$ 177,161,650
2. Assumption Changes	2,022,885,441	-	2,022,885,441
3. Net Difference between projected and actual earnings on pension plan investments	975,096,368	1,014,729,792	(39,633,424)
4. Total	\$ 3,302,030,022	\$ 1,141,616,354	\$ 2,160,413,667

D. Deferred Outflows and Deferred Inflows of Resources by Year to be recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2018	\$ 514,501,446
2019	758,273,832
2020	636,471,362
2021	243,991,058
2022	7,175,970
Thereafter	0
Total	\$ 2,160,413,667

**Schedule of Employer Allocations
and Pension Amounts
At June 30, 2017
Exhibit 1**

Employer	Proportionate Share as of June 30, 2017	Change in Proportioante Share	Proportionate Share of Net Pension Liability as of June 30, 2017 7.00%	Sensitivity Analysis		Proportionate Share of Pension Expense as of June 30, 2017
				Proportionate Share of Net Pension Liability 1% Decrease 6.00%	Proportionate Share of Net Pension Liability 1% Increase 8.00%	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
State of Hawaii	56.60727814%	0.00762501%	7,330,815,866	9,502,983,736	5,539,752,373	984,664,941
City and County of Honolulu	17.81599000%	-0.35176824%	2,307,225,262	3,029,030,120	1,712,060,245	335,429,079
County of Hawaii	4.70957357%	0.08606163%	609,904,199	800,723,468	452,563,954	92,637,465
County of Maui	4.62122285%	0.19031483%	598,462,510	784,170,433	445,336,831	87,966,688
County of Kauai	2.10364301%	0.06345222%	272,428,212	356,688,348	202,951,421	39,048,596
BWS City and County of Honolulu	0.87527115%	0.00504376%	113,350,294	146,890,615	85,694,584	16,930,371
DWS County of Hawaii	0.21903307%	0.00026540%	28,365,453	36,758,783	21,444,724	4,034,664
DOW County of Kauai	0.11909771%	-0.00746980%	15,423,518	19,987,333	11,660,419	2,145,423
HART	0.19868498%	0.02544857%	25,730,313	33,343,906	19,452,517	4,132,110
University of Hawaii	12.73020553%	-0.01897337%	1,648,600,600	2,136,421,071	1,246,367,675	208,958,283

Schedule of Employer Allocations
and Pension Amounts
At June 30, 2017
Exhibit 2

Deferred Outflows and Inflows of Resources by Source to be recognized in Future Pension Expenses

Employer	Deferred Outflows					Deferred Inflows				
	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
State of Hawaii	121,929,685	539,213,977	1,121,481,015	33,389,598	1,816,014,275	78,012,373	560,978,900	0	17,262,902	656,254,175
City and County of Honolulu	95,294,908	184,181,186	379,753,209	29,911,422	689,140,725	17,537,191	191,791,727	0	50,413,044	259,741,962
County of Hawaii	25,210,950	48,692,568	100,395,484	19,641,234	193,940,236	4,633,386	50,704,649	0	5,834,475	61,172,510
County of Maui	22,453,373	47,198,132	97,436,807	18,094,225	185,182,537	4,828,054	49,141,944	0	7,907,388	61,877,386
County of Kauai	9,808,463	21,380,301	44,160,349	9,386,253	84,735,366	2,248,652	22,259,637	0	7,316,216	31,824,505
BWS City and County of Honolulu	1,816,533	8,319,930	17,308,162	5,304,832	32,749,457	1,214,716	8,655,544	0	2,825,289	12,695,549
DWS County of Hawaii	454,580	2,082,029	4,331,298	1,670,417	8,538,324	303,978	2,166,015	0	1,443,617	3,913,610
DOW County of Kauai	247,175	1,132,089	2,355,113	615,280	4,349,657	165,286	1,177,756	0	707,101	2,050,143
HART	412,350	1,888,609	3,928,922	2,756,511	8,986,392	275,738	1,964,793	0	135,158	2,375,689
University of Hawaii	26,420,197	121,007,548	251,735,082	1,688,930	400,851,757	17,667,189	125,888,820	0	28,613,512	172,169,521

**Schedule of Employer Allocations
and Pension Amounts**

At June 30, 2017

Exhibit 3

Deferred Outflows and (Inflows) to be Recognized in Future Years

Employer	Total Deferred Outflow and (Inflow) 2018	Total Deferred Outflow and (Inflow) 2019	Total Deferred Outflow and (Inflow) 2020	Total Deferred Outflows of 2021	Total Deferred Outflows of 2022	Total Deferred Outflows of Thereafter
(1)	(2)	(3)	(4)	(5)	(6)	(7)
State of Hawaii	273,543,052	406,986,928	342,299,640	134,166,160	2,764,322	-
City and County of Honolulu	108,273,692	154,512,553	125,716,051	42,855,670	(1,959,203)	-
County of Hawaii	32,588,815	45,136,179	38,035,894	15,338,866	1,667,973	-
County of Maui	29,178,768	41,133,124	34,986,430	15,082,405	2,924,423	-
County of Kauai	12,311,784	17,968,847	15,482,045	6,080,184	1,068,001	-
BWS City and County of Honolulu	5,938,927	7,581,136	4,891,051	1,537,695	105,099	-
DWS County of Hawaii	1,284,099	1,634,618	1,115,726	576,729	13,542	-
DOW County of Kauai	649,823	933,954	684,485	121,322	(90,070)	-
HART	1,637,072	2,058,963	1,660,050	919,750	334,868	-
University of Hawaii	49,095,421	80,327,529	71,599,989	27,312,280	347,015	-

SECTION G

GLOSSARY OF TERMS

Glossary of Terms

Actuarial Accrued Liability (AAL)

The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability".

Actuarial Assumptions

These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.

Accrued Service

Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Equivalent

A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

Actuarial Cost Method

A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.

Actuarial Gain (Loss)

The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.

Actuarial Present Value

The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.

Actuarial Valuation

The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.

Actuarial Valuation Date

The date as of which an actuarial valuation is performed.

Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)

A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms (continued)

Amortization Payment

The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method

The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).

Cost-of-Living Adjustments

Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)

A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll

The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.

Deferred Retirement Option Program (DROP)

A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.

Deferred Inflows and Outflows

The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms (continued)

Entry Age Actuarial Cost Method (EAN)

The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Fiduciary Net Position

The fiduciary net position is the value of the assets of the trust.

Long-Term Expected Rate of Return

The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.

Money-Weighted Rate of Return

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

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.

Net Pension Liability (NPL)

The NPL is the liability of employers and nonemployer contribution entities to plan members for benefits provided through a defined benefit pension plan.

Nonemployer Contribution Entities

Nonemployer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting statement plan members are not considered nonemployer contribution entities.

Glossary of Terms (continued)

Normal Cost

The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

Other Postemployment Benefits (OPEB)

All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.

Real Rate of Return

The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.

Service Cost

The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

Total Pension Expense

The total pension expense is the sum of the following pension expense items that are recognized from the beginning to the end of the employer's fiscal year:

1. Total service cost;
2. Interest on total pension liability;
3. Current-period benefit changes;
4. Member contributions;
5. Projected earnings on plan investments;
6. Administrative expense;
7. Other Changes in Plan Fiduciary Net Position;
8. Recognition of beginning deferred outflows (inflows) due to liabilities; and
9. Recognition of beginning deferred outflows (inflows) due to assets.

Total Pension Liability (TPL)

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL)

The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets

The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of the GASB Statement No. 67, the valuation asset is equal to the market value of assets.