East Bay Municipal Utility District Employees' Retirement System

Actuarial Valuation and Review of Pension Plan Benefits

As of June 30, 2023

Segal

180 Howard Street, Suite 1100
San Francisco, CA 94105-6147
T 415.263.8200
segalco.com

January 5, 2024

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, 2023 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 2024/2025.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Retirement 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.

Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. To the extent we can, however, Segal does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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 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. The assumptions used in this actuarial valuation were selected by the Board based upon our analysis and recommendations. In our opinion, the assumptions are reasonable and take into account the experience of the Plan and reasonable expectations. In addition, in our opinion, the combined effect of these assumptions is expected to have no significant bias.

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

Sincerely,

Segal

Andy Yeung

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

DNA/jl

Table of Contents

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, 2023. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits.

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, 2023, provided by EBMUDERS;
- The assets of the Plan as of June 30, 2023, provided by EBMUDERS;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the June 30, 2023 valuation;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. adopted by the Board for the June 30, 2023 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 66.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit G* starting on page 53. A graphical projection of the UAAL amortization balances and payments has been included in *Section 3, Exhibit H* starting on page 55. In the aggregate, the total payment from all the UAAL layers was the same as amortizing the entire UAAL over a period of about 14 years.

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2024 through June 30, 2025.

Valuation Highlights

Pgs. 35-36

1. The funded ratio (the ratio of the valuation value of assets to actuarial accrued liability) is 75.2%, compared to the prior year funded ratio of 76.1%. 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 73.3%, compared to 70.7% 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, 2023 Retirement Plan and HIB Plan valuations, we note that the funded ratio on the PBO (and market value) basis is 73.6% for both plans combined, as shown in the Supplemental Exhibits report dated January 5, 2024.

Pgs. 29 & 53-56

2. The UAAL as of June 30, 2022 was $677.3 million. In this year's valuation, the UAAL has increased to $742.7 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) and a contribution loss due to actual contributions lower than expected from the anticipated one-year delay in implementing the higher contribution rates calculated in the last valuation, offset somewhat by miscellaneous actuarial gains.

   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. 23

3. An actuarial loss of $80.8 million, or 2.70% of the Actuarial Accrued Liability, is due to an investment loss of $28.6 million, a contribution experience loss of $0.4 million, and a net experience loss from sources other than investments and contributions of $51.8 million. This loss from sources other than investment and contribution experience was primarily due to higher than expected salary increases for continuing actives and higher than expected cost-of-living adjustment (COLA) increases for payees, offset somewhat by miscellaneous actuarial gains.

4. This valuation reflects one minor actuarial methodology refinement of applying beginning of year timing of decrements for exiting from active membership status in calculating the normal cost rate. The refinement resulted in a 0.11% of payroll net decrease in the total normal cost rate.

Pg. 32

5. The aggregate employer rate (if paid at the end of each pay period) calculated in this valuation has increased from 39.15% of payroll to 40.14% of payroll. The increase in the employer rate was primarily due to (a) the change in member demographics, (b) the lower than expected return on the valuation value of assets (after smoothing), (c) higher than expected salary increases for continuing actives, (d) higher than expected COLA increases for current retirees and beneficiaries, and(e) the contribution loss due to actual contributions lower than expected from the anticipated one-year delay in implementing the higher contributions rates calculated in the prior valuation, offset somewhat by (f) amortizing the prior year's UAAL over a larger than expected projected total payroll and (g) miscellaneous actuarial gains.

6. 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. There was an increase in the total normal cost rate for the 2013 Tier due to the changes in member demographics during 2022/2023 as the average salary for continuing active 2013 Tier members increased by more than the increase in the CalPEPRA limit between the June 30, 2022 and 2023 valuations. We will continue to monitor this relationship 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.

   Although there was an increase in the total normal cost rate for the 2013 Tier, from 19.61% of payroll in the June 30, 2022 valuation to 19.79% of payroll in the June 30, 2023 valuation, the total normal cost rate for the 2013 Tier remained within 1% of the 18.81% of payroll threshold that was newly 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. With that said, it is very likely that the total normal cost rate for the 2013 Tier will increase and will exceed the 1% of the 18.81% threshold in the next valuation as of June 30, 2024.

Pg. 33

7. The aggregate member rate calculated in this valuation has remained unchanged at 9.04% of payroll. A reconciliation of the aggregate member rate is provided in *Section 2, Subsection F*.

Pg. 24

8. The rate of return on the Market Value of Assets was 10.62% for the July 1, 2022 to June 30, 2023 plan year. The return on the Valuation Value of Assets (pension plan only) was 5.42% 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 6.75%. This actuarial investment loss increased the average employer contribution rate by 0.77% of pay.

Pg. 21

9. As indicated in *Section 2, Subsection B* of this report, the total net unrecognized investment loss as of June 30, 2023 is $59.2 million for the assets for the pension and HIB plans (note that in the previous valuation, this amount was a net deferred loss of $157.2

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, 2023.

The net deferred loss of $59.2 million represents 2.6% of the market value of assets as of June 30, 2023. Unless offset by future investment gains or other favorable experience, the recognition of the net $59.2 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 75.2% to 73.3%.

  For comparison purposes, if the pension plan portion of the net deferred loss were recognized immediately and entirely in the valuation value of assets in the June 30, 2022 valuation, the funded percentage would have decreased from 76.1% to 70.7%.

- 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 40.14% to about 41.7% of payroll.

  For comparison purposes, if the pension plan portion of the net deferred loss were recognized immediately and entirely in the valuation value of assets in the June 30, 2022 valuation, the aggregate employer rate (payable at the end of each pay period) would have increased from 39.60% of payroll to about 44.1% of payroll.

10. The actuarial valuation report as of June 30, 2023 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. 39

11. 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 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.

Pg. 42

Note that this year the risk assessment section includes the disclosure of a “Low-Default-Risk Obligation Measure” (LDROM). This disclosure, along with commentary on the significance of the LDROM, is a new requirement under Actuarial Standard of Practice No. 4 (ASOP 4) for all pension funding actuarial valuation reports.

12. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2023. 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. Moreover, this actuarial valuation does not include any possible short-term or long-term impacts on mortality of the covered population that may emerge after June 30, 2023 due to COVID-19. Segal is available to prepare projections of potential outcomes of market conditions and other demographic experience upon request.
13. Segal strongly recommends an actuarial funding policy that targets 100% funding of the Actuarial Accrued Liability. Generally, this implies payments that are ultimately at least enough to cover Normal Cost, interest on the UAAL and the principal balance. The funding policy adopted by the Board as described in Section 4, Exhibit 1 meets this standard.
14. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution (ADC) under the System’s funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the plan and employer's financial statements as of June 30, 2023, will be provided separately. The accounting disclosures will utilize different methodologies from those employed in the funding valuation, as required by GASB. However, the ADC in this valuation is expected to be used as the ADC for GASB financial reporting.

Summary of Key Valuation Results

		June 30, 2023		June 30, 2022	
		Total Rate	Estimated Annual Dollar Amount[1]	Total Rate	Estimated Annual Dollar Amount[1]
Employer Contribution Rates: ***(payable at the end of each pay period)***	• 1955/1980 Plan	44.59%	$57,738,772	43.73%	$56,625,174
	• 2013 Tier	35.80%	47,536,829	34.69%	46,062,921
	• Combined	40.14%	$105,275,601	39.15%	$102,688,095
Average Member Contribution Rates: ***(payable at the end of each pay period)***	• 1955/1980 Plan	8.66%[2]	$11,213,675	8.66%[2]	$11,213,675
	• 2013 Tier	9.41%	12,495,015	9.41%	12,495,015
	• Combined	9.04%	$23,708,690	9.04%	$23,708,690

[1] Estimated based on June 30, 2023 projected annual compensation of $262,272,600 (that is, $129,488,164 for the 1955/1980 Plan and $132,784,436 for the 2013 Tier).

[2] The rate of 8.66% payable during the fiscal years 2023/2024 and 2024/2025 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%.

Summary of Key Valuation Results (continued)

		June 30, 2023	June 30, 2022
Actuarial Accrued Liability:	• Retired members and beneficiaries	$1,959,982,363	$1,834,781,122
	• Inactive vested members	59,125,354	55,173,918
	• Active members	975,321,433	945,816,052
	• Total Actuarial Accrued Liability (AAL)	$2,994,429,150	$2,835,771,092
	• Normal Cost for plan year beginning June 30[1]	62,314,596	58,245,086
Assets:	• Valuation value of pension plan assets (VVA)[2]	$2,251,690,803	$2,158,462,528
	• Market value of pension plan assets (MVA)[2]	2,194,142,000	2,005,352,000
	• Actuarial value of pension plan and HIB plan assets	2,314,460,062	2,216,123,725
	• Market value of pension plan and HIB plan assets	2,255,307,000	2,058,923,000
	• Actuarial value of total plan assets as a percentage of market value of total plan assets	102.6%	107.6%
Funded status:	• Unfunded Actuarial Accrued Liability (UAAL) on VVA basis	$742,738,347	$677,308,564
	• Funded ratio on VVA basis	75.2%	76.1%
	• UAAL on MVA basis	$800,287,150	$830,419,092
	• Funded ratio on MVA basis	73.3%	70.7%
Key assumptions:	• Net investment return	6.75%	6.75%
	• Price Inflation	2.50%	2.50%
	• Real across-the-board increase	0.50%	0.50%
	• Payroll growth increase	3.00%	3.00%
	• Cost of Living Adjustment (COLA)	2.75%	2.75%
	• Amortization period on VVA basis[3]	20 years	20 years

[1] Adjusted with interest to middle of the year assuming contributions would be paid at the end of each pay period.
[2] Net of HIB plan assets.
[3] Changes in UAAL as a result of gains or losses for each valuation are amortized over separate 20-year periods. Details on the funding policy are provided in *Section 4, Exhibit 1*.

Summary of Key Valuation Results (continued)

		June 30, 2023	June 30, 2022	Change From Prior Year
Demographic data:	**Active Members:**			
	• Number of members	1,955	1,895	3.2%
	• Average age	47.1	47.2	-0.1
	• Average service	11.0	11.4	-0.4
	• Total projected compensation	$262,272,600	$241,537,720	8.6%
	• Average projected compensation	$134,155	$127,461	5.3%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	1,704	1,656	2.9%
	– Disability retired	51	53	-3.8%
	– Beneficiaries	362	339	6.8%
	– Total	2,117	2,048	3.4%
	• Average age	71.4	71.0	0.4
	• Average monthly benefit	$5,752	$5,592	2.9%
	Inactive Vested Members:			
	• Number of members[1]	381	360	5.8%
	• Average Age	48.4	48.3	0.1
	Total Members:	4,453	4,303	3.5%

[1] Includes inactive members due a refund of member contributions.

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 provisions	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 information	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.
Financial information	Part of the cost of a plan will be paid from existing assets – the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, typically reported by the System. A snapshot as of a single date may not be an appropriate value for determining a single year's contribution requirement, especially in volatile markets. Plan sponsors often use 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 starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of participants in each year, as well as forecasts of the plan's benefits for each of those events. In addition, the benefits forecasted for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan's assets. All of these factors are uncertain and unknowable. Thus, there is a range of reasonable assumptions, and the results may vary materially based on which assumptions are selected within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model may use approximations and estimates that will have an immaterial impact on our results. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

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.

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 at a specific date — it is not a prediction of a plan's future financial condition. Accordingly, Segal did not perform an analysis of the potential range of financial measurements, except where otherwise noted.
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.
While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal's valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.
Segal's report shall be deemed to be final and accepted by the System upon delivery and review. The System should notify Segal immediately of any questions or concerns about the final content.

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.

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: 2014 – 2023

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
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
2023	1,955	381	2,117	2,498	1.28	1.08

[1] Includes inactive members due a refund of member contributions.

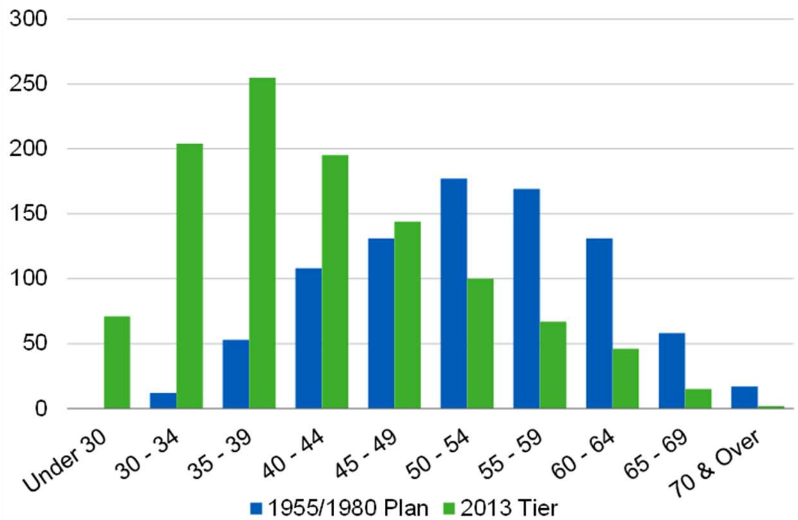
Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 1,955 active members with an average age of 47.1, average years of service of 11.0 years and average compensation of $134,155. The 1,895 active members in the prior valuation had an average age of 47.2, average service of 11.4 years and average compensation of $127,461.

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

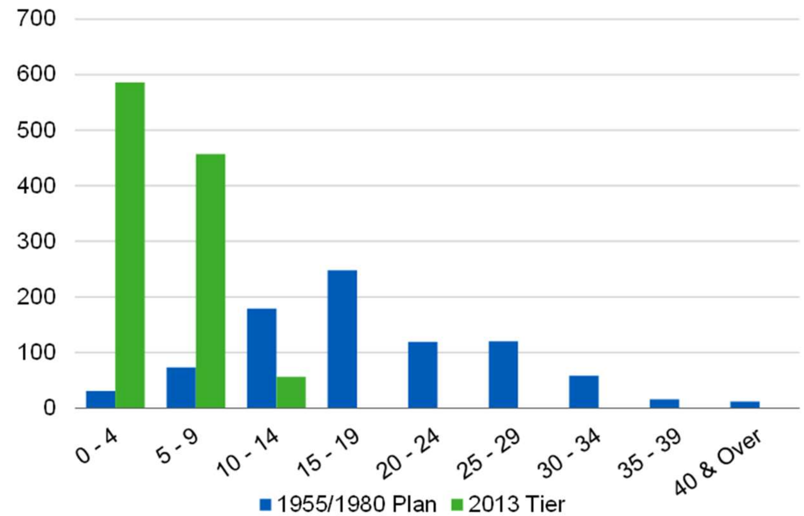
Distribution of Active Members as of June 30, 2023

Actives by Age



Average age	47.1
Prior year average age	47.2
Difference	-0.1

Actives by Years of Service



Average years of service	11.0
Prior year average years of service	11.4
Difference	-0.4

Inactive Members

In this year's valuation, there were 381 members with a vested right to a deferred or immediate vested benefit or a refund of contributions, versus 360 in the prior valuation.

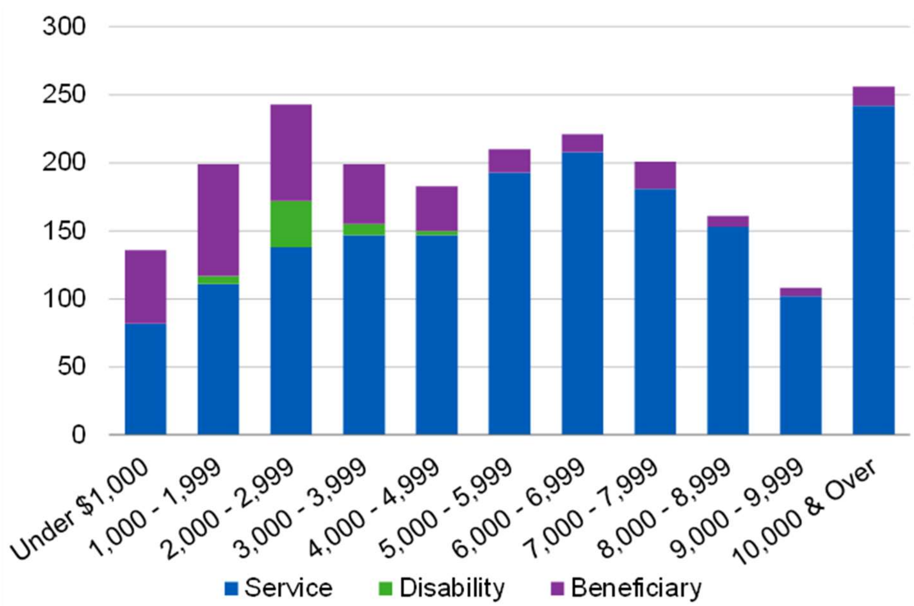
Retired Members and Beneficiaries

As of June 30, 2023, 1,755 retired members and 362 beneficiaries were receiving total monthly benefits of $12,176,254. For comparison, in the previous valuation, there were 1,709 retired members and 339 beneficiaries receiving monthly benefits of $11,452,514.

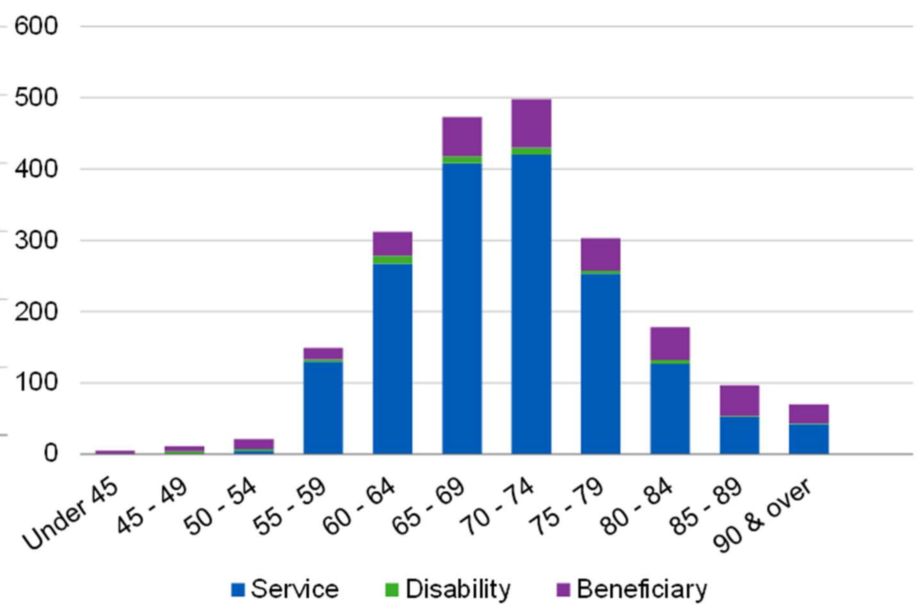
As of June 30, 2023, the average monthly benefit for retired members and beneficiaries is $5,752, compared to $5,592 in the previous valuation. The average age for retired members and beneficiaries is 71.4 in the current valuation, compared with 71.0 in the prior valuation.

Distribution of Retired Members and Beneficiaries as of June 30, 2023

Retired Members and Beneficiaries by Type and Monthly Amount



Retired Members and Beneficiaries by Type and Age



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: 2014 – 2023

	Active Members			Retired Members and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
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
2023	1,955	47.1	11.0	2,117	71.4	5,752

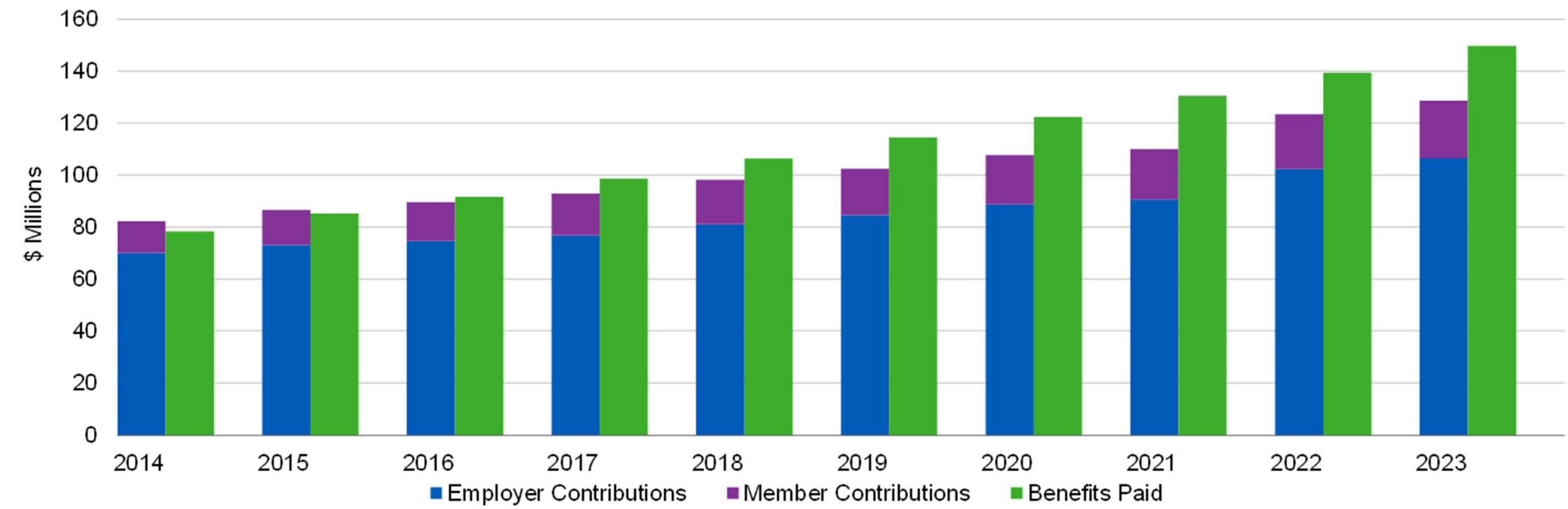
B. Financial Information

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, 2014 – 2023 (Pension and HIB Plans)



Determination of Actuarial Value of Assets for Year Ended June 30, 2023

1	**Market Value of Assets**					
	(a) Pension plan					**$2,194,142,000**
	(b) HIB plan					**61,165,000**
	(c) Total					**$2,255,307,000**
2	Calculation of unrecognized return	**Actual Return**	**Expected Return**	**Investment Gain/(Loss)**	**Percent Deferred**	**Deferred Return**
a)	Year ended June 30, 2019	$91,744,000	$122,306,135	$(30,562,135)	0%	$0
b)	Year ended June 30, 2020	39,376,000	127,791,930	(88,415,930)	20	(17,683,186)
c)	Year ended June 30, 2021	491,625,000	129,314,710	362,310,290	40	144,924,116
d)	Year ended June 30, 2022	(253,930,000)	162,455,125	(416,385,125)	60	(249,831,075)
e)	Year ended June 30, 2023	217,559,000	138,262,646	79,296,354	80	63,437,083
f)	Total unrecognized return[1]					$(59,153,062)
3	**Preliminary Actuarial Value of Assets: (1c) - (2f)**					**$2,314,460,062**
4	Adjustment to be within 30% corridor of market value					0
5	**Final Actuarial Value of Assets: 3 + 4**:					**$2,314,460,062**
6	Actuarial Value of Assets as a percentage of Market Value of Assets: **5 ÷ 1c**					102.6%
7	**Valuation Value of Pension Plan Assets: 1a ÷ 1c x 5**					**$2,251,690,803**

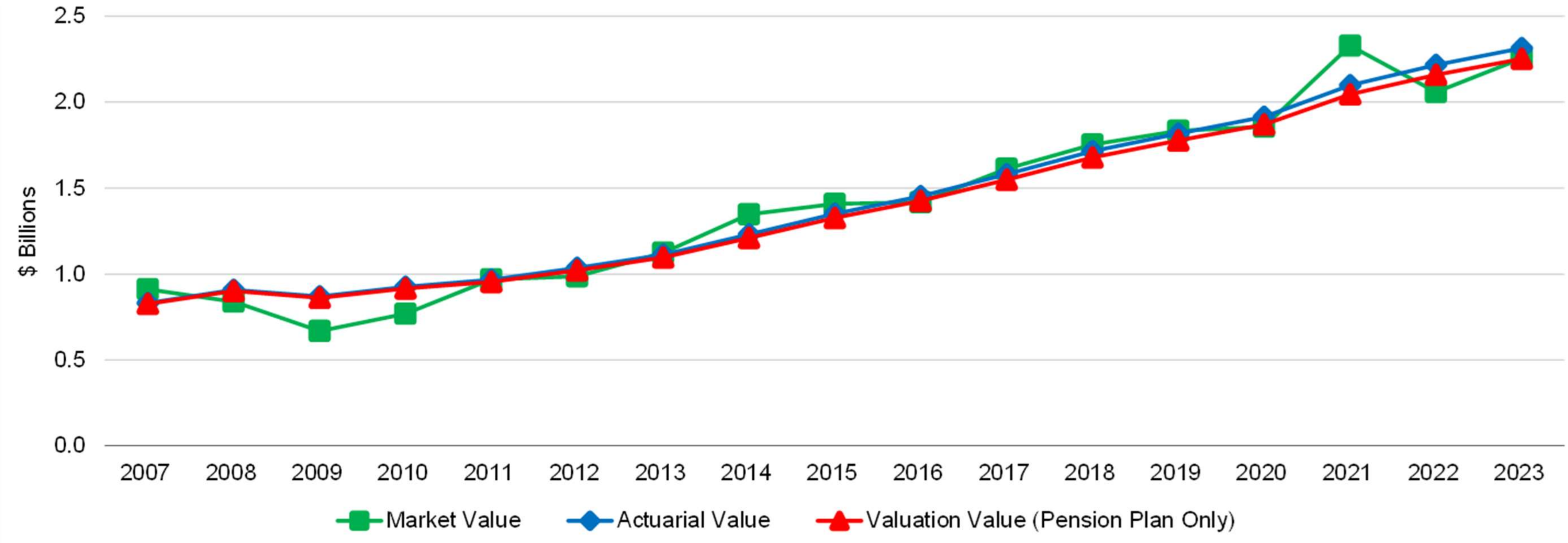
[1] Deferred return as of June 30, 2023 that will be recognized in each of the next four years (amounts may not total exactly due to rounding):

(a)	Amount recognized on June 30, 2024	$(12,638,882)
(b)	Amount recognized on June 30, 2025	5,044,304
(c)	Amount recognized on June 30, 2026	(67,417,754)
(d)	Amount recognized on June 30, 2027	15,859,271
(e)	Total unrecognized return as of June 30, 2023	$(59,153,062)

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 – 2023



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 $80.8 million, which includes $28.6 million from investment losses (after smoothing), a loss of $0.4 million from contribution experience and $51.8 million in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 1.73% 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, 2023

1	Net loss from investments[1]	$(28,574,882)
2	Actual contributions less than expected	(374,644)
3	Net loss from other experience[2]	(51,868,389)
4	**Net experience loss:[3] 1 + 2 + 3**	**$(80,817,915)**

[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, 2022 through June 30, 2023 compared to the projected experience based on the actuarial assumptions as of June 30, 2022. It does not include the effect of plan or assumption changes as of June 30, 2023, if any.

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 10.62% for the year ended June 30, 2023.

For valuation purposes, the assumed rate of return on the Valuation Value of Assets is 6.75% (for the June 30, 2022 valuation). The actual rate of return on a valuation value basis (after smoothing) for the 2022/2023 plan year was 5.42%. 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, 2023 with regard to its investments.

Investment Experience for Year Ended June 30, 2023

		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	$116,341,275	$119,511,337	$217,559,000
2	Average value of assets	2,146,906,028	2,205,536,225	2,048,335,500
3	Rate of return: **1 ÷ 2**	5.42%	5.42%	10.62%
4	Assumed rate of return	6.75%	6.75%	6.75%
5	Expected investment income: **2 x 4**	$144,916,157	$148,873,695	$138,262,646
6	**Actuarial gain/(loss): 1 - 5**	**$(28,574,882)**	**$(29,362,358)**	**$79,296,354**

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: 2014 – 2023[1]

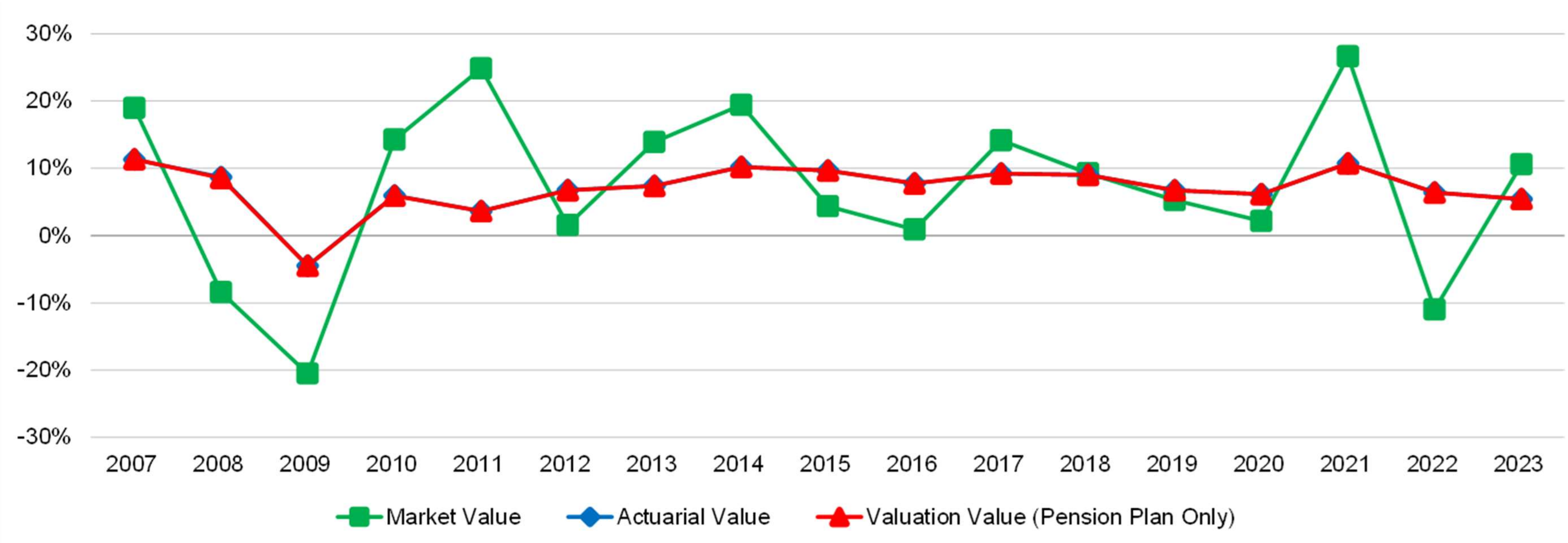
	Valuation Value Investment Return		Actuarial Value Investment Return		Market Value Investment Return	
Year Ended June 30	Amount	Percent	Amount	Percent	Amount	Percent
2014	$112,077,589	10.22%	$113,600,558	10.19%	$218,575,000	19.41%
2015	117,145,293	9.68%	118,952,917	9.67%	58,937,000	4.37%
2016	102,598,231	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)%
2023	116,341,275	5.42%	119,511,337	5.42%	217,559,000	10.62%
Most recent 5-year geometric average return		**7.08%**		**7.08%**		**6.05%**
Most recent 10-year geometric average return		**8.12%**		**8.11%**		**7.72%**

[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 – 2023



Contributions

Contributions for the year ended June 30, 2023, when adjusted for timing, totaled $120.9 million, compared to the projected amount of $121.3 million (also adjusted for timing). This resulted in a loss of $0.4 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, 2023 amounted to $51.8 million, which is 1.73% 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.

D. Other Changes in the Actuarial Accrued Liability

The Actuarial Accrued Liability as of June 30, 2023 is $2.994 billion, an increase of $158.7 million, or 5.6%, 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).

Methods

This valuation reflects one minor actuarial methodology refinement of applying beginning of year timing of decrements for exiting from active membership status in calculating the normal cost rate. The refinement resulting in a 0.11% of payroll net decrease in the total normal cost rate.

Actuarial Assumptions

There were no assumption changes since the prior valuation.

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*.

E. Development of Unfunded Actuarial Accrued Liability

Development for Year Ended June 30, 2023

1	**Unfunded actuarial accrued liability at beginning of year**		**$677,308,564**
2	Total Normal Cost at beginning of year		56,378,319
3	Expected employer and member contributions at beginning of year		(113,620,903)
4	Interest		41,854,452
5	Expected Unfunded Actuarial Accrued Liability at end of year		$661,920,432
6	Changes due to:		
	a. Investment loss on smoothed value of assets	$28,574,882	
	b. Effect of anticipated one-year delay in implementing the higher contribution rates calculated in the prior valuation	374,644	
	c. Loss due to higher than expected salary increases for continuing active members	20,544,168	
	d. Loss due to higher than expected COLA increases for current retirees and beneficiaries	34,571,566	
	e. Other gains on demographic experience	(3,247,345)	
	Total changes		$80,817,915
7	**Unfunded Actuarial Accrued Liability at end of year**		**$742,738,347**

Note: The “net loss from other experience” of $51,868,389 from *Subsection C* is equal to the sum of items 6c, 6d and 6e.

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, 2023, the average recommended employer contribution is 40.14% 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 20-year[1] amortization periods as a level percentage of payroll. See *Section 4, Exhibit 1* for further details on the funding policy. Based on this policy, there is no negative amortization[2] and each amortization layer is fully funded in 20 years. As shown in the graphical projection of the UAAL amortization balances and payments found in *Section 3, Exhibit H*, before taking into consideration the deferred investment gains/losses that will be recognized in the next several valuations, the UAAL of the Plan is expected to be fully amortized by 2045,[3] assuming all assumptions are realized and contributions are made in accordance with the funding policy.

The current funding policy is intended to fully fund the cost of the benefits and to allocate the cost of benefits reasonably and equitably over time while minimizing the volatility of employer contributions. The recommended contribution is expected to remain level as a percent of payroll, except when any current amortization layer is fully amortized, assuming there are no future actuarial gains or losses. Furthermore, the funded ratio is expected to increase as the UAAL is methodically funded by employer contributions.

The contribution requirement as of June 30, 2023 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.

[1] Changes in UAAL as a result of actuarial gains or losses or as a result of changes in actuarial assumptions or methods (on or after July 1, 2021) for each valuation are amortized over separate 20-year periods. Changes in UAAL as a result of plan changes are amortized over separate 15-year periods.
[2] Negative amortization means that the amortization payment towards the UAAL is less than the interest on the UAAL and therefore the outstanding balance of the UAAL would increase.
[3] The UAAL is expected to be fully amortized later than the 20-year amortization period because of a prior change in assumptions base that was originally established with a 25 year amortization period and which has 22 years remaining as of June 30, 2023.

Average Recommended Employer Contribution for Year Ended June 30

All Tiers Combined		2023 Amount	2023 % of Projected Compensation	2022 Amount	2022 % of Projected Compensation
1	Total Normal Cost	$62,314,596	23.76%	$58,245,086	24.11%
2	Expected member Normal Cost contributions	23,708,690	9.04%	21,744,422	9.00%
3	Employer Normal Cost: **1 – 2**	$38,605,906	14.72%	$36,500,664	15.11%
4	Actuarial Accrued Liability	2,994,429,150		2,835,771,092	
5	Valuation Value of Assets	2,251,690,803		2,158,462,528	
6	Unfunded Actuarial Accrued Liability: **4 – 5**	$742,738,347		$677,308,564	
7	Payment on Unfunded Actuarial Accrued Liability	66,669,695	25.42%	59,152,588	24.49%
8	Total average recommended employer contribution: **3 + 7**	$105,275,601	40.14%	$95,653,252	39.60%
9	Projected compensation	$262,272,600		$241,537,720	

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

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, 2022 to June 30, 2023

	Contribution Rate	Estimated Annual Dollar Amount[1]
Average Adopted Employer Contribution Rate as of June 30, 2022	**39.15%**	**$102,688,095**
1. Effect of change in membership demographics	0.06%	$157,364
2. Effect of investment return less than expected on smoothed value of assets	0.77%	2,019,499
3. Effect of individual salary increases higher than expected for continuing active members	0.56%	1,468,727
4. Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(1.26)%	(3,304,635)
5. Effect of higher than expected COLA increases for current retirees and beneficiaries	0.94%	2,465,362
6. Effect of anticipated one-year delay in implementing the higher contribution rates calculated in the prior valuation	0.01%	26,227
7. Effect of other demographic experience gains on accrued liability	(0.09)%	(245,038)
Total change	0.99%	$2,587,506
Average Recommended Employer Contribution Rate as of June 30, 2023	**40.14%**	**$105,275,601**

[1] Based on June 30, 2023 projected compensation of $262,272,600.

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, 2022 to June 30, 2023

	Contribution Rate	Estimated Annual Dollar Amount[1]
Average Recommended Member Contribution as of June 30, 2022	**9.04%**	**$23,708,690**
1. Effect of changes in member demographics	0.00%	$0
Total changes	0.00%	$0
Average Recommended Member Contribution as of June 30, 2023	**9.04%**	**$23,708,690**

[1] Based on June 30, 2023 projected compensation of $262,272,600.

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

	June 30, 2023 Actuarial Valuation		June 30, 2022 Actuarial Valuation	
	Contribution Rate	Estimated Annual Dollar Amount[1]	Contribution Rate	Estimated Annual Dollar Amount[1]
1955/1980 Plan				
Total Normal Cost	27.83%	$36,036,556	27.90%	$36,127,198
Expected Employee Contributions	-8.66%[2]	-11,213,675	-8.66%[2]	-11,213,675
Employer Normal Cost	19.17%	$24,822,881	19.24%	$24,913,523
UAAL	25.42%	32,915,891	24.49%	31,711,651
Total Employer Contribution	**44.59%**	**$57,738,772**	**43.73%**	**$56,625,174**
2013 Tier				
Total Normal Cost	19.79%	$26,278,040	19.61%	$26,039,028
Expected Employee Contributions	-9.41%	-12,495,015	-9.41%	-12,495,015
Employer Normal Cost	10.38%	$13,783,025	10.20%	$13,544,013
UAAL	25.42%	33,753,804	24.49%	32,518,908
Total Employer Contribution	**35.80%**	**$47,536,829**	**34.69%**	**$46,062,921**
Combined				
Total Normal Cost	23.76%	$62,314,596	23.70%	$62,166,226
Expected Employee Contributions	-9.04%	-23,708,690	-9.04%	-23,708,690
Employer Normal Cost	14.72%	$38,605,906	14.66%	$38,457,536
UAAL	25.42%	66,669,695	24.49%	64,230,559
Total Employer Contribution	**40.14%**	**$105,275,601**	**39.15%**	**$102,688,095**

1 Amounts are based on the following June 30, 2023 projected annual payroll:

1955/1980 Plan	$129,488,164
2013 Tier	132,784,436
Combined	$262,272,600

2 The rate of 8.66% payable during the fiscal years 2023/2024 and 2024/2025 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%.

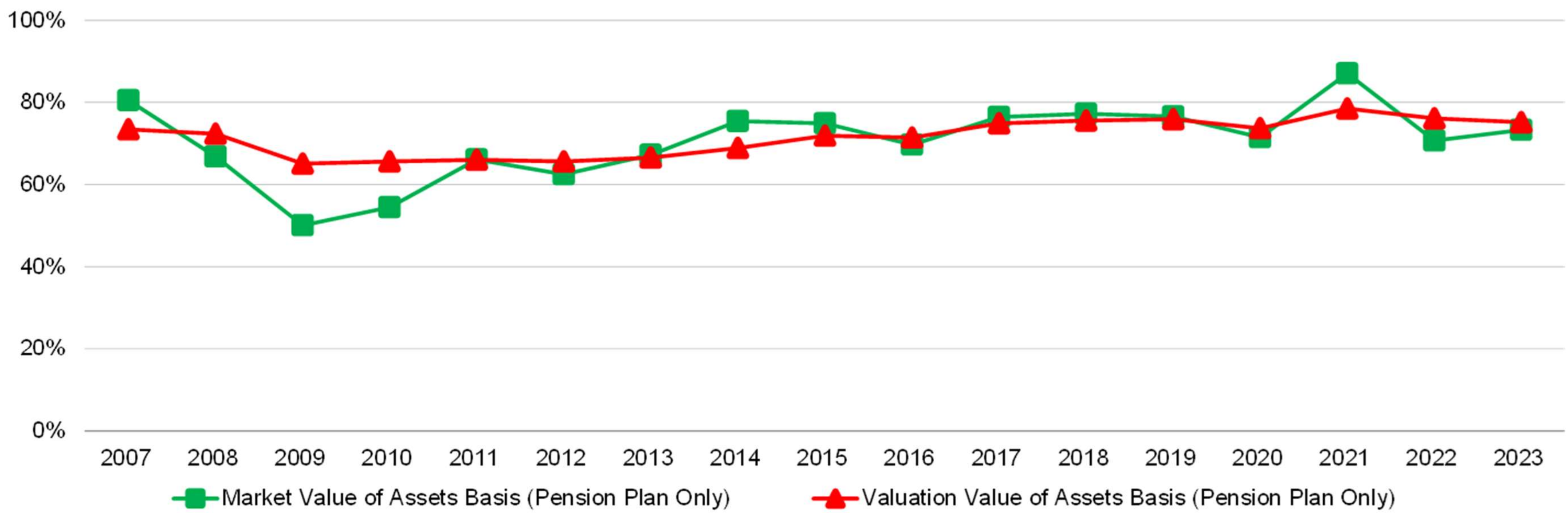
G. Funded Status

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 – 2023



Schedule of Funding Progress for Years Ended June 30, 2014 – 2023 (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)
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
2023	2,251,691	2,994,429	742,738	75.2	262,273	283.2

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, 2023	**June 30, 2022**
Actuarial Present Value of Future Benefits		
• Present value of benefits for retired members and beneficiaries	$1,959,982,363	$1,834,781,122
• Present value of benefits for inactive vested members	59,125,354	55,173,918
• Present value of benefits for active members	1,507,682,199	1,433,617,383
Total Actuarial Present Value of Future Benefits	**$3,526,789,916**	**$3,323,572,423**
Current and future assets		
• Total Valuation Value of Assets	$2,251,690,803	$2,158,462,528
• Present value of future contributions by members	219,099,771	197,570,495
• Present value of future employer contributions for:		
– Entry age Normal Cost	313,260,995	290,230,836
– Unfunded Actuarial Accrued Liability	742,738,347	677,308,564
Total of current and future assets	**$3,526,789,916**	**$3,323,572,423**

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 8.4. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 8.4% 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 11.4. This is about 36% 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, 2014 – 2023

Year Ended June 30	Asset Volatility Ratio	Liability Volatility Ratio
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
2023	8.4	11.4

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 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 38, a 1% asset gain or loss (relative to the assumed investment return) translates to about 8.4% 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 68.9% to 75.2%. 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 35.

- The average geometric investment return on the Actuarial Value of Assets over the most recent 10-year period was 8.11%. This includes a high of a 10.71% return and a low of 5.42%. The average over the last 5 years was 7.08%. For more details see the Investment Return table in *Section 2, Subsection C* on page 25.
- 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 53.
- 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 55 and 56.

Maturity Measures

In the last 10 years the ratio of retired members and beneficiaries to active members has increased from 0.87 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 16.

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 $21.2 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 20. 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 38.

[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.

Low-Default-Risk Obligation Measure (LDROM)

In December 2021, the Actuarial Standards Board issued a revision of Actuarial Standard of Practice No. 4 (ASOP 4) *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*. One of the revisions to ASOP 4 requires the disclosure of a Low-Default-Risk Obligation Measure (LDROM) when performing a funding valuation. The LDROM presented in this report is calculated using the same methodology and assumptions used to determine the Actuarial Accrued Liability (AAL) used for funding, except for the discount rate. The LDROM is required to be calculated using "a discount rate…derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future."

The LDROM is a calculation assuming a plan's assets are invested in an all-bond portfolio, generally lowering expected long-term investment returns. The discount rate selected and used for this purpose is the Bond Buyer General Obligation 20-year Municipal Bond Index Rate, published at the end of each week. The last published rate in June of the measurement period, by The Bond Buyer, is 3.65% for use effective June 30, 2023. This is the rate used to determine the discount rate for valuing reported public pension plan liabilities in accordance with Governmental Accounting Standards when plan assets are projected to be insufficient to make projected benefit payments, and the 20-year period reasonably approximates the duration of public pension plan liabilities. The LDROM is not used to determine a plan's funded status or Actuarially Determined Contribution Rate. The plan's expected return on assets, currently 6.75%, is used for these calculations.

As of June 30, 2023, the LDROM for the System is $4.515 billion. The difference between the System's AAL of $2.994 billion and the LDROM can be thought of as the increase in the AAL if the entire portfolio were invested in low-default-risk securities. Alternatively, this difference could also be viewed as representing the expected savings from investing in the plan's diversified portfolio compared to investing only in low-default-risk securities.

ASOP 4 requires commentary to help the intended user understand the significance of the LDROM with respect to the funded status of the plan, plan contributions, and the security of participant benefits. In general, if plan assets were invested exclusively in low-default-risk securities, the funded status would be lower and the Actuarially Determined Contribution would be higher. While investing in a portfolio with low-default-risk securities may be more likely to reduce investment volatility and the volatility of employer contributions, it also may be more likely to result in higher employer contributions or lower benefits.

Section 3: Supplemental Information

Exhibit A: Table of Plan Coverage

Total Plan

Category	Year Ended June 30 2023	Year Ended June 30 2022	Change From Prior Year
Active members in valuation:			
• Number	1,955	1,895	3.2%
• Average age	47.1	47.2	-0.1
• Average years of service	11.0	11.4	-0.4
• Total projected compensation	$262,272,600	$241,537,720	8.6%
• Average projected compensation	$134,155	$127,461	5.3%
• Account balances	$248,277,401	$235,786,215	5.3%
• Total active vested members	1,338	1,297	3.2%
Inactive vested members:			
• Number[1]	381	360	5.8%
• Average Age	48.4	48.3	0.1
Retired members:			
• Number in pay status	1,704	1,656	2.9%
• Average age	71.0	70.6	0.4
• Average monthly benefit	$6,332	$6,131	3.3%
Disabled members:			
• Number in pay status	51	53	-3.8%
• Average age	67.4	66.8	0.6
• Average monthly benefit	$2,653	$2,550	4.0%
Beneficiaries:			
• Number in pay status	362	339	6.8%
• Average age	73.8	73.2	0.6
• Average monthly benefit	$3,456	$3,434	0.6%

[1] Includes inactive members due a refund of member contributions.

Exhibit A: Table of Plan Coverage (continued)

1955/1980 Plan

Category	Year Ended June 30 2023	2022	Change From Prior Year
Active members in valuation:			
• Number	856	924	-7.4%
• Average age	53.3	52.9	0.4
• Average years of service	18.9	18.5	0.4
• Total projected compensation	$129,488,164	$131,236,899	-1.3%
• Average projected compensation	$151,271	$142,031	6.5%
• Account balances	$192,745,940	$192,084,135	0.3%
• Total active vested members	825	887	-7.0%
Inactive vested members:			
• Number[1]	211	214	-1.4%
• Average Age	52.9	52.4	0.5
Retired members:			
• Number in pay status	1,694	1,648	2.8%
• Average age	71.1	70.7	0.4
• Average monthly benefit	$6,363	$6,156	3.4%
Disabled members:			
• Number in pay status	51	53	-3.8%
• Average age	67.4	66.8	0.6
• Average monthly benefit	$2,653	$2,550	4.0%
Beneficiaries:			
• Number in pay status	362	339	6.8%
• Average age	73.8	73.2	0.6
• Average monthly benefit	$3,456	$3,434	0.6%

[1] Includes inactive members due a refund of member contributions.

Exhibit A: Table of Plan Coverage (continued)

2013 Tier

Category	Year Ended June 30 2023	Year Ended June 30 2022	Change From Prior Year
Active members in valuation:			
• Number	1,099	971	13.2%
• Average age	42.2	41.8	0.4
• Average years of service	4.9	4.6	0.3
• Total projected compensation	$132,784,436	$110,300,821	20.4%
• Average projected compensation	$120,823	$113,595	6.4%
• Account balances	$55,531,461	$43,702,080	27.1%
• Total active vested members	513	410	25.1%
Inactive vested members:			
• Number[1]	170	146	16.4%
• Average Age	42.8	42.4	0.4
Retired members:			
• Number in pay status	10	8	25.0%
• Average age	67.0	66.9	0.1
• Average monthly benefit	$1,161	$1,039	11.7%
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.

Exhibit B: Members in Active Service as of June 30, 2023 by Age, Years of Service, and Average Projected Compensation

Total Plan

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	7	7	—	—	—	—	—	—	—	—
	$103,361	$103,361	—	—	—	—	—	—	—	—
25 - 29	64	58	6	—	—	—	—	—	—	—
	115,649	114,229	$129,373	—	—	—	—	—	—	—
30 - 34	216	140	64	12	—	—	—	—	—	—
	120,553	113,638	131,951	$140,444	—	—	—	—	—	—
35 - 39	308	145	123	34	6	—	—	—	—	—
	124,317	114,391	129,322	145,084	$143,894	—	—	—	—	—
40 - 44	303	102	105	45	46	5	—	—	—	—
	132,971	114,892	129,190	149,576	159,895	$184,035	—	—	—	—
45 - 49	275	67	87	45	45	26	5	—	—	—
	140,548	123,635	132,342	145,664	160,702	162,891	$166,350	—	—	—
50 - 54	277	45	63	37	50	37	35	9	1	—
	142,362	121,016	134,139	149,018	149,401	150,298	152,961	$158,614	$211,945	—
55 - 59	236	30	46	22	57	24	37	19	1	—
	142,323	120,563	130,551	135,606	149,696	153,114	150,985	161,514	120,172	—
60 - 64	177	19	25	25	34	15	27	20	10	2
	143,294	121,744	122,818	153,044	146,420	146,777	153,131	146,875	148,178	$209,816
65 - 69	73	3	10	13	8	10	8	9	4	8
	135,772	113,234	112,746	142,875	125,771	107,364	144,611	151,757	153,665	171,204
70 & over	19	1	1	2	2	2	8	1	—	2
	135,823	110,935	146,042	155,142	132,275	123,222	140,847	93,888	—	140,857
Total	**1,955**	**617**	**530**	**235**	**248**	**119**	**120**	**58**	**16**	**12**
	$134,155	**$116,165**	**$130,201**	**$146,361**	**$152,023**	**$150,528**	**$151,584**	**$153,336**	**$151,785**	**$172,581**

Exhibit B: Members in Active Service as of June 30, 2023 by Age, Years of Service, and Average Projected Compensation (continued)

1955/1980 Plan

		Years of Service								
Age	**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	12	3	1	8	—	—	—	—	—	—
	$142,646	$138,544	$153,649	$142,809	—	—	—	—	—	—
35 – 39	53	5	16	26	6	—	—	—	—	—
	144,905	115,625	151,806	146,523	$143,894	—	—	—	—	—
40 – 44	108	6	16	35	46	5	—	—	—	—
	154,960	141,096	136,944	154,933	159,895	$184,035	—	—	—	—
45 – 49	131	7	13	35	45	26	5	—	—	—
	157,332	190,036	135,234	149,247	160,702	162,891	$166,350	—	—	—
50 – 54	177	3	15	27	50	37	35	9	1	—
	152,209	146,217	150,520	156,308	149,401	150,298	152,961	$158,614	$211,945	—
55 – 59	169	7	9	15	57	24	37	19	1	—
	151,117	153,027	156,486	138,424	149,696	153,114	150,985	161,514	120,172	—
60 – 64	131	—	3	20	34	15	27	20	10	2
	150,835	—	139,534	159,369	146,420	146,777	153,131	146,875	148,178	$209,816
65 – 69	58	—	—	11	8	10	8	9	4	8
	141,166	—	—	145,530	125,771	107,364	144,611	151,757	153,665	171,204
70 & over	17	—	—	2	2	2	8	1	—	2
	136,686	—	—	155,142	132,275	123,222	140,847	93,888	—	140,857
Total	**856**	**31**	**73**	**179**	**248**	**119**	**120**	**58**	**16**	**12**
	$151,271	**$150,982**	**$145,431**	**$150,802**	**$152,023**	**$150,528**	**$151,584**	**$153,336**	**$151,785**	**$172,581**

Exhibit B: Members in Active Service as of June 30, 2023 by Age, Years of Service, and Average Projected Compensation (continued)

2013 Tier

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	7	7	—	—	—	—	—	—	—	—
	$103,361	$103,361	—	—	—	—	—	—	—	—
25 – 29	64	58	6	—	—	—	—	—	—	—
	115,649	114,229	$129,373	—	—	—	—	—	—	—
30 – 34	204	137	63	4	—	—	—	—	—	—
	119,254	113,092	131,607	$135,713	—	—	—	—	—	—
35 – 39	255	140	107	8	—	—	—	—	—	—
	120,038	114,347	125,960	140,409	—	—	—	—	—	—
40 – 44	195	96	89	10	—	—	—	—	—	—
	120,792	113,255	127,795	130,826	—	—	—	—	—	—
45 – 49	144	60	74	10	—	—	—	—	—	—
	125,279	115,888	131,834	133,123	—	—	—	—	—	—
50 – 54	100	42	48	10	—	—	—	—	—	—
	124,934	119,216	129,020	129,335	—	—	—	—	—	—
55 – 59	67	23	37	7	—	—	—	—	—	—
	120,144	110,682	124,242	129,566	—	—	—	—	—	—
60 – 64	46	19	22	5	—	—	—	—	—	—
	121,819	121,744	120,539	127,741	—	—	—	—	—	—
65 – 69	15	3	10	2	—	—	—	—	—	—
	114,914	113,234	112,746	128,277	—	—	—	—	—	—
70 & over	2	1	1	—	—	—	—	—	—	—
	128,489	110,935	146,042	—	—	—	—	—	—	—
Total	**1,099**	**586**	**457**	**56**	**—**	**—**	**—**	**—**	**—**	**—**
	$120,823	**$114,323**	**$127,768**	**$132,164**	**—**	**—**	**—**	**—**	**—**	**—**

Exhibit C: Reconciliation of Member Data

	Active Members	Inactive Vested Members[1]	Retired Members	Disabled Members	Beneficiaries	Total
Number as of June 30, 2022	**1,895**	**360**	**1,656**	**53**	**339**	**4,303**
• New members	166	0	0	0	34	200
• Terminations – with vested rights	-35	35	0	0	0	0
• Contribution refunds	-5	-9	0	0	0	-14
• Retirements	-67	-14	81	0	0	0
• New disabilities	0	0	0	0	0	0
• Return to work	3	-3	0	0	0	0
• Died with or without beneficiary	-2	0	-32	-2	-11	-47
• Data adjustments	0	12[2]	-1	0	0	11
Number as of June 30, 2023	**1,955**	**381**	**1,704**	**51**	**362**	**4,453**

[1] Includes inactive members due a refund of member contributions.

[2] Includes 6 members who were hired and terminated during fiscal 2022/2023, 4 members who were previously categorized as having taken a refund of member contributions, and 2 members who were classified by EBMUDERS as terminated non-vested but who had member contributions still on file.

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, 2023		Year Ended June 30, 2022	
Net assets at market value at the beginning of the year		**$2,058,923,000**		**$2,328,722,000**
Contribution income:				
• Employer contributions	$106,523,000		$102,285,000	
• Member contributions	22,088,000		21,127,000	
Net contribution income		$128,611,000		$123,412,000
Investment income:				
• Interest, dividends and other income	$38,553,000		$28,386,000	
• Asset appreciation	187,897,000		(276,684,000)	
• Less investment and administrative fees	(8,891,000)		(5,632,000)	
Net investment income		$217,559,000		$(253,930,000)
Total income available for benefits		**$346,170,000**		**$(130,518,000)**
Less benefit payments:				
• Benefits paid	$(149,102,000)		$(138,582,000)	
• Refund of contributions	(684,000)		(699,000)	
Net benefit payments		$(149,786,000)		$(139,281,000)
Change in net assets at market value		**$196,384,000**		**$(269,799,000)**
Net assets at market value at the end of the year		**$2,255,307,000**		**$2,058,923,000**

Note: Results may be slightly off due to rounding.

Exhibit E: Summary Statement of Plan Assets

	June 30, 2023		June 30, 2022	
Cash equivalents:		$27,677,000		$25,336,000
Accounts receivable:				
• Brokers, securities sold	$2,854,000		$923,000	
• Employer and member contributions	4,493,000		3,840,000	
• Interest, dividends and recoverable taxes	4,833,000		4,700,000	
Total accounts receivable		$12,180,000		$9,463,000
Investments:				
• Equities	$1,581,310,000		$1,413,921,000	
• Fixed income investments	515,694,000		487,236,000	
• Real estate	122,000,000		125,557,000	
• Securities lending collateral	77,906,000		101,249,000	
• Capital assets	1,692,000		0	
• Prepaid expenses	575,000		568,000	
Total investments at market value		$2,299,177,000		$2,128,531,000
Total assets		$2,339,034,000		$2,163,330,000
Accounts payable:				
• Accounts payable and accrued expenses	$(3,224,000)		$(2,447,000)	
• Payables to brokers, securities purchased	(2,597,000)		(711,000)	
• Securities lending collateral	(77,906,000)		(101,249,000)	
Total accounts payable		$(83,727,000)		$(104,407,000)
Net assets at market value		**$2,255,307,000**		**$2,058,923,000**
Net assets at actuarial value		**$2,314,460,062**		**$2,216,123,725**
Net assets at valuation value (Pension Plan Only)		**$2,251,690,803**		**$2,158,462,528**

Note: Results may be slightly off due to rounding.

Exhibit F: Development of the Fund through June 30, 2023 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
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%
2023	106,523,000	22,088,000	217,559,000	149,786,000	2,255,307,000	2,314,460,062	102.6%

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

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	$(8,637,727)	7	$(1,370,198)
Change in Assumptions	06/30/2000	8,629,891	30	6,856,497	7	1,087,642
Plan Amendments	06/30/2000	13,607,265	30	10,811,046	7	1,714,950
3.5% Retiree COLA Assumption	06/30/2000	27,057,441	30	21,497,287	7	3,410,102
Experience Loss	06/30/2001	2,292,281	30	1,964,171	8	277,325
Experience Loss	06/30/2002	26,232,251	30	23,865,999	9	3,046,562
Plan Amendments	06/30/2002	5,111,914	30	4,650,796	9	593,687
Experience Loss	06/30/2003	43,692,270	30	41,691,103	10	4,871,277
Plan Amendments	06/30/2003	67,138,578	30	64,063,531	10	7,485,319
Experience Loss	06/30/2004	32,731,232	30	32,433,068	11	3,503,284
New Assumption / Domestic Partners	06/30/2004	(9,812,646)	30	(9,723,260)	11	(1,050,266)
Experience Loss	06/30/2005	26,910,233	30	27,465,202	12	2,765,133
Remove Limit Pension Base	06/30/2005	27,315,928	30	27,752,556	12	2,794,064
Experience Loss	06/30/2006	14,160,133	30	14,784,375	13	1,396,892
Experience Gain	06/30/2007	(3,098,126)	30	(3,289,907)	14	(293,428)
Experience Gain	06/30/2008	(7,800,585)	30	(8,382,940)	15	(709,330)
Change in Assumptions	06/30/2008	51,413,374	30	55,251,662	15	4,675,171
Experience Loss	06/30/2009	114,894,458	30	124,415,515	16	10,031,124
Experience Loss	06/30/2010	3,039,098	30	3,303,564	17	254,762
Change in Assumptions	06/30/2010	8,098,499	30	8,803,241	17	678,883
Experience Loss	06/30/2011	4,428,038	30	4,819,200	18	356,668
Experience Gain	06/30/2012	(15,668,764)	20	(12,239,654)	9	(1,562,426)
Change in Assumptions	06/30/2012	53,400,521	25	51,601,242	14	4,602,336

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

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	$8,924,458	10	$1,042,753
Experience Gain	06/30/2014	(26,406,581)	20	(22,610,099)	11	(2,442,248)
Change in Assumptions	06/30/2014	18,421,049	25	18,265,734	16	1,472,693
Experience Gain	06/30/2015	(28,955,525)	20	(25,678,709)	12	(2,585,273)
Experience Gain	06/30/2016	(1,408,751)	20	(1,285,146)	13	(121,426)
Change in Assumptions	06/30/2016	52,595,760	25	52,955,822	18	3,919,250
Experience Gain	06/30/2017	(50,022,788)	20	(46,710,776)	14	(4,166,153)
Experience Loss	06/30/2018	14,053,082	20	13,365,208	15	1,130,910
Change in Assumptions	06/30/2018	12,484,391	25	12,632,131	20	868,548
Experience Loss	06/30/2019	26,728,885	20	25,839,668	16	2,083,349
Experience Loss	06/30/2020	5,281,313	20	5,170,058	17	398,701
Change in Assumptions	06/30/2020	104,813,640	25	106,062,581	22	6,840,557
Experience Gain	06/30/2021	(97,336,901)	20	(96,165,305)	18	(7,117,175)
Experience Loss	06/30/2022	56,034,517	20	55,704,018	19	3,968,350
Change in Assumptions	06/30/2022	72,119,593	20	71,694,222	19	5,107,491
Experience Loss	06/30/2023	80,817,915	20	80,817,915	20	5,556,800
Total				**$742,738,347**		**$64,516,660**

Note: The equivalent single amortization period is about 14 years.

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

Exhibit H: Projection of UAAL Balances and Payments

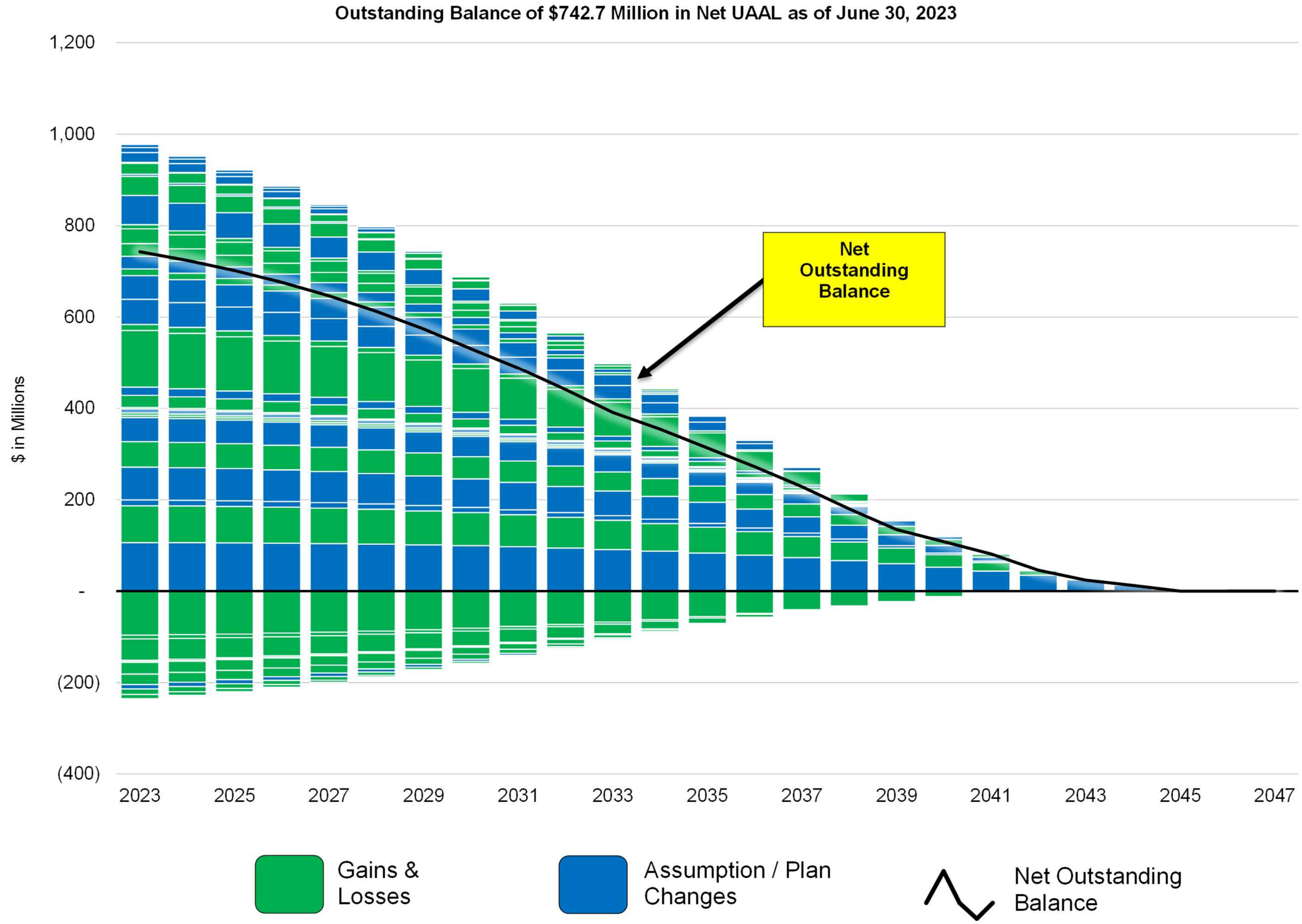


Exhibit H: Projection of UAAL Balances and Payments (continued)

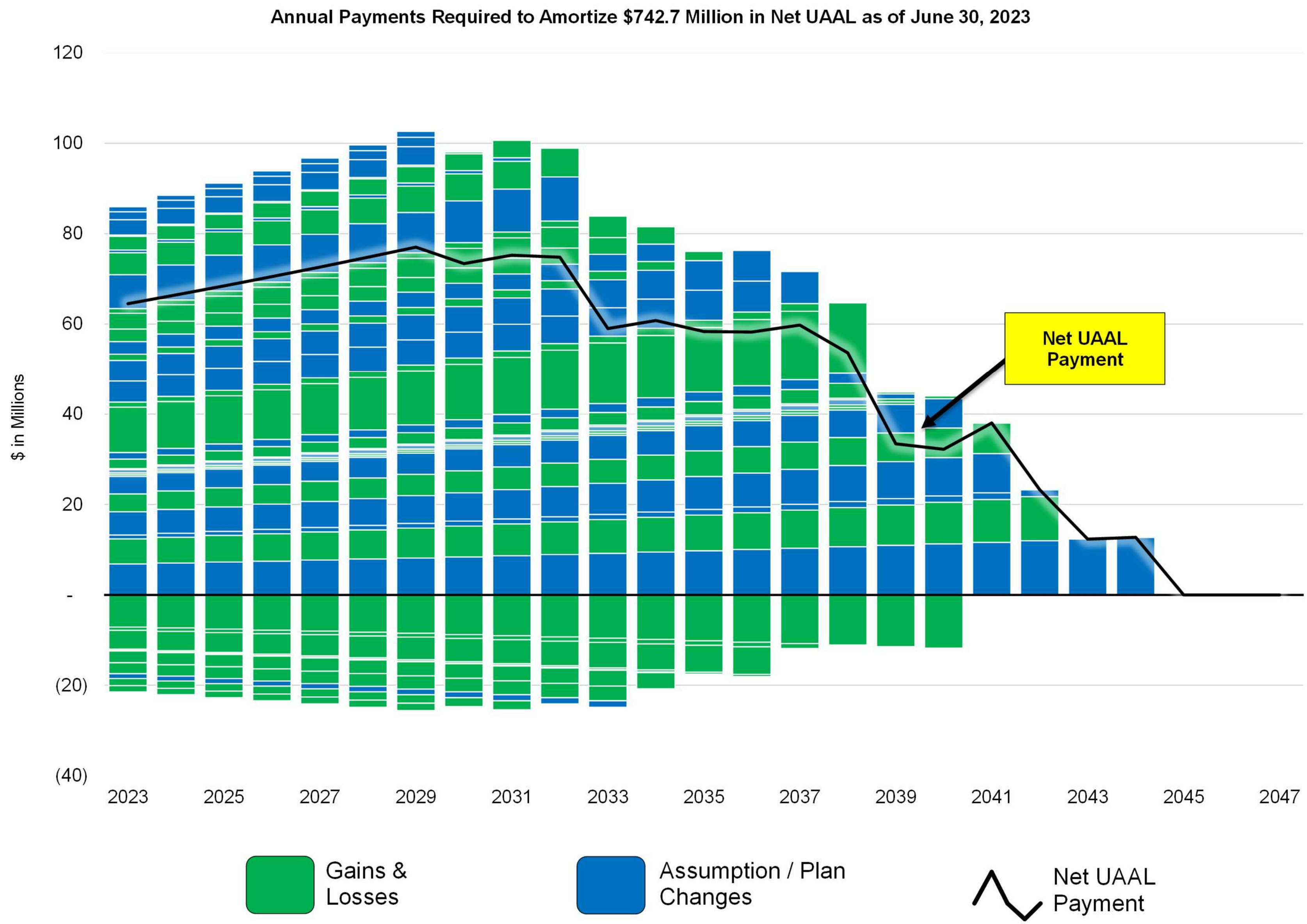


Exhibit I: Definition of Pension Terms

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):	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: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

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.

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: Investment return - the rate of investment yield that the Fund will earn over the long-term future; Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the probability of disability retirement at a given age; Withdrawal rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - 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.

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.

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

	Rate (%)	
Age	**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.

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:

	Rate (%)		
	1955/1980 Plan		
Age	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, 3.75% 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. Since birth dates for non-spouse/non-domestic partner contingent beneficiaries are not provided by EBMUDERS, the age differences noted above also apply to assumed contingent beneficiaries of retired members who chose an optional form of payment at retirement.
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):

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%

<u>Actuarial Funding Policy:</u>	
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:	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 (prior to July 1, 2021); and experience gains/losses are amortized over separate decreasing 20-year periods. On or after July 1, 2021, assumption and method changes are amortized over separate decreasing 20-year periods.
<u>**Other Actuarial Methods:**</u>	
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 3.00% (i.e., 2.50% 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.*

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:

	Member Rate		
	(a)	(b)	(c) = (a) – (b)
Effective Date	Total	HIB Plan	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.

	For the June 30, 2023 valuation, the 2013 Tier member contribution rate remains at 9.41% for the Pension Plan, because the total Normal Cost rate for this tier of 19.79% 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 $265,000 for 2023. 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.
Changes in Actuarial Assumptions:	There have been no changes in actuarial assumptions since the last valuation.

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:	
1955/1980 Plan	All employees who first become members before January 1, 2013.
2013 Tier	All employees who first become members on or after January 1, 2013.
Final Compensation for Benefit Determination:	
1955/1980 Plan	Highest two consecutive years of compensation earnable (FAS2).
2013 Tier	Highest thirty-six consecutive months of pensionable compensation (FAS3).
Compensation Limit:	
1955/1980 Plan	IRC Section 401(a)(17) compensation limit applies to all employees who began membership in EBMUDERS on or after January 1, 1996.
2013 Tier	$146,042 for 2023
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:	
Age and Service Requirement	
1955/1980 Plan	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.
2013 Tier	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)		
2013 Tier:	**Retirement Age**	**Benefit Formula**
	52	1.00% x FAS3 x Yrs
	55	1.30% x FAS3 x Yrs
	60	1.80% x FAS3 x Yrs
	62	2.00% x FAS3 x Yrs
	65	2.30% x FAS3 x Yrs
	67 & Over	2.50% x FAS3 x Yrs

Disability:	
Eligibility	Eight years of service (not available for Directors).
Benefit	Greater of: 1.5% times Final Compensation per year of service. One-third of Final Compensation.
Vesting:	
Requirements	Five years of service, must leave contributions on deposit, reciprocal service counts for vesting purposes.
Pre-Retirement Death:	
Eligibility	Eligible for retirement.
Benefit	50% of the unmodified service retirement benefit to eligible surviving spouse/surviving domestic partner plus the lump sum payment of accumulated retirement contributions OR
Eligibility	None.
Benefit	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:

	Member Rate		
	(a)	(b)	(c) = (a) – (b)
Effective Date	**Total**	**HIB Plan**	**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.

5793104v4/10419.001