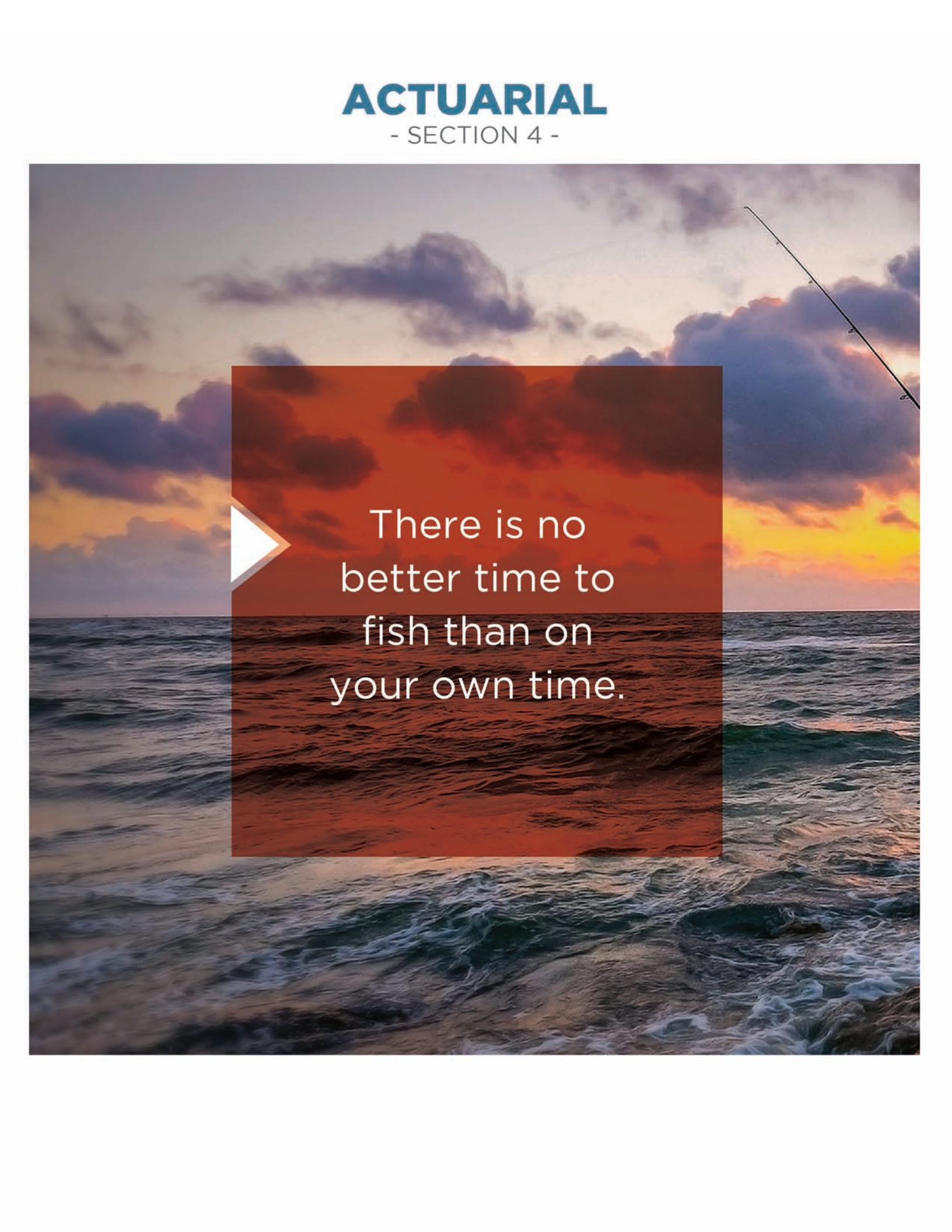


ACTUARIAL

- SECTION 4 -



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fish than on
your own time.



HMEPS
HOUSTON MUNICIPAL EMPLOYEES PENSION SYSTEM



HOUSTON MUNICIPAL EMPLOYEES PENSION SYSTEM

Actuarial Valuation Report
FOR THE YEAR BEGINNING JULY 1, 2023



November 22, 2023

Board of Trustees
Houston Municipal Employees Pension System
1201 Louisiana
Suite 900
Houston, TX 77002

Subject: Actuarial Valuation as of July 1, 2023 with RSVS

Dear Members of the Board:

This actuarial valuation, which includes the Risk Sharing Valuation Study (RSVS, or sometimes referred to as the actuarial valuation or valuation in the report) describes the current actuarial condition of the Houston Municipal Employees Pension System (HMEPS), determines the City Contribution Rate, and analyzes changes in this calculated contribution rate. The results presented herein may not be applicable for other purposes. Valuations are prepared annually, as of July 1, the first day of the HMEPS plan year. This report was prepared at the request of the Board and is intended for use by the HMEPS staff and those designated or approved by the Board. This report may be provided to parties other than HMEPS staff only in its entirety and only with the permission of the Board, or as required by law.

FINANCING OBJECTIVES AND FUNDING POLICY

Based on the HMEPS statute, the employer contribution is comprised of two pieces. The first piece is the amortization of the Legacy Liability as of July 1, 2016 determined as part of the July 1, 2016 Initial Risk Sharing Valuation Study (Initial RSVS). The Legacy Liability is amortized over a 30-year period beginning on July 1, 2017. These amortization payments are fixed and grow at the assumed payroll growth rate of 2.75%. The second part of the contribution is the City Contribution Rate determined by the valuation. The City Contribution Rate becomes effective twelve months after the valuation date, i.e., the rate determined by this July 1, 2023 actuarial valuation will be used by the Board when establishing the City Contribution Rate for the year beginning July 1, 2024 and ending June 30, 2025.

The contribution rate for fiscal year 2023 was determined by the July 1, 2021 actuarial valuation. In addition to the Legacy Liability payment of \$142,048,661, the City contributed 8.44% of payroll in fiscal year 2023. The contribution rate for fiscal year 2024 was determined by the July 1, 2022 actuarial valuation. The City will contribute a Legacy Liability payment of \$145,955,000 and 8.48% of payroll in fiscal year 2024.

Based on the statute, the City contribution rate for FY 2025 is 8.51% of pay, which is estimated to be \$63.8 million based on an estimated payroll of \$750.1 million. The City contribution amount for FY 2025 for the Legacy Liability amortization payment as determined in the Initial RSVS is \$149,968,762.

Each future valuation will establish either a liability gain layer or a liability loss layer. These layers will represent unexpected increases/decreases in the unfunded actuarial accrued liability (after subtracting out any remaining Legacy Liability or any remaining prior years' liability layers). Liability loss bases will be amortized over a 30-year period beginning one year after the valuation date. Liability gain bases will be amortized over the same period as the largest liability loss base, or 30 years if there is no liability loss base. All bases are amortized using a level percentage of payroll amortization method. This year a liability gain layer of \$132.4 million is being established. Since it is a gain layer it will be amortized over the same period as the Legacy Liability, a 23-year period beginning one year after the valuation date.

PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches 100%. The funded ratio as of July 1, 2023 is 69.0%. This is an increase from the 65.8% funded ratio from the prior year's valuation. However, the funded status alone is not appropriate for assessing the need for or the amount of future contributions and is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

The calculated City Contribution Rate for FY 2025 is 3.82%. However, because the System is less than 90% funded, the actual City Contribution Rate for FY 2025 will be the corridor midpoint of 8.51% of payroll as shown on page 2 of the Risk Sharing Valuation section of the valuation report. This rate is three basis points greater than the prior year rate as established in the Initial RSVS. Please see Table 6 for a detailed analysis of the change in the calculated employer contribution rate from the prior year to this year. This rate does not include the separate contribution for the Legacy Liability amortization payment discussed above.

PLAN EXPERIENCE

As part of each valuation, we examine the System's experience relative to the assumptions. The aggregate results of these analyses are disclosed in Tables 5 & 6. This past fiscal year the System had an experience liability gain on demographics of approximately \$10.0 million, an experience loss of approximately \$19.3 million due to the COLA being higher than assumed, and an experience gain on the actuarial value of assets of approximately \$118.1 million. The gain on the actuarial value of assets was due to the continued recognition of the outstanding investment performance (relative to the return assumption) during fiscal year 2021.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those in effect following the passage and signing into law of SB 2190 in 2017. These changes were reflected in the 2016 valuation and there have been no changes to the benefit provisions since the prior valuation.

The benefit provisions are summarized in Appendix B.

ASSUMPTIONS AND METHODS

Except as noted below, the actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary and the current assumptions were adopted by the Board in 2021 following a regularly scheduled experience study. The rationale for the current assumptions is included in that report, dated August 11, 2021.

As part of the legislation enacting the benefit changes (in 2017), the investment return assumption (7.0%) was set into the revised statute (Article 6243h, Vernon's Texas Civil Statutes). This assumption is now considered a prescribed assumption under the actuarial standards of practice. The experience study completed in 2021 confirmed that the investment assumption and the inflation assumption are reasonable and there have been no changes to these assumptions.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results (and future measures) can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. The actuarial calculations are intended to provide information for rational decision making.

This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

All assumptions and methods are described in Appendix A.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

GASB 67

The System was required to begin complying with Governmental Accounting Standards Board Statement No. 67 with the fiscal year ending June 30, 2014. The GASB No. 67 information for the fiscal year ending June 30, 2023 was provided to HMEPS in a separate report dated October 4, 2023 and is not contained in this report.

DATA

Member data for retired, active and inactive members was supplied as of July 1, 2023 by the HMEPS staff. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data.

Asset information as of July 1, 2023 was provided by HMEPS Staff.



CERTIFICATION

We were asked to determine if an unanticipated actuarial cost occurred in the administration of the Deferred Retirement Option Plan (DROP). It is our opinion that the administration of the DROP had no material unanticipated actuarial costs during the prior fiscal year.

All of the tables contained in this actuarial valuation report were prepared by Gabriel, Roeder, Smith & Company. The trend data schedules shown in the Notes section of the HMEPS Financial Statements are based on our valuation reports, but were prepared by HMEPS staff. We certify that the information presented herein is accurate and fairly portrays the actuarial position of HMEPS as of July 1, 2023.

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

Sincerely,
Gabriel, Roeder, Smith & Company

A handwritten signature in black ink that reads "Joseph P. Newton". The signature is fluid and cursive.

Joseph P. Newton, FSA, EA, MAAA
Pension Market Leader and Actuary

A handwritten signature in black ink that reads "Lewis Ward". The signature is fluid and cursive.

Lewis Ward
Consultant

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Section I

Risk Sharing Valuation Study

RSVS Discussion

The purpose of the Risk Sharing Valuation Study (RSVS) is to determine the City Contribution Rate for the fiscal year beginning one year after the valuation date.

The first exhibit in this section shows the RSVS Corridor which was created from the Initial RSVS. Column 3 shows the Corridor Midpoint for each fiscal year. Columns 2 and 4 show the Corridor Minimum and Corridor Maximum respectively. Column 5 shows the actual City Contribution Rate for the fiscal year. As shown on the table the actual City Contribution Rate for FY 2025 is 8.51% of pay.

The next exhibit shows the individual pieces and total calculated City Contribution Rate. As shown on the table the calculated City Contribution Rate from this valuation is 3.82% of pay. Because the System is less than 90% funded, the actual City Contribution Rate will be set equal to the Corridor Midpoint of 8.51% of pay.

The third exhibit shows the Liability Gain/Loss Layers established by each RSVS. Columns 2 and 3 show the original liability layer and any remaining liability layer respectively. Column 4 is the payment on that particular layer for the fiscal year beginning one year after the valuation date. The payment is determined using a level percentage of payroll and the remaining amortization period as shown in column 5. The payments reflect the one-year delay between the determination of the payment and the beginning of the fiscal year in which the payment is made. The dollar amounts of the payments are summed and then converted to a percentage of payroll based on the projected payroll for the fiscal year beginning one year after the valuation date. As shown on the table the current year's payment is negative which means it is a credit toward the contribution rate. The credit is determined to be 4.53% of projected payroll.

The next exhibit is the Legacy Liability schedule. This table shows the amortization schedule of the Legacy Liability for each of the 30 years over which it is scheduled to be paid. Column 2 shows the remaining Legacy Liability as of that measurement date while Column 3 shows the payment on the Legacy Liability for the fiscal year beginning one year after the valuation date.

The unfunded actuarial accrued liability is equal to the sum of the Remaining Layer column on the Liability Gain/Loss Layers exhibit and the Remaining Legacy Liability column as of the valuation date.

Risk Sharing Valuation - Corridor

| Fiscal Year Ending | Corridor Minimum | Corridor Midpoint | Corridor Maximum | Actual City Contribution Rate |
|-----------------------|---------------------|----------------------|---------------------|-------------------------------------|
| (1) | (2) | (3) | (4) | (5) |
| June 30, 2018 | 3.17% | 8.17% | 13.17% | 8.17% |
| June 30, 2019 | 3.27% | 8.27% | 13.27% | 8.27% |
| June 30, 2020 | 3.32% | 8.32% | 13.32% | 8.32% |
| June 30, 2021 | 3.36% | 8.36% | 13.36% | 8.36% |
| June 30, 2022 | 3.41% | 8.41% | 13.41% | 8.41% |
| June 30, 2023 | 3.44% | 8.44% | 13.44% | 8.44% |
| June 30, 2024 | 3.48% | 8.48% | 13.48% | 8.48% |
| June 30, 2025 | 3.51% | 8.51% | 13.51% | 8.51% |
| June 30, 2026 | 3.54% | 8.54% | 13.54% | |
| June 30, 2027 | 3.57% | 8.57% | 13.57% | |
| June 30, 2028 | 3.59% | 8.59% | 13.59% | |
| June 30, 2029 | 3.61% | 8.61% | 13.61% | |
| June 30, 2030 | 3.63% | 8.63% | 13.63% | |
| June 30, 2031 | 3.65% | 8.65% | 13.65% | |
| June 30, 2032 | 3.67% | 8.67% | 13.67% | |
| June 30, 2033 | 3.69% | 8.69% | 13.69% | |
| June 30, 2034 | 3.70% | 8.70% | 13.70% | |
| June 30, 2035 | 3.71% | 8.71% | 13.71% | |
| June 30, 2036 | 3.72% | 8.72% | 13.72% | |
| June 30, 2037 | 3.73% | 8.73% | 13.73% | |
| June 30, 2038 | 3.74% | 8.74% | 13.74% | |
| June 30, 2039 | 3.74% | 8.74% | 13.74% | |
| June 30, 2040 | 3.75% | 8.75% | 13.75% | |
| June 30, 2041 | 3.76% | 8.76% | 13.76% | |
| June 30, 2042 | 3.77% | 8.77% | 13.77% | |
| June 30, 2043 | 3.78% | 8.78% | 13.78% | |
| June 30, 2044 | 3.79% | 8.79% | 13.79% | |
| June 30, 2045 | 3.79% | 8.79% | 13.79% | |
| June 30, 2046 | 3.80% | 8.80% | 13.80% | |
| June 30, 2047 | 3.81% | 8.81% | 13.81% | |

Risk Sharing Valuation – Calculated City Contribution Rate

| Fiscal Year Ending | Employer Normal Cost | Amortization Payment | Calculated City Contribution Rate |
|--------------------|----------------------|----------------------|-----------------------------------|
| (1) | (2) | (3) | (4) |
| June 30, 2018 | 8.17% | 0.00% | 8.17% |
| June 30, 2019 | 8.27% | 0.00% | 8.27% |
| June 30, 2020 | 8.32% | -0.37% | 7.95% |
| June 30, 2021 | 8.40% | -0.90% | 7.50% |
| June 30, 2022 | 8.44% | -0.55% | 7.89% |
| June 30, 2023 | 8.19% | -2.28% | 5.91% |
| June 30, 2024 | 8.26% | -3.31% | 4.95% |
| June 30, 2025 | 8.35% | -4.53% | 3.82% |

Risk Sharing Valuation - Liability (Gain)/Loss Layers

| Valuation Year Base Established | Original Layer | Remaining Layer | Year's Payment ¹ | Remaining Payments |
|----------------------------------------------------------------------------|-------------------|--------------------|--------------------------------|-----------------------|
| (1) | (2) | (3) | (4) | (5) |
| July 1, 2023 | \$ (132,424,659) | \$ (132,424,659) | \$ (9,601,863) | 23 |
| July 1, 2022 | (110,541,255) | (118,279,143) | (8,028,492) | 23 |
| July 1, 2021 | (170,127,717) | (182,633,208) | (12,396,686) | 23 |
| July 1, 2020 | 38,069,638 | 41,475,701 | 2,580,512 | 27 |
| July 1, 2019 | (51,252,094) | (55,618,916) | (3,775,273) | 23 |
| July 1, 2018 | (36,414,848) | (39,808,516) | (2,702,101) | 23 |
| July 1, 2017 | (388,530) | (428,363) | (29,074) | 23 |
| Total | | \$ (487,717,104) | \$ (33,952,977) | |
| Projected Payroll for Fiscal Year +1 | | | \$ 750,074,515 | |
| Amortization Payments as % of Projected Pay | | | (4.53%) | |
| Single Equivalent Amortization Period from the Valuation Date ² | | | 24.1 | |

1 This is the payment to be made for the fiscal year beginning one year after the valuation date.

2 The single equivalent amortization period includes all liability layers including the Legacy Liability.



Risk Sharing Valuation – Legacy Liability

| Valuation Date | Remaining Legacy Liability | Current Year's Payment ¹ |
|----------------|----------------------------|-------------------------------------|
| (1) | (2) | (3) |
| June 30, 2017 | \$ 2,123,880,499 | \$ 124,030,357 |
| June 30, 2018 | 2,144,254,135 | 127,441,192 |
| June 30, 2019 | 2,162,525,731 | 130,945,824 |
| June 30, 2020 | 2,178,451,118 | 134,546,835 |
| June 30, 2021 | 2,191,766,369 | 138,246,872 |
| June 30, 2022 | 2,202,186,338 | 142,048,661 |
| June 30, 2023 | 2,209,403,104 | 145,955,000 |
| June 30, 2024 | 2,213,084,295 | 149,968,762 |
| June 30, 2025 | 2,212,871,302 | 154,092,903 |
| June 30, 2026 | 2,208,377,355 | 158,330,458 |
| June 30, 2027 | 2,199,185,471 | 162,684,546 |
| June 30, 2028 | 2,184,846,251 | 167,158,371 |
| June 30, 2029 | 2,164,875,526 | 171,755,226 |
| June 30, 2030 | 2,138,751,826 | 176,478,494 |
| June 30, 2031 | 2,105,913,679 | 181,331,653 |
| June 30, 2032 | 2,065,756,717 | 186,318,273 |
| June 30, 2033 | 2,017,630,566 | 191,442,026 |
| June 30, 2034 | 1,960,835,534 | 196,706,682 |
| June 30, 2035 | 1,894,619,048 | 202,116,115 |
| June 30, 2036 | 1,818,171,846 | 207,674,309 |
| June 30, 2037 | 1,730,623,900 | 213,385,352 |
| June 30, 2038 | 1,631,040,048 | 219,253,449 |
| June 30, 2039 | 1,518,415,320 | 225,282,919 |
| June 30, 2040 | 1,391,669,929 | 231,478,199 |
| June 30, 2041 | 1,249,643,912 | 237,843,850 |
| June 30, 2042 | 1,091,091,395 | 244,384,556 |
| June 30, 2043 | 914,674,442 | 251,105,131 |
| June 30, 2044 | 718,956,486 | 258,010,522 |
| June 30, 2045 | 502,395,281 | 265,105,812 |
| June 30, 2046 | 263,335,367 | 272,396,221 |
| June 30, 2047 | - | - |

1 Contribution amount for fiscal year that begins the July 1st following the valuation date

Section II

Discussion



Executive Summary

| Item | July 1, 2023 | July 1, 2022 |
|----------------------------------------------------------|-----------------------|-----------------------|
| Membership | | |
| • Number of: | | |
| -Active members | 11,578 | 11,402 |
| -Retirees and beneficiaries | 11,972 | 11,776 |
| -Inactive members | <u>8,890</u> | <u>8,301</u> |
| -Total | 32,440 | 31,479 |
| • Covered payroll (annualized) | \$ 729,928 | \$ 696,890 |
| City Contribution rates | 8.51% ¹ | 8.48% ¹ |
| Assets | | |
| • Market value | \$ 4,072,345 | \$ 3,952,351 |
| • Actuarial value | 3,836,122 | 3,573,373 |
| • Estimation of return on market value | 5.7% | 5.0% |
| • Estimation of return on actuarial value | 10.4% | 10.9% |
| • Employer contribution | \$ 204,895 | \$ 197,341 |
| • Member contribution | \$ 34,600 | \$ 32,655 |
| • Ratio of actuarial value to market value | 94.2% | 90.4% |
| • External cash flow as % of market value assets | -2.5% | -2.6% |
| Actuarial Information | | |
| • Unfunded actuarial accrued liability (UAAL) | \$ 1,721,686 | \$ 1,855,191 |
| • GASB funded ratio | 69.0% | 65.8% |
| • Employer normal cost % | 8.35% | 8.26% |
| • Amortization rate ² | <u>-4.53%</u> | <u>-3.31%</u> |
| • Calculated City Contribution Rate | 3.82% | 4.95% |
| Estimated Total City Contribution for Fiscal Year | | |
| | <u>2025</u> | <u>2024</u> |
| • Estimated City Contribution Rate Payment | \$ 63,831,341 | \$ 60,731,430 |
| • Legacy Liability Payment (City Contribution Amount) | <u>\$ 149,968,762</u> | <u>\$ 145,955,000</u> |
| • Total | \$ 213,800,103 | \$ 206,686,430 |

Note: Dollar amounts in \$000, unless otherwise noted

1 This rate is the City Contribution Rate determined in accordance with the State statute.

2 See Risk Sharing Valuation - Liability (Gain)/Loss Layers table for determination of rate.



Contribution Requirement

- The Executive Summary shows the estimated total City Contribution for fiscal year 2025
 - Comprised of the known Legacy Liability payment (City Contribution Amount) of \$150.0 million, and
 - City Contribution Rate times estimated payroll of \$750.1 million = \$63.8 million
- The calculated City Contribution Rates shown on the Executive Summary are calculated rates for the twelve-month period beginning one year after the valuation date, based on statute
- Table 6 reconciles the calculated City Contribution Rates from the prior valuation to the current valuation
- Legacy Liability is \$2,209 million as of July 1, 2023
 - Schedule of Legacy Liability contribution amounts is shown in RSVS section

Amortization of liability gain/loss layers are as follows

- Liability loss layers are amortized over a 30-year funding period beginning one year after the valuation date using level percentage of payroll amortization based on 2.75% payroll growth rate
- Liability gain layers are amortized over the remaining period of the largest liability loss layer (if no loss layer exists then over a 30-year funding period beginning one year after the valuation date) using level percentage of payroll amortization based on 2.75% payroll growth rate
- Amortization payment for layers is the sum of all payments divided by the projected payroll for the fiscal year beginning one year after the valuation date
- No future growth in the number of active members is taken into account

Calculation of Contribution Rates

The funds available to pay benefits come from two sources, contributions and investment income on those contributions (the majority of the funds available to pay benefits come from investment income). HMEPS receives contributions from two sources, employer contributions and member contributions. The employer contribution is comprised of two pieces. The first piece is a fixed dollar amount to amortize the Legacy Liability as of July 1, 2016 over a 30-year period beginning on July 1, 2017. The second piece is the City Contribution Rate.

As shown in Table 1, the Calculated City Contribution Rate has two components:

- The employer normal cost percentage (NC%)
- The amortization percentage (Liability Layers%)

The NC% is the theoretical amount which would be required to pay the members' benefits, based on the plan provisions for new employees, if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. This is the amount it should cost to provide the benefits for an average new member. The employer NC% includes a provision for administrative expenses and is net of member contributions. The NC% is shown in Table 4.

The actuarial accrued liability (AAL) is the difference between (i) the actuarial present value of all future benefits for all current participants of the fund, including active, inactive and retired members, and (ii) the actuarial present value of future normal costs. Thus the AAL represents the liability associated with past years. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and the actuarial value of assets (AVA). It is the shortfall/excess between the liability associated with prior years (the AAL) and the assets actually accumulated (the AVA). This shortfall/excess can arise from several sources, including actuarial gains and losses which are caused by differences between actual experience and the plan's assumptions, changes to the plan's actuarial assumptions, and amendments to the benefit provisions.

As of July 1, 2016, the UAAL was partitioned off into the Legacy Liability which has its own amortization schedule. For all valuations after July 1, 2016, any unexpected gains or losses will be set up as new liability gain/loss layers. These layers will be amortized over 30 years (see previous discussion for liability gain layers) using level percentage of payroll amortization beginning on the July 1st one year after the valuation date the layer is determined. The sum of any such layers' payments will be aggregated and converted to a percentage of projected payroll for the fiscal year beginning one year after the valuation date. This percentage is the Liability Layers' %.

In addition to these two pieces, the City Contribution Rate also includes a provision for administrative expenses which is equal to 1.25% of payroll as of July 1, 2023. The maximum addition to the City Contribution Rate for administrative expenses is 1.25%, unless the City agrees to a higher rate.

Calculation of Contribution Rates (Continued)

If the addition to the City Contribution Rate for administrative expenses is capped at 1.25%, then administrative expenses in excess of 1.25% of payroll (if any) will become part of the next year's liability gain/loss layer.

The calculated City Contribution Rate necessary to meet the funding policy specified by statute for the twelve-month period beginning July 1, 2024 is 3.82%. Since the System is less than 90% funded and the calculated City Contribution rate is less than the Corridor Midpoint, the actual City Contribution Rate will be the Corridor Midpoint of 8.51% of projected payroll. Therefore, the FY 2025 City Contribution is estimated to be approximately \$213.8 million. The contribution is comprised of the fixed Legacy Liability payment of \$150.0 million and the estimated payment of \$63.8 based on the City Contribution Rate of 8.51% and a projected FY 2025 payroll of \$750.1 million.

ASOP 4 requires the disclosure of a Reasonable Actuarially Determined Contribution (ADC) for comparisons to the actual contributions per the funding policy. For purposes of this valuation, the ADC is determined using the same assumptions and methodology as the valuation, with the following exceptions: a 20-year amortization was used which ensures immediate positive amortization of the UAAL and the individual entry age normal cost method was used. Based on this methodology, the initial minimum ADC is \$209.0 million for FY2025. We have also incorporated an Output Smoothing Method which will set the ADC equal to the City Contribution if the City Contribution exceeds the result of the preliminary calculation above. In this valuation, the City Contribution of \$213.6 million exceeds the initial minimum reasonable ADC and so the Reasonable ADC equals the projected City Contribution of \$213.8 million for FY2025.

Financial Data and Experience

As of July 1, 2023, HMEPS has a total market value of about \$4.07 billion. Financial information was gathered from the audited financial statements as of June 30, 2023.

This report includes a number of exhibits related to plan assets. Table 8 shows how the total market value is distributed among the various classes of investments. Current investment policy allocates 45% of invested assets to equities, 22.5% of invested assets to fixed income (including private credit), and 32.5% of invested assets to alternative investments including real estate.

Table 9 shows a reconciliation of the market values between the beginning and end of FY 2023.

As shown on Table 11, the dollar-weighted return net of investment expenses for FY 2023 was 5.69%.

In determining the contribution rates and funded status of the System, an actuarial value of assets (AVA) is used, rather than the market value of assets. This “smoothing method” is intended to help reduce the volatility of the contribution rates from year to year. The method used to compute the AVA takes the difference between the actual market value of assets and the expected actuarial value of assets (based on the prior year’s assumed investment return rate), and establishes a base each year which is equal to this difference less any unrecognized bases from prior years. If the current year’s base is of opposite sign from the prior years’ bases then it is offset dollar for dollar against the prior years’ bases (oldest bases first) until either the prior years’ bases or the current year’s base is reduced to zero. Any remaining bases are then recognized over the remaining period for the base (5 less the number of years between the base year and the valuation year) in equal dollar amounts.

The development of the AVA is shown on Table 10. The AVA as of the valuation date is \$3.84 billion. The AVA is 94.2%% of the MVA, compared to 90.4%% last year.

In addition to the market return, Table 11 also shows the return on the actuarial value of assets for HMEPS. For FY 2023, this return was 10.35%. Because this is more than the assumed 7.0% investment return, an actuarial gain occurred decreasing the unfunded actuarial accrued liabilities of the plan. Table 12 shows a summary of market and actuarial return rates in recent years.

Member Data

Member data as of July 1, 2023 was supplied electronically by HMEPS staff. While we did not audit this data, we did perform various tests to ensure that it was internally consistent, consistent with the prior year's data, and was reasonable overall.

Tables 15 and 16 show the summaries of certain historical data, including membership statistics. Table 17 shows the number of members by category (active, inactive, retired, etc.). Table 18 shows the active member statistics.

The number of active members increased from 11,402 to 11,578, a 1.5% increase.

The total annualized salaries shown on Table 2 and on the statistical tables is the amount that was supplied by HMEPS, annualized or adjusted for number of hours reported if necessary. For the cost calculations, the pays were adjusted in accordance with the actuarial assumptions to reflect one year's salary increase. The annualized salaries for active members increased 4.7% over last year.

We also show the projected payroll in Item 2 of Table 2. This is the payroll used for determining the expected amortization payments (amortization percentage) on liability (gain)/loss layers. The projected pay is determined by summing all pensionable pay for the just ended fiscal year for anyone who received pensionable pay during the year (actives, terminated members, retirees, etc.) and increasing this sum by the payroll growth rate. We believe this provides a better expectation of the upcoming year's actual payroll than the annualized salaries described above.

The overall trend in payroll is less significant than in prior years due to the creation of the Legacy Liability. The payments to amortize the Legacy Liability were determined in a manner that is consistent with the payroll growth assumption, but those payment amounts are now fixed and will be contributed whether payroll grows slower or faster than assumed. The current and future liability gain/loss layers will be amortized using level percentage of payroll amortization. Because the methodology used in amortizing these layers assumes a growing payroll into the future, if the payroll grows at a rate lower than the assumed 2.75% a year on average, the amortization payments (as a percentage of pay) will need to increase in order to keep the contribution dollars that amortize the UAAL growing at 2.75%. However, these layers are expected to be much smaller in magnitude than the Legacy Liability and therefore, the impact of the payroll growing slower or faster than expected is anticipated to be much less for many years into the future.

Benefit Provisions

SB 2190 passed by the 2017 Legislature made a few but very significant changes to the benefit provisions of HMEPS. All of these changes were reflected in the July 1, 2016 valuation. However, the changes were significant enough that we have shown them again in this year's valuation as a reminder.

Prior to the legislation members hired prior to January 1, 2005 were eligible for a cost of living adjustment (COLA) each year equal to 3% of their base benefit. Members hired on or after January 1, 2005 and prior to January 1, 2008 were eligible for a COLA based on 2% of their base benefit. Group D members were not eligible for any COLA. Effective with the 2018 COLA, all current and future retirees and their eligible survivors (except as noted below) will be eligible for the same COLA. The COLA will be equal to 50% of the average five-year net investment return rate less five percentage points, with a minimum of 0% and a maximum of 2%. Group D members who are entitled to an annuity but who terminated employment prior to the effective date of the 2017 legislation will not be eligible for any COLA.

Active members in DROP will not be eligible for a COLA on their DROP account until they have attained the age of 62 as of January 1 of the year in which the increase is made.

The member contributions for all groups have changed. The Group A member contribution rate increased from 5.0% of pay to 8.0% of pay. The Group B member contribution rate increased from no contributions to 4% of pay. The Group D member contribution rate increased from no contributions to 3% of pay. One-third of the Group D member contribution rate is attributed to a notional cash balance account. The contribution increases for Groups A and B were phased-in over a two-year period.

The interest credit rate on DROP accounts and the notional cash balance accounts will be based on 50% of the five-year average of the net rate of return on the market value of assets, but not less than 2.5% or more than 7.5%.

Survivor benefits:

- Effective July 1, 2017, if an active Group A, Group B or Group D member with at least 5 years of credited service dies while still in service with the City (off-duty death), the spousal survivor benefit will be 80% of the normal accrued pension, payable immediately, provided that the spouse was married to the participant for at least one continuous year as of the date of death. If such spouse was married less than one continuous year as of the date of death, the survivor benefit is 50% of the normal accrued pension.
- Effective July 1, 2017, if a Group A or Group B retiree dies, the spousal survivor benefit will be 80% of the retirement benefit being received by the retiree at the time of death, payable immediately, provided that the spouse was married to the retiree at the time of death and for at least one continuous year prior to the date of separation from service (the marriage requirement applies for separations from service on or after July 1, 2017). If such spouse was married less than one continuous year prior to the date of separation from service (the marriage requirement

Benefit Provisions (Continued)

applies for separations from service on or after July 1, 2017), the spousal survivor benefit is 50% of the retirement benefit being received by the retiree at the time of death.

- Effective July 1, 2017, if a Group A or Group B deferred participant (not yet receiving a pension benefit) dies, the spousal survivor benefit is 50% of the normal accrued pension, payable at the participant's eligibility date. However, the surviving spouse can elect an earlier actuarially equivalent benefit.
- Effective July 1, 2017, if an active Group A, Group B or Group D member dies from a service-related (on-duty) death, the spousal survivor benefit is 80% of the participant's final average salary, payable immediately.

This valuation reflects all benefits offered to members.

There have been no changes to the benefit provisions since the prior valuation.

Appendix B of our Report includes a summary of the benefit provisions for HMEPS.

Actuarial Methods and Assumptions

Except as noted below, the actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary and the current assumptions were adopted by the Board in 2021 following a regularly scheduled experience study. The rationale for the current assumptions is included in that report, dated August 11, 2021.

As part of the legislation enacting the benefit changes, the investment return assumption (7.0%) was set into statute (Article 6243h, Vernon's Texas Civil Statutes). In addition, the actuarial cost method was also set into statute. This assumption and method are now considered prescribed assumptions and methods under the actuarial standards of practice.

Liabilities are determined using the Entry Age Normal actuarial cost method. The assumed investment return rate is 7.00%.

With the lowering of the investment return assumption from 8.0% to 7.0% it was appropriate to make changes to other economic assumptions that are correlated with the investment return assumption. In particular, we recommended and the Board adopted a decrease in the inflation assumption from 2.50% to 2.25% and the corresponding decreases in the salary increase assumptions and payroll growth assumptions. These changes were reflected in the July 1, 2016 actuarial valuation.

There have been no changes in the actuarial assumptions and methods since the prior valuation.

Please see Appendix A of our Report for a complete description of these assumptions.

Funding Progress

As you are aware, the Governmental Accounting Standards Board Statements (GASB) that apply to the System have changed. In prior years, GASB Statement No. 25 applied to the System. Beginning with the 2014 fiscal year GASB Statement No. 67 applies to the System. The GASB No. 67 disclosure information has been provided in a separate report.

Although GASB No. 25 no longer applies to HMEPS, there are certain schedules from GASB No. 25 which we believe provide useful information and therefore we are continuing to include these in our report. In particular, we are continuing to show the Schedule of Funding Progress (Table 14).

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

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

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

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

1. **Investment risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. **Other demographic risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

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

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

The City Contribution Rate shown in the Executive Summary may be considered as a minimum contribution rate that complies with HMEPS' Statute. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

PLAN MATURITY MEASURES

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

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

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

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

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

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

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

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

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

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

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

DURATION OF PRESENT VALUE OF BENEFITS

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

ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

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

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|-------------------------------------------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Ratio of the market value of assets to total payroll | 5.58 | 5.67 | 5.91 | 4.38 | 4.87 | 4.79 | 4.17 | 3.95 | 4.21 | 4.33 |
| Ratio of actuarial accrued liability to payroll | 7.61 | 7.79 | 7.90 | 7.90 | 8.00 | 7.98 | 7.80 | 7.79 | 8.16 | 7.54 |
| Ratio of actives to retirees and beneficiaries | 0.97 | 0.97 | 0.97 | 1.02 | 1.04 | 1.10 | 1.14 | 1.18 | 1.18 | 1.23 |
| Ratio of net cash flow to market value of assets* | -2.5% | -2.6% | -2.5% | -3.6% | -2.9% | 5.3% | -3.4% | -3.6% | -3.4% | -3.4% |
| Duration of the actuarial present value of benefits** | 11.47 | 11.45 | 11.52 | 11.62 | 11.56 | N/A | N/A | N/A | N/A | N/A |

*The 2018 net cash flow reflects receipt of \$250 million in net Pension Obligation Bond proceeds

**Duration measure not available prior to 2019

Low-Default-Risk Obligation Measure

Actuarial Standards of Practice No. 4 (ASOP No. 4) was revised and reissued in December 2021 by the Actuarial Standards Board (ASB). It includes a new calculation called a low-default-risk obligation measure (LDRM) to be prepared and issued annually for defined benefit pension plans. The transmittal memorandum for ASOP No. 4 includes the following explanation:

“The ASB believes that the calculation and disclosure of this measure provides appropriate, useful information for the intended user regarding the funded status of a pension plan. The calculation and disclosure of this additional measure is not intended to suggest that this is the “right” liability measure for a pension plan. However, the ASB does believe that this additional disclosure provides a more complete assessment of a plan’s funded status and provides additional information regarding the security of benefits that members have earned as of the measurement date.”

The LDRM estimates the amount of money the plan would need to invest in low risk securities to provide the benefits with greater certainty. The current model expects lower costs but with higher risk, which creates less certainty and a possibility of higher costs. The LDRM model creates higher expected costs but more predictability when compared to the current model. Thus, the difference between the two measures (Valuation and LDRM) is one illustration of the possible costs the sponsor could incur if there was a reduction in the investment risk in comparison to the current diversified portfolio. However, the downside risk would be limited in the scenarios where the current portfolio would fail to achieve returns in excess of the low-default-risk discount, in this case 4.90%.



The following information has been prepared in compliance with this new requirement. Unless otherwise noted, the measurement date, actuarial cost methods, and assumptions used are the same as for the funding valuation covered in this actuarial valuation report.

- a. LDRM measure of benefits earned as of the measurement date: \$6,373 million
- b. Valuation liability (IEAN) at 7% on measurement date: 5,532 million
- c. Cost to mitigate investment risk in the System's portfolio: \$ 841 million

The HMEPS benefit structure has several risk sharing provisions that are contingent on the investment returns of the portfolio and thus if the portfolio was changed to expect lower returns, the expected liabilities that are contingent on those returns would also decrease. If these provisions were not contingent on the investment performance, it would have increased the LDRM by another \$388 million, meaning these provisions reduced the impact of lowering the discount rate from 7.0% to 4.9% by about a third, which is an illustration that more than a third of the investment risk is currently being borne by the HMEPS members and not the City.

Discount rate used to calculate LDRM: 4.90% Intermediate FTSE Pension Discount Curve as of June 30, 2023. Other significant assumptions that differ from those used for the funding valuation: Future assumed COLAs would decrease from 1.0% per year to 0.0% per year and the assumed DROP interest crediting rate would decrease from the current 4.0% to 3.0%. This measure is not appropriate for assessing the need for or amount of future contributions as the current portfolio is expected to generate significantly more investment earnings than the low-default-risk portfolio. This measure is also not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation as this measure includes projections of salary increases and the ability for current members to continue to accrue eligibility and vesting service.



Summary and Closing Comments

This year's valuation shows that HMEPS continues to trend in the right direction. The investment performance during fiscal year 2021 continues to create gains on the actuarial value of assets which resulted in the unfunded actuarial accrued liability decreasing rather than increasing as expected. Furthermore, there are substantial deferred investment gains yet to be recognized. These deferred investment gains will be available to offset future investment shortfalls, or to further improve the funded status of the System as they are recognized in the future. In addition, the amortization piece of the City Contribution Rate is now a significant credit resulting in a total rate several percent of pay less than the corridor midpoint.

The System's funded status increased from 65.8% to 69.0%.

The calculated City Contribution Rate is less than the normal cost and less than the Corridor Midpoint. However, because the System is less than 90% funded the City Contribution Rate is set equal to the Corridor Midpoint determined by the Initial RSVS at 8.51% of pay.

There was a small actuarial liability experience loss mostly due to a higher than assumed cost of living adjustment (to be paid in 2024). However, there was a large actuarial gain on assets. Combined, these resulted in a liability gain layer being established for fiscal year end 2023. The liability gain layer from this year's valuation in combination with the prior liability gain/loss layers from the prior years' valuations, produce a net annual amortization credit of 4.53%.

Given the plan's contribution policy, if all actuarial assumptions are met (including the assumption of the plan earning 7.00% on the actuarial valuation of assets), it is expected that:

- a. The employer normal cost as a percentage of pay will remain relatively level over time (upward drift will likely occur due to generational mortality),
- b. The funded ratio will increase slowly,
- c. The UAAL will continue to decline due to the difference between the calculated rate and the actual contribution rate. The UAAL is expected to be fully amortized by the July 1, 2047 valuation, or 24 years from the current July 1, 2023 valuation date.

It should be noted that the investment gain from fiscal year 2021 has only partially been recognized. If these deferred gains are not offset with future shortfalls, then it is likely that in the near future new liability layers will be gain layers.

Section III

Supporting Exhibits

Table 1
Summary of Cost Items

| | Valuation as of July 1, 2023 | | Valuation as of July 1, 2022 | |
|-----------------------------------------------------------------------------------------|---------------------------------|---------------------|---------------------------------|---------------------|
| | Cost Item | Cost as % of Pay | Cost Item | Cost as % of Pay |
| | (1) | (2) | (3) | (4) |
| 1. Participants | | | | |
| a. Actives | 11,578 | | 11,402 | |
| b. Retirees | 9,667 | | 9,484 | |
| c. Disabled retirees | 217 | | 235 | |
| d. Beneficiaries | 2,088 | | 2,057 | |
| e. Inactive, deferred vested | 4,007 | | 3,953 | |
| f. Inactive, nonvested | 4,883 | | 4,348 | |
| g. Total | 32,440 | | 31,479 | |
| 2. Covered payroll | \$ 729,928 | | \$ 696,890 | |
| 3. Averages for active members | | | | |
| a. Average age | 47.9 | | 48.0 | |
| b. Average years of service | 10.9 | | 11.3 | |
| c. Average pay (\$) | \$ 63,044 | | \$ 61,120 | |
| 4. Present value of future pay | \$ 5,704,670 | | \$ 5,454,046 | |
| 5. Employer normal cost rate | 8.35% | | 8.26% | |
| 6. Present value of future benefits | \$ 6,180,642 | 864.8% | \$ 6,026,416 | 864.8% |
| 7. Present value of future normal costs | \$ 622,834 | 85.8% | \$ 597,852 | 85.8% |
| 8. Actuarial accrued liability (6 - 7) | \$ 5,557,808 | 779.0% | \$ 5,428,564 | 779.0% |
| 9. Present actuarial assets | \$ 3,836,122 | 512.8% | \$ 3,573,373 | 541.6% |
| 10. Unfunded actuarial accrued liability (UAAL) (8 - 9) | \$ 1,721,686 | 266.2% | \$ 1,855,191 | 237.3% |
| 11. Calculated City Contribution Rate | | | | |
| a. Employer normal cost | 8.35% | | 8.26% | |
| b. Amortization charge ¹ | -4.53% | | -3.31% | |
| c. Total | 3.82% | | 4.95% | |
| 12. City Contribution Rate ² | 8.51% | | 8.48% | |
| 13. Average estimated return | | | | |
| a. Based on market value | 5.69% | | 4.98% | |
| b. Based on actuarial value | 10.35% | | 10.86% | |
| 14. Funded ratio (9 ÷ 8) | 69.0% | | 65.8% | |
| 15. Legacy Liability payment for fiscal year beginning one year after valuation date | \$ 149,969 | | \$ 145,955 | |

Note: Dollar amounts in \$000

1 This is the layered amortization payment excluding the Legacy Liability payment.

2 This is the payment to be made for the fiscal year beginning one year after the valuation date.



Table 2
Calculation of Annual Required Contribution Rate

| | July 1, 2023 (1) | July 1, 2022 (2) |
|--------------------------------------------------------------------------|---------------------|---------------------|
| 1. Annualized salaries on valuation date | \$ 729,928 | \$ 696,890 |
| 2. Projected payroll for upcoming fiscal year ¹ | \$ 730,000 | \$ 697,005 |
| 3. Present value of future pay | \$ 5,704,670 | \$ 5,454,046 |
| 4. Employer normal cost rate | 8.35% | 8.26% |
| 5. Actuarial accrued liability for active members | | |
| a. Present value of future benefits for active members | \$ 2,642,309 | \$ 2,599,449 |
| b. Less: present value of future normal costs | (551,184) | (521,646) |
| c. Less: present value of additional employee contributions ² | (71,650) | (76,206) |
| d. Actuarial accrued liability | \$ 2,019,475 | \$ 2,001,597 |
| 6. Total actuarial accrued liability for: | | |
| a. Retirees and beneficiaries | \$ 3,309,610 | \$ 3,211,423 |
| b. Inactive participants | \$ 228,723 | 215,544 |
| c. Active members (Item 5d) | \$ 2,019,475 | 2,001,597 |
| d. Total | \$ 5,557,808 | \$ 5,428,564 |
| 7. Actuarial value of assets | \$ 3,836,122 | \$ 3,573,373 |
| 8. Unfunded actuarial accrued liability (UAAL) (Item 6d - Item 7) | \$ 1,721,686 | \$ 1,855,191 |

Note: Dollar amounts in \$000

- 1 The projected payroll is the actual pay received for the just completed fiscal year (including pay for any member who received pay during the year: i.e. active, terminated, retired, etc.). This pay is then increased by the payroll growth rate.
- 2 Additional employee contributions in excess of the 3.00% employee rate used to determine the normal cost.



Table 3
Actuarial Present Value of Future Benefits

| | July 1, 2023 | July 1, 2022 |
|-----------------------------------------------------|--------------|--------------|
| | (1) | (2) |
| 1. Active members | | |
| a. Retirement benefits | \$ 2,450,056 | \$ 2,409,061 |
| b. Deferred termination benefits | 119,084 | 118,418 |
| c. Refunds | 10,437 | 9,968 |
| d. Death benefits | 52,019 | 51,324 |
| e. Disability benefits | 10,713 | 10,678 |
| f. Total | \$ 2,642,309 | \$ 2,599,449 |
| 2. Members in Pay Status | | |
| a. Service retirements | \$ 2,965,835 | \$ 2,871,606 |
| b. Disability retirements | 25,179 | 27,178 |
| c. Beneficiaries | 318,596 | 312,639 |
| d. Total | \$ 3,309,610 | \$ 3,211,423 |
| 3. Inactive members | | |
| a. Vested terminations | \$ 221,287 | \$ 209,149 |
| b. Nonvested terminations | 7,436 | 6,395 |
| c. Total | \$ 228,723 | \$ 215,544 |
| 4. Total actuarial present value of future benefits | \$ 6,180,642 | \$ 6,026,416 |

Note: Dollar amounts in \$000

Table 4
Analysis of Normal Cost

| | July 1, 2023 | July 1, 2022 |
|-------------------------------------------------------------|--------------|--------------|
| | (1) | (2) |
| 1. Gross normal cost rate | | |
| a. Retirement benefits | 7.96% | 7.84% |
| b. Deferred termination benefits | 1.28% | 1.28% |
| c. Refunds | 0.44% | 0.46% |
| d. Disability benefits | 0.12% | 0.12% |
| e. Death benefits | 0.30% | 0.31% |
| f. Administrative expenses | 1.25% | 1.25% |
| g. Total | 11.35% | 11.26% |
| 2. Employee Contribution rate ¹ | 3.00% | 3.00% |
| 3. Employer Normal Cost (including Administrative Expenses) | 8.35% | 8.26% |

1 Normal cost is determined using Ultimate Entry Age method. Therefore, Employee Contribution rate is the rate for a Group D new hire.

Table 5
Calculation of Total Actuarial Gain or Loss

| | |
|-------------------------------------------------------------------------|--------------|
| 1. Unfunded actuarial accrued liability (UAAL) as of July 1, 2022 | \$ 1,855,191 |
| 2. Total normal cost and administrative expense for year | \$ 90,039 |
| 3. Employer and Employee Contributions during year ending June 30, 2023 | \$ (239,495) |
| 4. Interest on UAAL for one year | \$ 129,863 |
| 5. Interest on Item 2 and Item 3 for one-half year | \$ (5,142) |
| 6. Expected UAAL as of July 1, 2023 (1+2+3+4+5) | \$ 1,830,456 |
| 7. Actual UAAL as of July 1, 2023 | \$ 1,721,686 |
| 8. Actuarial gain/(loss) for the period (6 - 7) | \$ 108,770 |
| <u>SOURCE OF GAINS/(LOSSES)</u> | |
| 9. Asset gain/(loss) (See Table 10) | \$ 118,112 |
| 10. Plan changes | 0 |
| 11. Assumption changes | 0 |
| 12. Method change | 0 |
| 13. Next Year's COLA different than assumed | (19,331) |
| 14. Liability experience gain/(loss) for the period | 9,989 |
| 15. Actuarial gain/(loss) for the period | \$ 108,770 |

Note: Dollar amounts in \$000

Table 6 Change in Calculated Contribution Rate Since the Prior Valuation

| | | |
|-----------------------------------------------------------------|---------|---------|
| 1. Calculated City Contribution Rate as of July 1, 2022 | | 4.95% |
| 2. Change in Contribution Rate During Year | | |
| a. Change in Employer Normal Cost (excluding assumption change) | 0.09% | |
| b. Recognition of prior years' asset (gains) | (1.22%) | |
| c. Actuarial loss from current year asset performance | 0.08% | |
| d. Actuarial loss from COLA | 0.19% | |
| e. Actuarial loss from liability sources | (0.25%) | |
| f. Effect of projected payroll growing faster than expected | 0.21% | |
| g. Change in Actuarial Assumptions and Methods | 0.00% | |
| h. Impact of Contributing at Corridor Midpoint | (0.23%) | |
| i. Total Change | | (1.13%) |
| Calculated City Contribution Rate as of July 1, 2023 | | 3.82% |

Table 7
Near Term Outlook

| Valuation as of July 1, | Unfunded Actuarial Accrued Liability (UAAL, in 000s) | Funded Ratio | Calculated City Contribution Rate ¹ | Corridor Midpoint ¹ | Actuarial Value of Fund (in 000s) | For Fiscal Year Ending June 30, | Estimated Payroll | Employer Contributions | Employee Contributions | Benefit Payments ² | Net External Cash Flow |
|-------------------------|------------------------------------------------------|--------------|------------------------------------------------|--------------------------------|-----------------------------------|---------------------------------|-------------------|------------------------|------------------------|-------------------------------|------------------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| 2023 | \$ 1,721,686 | 69.0% | 3.82% | 8.51% | \$ 3,836,122 | 2024 | \$ 730,000 | \$ 207,831 | \$ 33,365 | \$ 371,582 | \$ (141,851) |
| 2024 | 1,690,293 | 70.1% | 3.63% | 8.51% | 3,957,919 | 2025 | 750,075 | 213,792 | 33,031 | 398,737 | (162,443) |
| 2025 | 1,652,304 | 71.1% | 3.34% | 8.54% | 4,066,940 | 2026 | 770,702 | 219,902 | 32,808 | 424,009 | (180,986) |
| 2026 | 1,607,451 | 72.2% | 3.04% | 8.57% | 4,164,413 | 2027 | 791,896 | 226,184 | 32,639 | 448,578 | (198,637) |
| 2027 | 1,555,178 | 73.2% | 2.71% | 8.59% | 4,250,450 | 2028 | 813,673 | 232,564 | 32,523 | 472,986 | (216,012) |
| 2028 | 1,494,923 | 74.3% | 2.35% | 8.61% | 4,324,537 | 2029 | 836,049 | 239,125 | 32,464 | 496,965 | (232,758) |
| 2029 | 1,425,990 | 75.5% | 1.97% | 8.63% | 4,386,487 | 2030 | 859,040 | 245,870 | 32,469 | 520,544 | (248,903) |
| 2030 | 1,347,622 | 76.7% | 1.55% | 8.65% | 4,436,074 | 2031 | 882,664 | 252,805 | 32,537 | 543,211 | (263,926) |
| 2031 | 1,259,014 | 78.0% | 1.11% | 8.67% | 4,473,591 | 2032 | 906,937 | 259,936 | 32,663 | 471,705 | (184,560) |
| 2032 | 1,159,297 | 79.9% | 0.63% | 8.69% | 4,595,832 | 2033 | 931,878 | 267,269 | 32,846 | 477,886 | (182,661) |
| 2033 | 1,047,500 | 81.9% | 0.11% | 8.70% | 4,728,594 | 2034 | 957,505 | 274,712 | 33,087 | 481,586 | (178,149) |

These projections are based on the HMEPS statute as amended by SB 2190 of the 2017 Legislature.

- 1 Actual City Contribution Rate will be set to Corridor Midpoint if Fund is less than 90% funded. Contribution rate goes into effect 12 months after the valuation date
- 2 Includes refunds taken by terminating members and plan administrative expenses

Note: Dollar amounts in \$000. Projections assume all actuarial assumptions are met, including actual investment returns are 7.0% annually projected from the smoothed (actuarial) value of assets.



Table 8
Statement of Plan Net Assets

| | July 1, 2023 (1) | July 1, 2022 (2) |
|------------------------------------------------------------------------|---------------------|---------------------|
| A. ASSETS | | |
| 1. Current Assets | | |
| a. Cash and cash equivalents | \$ 45,679 | \$ 12,718 |
| b. Accounts Receivable | | |
| 1) Sale of investments | \$ 3,060 | \$ 1,960 |
| 2) Other | \$ 11,354 | \$ 23,836 |
| c. Total Current Assets | \$ 60,093 | \$ 38,514 |
| 2. Investments at Fair Value | | |
| a. Short-term investment funds | \$ 115,072 | \$ 177,419 |
| b. Global Equity | 1,156,332 | 1,020,112 |
| c. Fixed Income | 223,978 | 242,208 |
| d. Absolute Return | 133,374 | 130,356 |
| e. Inflation Linked | 681,144 | 592,120 |
| f. Private Credit | 152,324 | 104,327 |
| g. Private Equity | 1,151,363 | 1,238,475 |
| h. Real Estate | 406,774 | 421,206 |
| i. Total Investments | \$ 4,020,361 | \$ 3,926,222 |
| 3. Other Assets | | |
| a. Collateral on securities lending | \$ 61,029 | \$ 35,555 |
| b. Net OPEB Asset | \$ 5,088 | \$ 4,240 |
| c. Furniture, fixtures and equipment, net | 1,636 | 2,057 |
| d. Total other assets | \$ 67,753 | \$ 41,851 |
| 4. Total Assets | \$ 4,148,207 | \$ 4,006,588 |
| 5. Deferred outflow of resources | \$ 569 | \$ 767 |
| B. LIABILITIES | | |
| 1. Current Liabilities | | |
| a. Amounts due on asset purchases | \$ 7,759 | \$ 12,413 |
| b. Accrued liabilities | 6,261 | 5,683 |
| c. Collateral on securities lending | 61,029 | 35,555 |
| 2. Total Liabilities | 75,049 | 53,651 |
| 3. Deferred inflows of resources | 1,382 | 1,353 |
| Net Assets Held in Trust | \$ 4,072,345 | \$ 3,952,351 |
| C. TARGET ASSET ALLOCATION FOR CASH & LONG TERM INVESTMENTS | | |
| 1. Cash | 0.0% | 0.0% |
| 2. Fixed Income | 10.0% | 10.0% |
| 3. Private Credit | 12.5% | 5.0% |
| 4. Real Estate | 12.5% | 12.5% |
| 5. Private Equity | 17.0% | 17.0% |
| 6. Global Equity | 28.0% | 32.5% |
| 7. Inflation-Linked Asset Class | 20.0% | 15.0% |
| 8. Absolute Return | 0.0% | 8.0% |
| 9. Total | 100.0% | 100.0% |

Note: Dollar amounts in \$000
Columns may not add due to rounding



Table 9
Reconciliation of Plan Net Assets

| | Year Ending | |
|------------------------------------------------------------|---------------|---------------|
| | June 30, 2023 | June 30, 2022 |
| | (1) | (2) |
| 1. Market value of assets at beginning of year | \$ 3,952,351 | \$ 3,867,087 |
| a. Prior year adjustment | 0 | 0 |
| b. Restated Market value | \$ 3,952,351 | \$ 3,867,087 |
| 2. Revenue for the year | | |
| a. Contributions | | |
| i. Member contributions | \$ 34,600 | \$ 32,655 |
| ii. Employer contributions | 204,895 | 197,341 |
| iii. Total | \$ 239,495 | \$ 229,996 |
| b. Net investment income | | |
| i. Interest | \$ 14,845 | \$ 11,170 |
| ii. Dividends | 33,159 | 29,608 |
| iii. Earnings from LP's and real estate trusts | 10,239 | 4,828 |
| iv. Net appreciation (depreciation) on investments | 172,913 | 152,876 |
| v. Net proceeds from lending securities | 180 | 77 |
| vi. Less investment expenses | (9,972) | (9,169) |
| vii. Other | 619 | 466 |
| c. Total revenue | \$ 461,478 | \$ 419,851 |
| 3. Expenditures for the year | | |
| a. Refunds | \$ 990 | \$ 1,133 |
| b. Benefit payments | 334,859 | 327,773 |
| c. Administrative and miscellaneous expenses | 5,636 | 5,681 |
| d. Total expenditures | \$ 341,484 | \$ 334,587 |
| 4. Increase in net assets (Item 2c - Item 3d) | \$ 119,993 | \$ 85,264 |
| 5. Market value of assets at end of year (Item 1 + Item 4) | \$ 4,072,345 | \$ 3,952,351 |

Note: Dollar amounts in \$000

Columns may not add due to rounding

Table 10
Development of Actuarial Value of Assets

| | | July 1, 2023 | | | | |
|--------------------|----------------------------------------------------------------------------------|---------------------------------|----------------------------|--------------------|----------------------------------|-----------------------------------|
| 1. | Actuarial value of assets at beginning of year | \$ | | | | 3,573,373 |
| 2. | Net new investments | | | | | |
| | a. Contributions | \$ | | | | 239,495 |
| | b. Benefits and refunds paid | \$ | | | | (335,849) |
| | c. Administrative Expenses | \$ | | | | (5,636) |
| | d. Subtotal | \$ | | | | (101,990) |
| 3. | Assumed investment return rate for fiscal year | | | | | 7.00% |
| 4. | Assumed investment income for fiscal year | \$ | | | | 246,627 |
| 5. | Expected actuarial value at end of year (1+ 2 + 4) | \$ | | | | 3,718,010 |
| 6. | Market value of assets at end of year | \$ | | | | 4,072,345 |
| 7. | Difference (6 - 5) | \$ | | | | 354,335 |
| 8. | Development of amounts to be recognized as of July 1, 2023: | | | | | |
| | Remaining Deferrals of Excess (Shortfall) of | | | | | |
| Fiscal Year End | Investment Income | Offsetting of Gains/(Losses) | Net Deferrals Remaining | Years Remaining | Recognized for this valuation | Remaining after this valuation |
| | (1) | (2) | (3) = (1) + (2) | (4) | (5) = (3) / (4) | (6) = (3) - (5) |
| 2019 | \$ 0 | \$ 0 | \$ 0 | 1 | \$ 0 | \$ 0 |
| 2020 | 0 | 0 | 0 | 2 | 0 | 0 |
| 2021 | 378,978 | (24,644) | 354,335 | 3 | 118,112 | 236,223 |
| 2022 | 0 | 0 | 0 | 4 | 0 | 0 |
| 2023 | (24,644) | 24,644 | 0 | 5 | 0 | 0 |
| Total | 354,335 | \$ 0 | \$ 354,335 | | \$ 118,112 | 236,223 |
| 9. | Final actuarial value of plan net assets, end of year (Item 6 - Item 8 Column 6) | | | | | 3,836,122 |
| 10. | Asset gain (loss) for year (Item 9 - Item 5) | \$ | | | | 118,112 |
| 11. | Asset gain (loss) as % of actual actuarial assets | | | | | 3.08% |
| 12. | Ratio of actuarial value to market value | | | | | 94.2% |

Notes: Remaining deferrals in Column (1) for prior years are from last year's report column (6) of Table 10. The number in the current year is the difference between the remaining deferrals for prior years and the total Excess/(Shortfall) return shown in Item 7. Column 2 is a direct offset of the current year's excess/(shortfall) return against prior years' excess/(shortfall) of the opposite type.



Table 11
Estimation of Investment Return Yield (Net of Expenses)

| Item | July 1, 2023 | July 1, 2022 |
|-------------------------------------------------------|--------------|--------------|
| (1) | (2) | (3) |
| A. Market value yield | | |
| 1. Beginning of year net market assets | \$ 3,952,351 | \$ 3,867,087 |
| 2. Net Investment income (net of investment expenses) | 221,983 | 189,856 |
| 3. End of year market assets | 4,072,345 | 3,952,351 |
| 4. Estimated market value yield | 5.69% | 4.98% |
| B. Actuarial value yield | | |
| 1. Beginning of year actuarial assets | \$ 3,573,373 | \$ 3,322,651 |
| 2. Net Investment income (net of investment expenses) | 364,739 | 355,314 |
| 3. End of year actuarial assets | 3,836,122 | 3,573,373 |
| 4. Estimated actuarial value yield | 10.35% | 10.86% |

Note: Dollar amounts in \$000

Table 12
History of Investment Returns

| For Fiscal Year Ending | Market Value | Actuarial Value |
|-----------------------------------------|--------------|-----------------|
| (1) | (2) | (3) |
| June 30, 2008 | (0.25%) | 8.97% |
| June 30, 2009 | (20.14%) | 2.60% |
| June 30, 2010 | 11.21% | 3.54% |
| June 30, 2011 | 21.56% | 6.27% |
| June 30, 2012 | (0.89%) | 4.46% |
| June 30, 2013 | 13.02% | 5.39% |
| June 30, 2014 | 16.04% | 7.95% |
| June 30, 2015 | 2.78% | 6.82% |
| June 30, 2016 | 1.21% | (3.81%) |
| June 30, 2017 | 12.41% | 8.08% |
| June 30, 2018 | 8.68% | 8.30% |
| June 30, 2019 | 6.83% | 8.26% |
| June 30, 2020 | (3.76)% | 5.38% |
| June 30, 2021 | 38.31% | 11.50% |
| June 30, 2022 | 4.98% | 10.86% |
| June 30, 2023 | 5.69% | 10.35% |
| Average Compound Return - last 5 years | 9.55% | 9.25% |
| Average Compound Return - last 10 years | 8.81% | 7.29% |

Note: Investment returns are estimations made by the actuary. Prior to June 30, 2016 these are dollar-weighted returns net of administrative and investment expenses. Beginning with June 30, 2016 the returns are net of investment expenses only.

Table 13
Historical Solvency Test

| Aggregated Accrued Liabilities for | | | | | Portions of Accrued Liabilities Covered by Reported Assets | | |
|------------------------------------|------------------------------------|----------------------------------------------------------------------|------------------------------------------|------------------------------|---------------------------------------------------------------|---------------|-----------------------|
| Valuation Date | Active Members Contributions | Retirees Beneficiaries and Vested Terminations ¹ | Members (City Financed Portion) | Actuarial Value of Assets | (5)/(2) | [(5)-(2)]/(3) | [(5)-(2)- (3)]/(4) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| July 1, 2003 | 44,388 | 1,115,801 | 2,118,063 | 1,510,264 | 100.0% | 100.0% | 17% |
| July 1, 2004 | 62,062 | 1,355,157 | 1,216,599 | 1,501,235 | 100.0% | 100.0% | 7% |
| July 1, 2005 | 48,150 | 1,577,345 | 1,099,777 | 1,777,656 | 100.0% | 100.0% | 14% |
| July 1, 2006 | 58,043 | 1,729,863 | 1,106,389 | 1,867,293 | 100.0% | 100.0% | 7% |
| July 1, 2007 | 69,544 | 1,824,992 | 1,234,178 | 2,193,745 | 100.0% | 100.0% | 24% |
| July 1, 2008 | 81,182 | 1,904,333 | 1,310,855 | 2,310,384 | 100.0% | 100.0% | 25% |
| July 1, 2009 | 95,268 | 1,974,714 | 1,381,428 | 2,284,442 | 100.0% | 100.0% | 16% |
| July 1, 2010 | 107,421 | 2,058,813 | 1,466,236 | 2,273,142 | 100.0% | 100.0% | 7% |
| July 1, 2011 | 118,202 | 2,154,959 | 1,517,167 | 2,328,804 | 100.0% | 100.0% | 4% |
| July 1, 2012 | 124,848 | 2,312,548 | 1,529,468 | 2,344,128 | 100.0% | 96.0% | 0% |
| July 1, 2013 | 132,238 | 2,431,950 | 1,565,395 | 2,382,585 | 100.0% | 92.5% | 0% |
| July 1, 2014 | 139,203 | 2,538,225 | 1,611,151 | 2,490,521 | 100.0% | 92.6% | 0% |
| July 1, 2015 | 143,097 | 2,832,860 | 1,789,762 | 2,582,510 | 100.0% | 86.1% | 0% |
| July 1, 2016 | 146,407 | 2,894,489 | 1,694,103 | 2,625,896 | 100.0% | 85.7% | 0% |
| July 1, 2017 | 149,190 | 2,993,101 | 1,723,740 | 2,742,539 | 100.0% | 86.6% | 0% |
| July 1, 2018 | 162,180 | 3,093,196 | 1,726,632 | 2,874,585 | 100.0% | 87.7% | 0% |
| July 1, 2019 | 176,988 | 3,159,103 | 1,755,054 | 3,019,255 | 100.0% | 90.0% | 0% |
| July 1, 2020 | 191,620 | 3,221,122 | 1,783,605 | 3,074,339 | 100.0% | 89.5% | 0% |
| July 1, 2021 | 203,932 | 3,301,271 | 1,784,730 | 3,322,651 | 100.0% | 94.5% | 0% |
| July 1, 2022 | 209,641 | 3,426,967 | 1,791,956 | 3,812,008 | 100.0% | 100.0% | 10% |
| July 1, 2023 | 218,311 | 3,538,333 | 1,801,164 | 3,836,122 | 100.0% | 100.0% | 4% |

Note: Dollar amounts in \$000

1 Column (3) included AAL for DROP participants until 2003, thereafter in Column (4)



Table 14
Schedule of Funding Progress

| Date | Actuarial Value of Assets (AVA) | Actuarial Liability (AAL) | Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) | Funded Ratio (2)/(3) | Annualized Salaries | UAAL as % of Salaries (4)/(6) |
|--------------|---------------------------------|---------------------------|-------------------------------------------------------|----------------------|---------------------|-------------------------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| July 1, 2003 | \$ 1,510,264 | \$ 3,278,251 | \$ 1,767,987 | 46.1% | \$ 390,314 | 453.0% |
| July 1, 2004 | 1,501,235 | 2,633,817 | 1,132,582 | 57.0% | 366,190 | 309.3% |
| July 1, 2005 | 1,777,656 | 2,725,272 | 947,616 | 65.2% | 404,565 | 234.2% |
| July 1, 2006 | 1,867,293 | 2,894,295 | 1,027,002 | 64.5% | 422,496 | 243.1% |
| July 1, 2007 | 2,193,745 | 3,128,713 | 934,968 | 70.1% | 448,925 | 208.3% |
| July 1, 2008 | 2,310,384 | 3,296,370 | 985,986 | 70.1% | 483,815 | 203.8% |
| July 1, 2009 | 2,284,442 | 3,451,410 | 1,166,968 | 66.2% | 539,023 | 216.5% |
| July 1, 2010 | 2,273,142 | 3,632,470 | 1,359,328 | 62.6% | 550,709 | 246.8% |
| July 1, 2011 | 2,328,804 | 3,790,328 | 1,461,524 | 61.4% | 544,665 | 268.3% |
| July 1, 2012 | 2,344,128 | 3,966,864 | 1,622,736 | 59.1% | 534,394 | 303.7% |
| July 1, 2013 | 2,382,585 | 4,129,583 | 1,746,998 | 57.7% | 549,971 | 317.7% |
| July 1, 2014 | 2,490,521 | 4,288,579 | 1,798,058 | 58.1% | 568,992 | 316.0% |
| July 1, 2015 | 2,582,510 | 4,765,719 | 2,183,209 | 54.2% | 584,025 | 373.8% |
| July 1, 2016 | 2,625,896 | 4,734,999 | 2,109,103 | 55.5% | 608,210 | 346.8% |
| July 1, 2017 | 2,742,539 | 4,866,031 | 2,123,492 | 56.4% | 623,577 | 340.5% |
| July 1, 2018 | 2,874,585 | 4,982,008 | 2,107,424 | 57.7% | 624,266 | 337.6% |
| July 1, 2019 | 3,019,255 | 5,091,145 | 2,071,890 | 59.3% | 636,463 | 325.5% |
| July 1, 2020 | 3,074,339 | 5,196,347 | 2,122,008 | 59.2% | 657,876 | 322.6% |
| July 1, 2021 | 3,322,651 | 5,289,933 | 1,967,283 | 62.8% | 669,217 | 294.0% |
| July 1, 2022 | 3,573,373 | 5,428,564 | 1,855,191 | 65.8% | 696,890 | 266.2% |
| July 1, 2023 | 3,836,122 | 5,557,808 | 1,721,686 | 69.0% | 729,928 | 235.9% |

Table 15
Historical Active Participant Data

| Valuation Date | Active Count | Average Age | Average Svc | Annualized Salaries | Average Salary | Percent Changes |
|-------------------|--------------|-------------|-------------|---------------------|----------------|-----------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1995 | 14,364 | 41.3 | N/A | \$378,511 | \$26,351 | 0.8% |
| 1996 | 14,067 | 41.8 | N/A | \$367,610 | \$26,133 | (0.8%) |
| 1998 ¹ | 13,764 | 42.8 | 9.8 | \$394,919 | \$28,692 | 9.8% |
| 1999 ¹ | 13,286 | 42.9 | 9.8 | \$396,617 | \$29,852 | 4.0% |
| 2000 ¹ | 13,126 | 43.7 | 10.3 | \$421,591 | \$32,119 | 7.6% |
| 2001 ¹ | 12,928 | 43.9 | 10.3 | \$413,021 | \$31,948 | (0.5%) |
| 2002 | 12,527 | 44.7 | 11 | \$399,794 | \$31,915 | (0.1%) |
| 2003 | 12,120 | 45.2 | 11.2 | \$390,314 | \$32,204 | 0.9% |
| 2004 | 11,856 | 45.1 | 10.3 | \$366,190 | \$30,886 | (4.1%) |
| 2005 ² | 11,974 | 44.8 | 9.6 | \$404,565 | \$33,787 | 9.4% |
| 2006 | 12,145 | 44.8 | 9.31 | \$422,496 | \$34,788 | 3.0% |
| 2007 | 12,376 | 45.2 | 9.3 | \$448,925 | \$36,274 | 4.3% |
| 2008 | 12,653 | 45.2 | 9.3 | \$483,815 | \$38,237 | 5.4% |
| 2009 | 13,333 | 45.1 | 9.2 | \$539,023 | \$40,428 | 5.7% |
| 2010 | 12,913 | 45.8 | 10.0 | \$550,709 | \$42,648 | 5.5% |
| 2011 | 12,345 | 46.5 | 10.6 | \$544,665 | \$44,120 | 3.5% |
| 2012 | 11,670 | 46.8 | 11.1 | \$534,394 | \$45,792 | 3.8% |
| 2013 | 11,781 | 46.9 | 11.1 | \$549,971 | \$46,683 | 1.9% |
| 2014 | 11,949 | 46.9 | 11.1 | \$568,992 | \$47,618 | 2.0% |
| 2015 | 11,827 | 47.1 | 11.2 | \$584,025 | \$49,381 | 3.7% |
| 2016 | 12,103 | 47.1 | 11.1 | \$608,210 | \$50,253 | 1.8% |
| 2017 | 12,066 | 47.3 | 11.1 | \$623,577 | \$51,681 | 2.8% |
| 2018 | 11,880 | 47.5 | 11.3 | \$624,266 | \$52,548 | 1.7% |
| 2019 | 11,507 | 47.9 | 11.5 | \$636,463 | \$55,311 | 5.3% |
| 2020 | 11,594 | 47.9 | 11.3 | \$657,876 | \$56,743 | 2.6% |
| 2021 | 11,579 | 48.0 | 11.4 | \$669,217 | \$57,796 | 1.9% |
| 2022 | 11,402 | 48.0 | 11.3 | \$696,890 | \$61,120 | 5.8% |
| 2023 | 11,578 | 47.9 | 10.9 | \$729,928 | \$63,044 | 3.1% |

Note: Dollar amounts in \$000

- 1 Excludes DROP participants
- 2 Beginning with the 2005 valuation, a change in methodology annualizes payroll for new entrants. If the methodology had not been changed, the covered payroll for 2005 would have been \$376,208,345 and the average salary would have been \$31,419.



Table 16
Retirees, Beneficiaries, and Disabled Participants Added to and Removed from Rolls

| Valuation July 1, | Added to Rolls | | Removed from Rolls | | Rolls-End of Year | | % Increase in Annual Allowances | Average Annual Allowances |
|----------------------|----------------|----------------------|--------------------|----------------------|-------------------|----------------------|---------------------------------------|---------------------------------|
| | Number | Annual Allowances | Number | Annual Allowances | Number | Annual Allowances | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 2003 | 598 | \$ 11,497 | 311 | \$ 1,873 | 6,215 | \$ 84,519 | 17.0% | \$ 13,599 |
| 2004 | 942 | 25,189 | 279 | 2,624 | 6,878 | 107,084 | 26.7% | 15,569 |
| 2005 | 861 | 18,054 | 216 | 1,926 | 7,523 | 123,212 | 15.1% | 16,378 |
| 2006 | 654 | 14,722 | 397 | 2,246 | 7,780 | 135,688 | 10.1% | 17,441 |
| 2007 | 440 | 10,280 | 249 | 3,007 | 7,971 | 142,961 | 5.4% | 17,935 |
| 2008 | 464 | 11,052 | 280 | 3,420 | 8,155 | 150,592 | 5.3% | 18,466 |
| 2009 | 474 | 11,430 | 289 | 3,667 | 8,340 | 158,356 | 5.2% | 18,988 |
| 2010 | 476 | 12,040 | 290 | 3,938 | 8,526 | 166,458 | 5.1% | 19,524 |
| 2011 | 502 | 13,202 | 311 | 4,451 | 8,717 | 175,210 | 5.3% | 20,100 |
| 2012 | 654 | 16,299 | 293 | 3,993 | 9,078 | 187,515 | 7.0% | 20,656 |
| 2013 | 695 | 15,566 | 346 | 5,051 | 9,427 | 198,030 | 5.6% | 21,007 |
| 2014 | 619 | 15,370 | 361 | 5,717 | 9,685 | 207,683 | 4.9% | 21,444 |
| 2015 | 771 | 17,334 | 433 | 5,534 | 10,023 | 219,484 | 5.7% | 21,898 |
| 2016 | 590 | 17,295 | 324 | 5,842 | 10,289 | 230,937 | 5.2% | 22,445 |
| 2017 | 659 | 19,402 | 347 | 6,285 | 10,601 | 244,054 | 5.7% | 23,022 |
| 2018 | 607 | 19,691 | 374 | 9,929 | 10,834 | 253,816 | 4.0% | 23,428 |
| 2019 | 634 | 15,297 | 358 | 6,815 | 11,110 | 262,297 | 3.3% | 23,609 |
| 2020 | 579 | 13,011 | 337 | 6,455 | 11,352 | 268,854 | 2.5% | 23,683 |
| 2021 | 588 | 13,569 | 478 | 9,035 | 11,462 | 273,387 | 1.7% | 23,852 |
| 2022 | 753 | 18,043 | 439 | 6,695 | 11,776 | 284,735 | 4.2% | 24,179 |
| 2023 | 628 | 16,003 | 432 | 7,133 | 11,972 | 293,605 | 3.1% | 24,524 |

Note: Dollar amounts in \$000



Table 17
Membership Data

| | July 1, 2023 | July 1, 2022 | July 1, 2021 |
|-------------------------------------|----------------|----------------|----------------|
| | (1) | (2) | (3) |
| 1. Active members | | | |
| a. Number | 11,578 | 11,402 | 11,579 |
| b. Number vested | 7,167 | 7,420 | 7,700 |
| c. Annualized salaries | \$ 729,928,000 | \$ 696,890,000 | \$ 669,217,000 |
| d. Average salary | 63,044 | 61,120 | 57,796 |
| e. Average age | 47.9 | 48.0 | 48.0 |
| f. Average service | 10.9 | 11.3 | 11.4 |
| 2. Inactive participants | | | |
| a. Vested | 4,007 | 3,953 | 3,789 |
| b. Total annual benefits (deferred) | \$ 30,911,933 | \$ 29,256,498 | \$ 27,690,996 |
| c. Average annual benefit | 7,714 | 7,401 | 7,308 |
| d. Nonvested | 4,883 | 4,348 | 3,837 |
| 3. Service retirees | | | |
| a. Number | 9,667 | 9,484 | 9,184 |
| b. Total annual benefits | \$ 253,363,089 | \$ 245,589,241 | \$ 235,185,322 |
| c. Average annual benefit | 26,209 | 25,895 | 25,608 |
| d. Average age | 71.5 | 71.2 | 70.9 |
| 4. Disabled retirees | | | |
| a. Number | 217 | 235 | 251 |
| b. Total annual benefits | \$ 2,677,835 | \$ 2,843,197 | \$ 3,007,163 |
| c. Average annual benefit | 12,340 | 12,099 | 11,981 |
| d. Average age | 70.5 | 69.7 | 69.2 |
| 5. Beneficiaries and spouses | | | |
| a. Number | 2,088 | 2,057 | 2,046 |
| b. Total annual benefits | \$ 37,563,727 | \$ 36,302,634 | \$ 35,194,722 |
| c. Average annual benefit | 17,990 | 17,813 | 17,363 |
| d. Average age | 72.6 | 71.7 | 71.5 |



Table 18
Distribution of All Active Members by Age and by Years of Service

| Attained Age | 0 No. & Avg. Comp. | 1 No. & Avg. Comp. | 2 No. & Avg. Comp. | 3 No. & Avg. Comp. | 4 No. & Avg. Comp. | 5-9 No. & Avg. Comp. | 10-14 No. & Avg. Comp. | 15-19 No. & Avg. Comp. | 20-24 No. & Avg. Comp. | 25-29 No. & Avg. Comp. | 30-34 No. & Avg. Comp. | 35 & Over No. & Avg. Comp. | Total No. & Avg. Comp. |
|--------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|
| Under 25 | 122 \$38,648 | 47 \$41,738 | 19 \$40,259 | 6 \$44,561 | 2 * | 1 * | | | | | | | 197 \$39,883 |
| 25-29 | 261 \$44,599 | 167 \$48,185 | 81 \$48,800 | 56 \$50,032 | 44 \$50,353 | 76 \$51,512 | | | | | | | 685 \$47,550 |
| 30-34 | 272 \$47,214 | 177 \$53,348 | 110 \$54,793 | 106 \$54,862 | 75 \$57,353 | 279 \$55,887 | 60 \$55,581 | 4 \$76,258 | | | | | 1,083 \$53,242 |
| 35-39 | 207 \$52,086 | 145 \$56,517 | 78 \$60,613 | 88 \$60,848 | 74 \$62,277 | 350 \$61,471 | 148 \$60,905 | 82 \$62,537 | 1 * | | | | 1,173 \$59,155 |
| 40-44 | 194 \$56,216 | 153 \$60,875 | 74 \$67,964 | 85 \$62,472 | 70 \$62,242 | 335 \$66,785 | 193 \$68,001 | 275 \$71,753 | 53 \$65,082 | 3 * | | | 1,435 \$65,343 |
| 45-49 | 138 \$55,113 | 127 \$62,466 | 84 \$63,540 | 76 \$66,372 | 59 \$69,164 | 293 \$66,278 | 149 \$70,077 | 287 \$70,974 | 118 \$69,803 | 63 \$66,990 | | | 1,394 \$66,491 |
| 50-54 | 152 \$55,190 | 119 63,078 | 87 \$66,798 | 66 \$55,565 | 60 \$64,087 | 284 \$67,123 | 177 \$70,428 | 301 \$70,276 | 172 \$65,518 | 168 \$69,624 | 66 \$68,762 | 1 * | 1,653 \$66,232 |
| 55-59 | 121 59,031 | 98 60,880 | 51 \$60,061 | 46 \$62,460 | 68 \$58,921 | 255 \$63,776 | 181 \$66,704 | 335 \$67,639 | 147 \$63,124 | 212 \$68,205 | 166 \$71,756 | 45 \$66,391 | 1,725 \$65,325 |
| 60-64 | 63 \$52,835 | 63 \$56,762 | 38 \$73,627 | 43 \$61,275 | 31 \$63,169 | 213 \$64,629 | 148 \$71,398 | 291 \$68,142 | 145 \$64,037 | 148 \$72,741 | 128 \$72,332 | 80 \$77,052 | 1,391 \$67,528 |
| 65 & Over | 26 \$51,126 | 30 \$65,699 | 18 \$71,357 | 18 \$56,829 | 16 \$60,468 | 129 \$70,034 | 120 \$75,953 | 183 \$70,427 | 84 \$71,880 | 84 \$70,650 | 79 \$75,852 | 55 \$78,513 | 842 \$71,134 |
| Total | 1,556 \$50,566 | 1,126 \$56,761 | 640 \$60,619 | 590 \$58,969 | 499 \$61,019 | 2,215 \$63,648 | 1,176 \$68,142 | 1,758 \$69,434 | 720 \$66,141 | 678 \$69,690 | 439 \$72,211 | 181 \$74,844 | 11,578 \$63,044 |

Average: Age: 47.94 Number of participants: Fully vested: 7,167 Males: 6,260
 Service: 10.88 Not Vested: 4,411 Females: 5,318

* Detailed pay data is not shown if there are 3 or fewer members, but the pay is included in the Total column.



Appendix A

Summary of Actuarial Assumptions and Methods

APPENDIX A

Summary of Actuarial Assumptions and Methods

The following methods and assumptions were used in preparing the July 1, 2023, actuarial valuation.

1. Valuation Date

The valuation date is July 1st of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

2. Actuarial Cost Method (Prescribed Method under Actuarial Standards of Practice)

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial accrued liability.

- a. The valuation is prepared on the projected benefit basis, under which the present value, at the investment return rate assumed to be earned in the future (7.0 percent), of each participant's expected benefit payable at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability, or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Plan on account of the present group of participants and beneficiaries.
- b. The employer contributions required to support the benefits of the Plan are determined using a level funding approach, and consist of a normal cost contribution and an accrued liability contribution.
- c. The normal contribution is determined using the "entry age normal" method. Under this cost method, a calculation is made to determine the average uniform and constant percentage rate of employer contribution which, if applied to the compensation of each participant during the entire period of his/her anticipated covered service, would be required to meet the cost of all benefits payable on his behalf based on the benefits provisions for new employees hired on or after the valuation date.
- d. The actuarial accrued liability (AAL) for each member is the difference between their present value of future benefits (PVFB), based on the tier of benefits that apply to the member, and their present value of future normal costs determined using the normal cost rate described in item c above. For inactive and retired members their AAL is equal to their PVFB.

- e. The Legacy Liability payments were established in the Initial RSVS valuation. Each subsequent valuation a liability (gain)/loss layer is established that is the difference between the sum of (i) the remaining Legacy Liability and (ii) the remaining liability (gain)/loss layers, and the unfunded accrued liability. The amortization payment for each liability (gain)/loss layer is determined by amortizing the layer over 30 years with the first payment made one year after the valuation in which the layer was established.

The contribution rate determined by this valuation will not be effective until one year later and the determination of the rate reflects this deferral. It is assumed that there will be no change in the employer normal cost rate due to the deferral, and it is assumed that payments are made uniformly throughout the year.

3. Actuarial Value of Assets

The actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual market value and the expected actuarial value of assets each year, and recognizes the cumulative excess return (or shortfall) at a minimum rate of 20% per year. Each year a base is set up to reflect this difference. If the current year's base is of opposite sign to the deferred bases then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base (5 less the number of years between the base year and the valuation year). This is intended to ensure the smoothed value of assets will converge towards the market value in a reasonable amount of time.

Expected earnings are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of investment expenses.

The actuarial value of assets was marked to market value as of July 1, 2016 by recognizing all deferred investment shortfalls on that date. The method described above began again with the 2017 valuation.

4. Economic Assumptions

- a. Investment return: 7.00% per year, compounded annually, composed of an assumed 2.25% inflation rate and a 4.75% net real rate of return. This rate represents the assumed return, net of all investment expenses.
- b. Salary increase rate: A 2.25% inflation component, plus a 1.00% general increase, plus a service-related component as follows:

| Years of Service | Service-related Component | Total Annual Rate of Increase Including 2.25% Inflation Component and 1.00% General Increase Rate |
|------------------|---------------------------|---------------------------------------------------------------------------------------------------|
| (1) | (2) | (3) |
| 1 | 2.25% | 5.50% |
| 2 | 2.25 | 5.50 |
| 3 | 2.75 | 6.00 |
| 4 | 2.25 | 5.50 |
| 5 | 1.75 | 5.00 |
| 6 | 1.50 | 4.75 |
| 7 | 1.25 | 4.50 |
| 8 | 1.00 | 4.25 |
| 9 | 0.75 | 4.00 |
| 10-19 | 0.50 | 3.75 |
| 20-24 | 0.25 | 3.50 |
| 25+ | 0.00 | 3.25 |

- c. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 2.75% per year. This increase rate is solely due to the effect of inflation on salaries, with no allowance for future membership growth.

The investment return assumption is established in statute at 7.0% and therefore is considered a prescribed assumption under the Actuarial Standards of Practice.

5. Demographic Assumptions

a. Retirement Rates

| | Expected Retirements per 100 Lives | | |
|-------|------------------------------------|-----------------|--------------|
| | Group A & B Members | Group D Members | |
| Age | All | Service <20 | Service >=20 |
| (1) | (2) | (3) | (4) |
| 45-51 | 5 | | |
| 52 | 6 | | |
| 53 | 7 | | |
| 54 | 8 | | |
| 55 | 9 | 1 | 1 |
| 56 | 10 | 2 | 2 |
| 57 | 11 | 3 | 3 |
| 58 | 12 | 4 | 4 |
| 59 | 13 | 5 | 5 |
| 60 | 14 | 6 | 6 |
| 61 | 15 | 7 | 7 |
| 62 | 16 | 16 | 26 |
| 63 | 17 | 17 | 17 |
| 64 | 18 | 18 | 18 |
| 65 | 19 | 19 | 19 |
| 66 | 20 | 20 | 20 |
| 67 | 21 | 21 | 21 |
| 68 | 22 | 22 | 22 |
| 69 | 23 | 23 | 23 |
| 70-74 | 24 | 24 | 24 |
| 75+ | 100 | 100 | 100 |

b. DROP Participation

100% of eligible members who reach eligibility for normal retirement prior to age 60 are assumed to enter DROP. 0% of eligible members who reach eligibility for normal retirement at or after age 60 are assumed to enter DROP.

c. DROP Entry Date

Those active members (not already in DROP) are assumed to enter DROP when first eligible. For members who have already entered DROP, the actual DROP entry date supplied in the data is used.

d. DROP Interest Credit

Interest is credited as 50% of the average five-year net investment return, with a minimum of 2.5% and a maximum of 7.5%. The credit rate is assumed to be 4.00% per year.

e. Mortality rate (active members)

Based on the Pub-2010, Amount-Weighted, Below-Median Income, General, Employee Male and Female tables, with a 2-year set forward. The rates are projected on a fully generational basis by the long-term rates of scale MP 2020 to account for future mortality improvements. 90% of the rates are assumed to be for non-service related deaths and 10% for service related deaths.

Mortality rates (retired members and beneficiaries):

Healthy Retirees and beneficiaries: Gender-distinct Pub-2010, Amount-Weighted, Below-Median Income, General, Healthy Retiree tables with a 2-year set-forward. The rates are projected on a fully generational basis by the long-term rates of scale MP 2020 to account for future mortality improvements. Life Expectancies are shown in the table below:

| | Life Expectancy for an Age 65 Retiree in years | | | | |
|--------|------------------------------------------------|------|------|------|------|
| | Year of Retirement | | | | |
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| Male | 18.4 | 18.8 | 19.3 | 19.7 | 20.1 |
| Female | 21.8 | 22.1 | 22.5 | 22.9 | 23.2 |

Disabled Retirees: Gender-distinct Pub-2010, Amount-Weighted, Below-Median Income, General, Healthy Retiree tables with a 7-year set-forward. The rates are projected on a fully generational basis by the long-term rates of scale MP 2020 to account for future mortality improvements. A minimum rate of 0.04 is applied to male and 0.03 to female.

f. Termination Rates and Disability Rates

Termination rates (for causes other than death, disability or retirement):

Termination rates are a function of the member's age and service. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates at selected ages are shown below.

Probability of Decrement Due to Withdrawal - Male Members

| Age | Years of Service | | | | | | | | | | |
|-----|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 20 | 0.2528 | 0.2156 | 0.1864 | 0.1670 | 0.1513 | 0.1379 | 0.1160 | 0.0982 | 0.0828 | 0.0724 | 0.0675 |
| 30 | 0.2175 | 0.1642 | 0.1345 | 0.1204 | 0.1160 | 0.1141 | 0.1039 | 0.0859 | 0.0738 | 0.0675 | 0.0555 |
| 40 | 0.1925 | 0.1397 | 0.1080 | 0.0942 | 0.0911 | 0.0910 | 0.0823 | 0.0644 | 0.0511 | 0.0451 | 0.0375 |
| 50 | 0.1708 | 0.1270 | 0.0910 | 0.760 | 0.0716 | 0.0703 | 0.0622 | 0.0523 | 0.0426 | 0.0400 | 0.0253 |
| 60 | 0.1321 | 0.1140 | 0.0959 | 0.0821 | 0.0705 | 0.0619 | 0.0525 | 0.0394 | 0.0295 | 0.0269 | 0.0171 |

Probability of Decrement Due to Withdrawal - Female Members

| Age | Years of Service | | | | | | | | | | |
|-----|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 20 | 0.2088 | 0.1924 | 0.1687 | 0.1470 | 0.1335 | 0.1244 | 0.1222 | 0.1139 | 0.0972 | 0.0845 | 0.0441 |
| 30 | 0.2004 | 0.1708 | 0.1465 | 0.1270 | 0.1134 | 0.1072 | 0.1010 | 0.0871 | 0.0726 | 0.0706 | 0.0441 |
| 40 | 0.1942 | 0.1541 | 0.1314 | 0.1104 | 0.0943 | 0.0845 | 0.0764 | 0.0635 | 0.0507 | 0.0387 | 0.0318 |
| 50 | 0.1713 | 0.1378 | 0.1120 | 0.0885 | 0.0770 | 0.0687 | 0.0602 | 0.0499 | 0.0415 | 0.0336 | 0.0253 |
| 60 | 0.0925 | 0.0808 | 0.0712 | 0.0640 | 0.0598 | 0.0562 | 0.0494 | 0.0401 | 0.0336 | 0.0336 | 0.0223 |

| Age | Rates of Decrement Due to Disability | | | |
|-----|--------------------------------------|----------|----------------------|------------------------|
| | Males | Females | Service-related Male | Service-related Female |
| 20 | 0.000004 | 0.000006 | 0.000000 | 0.000001 |
| 25 | 0.000009 | 0.000013 | 0.000001 | 0.000002 |
| 30 | 0.000073 | 0.000065 | 0.000005 | 0.000008 |
| 35 | 0.000318 | 0.000102 | 0.000022 | 0.000013 |
| 40 | 0.000650 | 0.000234 | 0.000045 | 0.000029 |
| 45 | 0.001259 | 0.000528 | 0.000087 | 0.000066 |
| 50 | 0.002195 | 0.001256 | 0.000151 | 0.000157 |
| 55 | 0.003171 | 0.002021 | 0.000219 | 0.000253 |
| 60 | 0.004188 | 0.002436 | 0.000289 | 0.000305 |

Rates of disability are reduced to zero once a member becomes eligible for retirement.

6. Other Assumptions

- a. Projected payroll for contribution purposes: The aggregate projected payroll for the fiscal year following the valuation date is calculated by increasing the actual payroll paid during the previous fiscal year to all members (actives, terminated and retired) by the payroll growth rate.
- b. Percent married: 70% of employees are assumed to be married. (No beneficiaries other than the spouse assumed). The 70% assumption is intended to provide sufficient margin to cover the costs of any surviving children benefits.
- c. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.
- d. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.
- e. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.
- f. There will be no recoveries once disabled.
- g. No surviving spouse will remarry.
- h. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.
- i. Administrative expenses: The administrative expenses of the plan are added into the employer contribution rate as a percentage of payroll at a rate of 1.25%.
- j. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
- k. Decrement timing: Decrements of all types are assumed to occur mid-year.
- l. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
- m. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
- n. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
- o. Benefit Service: All members are assumed to accrue 1 year of service each year. Fractional service is used to determine the amount of benefit payable.

- p. Retiree DROP Balances Payout Duration: It is assumed that retirees will receive their DROP balances in equal installments over the eight years following retirement.
- q. COLA is assumed to be 1.00% per year for almost all members effective 7/1/2017. Group D members who terminated prior to the effective date of the 2017 legislation are not eligible for a COLA.

7. Participant Data

Participant data was supplied on electronic files. There were separate files for (i) active members, (ii) inactive members, and (iii) members and beneficiaries receiving benefits.

The data for active members included birth date, sex, most recent hire date, salary paid during last fiscal year, hours worked by the employee, and employee contribution amounts. For retired members and beneficiaries, the data included date of birth, sex, amount of monthly benefit, and date of retirement. Also included was the member's Group and for members participating in DROP, their account balances and monthly DROP income.

Most healthy and disabled retirees are assumed to have an 80% joint and survivor form of payment (a small group of retirees is only eligible for a 50% joint and survivor annuity), prorated by the 70% marriage assumption and reflecting the 3 year spousal age differential. All non-children beneficiaries are assumed to have life only benefits and all children beneficiaries' annuities are assumed to stop at age 21.

Salary for the prior fiscal year as well as an annualized rate of pay is provided in the data. The annualized rate increased by one-year's salary increase is the rate of pay the member is assumed to earn in the upcoming fiscal year.

Except as noted below, assumptions were made to correct for missing, or inconsistent data. These had no material impact on the results presented.

We received salary information on City of Houston employees employed by HFC, HFF, and CCSI. Where we had additional information because of prior HMEPS service, we added the salary information and treated the records as active employees. For the records where we had no additional information, we assumed these records were Group D members and we grossed up the Group D liabilities and payroll to reflect these additions.

8. Group Transfers

We assume no current Group B members will transfer to Group A.

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Appendix B

Summary of Plan Provisions

APPENDIX B

Summary of Plan Provisions

The provisions summarized in this section apply to persons who are members (active employees). Former members may have been covered under different plan provisions, depending on their dates of separation from service.

1. Covered Members

Any person who is a participant of Group A, under the original act.

Persons who became employees of the City of Houston after September 1, 1981 and prior to September 1, 1999, and elected officials of the City of Houston who assumed office after September 1, 1981 and prior to September 1, 1999, participate in Group B, but may make an irrevocable election to participate in Group A instead.

Persons who become employees of the City and persons who are elected as City officials after September 1, 1999 and prior to January 1, 2008 become members of Group A. Certain persons who were or became a Director of a City Department, Chief Administrative Officer, or Executive Director of HMEPS on or after September 1, 1999 and prior to January 1, 2005 participate in Group C. Effective January 1, 2005, all Group C participation ceased and all Group C participants became Group A participants. Accruals earned by Group C participants prior to January 1, 2005 are retained, but all future accruals are based on the Group A formulas.

All future references to Group C participants in this appendix are intended to reflect this change in the Group C status.

Covered employees newly hired on or after January 1, 2008 are members of Group D.

A former employee who is rehired on or after January 1, 2008 is a member of the group in which such employee participated at the time of his/her immediately preceding separation from service.

2. Monthly Final Average Salary (FAS)

The sum of the seventy-eight highest biweekly salaries paid to a member during his period of credited service, divided by thirty-six. Salary includes base pay, longevity pay, and any shift differential pay. If there are fewer than seventy-eight biweekly salaries, the FAS is determined by multiplying the average of all biweekly salaries paid to the member during the period of credited service by 26 and dividing the product by 12.

3. Credited Service

All services and work performed by an employee, including prior service. For members of Group A and former Group C, all services and work performed after September 1, 1943 must have been accompanied by corresponding contributions to HMEPS by the employee or legally authorized repayments must have been made. The contribution requirement applies to all Group B and Group D members effective with the first full pay period on or after July 1, 2017.



Credited service for former participants in Group C means the number of years of eligible service after the executive official's effective date of participation in Group C. A former Group C member receives two times the number of actual years of credited service in Group C solely for the purpose of fulfilling the eligibility requirements in Group C.

If former Group D and pre-1997 Group B members who forfeited their previous non-contributory credited service are rehired they will regain a year of forfeited non-contributory credited service for each year of service earned upon reemployment.

4. Normal Retirement

- a. Eligibility For participants in Group A or Group B, or, a former Group C member who became a Group A member as of January 1, 2005, the earliest of:
- (i) age 62 and 5 years of Credited Service
 - (ii) 5 years of Credited Service, and age plus years of Credited Service equal 70 or more, provided that, prior to January 1, 2005, the participant had at least five years of credited service and the combination of age and years of credited service was equal to or greater than 68.
 - (iii) 5 years of Credited Service, and age plus years of Credited Service equal 75 or more with minimum age 50.

For participants in Group D
Age 62 and 5 years of Credited Service

- b. Benefit Prior to January 1, 2005:
- Group A: 3.25% of FAS for each of the first 10 years of Credited Service plus 3.50% of FAS for Credited Service greater than 10 years but less than 20 years plus 4.25% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.
- Group B: 1.75% of FAS for each of the first 10 years of Credited Service plus 2.00% of FAS for Credited Service greater than 10 years but less than 20 years, plus 2.75% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.
- Group C: Double the rate for Group A
- All accruals after January 1, 2005:
- All accruals under the prior multipliers were frozen as of January 1, 2005 and the following benefit multipliers apply to service on or after that date:
- Group A: 2.50% of FAS for each of the first 20 years of Credited Service plus 3.25% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.



Group B: 1.75% of FAS for each of the first 10 years of Credited Service plus 2.00% of FAS for Credited Service greater than 10 years but less than 20 years, plus 2.50% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.

Group D: 1.80% of FAS for each of the first 25 years of Credited Service, plus 1.00% of FAS for each year of Credited Service greater than 25 years. Maximum benefit is 90% of FAS for all future retirees.

5. Early Retirement (Group D only)

- a. Eligibility
 - (i) at least ten years of Credited Service; or
 - (ii) at least five years of Credited Service and a combination of age and service equals or is greater than 75.
- b. Benefit Accrued normal retirement benefit reduced by 0.25% for each month less than age 62.

6. Vested Pension

- a. Eligibility 5 years of Credited Service.
- b. Benefit Group A and Group C: Either the accrued normal retirement benefit with payments beginning at the normal retirement eligibility date or a refund of employee contributions, if any, without interest.

Group B and Group D: Accrued normal retirement benefit payable at the normal retirement eligibility date or a refund of employee contributions, if any, without interest.

If the actuarial present value of a pension is less than \$20,000, a terminated participant who is not eligible to begin receiving a pension may request an early lump sum distribution of the pension. Such early lump sum distribution is irrevocable. Credited Service associated therewith can be reinstated after reemployment and pursuant to the rules of the plan.

7. Withdrawal Benefit

If a nonvested contributory member withdraws from service with less than 5 years, a refund of the member's contributions is made without interest, upon request.

8. Service-Connected Disability Retirement

- a. Eligibility Any age
- b. Benefit Group A: Accrued normal retirement benefit, but not less than 20% of final monthly salary at time of disability plus 1% of final monthly salary per year of Credited Service, to a maximum of 40% of final monthly salary.



Group B and Group D: Accrued normal retirement benefit, but not less than 20% of final monthly salary at time of disability.

9. Non-service-Connected Disability Retirement

- a. Eligibility 5 years of Credited Service.
- b. Benefit Accrued normal retirement benefit payable immediately.

10. Pre-retirement Survivor Benefits

A. Service-connected

- a. Eligibility Any age or Credited Service
- b. Benefit If there is a surviving spouse, 80% of FAS payable to the spouse. 10% of FAS is payable to each qualifying dependent to a maximum of 20% for all dependents. Surviving spouse's benefit will be reduced by the amount of dependent benefits. If no surviving spouse, dependent benefits are 50% of the amount a surviving spouse would have received for each dependent to a maximum of 80% of FAS for all dependents in the aggregate.

B. Non service-connected

- a. Eligibility 5 years of Credited Service
- b. Benefit If an active Group A, Group B or Group D member with at least 5 years of credited service dies while still in service with the City (off-duty death), the spousal survivor benefit will be 80% of the normal accrued pension, payable immediately, provided that the spouse was married to the participant for at least one continuous year as of the date of death. If such spouse was married less than one continuous year as of the date of death, the survivor benefit is 50% of the normal accrued pension.

If a Group A or Group B deferred participant (not yet receiving a pension benefit) dies, the spousal survivor benefit is 50% of the normal accrued pension, payable at the participant's eligibility date. However, the surviving spouse can elect an earlier actuarially equivalent benefit.

11. Postretirement Survivor Benefits

All Groups except Option-Eligible Participants:

If there is a surviving spouse, 80% of the retirement benefit the deceased retiree was receiving at the time of death payable immediately, provided that the spouse was married to the retiree at the time of death and for at least one continuous year prior to the date of separation from service (the marriage requirement applies for separations from service on or after July 1, 2017). If such spouse was married less than one continuous year prior to the date of separation from service (the marriage requirement



applies for separations from service on or after July 1, 2017), the spousal survivor benefit is 50% of the retirement benefit being received by the retiree at the time of death.

Option-Eligible Participants:

Life only to the retiree. Option-Eligible Participants may elect other options based on actuarial factors.

Option-Eligible Participants are all Group D members, Group A & B members who terminate after June 30, 2011 eligible for a normal retirement benefit and who are not married at their termination of service, and Group B members who terminated prior to September 1, 1997 and who are eligible for a normal retirement benefit.

12. Benefit Adjustments

COLAs are calculated as half of the average five-year investment return less five percentage points, with a minimum of 0% and a maximum of 2%, not compounded. Group D retirees who terminated after the effective date of the 2017 Legislation will receive COLAs in the future. For employees who are participating in DROP, COLAs will be delayed until the earlier of their age at retirement or age 62 as of January 1 of the year in which the increase is made.

13. Contribution Rates (all rates occur as of the first full pay period on or after the applicable effective date)

- a. Members Effective July 1, 2017, 7% of salary for Group A members, 2% of salary for Group B members and 2% of salary for Group D members. For Group D, beginning January 1, 2018, in addition to the 2%, employees contribute 1% to a notional account that will be credited with the DROP Credit interest converted to a bi-weekly rate. Effective July 1, 2018, the total contribution increases to 8% of salary for Group A members and 4% of salary for Group B members.
- b. City Effective July 1, 2017, the City's contribution obligation is set by state statute as described in the RSVS Section.

14. Deferred Retirement Option

- a. Eligibility Participants (other than Group D) who are eligible to retire but who have not retired and who remain in service with the City may participate in the DROP.

- b. Monthly DROP Credit

An amount equal to the accrued normal retirement benefit as of the effective date of DROP participation. The Monthly DROP Credit is credited to a notional account (DROP Account) on the last calendar day



each month.

c. DROP Credit Interest

Interest is credited to the DROP Account at the beginning of each day based on the DROP Account balance at the end of the previous day and posted monthly on the last calendar day of each month. Effective July 1, 2017, the annual interest rate effective beginning January 1 each year is half of the average five-year investment return, not less than 2.5% and not greater than 7.5%. The assumed DROP Credit interest is 4.0%.

d. DROP Credits-COLA

COLAs will not be given if the DROP participant is younger than age 62. When the DROP participant attains at least age 62 as of January 1 of the year of the increase, COLAs are calculated as half of the average five-year investment return less five percentage points, with a minimum of 0% and a maximum of 2%, not compounded

e. DROP Account Balance

The sum of a participant's Monthly DROP Credits, applicable COLAs, applicable interest, and, prior to January 1, 2005, the employee contributions as applicable.

15. DROP Benefit Pay-out A terminated DROP participant may elect to:

- a. Receive the entire DROP Account Balance in a lump sum.
- b. Receive the DROP Account Balance in periodic payments as approved by the Pension Board.
- c. Receive a portion of the DROP Account balance in a lump sum and the remainder in periodic payments as approved by the Pension Board.
- d. Receive a partial payment of not less than \$1,000, no more than once each ninety (90) days.
- e. Defer election of a payout option until a future date.

16. Post DROP Retirement The Final Pension is the accrued normal retirement benefit as of the effective date of DROP participation, increased with COLAs since DROP entry.

Changes in Plan Provisions Since Prior Year

There have been no changes to the benefit provisions of the System since the prior valuation.