

East Bay Municipal Utility District Employees' Retirement System

Actuarial Valuation and Review of Pension Plan Benefits

As of June 30, 2022



This report has been prepared at the request of the Retirement Board to assist in administering the Fund. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Retirement Board and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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March 2, 2023

Ms. Sophia Skoda
Director of Finance
East Bay Municipal Utility District
375 Eleventh Street
Oakland, CA 94607-4240

Dear Sophia:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2022 for only the pension plan. The Review of Contribution Rates and Funding Status for the health insurance benefit (HIB) plan is provided in a separate report. This report summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal year 2023/2024.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census information and financial information on which our calculations were based was prepared by the East Bay Municipal Utility District Employees' Retirement System (EBMUDERS). That assistance is gratefully acknowledged.

The actuarial calculations were directed under my supervision. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal

A handwritten signature in black ink that reads "Andy Yeung".

Andy Yeung, ASA, MAAA, FCA, EA
Vice President and Actuary

DNA/jl

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Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal to present a valuation of the East Bay Municipal Utility District Employees' Retirement System ("the System") as of June 30, 2022. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of current Plan assets to cover the estimated cost of settling the Plan's accrued benefit obligations.

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; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Plan, as administered by the Board;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of June 30, 2022, provided by EBMUDERS;
- The assets of the Plan as of June 30, 2022, provided by EBMUDERS;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the June 30, 2022 valuation;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. adopted by the Board for the June 30, 2022 valuation; and
- The funding policy adopted by the Board.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the System's liabilities, and which, as a percentage of payroll, remain as level as possible for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

Section 1: Actuarial Valuation Summary

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the System's liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the System's staff. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's information.

The contribution requirements are determined as a percentage of payroll. The System's employer rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the revised funding policy adopted by the Board on September 22, 2022. In particular, any changes in the Unfunded Actuarial Accrued Liability (UAAL) as a result of assumption or method changes on or after July 1, 2021 are amortized over 20 years (instead of 25 years). Details of the funding policy are provided in *Section 4, Exhibit 1* starting on page 64.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit G* starting on page 51. A graphical projection of the UAAL amortization balances and payments has been included in *Section 3, Exhibit H* starting on page 53. In the aggregate, the total payment from all the UAAL layers was the same as amortizing the entire UAAL over a period of about 15 years.

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2023 through June 30, 2024.

Section 1: Actuarial Valuation Summary

Valuation Highlights

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1. The results of this valuation reflect changes in the economic actuarial assumptions adopted by the Board on January 19, 2023 based on our June 30, 2022 Economic Assumptions Review report dated November 8, 2022. These new assumptions (6.75% investment return, 2.50% inflation, and 3.00% payroll growth) are described in Section 4, Exhibit 1 of this report. These assumption changes resulted in an increase in the combined (1955/1980 Plan and 2013 Tier) employer contribution rate of 2.86% of payroll.

The results of this valuation also reflect a change in the amortization period, from 25 years to 20 years, for any new UAAL layers established on or after July 1, 2021 resulting from assumption or method changes. This change was adopted by the Board on September 22, 2022 based on our Actuarial Funding Policy review letter dated September 14, 2022. This change in the funding policy is described in Section 4, Exhibit 1 of this report.

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2. The funded ratio (the ratio of the valuation value of assets to actuarial accrued liability) is 76.1%, compared to the prior year funded ratio of 78.5%. This ratio is one measure of funding status, and its history is a measure of funding progress. The funded ratio measured on a market value basis is 70.7%, compared to 87.1% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for, or the amount of, future contributions.

In addition to the type of funded ratios noted above, Section 33 of the Employees' Retirement System Ordinance ("Ordinance") references a funded ratio based on the ratio of the market value of assets to the projected benefit obligation (PBO) for purposes of determining post-retirement cost of living adjustments (COLA). As noted in the plan provisions section of this report (*Section 4, Exhibit 2*), the basic minimum COLA benefit is the lesser of 3% and the actual change in the cost of living index. Any excess of the actual change in the cost of living index over 3% is accumulated in individual retiree COLA banks, and withdrawals from the bank are made in years when the index increases less than 3%. However, increases of up to 5% are granted in years when the Retirement Board determines that the System is more than 85% funded on a PBO basis. In those years when the System is more than 85% funded and the cost of living index exceeds 5%, any excess cost of living over 5% is accumulated in the COLA bank. Furthermore, effective October 1, 2000, in those years when the system is more than 85% funded on a PBO basis and the cost of living is less than 4%, withdrawals from the bank are made to allow cost of living increases up to 4%.

For the June 30, 2022 Retirement Plan and HIB Plan valuations, we note that the funded ratio on the PBO (and market value) basis is 70.8% for both plans combined, as shown in the Supplemental Exhibits report dated March 2, 2023.

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3. The UAAL as of June 30, 2021 was \$560.1 million. In this year's valuation, the UAAL has increased to \$677.3 million mainly due to unfavorable investment experience (after asset smoothing), higher than expected salary increases for continuing actives, higher than expected cost-of-living adjustment (COLA) increases for payees, other actuarial losses, and changes in actuarial assumptions, offset somewhat by a contribution gain due to actual contributions greater than expected from the anticipated one-year delay in implementing the lower contribution rates calculated in the last valuation.

Section 1: Actuarial Valuation Summary

A reconciliation of the System's UAAL is provided in *Section 2, Subsection E*. A schedule of the current UAAL amortization amounts is provided in *Section 3, Exhibit G*. Note that a graphical projection of the UAAL amortization bases and payments has been provided in *Section 3, Exhibit H*.

- Pg. 22
4. The net actuarial loss from investment (after smoothing) and contribution experience was \$1.2 million, or 0.04% of the actuarial accrued liability. The net experience loss from sources other than investment and contribution experience was \$54.8 million or 1.93% of the actuarial accrued liability. This net loss was primarily due to higher than expected salary increases for continuing actives, higher than expected cost-of-living adjustment (COLA) increases for payees, and other actuarial losses.
 5. The employer contribution rates that Segal recommended for the 2022/2023 Fiscal Year ("recommended rates") were provided in the June 30, 2021 valuation report. Based on the concern that a review of the actuarial assumptions was to be performed prior to this June 30, 2022 valuation and the results of that review would be expected to increase the overall cost of the plan, the Board decided to carry over unchanged for the 2022/2023 Fiscal Year ("adopted rates") the higher total (Pension and HIB Plans) employer contribution rates previously adopted for the 2021/2022 Fiscal Year, as originally determined in the June 30, 2020 valuations. The adopted and recommended aggregate employer rates from the June 30, 2021 valuation (based on June 30, 2022 projected payroll) were 38.24% and 36.06%, respectively.
- Pg. 30
6. The aggregate employer rate (if paid at the end of each pay period) calculated in this valuation has increased from 36.06% of payroll to 39.60% of payroll. The increase in the employer rate was primarily due to (a) the lower than expected return on the valuation value of assets (after smoothing), (b) higher than expected salary increases for continuing actives, (c) higher than expected COLA increases for current retirees and beneficiaries, (d) other actuarial losses, and (e) changes in actuarial assumptions, offset somewhat by (f) change in member demographics, (g) amortizing the prior year's UAAL over a larger than expected projected total payroll, and (h) the contribution gain due to actual contributions greater than expected from the anticipated one year delay in implementing the lower contribution rates calculated in the prior valuation.
 7. The total normal cost rates for both the 1955/1980 Plan and the 2013 Tier have been developed assuming the normal cost dollar contribution amounts would increase at the rate of the total salary increase assumption. The dollar contribution amounts are then converted to a percent of payroll normal cost rate by dividing the dollar contribution amounts by the payroll after limiting each individual employee's payroll by the appropriate compensation limit. Before considering the assumption changes in this year's valuation, there was a decrease in the total normal cost rate for the 2013 Tier due to the changes in member demographics during 2021/2022 in spite of the higher proportion of the 2013 Tier members exceeding the compensation limit imposed by CalPEPRA on that tier compared to last year. We will continue to monitor the proportion of members exceeding the compensation limit in future valuations and are available to discuss with the Retirement System other alternatives that could be used in the total normal cost calculation in order to mitigate future rate increases that could result from such event.

After considering the assumption changes in this year's valuation, there was an increase in the total normal cost rate for the 2013 Tier. However, the total normal cost rate for the 2013 Tier remained within 1% of the 18.81% of payroll threshold that was newly

Section 1: Actuarial Valuation Summary

established in the June 30, 2020 valuation for determining whether a change in the member rate for that tier would be warranted. Consequently, the member rate for the 2013 Tier has remained unchanged at 9.41% of payroll in this valuation.

- Pg. 31 8. The aggregate member rate calculated in this valuation has remained unchanged at 9.00% of payroll. A reconciliation of the aggregate member rate is provided in *Section 2, Subsection F*.
- Pg. 23 9. The rate of return on the Market Value of Assets was (10.94)% for the July 1, 2021 to June 30, 2022 plan year. The return on the Valuation Value of Assets (pension plan only) was 6.41% for the same period after considering the recognition of current and prior years' investment gains and losses. This resulted in an actuarial loss when measured against the previous valuation's assumed rate of return of 7.00%. This actuarial investment loss increased the average employer contribution rate by 0.35% of pay.
- Pg. 20 10. As indicated in *Section 2, Subsection B* of this report, the total net unrecognized investment loss as of June 30, 2022 is \$157.2 million for the assets for the pension and HIB plans (note that in the previous valuation, this amount was a net deferred gain of \$231.0 million). This net investment loss will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years. This implies that earning the assumed rate of investment return of 6.75% per year (net of expenses) on a market value basis will produce investment losses on the actuarial value of assets after June 30, 2022.
- The net deferred loss of \$157.2 million represents 7.6% of the market value of assets as of June 30, 2022. Unless offset by future investment gains or other favorable experience, the recognition of the net \$157.2 million market loss is expected to have an impact on the System's future funded percentage and contribution rate requirements. This potential impact may be illustrated as follows:
- If the pension plan portion of the net deferred loss were recognized immediately and entirely in the valuation value of assets, the funded percentage would decrease from 76.1% to 70.7%.
For comparison purposes, if the pension plan portion of the net deferred gain were recognized immediately and entirely in the valuation value of assets in the June 30, 2021 valuation, the funded percentage would have increased from 78.5% to 87.1%.
 - If the pension plan portion of the net deferred loss were recognized immediately and entirely in the valuation value of assets, the aggregate employer rate (payable at the end of each pay period) would increase from 39.60% to about 44.1% of payroll.
For comparison purposes, if the pension plan portion of the net deferred gain were recognized immediately and entirely in the valuation value of assets in the June 30, 2021 valuation, the aggregate employer rate (payable at the end of each pay period) would have decreased from 36.47% of payroll to about 29.3% of payroll.
11. The actuarial valuation report as of June 30, 2022 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.
- Pg. 38 12. Actuarial Standard of Practice No. 51 (ASOP 51) requires actuaries to identify and assess risks that "may reasonably be anticipated to significantly affect the plan's future financial condition." Examples of key risks listed that are particularly relevant to EBMUDERS are

Section 1: Actuarial Valuation Summary

asset/liability mismatch risk, investment risk, and longevity risk. The standard also requires an actuary to consider if there is any ongoing contribution risk to the plan, however it does not require the actuary to evaluate the particular ability or willingness of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

The actuary's initial assessment can be strictly a qualitative discussion about potential adverse experience and the possible effect on future results, but it may also include quantitative numerical demonstrations where informative. The actuary is also encouraged to consider a recommendation as to whether a more detailed assessment or risk report would be significantly beneficial for the intended user in order to examine particular financial risks. When making that recommendation, the actuary will take into account such factors as the plan's design, risk profile, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan. In 2021 we prepared a standalone Risk Assessment report for the Pension Plan dated April 29, 2021 by using membership and financial information as provided in the actuarial valuation as of June 30, 2020. That report includes various deterministic projections of future results under different investment return scenarios based on the assumptions adopted in the quadrennial experience study for the June 30, 2020 valuation.

We understand that the next stand-alone risk assessment report is not scheduled to be performed until after the next full experience study is conducted, which is scheduled prior to the June 30, 2024 actuarial valuation, unless EBMUDERS decides to have Segal develop a risk assessment report before then. In the meantime, we have included a brief discussion of key risks that may affect the System in Section 2, Subsection J.

13. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2022. Due to the COVID-19 pandemic, market conditions have changed significantly since the onset of the Public Health Emergency. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. While it is impossible to determine how the pandemic will continue to affect market conditions and other demographic experience of the Plan in future valuations, Segal is available to prepare projections of potential outcomes upon request.

Section 1: Actuarial Valuation Summary

Summary of Key Valuation Results

		June 30, 2022		June 30, 2021 (Adopted Rates) ¹	
		Total Rate	Estimated Annual Dollar Amount ²	Total Rate	Estimated Annual Dollar Amount ²
Employer Contribution Rates: <i>(payable at the <u>end</u> of each pay period)</i>	• 1955/1980 Plan	43.73%	\$57,389,897	42.37%	\$55,605,074
	• 2013 Tier	34.69%	<u>38,263,355</u>	33.32%	<u>36,752,234</u>
	• Combined	39.60%	\$95,653,252	38.24%	\$92,357,308
Average Member Contribution Rates: <i>(payable at the <u>end</u> of each pay period)</i>	• 1955/1980 Plan	8.66% ³	\$11,365,115	8.66% ³	\$11,365,115
	• 2013 Tier	9.41%	<u>10,379,307</u>	9.41%	<u>10,379,307</u>
	• Combined	9.00%	\$21,744,422	9.00%	\$21,744,422

¹ The recommended employer contribution rates from the June 30, 2021 valuation were 40.03% for the 1955/1980 Plan, 31.33% for the 2013 Tier, and 36.06% for the two plans combined (based on the June 30, 2022 projected annual compensation, as detailed in footnote 2 below).

² Estimated based on June 30, 2022 projected annual compensation of \$241,537,720 (that is, \$131,236,899 for the 1955/1980 Plan and \$110,300,821 for the 2013 Tier).

³ The rate of 8.66% payable during the fiscal years 2022/2023 and 2023/2024 is calculated by taking the total employee rate payable beginning April 18, 2016 (i.e., 8.75%), less the HIB employee contribution rate of 0.09%.

Section 1: Actuarial Valuation Summary

Summary of Key Valuation Results (continued)

		June 30, 2022	June 30, 2021
Actuarial Accrued Liability:	• Retired members and beneficiaries	\$1,834,781,122	\$1,677,463,290
	• Inactive vested members	55,173,918	48,098,062
	• Active members	<u>945,816,052</u>	<u>880,052,410</u>
	• Total Actuarial Accrued Liability (AAL)	\$2,835,771,092	\$2,605,613,762
	• Normal Cost for plan year beginning June 30	56,378,319	51,705,682
Assets:	• Valuation value of pension plan assets (VVA) ¹	\$2,158,462,528	\$2,045,502,995
	• Market value of pension plan assets (MVA) ¹	2,005,352,000	2,270,763,000
	• Actuarial value of pension plan and HIB plan assets	2,216,123,725	2,097,712,454
	• Market value of pension plan and HIB plan assets	2,058,923,000	2,328,722,000
	• Actuarial value of total plan assets as a percentage of market value of total plan assets	107.6%	90.1%
Funded status:	• Unfunded Actuarial Accrued Liability (UAAL) on VVA basis	\$677,308,564	\$560,110,767
	• Funded ratio on VVA basis	76.1%	78.5%
	• UAAL on MVA basis	\$830,419,092	\$334,850,762
	• Funded ratio on MVA basis	70.7%	87.1%
Key assumptions:	• Net investment return	6.75%	7.00%
	• Price Inflation	2.50%	2.75%
	• Payroll growth increase	3.00%	3.25%
	• Cost-of-Living Adjustment (COLA)	2.75%	2.75%

¹ Net of HIB plan assets.

Section 1: Actuarial Valuation Summary

Summary of Key Valuation Results (continued)

	June 30, 2022	June 30, 2021	Change From Prior Year
Demographic data:			
Active Members:			
• Number of members	1,895	1,896	-0.1%
• Average age	47.2	47.4	-0.2
• Average service	11.4	11.6	-0.2
• Total projected compensation	\$241,537,720	\$224,391,553	7.6%
• Average projected compensation	\$127,461	\$118,350	7.7%
Retired Members and Beneficiaries:			
• Number of members:			
– Service retired	1,656	1,588	4.3%
– Disability retired	53	53	0.0%
– Beneficiaries	339	336	0.9%
– Total	2,048	1,977	3.6%
• Average age	71.0	70.8	0.2
• Average monthly benefit	\$5,592	\$5,376	4.0%
Inactive Vested Members:			
• Number of members ¹	360	327	10.1%
• Average Age	48.3	48.9	-0.6
Total Members:	4,303	4,200	2.5%

¹ Includes inactive members due a refund of member contributions.

Section 1: Actuarial Valuation Summary

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the Market Value of Assets as of the valuation date, as provided by the System. The System uses an “Actuarial Value of Assets” that differs from market value to gradually reflect year-to-year changes in the Market Value of Assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, termination, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable.
Models	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The actuarial valuation is prepared at the request of the System. Segal is not responsible for the use or misuse of its report, particularly by any other party.

An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:

- Differences between actual experience and anticipated experience;
- Changes in actuarial assumptions or methods;
- Changes in statutory provisions; and
- Differences between the contribution rates determined by the valuation and those adopted by the Board.¹

Some actuarial results in this report are not rounded, but that does not imply precision.

If EBMUDERS is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.

Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

¹ EBMUDERS has a proven track-record of adopting at least the Actuarially Determined Contributions as determined by the valuation and based on the Board's Actuarial Funding Policy.

Section 2: Actuarial Valuation Results

A. Member Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and C.*

Member Population: 2013 – 2022

Year Ended June 30	Active Members	Inactive Vested Members ¹	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2013	1,666	232	1,440	1,672	1.00	0.86
2014	1,715	237	1,497	1,734	1.01	0.87
2015	1,762	239	1,563	1,802	1.02	0.89
2016	1,789	248	1,630	1,878	1.05	0.91
2017	1,802	267	1,713	1,980	1.10	0.95
2018	1,828	284	1,779	2,063	1.13	0.97
2019	1,847	303	1,844	2,147	1.16	1.00
2020	1,903	312	1,905	2,217	1.17	1.00
2021	1,896	327	1,977	2,304	1.22	1.04
2022	1,895	360	2,048	2,408	1.27	1.08

¹ Includes inactive members due a refund of member contributions.

Section 2: Actuarial Valuation Results

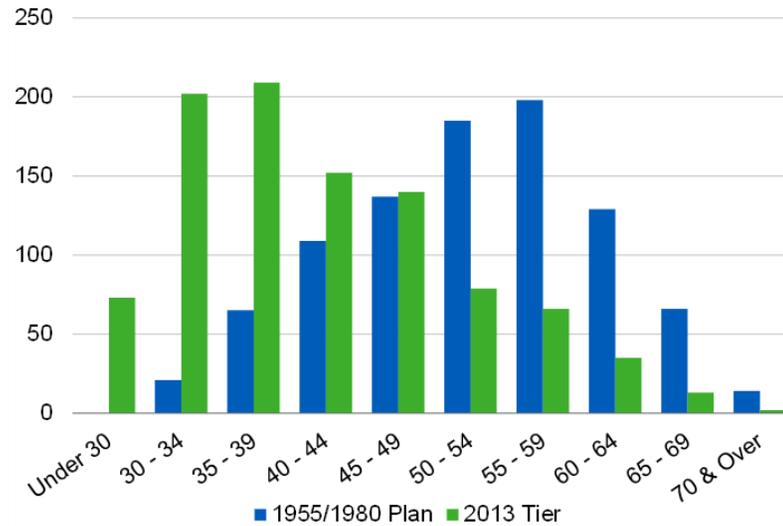
Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 1,895 active members with an average age of 47.2, average years of service of 11.4 years and average compensation of \$127,461. The 1,896 active members in the prior valuation had an average age of 47.4, average service of 11.6 years and average compensation of \$118,350.

Among the active members, there were none with unknown age information.

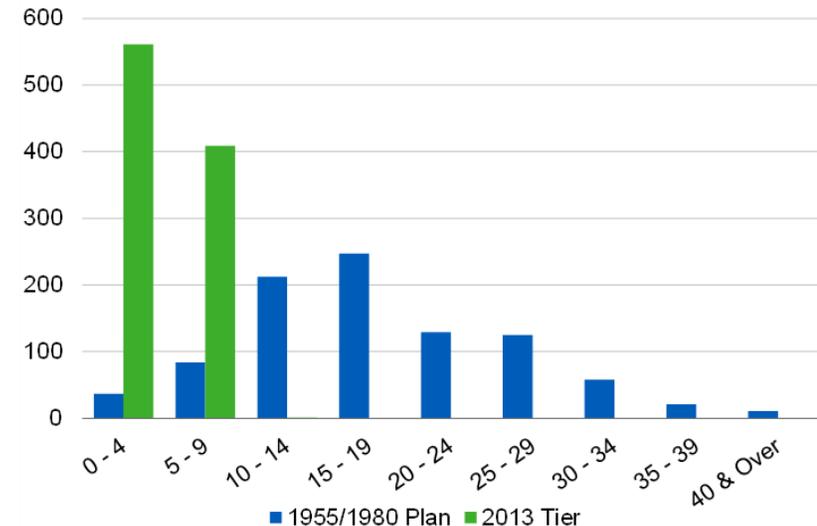
Distribution of Active Members as of June 30, 2022

Actives by Age



Average age	47.2
Prior year average age	47.4
Difference	-0.2

Actives by Years of Service



Average years of service	11.4
Prior year average years of service	11.6
Difference	-0.2

Inactive Members

In this year's valuation, there were 360 members with a vested right to a deferred or immediate vested benefit or a refund of contributions, versus 327 in the prior valuation.

Section 2: Actuarial Valuation Results

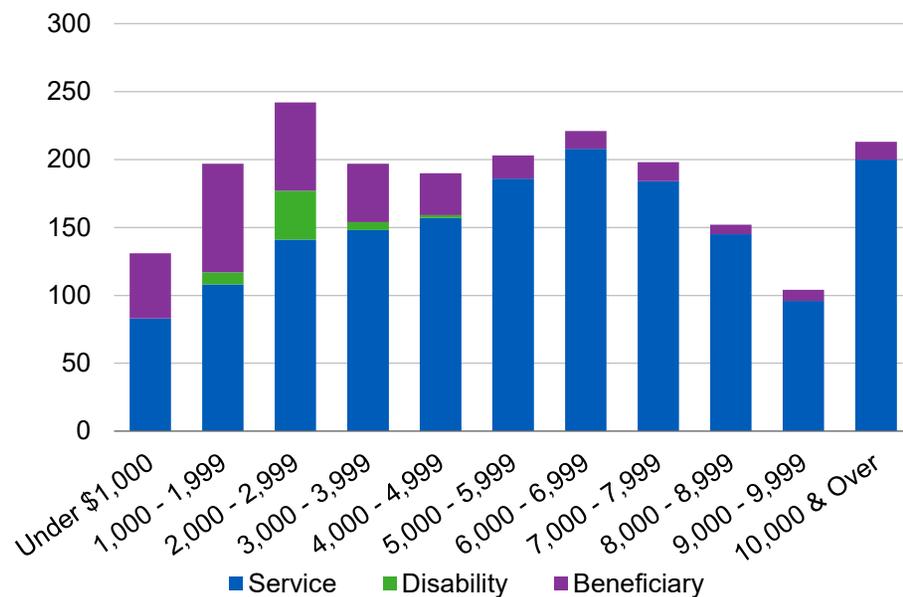
Retired Members and Beneficiaries

As of June 30, 2022, 1,709 retired members and 339 beneficiaries were receiving total monthly benefits of \$11,452,514. For comparison, in the previous valuation, there were 1,641 retired members and 336 beneficiaries receiving monthly benefits of \$10,627,505.

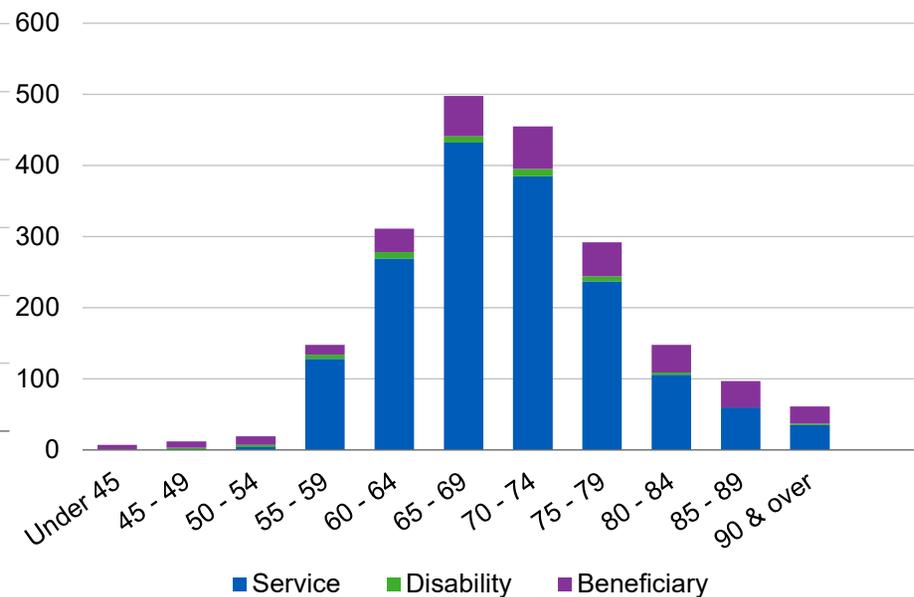
As of June 30, 2022, the average monthly benefit for retired members and beneficiaries is \$5,592, compared to \$5,376 in the previous valuation. The average age for retired members and beneficiaries is 71.0 in the current valuation, compared with 70.8 in the prior valuation.

Distribution of Retired Members and Beneficiaries as of June 30, 2022

Retired Members and Beneficiaries
by Type and Monthly Amount



Retired Members and Beneficiaries
by Type and Age



Section 2: Actuarial Valuation Results

Historical Plan Population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the growth among the retired population over the same time period.

Member Data Statistics: 2013 – 2022

Year Ended June 30	Active Members			Retired Members and Beneficiaries		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2013	1,666	49.7	14.9	1,440	70.3	\$4,007
2014	1,715	49.3	14.3	1,497	70.3	4,183
2015	1,762	48.8	13.7	1,563	70.1	4,360
2016	1,789	48.5	13.3	1,630	70.1	4,499
2017	1,802	48.0	12.8	1,713	70.1	4,649
2018	1,828	47.8	12.4	1,779	70.2	4,841
2019	1,847	47.6	12.0	1,844	70.3	5,024
2020	1,903	47.3	11.7	1,905	70.6	5,211
2021	1,896	47.4	11.6	1,977	70.8	5,376
2022	1,895	47.2	11.4	2,048	71.0	5,592

Section 2: Actuarial Valuation Results

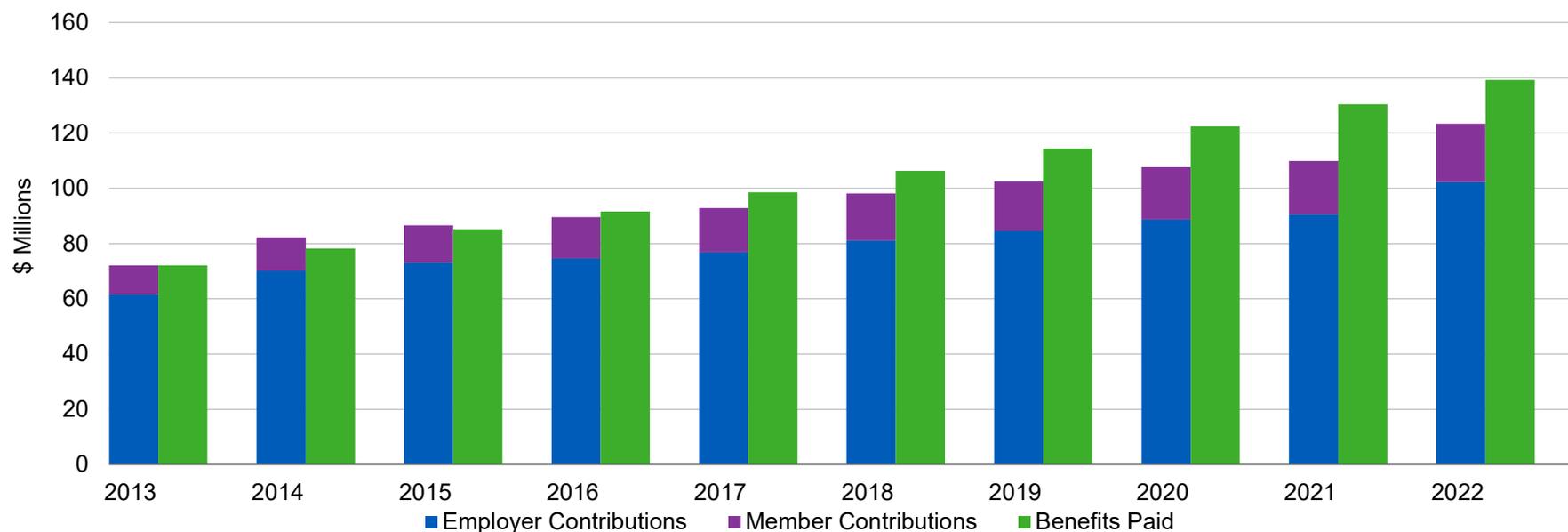
B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions and investment earnings (less investment fees and administrative expenses) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits D, E and F*.

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Comparison of Contributions Made with Benefits
for Years Ended June 30, 2013 – 2022
(Pension and HIB Plans)



Section 2: Actuarial Valuation Results

Determination of Actuarial Value of Assets for Year Ended June 30, 2022

1	Market Value of Assets					
	(a) Pension plan					\$2,005,352,000
	(b) HIB plan					<u>53,571,000</u>
	(c) Total					\$2,058,923,000
2	Calculation of unrecognized return	Actual	Expected	Investment	Percent	Deferred
		Return	Return	Gain/(Loss)	Deferred	Return
a)	Year ended June 30, 2018	\$148,798,000	\$116,619,368	\$32,178,632	0%	\$0
b)	Year ended June 30, 2019	91,744,000	122,306,135	(30,562,135)	20	(6,112,427)
c)	Year ended June 30, 2020	39,376,000	127,791,930	(88,415,930)	40	(35,366,372)
d)	Year ended June 30, 2021	491,625,000	129,314,710	362,310,290	60	217,386,174
e)	Year ended June 30, 2022	(253,930,000)	162,455,125	(416,385,125)	80	<u>(333,108,100)</u>
f)	Total unrecognized return ¹					\$(157,200,725)
3	Preliminary Actuarial Value of Assets: (1c) - (2f)					\$2,216,123,725
4	Adjustment to be within 30% corridor of market value					0
5	Final Actuarial Value of Assets: 3 + 4:					<u>\$2,216,123,725</u>
6	Actuarial Value of Assets as a percentage of Market Value of Assets: 5 ÷ 1c					107.6%
7	Valuation Value of Pension Plan Assets: 1a ÷ 1c x 5					<u>\$2,158,462,528</u>

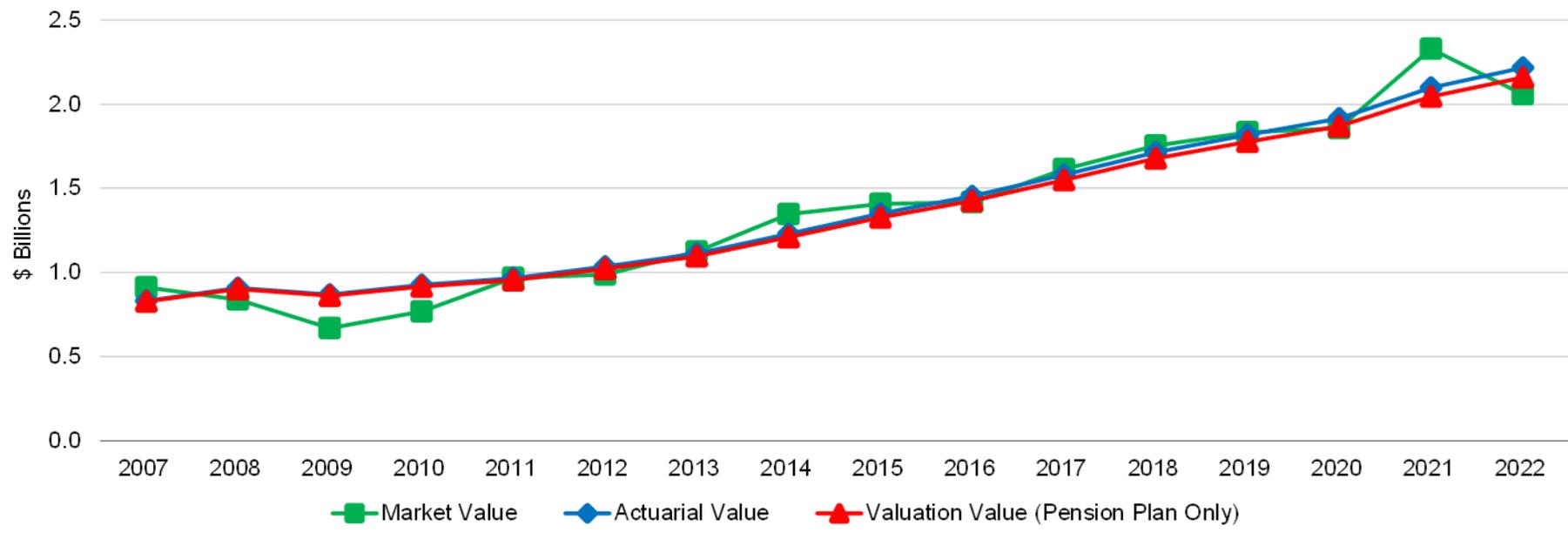
¹ Deferred return as of June 30, 2022 that will be recognized in each of the next four years (amounts may not total exactly due to rounding):

(a)	Amount recognized on June 30, 2023	\$(34,610,580)
(b)	Amount recognized on June 30, 2024	(28,498,153)
(c)	Amount recognized on June 30, 2025	(10,814,967)
(d)	Amount recognized on June 30, 2026	<u>(83,277,025)</u>
(e)	Total unrecognized return as of June 30, 2022	\$(157,200,725)

Section 2: Actuarial Valuation Results

The Market Value, Actuarial Value and Valuation Value of Assets are representations of the Plan's financial status. As investment gains and losses are gradually taken into account, the Actuarial Value of Assets tracks the Market Value of Assets. The Valuation Value of Assets is the actuarial value, excluding HIB assets. The Valuation Value of Assets is significant because the Plan's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the Unfunded Actuarial Accrued Liability is an important element in determining the contribution requirement.

Market Value, Actuarial Value, and Valuation Value (Pension Plan Only) of Assets
as of June 30, 2007 – 2022



Section 2: Actuarial Valuation Results

C. Actuarial Experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the actuarially determined contribution will decrease from the previous year. On the other hand, the actuarially determined contribution will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years. There are no assumption changes reflected in this report.

The total loss is \$56.0 million, which includes \$11.9 million from investment losses, a gain of \$10.7 million from contribution experience and \$54.8 million in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 1.93% of the Actuarial Accrued Liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended June 30, 2022

1	Net loss from investments ¹	\$(11,976,557)
2	Actual contributions gain than expected	10,749,632
3	Net loss from other experience ²	<u>(54,807,592)</u>
4	Net experience loss:³ 1 + 2 + 3	\$(56,034,517)

¹ Details on next page.

² See *Subsection E* for further details.

³ The net loss is attributed to actual liability experience from July 1, 2021 through June 30, 2022 compared to the projected experience based on the actuarial assumptions as of June 30, 2021. It does not include the effect of plan or assumption changes as of June 30, 2022, if any.

Section 2: Actuarial Valuation Results

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the Market Value of Assets was (10.94)% for the year ended June 30, 2022.

For valuation purposes, the assumed rate of return on the Valuation Value of Assets is 7.00% (for the June 30, 2021 valuation). The actual rate of return on a valuation value basis (after smoothing) for the 2021/2022 plan year was 6.41%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2022 with regard to its investments.

Investment Experience for Year Ended June 30, 2022

	Valuation Value (pension plan assets only)	Actuarial Value (includes pension and HIB plan assets)	Market Value (includes pension and HIB plan assets)
1 Net investment income	\$130,591,533	\$134,280,271	\$(253,930,000)
2 Average value of assets	2,036,686,995	2,089,777,954	2,320,787,500
3 Rate of return: 1 ÷ 2	6.41%	6.43%	(10.94)%
4 Assumed rate of return	7.00%	7.00%	7.00%
5 Expected investment income: 2 x 4	\$142,568,090	\$146,284,457	\$162,455,125
6 Actuarial gain/(loss): 1 - 5	\$(11,976,557)	\$(12,004,186)	\$(416,385,125)

Section 2: Actuarial Valuation Results

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on a valuation value, actuarial value, and market value basis for the last ten years.

Investment Return – Valuation Value, Actuarial Value and Market Value: 2013 – 2022¹

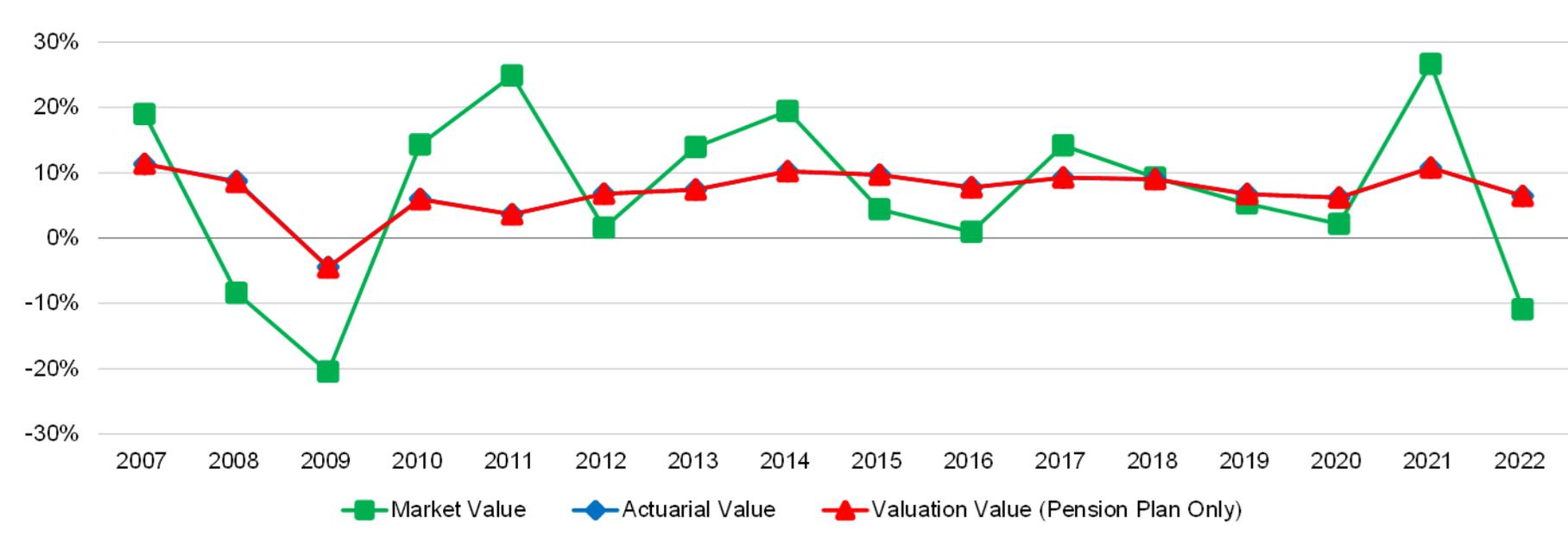
Year Ended June 30	Valuation Value Investment Return		Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2013	\$75,506,213	7.40%	\$76,545,489	7.39%	\$137,318,000	13.91%
2014	112,077,589	10.22%	113,600,558	10.19%	218,575,000	19.41%
2015	117,145,293	9.68%	118,952,917	9.67%	58,937,000	4.37%
2016	102,598,231	7.74%	104,468,421	7.74%	12,894,000	0.92%
2017	131,217,766	9.23%	133,617,292	9.22%	200,254,000	14.15%
2018	139,184,681	9.01%	141,900,834	9.00%	148,798,000	9.25%
2019	112,719,164	6.74%	115,218,143	6.74%	91,744,000	5.25%
2020	108,905,040	6.16%	111,447,050	6.16%	39,376,000	2.16%
2021	199,446,791	10.74%	203,946,418	10.71%	491,625,000	26.61%
2022	130,591,533	6.41%	134,280,271	6.43%	(253,930,000)	(10.94)%
Most recent 5-year geometric average return		7.80%	7.79%		5.78%	
Most recent 10-year geometric average return		8.32%	8.31%		8.04%	

¹ Market Value and Actuarial Value of Assets are for the pension plan and the HIB plan. Valuation Value of Assets are for the pension plan only.

Section 2: Actuarial Valuation Results

Section 2, Subsection B described the actuarial asset valuation method that gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

Market, Actuarial and Valuation (Pension Plan Only)
Rates of Return for Years Ended June 30, 2007 – 2022



Section 2: Actuarial Valuation Results

Contributions

Contributions for the year ended June 30, 2022, when adjusted for timing, totaled \$116.2 million, compared to the projected amount of \$105.5 million (also adjusted for timing). This resulted in a gain of \$10.7 million for the year, when adjusted for timing.

Non-Investment Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected),
- salary increases (greater or smaller than projected), and
- cost-of-living adjustments (COLAs; higher or lower than anticipated).

The net loss from this other experience for the year ended June 30, 2022 amounted to \$54.8 million, which is 1.93% of the Actuarial Accrued Liability. This loss was mainly due to the effect of higher than expected individual salary increases for actives and higher than anticipated COLA increases for current retirees and beneficiaries. See *Subsection E* for a detailed development of the Unfunded Actuarial Accrued Liability.

Section 2: Actuarial Valuation Results

D. Other Changes in the Actuarial Accrued Liability

The Actuarial Accrued Liability as of June 30, 2022 is \$2.836 billion, an increase of \$230.2 million, or 8.8%, from the liability as of the prior valuation date. The Actuarial Accrued Liability is expected to grow each year with Normal Cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions

There were assumption changes reflected in this report based on the June 30, 2022 Economic Assumptions Review report (dated November 8, 2022).

- The changes in actuarial assumptions increased the Actuarial Accrued Liability by \$72.1 million (a 2.6% increase) and increased the total Normal Cost by \$1.7 million (a 3.2% increase). The effect on the employer contribution rate was an increase of 2.86% of payroll (payable at the end of each pay period). There was no increase in the member contribution rates.

Details on actuarial assumptions and methods are in *Section 4, Exhibit 1*.

Plan Provisions

There were no changes in plan provisions since the prior valuation.

A summary of plan provisions is in *Section 4, Exhibit 2*.

Section 2: Actuarial Valuation Results

E. Development of Unfunded Actuarial Accrued Liability

Development for Year Ended June 30, 2022

1	Unfunded actuarial accrued liability at beginning of year	\$560,110,767
2	Total Normal Cost at beginning of year	51,705,682
3	Expected employer and member contributions at beginning of year	(98,587,989)
4	Interest	<u>35,925,994</u>
5	Expected Unfunded Actuarial Accrued Liability at end of year	\$549,154,454
6	Changes due to:	
	a. Investment loss on smoothed value of assets	\$11,976,557
	b. Effect of anticipated one-year delay in implementing the lower contribution rates calculated in the prior valuation	(10,749,632)
	c. Loss due to higher than expected salary increases for continuing active members	41,584,730
	d. Loss due to higher than expected COLA increases for current retirees and beneficiaries	6,697,298
	e. Other losses on demographic experience	6,525,564
	f. Increase due to change in actuarial assumptions	<u>72,119,593</u>
	Total changes	<u>\$128,154,110</u>
7	Unfunded Actuarial Accrued Liability at end of year	<u>\$677,308,564</u>

Note: The “net loss from other experience” of \$54,807,592 from *Subsection C* is equal to the sum of items 6c, 6d and 6e.

Section 2: Actuarial Valuation Results

F. Recommended Contribution

The recommended contribution is equal to the employer Normal Cost payment and a payment on the Unfunded Actuarial Accrued Liability. As of June 30, 2022, the average recommended employer contribution is 39.60% of compensation, payable at the end of each pay period.

The Board sets the funding policy used to calculate the recommended contribution based on layered amortization periods. See *Section 4, Exhibit 1* for further details on the funding policy.

The contribution requirement as of June 30, 2022 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Average Recommended Employer Contribution for Year Ended June 30

All Tiers Combined	2022		2021 (Recommended Rates)	
	Amount	% of Projected Compensation	Amount	% of Projected Compensation
1 Total Normal Cost	\$58,245,086	24.11%	\$53,488,238	23.83%
2 Expected member Normal Cost contributions	<u>21,744,422</u>	<u>9.00%</u>	<u>20,118,817</u>	<u>8.97%</u>
3 Employer Normal Cost: 1 – 2	\$36,500,664	15.11%	\$33,369,421	14.86%
4 Actuarial Accrued Liability	2,835,771,092		2,605,613,762	
5 Valuation Value of Assets	<u>2,158,462,528</u>		<u>2,045,502,995</u>	
6 Unfunded Actuarial Accrued Liability: 4 – 5	\$677,308,564		\$560,110,767	
7 Payment on Unfunded Actuarial Accrued Liability	59,152,588	24.49%	48,491,014	21.61%
8 Total average recommended employer contribution: 3 + 7	<u>\$95,653,252</u>	<u>39.60%</u>	<u>\$81,860,435</u>	<u>36.47%</u>
9 Projected compensation	\$241,537,720		\$224,391,553	

Note: Contributions are assumed to be paid at the end of each pay period.

Section 2: Actuarial Valuation Results

Reconciliation of Average Recommended Employer Contribution Rate

The chart below details the changes in the average recommended employer contribution rate from the prior valuation to the current year's valuation.

Reconciliation from June 30, 2021 to June 30, 2022

	Contribution Rate	Estimated Annual Dollar Amount ¹
Average <u>Adopted</u> Employer Contribution Rate as of June 30, 2021	38.24%	\$92,357,308
Average <u>Recommended</u> Employer Contribution Rate as of June 30, 2021	36.06%	\$87,091,378
1. Effect of change in membership demographics	(0.06)%	\$(144,923)
2. Effect of investment return less than expected on smoothed value of assets	0.35%	845,382
3. Effect of individual salary increases higher than expected for continuing active members	1.22%	2,946,760
4. Effect higher than expected COLA increases for current retirees and beneficiaries	0.20%	483,075
5. Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(0.90)%	(2,173,839)
6. Effect of anticipated one-year delay in implementing the lower contribution rates calculated in the prior valuation	(0.32)%	(772,921)
7. Effect of other demographic experience losses on accrued liability	0.19%	470,361
8. Effect of changes in actuarial assumptions	<u>2.86%</u>	<u>6,907,979</u>
Total change	3.54% ²	\$8,561,874
Average Recommended Employer Contribution Rate as of June 30, 2022	39.60%	\$95,653,252

¹ Based on June 30, 2022 projected compensation of \$241,537,720.

² The total change from the adopted employer contribution rate as of June 30, 2021 to the recommended employer contribution rate as of June 30, 2022 is 1.36% or \$3,295,944.

Section 2: Actuarial Valuation Results

Reconciliation of Average Recommended Member Contribution Rate

The chart below details the changes in the average recommended member contribution rate from the prior valuation to the current year's valuation.

Reconciliation from June 30, 2021 to June 30, 2022

	Contribution Rate	Estimated Annual Dollar Amount ¹
Average Recommended Member Contribution as of June 30, 2021	9.00%	\$21,744,422
1. Effect of changes in member demographics	0.00%	\$0
2. Effect of changes in assumptions	<u>0.00%</u>	<u>0</u>
Total changes	0.00%	\$0
Average Recommended Member Contribution as of June 30, 2022	9.00%	\$21,744,422

¹ Based on June 30, 2022 projected compensation of \$241,537,720.

Section 2: Actuarial Valuation Results

Recommended Employer Contribution Rate (% of payroll; payable at the end of each pay period)

	June 30, 2022 Actuarial Valuation		June 30, 2021 Actuarial Valuation (Adopted Rates)	
	Contribution Rate	Estimated Annual Dollar Amount ¹	Contribution Rate	Estimated Annual Dollar Amount ¹
1955/1980 Plan				
Total Normal Cost	27.90%	\$36,615,095	27.08%	\$35,538,952
Expected Employee Contributions	-8.66% ²	-11,365,115	-8.66% ²	-11,365,115
Employer Normal Cost	19.24%	\$25,249,980	18.42%	\$24,173,837
UAAL	24.49%	32,139,917	23.95% ³	31,431,237
Total Employer Contribution	43.73%	\$57,389,897	42.37%	\$55,605,074
2013 Tier				
Total Normal Cost	19.61%	\$21,629,991	19.13%	\$21,100,547
Expected Employee Contributions	-9.41%	-10,379,307	-9.41%	-10,379,307
Employer Normal Cost	10.20%	\$11,250,684	9.72%	\$10,721,240
UAAL	24.49%	27,012,671	23.60% ³	26,030,994
Total Employer Contribution	34.69%	\$38,263,355	33.32%	\$36,752,234
Combined				
Total Normal Cost	24.11%	\$58,245,086	23.45%	\$56,639,499
Expected Employee Contributions	-9.00%	-21,744,422	-9.00%	-21,744,422
Employer Normal Cost	15.11%	\$36,500,664	14.45%	\$34,895,077
UAAL	24.49%	59,152,588	23.79%	57,462,231
Total Employer Contribution	39.60%	\$95,653,252	38.24%	\$92,357,308

¹ Amounts are based on the following June 30, 2022 projected annual payroll:

1955/1980 Plan	\$131,236,899
2013 Tier	110,300,821
Combined	\$241,537,720

² The rate of 8.66% payable during the fiscal years 2022/2023 and 2023/2024 is calculated by taking the total employee rate payable beginning April 18, 2016 (i.e., 8.75%), less the HIB employee contribution rate of 0.09%.

³ The Board decided to carry over unchanged for the 2022/2023 Fiscal Year ("adopted rates") the higher Pension Plan total employer contribution rates for the 2021/2022 Fiscal Year (FY), as originally determined in the June 30, 2020 valuations. (The recommended Pension Plan employer contribution rates for FY 2022/2023 are shown on the following page.) Note that the adopted UAAL rates for FY 2022/2023 for the 1955/1980 Plan and the 2013 Tier are not the same, since the employer normal cost rates remain the same as those rates actuarially determined for the June 30, 2021 valuation in order to reflect the most recent demographic information, and the UAAL rates represent the difference between the total rates and the normal cost rates, which produces said variance in the UAAL rates.

Section 2: Actuarial Valuation Results

Recommended Employer Contribution Rate (% of payroll; payable at the end of each pay period)

	June 30, 2022 Actuarial Valuation		June 30, 2021 Actuarial Valuation (Recommended Rates)	
	Contribution Rate	Estimated Annual Dollar Amount ¹	Contribution Rate	Estimated Annual Dollar Amount ¹
1955/1980 Plan				
Total Normal Cost	27.90%	\$36,615,095	27.08%	\$35,538,952
Expected Employee Contributions	<u>-8.66%</u> ²	<u>-11,365,115</u>	<u>-8.66%</u> ²	<u>-11,365,115</u>
Employer Normal Cost	19.24%	\$25,249,980	18.42%	\$24,173,837
UAAL	24.49%	32,139,917	21.61%	28,360,294
Total Employer Contribution	43.73%	\$57,389,897	40.03%	\$52,534,131
2013 Tier				
Total Normal Cost	19.61%	\$21,629,991	19.13%	\$21,100,547
Expected Employee Contributions	<u>-9.41%</u>	<u>-10,379,307</u>	<u>-9.41%</u>	<u>-10,379,307</u>
Employer Normal Cost	10.20%	\$11,250,684	9.72%	\$10,721,240
UAAL	24.49%	27,012,671	21.61%	23,836,007
Total Employer Contribution	34.69%	\$38,263,355	31.33%	\$34,557,247
Combined				
Total Normal Cost	24.11%	\$58,245,086	23.45%	\$56,639,499
Expected Employee Contributions	<u>-9.00%</u>	<u>-21,744,422</u>	<u>-9.00%</u>	<u>-21,744,422</u>
Employer Normal Cost	15.11%	\$36,500,664	14.45%	\$34,895,077
UAAL	24.49%	59,152,588	21.61%	52,196,301
Total Employer Contribution	39.60%	\$95,653,252	36.06%	\$87,091,378

¹ Amounts are based on the following June 30, 2022 projected annual payroll:

1955/1980 Plan	\$131,236,899
2013 Tier	<u>110,300,821</u>
Combined	\$241,537,720

² The rate of 8.66% payable during the fiscal years 2022/2023 and 2023/2024 is calculated by taking the total employee rate payable beginning April 18, 2016 (i.e., 8.75%), less the HIB employee contribution rate of 0.09%.

Section 2: Actuarial Valuation Results

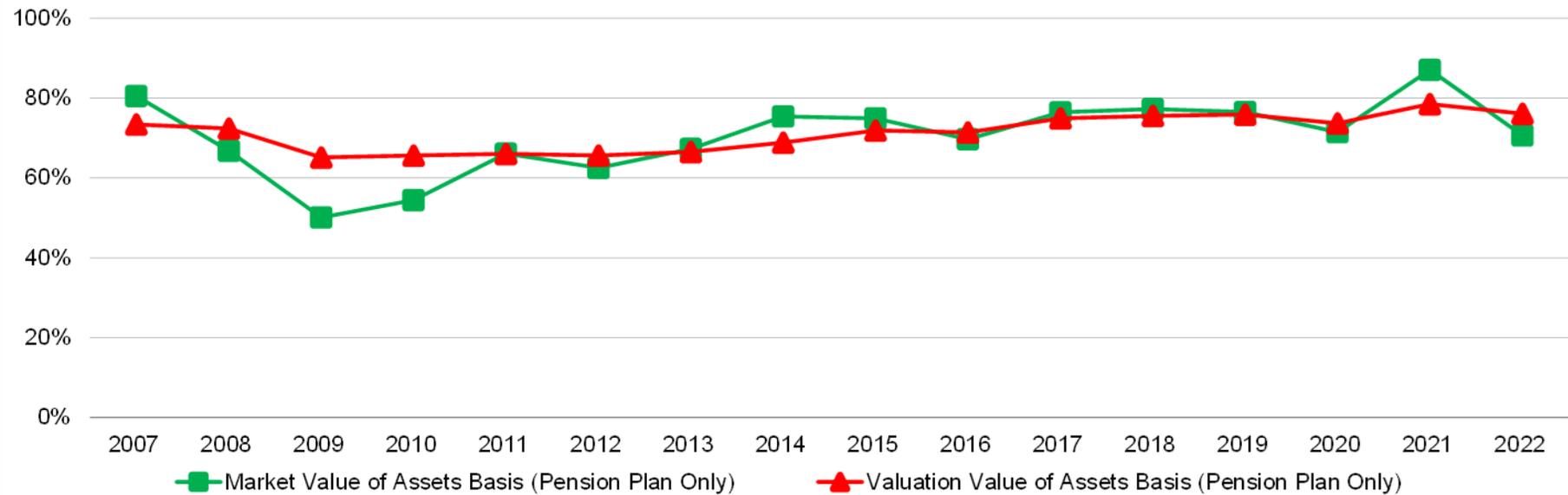
G. Funded Status

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the Valuation Value of Assets and the Market Value of Assets to the Actuarial Accrued Liability of the Plan. Higher ratios indicate a relatively well-funded plan, while lower ratios may indicate recent changes to actuarial assumptions, funding of the plan below actuarial requirements, poor asset performance, or a variety of other causes.

The chart below depicts a history of the funded ratio for the Plan. The chart on the next page shows the Plan's schedule of funding progress for the last ten years.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. As the chart below shows, the measures are different depending on whether the Valuation Value or Market Value of Assets is used.

Funded Ratio for Years Ended June 30, 2007 – 2022



Section 2: Actuarial Valuation Results

Schedule of Funding Progress for Years Ended June 30, 2013 – 2022 (Dollar amounts in thousands)

Actuarial Valuation Date as of June 30,	Valuation Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (%) [(b) - (a)] / (c)
2013	\$1,095,847	\$1,646,534	\$550,687	66.6%	\$159,246	345.8%
2014	1,210,321	1,756,706	546,385	68.9	167,196	326.8
2015	1,327,113	1,845,912	518,799	71.9	174,899	296.6
2016	1,425,785	1,995,863	570,078	71.4	183,971	309.9
2017	1,549,213	2,068,015	518,802	74.9	184,859	280.6
2018	1,678,417	2,220,977	542,560	75.6	202,995	267.3
2019	1,777,065	2,340,773	563,708	75.9	212,351	265.5
2020	1,868,917	2,535,238	666,321	73.7	224,412	296.9
2021	2,045,503	2,605,614	560,111	78.5	224,392	249.6
2022	2,158,463	2,835,771	677,308	76.1	241,538	280.4

Section 2: Actuarial Valuation Results

H. Actuarial Balance Sheet

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the Plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the Actuarial Present Value of Future Benefits of the Plan.

Second, this Actuarial Present Value of Future Benefits is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer Normal Cost contributions, and the present value of future employer amortization payments for the Unfunded Actuarial Accrued Liability.

Actuarial Balance Sheet

	Year Ended	
	June 30, 2022	June 30, 2021
Actuarial Present Value of Future Benefits		
• Present value of benefits for retired members and beneficiaries	\$1,834,781,122	\$1,677,463,290
• Present value of benefits for inactive vested members	55,173,918	48,098,062
• Present value of benefits for active members	<u>1,433,617,383</u>	<u>1,323,474,305</u>
Total Actuarial Present Value of Future Benefits	<u>\$3,323,572,423</u>	<u>\$3,049,035,657</u>
Current and future assets		
• Total Valuation Value of Assets	\$2,158,462,528	\$2,045,502,995
• Present value of future contributions by members	197,570,495	181,460,556
• Present value of future employer contributions for:		
– Entry age Normal Cost	290,230,836	261,961,339
– Unfunded Actuarial Accrued Liability	<u>677,308,564</u>	<u>560,110,767</u>
Total of current and future assets	<u>\$3,323,572,423</u>	<u>\$3,049,035,657</u>

Section 2: Actuarial Valuation Results

I. Volatility Ratios

Retirement plans are subject to volatility in the level of required contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the Market Value of Assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measurement since it is based on the current level of assets.

The current AVR is about 8.3. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 8.3% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.6% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions. The current LVR is about 11.7. This is about 41% higher than the AVR. Therefore, we would expect that contribution volatility will increase over the long term.

The chart below shows how the asset and liability volatility ratios have varied over time.

Volatility Ratios for Years Ended June 30, 2013 – 2022

Year Ended June 30	Asset Volatility Ratio	Liability Volatility Ratio
2013	7.0	10.3
2014	7.9	10.5
2015	7.9	10.6
2016	7.6	10.8
2017	8.6	11.2
2018	8.5	10.9
2019	8.4	11.0
2020	8.1	11.3
2021	10.1	11.6
2022	8.3	11.7

Section 2: Actuarial Valuation Results

J. Risk Assessment

Because the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. We recommend a more detailed assessment of the risks to provide the Board with a better understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Board to highlight and illustrate particular risks or potential future outcomes they may be interested in discussing and could include scenario testing, sensitivity testing, stress testing and stochastic modeling. As noted in the valuation highlights section of this report, the results of our more detailed risk assessment through the June 30, 2020 valuation date was provided in a separate stand-alone report dated April 29, 2021. That report included investment return scenarios that demonstrated the effects of short-term market volatility on funded status and contribution rates, which may aid in illustrating the effect on the plan of market volatility that can result from events such as COVID-19.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the Plan's financial health, as well as a discussion of historical trends and maturity measures:

Risk Assessments

- Asset/Liability Mismatch Risk (the potential that future plan experience does not affect asset and liability values in the same way, causing them to diverge)

The most significant asset/liability mismatch risk to the Plan is investment risk, as discussed below. In fact, investment risk has the potential to impact asset/liability mismatch in two ways. The first mismatch is evident in annual valuations: when asset values deviate from assumptions, they are typically independent from liability changes. The second mismatch can be caused when systemic asset deviations from assumptions may signal the need for an assumption change, which causes liability values and contribution rates to move in the opposite direction from any changes in the expected experience of asset growth rates.

Asset/liability mismatch can also be caused by demographic assumption risk such as longevity, which affects liabilities but have no impact on asset levels. This risk is also discussed below.

- Investment Risk (the risk that investment returns will be different than expected)

The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial condition of the Plan, affecting both

Section 2: Actuarial Valuation Results

funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets, however investment experience can still have a sizable impact. As discussed in *Section 2, Subsection I, Volatility Ratios*, on page 37, a 1% asset gain or loss (relative to the assumed investment return) translates to about 8.3% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.6% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The year-by-year market value rate of return over the last 10 years has ranged from a low of (10.94)% to a high of 26.61%.

- Longevity Risk (the risk that mortality experience will be different than expected)

The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections. Effective with the June 30, 2020 valuation, the Board adopted mortality tables based on public plan experience that are weighted by benefits and include generational mortality projections.

- Other Risks

In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. One example is projected salary scales over time. As salary is central to the determination of benefits paid in retirement, deviations from the projected salary scales could have a material impact on the benefits anticipated for each member. Examples of demographic assumptions include retirement, termination and disability assumptions, and will likely vary in significance for different pension plans.

Some plans also carry significant contribution risk, defined as the potential for actual future contributions deviating from expected future contributions. However, the employer has a proven track-record of making at least the Actuarially Determined Contributions based on the Board's Actuarial Funding Policy, so contribution risk is minimal.

Evaluation of Historical Trends

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

- The funded percentage on the Valuation Value of Assets basis has increased from 66.6% to 76.1%. This is primarily due to contributions made to amortize the UAAL under the Board's actuarial funding policy. For a more detailed history see *Section 2, Subsection G, Funded Status* starting on page 34.

Section 2: Actuarial Valuation Results

- The average geometric investment return on the Actuarial Value of Assets over the most recent 10-year period was 8.31%. This includes a high of a 10.71% return and a low of 6.16%. The average over the last 5 years was 7.79%. For more details see the Investment Return table in *Section 2, Subsection C* on page 24.
- The primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in:
 - 2016 included a change in the discount rate from 7.50% to 7.25%, adding \$52.6 million in unfunded liability;
 - 2018 included a change in the discount rate from 7.25% to 7.00%, adding \$12.5 million in unfunded liability;
 - 2020 included the use of amount-weighted mortality tables projected generationally to better reflect future mortality improvement, adding \$104.8 million in unfunded liability; and
 - 2022 includes a change in the discount rate from 7.00% to 6.75%, adding \$72.1 million in unfunded liability.

For more details on unfunded liability changes see *Section 3, Exhibit G, Table of Amortization Bases* starting on page 51. A graphical representation of historical changes in UAAL by source will be included in the stand-alone risk assessment report.

- The plan's funding policy effectively deals with these unfunded liabilities over time.¹ This can be seen most clearly in the *Section 3, Exhibit H, Projection of UAAL Balances and Payments* provided on pages 53 and 54.

Maturity Measures

In the last 10 years the ratio of retired members and beneficiaries to active members has increased from 0.86 to 1.08. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative for understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on page 15.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year, benefits paid were \$15.9 million more than contributions received.² Plans with high levels of negative cash flows may have a need for a larger allocation to income generating assets, which can create a drag on investment return. However, this plan currently has relatively low levels of negative cash flows. For more details on historical cash flows see the Comparison of Contributions Made with Benefits in *Section 2, Subsection B* on page 19. A further discussion of plan maturity measures and how they relate to changes in assets and liabilities is included in *Section 2, Subsection I, Volatility Ratios* on page 37.

¹ In addition, during the last ten years, the Board had on five occasions elected to continue to carry over the higher employer contribution rates in a previous valuation even though the employer contribution rates would have come down in the absence of such action. The Board made that election for the purpose of accelerating the payment of the UAAL.

² Under the Retirement Board's actuarial funding policy, current assets plus the present value of future (employer and member) contributions will always be equal to the present value of benefits expected to be paid by the System. Based on the understanding that the present value of future contributions includes both the amounts required to pay the ongoing normal cost and any unfunded liabilities, it appears that the minimum contribution limit pursuant to Section 12335 of the Public Utilities Code does not apply.

Section 3: Supplemental Information

Exhibit A: Table of Plan Coverage

Total Plan

Category	Year Ended June 30		Change From Prior Year
	2022	2021	
Active members in valuation:			
• Number	1,895	1,896	-0.1%
• Average age	47.2	47.4	-0.2
• Average years of service	11.4	11.6	-0.2
• Total projected compensation	\$241,537,720	\$224,391,553	7.6%
• Average projected compensation	\$127,461	\$118,350	7.7%
• Account balances	\$235,786,215	\$225,481,306	4.6%
• Total active vested members	1,297	1,319	-1.7%
Inactive vested members:			
• Number ¹	360	327	10.1%
• Average Age	48.3	48.9	-0.6
Retired members:			
• Number in pay status	1,656	1,588	4.3%
• Average age	70.6	70.4	0.2
• Average monthly benefit	\$6,131	\$5,919	3.6%
Disabled members:			
• Number in pay status	53	53	0.0%
• Average age	66.8	66.9	-0.1
• Average monthly benefit	\$2,550	\$2,412	5.7%
Beneficiaries:			
• Number in pay status	339	336	0.9%
• Average age	73.2	73.0	0.2
• Average monthly benefit	\$3,434	\$3,273	4.9%

¹ Includes inactive members due a refund of member contributions.

Section 3: Supplemental Information

Exhibit A: Table of Plan Coverage (continued)

1955/1980 Plan

Category	Year Ended June 30		Change From Prior Year
	2022	2021	
Active members in valuation:			
• Number	924	1,023	-9.7%
• Average age	52.9	52.6	0.3
• Average years of service	18.5	18.0	0.5
• Total projected compensation	\$131,236,899	\$132,857,022	-1.2%
• Average projected compensation	\$142,031	\$129,870	9.4%
• Account balances	\$192,084,135	\$191,990,994	0.0%
• Total active vested members	887	976	-9.1%
Inactive vested members:			
• Number ¹	214	213	0.5%
• Average Age	52.4	52.2	0.2
Retired members:			
• Number in pay status	1,648	1,585	4.0%
• Average age	70.7	70.4	0.3
• Average monthly benefit	\$6,156	\$5,929	3.8%
Disabled members:			
• Number in pay status	53	53	0.0%
• Average age	66.8	66.9	-0.1
• Average monthly benefit	\$2,550	\$2,412	5.7%
Beneficiaries:			
• Number in pay status	339	336	0.9%
• Average age	73.2	73.0	0.2
• Average monthly benefit	\$3,434	\$3,273	4.9%

¹ Includes inactive members due a refund of member contributions.

Section 3: Supplemental Information

Exhibit A: Table of Plan Coverage (continued)

2013 Tier

Category	Year Ended June 30		Change From Prior Year
	2022	2021	
Active members in valuation:			
• Number	971	873	11.2%
• Average age	41.8	41.2	0.6
• Average years of service	4.6	4.2	0.4
• Total projected compensation	\$110,300,821	\$91,534,531	20.5%
• Average projected compensation	\$113,595	\$104,851	8.3%
• Account balances	\$43,702,080	\$33,490,312	30.5%
• Total active vested members	410	343	19.5%
Inactive vested members:			
• Number ¹	146	114	28.1%
• Average Age	42.4	42.6	-0.2
Retired members:			
• Number in pay status	8	3	166.7%
• Average age	66.9	67.9	-1.0
• Average monthly benefit	\$1,039	\$741	40.2%
Disabled members:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A

¹ Includes inactive members due a refund of member contributions.

Section 3: Supplemental Information

Exhibit B: Members in Active Service as of June 30, 2022 by Age, Years of Service, and Average Projected Compensation

Total Plan

Age	Years of Service									
	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	9	9	—	—	—	—	—	—	—	—
	\$89,300	\$89,300	—	—	—	—	—	—	—	—
25 - 29	64	53	11	—	—	—	—	—	—	—
	108,480	105,992	\$120,466	—	—	—	—	—	—	—
30 - 34	223	143	71	9	—	—	—	—	—	—
	114,273	108,898	122,796	\$132,435	—	—	—	—	—	—
35 - 39	274	130	105	33	6	—	—	—	—	—
	118,833	107,999	122,906	142,521	\$151,993	—	—	—	—	—
40 - 44	261	83	91	46	35	6	—	—	—	—
	128,141	111,298	122,308	147,090	150,113	\$176,142	—	—	—	—
45 - 49	277	73	86	41	46	24	7	—	—	—
	129,263	114,238	123,333	135,804	149,087	145,596	\$134,243	—	—	—
50 - 54	264	44	52	29	56	41	29	12	1	—
	137,992	114,290	129,423	142,613	143,686	142,432	155,659	\$161,957	\$191,517	—
55 - 59	264	40	47	18	62	27	47	19	3	1
	136,218	119,067	120,932	140,395	142,714	140,070	144,703	152,340	181,871	\$116,798
60 - 64	164	19	19	26	30	16	26	16	11	1
	134,792	115,890	116,443	147,535	132,456	126,945	141,319	132,829	168,203	201,089
65 - 69	79	3	10	10	11	11	10	10	6	8
	126,676	107,969	108,222	130,586	130,655	87,282	136,002	143,645	133,568	162,528
70 & over	16	1	1	1	1	4	6	1	—	1
	124,560	100,709	134,974	160,795	98,093	120,814	128,799	89,071	—	153,265
Total	1,895	598	493	213	247	129	125	58	21	11
	\$127,461	\$110,416	\$122,776	\$141,759	\$143,431	\$136,800	\$144,496	\$146,357	\$161,370	\$161,034

Section 3: Supplemental Information

Exhibit B: Members in Active Service as of June 30, 2022 by Age, Years of Service, and Average Projected Compensation (continued)

1955/1980 Plan

Age	Years of Service									
	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	—	—	—	—	—	—	—	—	—	—
25 – 29	—	—	—	—	—	—	—	—	—	—
30 – 34	21	5	7	9	—	—	—	—	—	—
35 – 39	65	5	21	33	6	—	—	—	—	—
40 – 44	109	5	17	46	35	6	—	—	—	—
45 – 49	137	6	14	40	46	24	7	—	—	—
50 – 54	185	4	13	29	56	41	29	12	1	—
55 – 59	198	11	10	18	62	27	47	19	3	1
60 – 64	129	1	2	26	30	16	26	16	11	1
65 – 69	66	—	—	10	11	11	10	10	6	8
70 & over	14	—	—	1	1	4	6	1	—	1
Total	924	37	84	212	247	129	125	58	21	11
	\$142,031	\$136,559	\$134,875	\$141,836	\$143,431	\$136,800	\$144,496	\$146,357	\$161,370	\$161,034

Section 3: Supplemental Information

Exhibit B: Members in Active Service as of June 30, 2022 by Age, Years of Service, and Average Projected Compensation (continued)

2013 Tier

Age	Years of Service									
	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	9	9	—	—	—	—	—	—	—	—
	\$89,300	\$89,300	—	—	—	—	—	—	—	—
25 – 29	64	53	11	—	—	—	—	—	—	—
	108,480	105,992	\$120,466	—	—	—	—	—	—	—
30 – 34	202	138	64	—	—	—	—	—	—	—
	112,392	108,162	121,513	—	—	—	—	—	—	—
35 – 39	209	125	84	—	—	—	—	—	—	—
	113,111	107,561	121,370	—	—	—	—	—	—	—
40 – 44	152	78	74	—	—	—	—	—	—	—
	114,737	108,926	120,862	—	—	—	—	—	—	—
45 – 49	140	67	72	1	—	—	—	—	—	—
	117,199	111,989	121,932	\$125,539	—	—	—	—	—	—
50 – 54	79	40	39	—	—	—	—	—	—	—
	116,203	111,216	121,319	—	—	—	—	—	—	—
55 – 59	66	29	37	—	—	—	—	—	—	—
	113,906	112,129	115,298	—	—	—	—	—	—	—
60 – 64	35	18	17	—	—	—	—	—	—	—
	114,956	114,368	115,578	—	—	—	—	—	—	—
65 – 69	13	3	10	—	—	—	—	—	—	—
	108,164	107,969	108,222	—	—	—	—	—	—	—
70 & over	2	1	1	—	—	—	—	—	—	—
	117,841	100,709	134,974	—	—	—	—	—	—	—
Total	971	561	409	1	—	—	—	—	—	—
	\$113,595	\$108,692	\$120,292	\$125,539	—	—	—	—	—	—

Section 3: Supplemental Information

Exhibit C: Reconciliation of Member Data

	Active Members	Inactive Vested Members ¹	Retired Members	Disabled Members	Beneficiaries	Total
Number as of June 30, 2021	1,896	327	1,588	53	336	4,200
• New members	148	0	0	0	0	148
• Terminations – with vested rights	-48	48	0	0	0	0
• Contribution refunds	-8	-11	0	0	0	-19
• Retirements	-93	-9	102	0	0	0
• New disabilities	-2	0	0	2	0	0
• Return to work	3	-3	0	0	0	0
• Died with or without beneficiary	-1	0	-35	-2	3 ²	-35
• Data adjustments	0	8 ³	1	0	0	9
Number as of June 30, 2022	1,895	360	1,656	53	339	4,303

¹ Includes inactive members due a refund of member contributions.

² This is the net increase in the number of beneficiaries after subtracting the number of beneficiaries who died (16) during the year.

³ All 8 members were hired and terminated during fiscal 2021/2022.

Section 3: Supplemental Information

Exhibit D: Summary Statement of Income and Expenses on a Market Value Basis for all Pension Plan and HIB Plan Assets

	Year Ended June 30, 2022	Year Ended June 30, 2021
Net assets at market value at the beginning of the year	\$2,328,722,000	\$1,857,609,000
Contribution income:		
• Employer contributions	\$102,285,000	\$90,624,000
• Member contributions	<u>21,127,000</u>	<u>19,336,000</u>
Net contribution income	\$123,412,000	\$109,960,000
Investment income:		
• Interest, dividends and other income	\$28,386,000	\$26,504,000
• Asset appreciation	(276,684,000)	471,771,000
• Less investment and administrative fees	<u>(5,632,000)</u>	<u>(6,650,000)</u>
Net investment income	<u>\$(253,930,000)</u>	<u>\$491,625,000</u>
Total income available for benefits	\$(130,518,000)	\$601,585,000
Less benefit payments:		
• Benefits paid	\$(138,582,000)	\$(130,198,000)
• Refund of contributions	<u>(699,000)</u>	<u>(274,000)</u>
Net benefit payments	<u>\$(139,281,000)</u>	<u>\$(130,472,000)</u>
Change in net assets at market value	\$(269,799,000)	\$471,113,000
Net assets at market value at the end of the year	\$2,058,923,000	\$2,328,722,000

Note: Results may be slightly off due to rounding.

Section 3: Supplemental Information

Exhibit E: Summary Statement of Plan Assets

	June 30, 2022	June 30, 2021
Cash equivalents:	\$25,336,000	\$37,595,000
Accounts receivable:		
• Brokers, securities sold	\$923,000	\$189,000
• Employer and member contributions	3,840,000	3,015,000
• Interest and dividends	<u>4,700,000</u>	<u>4,325,000</u>
Total accounts receivable	\$9,463,000	\$7,529,000
Investments:		
• Equities	\$1,413,921,000	\$1,715,553,000
• Fixed income investments	487,236,000	460,008,000
• Real estate	125,557,000	113,913,000
• Securities lending collateral	101,249,000	157,933,000
• Other assets	<u>568,000</u>	<u>578,000</u>
Total investments at market value	<u>\$2,128,531,000</u>	<u>\$2,447,985,000</u>
Total assets	\$2,163,330,000	\$2,493,109,000
Accounts payable:		
• Accounts payable and accrued expenses	\$(2,447,000)	\$(2,609,000)
• Payables to brokers, securities purchased	(711,000)	(3,845,000)
• Securities lending collateral	<u>(101,249,000)</u>	<u>(157,933,000)</u>
Total accounts payable	\$(104,407,000)	\$(164,387,000)
Net assets at market value	<u>\$2,058,923,000</u>	<u>\$2,328,722,000</u>
Net assets at actuarial value	<u>\$2,216,123,725</u>	<u>\$2,097,712,454</u>
Net assets at valuation value (Pension Plan Only)	<u>\$2,158,462,528</u>	<u>\$2,045,502,995</u>

Note: Results may be slightly off due to rounding.

Section 3: Supplemental Information

Exhibit F: Development of the Fund through June 30, 2022 for all Pension Plan and HIB Plan Assets

Year Ended June 30	Employer Contributions	Member Contributions	Net Investment Return ¹	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2013	\$61,567,000	\$10,566,000	\$137,318,000	\$72,095,000	\$1,124,328,000	\$1,112,369,821	98.9%
2014	70,117,000	12,133,000	218,575,000	78,265,000	1,346,888,000	1,229,955,379	91.3%
2015	73,141,000	13,427,000	58,937,000	85,184,000	1,407,209,000	1,350,292,296	96.0%
2016	74,672,000	14,925,000	12,894,000	91,571,000	1,418,129,000	1,452,786,717	102.4%
2017	76,860,000	16,018,000	200,254,000	98,617,000	1,612,644,000	1,580,665,009	98.0%
2018	81,096,000	17,079,000	148,798,000	106,377,000	1,753,240,000	1,714,363,843	97.8%
2019	84,551,000	17,865,000	91,744,000	114,435,000	1,832,965,000	1,817,562,986	99.2%
2020	88,734,000	18,885,000	39,376,000	122,351,000	1,857,609,000	1,914,278,036	103.1%
2021	90,624,000	19,336,000	491,625,000	130,472,000	2,328,722,000	2,097,712,454	90.1%
2022	102,285,000	21,127,000	(253,930,000)	139,281,000	2,058,923,000	2,216,123,725	107.6%

¹ On a market value basis, net of investment fees and administrative expenses.

Section 3: Supplemental Information

Exhibit G: Table of Amortization Bases

Type	Date Established	Initial Amount	Initial Period	Outstanding Balance	Years Remaining	Annual Payment ¹
Experience Gain	06/30/2000	\$(10,871,830)	30	\$(9,421,837)	8	\$(1,330,289)
Change in Assumptions	06/30/2000	8,629,891	30	7,478,911	8	1,055,963
Plan Amendments	06/30/2000	13,607,265	30	11,792,444	8	1,665,000
3.5% Retiree COLA Assumption	06/30/2000	27,057,441	30	23,448,753	8	3,310,779
Experience Loss	06/30/2001	2,292,281	30	2,109,221	9	269,248
Experience Loss	06/30/2002	26,232,251	30	25,314,735	10	2,957,827
Plan Amendments	06/30/2002	5,111,914	30	4,933,114	10	576,396
Experience Loss	06/30/2003	43,692,270	30	43,784,292	11	4,729,395
Plan Amendments	06/30/2003	67,138,578	30	67,279,975	11	7,267,300
Experience Loss	06/30/2004	32,731,232	30	33,783,511	12	3,401,246
New Assumption / Domestic Partners	06/30/2004	(9,812,646)	30	(10,128,115)	12	(1,019,675)
Experience Loss	06/30/2005	26,910,233	30	28,413,122	13	2,684,596
Remove Limit Pension Base	06/30/2005	27,315,928	30	28,710,394	13	2,712,683
Experience Loss	06/30/2006	14,160,133	30	15,205,738	14	1,356,206
Experience Gain	06/30/2007	(3,098,126)	30	(3,366,762)	15	(284,882)
Experience Gain	06/30/2008	(7,800,585)	30	(8,541,541)	16	(688,670)
Change in Assumptions	06/30/2008	51,413,374	30	56,296,998	16	4,539,001
Experience Loss	06/30/2009	114,894,458	30	126,287,447	17	9,738,955
Experience Loss	06/30/2010	3,039,098	30	3,342,016	18	247,342
Change in Assumptions	06/30/2010	8,098,499	30	8,905,706	18	659,110
Experience Loss	06/30/2011	4,428,038	30	4,860,753	19	346,280
Experience Gain	06/30/2012	(15,668,764)	20	(12,982,637)	10	(1,516,919)
Change in Assumptions	06/30/2012	53,400,521	25	52,806,687	15	4,468,287

¹ Beginning of year payment, reflecting level percentage of payroll.

Section 3: Supplemental Information

Exhibit G: Table of Amortization Bases (continued)

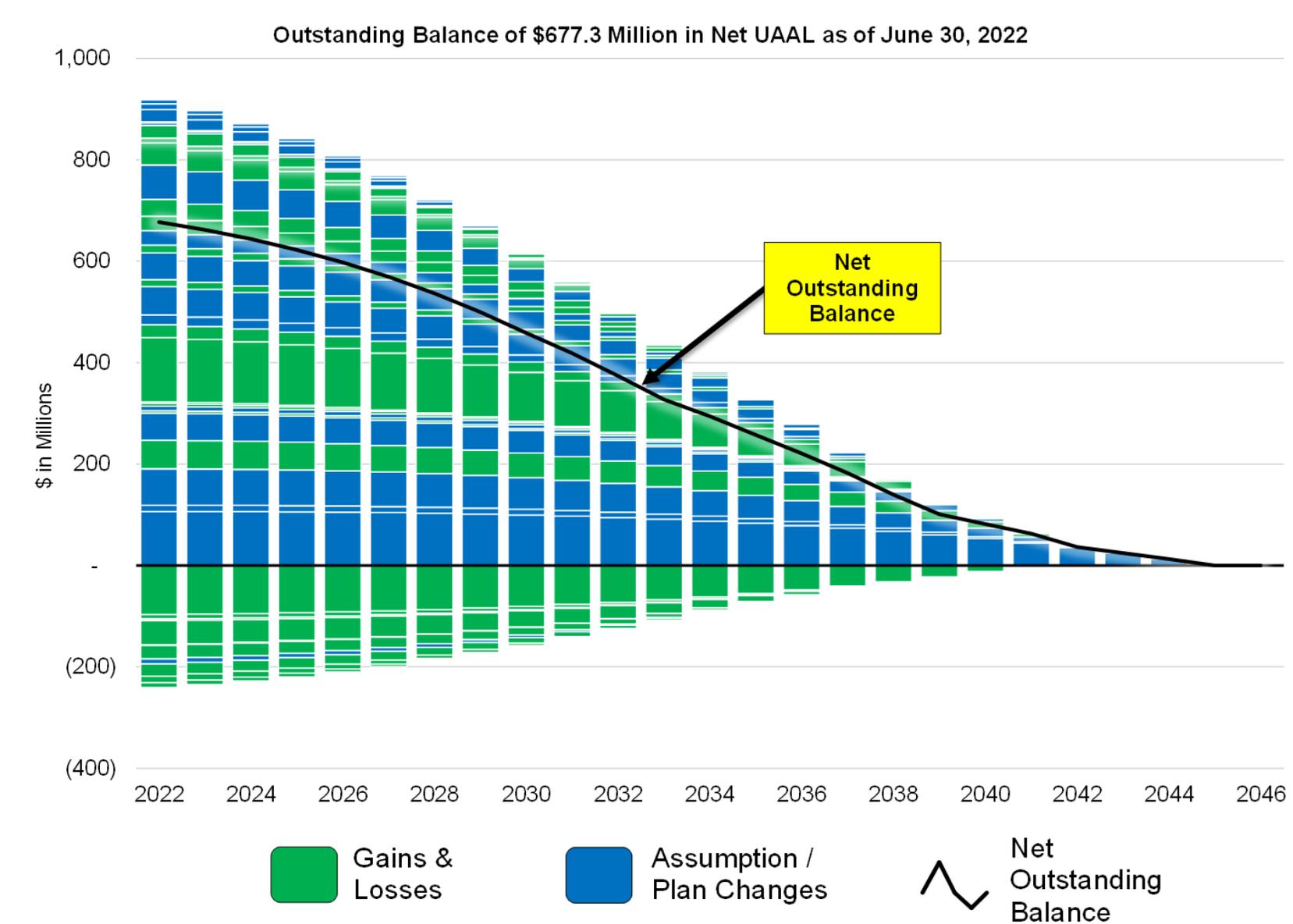
Type	Date Established	Initial Amount	Initial Period	Outstanding Balance	Years Remaining	Annual Payment ¹
Experience Loss	06/30/2013	\$10,858,322	20	\$9,372,529	11	\$1,012,381
Experience Gain	06/30/2014	(26,406,581)	20	(23,551,535)	12	(2,371,114)
Change in Assumptions	06/30/2014	18,421,049	25	18,540,557	17	1,429,799
Experience Gain	06/30/2015	(28,955,525)	20	(26,564,971)	13	(2,509,974)
Experience Gain	06/30/2016	(1,408,751)	20	(1,321,773)	14	(117,889)
Change in Assumptions	06/30/2016	52,595,760	25	53,412,424	19	3,805,097
Experience Gain	06/30/2017	(50,022,788)	20	(47,801,976)	15	(4,044,809)
Experience Loss	06/30/2018	14,053,082	20	13,618,072	16	1,097,971
Change in Assumptions	06/30/2018	12,484,391	25	12,676,628	21	843,250
Experience Loss	06/30/2019	26,728,885	20	26,228,447	17	2,022,669
Experience Loss	06/30/2020	5,281,313	20	5,230,235	18	387,089
Change in Assumptions	06/30/2020	104,813,640	25	105,997,366	23	6,641,318
Experience Gain	06/30/2021	(97,336,901)	20	(96,994,474)	19	(6,909,879)
Experience Loss	06/30/2022	56,034,517	20	56,034,517	20	3,852,767
Change in Assumptions	06/30/2022	72,119,593	20	<u>72,119,593</u>	20	<u>4,958,729</u>
Total				\$677,308,564		\$57,242,584

Note: The equivalent single amortization period is about 15 years.

¹ Beginning of year payment, reflecting level percentage of payroll.

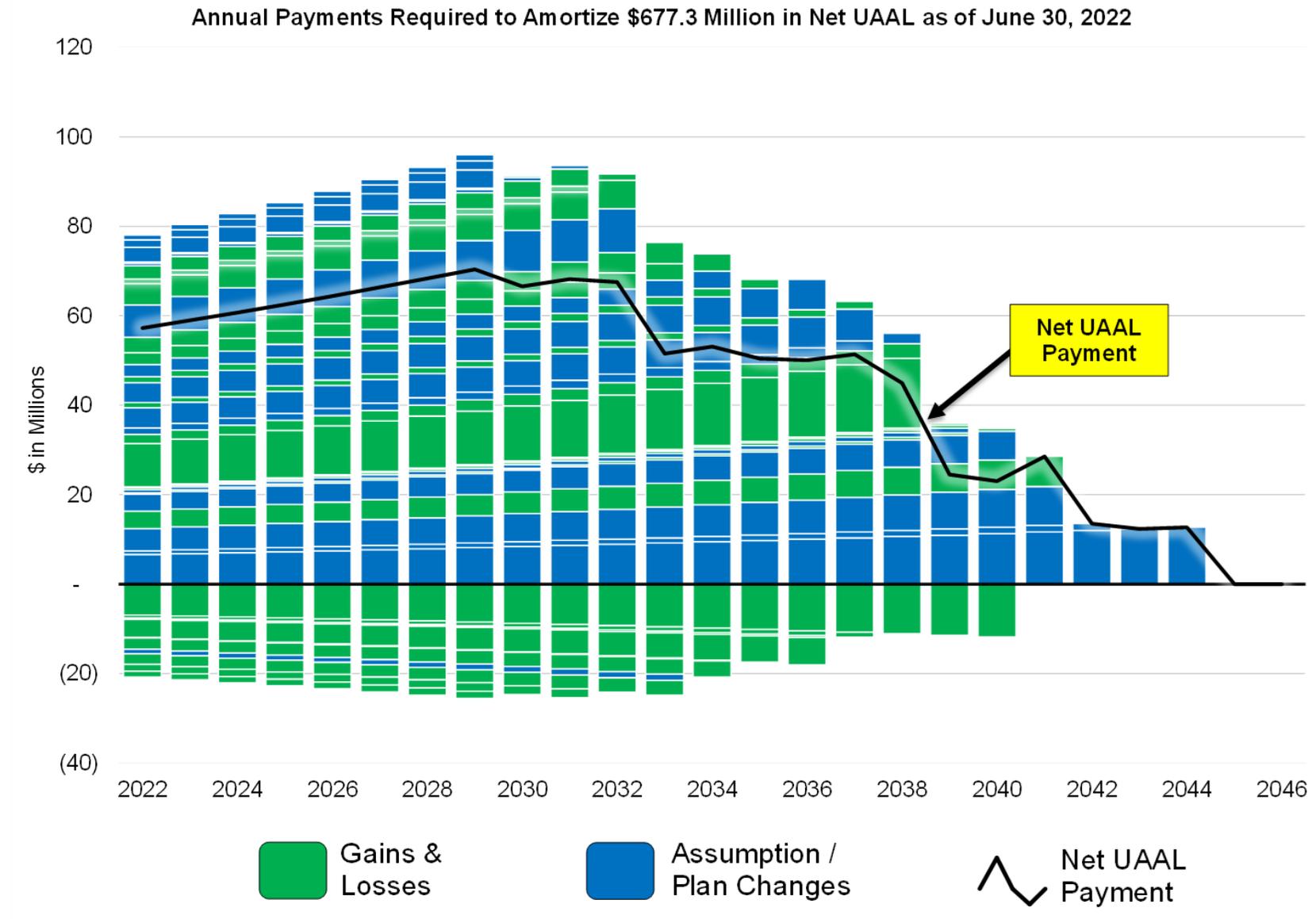
Section 3: Supplemental Information

Exhibit H: Projection of UAAL Balances and Payments



Section 3: Supplemental Information

Exhibit H: Projection of UAAL Balances and Payments (continued)



Section 3: Supplemental Information

Exhibit I: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated Normal Costs allocated to the years before the Valuation Date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	The single-sum value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the Actuarially Determined Contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	<p>The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:</p> <p>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</p> <p>Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and</p> <p>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</p>

Section 3: Supplemental Information

Actuarial Present Value of Future Plan Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
Actuarial Value of Assets (AVA):	The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Section 3: Supplemental Information

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: <u>Investment return</u> - the rate of investment yield that the Fund will earn over the long-term future; <u>Mortality rates</u> - the death rates of employees and pensioners; life expectancy is based on these rates; <u>Retirement rates</u> - the rate or probability of retirement at a given age or service; <u>Disability rates</u> - the probability of disability retirement at a given age; <u>Withdrawal rates</u> - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; <u>Salary increase rates</u> - the rates of salary increase due to inflation and productivity growth.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the Actuarial Value of Assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

Section 3: Supplemental Information

Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of non-valuation reserves.

Section 4: Actuarial Valuation Basis

Exhibit 1: Actuarial Assumptions and Methods

Rationale for Assumptions and Methods:	The information and analysis used in selecting each assumption and method that has a significant effect on this actuarial valuation is shown in the July 1, 2016 through June 30, 2020 Actuarial Experience Study report dated November 12, 2020, the Actuarial Funding Policy review letter dated September 14, 2022, and the June 30, 2022 Economic Assumptions Review report dated November 8, 2022. Unless otherwise noted, all actuarial assumptions and methods shown below apply to both tiers. These assumptions and methods were adopted by the Board.
<u>Economic Assumptions:</u>	
Net Investment Return:	6.75%; net of administrative and investment expenses. Based on the Economic Assumptions Review referenced above, expected administrative and investment expenses represent about 0.25% of the average Market Value of Assets.
Employee Contribution Crediting Rate:	6.75%, compounded semi-annually.
Cost of Living Adjustment (COLA):	Retiree COLA increases of 2.75% per year. For members with a sufficient COLA bank, withdrawals from the bank can be made to increase the retiree COLA up to 3.00% per year.
Payroll Growth:	Inflation of 2.50% per year plus real “across the board” salary increases of 0.50% per year, used to amortize the Unfunded Actuarial Accrued Liability as a level percentage of payroll.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 2.50% per year from the valuation date.
Increase in California Government Code Section 7522.10 Compensation Limit:	Increase of 2.50% per year from the valuation date.

Section 4: Actuarial Valuation Basis

Salary Increases:

The annual rate of compensation increase includes: inflation at 2.50%, plus “across the board” salary increases of 0.50% per year, plus the following merit and promotion increases:

Merit and Promotion Increases	
Time from Hire (Years)	Rate (%)
Less than 1	6.25
1 – 2	6.00
2 – 3	5.00
3 – 4	3.75
4 – 5	2.50
5 – 6	1.50
6 – 7	1.25
7 – 8	1.25
8 – 9	1.00
9 – 10	1.00
10 & Over	0.75

Demographic Assumptions:

Post-Retirement Mortality Rates:

Healthy Members:

- Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020.

Disabled Members:

- Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Tables with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020

Beneficiaries:

- Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Tables with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2020

The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Section 4: Actuarial Valuation Basis

Pre-Retirement Mortality Rates:

Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables, projected generationally with the two-dimensional mortality improvement scale MP-2020

Age	Rate (%)	
	Male	Female
20	0.04	0.01
25	0.02	0.01
30	0.03	0.01
35	0.04	0.02
40	0.06	0.03
45	0.09	0.05
50	0.13	0.08
55	0.19	0.11
60	0.28	0.17
65	0.41	0.27

Generational projections beyond the base year (2010) are not reflected in the above mortality rates.

Disability Incidence:

Age	Rate (%)
25	0.000
30	0.006
35	0.022
40	0.084
45	0.150
50	0.170
55	0.182
60	0.220
65	0.288

Disabilities rates are applicable after eight years of service.

Section 4: Actuarial Valuation Basis

Termination:

Less Than Five Years of Service

Years of Service	Rate (%)
Less than 1	6.75
1 – 2	4.25
2 – 3	4.00
3 – 4	3.50
4 – 5	2.50

Five or More Years of Service

Age	Rate (%)
25	2.34
30	2.24
35	2.14
40	2.04
45	1.85
50	1.60
55	1.35
60	1.10

No termination is assumed after a member is eligible for retirement (as long as a retirement rate is present).

Section 4: Actuarial Valuation Basis

Retirement Rates:

Age	Rate (%)		
	1955/1980 Plan		
	Unreduced Pension ¹	Reduced Pension	2013 Tier
52	0.00	0.00	1.75
53	0.00	0.00	1.75
54	55.00	7.00	2.75
55	16.00	7.00	4.75
56	16.00	7.00	5.75
57	16.00	7.00	5.75
58	16.00	7.00	5.75
59	16.00	7.00	7.75
60	16.00	7.00	7.75
61	16.00	12.00	10.25
62	16.00	N/A ²	18.00
63	16.00	N/A	15.00
64	16.00	N/A	9.00
65	16.00	N/A	23.75
66	27.00	N/A	23.75
67	27.00	N/A	32.50
68	27.00	N/A	35.00
69	27.00	N/A	38.75
70 & Over	100.00	N/A	100.00

¹ For example, a 1955/1980 Plan member age 54 with 30 or more years of service would receive the full 2.60% per year of service accrual.

² For ages 62 and over, all 1955/1980 Plan members who are eligible for retirement receive the full 2.60% per year of service accrual.

Section 4: Actuarial Valuation Basis

Retirement Age for Inactive Vested Members:	59 1955/1980 Plan non-reciprocal members who are currently terminated with less than five years of service and are not vested are assumed to retire at age 65 if they decide to leave their contributions on deposit.										
Reciprocity:	15% of members who terminate with a vested benefit are assumed to enter a reciprocal system. For reciprocals, 4.00% compensation increases are assumed per annum.										
Future Benefit Accruals:	1.0 year of service per year of employment, plus 0.038 years of additional service to anticipate conversion of unused sick leave for each year of employment. As directed by EBMUDERS, this assumption has been applied to active members in the 1955/1980 Plan and the 2013 Tier.										
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.										
Percent Married/Domestic Partnership:	For all active and inactive members, 85% of male members and 60% of female members are assumed to be married or with domestic partner at pre-retirement death or retirement.										
Age and Gender of Spouse/Domestic Partner:	For all active and inactive members, male members are assumed to have a female spouse who is 2 years younger than the member and female members are assumed to have a male spouse who is 3 years older than the member.										
Form of Payment:	At retirement, members with spouses or domestic partners are assumed to elect the following form of payment (single members are assumed to elect the Unmodified option): <table border="1" data-bbox="760 852 1524 1084"> <thead> <tr> <th>Form of Payment</th> <th>Election Percentage</th> </tr> </thead> <tbody> <tr> <td>Unmodified or Option 1</td> <td>50%</td> </tr> <tr> <td>Option 2 (100% Continuance)</td> <td>10%</td> </tr> <tr> <td>Option 3 (50% Continuance)</td> <td>20%</td> </tr> <tr> <td>Option 4 (25% Continuance)</td> <td>20%</td> </tr> </tbody> </table>	Form of Payment	Election Percentage	Unmodified or Option 1	50%	Option 2 (100% Continuance)	10%	Option 3 (50% Continuance)	20%	Option 4 (25% Continuance)	20%
Form of Payment	Election Percentage										
Unmodified or Option 1	50%										
Option 2 (100% Continuance)	10%										
Option 3 (50% Continuance)	20%										
Option 4 (25% Continuance)	20%										
Actuarial Funding Policy:											
Actuarial Cost Method:	Entry Age Cost Method. Entry Age is the age at the member's hire date. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation, as if the current benefit formula for each individual has always been in effect (i.e., "replacement life within a tier").										

Section 4: Actuarial Valuation Basis

Actuarial Value of Assets:	Market value of assets (MVA) less unrecognized returns in each of the last five years. Unrecognized returns are equal to the difference between the actual market returns and the expected returns on the market value, and are recognized over a five-year period. The actuarial value of assets (AVA) is limited by a 30% corridor; the AVA cannot be less than 70% of MVA, nor greater than 130% of MVA.
Valuation Value of Assets:	The proportion of the Actuarial Value of Assets allocated to the pension plan, based on the proportion of the MVA attributable to the pension plan.
Amortization Policy:	<p>Prior to July 1, 2011, the UAAL from plan changes, assumption changes, and experience gains/losses were amortized over separate decreasing 30-year periods.</p> <p>On or after July 1, 2011, any new UAAL resulting from plan changes are amortized over separate decreasing 15-year periods; assumption and method changes are amortized over separate decreasing 25-year periods (prior to July 1, 2021); and experience gains/losses are amortized over separate decreasing 20-year periods.</p> <p>On or after July 1, 2021, assumption and method changes are amortized over separate decreasing 20-year periods.</p>
<u>Other Actuarial Methods:</u>	
Employer Contributions:	<p>Employer contributions consist of two components:</p> <p><i>Normal Cost</i></p> <p>The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earnings rate. The contribution rate is expressed as a level percentage of the member's compensation.</p> <p><i>Contribution to the Unfunded Actuarial Accrued Liability (UAAL)</i></p> <p>The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the System) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.00% (i.e., 2.50% inflation plus 0.50% across-the-board salary increase).</p> <p>The amortization policy is described above.</p> <p>The recommended employer contributions are provided in <i>Section 2, Subsection F</i>.</p>

Section 4: Actuarial Valuation Basis

Member Contributions:

1955/1980 Plan Members

Employee contribution rates for 1955/1980 Plan members are prescribed in the Ordinance. Effective April 17, 2006, the rate of member retirement contributions is 6.83%, and 6.74% of that rate is allocated to pay pension benefits. The rest, or 0.09%, is used to pay HIB benefits. The Board of Directors may adjust the employee rates solely pursuant to the terms of a negotiated collective bargaining agreement or memorandum of understanding with employee bargaining units.

Based on bargaining unit contract negotiations in 2013, members are contracted to pay the following employee rates (as a percentage of pay) beginning April 22, 2013:

Effective Date	Member Rate		
	(a) Total	(b) HIB Plan	(c) = (a) – (b) Pension Plan
April 17, 2006 ⁽¹⁾	6.83% ¹	0.09%	6.74%
April 22, 2013	7.33%	0.09%	7.24%
April 21, 2014	7.83%	0.09%	7.74%
April 20, 2015	8.33%	0.09%	8.24%
April 18, 2016	8.75%	0.09%	8.66%

¹ Pursuant to the Ordinance.

2013 Tier Members

Pursuant to Section 7522.30(a) of the California Government Code, 2013 Tier members are required to contribute at least 50% of the Normal Cost rate. In addition, Section 7522.30(c) requires that the initial employee contribution rate be rounded to the nearest quarter of 1 percent, unless a greater contribution rate has been agreed to pursuant to Section 7522.30(e). In preparing the initial Normal Cost rates, we assumed that exactly 50% of the Normal Cost would be paid by the new members and we took into account only the requirements of Section 7522.30(c), but not requirements of Section 7522.30(e). In particular, the total Normal Cost rate of 17.56% was determined in the first CalPEPRA valuation, and this total rate has been used through the June 30, 2019 valuation to determine the 50% of the Normal Cost (rounded to one quarter of 1 percent) paid by the employees, or 8.75%.

Pursuant to Section 7522.30(d), each year we have compared the total Normal Cost rates between the current valuation and the initial CalPEPRA valuation since a rate increase (or decrease) of less than 1% of payroll would result in no change to the members' rate. Effective with the June 30, 2020 valuation, the total Normal Cost rate was determined to be 18.81%, which is a change of more than 1% of payroll compared to the rate of 17.56% that was determined in the first CalPEPRA valuation. This was the first time since the first CalPEPRA valuation that the change in the total Normal Cost rate has exceeded the 1% of payroll threshold. Consequently, the member contribution rate for 2013 Tier members was increased to 9.41%, which is 50% of the total Normal Cost rate.

Section 4: Actuarial Valuation Basis

For the June 30, 2022 valuation, the 2013 Tier member contribution rate remains at 9.41% for the Pension Plan, because the total Normal Cost rate for this tier has remained within 1% of payroll of the new 18.81% threshold noted above.

As stated in our Actuarial Experience Study Report dated November 12, 2020, once the 1% threshold has been exceeded an adjustment to the members' rate is required as was the case in the June 30, 2020 valuation. Upon consulting with the Retirement System, the final member contribution rate determined in that valuation was calculated without the quarter of 1 percent rounding based on the Retirement System's direction that the rounding does not apply after the initial calculation. However, the rate paid by the employee was rounded to the nearest one/one hundredth of one percent (two decimals) consistent with the rounding methods used throughout the June 30, 2020 valuation report to ensure that the employees would pay at least 50% of the Normal Cost.

Accumulation for all members includes crediting of interest at the assumed investment earnings rate. The member contribution rates are provided in *Section 2, Subsection F*.

Internal Revenue Code Section 415:

Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan.

A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active members could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets.

In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of \$160,000 indexed for inflation. That limit is \$245,000 for 2022. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions.

Benefits for members in the non-CalPEPRA plan in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m).

Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard.

Contribution rates determined in this valuation have not been reduced for the Section 415 limitations. Actual limitations will result in gains as they occur.

Section 4: Actuarial Valuation Basis

Changes in Actuarial Assumptions and Methods:	Based on the Actuarial Funding Policy review letter dated September 14, 2022 and the June 30, 2022 Economic Assumptions Review report dated November 8, 2022, the following assumptions and methods were changed. Previously, these assumptions and methods were as follows:																										
<u>Economic Assumptions:</u>																											
Net Investment Return:	7.00%, net of investment and administrative expenses.																										
Employee Contribution Crediting Rate:	7.00%, compounded semi-annually																										
Payroll Growth:	Inflation of 2.75% per year plus real “across the board” salary increases of 0.50% per year.																										
Increase in Internal Revenue Code Section 401(a)(17) Limit:	Increases of 2.75% per year from the valuation date.																										
Increase in California Government Code Section 7522.10 Compensation Limit:	Increases of 2.75% per year from the valuation date.																										
Salary Increases:	<p>The annual rate of compensation increase includes: inflation at 2.75%, plus “across the board” salary increases of 0.50% per year, plus the following merit and promotion increases:</p> <table border="1" data-bbox="961 808 1612 1422"> <thead> <tr> <th colspan="2">Merit and Promotion Increases</th> </tr> <tr> <th>Time from Hire (Years)</th> <th>Rate (%)</th> </tr> </thead> <tbody> <tr> <td>Less than 1</td> <td>6.25</td> </tr> <tr> <td>1 – 2</td> <td>6.00</td> </tr> <tr> <td>2 – 3</td> <td>5.00</td> </tr> <tr> <td>3 – 4</td> <td>3.75</td> </tr> <tr> <td>4 – 5</td> <td>2.50</td> </tr> <tr> <td>5 – 6</td> <td>1.50</td> </tr> <tr> <td>6 – 7</td> <td>1.25</td> </tr> <tr> <td>7 – 8</td> <td>1.25</td> </tr> <tr> <td>8 – 9</td> <td>1.00</td> </tr> <tr> <td>9 – 10</td> <td>1.00</td> </tr> <tr> <td>10 & Over</td> <td>0.75</td> </tr> </tbody> </table>	Merit and Promotion Increases		Time from Hire (Years)	Rate (%)	Less than 1	6.25	1 – 2	6.00	2 – 3	5.00	3 – 4	3.75	4 – 5	2.50	5 – 6	1.50	6 – 7	1.25	7 – 8	1.25	8 – 9	1.00	9 – 10	1.00	10 & Over	0.75
Merit and Promotion Increases																											
Time from Hire (Years)	Rate (%)																										
Less than 1	6.25																										
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3 – 4	3.75																										
4 – 5	2.50																										
5 – 6	1.50																										
6 – 7	1.25																										
7 – 8	1.25																										
8 – 9	1.00																										
9 – 10	1.00																										
10 & Over	0.75																										

Section 4: Actuarial Valuation Basis

Actuarial Funding Policy:

Amortization Policy:

Prior to July 1, 2011, the UAAL from plan changes, assumption changes, and experience gains/losses were amortized over separate decreasing 30-year periods.

On or after July 1, 2011, any new UAAL resulting from plan changes are amortized over separate decreasing 15-year periods; assumption and method changes are amortized over separate decreasing 25-year periods; and experience gains/losses are amortized over separate decreasing 20-year periods.

Other Actuarial Methods:

Employer Contributions:

Employer contributions consist of two components:

Normal Cost

The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earnings rate. The contribution rate is expressed as a level percentage of the member's compensation.

Contribution to the Unfunded Actuarial Accrued Liability (UAAL)

The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the System) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.25% (i.e., 2.75% inflation plus 0.50% across-the-board salary increase).

The amortization policy is described above.

The recommended employer contributions are provided in *Section 2, Subsection F*.

Section 4: Actuarial Valuation Basis

Exhibit 2: Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	July 1 through June 30
Census Date:	June 30
Membership Eligibility:	
<i>1955/1980 Plan</i>	All employees who first become members before January 1, 2013.
<i>2013 Tier</i>	All employees who first become members on or after January 1, 2013.
Final Compensation for Benefit Determination:	
<i>1955/1980 Plan</i>	Highest two consecutive years of compensation earnable (FAS2).
<i>2013 Tier</i>	Highest thirty-six consecutive months of pensionable compensation (FAS3).
Compensation Limit:	
<i>1955/1980 Plan</i>	IRC Section 401(a)(17) compensation limit applies to all employees who began membership in EBMUDERS on or after January 1, 1996.
<i>2013 Tier</i>	\$134,974 for 2022
Service:	Years of service (Yrs) are generally based on a member's employment during a period of time in which retirement contributions are deducted from their compensation.
Normal or Unreduced Retirement Eligibility:	
<i>Age and Service Requirement</i>	
<i>1955/1980 Plan</i>	Age 65; Age 62 with 5 years of service; Age 59 with 20 years of service; Age 54 with 30 years of service; Other combinations of age and service between ages 54 and 59.
<i>2013 Tier</i>	Age 67 with 5 years of service (for unreduced benefit).

Section 4: Actuarial Valuation Basis

Early Retirement Eligibility:

Age and Service Requirement

1955/1980 Plan Age 54 with 5 years of service.

2013 Tier Age 52 with 5 years of service.

Benefit Formula:

1955/1980 Plan:

1955 Formula 2.42% (2.82% if member is credited with District Service on or after January 1, 2004) times Final Compensation per year of service including all service extension credit.

1955/80 Formula 2.42% (2.82% if member is credited with District Service on or after January 1, 2004) times Final Compensation per year of service up to August 1, 1980 including all service extension credit, plus 2.20% (2.60% if member is credited with District Service on or after January 1, 2004) times Final Compensation per year of service after August 1, 1980. Applies to members who elected to convert to the 1980 Formula in 1980.

1955/90 Formula 2.42% (2.82% if member is credited with District Service on or after January 1, 2004) times Final Compensation per year of service up to January 1, 2000 including all service extension credit, plus 2.20% (2.60% if member is credited with District Service on or after January 1, 2004) times Final Compensation per year of service after January 1, 2000. Applies to members who elected to convert to the 1980 Formula in 1989.

1980 Formula 2.20% (2.60% if member is credited with District Service on or after January 1, 2004) times Final Compensation per year of service including all service extension credit. Applies to all members hired on or after January 1, 1980.

Service Extension Credit 2.42% (2.82% if member is credited with District Service on or after January 1, 2004) for members with any service under the 1955 Formula or 2.20% (2.60% if member is credited with District Service on or after January 1, 2004) for members with service only under the 1980 Formula times Final Compensation per year of Service Extension Credit. Service extension credit is the number of unused sick leave days credited to a member at the time of retirement converted on a 260-day basis. The number of such days is then doubled for the benefit calculation and for service retirements to meet the early retirement provision of the Ordinance.

Benefit Adjustments Reduced by 3% per year under the age of eligibility for an unreduced benefit, based on service at retirement, for retirements before age 63 (before age 62 commencing November 1, 2000). Effective July 1, 1999, Service Extension Credit is included in the years of service calculation of service for determining eligibility for unreduced retirement.

Section 4: Actuarial Valuation Basis

Benefit Formula: (continued)	
<i>2013 Tier:</i>	
	Retirement Age
	52
	55
	60
	62
	65
	67 & Over
	Benefit Formula
	1.00% x FAS3 x Yrs
	1.30% x FAS3 x Yrs
	1.80% x FAS3 x Yrs
	2.00% x FAS3 x Yrs
	2.30% x FAS3 x Yrs
	2.50% x FAS3 x Yrs
Disability:	
<i>Eligibility</i>	Eight years of service (not available for Directors).
<i>Benefit</i>	Greater of: 1.5% times Final Compensation per year of service. One-third of Final Compensation.
Vesting:	
<i>Requirements</i>	Five years of service, must leave contributions on deposit, reciprocal service counts for vesting purposes.
Pre-Retirement Death:	
<i>Eligibility</i>	Eligible for retirement.
<i>Benefit</i>	50% of the unmodified service retirement benefit to eligible surviving spouse/surviving domestic partner plus the lump sum payment of accumulated retirement contributions
	OR
<i>Eligibility</i>	None.
<i>Benefit</i>	Lump sum payment of accumulated retirement contributions.
Post-Retirement Death Benefit:	50% of the unmodified service retirement benefit to surviving spouse or registered domestic partner (tied to the implementation of the AB 205 legislation).

Section 4: Actuarial Valuation Basis

Post-Retirement Cost of Living Benefits:

Payable July 1 of each year, the basic minimum COLA benefit is the lesser of 3% and the actual change in the cost of living index.

Excess of the actual change of cost of living index over 3% is accumulated in individual retiree COLA banks.

Withdrawals from the bank are made in years when the index increases less than 3%.

Increases of up to 5% are granted in years when the Retirement Board determines that the System is more than 85% funded on a Projected Benefit Obligation basis. In those years when the System is more than 85% funded and the cost of living index exceeds 5%, any excess cost of living over 5% is accumulated in the COLA bank.

Effective October 1, 2000, in those years when the system is more than 85% funded on a Projected Benefit Obligation basis and the cost of living is less than 4%, withdrawals from the bank are made to allow cost of living increases up to 4%.

Member Contributions:

1955/1980 Plan

Effective April 17, 2006, retirement system members contribute at a rate of 6.83% of pay, as prescribed in the Ordinance. Based on bargaining unit contract negotiations in 2013, members are contracted to pay the following employee rates (as a percentage of pay) beginning April 22, 2013:

Effective Date	Member Rate		
	(a) Total	(b) HIB Plan	(c) = (a) – (b) Pension Plan
April 17, 2006 ⁽¹⁾	6.83% ⁽¹⁾	0.09%	6.74%
April 22, 2013	7.33%	0.09%	7.24%
April 21, 2014	7.83%	0.09%	7.74%
April 20, 2015	8.33%	0.09%	8.24%
April 18, 2016	8.75%	0.09%	8.66%

⁽¹⁾ Pursuant to the Ordinance.

2013 Tier

Initial member contribution rate is set at 50% of the total 2013 Tier Normal Cost rate, rounded to the nearest quarter of 1%. Once established, the member contribution rate will be adjusted annually to reflect the change in the 2013 Tier Normal Cost rate, but only if the change is more than 1% of payroll.

Effective with the June 30, 2020 valuation, the member contribution rate for the Pension Plan is 9.41% of pay.

Changes in Plan Provisions:

There have been no changes in plan provisions since the last valuation.

Note: The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the System should find the plan summary not in accordance with the actual provisions, the System should alert the actuary so they can both be sure the proper provisions are valued.

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