

Employees' Retirement System of the State of Hawaii

GASB Statement Nos. 67 and 68 Accounting and
Financial Reporting for Pensions

June 30, 2022



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March 24, 2023

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

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, 2022, but it is intended that the employers covered by ERS will use this information in financial reporting for their fiscal years ending June 30, 2023.

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.

Section F 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, 2022 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 _____
Joseph P. Newton, FSA, EA
Pension Market Leader & Actuary



SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2022

| | 2022 |
|---|-------------------|
| Actuarial Valuation Date | June 30, 2022 |
| Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date) | June 30, 2022 |
| Membership | |
| Number of | |
| - Retirees and Beneficiaries | 53,990 |
| - Inactive, Nonretired Members | 33,903 |
| - Active Members | 64,234 |
| - Total | 152,127 |
| Reported Payroll for Fiscal Year | \$ 4,483,686,505 |
| Net Pension Liability | |
| Total Pension Liability | \$ 34,822,778,620 |
| Plan Fiduciary Net Position | 21,854,814,032 |
| Net Pension Liability | \$ 12,967,964,588 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | 62.76% |
| Net Pension Liability as a Percentage of Covered Payroll | 289.23% |
| Development of the Single Discount Rate | |
| Single Discount Rate | 7.00% |
| Long-Term Expected Rate of Return | 7.00% |
| Long-Term Municipal Bond Rate* | 3.69% |
| Last year ending June 30 in the 2022 to 2121 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, 2022. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.*



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

Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.00% the municipal bond rate is 3.69% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting single discount rate is 7.00%.

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, 2022

| | 2022 |
|---|------------------------------|
| Assets | |
| Cash and Deposits | \$ 1,008,317,872 |
| Receivables | |
| Accounts receivable and others | \$ 2,622,869 |
| Investment sales proceeds | 39,940,051 |
| Accrued investment income | 28,852,378 |
| Employer contributions | 84,468,296 |
| Member contributions | - |
| Other | - |
| Total Receivables | \$ 155,883,594 |
| Investments | |
| Equity securities | \$ 5,360,412,415 |
| Fixed income securities | 3,262,952,343 |
| Real estate investments | 3,372,222,912 |
| Alternative investments | 8,825,905,906 |
| Total Investments | \$ 20,821,493,576 |
| Invested Securities Lending Collateral | \$ 735,926,602 |
| Equipment at cost, net of depreciation | \$ 4,984,223 |
| Total Assets | \$ 22,726,605,867 |
| Liabilities | |
| Payables | |
| Accounts and other payables | \$ 111,219,287 |
| Payables for securities purchased | 24,645,946 |
| Securities lending collateral | 735,926,602 |
| Notes payable | - |
| Total Liabilities | \$ 871,791,835 |
| Net Position Restricted for Pensions | \$ 21,854,814,032 |



Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2022

| | Year Ending June 30, 2022 |
|---|------------------------------|
| Additions | |
| Contributions | |
| Non-Employer Contributing Entity | \$ - |
| Employer | 1,242,139,095 |
| Employer (picked-up employee contributions) | 292,422,087 |
| Employee | 605,473 |
| Other | - |
| Total Contributions | \$ 1,535,166,655 |
| Investment Income | |
| Net Appreciation in Fair Value of Investments | \$ (427,662,487) |
| Interest and Dividends | 268,772,564 |
| Less Investment Expense | (212,497,577) |
| Net Investment Income | \$ (371,387,500) |
| Other | \$ 535,946,535 |
| Total Additions | \$ 1,699,725,690 |
| Deductions | |
| Benefit payments, including refunds of employee contributions | \$ 1,763,205,748 |
| Pension Plan Administrative Expense | 17,497,621 |
| Other | - |
| Total Deductions | \$ 1,780,703,369 |
| Net Increase in Net Position | \$ (80,977,679) |
| Net Position Restricted for Pensions | |
| Beginning of Year | \$ 21,935,791,711 |
| End of Year | \$ 21,854,814,032 |



SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in the Net Pension Liability and Related Ratios Fiscal Year Ended June 30, 2022

| | |
|--|---------------------------------|
| A. Total pension liability | |
| 1. Service Cost | \$ 613,550,345 |
| 2. Interest on the Total Pension Liability | 2,349,503,644 |
| 3. Changes of benefit terms | 0 |
| 4. Difference between expected and actual experience of the Total Pension Liability | (361,275,093) |
| 5. Changes of assumptions | (154,960,000) |
| 6. Benefit payments, including refunds of employee contributions | (1,763,205,748) |
| 7. Net change in total pension liability | \$ 683,613,148 |
| 8. Total pension liability – beginning | 34,139,165,472 |
| 9. Total pension liability – ending | <u><u>\$ 34,822,778,620</u></u> |
| B. Plan fiduciary net position | |
| 1. Contributions – employer | \$ 1,242,139,095 |
| 2. Contributions – employer (picked-up employee contributions) | 292,422,087 |
| 3. Contributions – employee | 605,473 |
| 4. Net investment income | 164,559,035 |
| 5. Benefit payments, including refunds of employee contributions | (1,763,205,748) |
| 6. Pension Plan Administrative Expense | (17,497,621) |
| 7. Other | - |
| 8. Net change in plan fiduciary net position | \$ (80,977,679) |
| 9. Plan fiduciary net position – beginning | 21,935,791,711 |
| 10. Plan fiduciary net position – ending | <u><u>\$ 21,854,814,032</u></u> |
| C. Net pension liability | <u><u>\$ 12,967,964,588</u></u> |
| D. Plan fiduciary net position as a percentage of the total pension liability | 62.76% |
| E. Covered-employee payroll | \$ 4,483,686,505 |
| F. Net pension liability as a percentage of covered employee payroll | 289.23% |



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 |
|-----------------------|-------------------------------|----------------------|--------------------------|---|--------------------|---|
| 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% |
| 2018 | 29,917,401,383 | 16,598,407,973 | 13,318,993,410 | 55.48% | 4,256,052,840 | 312.94% |
| 2019 | 31,396,447,685 | 17,227,026,987 | 14,169,420,698 | 54.87% | 4,376,216,753 | 323.78% |
| 2020 | 32,691,755,844 | 17,385,480,476 | 15,306,275,368 | 53.18% | 4,481,443,808 | 341.55% |
| 2021 | 34,139,165,472 | 21,935,791,711 | 12,203,373,761 | 64.25% | 4,667,346,006 | 261.46% |
| 2022 | 34,822,778,620 | 21,854,814,032 | 12,967,964,588 | 62.76% | 4,483,686,505 | 289.23% |



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,

| | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------|
| Total Pension Liability | | | | | | | | | | |
| Service Cost | \$ 613,550,345 | \$ 642,140,242 | \$ 643,407,238 | \$ 619,504,278 | \$ 584,470,193 | \$ 576,724,568 | \$ 484,278,499 | \$ 437,901,029 | \$ 421,956,129 | |
| Interest on the Total Pension Liability | 2,349,503,644 | 2,252,271,074 | 2,165,389,424 | 2,063,885,936 | 1,976,275,120 | 1,894,622,190 | 1,748,619,873 | 1,693,252,684 | 1,618,917,776 | |
| Benefit Changes | - | - | - | - | - | - | - | - | - | |
| Difference between Expected and Actual Experience | (361,275,093) | 228,048,119 | 54,544,851 | 221,473,495 | 124,753,379 | 61,179,390 | 297,534,219 | (192,816,757) | 66,400,876 | |
| Assumption Changes | (154,960,000) | - | - | 60,320,037 | - | - | 2,915,922,677 | 261,213,541 | - | |
| Benefit Payments | (1,738,751,492) | (1,651,431,372) | (1,545,589,761) | (1,469,634,809) | (1,395,881,342) | (1,306,788,954) | (1,232,589,353) | (1,170,744,770) | (1,122,445,642) | |
| Refunds | (24,454,256) | (23,618,435) | (22,443,593) | (16,502,635) | (20,846,500) | (16,340,290) | (12,927,672) | (10,507,888) | (8,475,969) | |
| Net Change in Total Pension Liability | 683,613,148 | 1,447,409,628 | 1,295,308,159 | 1,479,046,302 | 1,268,770,850 | 1,209,396,904 | 4,200,838,243 | 1,018,297,839 | 976,353,170 | |
| Total Pension Liability - Beginning | 34,139,165,472 | 32,691,755,844 | 31,396,447,685 | 29,917,401,383 | 28,648,630,533 | 27,439,233,629 | 23,238,395,386 | 22,220,097,547 | 21,243,744,377 | |
| Total Pension Liability - Ending (a) | \$ 34,822,778,620 | \$ 34,139,165,472 | \$ 32,691,755,844 | \$ 31,396,447,685 | \$ 29,917,401,383 | \$ 28,648,630,533 | \$ 27,439,233,629 | \$ 23,238,395,386 | \$ 22,220,097,547 | |
| Plan Fiduciary Net Position | | | | | | | | | | |
| Employer Contributions | \$ 1,242,139,095 | \$ 1,281,558,696 | \$ 1,098,589,013 | \$ 922,635,334 | \$ 847,595,466 | \$ 781,244,218 | \$ 756,558,222 | \$ 717,792,981 | \$ 653,127,697 | |
| Employer Contributions (picked-up employee contributions) | 292,422,087 | 299,473,128 | 284,142,994 | 270,764,670 | 257,294,033 | 249,211,751 | 235,079,968 | 221,909,859 | 204,821,010 | |
| Employee Contributions | 605,473 | 1,153,318 | 3,255,037 | 2,458,908 | 2,133,901 | 1,492,316 | 1,721,893 | 1,595,560 | 1,306,327 | |
| Pension Plan Net Investment Income | 164,559,035 | 4,662,225,761 | 358,282,664 | 932,696,412 | 1,225,572,599 | 1,934,512,507 | (169,368,110) | 556,436,475 | 2,175,479,960 | |
| Benefit Payments | (1,738,751,492) | (1,651,431,372) | (1,545,589,761) | (1,469,634,809) | (1,395,881,342) | (1,306,788,954) | (1,232,589,353) | (1,170,744,770) | (1,122,445,642) | |
| Refunds | (24,454,256) | (23,618,435) | (22,443,593) | (16,502,635) | (20,846,500) | (16,340,290) | (12,927,672) | (10,507,888) | (8,475,969) | |
| Pension Plan Administrative Expense | (17,497,621) | (19,049,861) | (17,782,865) | (13,798,866) | (15,784,490) | (14,986,159) | (13,960,587) | (14,032,964) | (12,626,030) | |
| Other | - | - | - | - | - | - | - | - | - | |
| Net Change in Plan Fiduciary Net Position | (80,977,679) | 4,550,311,235 | 158,453,489 | 628,619,014 | 900,083,667 | 1,628,345,389 | (435,485,639) | 302,449,253 | 1,891,187,353 | |
| Plan Fiduciary Net Position - Beginning | 21,935,791,711 | 17,385,480,476 | 17,227,026,987 | 16,598,407,973 | 15,698,324,306 | 14,069,978,917 | 14,505,464,556 | 14,203,015,303 | 12,311,827,950 | |
| Plan Fiduciary Net Position - Ending (b) | \$ 21,854,814,032 | \$ 21,935,791,711 | \$ 17,385,480,476 | \$ 17,227,026,987 | \$ 16,598,407,973 | \$ 15,698,324,306 | \$ 14,069,978,917 | \$ 14,505,464,556 | \$ 14,203,015,303 | |
| Net Pension Liability - Ending (a) - (b) | 12,967,964,588 | 12,203,373,761 | 15,306,275,368 | 14,169,420,698 | 13,318,993,410 | 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 | 62.76 % | 64.25 % | 53.18 % | 54.87 % | 55.48 % | 54.80 % | 51.28 % | 62.42 % | 63.92 % | |
| Covered Employee Payroll | \$ 4,483,686,505 | \$ 4,667,346,006 | \$ 4,481,443,808 | \$ 4,376,216,753 | \$ 4,256,052,840 | \$ 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 | 289.23 % | 261.46 % | 341.55 % | 323.78 % | 312.94 % | 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% |
| \$17,561,685,932 | \$12,967,964,588 | \$9,165,239,778 |

Summary of Population Statistics

| | |
|---|---------|
| Inactive Plan Members or Beneficiaries Currently Receiving Benefits | 53,990 |
| Inactive Plan Members Entitled to But Not Yet Receiving Benefits | 33,903 |
| Active Plan Members | 64,234 |
| Total Plan Members | 152,127 |



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 3.69% (based on the daily rate closest to but not later than the measurement date of the Fidelity “20-Year Municipal GO AA Index”); and the resulting single discount rate is 7.00%.

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.



Single Discount Rate Development

Projection of Contributions Beginning July 1, 2022

| 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 | 4,491,835,605 | \$ 122,155,331 | \$ 4,613,990,936 | \$ 296,011,966 | \$ 1,164,380,687 | \$ 25,403,164 | \$ 1,485,795,817 |
| 2 | 4,328,096,004 | \$ 420,162,068 | 4,748,258,072 | 292,579,290 | 1,121,983,219 | 87,380,613 | 1,501,943,122 |
| 3 | 4,193,818,260 | \$ 692,614,122 | 4,886,432,382 | 288,954,078 | 1,087,072,248 | 144,025,333 | 1,520,051,659 |
| 4 | 4,070,272,156 | \$ 958,355,408 | 5,028,627,564 | 285,733,105 | 1,054,781,060 | 199,221,915 | 1,539,736,080 |
| 5 | 3,954,030,108 | \$ 1,220,930,518 | 5,174,960,627 | 282,713,153 | 1,024,280,040 | 253,689,111 | 1,560,682,304 |
| 6 | 3,840,271,060 | \$ 1,485,280,921 | 5,325,551,981 | 279,187,706 | 994,486,848 | 308,491,335 | 1,582,165,889 |
| 7 | 3,729,047,511 | \$ 1,751,478,033 | 5,480,525,543 | 275,576,611 | 965,451,837 | 363,671,114 | 1,604,699,562 |
| 8 | 3,618,330,665 | \$ 2,021,678,171 | 5,640,008,837 | 271,736,633 | 936,362,367 | 419,537,208 | 1,627,636,208 |
| 9 | 3,507,360,038 | \$ 2,296,773,056 | 5,804,133,094 | 266,910,099 | 907,645,058 | 476,624,702 | 1,651,179,859 |
| 10 | 3,393,592,268 | \$ 2,579,441,099 | 5,973,033,367 | 261,985,323 | 878,203,897 | 535,283,772 | 1,675,472,992 |
| 11 | 3,278,228,309 | \$ 2,868,620,329 | 6,146,848,638 | 256,357,454 | 848,349,668 | 595,294,039 | 1,700,001,161 |
| 12 | 3,163,890,669 | \$ 3,161,831,264 | 6,325,721,933 | 250,580,141 | 818,761,034 | 656,140,963 | 1,725,482,138 |
| 13 | 3,049,941,071 | \$ 3,459,859,371 | 6,509,800,442 | 244,300,280 | 789,272,818 | 717,987,542 | 1,751,560,640 |
| 14 | 2,933,443,905 | \$ 3,765,791,729 | 6,699,235,634 | 237,608,956 | 759,125,335 | 781,474,406 | 1,778,208,697 |
| 15 | 2,815,550,672 | \$ 4,078,632,720 | 6,894,183,391 | 230,593,600 | 728,616,574 | 846,394,945 | 1,805,605,119 |
| 16 | 2,696,270,852 | \$ 4,398,533,276 | 7,094,804,128 | 222,981,599 | 697,748,987 | 912,780,480 | 1,833,511,066 |
| 17 | 2,576,651,669 | \$ 4,724,611,259 | 7,301,262,928 | 214,892,749 | 666,793,580 | 980,447,949 | 1,862,134,278 |
| 18 | 2,457,366,079 | \$ 5,056,363,601 | 7,513,729,679 | 206,664,487 | 635,924,500 | 1,049,292,958 | 1,891,881,945 |
| 19 | 2,338,159,910 | \$ 5,394,219,303 | 7,732,379,213 | 198,042,144 | 605,075,973 | 1,119,404,532 | 1,922,522,649 |
| 20 | 2,216,968,762 | \$ 5,740,422,686 | 7,957,391,448 | 189,107,435 | 573,713,768 | 1,191,248,410 | 1,954,069,613 |
| 21 | 2,094,366,710 | \$ 6,094,584,829 | 8,188,951,539 | 179,696,664 | 541,986,444 | 1,264,743,885 | 1,986,426,993 |
| 22 | 1,971,051,648 | \$ 6,456,198,381 | 8,427,250,029 | 169,904,652 | 510,074,606 | 1,339,785,671 | 2,019,764,929 |
| 23 | 1,845,296,530 | \$ 6,827,186,474 | 8,672,483,005 | 159,618,150 | 477,531,322 | 1,416,772,854 | 2,053,922,326 |
| 24 | 1,717,761,180 | \$ 7,207,091,080 | 8,924,852,260 | 149,101,670 | 444,527,345 | 1,495,610,387 | 2,089,239,402 |
| 25 | 1,589,133,498 | \$ 7,595,431,963 | 9,184,565,461 | 138,413,528 | 411,240,691 | 1,576,198,609 | 2,125,852,828 |
| 26 | 1,461,856,668 | \$ 7,989,979,648 | 9,451,836,316 | 127,620,087 | 378,303,615 | 1,658,074,862 | 2,163,998,564 |
| 27 | 1,334,500,677 | \$ 8,392,384,076 | 9,726,884,753 | 116,768,809 | 345,346,053 | 1,741,581,541 | 2,203,696,403 |
| 28 | 1,206,274,949 | \$ 8,803,662,150 | 10,009,937,099 | 105,669,686 | 312,163,418 | 1,826,929,673 | 2,244,762,777 |
| 29 | 1,078,245,530 | \$ 9,222,980,739 | 10,301,226,269 | 94,669,958 | 279,031,584 | 1,913,946,367 | 2,287,647,909 |
| 30 | 952,172,296 | \$ 9,648,819,657 | 10,600,991,953 | 83,695,945 | 246,405,978 | 2,002,316,155 | 2,332,418,078 |
| 31 | 831,643,882 | \$ 10,077,836,937 | 10,909,480,819 | 73,101,497 | 215,215,276 | 2,091,345,514 | 2,379,662,287 |
| 32 | 718,831,781 | \$ 10,508,114,930 | 11,226,946,711 | 63,257,197 | 186,021,425 | 2,180,636,495 | 2,429,915,117 |
| 33 | 613,903,893 | \$ 10,939,746,968 | 11,553,650,860 | 54,023,543 | 158,867,875 | 2,270,208,467 | 2,483,099,885 |
| 34 | 518,157,145 | \$ 11,371,704,955 | 11,889,862,100 | 45,649,644 | 134,090,247 | 2,359,848,079 | 2,539,587,970 |
| 35 | 432,450,483 | \$ 11,803,406,604 | 12,235,857,087 | 38,098,888 | 111,910,822 | 2,449,434,497 | 2,599,444,207 |
| 36 | 357,182,824 | \$ 12,234,737,704 | 12,591,920,529 | 31,467,807 | 92,432,833 | 2,538,944,018 | 2,662,844,658 |
| 37 | 291,094,317 | \$ 12,667,251,098 | 12,958,345,416 | 25,674,519 | 75,330,253 | 2,628,698,888 | 2,729,703,660 |
| 38 | 234,787,695 | \$ 13,100,645,573 | 13,335,433,268 | 20,708,275 | 60,759,058 | 2,718,636,600 | 2,800,103,933 |
| 39 | 188,135,607 | \$ 13,535,358,769 | 13,723,494,376 | 16,593,561 | 48,686,292 | 2,808,847,971 | 2,874,127,824 |
| 40 | 149,658,991 | \$ 13,973,189,071 | 14,122,848,062 | 13,199,923 | 38,729,199 | 2,899,706,202 | 2,951,635,324 |
| 41 | 117,870,448 | \$ 14,415,952,492 | 14,533,822,941 | 10,407,961 | 30,502,865 | 2,991,588,151 | 3,032,498,977 |
| 42 | 92,021,526 | \$ 14,864,735,662 | 14,956,757,188 | 8,125,501 | 23,813,604 | 3,084,719,314 | 3,116,658,419 |
| 43 | 70,996,657 | \$ 15,321,002,166 | 15,391,998,822 | 6,269,005 | 18,372,726 | 3,179,403,412 | 3,204,045,143 |
| 44 | 54,051,351 | \$ 15,785,854,637 | 15,839,905,988 | 4,772,734 | 13,987,569 | 3,275,869,264 | 3,294,629,567 |
| 45 | 40,466,177 | \$ 16,260,381,075 | 16,300,847,252 | 3,577,210 | 10,471,958 | 3,374,342,651 | 3,388,391,819 |
| 46 | 29,949,465 | \$ 16,745,252,442 | 16,775,201,907 | 2,647,533 | 7,750,412 | 3,474,962,811 | 3,485,360,756 |
| 47 | 21,493,962 | \$ 17,241,866,321 | 17,263,360,283 | 1,902,216 | 5,562,271 | 3,578,019,768 | 3,585,484,255 |
| 48 | 14,912,547 | \$ 17,750,811,520 | 17,765,724,067 | 1,319,760 | 3,859,113 | 3,683,635,712 | 3,688,814,585 |
| 49 | 9,737,719 | \$ 18,272,968,918 | 18,282,706,637 | 861,788 | 2,519,956 | 3,791,993,441 | 3,795,375,185 |
| 50 | 6,075,086 | \$ 18,808,658,314 | 18,814,733,401 | 538,253 | 1,572,129 | 3,903,159,322 | 3,905,269,704 |



Single Discount Rate Development

Projection of Contributions Beginning July 1, 2022

(Continued)

| Year | Payroll for Current | | Total Employee Payroll | Employer Contributions for | | Employer Contributions for Future Employees | Total Contributions |
|------|---------------------|-------------------|------------------------|----------------------------|-------------------|---|---------------------|
| | Employees | Employees | | Current Employees | Current Employees | | |
| 51 | 3,432,406 | \$ 19,358,809,736 | 19,362,242,143 | 304,111 | 888,248 | 4,017,326,351 | 4,018,518,710 |
| 52 | 1,671,755 | \$ 19,924,011,634 | 19,925,683,389 | 148,285 | 432,622 | 4,134,616,645 | 4,135,197,552 |
| 53 | 775,900 | \$ 20,504,744,875 | 20,505,520,775 | 68,822 | 200,790 | 4,255,129,992 | 4,255,399,604 |
| 54 | 368,164 | \$ 21,101,863,266 | 21,102,231,430 | 32,693 | 95,275 | 4,379,043,573 | 4,379,171,541 |
| 55 | 138,812 | \$ 21,716,167,553 | 21,716,306,365 | 12,327 | 35,922 | 4,506,523,559 | 4,506,571,808 |
| 56 | 42,657 | \$ 22,348,208,223 | 22,348,250,880 | 3,792 | 11,039 | 4,637,684,187 | 4,637,699,018 |
| 57 | 7,166 | \$ 22,998,577,814 | 22,998,584,980 | 637 | 1,855 | 4,772,648,420 | 4,772,650,912 |
| 58 | - | \$ 23,667,843,803 | 23,667,843,803 | - | - | 4,911,534,019 | 4,911,534,019 |
| 59 | - | \$ 24,356,578,058 | 24,356,578,058 | - | - | 5,054,459,659 | 5,054,459,659 |
| 60 | - | \$ 25,065,354,480 | 25,065,354,480 | - | - | 5,201,544,435 | 5,201,544,435 |
| 61 | - | \$ 25,794,756,295 | 25,794,756,295 | - | - | 5,352,909,378 | 5,352,909,378 |
| 62 | - | \$ 26,545,383,703 | 26,545,383,703 | - | - | 5,508,679,041 | 5,508,679,041 |
| 63 | - | \$ 27,317,854,369 | 27,317,854,369 | - | - | 5,668,981,601 | 5,668,981,601 |
| 64 | - | \$ 28,112,803,931 | 28,112,803,931 | - | - | 5,833,948,966 | 5,833,948,966 |
| 65 | - | \$ 28,930,886,525 | 28,930,886,525 | - | - | 6,003,716,881 | 6,003,716,881 |
| 66 | - | \$ 29,772,775,323 | 29,772,775,323 | - | - | 6,178,425,042 | 6,178,425,042 |
| 67 | - | \$ 30,639,163,085 | 30,639,163,085 | - | - | 6,358,217,211 | 6,358,217,211 |
| 68 | - | \$ 31,530,762,731 | 31,530,762,731 | - | - | 6,543,241,332 | 6,543,241,332 |
| 69 | - | \$ 32,448,307,926 | 32,448,307,926 | - | - | 6,733,649,654 | 6,733,649,654 |
| 70 | - | \$ 33,392,553,687 | 33,392,553,687 | - | - | 6,929,598,859 | 6,929,598,859 |
| 71 | - | \$ 34,364,276,999 | 34,364,276,999 | - | - | 7,131,250,186 | 7,131,250,186 |
| 72 | - | \$ 35,364,277,460 | 35,364,277,460 | - | - | 7,338,769,566 | 7,338,769,566 |
| 73 | - | \$ 36,393,377,934 | 36,393,377,934 | - | - | 7,552,327,761 | 7,552,327,761 |
| 74 | - | \$ 37,452,425,232 | 37,452,425,232 | - | - | 7,772,100,499 | 7,772,100,499 |
| 75 | - | \$ 38,542,290,806 | 38,542,290,806 | - | - | 7,998,268,623 | 7,998,268,623 |
| 76 | - | \$ 39,663,871,469 | 39,663,871,469 | - | - | 8,231,018,240 | 8,231,018,240 |
| 77 | - | \$ 40,818,090,129 | 40,818,090,129 | - | - | 8,470,540,871 | 8,470,540,871 |
| 78 | - | \$ 42,005,896,551 | 42,005,896,551 | - | - | 8,717,033,610 | 8,717,033,610 |
| 79 | - | \$ 43,228,268,141 | 43,228,268,141 | - | - | 8,970,699,288 | 8,970,699,288 |
| 80 | - | \$ 44,486,210,744 | 44,486,210,744 | - | - | 9,231,746,638 | 9,231,746,638 |
| 81 | - | \$ 45,780,759,476 | 45,780,759,476 | - | - | 9,500,390,465 | 9,500,390,465 |
| 82 | - | \$ 47,112,979,577 | 47,112,979,577 | - | - | 9,776,851,827 | 9,776,851,827 |
| 83 | - | \$ 48,483,967,283 | 48,483,967,283 | - | - | 10,061,358,215 | 10,061,358,215 |
| 84 | - | \$ 49,894,850,731 | 49,894,850,731 | - | - | 10,354,143,740 | 10,354,143,740 |
| 85 | - | \$ 51,346,790,887 | 51,346,790,887 | - | - | 10,655,449,322 | 10,655,449,322 |
| 86 | - | \$ 52,840,982,502 | 52,840,982,502 | - | - | 10,965,522,898 | 10,965,522,898 |
| 87 | - | \$ 54,378,655,093 | 54,378,655,093 | - | - | 11,284,619,614 | 11,284,619,614 |
| 88 | - | \$ 55,961,073,956 | 55,961,073,956 | - | - | 11,613,002,045 | 11,613,002,045 |
| 89 | - | \$ 57,589,541,208 | 57,589,541,208 | - | - | 11,950,940,404 | 11,950,940,404 |
| 90 | - | \$ 59,265,396,857 | 59,265,396,857 | - | - | 12,298,712,770 | 12,298,712,770 |
| 91 | - | \$ 60,990,019,906 | 60,990,019,906 | - | - | 12,656,605,312 | 12,656,605,312 |
| 92 | - | \$ 62,764,829,485 | 62,764,829,485 | - | - | 13,024,912,526 | 13,024,912,526 |
| 93 | - | \$ 64,591,286,023 | 64,591,286,023 | - | - | 13,403,937,481 | 13,403,937,481 |
| 94 | - | \$ 66,470,892,446 | 66,470,892,446 | - | - | 13,793,992,061 | 13,793,992,061 |
| 95 | - | \$ 68,405,195,416 | 68,405,195,416 | - | - | 14,195,397,230 | 14,195,397,230 |
| 96 | - | \$ 70,395,786,603 | 70,395,786,603 | - | - | 14,608,483,290 | 14,608,483,290 |
| 97 | - | \$ 72,444,303,993 | 72,444,303,993 | - | - | 15,033,590,153 | 15,033,590,153 |
| 98 | - | \$ 74,552,433,239 | 74,552,433,239 | - | - | 15,471,067,627 | 15,471,067,627 |
| 99 | - | \$ 76,721,909,047 | 76,721,909,047 | - | - | 15,921,275,695 | 15,921,275,695 |
| 100 | - | \$ 78,954,516,600 | 78,954,516,600 | - | - | 16,384,584,818 | 16,384,584,818 |



Single Discount Rate Development

Projection of Plan Fiduciary Net Position Beginning July 1, 2022

| Year | Projected | | | | | |
|------|---------------------------------------|-------------------------------|----------------------------|-------------------------|--|------------------------------------|
| | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Administrative Expenses | Projected Investment Earnings at 7.00% | Projected Ending Plan Net Position |
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 1 | \$ 21,854,814,032 | \$ 1,485,795,817 | \$ 1,837,405,023 | \$ 18,006,802 | \$ 1,517,119,219 | \$ 23,002,317,244 |
| 2 | 23,002,317,244 | 1,501,943,122 | \$ 1,934,535,905 | 16,940,379 | 1,594,694,651 | \$ 24,147,478,732 |
| 3 | 24,147,478,732 | 1,520,051,659 | \$ 2,028,209,242 | 16,135,114 | 1,672,283,625 | \$ 25,295,469,661 |
| 4 | 25,295,469,661 | 1,539,736,080 | \$ 2,123,400,708 | 15,427,974 | 1,750,069,272 | \$ 26,446,446,331 |
| 5 | 26,446,446,331 | 1,560,682,304 | \$ 2,216,779,601 | 14,804,622 | 1,828,166,821 | \$ 27,603,711,232 |
| 6 | 27,603,711,232 | 1,582,165,889 | \$ 2,312,230,054 | 14,218,047 | 1,906,650,492 | \$ 28,766,079,512 |
| 7 | 28,766,079,512 | 1,604,699,562 | \$ 2,407,585,758 | 13,663,328 | 1,985,529,695 | \$ 29,935,059,683 |
| 8 | 29,935,059,683 | 1,627,636,208 | \$ 2,503,105,843 | 13,137,852 | 2,064,878,933 | \$ 31,111,331,129 |
| 9 | 31,111,331,129 | 1,651,179,859 | \$ 2,598,614,767 | 12,626,009 | 2,144,759,361 | \$ 32,296,029,574 |
| 10 | 32,296,029,574 | 1,675,472,992 | \$ 2,695,370,811 | 12,123,208 | 2,225,212,246 | \$ 33,489,220,793 |
| 11 | 33,489,220,793 | 1,700,001,161 | \$ 2,792,779,965 | 11,628,067 | 2,306,244,976 | \$ 34,691,058,897 |
| 12 | 34,691,058,897 | 1,725,482,138 | \$ 2,889,270,154 | 11,145,347 | 2,387,946,965 | \$ 35,904,072,499 |
| 13 | 35,904,072,499 | 1,751,560,640 | \$ 2,983,739,526 | 10,682,497 | 2,470,520,647 | \$ 37,131,731,762 |
| 14 | 37,131,731,762 | 1,778,208,697 | \$ 3,077,953,512 | 10,223,658 | 2,554,147,771 | \$ 38,375,911,061 |
| 15 | 38,375,911,061 | 1,805,605,119 | \$ 3,170,251,897 | 9,768,135 | 2,639,022,846 | \$ 39,640,518,993 |
| 16 | 39,640,518,993 | 1,833,511,066 | \$ 3,260,057,654 | 9,316,115 | 2,725,431,104 | \$ 40,930,087,394 |
| 17 | 40,930,087,394 | 1,862,134,278 | \$ 3,346,601,013 | 8,866,255 | 2,813,723,451 | \$ 42,250,477,857 |
| 18 | 42,250,477,857 | 1,891,881,945 | \$ 3,429,272,080 | 8,420,546 | 2,904,345,129 | \$ 43,609,012,305 |
| 19 | 43,609,012,305 | 1,922,522,649 | \$ 3,507,699,198 | 7,981,356 | 2,997,813,415 | \$ 45,013,667,816 |
| 20 | 45,013,667,816 | 1,954,069,613 | \$ 3,582,342,863 | 7,549,287 | 3,094,671,294 | \$ 46,472,516,573 |
| 21 | 46,472,516,573 | 1,986,426,993 | \$ 3,652,633,916 | 7,115,751 | 3,195,500,401 | \$ 47,994,694,300 |
| 22 | 47,994,694,300 | 2,019,764,929 | \$ 3,717,883,357 | 6,683,550 | 3,300,969,701 | \$ 49,590,862,023 |
| 23 | 49,590,862,023 | 2,053,922,326 | \$ 3,778,776,912 | 6,257,104 | 3,411,796,176 | \$ 51,271,546,509 |
| 24 | 51,271,546,509 | 2,089,239,402 | \$ 3,835,135,726 | 5,827,867 | 3,528,734,854 | \$ 53,048,557,171 |
| 25 | 53,048,557,171 | 2,125,852,828 | \$ 3,886,025,878 | 5,402,111 | 3,652,649,015 | \$ 54,935,631,025 |
| 26 | 54,935,631,025 | 2,163,998,564 | \$ 3,930,185,160 | 4,981,843 | 3,784,551,731 | \$ 56,949,014,317 |
| 27 | 56,949,014,317 | 2,203,696,403 | \$ 3,968,236,555 | 4,567,947 | 3,925,559,454 | \$ 59,105,465,673 |
| 28 | 59,105,465,673 | 2,244,762,777 | \$ 4,000,837,819 | 4,153,325 | 4,076,816,583 | \$ 61,422,053,888 |
| 29 | 61,422,053,888 | 2,287,647,909 | \$ 4,027,426,357 | 3,741,365 | 4,239,552,667 | \$ 63,918,086,742 |
| 30 | 63,918,086,742 | 2,332,418,078 | \$ 4,047,205,454 | 3,333,414 | 4,415,148,897 | \$ 66,615,114,849 |
| 31 | 66,615,114,849 | 2,379,662,287 | \$ 4,058,515,457 | 2,933,588 | 4,605,191,048 | \$ 69,538,519,139 |
| 32 | 69,538,519,139 | 2,429,915,117 | \$ 4,059,952,537 | 2,557,999 | 4,811,521,926 | \$ 72,717,445,645 |
| 33 | 72,717,445,645 | 2,483,099,885 | \$ 4,051,512,857 | 2,208,325 | 5,036,179,190 | \$ 76,183,003,538 |
| 34 | 76,183,003,538 | 2,539,587,970 | \$ 4,031,931,028 | 1,884,564 | 5,281,396,799 | \$ 79,970,172,715 |
| 35 | 79,970,172,715 | 2,599,444,207 | \$ 4,000,658,225 | 1,590,336 | 5,549,644,337 | \$ 84,117,012,697 |
| 36 | 84,117,012,697 | 2,662,844,658 | \$ 3,957,676,702 | 1,324,695 | 5,843,592,672 | \$ 88,664,448,630 |
| 37 | 88,664,448,630 | 2,729,703,660 | \$ 3,903,861,745 | 1,091,369 | 6,166,073,370 | \$ 93,655,272,545 |
| 38 | 93,655,272,545 | 2,800,103,933 | \$ 3,838,963,315 | 885,595 | 6,520,093,488 | \$ 99,135,621,056 |
| 39 | 99,135,621,056 | 2,874,127,824 | \$ 3,763,088,686 | 712,717 | 6,908,881,547 | \$ 105,154,829,024 |
| 40 | 105,154,829,024 | 2,951,635,324 | \$ 3,677,377,158 | 568,682 | 7,335,847,108 | \$ 111,764,365,616 |
| 41 | 111,764,365,616 | 3,032,498,977 | \$ 3,583,121,925 | 450,345 | 7,804,544,239 | \$ 119,017,836,562 |
| 42 | 119,017,836,562 | 3,116,658,419 | \$ 3,480,950,147 | 353,597 | 8,318,701,827 | \$ 126,971,893,064 |
| 43 | 126,971,893,064 | 3,204,045,143 | \$ 3,372,044,148 | 275,075 | 8,882,242,533 | \$ 135,685,861,516 |
| 44 | 135,685,861,516 | 3,294,629,567 | \$ 3,257,166,147 | 211,277 | 9,499,292,079 | \$ 145,222,405,739 |
| 45 | 145,222,405,739 | 3,388,391,819 | \$ 3,137,155,996 | 159,687 | 10,174,207,440 | \$ 155,647,689,315 |
| 46 | 155,647,689,315 | 3,485,360,756 | \$ 3,012,632,689 | 118,958 | 10,911,599,807 | \$ 167,031,898,231 |
| 47 | 167,031,898,231 | 3,585,484,255 | \$ 2,884,626,608 | 87,348 | 11,716,345,011 | \$ 179,449,013,540 |
| 48 | 179,449,013,540 | 3,688,814,585 | \$ 2,753,716,974 | 61,724 | 12,593,603,703 | \$ 192,977,653,131 |
| 49 | 192,977,653,131 | 3,795,375,185 | \$ 2,620,593,069 | 41,954 | 13,548,856,229 | \$ 207,701,249,522 |
| 50 | 207,701,249,522 | 3,905,269,704 | \$ 2,485,588,851 | 27,358 | 14,587,934,965 | \$ 223,708,837,982 |



Single Discount Rate Development

Projection of Plan Fiduciary Net Position Beginning July 1, 2022 (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 | 223,708,837,982 | 4,018,518,710 | \$ 2,349,470,489 | 16,365 | 15,717,046,779 | \$ 241,094,916,618 |
| 52 | 241,094,916,618 | 4,135,197,552 | \$ 2,212,726,053 | 8,980 | 16,942,792,337 | \$ 259,960,171,474 |
| 53 | 259,960,171,474 | 4,255,399,604 | \$ 2,075,866,088 | 4,102 | 18,272,205,346 | \$ 280,411,906,234 |
| 54 | 280,411,906,234 | 4,379,171,541 | \$ 1,939,697,912 | 1,845 | 19,712,770,887 | \$ 302,564,148,906 |
| 55 | 302,564,148,906 | 4,506,571,808 | \$ 1,804,996,574 | 704 | 21,272,446,317 | \$ 326,538,169,753 |
| 56 | 326,538,169,753 | 4,637,699,018 | \$ 1,672,355,024 | 231 | 22,959,703,559 | \$ 352,463,217,076 |
| 57 | 352,463,217,076 | 4,772,650,912 | \$ 1,542,409,493 | 51 | 24,783,571,480 | \$ 380,477,029,925 |
| 58 | 380,477,029,925 | 4,911,534,019 | \$ 1,415,746,770 | - | 26,753,675,294 | \$ 410,726,492,468 |
| 59 | 410,726,492,468 | 5,054,459,659 | \$ 1,292,935,188 | - | 28,880,281,170 | \$ 443,368,298,109 |
| 60 | 443,368,298,109 | 5,201,544,435 | \$ 1,174,513,045 | - | 31,174,343,138 | \$ 478,569,672,636 |
| 61 | 478,569,672,636 | 5,352,909,378 | \$ 1,060,967,663 | - | 33,647,554,401 | \$ 516,509,168,752 |
| 62 | 516,509,168,752 | 5,508,679,041 | \$ 952,737,579 | - | 36,312,402,844 | \$ 557,377,513,058 |
| 63 | 557,377,513,058 | 5,668,981,601 | \$ 850,204,445 | - | 39,182,230,607 | \$ 601,378,520,821 |
| 64 | 601,378,520,821 | 5,833,948,966 | \$ 753,690,268 | - | 42,271,298,219 | \$ 648,730,077,737 |
| 65 | 648,730,077,737 | 6,003,716,881 | \$ 663,453,957 | - | 45,594,853,439 | \$ 699,665,194,100 |
| 66 | 699,665,194,100 | 6,178,425,042 | \$ 579,687,023 | - | 49,169,205,207 | \$ 754,433,137,326 |
| 67 | 754,433,137,326 | 6,358,217,211 | \$ 502,508,333 | - | 53,011,803,097 | \$ 813,300,649,302 |
| 68 | 813,300,649,302 | 6,543,241,332 | \$ 431,964,456 | - | 57,141,322,530 | \$ 876,553,248,709 |
| 69 | 876,553,248,709 | 6,733,649,654 | \$ 368,038,774 | - | 61,577,755,624 | \$ 944,496,615,212 |
| 70 | 944,496,615,212 | 6,929,598,859 | \$ 310,654,916 | - | 66,342,507,975 | \$ 1,017,458,067,130 |
| 71 | 1,017,458,067,130 | 7,131,250,186 | \$ 259,674,140 | - | 71,458,502,185 | \$ 1,095,788,145,361 |
| 72 | 1,095,788,145,361 | 7,338,769,566 | \$ 214,891,162 | - | 76,950,288,892 | \$ 1,179,862,312,657 |
| 73 | 1,179,862,312,657 | 7,552,327,761 | \$ 176,030,768 | - | 82,844,165,832 | \$ 1,270,082,775,482 |
| 74 | 1,270,082,775,482 | 7,772,100,499 | \$ 142,740,711 | - | 89,168,305,625 | \$ 1,366,880,440,895 |
| 75 | 1,366,880,440,895 | 7,998,268,623 | \$ 114,589,275 | - | 95,952,892,843 | \$ 1,470,717,013,086 |
| 76 | 1,470,717,013,086 | 8,231,018,240 | \$ 91,080,301 | - | 103,230,270,253 | \$ 1,582,087,221,278 |
| 77 | 1,582,087,221,278 | 8,470,540,871 | \$ 71,684,110 | - | 111,035,093,716 | \$ 1,701,521,171,755 |
| 78 | 1,701,521,171,755 | 8,717,033,610 | \$ 55,860,513 | - | 119,404,496,042 | \$ 1,829,586,840,894 |
| 79 | 1,829,586,840,894 | 8,970,699,288 | \$ 43,090,911 | - | 128,378,260,398 | \$ 1,966,892,709,669 |
| 80 | 1,966,892,709,669 | 9,231,746,638 | \$ 32,897,592 | - | 137,999,004,073 | \$ 2,114,090,562,788 |
| 81 | 2,114,090,562,788 | 9,500,390,465 | \$ 24,853,360 | - | 148,312,374,086 | \$ 2,271,878,473,979 |
| 82 | 2,271,878,473,979 | 9,776,851,827 | \$ 18,581,359 | - | 159,367,256,171 | \$ 2,441,004,000,618 |
| 83 | 2,441,004,000,618 | 10,061,358,215 | \$ 13,753,685 | - | 171,215,998,455 | \$ 2,622,267,603,602 |
| 84 | 2,622,267,603,602 | 10,354,143,740 | \$ 10,088,084 | - | 183,914,650,967 | \$ 2,816,526,310,224 |
| 85 | 2,816,526,310,224 | 10,655,449,322 | \$ 7,340,747 | - | 197,523,222,296 | \$ 3,024,697,641,095 |
| 86 | 3,024,697,641,095 | 10,965,522,898 | \$ 5,306,098 | - | 212,105,954,491 | \$ 3,247,763,812,386 |
| 87 | 3,247,763,812,386 | 11,284,619,614 | \$ 3,816,213 | - | 227,731,617,239 | \$ 3,486,776,233,026 |
| 88 | 3,486,776,233,026 | 11,613,002,045 | \$ 2,736,031 | - | 244,473,822,847 | \$ 3,742,860,321,887 |
| 89 | 3,742,860,321,887 | 11,950,940,404 | \$ 1,959,355 | - | 262,411,363,589 | \$ 4,017,220,666,526 |
| 90 | 4,017,220,666,526 | 12,298,712,770 | \$ 1,405,577 | - | 281,628,572,935 | \$ 4,311,146,546,653 |
| 91 | 4,311,146,546,653 | 12,656,605,312 | \$ 1,012,011 | - | 302,215,712,468 | \$ 4,626,017,852,422 |
| 92 | 4,626,017,852,422 | 13,024,912,526 | \$ 731,901 | - | 324,269,386,240 | \$ 4,963,311,419,287 |
| 93 | 4,963,311,419,287 | 13,403,937,481 | \$ 532,029 | - | 347,892,984,305 | \$ 5,324,607,809,044 |
| 94 | 5,324,607,809,044 | 13,793,992,061 | \$ 389,623 | - | 373,197,157,503 | \$ 5,711,598,568,985 |
| 95 | 5,711,598,568,985 | 14,195,397,230 | \$ 287,012 | - | 400,300,325,796 | \$ 6,126,094,004,999 |
| 96 | 6,126,094,004,999 | 14,608,483,290 | \$ 213,414 | - | 429,329,222,332 | \$ 6,570,031,497,207 |
| 97 | 6,570,031,497,207 | 15,033,590,153 | \$ 159,598 | - | 460,419,475,734 | \$ 7,045,484,403,496 |
| 98 | 7,045,484,403,496 | 15,471,067,627 | \$ 120,480 | - | 493,716,233,264 | \$ 7,554,671,583,906 |
| 99 | 7,554,671,583,906 | 15,921,275,695 | \$ 91,638 | - | 529,374,827,664 | \$ 8,099,967,595,627 |
| 100 | 8,099,967,595,627 | 16,384,584,818 | \$ 69,659 | - | 567,561,490,801 | \$ 8,683,913,601,587 |



Single Discount Rate Development

Present Values of Projected Benefit Payments Beginning July 1, 2022

| 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 ((a)-.5) | (g)=(e)*vf ^a ((a)-.5) | (h)=(c)/(1+sdr) ^a ((a)-.5) |
| 1 | \$ 21,854,814,032 | \$ 1,837,405,023 | \$ 1,837,405,023 | \$ - | \$ 1,776,286,481 | \$ - | \$ 1,776,286,481 |
| 2 | 23,002,317,244 | 1,934,535,905 | 1,934,535,905 | - | 1,747,837,803 | - | 1,747,837,803 |
| 3 | 24,147,478,732 | 2,028,209,242 | 2,028,209,242 | - | 1,712,589,642 | - | 1,712,589,642 |
| 4 | 25,295,469,661 | 2,123,400,708 | 2,123,400,708 | - | 1,675,670,931 | - | 1,675,670,931 |
| 5 | 26,446,446,331 | 2,216,779,601 | 2,216,779,601 | - | 1,634,916,274 | - | 1,634,916,274 |
| 6 | 27,603,711,232 | 2,312,230,054 | 2,312,230,054 | - | 1,593,750,245 | - | 1,593,750,245 |
| 7 | 28,766,079,512 | 2,407,585,758 | 2,407,585,758 | - | 1,550,912,194 | - | 1,550,912,194 |
| 8 | 29,935,059,683 | 2,503,105,843 | 2,503,105,843 | - | 1,506,957,074 | - | 1,506,957,074 |
| 9 | 31,111,331,129 | 2,598,614,767 | 2,598,614,767 | - | 1,462,109,139 | - | 1,462,109,139 |
| 10 | 32,296,029,574 | 2,695,370,811 | 2,695,370,811 | - | 1,417,335,395 | - | 1,417,335,395 |
| 11 | 33,489,220,793 | 2,792,779,965 | 2,792,779,965 | - | 1,372,483,255 | - | 1,372,483,255 |
| 12 | 34,691,058,897 | 2,889,270,154 | 2,889,270,154 | - | 1,327,011,566 | - | 1,327,011,566 |
| 13 | 35,904,072,499 | 2,983,739,526 | 2,983,739,526 | - | 1,280,748,000 | - | 1,280,748,000 |
| 14 | 37,131,731,762 | 3,077,953,512 | 3,077,953,512 | - | 1,234,755,751 | - | 1,234,755,751 |
| 15 | 38,375,911,061 | 3,170,251,897 | 3,170,251,897 | - | 1,188,581,578 | - | 1,188,581,578 |
| 16 | 39,640,518,993 | 3,260,057,654 | 3,260,057,654 | - | 1,142,290,925 | - | 1,142,290,925 |
| 17 | 40,930,087,394 | 3,346,601,013 | 3,346,601,013 | - | 1,095,901,714 | - | 1,095,901,714 |
| 18 | 42,250,477,857 | 3,429,272,080 | 3,429,272,080 | - | 1,049,508,195 | - | 1,049,508,195 |
| 19 | 43,609,012,305 | 3,507,699,198 | 3,507,699,198 | - | 1,003,280,696 | - | 1,003,280,696 |
| 20 | 45,013,667,816 | 3,582,342,863 | 3,582,342,863 | - | 957,598,561 | - | 957,598,561 |
| 21 | 46,472,516,573 | 3,652,633,916 | 3,652,633,916 | - | 912,512,253 | - | 912,512,253 |
| 22 | 47,994,694,300 | 3,717,883,357 | 3,717,883,357 | - | 868,049,598 | - | 868,049,598 |
| 23 | 49,590,862,023 | 3,778,776,912 | 3,778,776,912 | - | 824,548,594 | - | 824,548,594 |
| 24 | 51,271,546,509 | 3,835,135,726 | 3,835,135,726 | - | 782,099,418 | - | 782,099,418 |
| 25 | 53,048,557,171 | 3,886,025,878 | 3,886,025,878 | - | 740,633,130 | - | 740,633,130 |
| 26 | 54,935,631,025 | 3,930,185,160 | 3,930,185,160 | - | 700,046,165 | - | 700,046,165 |
| 27 | 56,949,014,317 | 3,968,236,555 | 3,968,236,555 | - | 660,583,079 | - | 660,583,079 |
| 28 | 59,105,465,673 | 4,000,837,819 | 4,000,837,819 | - | 622,439,379 | - | 622,439,379 |
| 29 | 61,422,053,888 | 4,027,426,357 | 4,027,426,357 | - | 585,585,000 | - | 585,585,000 |
| 30 | 63,918,086,742 | 4,047,205,454 | 4,047,205,454 | - | 549,963,428 | - | 549,963,428 |
| 31 | 66,615,114,849 | 4,058,515,457 | 4,058,515,457 | - | 515,420,853 | - | 515,420,853 |
| 32 | 69,538,519,139 | 4,059,952,537 | 4,059,952,537 | - | 481,872,297 | - | 481,872,297 |
| 33 | 72,717,445,645 | 4,051,512,857 | 4,051,512,857 | - | 449,411,774 | - | 449,411,774 |
| 34 | 76,183,003,538 | 4,031,931,028 | 4,031,931,028 | - | 417,981,001 | - | 417,981,001 |
| 35 | 79,970,172,715 | 4,000,658,225 | 4,000,658,225 | - | 387,606,562 | - | 387,606,562 |
| 36 | 84,117,012,697 | 3,957,676,702 | 3,957,676,702 | - | 358,357,259 | - | 358,357,259 |
| 37 | 88,664,448,630 | 3,903,861,745 | 3,903,861,745 | - | 330,359,305 | - | 330,359,305 |
| 38 | 93,655,272,545 | 3,838,963,315 | 3,838,963,315 | - | 303,614,353 | - | 303,614,353 |
| 39 | 99,135,621,056 | 3,763,088,686 | 3,763,088,686 | - | 278,143,562 | - | 278,143,562 |
| 40 | 105,154,829,024 | 3,677,377,158 | 3,677,377,158 | - | 254,026,460 | - | 254,026,460 |
| 41 | 111,764,365,616 | 3,583,121,925 | 3,583,121,925 | - | 231,322,880 | - | 231,322,880 |
| 42 | 119,017,836,562 | 3,480,950,147 | 3,480,950,147 | - | 210,025,018 | - | 210,025,018 |
| 43 | 126,971,893,064 | 3,372,044,148 | 3,372,044,148 | - | 190,144,033 | - | 190,144,033 |
| 44 | 135,685,861,516 | 3,257,166,147 | 3,257,166,147 | - | 171,650,702 | - | 171,650,702 |
| 45 | 145,222,405,739 | 3,137,155,996 | 3,137,155,996 | - | 154,510,503 | - | 154,510,503 |
| 46 | 155,647,689,315 | 3,012,632,689 | 3,012,632,689 | - | 138,670,570 | - | 138,670,570 |
| 47 | 167,031,898,231 | 2,884,626,608 | 2,884,626,608 | - | 124,092,045 | - | 124,092,045 |
| 48 | 179,449,013,540 | 2,753,716,974 | 2,753,716,974 | - | 110,710,768 | - | 110,710,768 |
| 49 | 192,977,653,131 | 2,620,593,069 | 2,620,593,069 | - | 98,466,017 | - | 98,466,017 |
| 50 | 207,701,249,522 | 2,485,588,851 | 2,485,588,851 | - | 87,283,529 | - | 87,283,529 |



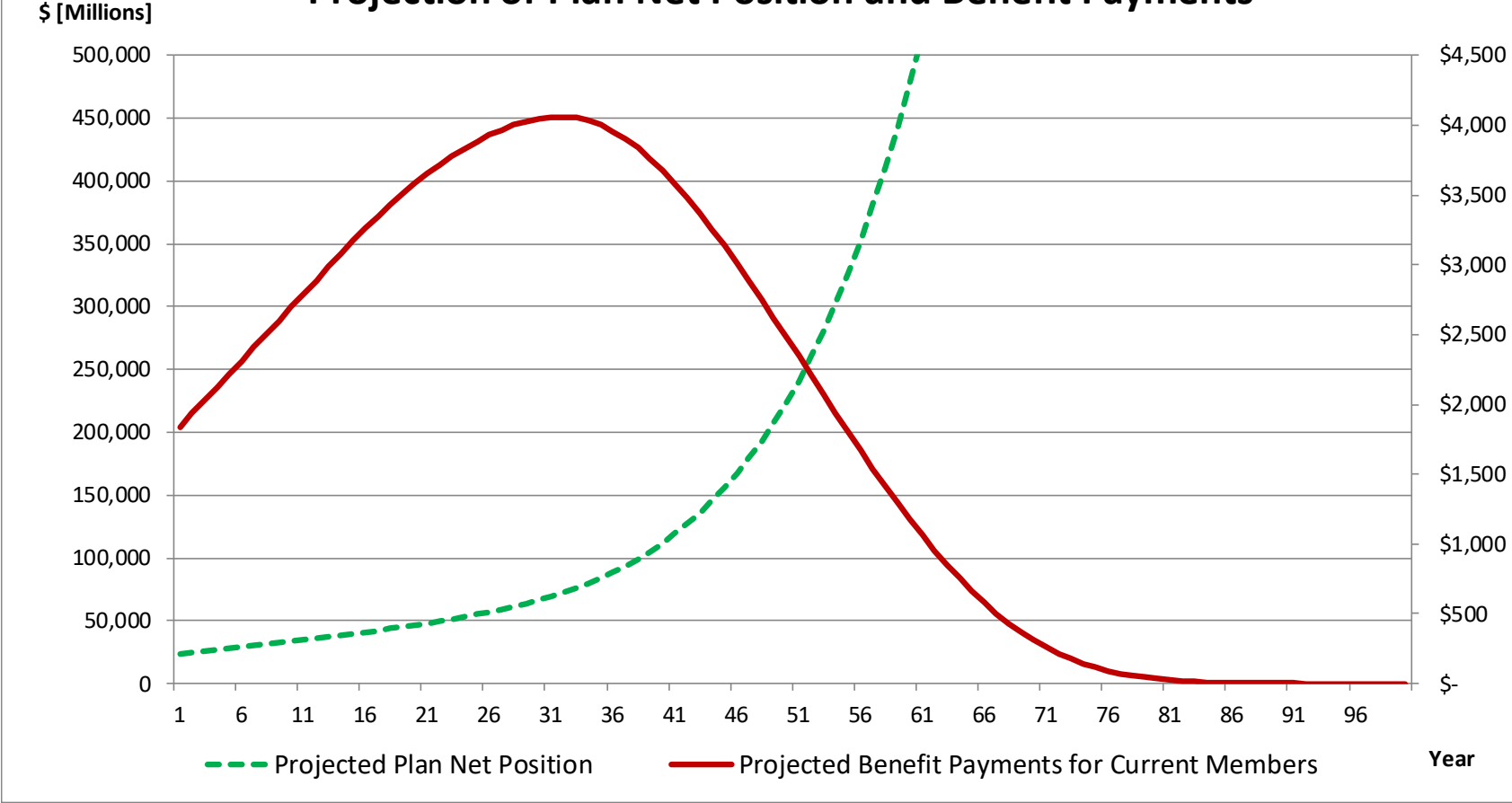
Single Discount Rate Development

PVs of Projected Benefit Payments Beginning July 1, 2022 (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 ⁿ ((a)-.5) | (g)=(e)*vf ⁿ ((a)-.5) | (h)=((c)/((1+sdr) ⁿ *(a)-.5) |
| 51 | \$ 223,708,837,982 | \$ 2,349,470,489 | \$ 2,349,470,489 | \$ - | \$ 77,106,186 | \$ - | \$ 77,106,186 |
| 52 | 241,094,916,618 | 2,212,726,053 | 2,212,726,053 | - | 67,867,695 | - | 67,867,695 |
| 53 | 259,960,171,474 | 2,075,866,088 | 2,075,866,088 | - | 59,504,664 | - | 59,504,664 |
| 54 | 280,411,906,234 | 1,939,697,912 | 1,939,697,912 | - | 51,963,930 | - | 51,963,930 |
| 55 | 302,564,148,906 | 1,804,996,574 | 1,804,996,574 | - | 45,191,889 | - | 45,191,889 |
| 56 | 326,538,169,753 | 1,672,355,024 | 1,672,355,024 | - | 39,131,709 | - | 39,131,709 |
| 57 | 352,463,217,076 | 1,542,409,493 | 1,542,409,493 | - | 33,729,993 | - | 33,729,993 |
| 58 | 380,477,029,925 | 1,415,746,770 | 1,415,746,770 | - | 28,934,659 | - | 28,934,659 |
| 59 | 410,726,492,468 | 1,292,935,188 | 1,292,935,188 | - | 24,695,951 | - | 24,695,951 |
| 60 | 443,368,298,109 | 1,174,513,045 | 1,174,513,045 | - | 20,966,362 | - | 20,966,362 |
| 61 | 478,569,672,636 | 1,060,967,663 | 1,060,967,663 | - | 17,700,421 | - | 17,700,421 |
| 62 | 516,509,168,752 | 952,737,579 | 952,737,579 | - | 14,854,942 | - | 14,854,942 |
| 63 | 557,377,513,058 | 850,204,445 | 850,204,445 | - | 12,389,029 | - | 12,389,029 |
| 64 | 601,378,520,821 | 753,690,268 | 753,690,268 | - | 10,264,151 | - | 10,264,151 |
| 65 | 648,730,077,737 | 663,453,957 | 663,453,957 | - | 8,444,173 | - | 8,444,173 |
| 66 | 699,665,194,100 | 579,687,023 | 579,687,023 | - | 6,895,347 | - | 6,895,347 |
| 67 | 754,433,137,326 | 502,508,333 | 502,508,333 | - | 5,586,272 | - | 5,586,272 |
| 68 | 813,300,649,302 | 431,964,456 | 431,964,456 | - | 4,487,898 | - | 4,487,898 |
| 69 | 876,553,248,709 | 368,038,774 | 368,038,774 | - | 3,573,591 | - | 3,573,591 |
| 70 | 944,496,615,212 | 310,654,916 | 310,654,916 | - | 2,819,069 | - | 2,819,069 |
| 71 | 1,017,458,067,130 | 259,674,140 | 259,674,140 | - | 2,202,279 | - | 2,202,279 |
| 72 | 1,095,788,145,361 | 214,891,162 | 214,891,162 | - | 1,703,250 | - | 1,703,250 |
| 73 | 1,179,862,312,657 | 176,030,768 | 176,030,768 | - | 1,303,961 | - | 1,303,961 |
| 74 | 1,270,082,775,482 | 142,740,711 | 142,740,711 | - | 988,189 | - | 988,189 |
| 75 | 1,366,880,440,895 | 114,589,275 | 114,589,275 | - | 741,400 | - | 741,400 |
| 76 | 1,470,717,013,086 | 91,080,301 | 91,080,301 | - | 550,743 | - | 550,743 |
| 77 | 1,582,087,221,278 | 71,684,110 | 71,684,110 | - | 405,102 | - | 405,102 |
| 78 | 1,701,521,171,755 | 55,860,513 | 55,860,513 | - | 295,027 | - | 295,027 |
| 79 | 1,829,586,840,894 | 43,090,911 | 43,090,911 | - | 212,696 | - | 212,696 |
| 80 | 1,966,892,709,669 | 32,897,592 | 32,897,592 | - | 151,759 | - | 151,759 |
| 81 | 2,114,090,562,788 | 24,853,360 | 24,853,360 | - | 107,150 | - | 107,150 |
| 82 | 2,271,878,473,979 | 18,581,359 | 18,581,359 | - | 74,869 | - | 74,869 |
| 83 | 2,441,004,000,618 | 13,753,685 | 13,753,685 | - | 51,791 | - | 51,791 |
| 84 | 2,622,267,603,602 | 10,088,084 | 10,088,084 | - | 35,503 | - | 35,503 |
| 85 | 2,816,526,310,224 | 7,340,747 | 7,340,747 | - | 24,144 | - | 24,144 |
| 86 | 3,024,697,641,095 | 5,306,098 | 5,306,098 | - | 16,310 | - | 16,310 |
| 87 | 3,247,763,812,386 | 3,816,213 | 3,816,213 | - | 10,963 | - | 10,963 |
| 88 | 3,486,776,233,026 | 2,736,031 | 2,736,031 | - | 7,346 | - | 7,346 |
| 89 | 3,742,860,321,887 | 1,959,355 | 1,959,355 | - | 4,916 | - | 4,916 |
| 90 | 4,017,220,666,526 | 1,405,577 | 1,405,577 | - | 3,296 | - | 3,296 |
| 91 | 4,311,146,546,653 | 1,012,011 | 1,012,011 | - | 2,218 | - | 2,218 |
| 92 | 4,626,017,852,422 | 731,901 | 731,901 | - | 1,499 | - | 1,499 |
| 93 | 4,963,311,419,287 | 532,029 | 532,029 | - | 1,018 | - | 1,018 |
| 94 | 5,324,607,809,044 | 389,623 | 389,623 | - | 697 | - | 697 |
| 95 | 5,711,598,568,985 | 287,012 | 287,012 | - | 480 | - | 480 |
| 96 | 6,126,094,004,999 | 213,414 | 213,414 | - | 333 | - | 333 |
| 97 | 6,570,031,497,207 | 159,598 | 159,598 | - | 233 | - | 233 |
| 98 | 7,045,484,403,496 | 120,480 | 120,480 | - | 164 | - | 164 |
| 99 | 7,554,671,583,906 | 91,638 | 91,638 | - | 117 | - | 117 |
| 100 | 8,099,967,595,627 | 69,659 | 69,659 | - | 83 | - | 83 |
| Totals | | | | | \$ 40,815,660,421 | \$ - | \$ 40,815,660,421 |



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, 2022. Pension Expense for each employer is determined on a proportionate share basis and is shown on page F-4.

A. Expense

| | |
|---|-----------------------|
| 1. Service Cost | \$ 613,550,345 |
| 2. Interest on the Total Pension Liability | 2,349,503,644 |
| 3. Current-Period Benefit Changes | 0 |
| 4. Employee Contributions (made negative for addition here) | (293,027,560) |
| 5. Projected Earnings on Plan Investments (made negative for addition here) | (1,526,911,635) |
| 6. Pension Plan Administrative Expense | 17,497,621 |
| 7. Other Changes in Plan Fiduciary Net Position | 0 |
| 8. Recognition of Outflow (Inflow) of Resources due to Liabilities | 39,475,950 |
| 9. Recognition of Outflow (Inflow) of Resources due to Assets | (233,144,776) |
| 10. Total Pension Expense | \$ 966,943,589 |

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 2022 fiscal year, the expected remaining service lives of all employees was 756,705.06 years. Additionally, the plan membership (active employees and inactive employees) was 149,416. 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 2022 fiscal year is 5.0644 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, 2022

A. Outflows (Inflows) of Resources due to Liabilities

| | |
|--|------------------|
| 1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses | \$ (361,275,093) |
| 2. Assumption Changes (gains) or losses | \$ (154,960,000) |
| 3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years} | 5.0644 |
| 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 | \$ (71,336,210) |
| 5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes | \$ (30,597,899) |
| 6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities | \$ (101,934,109) |
| 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 | \$ (289,938,883) |
| 8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes | \$ (124,362,101) |
| 9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities | \$ (414,300,984) |

B. Outflows (Inflows) of Resources due to Assets

| | |
|--|------------------|
| 1. Net difference between projected and actual earnings on pension plan investments (gains) or losses | \$ 1,362,352,600 |
| 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 | \$ 272,470,521 |
| 4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets | \$ 1,089,882,079 |



Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods for Fiscal Year Ending June 30, 2022

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 | \$ 151,999,036 | \$ 112,523,086 | \$ 39,475,950 |
| 2. due to Assets | \$ 484,303,450 | \$ 717,448,226 | \$ (233,144,776) |
| 3. Total | \$ 636,302,486 | \$ 829,971,312 | \$ (193,668,826) |

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 | \$ 136,584,626 | \$ 77,863,000 | \$ 58,721,626 |
| 2. Assumption Changes | 15,414,410 | 34,660,086 | (19,245,676) |
| 3. Net Difference between projected and actual earnings on pension plan investments | 484,303,450 | 717,448,226 | (233,144,776) |
| 4. Total | \$ 636,302,486 | \$ 829,971,312 | \$ (193,668,826) |

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 | \$ 254,311,241 | \$ 310,525,682 | \$ (56,214,441) |
| 2. Assumption Changes | 29,285,404 | 138,736,360 | (109,450,956) |
| 3. Net Difference between projected and actual earnings on pension plan investments | 1,469,838,045 | 2,069,495,480 | (599,657,435) |
| 4. Total | \$ 1,753,434,690 | \$ 2,518,757,522 | \$ (765,322,832) |

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 |
|------------------------|---------------------------------------|
| 2023 | \$ (187,393,460) |
| 2024 | \$ (276,498,864) |
| 2025 | \$ (472,224,961) |
| 2026 | \$ 177,359,001 |
| 2027 | \$ (6,564,548) |
| Thereafter | 0 |
| Total | \$ (765,322,832) |



Recognition of Deferred Outflows and Inflows of Resources for Fiscal Year Ending June 30, 2022

| Year Established | Initial Amount | Initial Recognition Period | Current Year Recognition | Remaining Recognition | Remaining Recognition Period |
|---|-------------------|----------------------------------|-----------------------------|--------------------------|------------------------------------|
| Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities | | | | | |
| 2017 | 61,179,390 | 5.6644 | 7,175,970 | 0 | 0.0000 |
| 2018 | 124,753,379 | 5.3882 | 23,153,073 | 8,988,014 | 0.3882 |
| 2019 | 221,473,495 | 5.3135 | 41,681,283 | 54,748,363 | 1.3135 |
| 2020 | 71,837,371 | 5.2047 | 13,802,405 | 30,430,156 | 2.2047 |
| 2021 | 228,048,119 | 5.1542 | 44,245,105 | 139,557,909 | 3.1542 |
| 2022 | (361,275,093) | 5.0644 | (71,336,210) | (289,938,883) | 4.0644 |
| Total | | | 58,721,626 | (56,214,441) | |
| Deferred Outflow (Inflow) due to Assumption Changes | | | | | |
| 2017 | 0 | 5.6644 | 0 | 0 | 0.0000 |
| 2018 | 0 | 5.3882 | 0 | 0 | 0.3882 |
| 2019 | 60,320,037 | 5.3135 | 11,352,223 | 14,911,145 | 1.3135 |
| 2020 | 0 | 5.2047 | 0 | 0 | 2.2047 |
| 2021 | 0 | 5.1542 | 0 | 0 | 3.1542 |
| 2022 | (154,960,000) | 5.0644 | (30,597,899) | (124,362,101) | 4.0644 |
| Total | | | (19,245,676) | (109,450,956) | |
| Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments | | | | | |
| 2017 | (960,329,832) | 5.0000 | 0 | 0 | 0.0000 |
| 2018 | (138,082,010) | 5.0000 | (27,616,398) | 0 | 0.0000 |
| 2019 | 218,549,437 | 5.0000 | 43,709,888 | 43,709,885 | 1.0000 |
| 2020 | 840,615,204 | 5.0000 | 168,123,041 | 336,246,081 | 2.0000 |
| 2021 | (3,449,159,136) | 5.0000 | (689,831,828) | (2,069,495,480) | 3.0000 |
| 2022 | 1,362,352,600 | 5.0000 | 272,470,521 | 1,089,882,079 | 4.0000 |
| Total | | | (233,144,776) | (599,657,435) | |

**Schedule of Employer Allocations
and Pension Amounts
At June 30, 2022
Exhibit 1**

| Employer (1) | Proportionate Share as of June 30, 2022 (2) | Change in Proportionate Share (3) | Proportionate Share of Net Pension Liability as of June 30, 2022 7.00% (4) | Sensitivity Analysis | | Proportionate Share of Pension Expense as of June 30, 2022 (7) |
|---------------------------------|--|--|---|---|---|--|
| | | | | Proportionate Share of Net Pension Liability 1% Decrease 6.00% (5) | Proportionate Share of Net Pension Liability 1% Increase 8.00% (6) | |
| State of Hawaii | 57.35699633% | 0.66535832% | 7,438,034,973 | 9,974,642,073 | 5,338,208,267 | 558,520,297 |
| City and County of Honolulu | 18.46585640% | -0.13642324% | 2,394,645,719 | 3,328,036,098 | 1,621,976,572 | 204,507,325 |
| County of Hawaii | 4.50509628% | -0.12595295% | 584,219,290 | 809,911,610 | 397,389,112 | 43,498,747 |
| County of Maui | 4.41356811% | -0.06217884% | 572,349,949 | 788,089,841 | 393,758,481 | 42,484,915 |
| County of Kauai | 2.04442130% | -0.05705003% | 265,119,830 | 364,797,627 | 182,605,631 | 19,778,998 |
| BWS City and County of Honolulu | 0.93429671% | 0.05942508% | 121,159,266 | 162,352,824 | 87,058,860 | 10,475,924 |
| DWS County of Hawaii | 0.23827429% | 0.00049443% | 30,899,325 | 41,404,944 | 22,202,677 | 2,624,255 |
| DOW County of Kauai | 0.13840949% | 0.03027981% | 17,948,894 | 24,051,431 | 12,897,159 | 1,594,421 |
| HART | 0.10613883% | -0.07081199% | 13,764,046 | 18,443,754 | 9,890,140 | -1,142,528 |
| University of Hawaii | 11.79694227% | -0.30314059% | 1,529,823,296 | 2,049,955,730 | 1,099,252,879 | 84,601,235 |



Schedule of Employer Allocations
and Pension Amounts
At June 30, 2022
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 | 134,378,798 | 798,948,381 | 11,342,104 | 72,423,867 | 1,017,093,150 | 112,805,915 | 1,122,480,208 | 93,268,994 | 20,356,386 | 1,348,911,503 |
| City and County of Honolulu | 56,915,946 | 309,644,795 | 10,135,688 | 64,073,121 | 440,769,550 | 113,937,902 | 438,068,945 | 13,750,452 | 10,498,271 | 576,255,570 |
| County of Hawaii | 13,648,778 | 74,633,880 | 2,360,263 | 24,934,567 | 115,577,488 | 26,450,233 | 105,544,288 | 3,637,168 | 25,281,650 | 160,913,339 |
| County of Maui | 12,743,772 | 70,707,256 | 2,014,201 | 15,768,835 | 101,234,064 | 22,344,242 | 99,874,113 | 4,311,617 | 20,880,907 | 147,410,879 |
| County of Kauai | 5,873,176 | 32,637,682 | 918,803 | 7,680,507 | 47,110,168 | 10,180,135 | 46,094,999 | 2,032,847 | 12,963,655 | 71,271,636 |
| BWS City and County of Honolulu | 2,174,225 | 12,957,777 | 177,776 | 9,942,828 | 25,252,606 | 1,753,990 | 18,201,727 | 1,536,787 | 3,534,664 | 25,027,168 |
| DWS County of Hawaii | 554,494 | 3,304,630 | 45,338 | 797,771 | 4,702,233 | 447,321 | 4,641,998 | 391,928 | 753,176 | 6,234,423 |
| DOW County of Kauai | 322,096 | 1,919,604 | 26,336 | 4,348,919 | 6,616,955 | 259,841 | 2,696,458 | 227,664 | 3,604,348 | 6,788,311 |
| HART | 246,998 | 1,472,041 | 20,196 | 74,601 | 1,813,836 | 199,258 | 2,067,769 | 174,584 | 8,613,174 | 11,054,785 |
| University of Hawaii | 27,452,958 | 163,611,999 | 2,244,699 | 0 | 193,309,656 | 22,146,845 | 229,824,975 | 19,404,319 | 93,558,785 | 364,934,924 |



**Schedule of Employer Allocations
and Pension Amounts
At June 30, 2022
Exhibit 3**

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

| Employer (1) | Total Deferred Outflow and (Inflow) 2023 (2) | Total Deferred Outflow and (Inflow) 2024 (3) | Total Deferred Outflow and (Inflow) 2025 (4) | Total Deferred Outflows of 2026 (5) | Total Deferred Outflows of 2027 (6) | Total Deferred Outflows of Thereafter (7) |
|---------------------------------|---|---|---|--|--|--|
| State of Hawaii | (86,114,159) | (125,444,240) | (232,509,742) | 114,685,345 | (2,435,557) | - |
| City and County of Honolulu | (19,213,343) | (50,047,406) | (99,505,807) | 34,855,354 | (1,574,818) | - |
| County of Hawaii | (12,289,391) | (16,457,367) | (22,566,768) | 6,529,486 | (551,811) | - |
| County of Maui | (10,526,745) | (15,064,582) | (26,622,685) | 6,461,966 | (424,769) | - |
| County of Kauai | (6,887,141) | (8,223,859) | (11,324,446) | 2,520,202 | (246,224) | - |
| BWS City and County of Honolulu | (522,915) | (100,082) | (2,358,251) | 3,160,309 | 46,377 | - |
| DWS County of Hawaii | (484,622) | (551,221) | (908,685) | 426,429 | (14,091) | - |
| DOW County of Kauai | 86,098 | (564,355) | (676,330) | 938,398 | 44,833 | - |
| HART | (2,494,606) | (2,433,255) | (2,420,321) | (1,760,930) | (131,837) | - |
| University of Hawaii | (48,946,636) | (57,612,497) | (73,331,926) | 9,542,442 | (1,276,651) | - |



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.

