Classic Values, Innovative Advice

City and County of San Francisco Employees' Retirement System

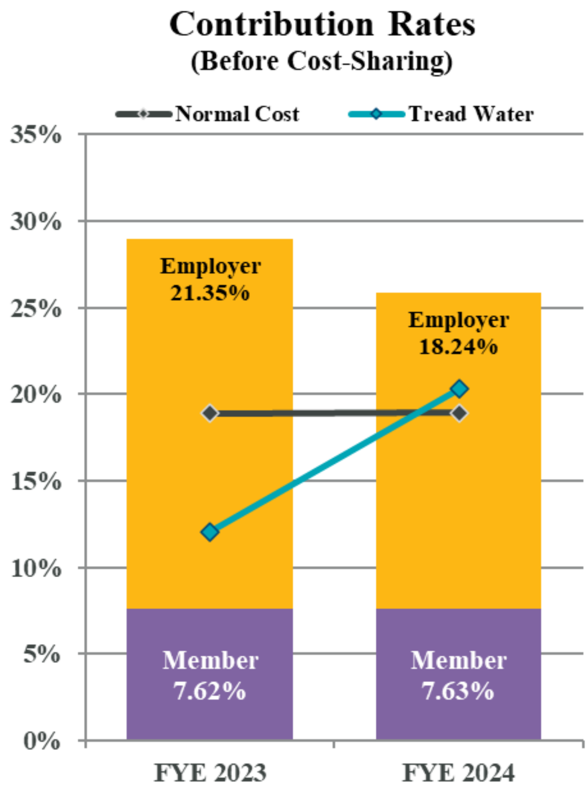
July 1, 2022
Actuarial Valuation Report

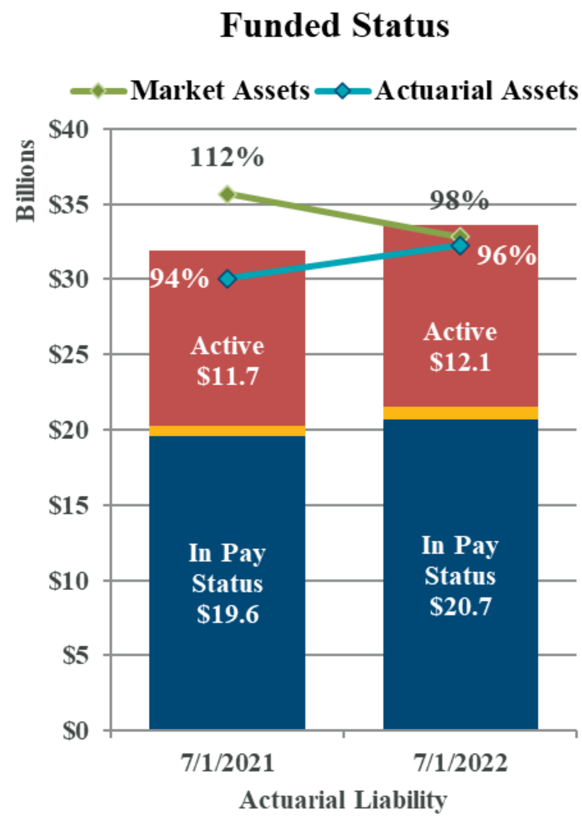
Produced by Cheiron

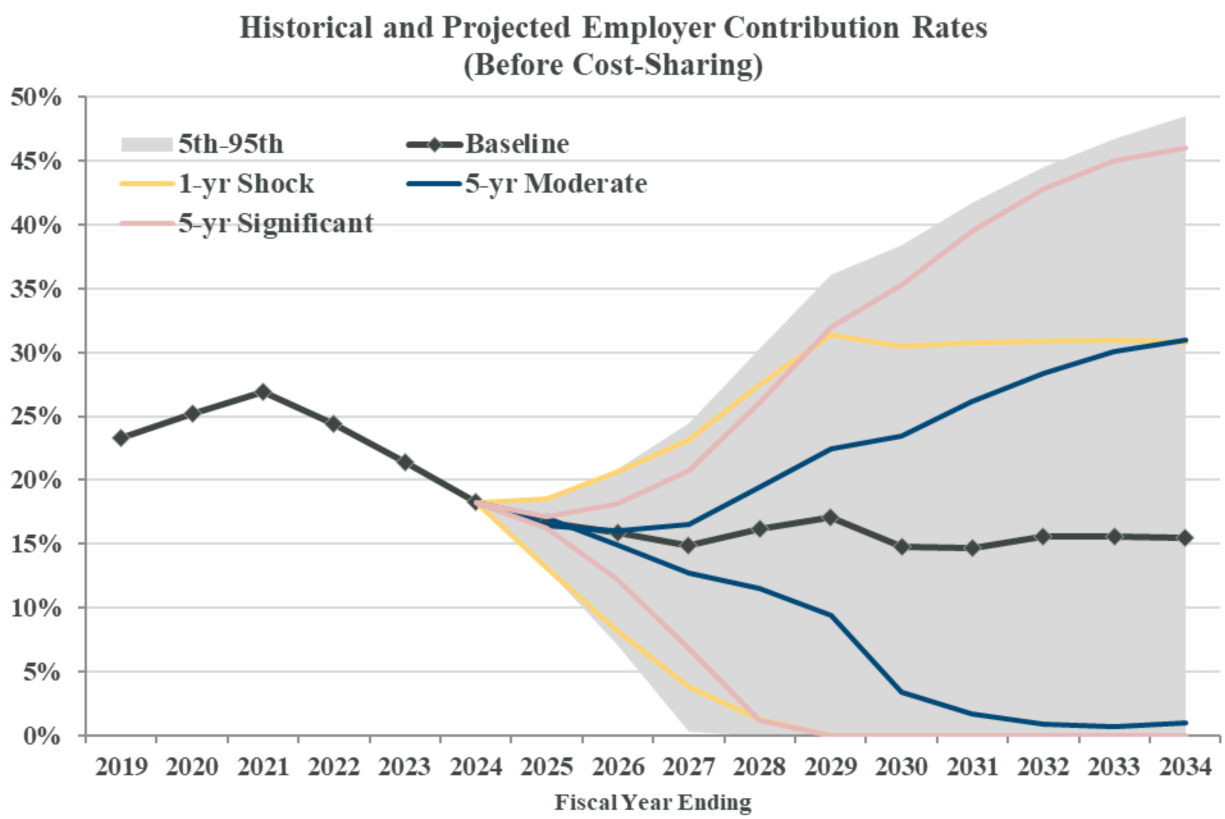
February 2023

TABLE OF CONTENTS

SECTION I – BOARD SUMMARY







SECTION I – BOARD SUMMARY

Key Findings of the July 1, 2022 Valuation

The key results of the July 1, 2022 actuarial valuation are as follows:

- The employer contribution rate decreased from 21.35% for FYE 2023 to 18.24% for FYE 2024 before any cost-sharing adjustments.[1] See Table I-4 for details on the components of the decrease in contribution rates. After the cost-sharing adjustments, the estimated employer contribution rate decreased from 18.76% to 16.15%. The actual aggregate employer contribution rates after cost-sharing adjustments will depend upon the proportion of the actual payroll for each employee group defined in the Charter. See Table VI-2 for more details.

- The cost-sharing adjustment for employee contribution rates will decrease by 0.49% of pay in FYE 2024. The average employee contribution rate after cost-sharing adjustments is estimated to be 9.72% of pay in FYE 2024 compared to 10.21% in FYE 2023.

- Based on the Market Value of Assets, the funded ratio decreased from 111.8% to 97.6%, and the Unfunded Actuarial Liability (UAL) increased from a $3.77 billion surplus to $0.79 billion liability. Based on the smoothed Actuarial Value of Assets, the funded ratio increased from 94.2% to 96.1%, and the Unfunded Actuarial Liability decreased from $1.86 billion to $1.32 billion.

- The return on the Market Value of Assets for the year ended June 30, 2022 was approximately -6.5% resulting in an actuarial loss of about $4.48 billion that will be recognized over the next five years. The return on the Actuarial Value of Assets was 9.3%, which recognizes 20% of the FYE 2022 loss as well as deferred investment gains and losses from previous years, and results in an actuarial gain of about $0.63 billion.

- On November 8, 2022, voters approved Proposition A, eliminating the full funding requirement to receive a Supplemental COLA for members who retired prior to November 6, 1996. In addition, effective January 1, 2023, the retirement allowance for these members is increased to account for the Supplemental COLAs not received in 2013, 2014, 2017, 2018, and 2019. The increase is limited to $200 per month for members with monthly retirement allowances exceeding $4,167. This Charter change affected 4,086 members and is incorporated in the valuation as of July 1, 2022, increasing the Actuarial Liability by $48 million. The Board elected to amortize this increase over 10 years, resulting in an increase in the contribution rate of 0.15% of payroll.

- Because actual investment returns were less than expected, a Supplemental COLA was not payable on July 1, 2022.

[1] *The cost-sharing adjustments depend on the employer contribution rate, the employee group, and the level of pay based on the applicable table in the Charter. The FYE 2024 average cost-sharing adjustment is 2.09%, details of the calculation can be found in Table VI-2 of this report.*

Funded Status

This report measures assets and liabilities for funding purposes. Table I-1 below summarizes the Actuarial Liability, assets, and related ratios as of July 1, 2022 compared to July 1, 2021.

Table I-1
Summary of Key Valuation Results
(Amounts in millions)

Valuation Date	July 1, 2021	July 1, 2022	% Change
Actuarial Liability	$ 31,905.3	$ 33,591.6	5.3%
Actuarial Value of Assets	$ 30,043.2	$ 32,275.5	7.4%
Unfunded Actuarial Liability (actuarial value)	1,862.1	1,316.1	-29.3%
Funding Ratio (actuarial value)	94.2%	96.1%	1.9%
Market Value of Assets	$ 35,673.8	$ 32,798.5	-8.1%
Unfunded Liability (market value)	(3,768.5)	793.1	-121.0%
Funding Ratio (market value)	111.8%	97.6%	-14.2%
Expected Payroll	$ 3,828.8	$ 3,984.1	4.1%
Interest on UAL (MVA basis)	$ (262.1)	$ 55.2	-121.0%
Interest Cost as Percent of Payroll	-6.8%	1.4%	8.2%

The Actuarial Liability increased by approximately $1.69 billion, including $0.05 billion due to Proposition A. The Actuarial Value of Assets, which is used as the basis to set contribution rates, increased by approximately $2.2 billion reflecting smoothed investment returns and contributions offset by benefits and expenses paid during the year. The Unfunded Actuarial Liability decreased by approximately $0.5 billion based on the Actuarial Value of Assets.

The Market Value of Assets decreased approximately $2.9 billion, and the UAL based on the Market Value of Assets increased approximately $4.6 billion.

The interest cost on the UAL – based on the Market Value of Assets – increased by $317 million. As a result, approximately 1.4% of payroll is necessary to pay the interest on the UAL, which is an increase of 8.2% of payroll compared to the credit of 6.8% received in the prior year.

Contributions

The City and County of San Francisco Employees' Retirement System (SFERS) funding policy sets employer contributions equal to the sum of:

- The employer normal cost under the Entry Age Normal Cost Method,
- The expected administrative expenses, and
- An amortization payment on the Unfunded Actuarial Liability.

The Charter requires employees to pay a portion of the employer contribution rate, depending on the employer contribution rate, the employee group, and the level of pay received by the employee. Unless explicitly identified, the figures shown in this report are before applying the cost-sharing adjustments. Table I-2 summarizes the employer and member contribution rates both before and after the cost-sharing adjustments.

Table I-2
Summary Of Contributions
(Amounts in millions)

	FYE 2023	FYE 2024	Change
Contribution Rates Before Adjustments			
Net Employer Contribution Rate	21.35%	18.24%	-3.11%
Est. Aggregate Employee Contribution Rate	7.62%	7.63%	0.01%
Total Contribution Rate	28.97%	25.87%	-3.10%
Estimated Payroll	$ 3,953.2	$ 4,113.6	$ 160.4
Estimated Net Employer Contributions	843.9	750.1	(93.8)
Contribution Rates After Adjustments			
Net Employer Contribution Rate	18.76%	16.12%	-2.64%
Est. Aggregate Employee Contribution Rate	10.21%	9.75%	-0.46%
Total Contribution Rate	28.97%	25.87%	-3.10%
Estimated Payroll	$ 3,953.2	$ 4,113.6	$ 160.4
Estimated Net Employer Contributions	741.6	663.1	(78.5)
Total Contribution Rate			
Normal Cost Rate	18.31%	18.33%	0.02%
Administrative Expense Rate	0.60%	0.60%	0.00%
UAL Rate			
Interest on Market Value UAL	-6.84%	1.38%	8.22%
Principal on UAL	16.90%	5.56%	-11.34%
Total UAL Rate	10.06%	6.94%	-3.12%
Total Contribution Rate	28.97%	25.87%	-3.10%

SECTION I – BOARD SUMMARY

The net employer contribution rate before applying the cost-sharing adjustments decreased 3.11% of payroll from 21.35% to 18.24% for the fiscal year ending June 30, 2024. The cost-sharing adjustment is estimated to decrease the employer contribution and increase the aggregate employee contributions by about 2.09% of payroll. Thus, the estimated employer contribution rate after cost sharing is 16.15% for FYE 2024. The cost-sharing adjustments will remain at this level as long as the employer contribution rate before adjustment is between 17.51% and 20.00%.

SFERS Membership

As shown in Table I-3 below, membership in SFERS increased in total by 1.8%. Active membership decreased 1.3%, terminated vested membership increased 8.6%, and members receiving benefits increased by 2.8%. Total payroll increased by 4.1%. The average pay per active member increased 5.4%.

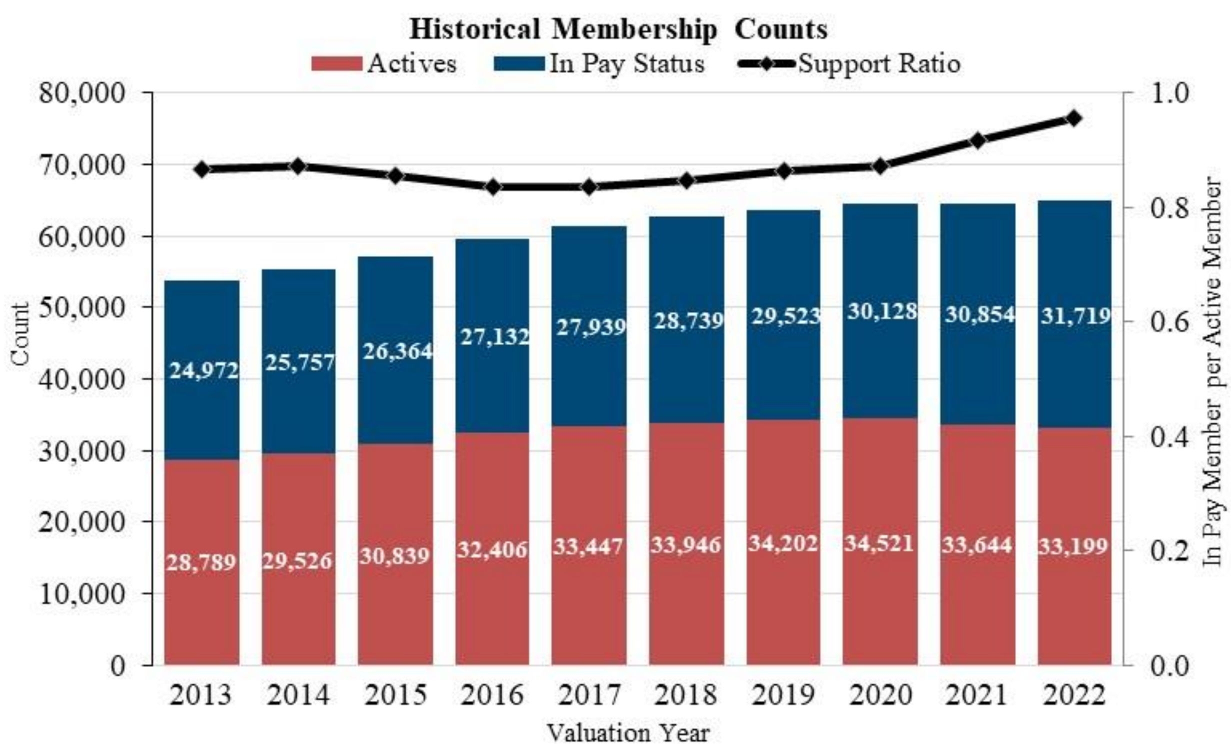
Table I-3
Membership Total

	July 1, 2021	July 1, 2022	% Change
Actives	33,644	33,199	-1.3%
Terminated Vested	11,126	12,085	8.6%
Members Receiving Benefits	30,854	31,719	2.8%
Total SFERS Members	75,624	77,003	1.8%
Active Member Payroll (thousands)[1]	$ 3,828,800	$ 3,984,150	4.1%
Average Pay per Active	$ 113,800	$ 120,000	5.4%

[1] *Active member payroll is projected for the fiscal year beginning on the valuation date.*

SECTION I – BOARD SUMMARY

The chart below shows the historical trend in membership counts over the last 10 years. This trend can be an important indicator of growing plan maturity and sensitivity to investment returns, assumption changes, and other changes to the System. In particular, if the ratio of retirees to active members grows, it indicates that any losses on retiree liabilities or assets are likely to place a relatively greater burden on employers and active members. For SFERS, the ratio had remained relatively stable over the last decade until it began to increase in 2021 due to the first decline in active membership since 2011, which has continued into 2022. Over the last decade, growth in the number of retirees has outpaced the growth in active membership and as a result the support ratio has increased from 0.87 to 0.96 over this period indicating a gradually maturing population of members.



Contribution Reconciliation

The SFERS contribution rate for FYE 2024 before cost-sharing adjustments decreased from 21.35% to 18.24% of payroll. Table I-4 shows sources for the change in the net employer contribution rate. The amortization payments for two 2002 Charter Amendments and the 2017 Supplemental COLA were completed resulting in a 2.57% decrease in the employer contribution rate. Investment gains on the smoothed Actuarial Value of Assets further reduced the contribution rate by 1.18%. Other plan experience (primarily salary increases and basic COLAs for Old Safety members increased the contribution rate by 0.72%, and Proposition A increased the contribution rate by 0.15% of payroll.

Table I-4
Net Employer Contribution Rate Reconciliation
(Before Cost-Sharing Adjustment)

	Normal Cost[1]	UAL Payment	Total
FYE 2023 Net Employer Contribution Rate	11.29%	10.06%	21.35%
Investment gain on actuarial value of assets	0.00%	-1.18%	-1.18%
Fully paid two Charter Amendments	0.00%	-1.18%	-1.18%
Fully paid 2017 Supplemental COLA	0.00%	-1.39%	-1.39%
Salary increases and Old Safety Basic COLAs	0.11%	0.61%	0.72%
Other liability experience	-0.10%	-0.07%	-0.17%
Payroll increase more than assumed	0.00%	-0.06%	-0.06%
Total Change Prior to Prop A	0.01%	-3.27%	-3.26%
Prop A - Pre96 Retiree Supplemental COLAs	0.00%	0.15%	0.15%
FYE 2024 Net Employer Contribution Rate	11.30%	6.94%	18.24%

[1] *Includes administrative expenses and is net of employee contributions.*

Historical and Projected Trends

Each valuation is a snapshot of the long-term progress of a pension fund. It is important to judge a current year's valuation result in the context of historical and projected future trends. **The baseline projections on the next page include the cost and liability for assumed future Supplemental COLAs.**

Supplemental COLAs are granted if there are excess returns (the actual return on the Market Value of Assets minus the expected return on Actuarial Value of Assets). For members who were hired after Proposition C (Prop C) passed in 2012, the Supplemental COLA is only payable if the System was 100% funded based on the Market Value of Assets. For non-Prop C Retirees, the projections assume 50% of a full Supplemental COLA each year (0.75% for most members). For the Prop C Retirees, the probability is slightly lower than 50% in the short term since the System is only 98% funded based on the Market Value of Assets.

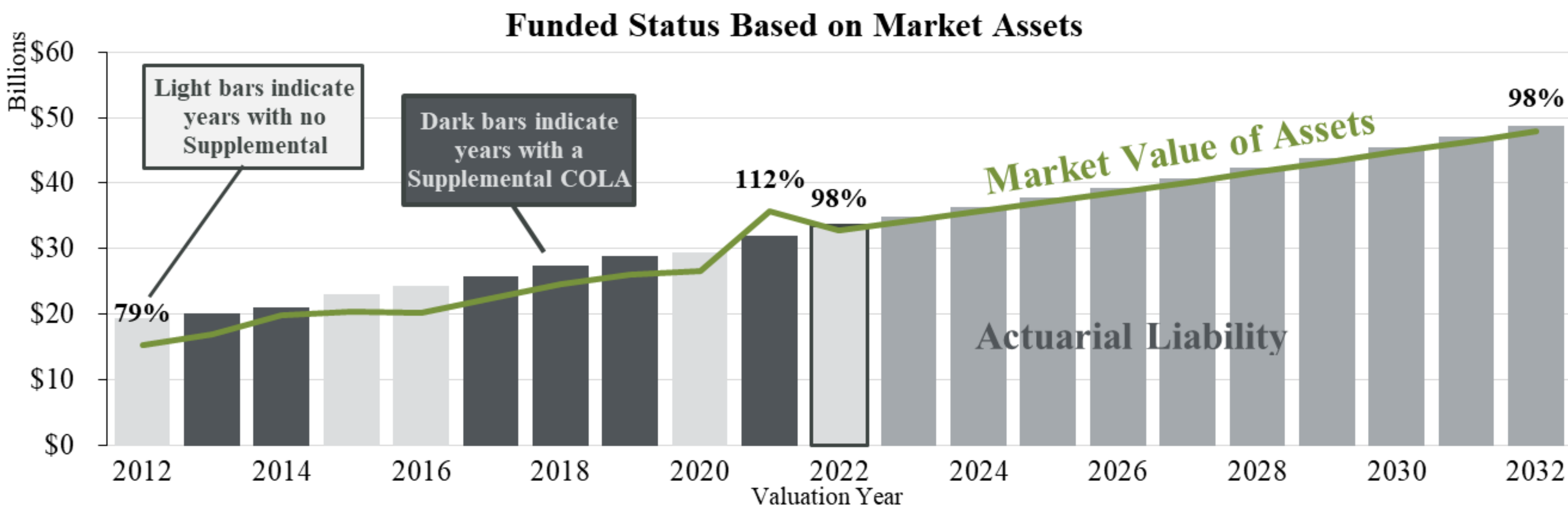
The top chart on page 9 compares the Market Value of Assets to the Actuarial Liability for the historical period from 2012 to 2022 and the projected period from 2023 to 2032 assuming all assumptions are met. The light gray bars represent the historical Actuarial Liability in years when no Supplemental COLA was paid, while the black bars represent the historical Actuarial Liability in years when a Supplemental COLA was paid. The medium gray bars represent the projected Actuarial Liability. The black bar with a light gray outline is the current valuation year.

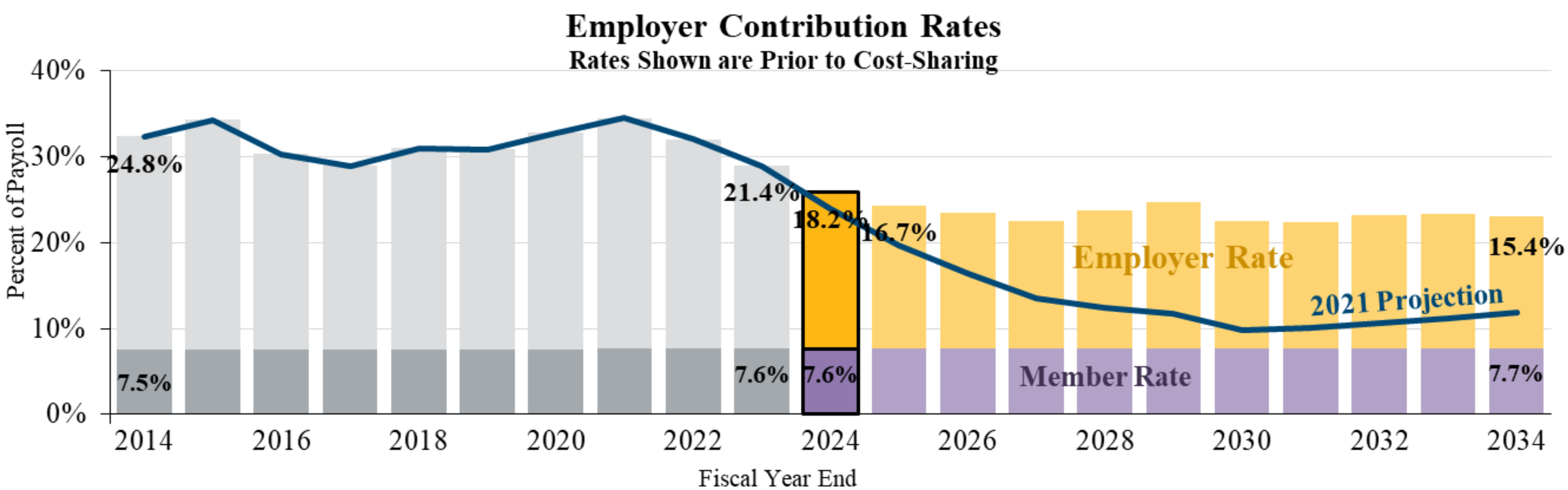
At the top of the bars, the funding ratios based on the Market Value of Assets are shown. The System was 79% funded as of July 1, 2012. Since then, investment returns and contribution increases offset by some assumption changes and the impact of actual Supplemental COLAs have increased funding ratios, jumping to 112% as of July 1, 2021, and dropping back to 98% as of July 1, 2022.

The bottom chart on page 10 shows historical and projected contribution rates for the fiscal years ending 2014 through 2034. The dark and light gray bars represent historical member and employer contribution rates while the purple and gold bars represent member and employer contribution rates currently in effect and projected for the future. The rates determined by the current valuation are a darker shade. The blue line represents the baseline projection from the 2021 actuarial valuation.

The employer contribution rate increased significantly from fiscal year ending 2013 through 2015. The increases were primarily due to the recognition of investment losses and assumption changes. Employer contribution rates declined for 2016 and 2017, but then increased again reaching a peak in 2021 at 26.9%. This increase has been driven primarily by Supplemental COLAs. Since 2021, the contribution rate has decreased primarily due to the completion of the amortization payments for certain charter amendments and investment returns on the actuarial value of assets. After FYE 2024, employer contributions are expected to decline gradually over the next three years as the deferred asset gains from FYE 2021 are recognized and then increase as the deferred asset loss from FYE 2022 is recognized and some amortization credits are fully recognized. After FYE 2030, employer contributions are expected to remain relatively level.

SECTION I – BOARD SUMMARY





SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Actuarial valuations are based on a set of assumptions about future economic and demographic experience. These assumptions represent a reasonable estimate of future experience, but actual future experience will undoubtedly be different and may be significantly different. This section of the report is intended to identify the primary risks to the plan, provide some background information about those risks, and provide an assessment of those risks.

Identification of Risks

The fundamental risk to the System is that the contributions needed to pay the benefits become unaffordable. While SFERS cannot determine on its own what contribution level is unaffordable, we can project expected contribution rates and illustrate the potential impact of key sources of risk on those contribution rates so the employers can assess affordability. While there are several factors that could lead to contribution amounts becoming unaffordable, we believe the primary risks for this System are:

- Investment risk,
- Interest rate risk, and
- Supplemental COLA risk.

Investment risk is the potential for investment returns to be different than expected. Interest rate risk is the potential for interest rates to be different than expected. For public plans, short-term fluctuations in interest rates have little or no effect, but longer-term trends can have a powerful effect on economic assumptions, particularly the discount rate. Supplemental COLA risk is the potential for the cost of future Supplemental COLAs to increase contribution rates.

Other risks that we have not identified may also turn out to be important.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

The chart below shows the components of changes in the Unfunded Actuarial Liability for the last 10 years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, assumption changes, benefit changes, and contributions compared to the tread water level of contributions (normal cost plus interest on the UAL, explained in more detail below). The net UAL change is shown by the dark blue line.

<u>SFERS Historical Changes in UAL 2013-2022</u>

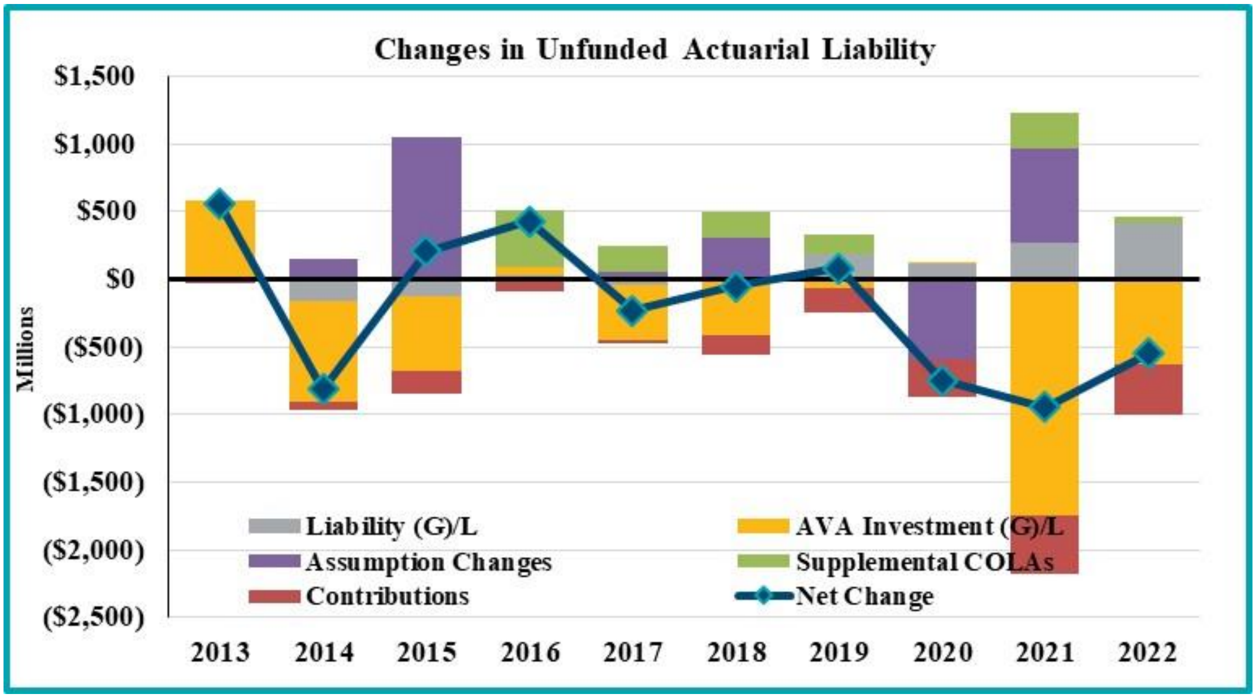


Table II-1
Changes in Unfunded Actuarial Liability
(Amounts in millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Discount Rate	**7.58%**	**7.50%**	**7.50%**	**7.50%**	**7.50%**	**7.40%**	**7.40%**	**7.40%**	**7.20%**	**7.20%**	
<u>Source</u>											
AVA (G)/L	$ 579.6	$ (749.2)	$ (545.5)	$ 51.5	$ (405.7)	$ (408.9)	$ (58.6)	$ 6.4	$ (1,750.1)	$ (628.0)	**$ (3,908.5)**
Liability (G)/L	(9.9)	(157.9)	(127.6)	34.5	(45.5)	6.5	185.4	112.3	270.0	412.9	**680.7**
Assumptions/Methods	0.0	153.1	1,048.4	0.0	50.2	297.7	0.0	(591.4)	701.6	0.0	**1,659.6**
Supplemental COLAs	0.0	0.0	0.0	429.3	200.1	200.8	141.0	0.0	264.1	48.0	**1,283.3**
Contributions[1]	(14.5)	(56.9)	(168.2)	(83.7)	(27.4)	(147.5)	(186.2)	(274.2)	(427.6)	(378.9)	**(1,765.1)**
Total UAL Change	**$ 555.2**	**$ (810.9)**	**$ 207.1**	**$ 431.6**	**$ (228.3)**	**$ (51.4)**	**$ 81.6**	**$ (746.9)**	**$ (942.0)**	**$ (546.0)**	**$ (2,050.0)**

[1] *Actual contributions (greater)/less than normal cost, administrative expenses and interest on the UAL; also includes rate implementation delay, payroll growth not as anticipated.*

The totals above support the identification of investment returns, Supplemental COLAs, and interest rates that drive assumption changes as the primary risks to the System.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

On a smoothed asset basis, the investment loss (gold bar) from 2013 reflects the recognition of the last portion of the material investment loss in FYE 2009, which was spread over the five successive years. Recent market experience has primarily produced gains with $1.75 billion and $0.628 billion gains in 2021 and 2022, respectively. Over the 10-year period, investment gains reduced the UAL by approximately $3.9 billion.

On the liability side (gray bars), gains early in the period have been offset by more recent losses with a net experience loss increasing the UAL by approximately $681 million over the 10-year period.

Assumption and method changes (purple bars) over the last 10 years have increased the UAL by about $1.7 billion. The significant changes increasing the UAL have included reductions in the discount rate as interest rates have declined, decreases in mortality rates, and increases in retirement rates. The assumption changes lowering the UAL in 2020 were primarily due to reductions in wage inflation and assumed Old Safety COLAs. In 2021, the discount rate was reduced from 7.4% to 7.2% which increased the UAL by $702 million.

Benefit changes (green bars) are all Supplemental COLAs. While our projections include an assumed level of Supplemental COLAs, the Actuarial Liability for determining contribution rates in each valuation does not. In 2016, the benefit increase is a result of the 2013 and 2014 retroactive Supplemental COLAs. The 2022 increase is due to Proposition A that increased pre-96 retiree benefits for prior Supplemental COLAs that were not granted due to SFERS not being 100% funded. Over the 10-year period, Supplemental COLAs increased the UAL by about $1.3 billion.

Each year, absent any contributions, the UAL is expected to increase for active member benefits attributable to the current year of service (the normal cost), administrative expenses, and interest on the UAL. This expected increase is referred to as the tread water level. If contributions are greater than the tread water level, the UAL is expected to decrease. Conversely, if contributions are less than the tread water level, the UAL is expected to increase. Over the 10-year period, contributions have decreased the UAL by about $1.8 billion, and during 2022, contributions decreased the UAL by about $379 million.

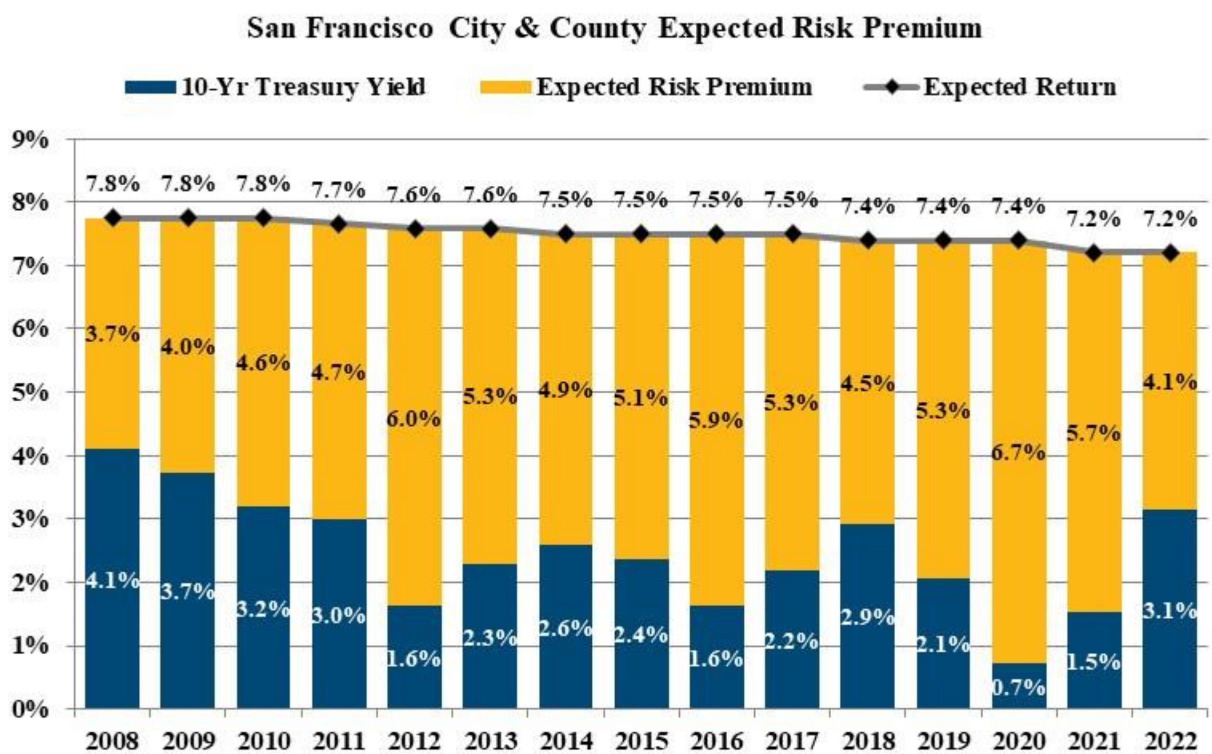
In general, the amortization methods used to determine contributions to the System are designed to collect more than the tread water level. However, the System may temporarily pay less than this threshold due to asset smoothing, the one-year delay between the valuation date and when contribution rates become effective or due to unexpected reductions in payroll.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

The chart below shows the yield on a 10-year Treasury security compared to the System's assumed rate of return. The difference is a simple measure of the investment risk premium. From 2008 to 2020, the yield on the 10-year Treasury declined from about 4.1% to 0.7%. In the last two years, the yield on the 10-year Treasury has rebounded to 3.1%. As interest rates declined, the System faced a choice:

- maintain the same risk premium and reduce the expected rate of return;
- maintain the same expected rate of return and increase the risk premium; or
- some combination of the two strategies.

During this period, the System reduced its expected rate of return 60 basis points from 7.8% to 7.2%. Meanwhile, its expected risk premium grew 300 basis points from 3.7% to 6.7% before contracting 160 basis points over the last two years to 4.1%. If interest rates remain at the current level, there will be less pressure to reduce the discount rate further.



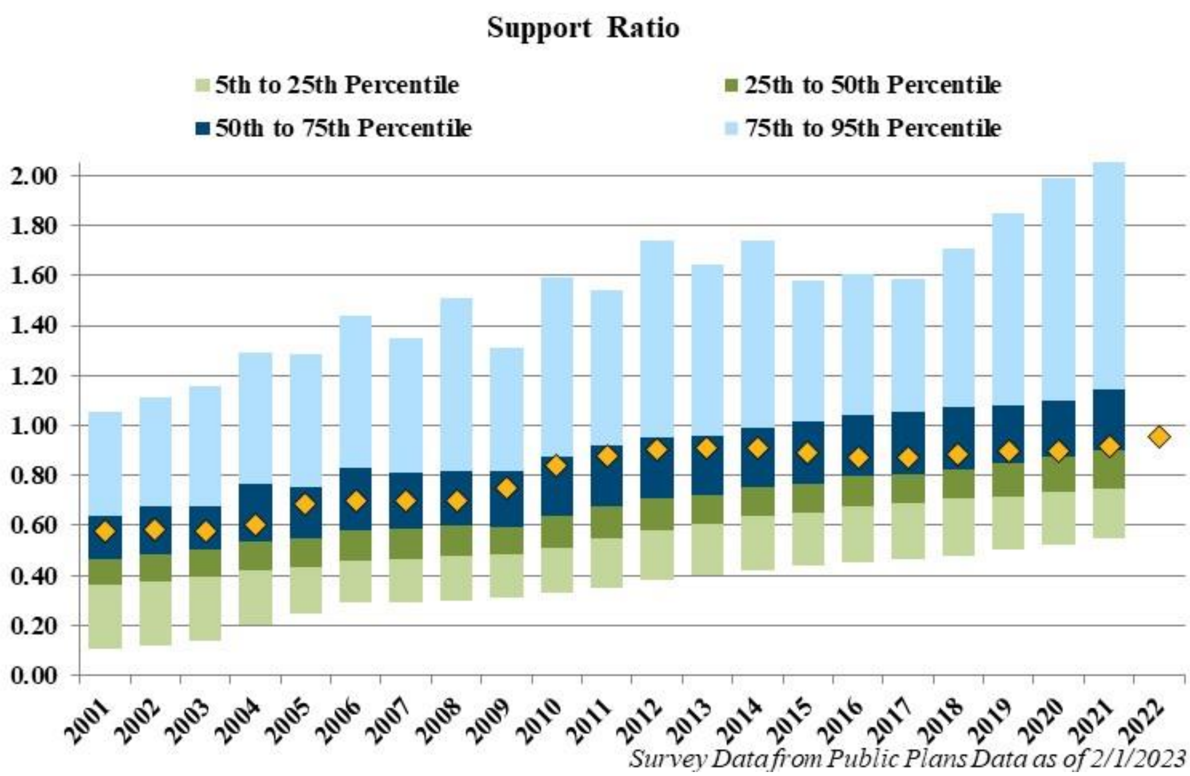
Plan Maturity Measures

The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. Before assessing each of these risks, it is important to understand the maturity of SFERS compared to other public plans and how the maturity has changed over time.

Plan maturity can be measured in a variety of ways, but all of the measures get at one basic dynamic – the larger the plan is compared to the contribution or revenue base that supports it; the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the primary risks identified for SFERS.

Support Ratio (Inactives per Active)

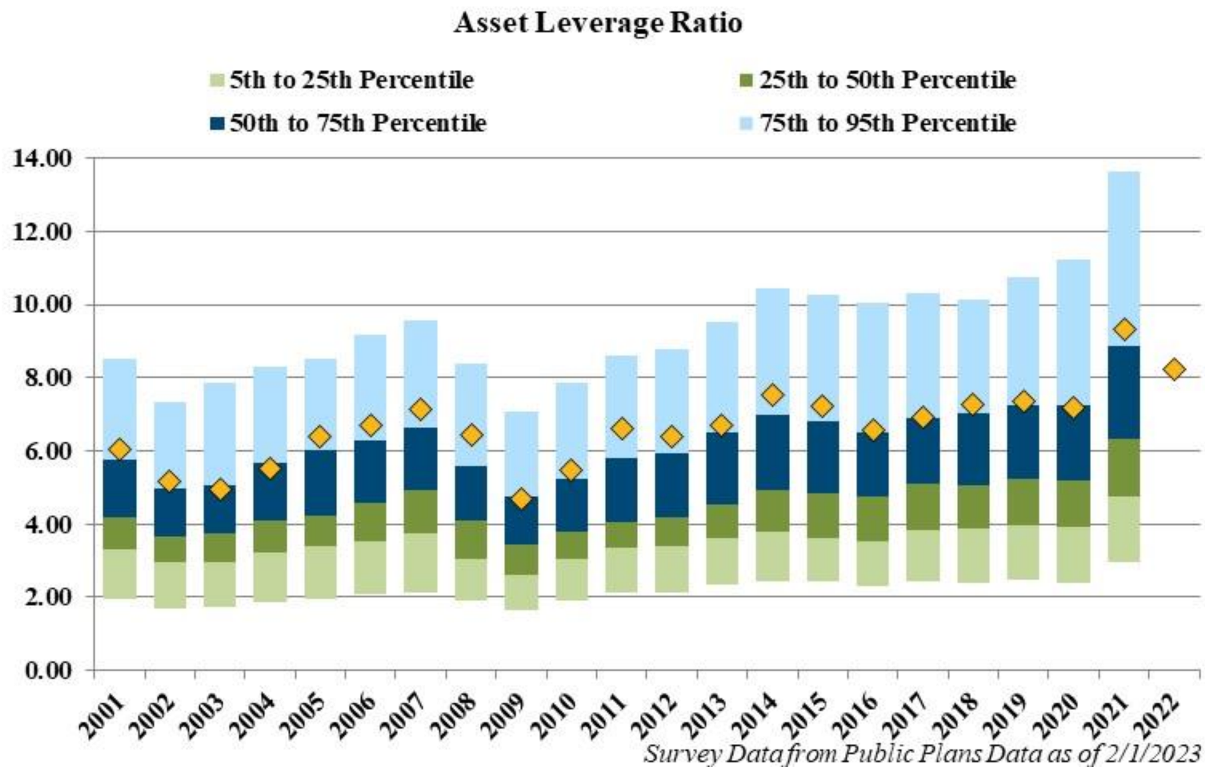
One simple measure of plan maturity is the ratio of the number of members receiving benefits to the number of active members. The revenue base supporting the plan is usually proportional to the number of active members, so a relatively high number of inactives compared to actives indicate a larger plan relative to its revenue base as well.



The chart above compares the distribution from the 5th to 95th percentile of support ratios for the plans in Public Plans Data to SFERS (yellow diamonds). Like many other plans, SFERS support ratio increased during the Great Recession, but SFERS has stabilized in recent years while other plans have continued to increase. The support ratio for SFERS increased slightly in 2022 due to a decline in the active membership.

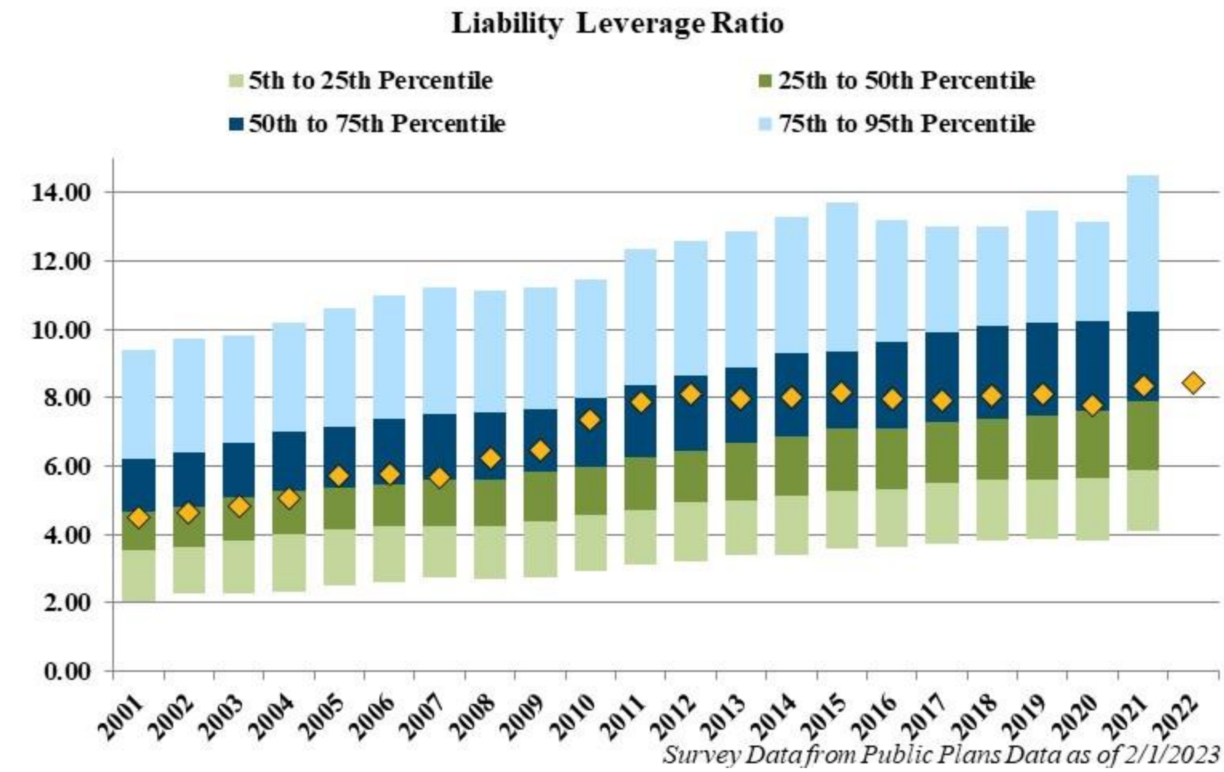
Leverage Ratios

Leverage or volatility ratios measure the size of the plan compared to its revenue base more directly. An asset leverage ratio of 5.0, for example, means that if the system experiences a 10% loss on assets compared to the expected return, the loss would be equivalent to 50% of payroll. The same investment loss for a system with an asset leverage ratio of 10.0 would be equivalent to 100% of payroll. Plans with higher asset leverage ratios are more sensitive to variations in investment returns.



The chart above compares the distribution from the 5th to 95th percentile of asset leverage ratios for the plans in the Public Plans Database to SFERS (yellow diamonds).

SFERS' asset leverage ratio has consistently been at the 75th percentile or above compared to other plans while its absolute level has fluctuated with investment returns and the growth of the system. It reached a low during this period of 4.7 in 2009 and a peak of 9.3 in 2021. SFERS' asset leverage ratio decreased in 2022 primarily due to investment losses on the Market Value of Assets. This level indicates that SFERS is more sensitive to investment returns than 75% of public plans. For example, an investment loss of 10% (compared to the assumed return) would increase SFERS UAL by about 82% of payroll compared to only 63% of payroll for the median plan in 2021.



The chart above compares the distribution from the 5th to 95th percentile of liability leverage ratios for the plans in the Public Plans Database to SFERS (yellow diamonds).

SFERS' Actuarial Liability leverage ratio has consistently been between the 50th-75th percentiles since 2001 and has recently been holding relatively constant around 8.0 while other plans have been increasing. SFERS remains in the 50th to 75th percentile which means that it is slightly more sensitive to the impact of assumption changes than most public plans. For example, an assumption change that increases the Actuarial Liability by 5% would add a liability equivalent to about 42% of payroll for SFERS compared to just under 40% of payroll for the median plan in 2021.

Assessment of Risks

The fundamental risk to the System is that the contributions needed to fund the benefits become unaffordable. Assessing this risk, however, is complex because there is no bright line of what is unaffordable and the contribution amounts themselves are affected not just by the experience of the System, but also by the interaction of that experience and decisions by the Board related to assumptions, asset smoothing methods, and amortization periods.

Investment Risk – Stress Testing

To assess the potential impact of investment risk, we developed six hypothetical scenarios. The scenarios are balanced between positive and negative scenarios and are based on a lognormal distribution of one and five year expected returns as shown in the table below using the 10-year capital market assumptions from SFERS' investment consultant NEPC (Geometric return = 6.6%, unsmoothed standard deviation = 15.7%).[2]

Distribution of Expected Average Annual Returns		
Percentile	**1 Year**	**5 Year**
5%	-16.0%	-4.2%
25%	-3.4%	2.0%
50%	6.6%	6.6%
75%	17.4%	11.3%
95%	35.1%	18.5%

The scenarios include a one-year shock using the 5th and 95th percentile returns for one year, a 5-year moderate scenario using the 25th and 75th percentile returns for five years, and a 5-year significant scenario using the 5th and 95th percentile returns for five years. The table below summarizes the theoretical scenarios.

Theoretical Scenarios						
	1-Yr Shock		**5-Yr Moderate**		**5-Yr Significant**	
FYE	**Neg**	**Pos**	**Neg**	**Pos**	**Neg**	**Pos**
2023	-16.0%	35.1%	2.0%	11.3%	-4.2%	18.5%
2024	7.2%	7.2%	2.0%	11.3%	-4.2%	18.5%
2025	7.2%	7.2%	2.0%	11.3%	-4.2%	18.5%
2026	7.2%	7.2%	2.0%	11.3%	-4.2%	18.5%
2027	7.2%	7.2%	2.0%	11.3%	-4.2%	18.5%
2028+	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%

The charts on pages 19-24 show the projections under each of these theoretical scenarios. The contribution charts include a blue line representing the 2021 baseline projections shown in the Board Summary (on page 9) to facilitate the comparison between the scenario and the projections assuming all assumptions are met. Supplemental COLAs for future years where the return differs from the assumption are calculated based on actual returns in excess of the

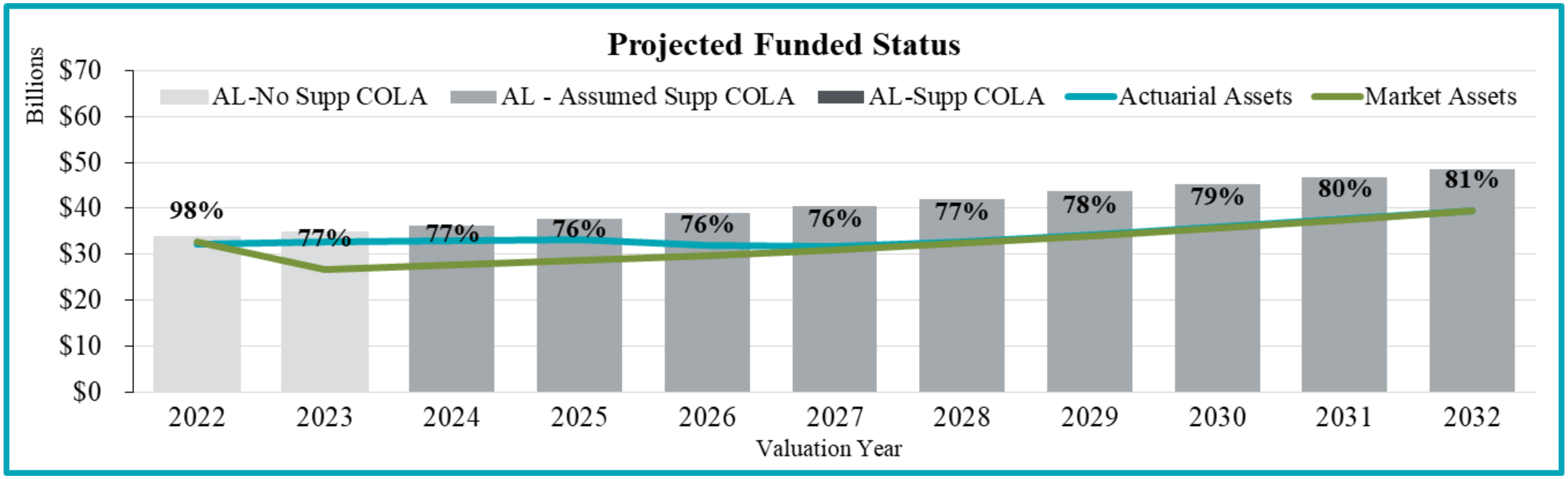
[2] NEPC's smoothed standard deviation is 11.9%.

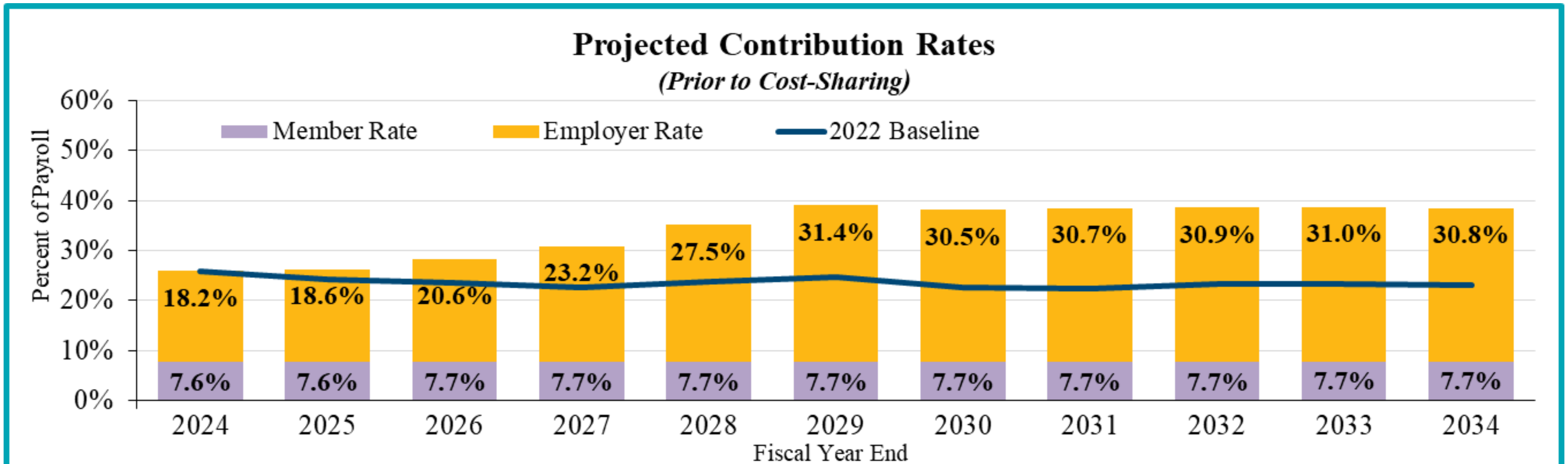
SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

expected return on the Actuarial Value of Assets. In years, where the return equals the assumed return, a partial Supplemental COLA is assumed based on the probability of the return exceeding the amount necessary to generate a Supplemental COLA. The liability projections are shown as black bars in years a Supplemental COLA is payable, medium gray bars in years when a Supplemental COLA is assumed to be payable, and light gray bars in years when no Supplemental COLA is payable. The contribution rates are shown before any cost-sharing adjustments.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

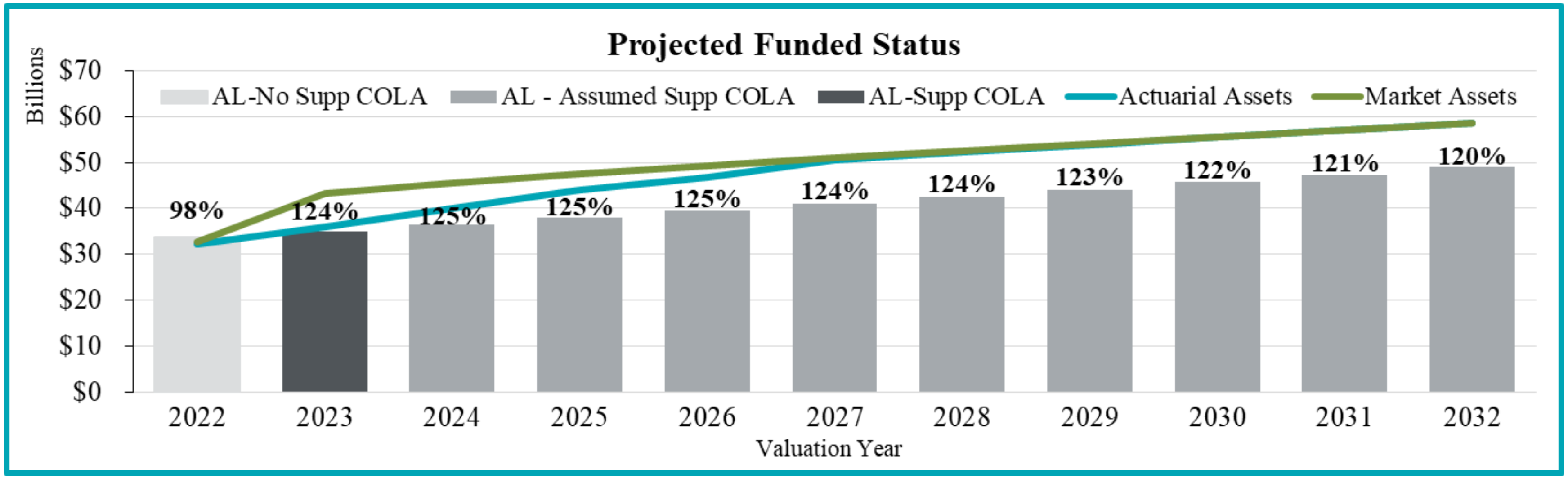
<u>One-Year Negative Shock Scenario: -16.0% return FYE 2023, 7.2% thereafter</u>

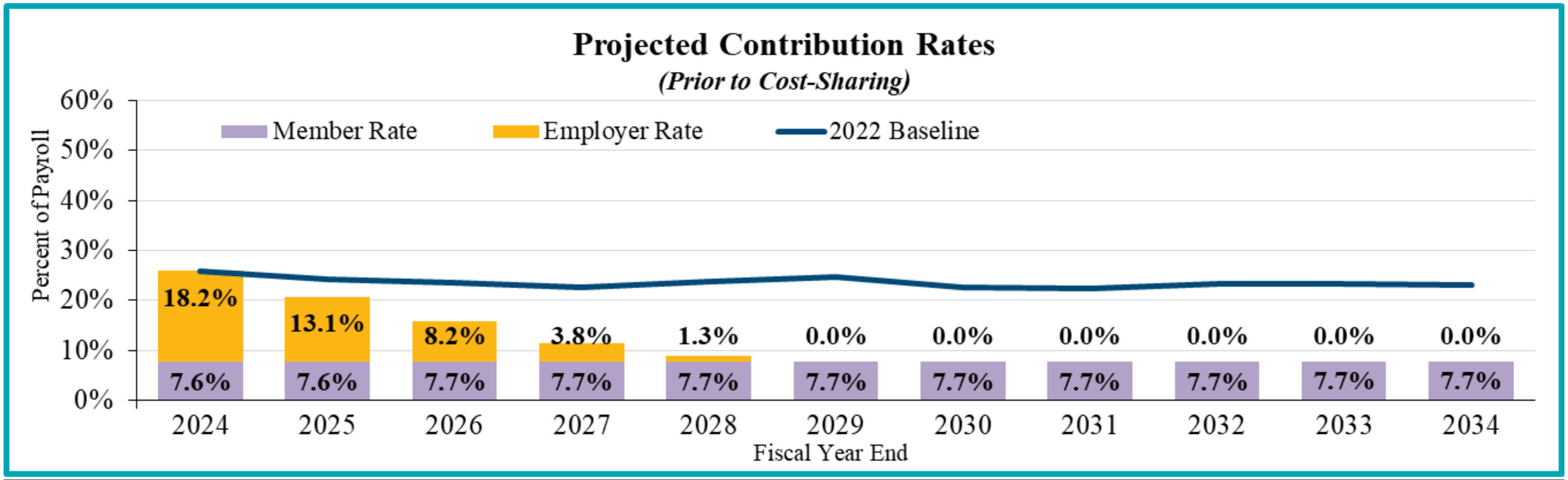




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

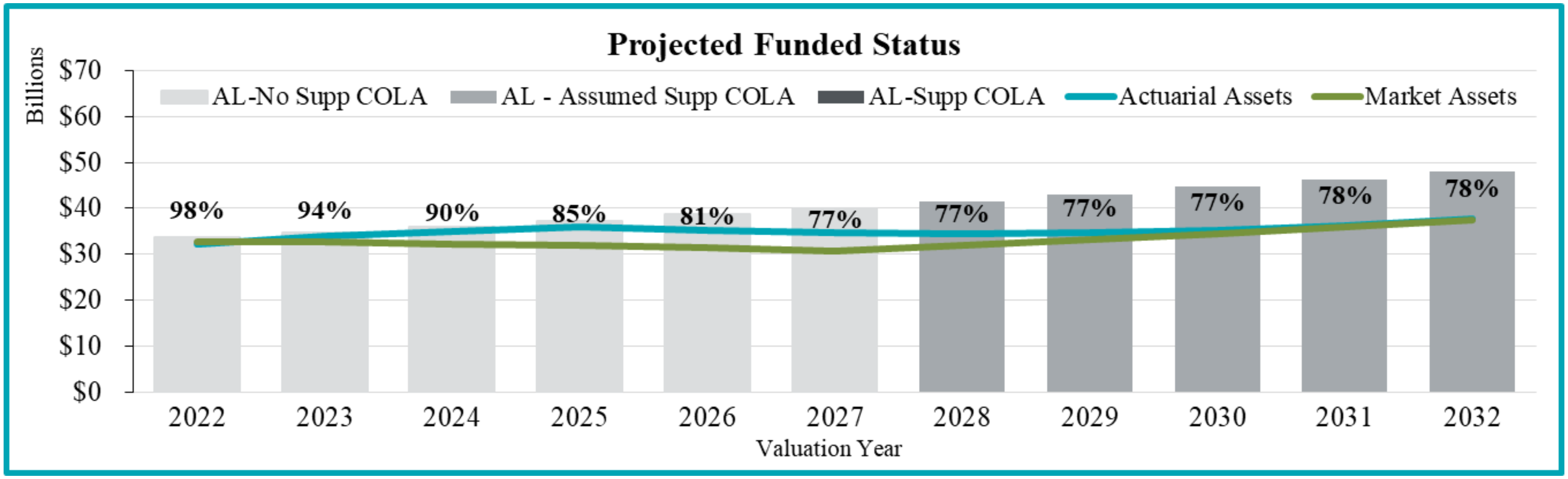
One-Year Positive Shock Scenario: 35.1% return FYE 2023, 7.2% thereafter

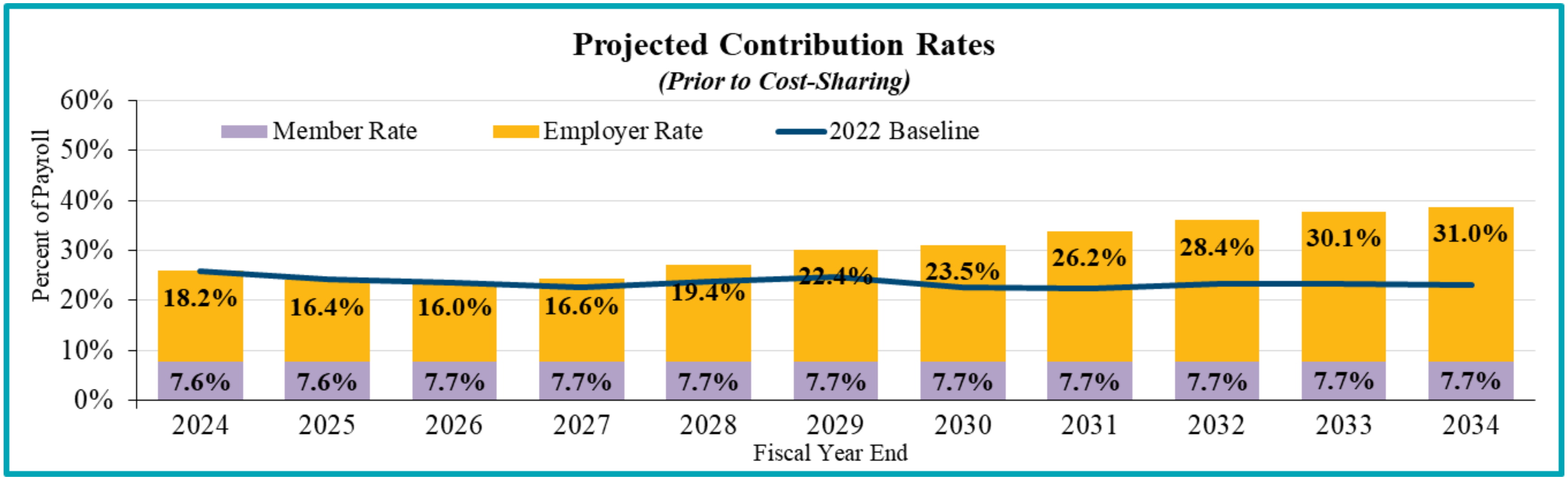




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

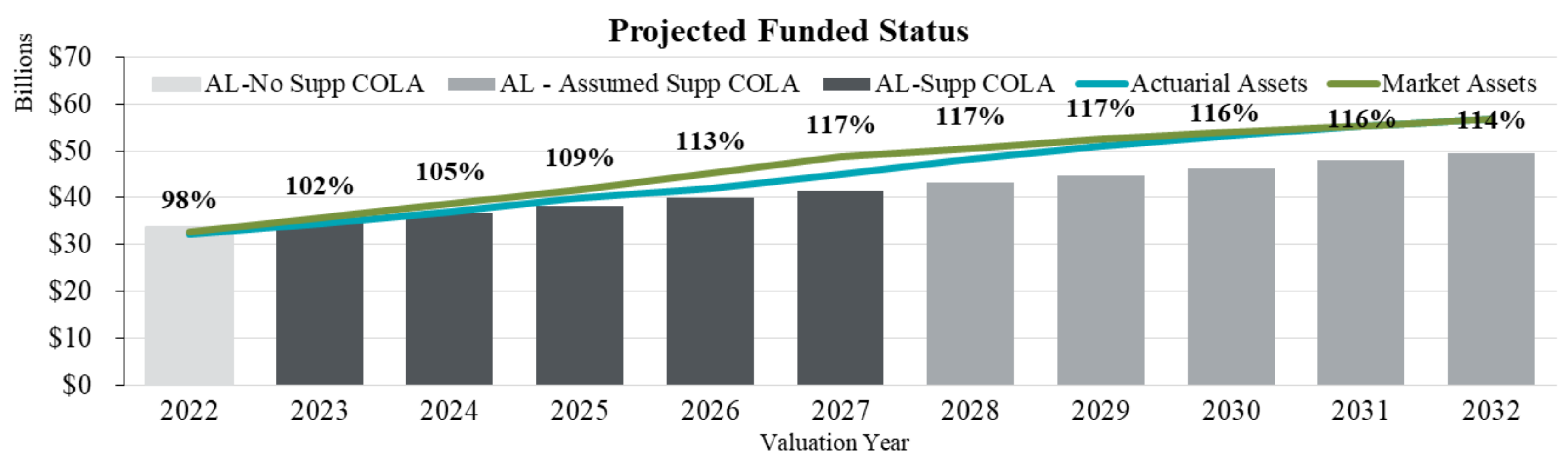
Five-Year Moderate Negative Scenario: 2.0% return FYE 2023-2027, 7.2% thereafter

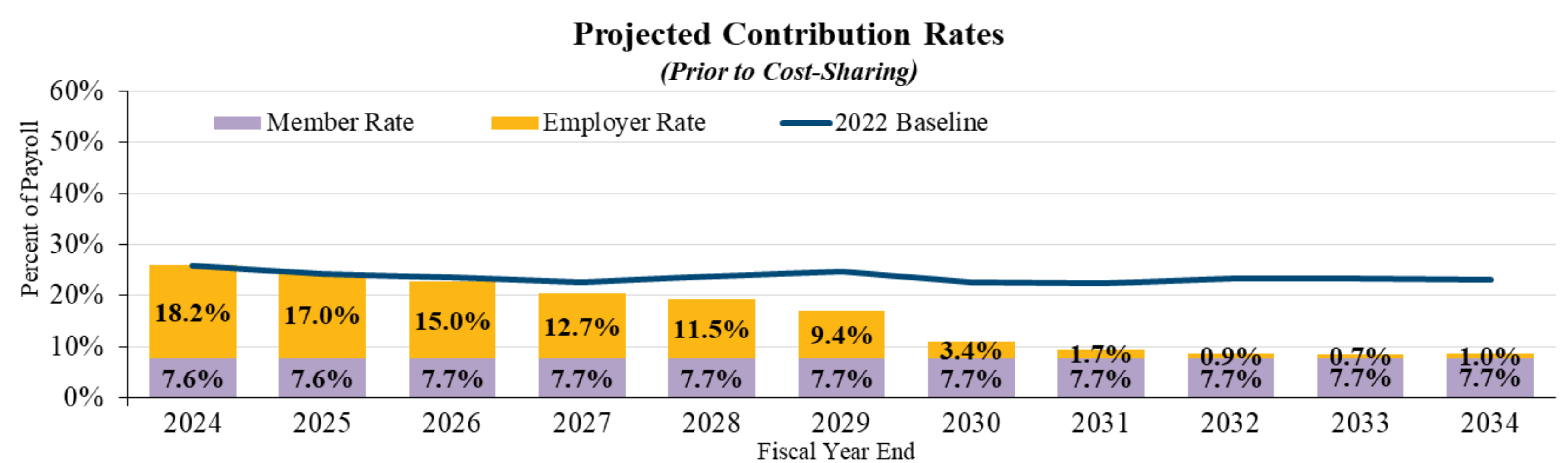




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

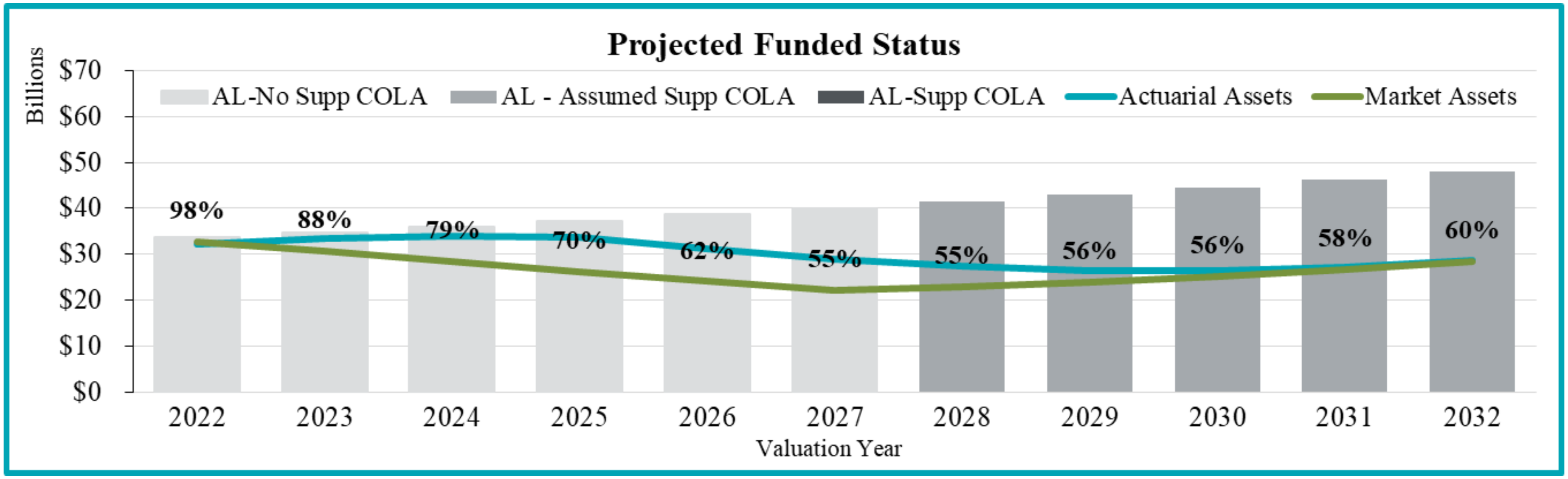
Five-Year Moderate Positive Scenario: 11.3% return FYE 2023-2027, 7.2% thereafter

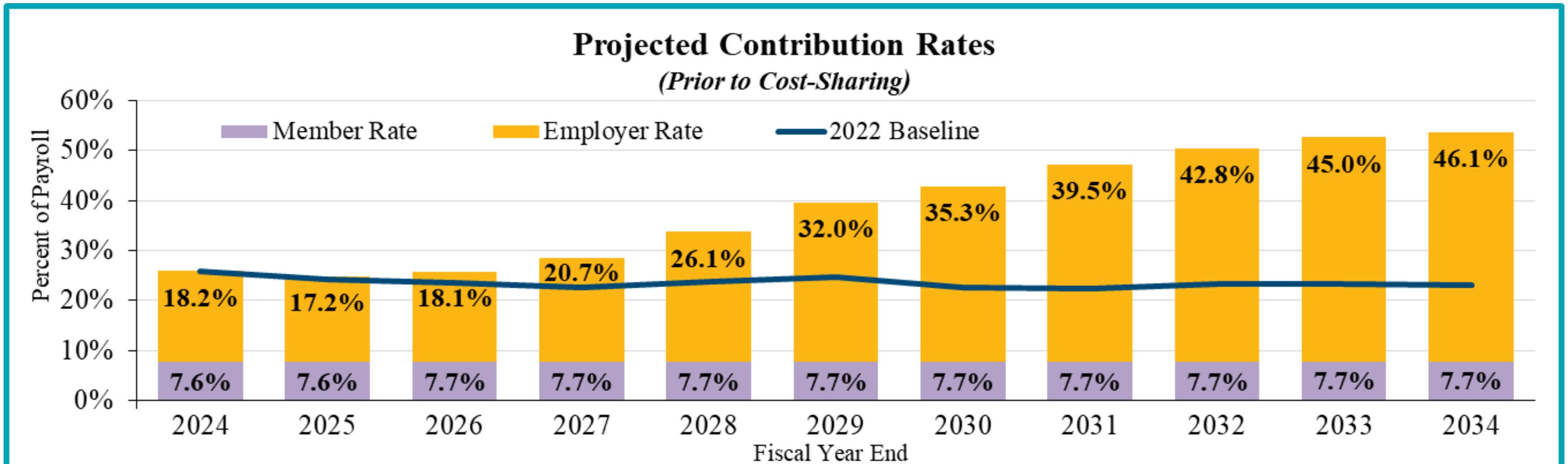




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

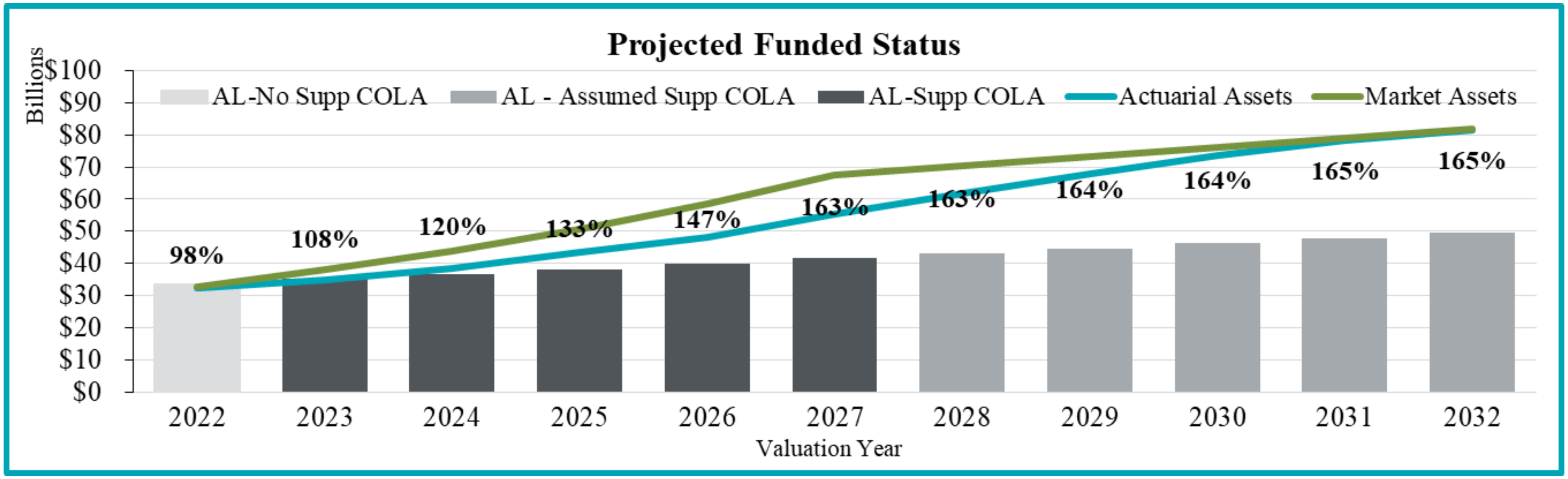
Five-Year Significant Negative Scenario: -4.2% return FYE 2023–2027, 7.2% thereafter

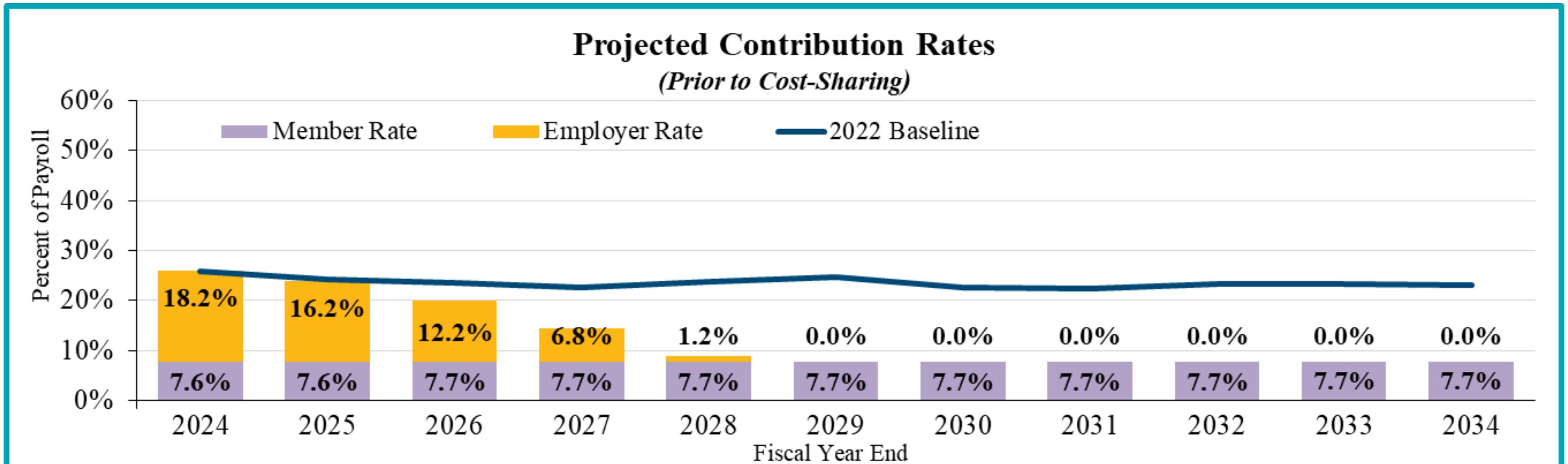




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

<u>Five-Year Significant Positive Scenario: 18.5% return FYE 2023-2027, 7.2% thereafter</u>





The scenarios show that actual future investment returns have a significant impact on future contribution rates. The five-year positive economic scenarios both result in the payment of Supplemental COLAs to all retirees. The employer contribution rates decrease in FYE 2025 and continue to decline quickly and steadily reaching 0% and 1% in FYE 2029 and 2032, for the five-year significant and five-year moderate, respectively.

The five-year negative economic scenarios show decreases in the employer contribution rates next year before contributions rise again. The recognition of the deferred investment gains from FYE 2021 and the completion of payments on amortization layers creates some downward pressure on contribution rates.

- The one-year negative shock (-16.0%) shows employer rates increasing immediately reaching a peak in FYE 2029 of 31.4%. The funded status declines but stays at or above 76% throughout the 10-year period.

- The five-year moderate negative scenario (2.0%) produces rate decreases in each of the next two years before it increases to 31.0% in FYE 2034. The funded status remains at or above 77% throughout the 10-year period.

- The five-year significant negative scenario (-4.2%) produces a rate decrease for FYE 2025 before the employer rate escalates to 46.1% in FYE 2034. The funded status declines significantly each year, dropping to 55% funded in 2027.

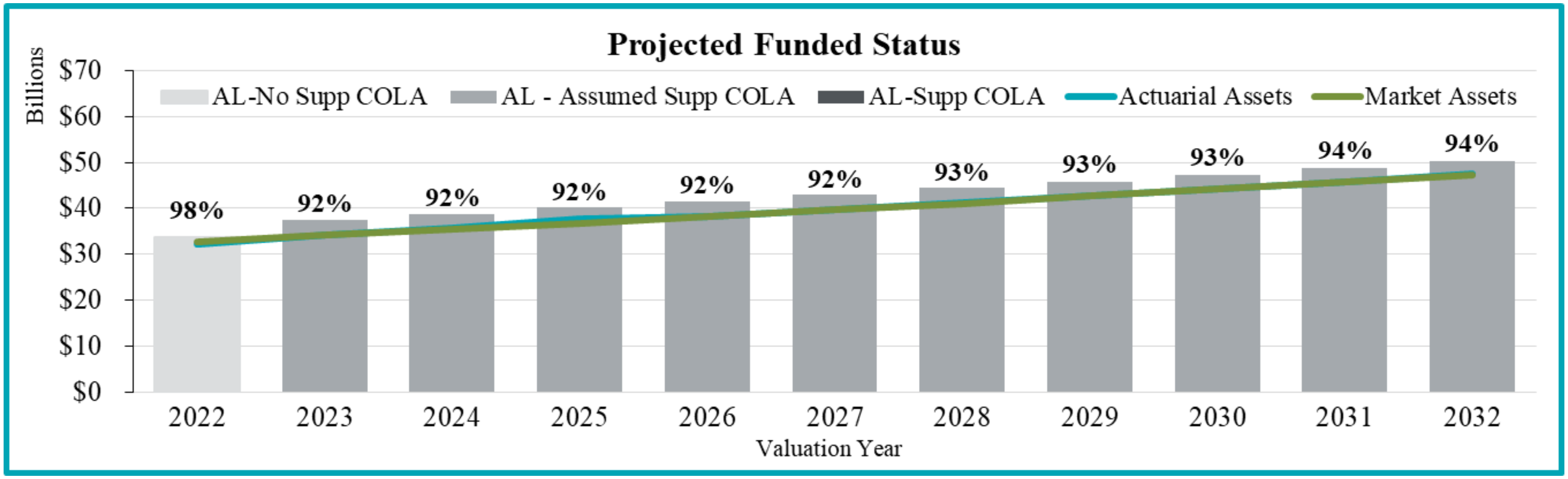
The investment returns used in the projections above were selected solely to illustrate the impact of investment volatility on the pattern of funded status and employer contribution rates. They are not intended to be predictive of actual future contribution rates or funded status or even to represent a realistic pattern of investment returns.

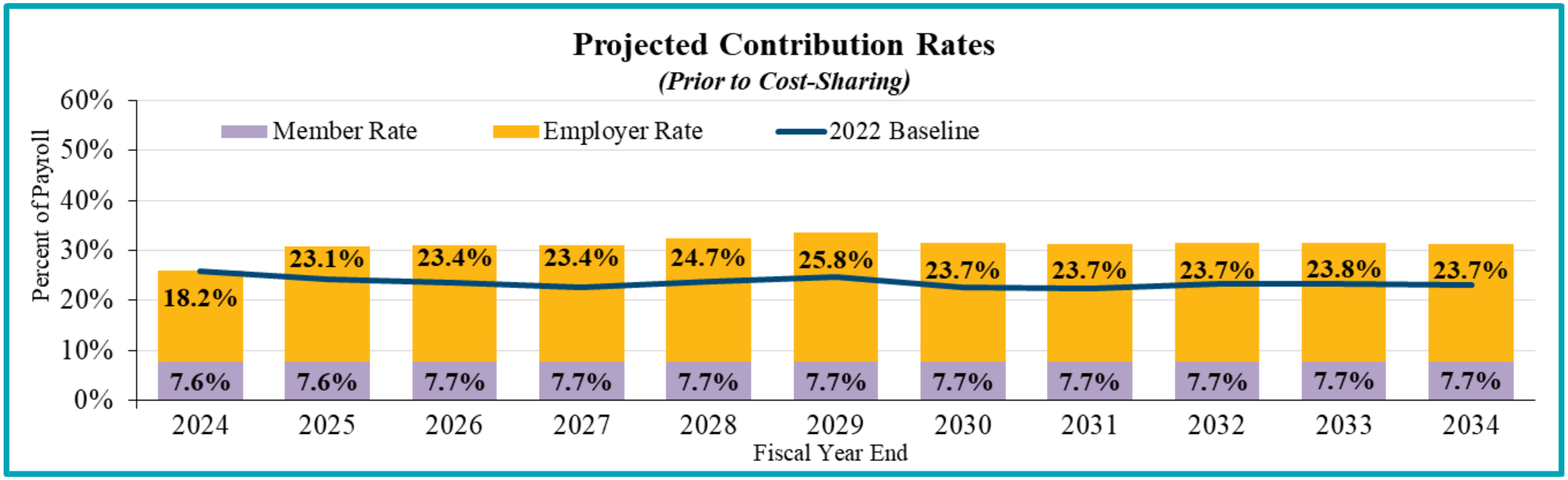
Interest Rate and Discount Rate Change Risk – Sensitivity Testing

As shown above, assumption changes over the last decade have increased the UAL by approximately $1.7 billion, with decreases in the discount rate from 7.66% to 7.20% accounting for approximately $1.3 billion of the increase. The reductions in discount rates have been largely driven by declines in interest rates that affect expectations of future investment returns. If interest rates revert to the low levels reached during the pandemic or if there is a desire or need to reduce investment risk that reduces expected returns, the discount rate and expected returns may need to be reduced further. Conversely, if interest rates continue to rise, expectations of future investment returns would also increase and the discount rate could be increased or investment risk could be reduced without affecting the discount rate. The charts on pages 26-27 show the impact on projected funded status and projected contributions if the discount rate and expected returns were reduced or increased by 100 basis points.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

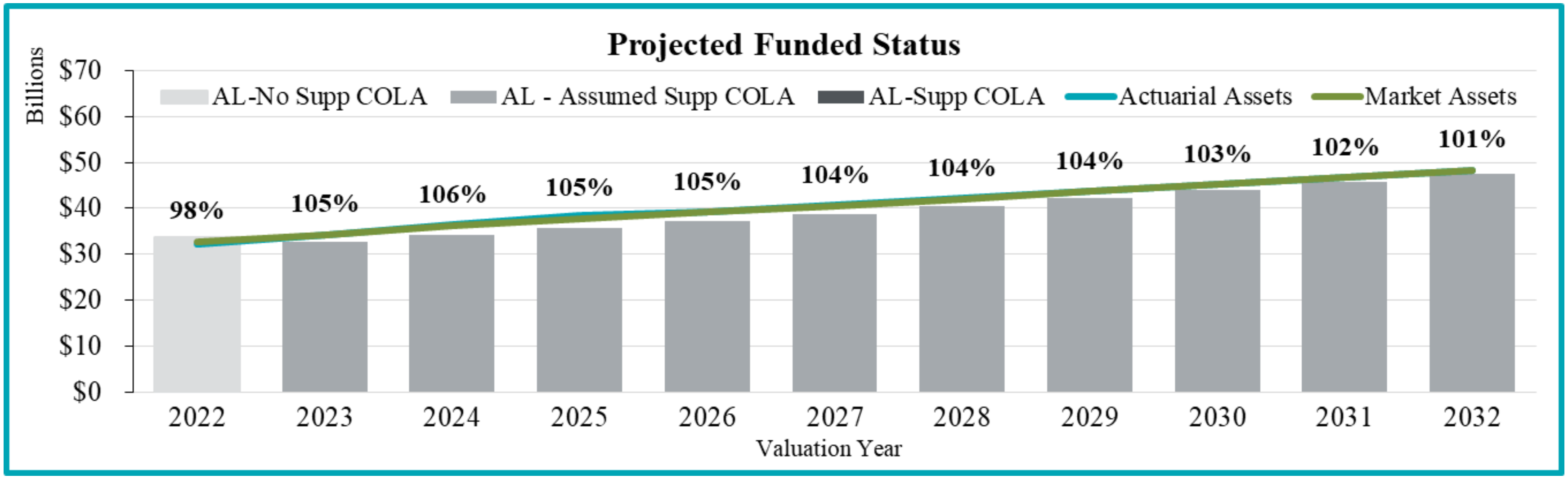
Discount Rate Sensitivity Testing – 100 Basis Point Reduction – 6.20%

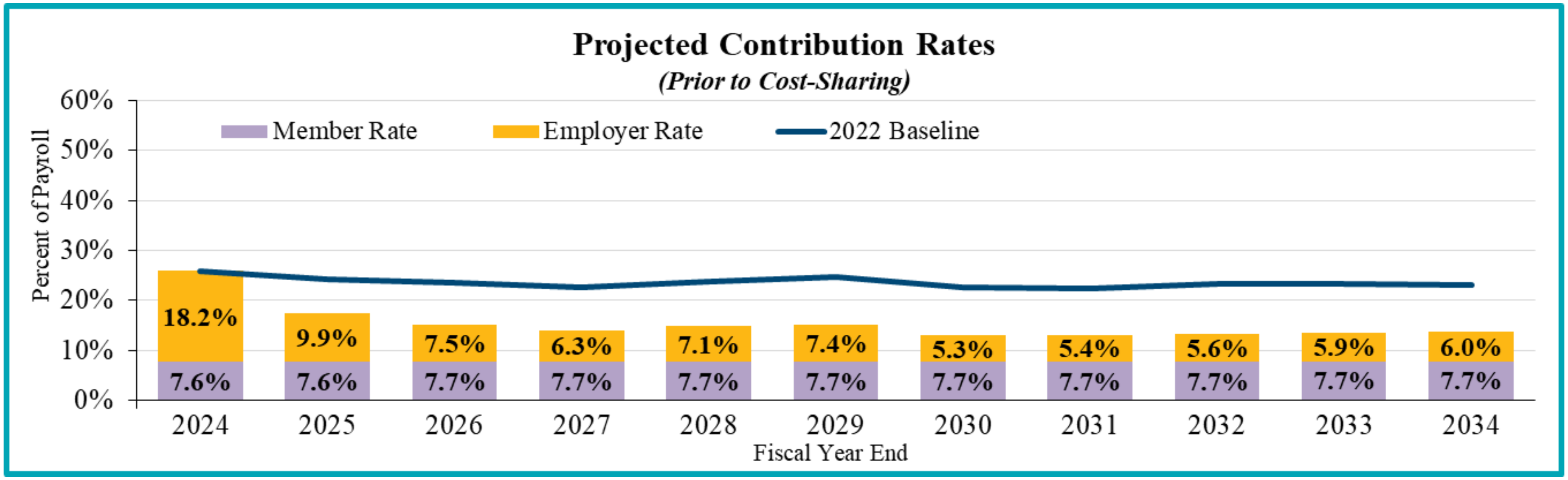




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Discount Rate Sensitivity Testing – 100 Basis Point Increase – 8.20%





Supplemental COLA Risk – Stress Testing

Supplemental COLA risk is the potential for the cost of future Supplemental COLAs to increase contribution rates. Supplemental COLAs are granted if there are excess returns (the actual return on the Market Value of Assets minus the expected return on Actuarial Value of Assets). For members who were hired after Proposition C passed in 2012, the Supplemental COLA is only payable if the System is also 100% funded.

In determining the Actuarial Liability in the funding valuation and whether or not the System is 100% funded, there are no future Supplemental COLAs assumed. In the projections, however, Supplemental COLAs are assumed to be granted each year in the future with 50% probability (multiplied by the probability of being 100% funded for members with that requirement). If the Actuarial Liability were determined with the same assumption, it would affect the funded status as shown in the table below.

Table II-2
Impact of Anticipating Future Supplemental COLAs
(Amounts in millions)

	Future Supplemental COLAs		
	None	**Assumed**	**% Difference**
Actuarial Liability	$ 33,591.6	$ 35,958.1	7.0%
Actuarial Value of Assets	$ 32,275.5	$ 32,275.5	0.0%
Unfunded Actuarial Liability (actuarial value)	1,316.1	3,682.6	179.8%
Funding Ratio (actuarial value)	96.1%	89.8%	-6.3%
Market Value of Assets	$ 32,798.5	$ 32,798.5	0.0%
Unfunded Liability (market value)	793.1	3,159.6	298.4%
Funding Ratio (market value)	97.6%	91.2%	-6.4%

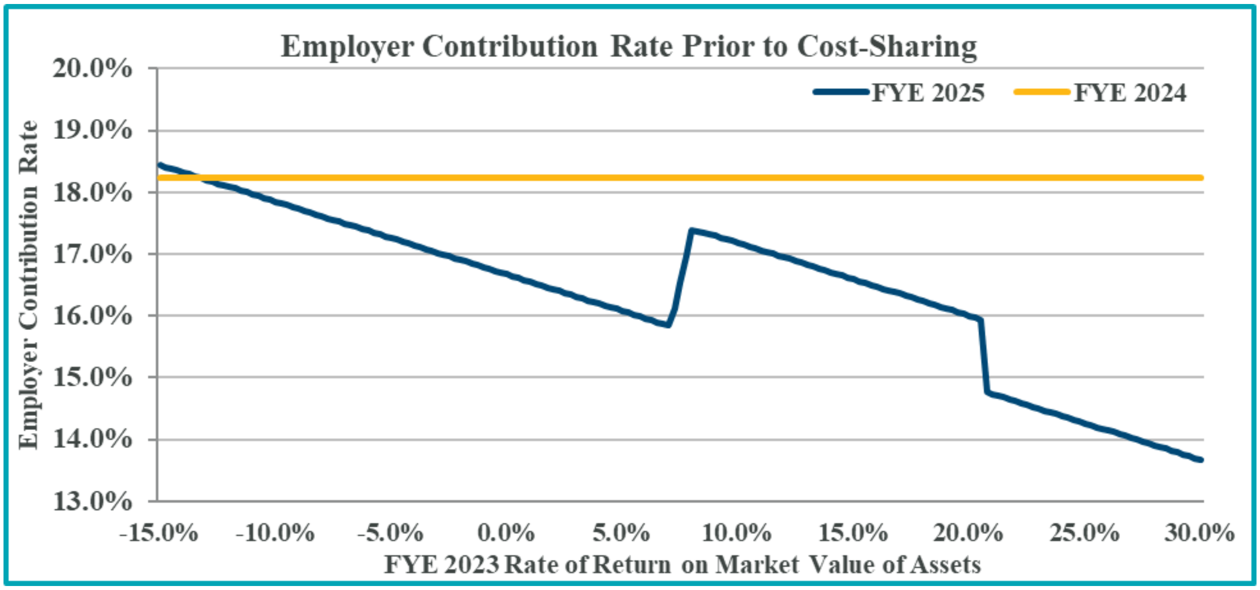
While current contributions rates do not anticipate any future Supplemental COLAs, when a Supplemental COLA is granted, the increase in Actuarial Liability is amortized over five years, increasing contribution rates. The higher-than-expected investment returns that generate a Supplemental COLA are smoothed into the Actuarial Value of Assets over five years and then amortized over 20 years providing a reduction in contribution rates. In most cases, the gain from the investment returns is sufficient to offset the loss due to the Supplemental COLA in contribution rates. However, the worst situation for near-term contribution rates is for investment returns to be just large enough to generate a Supplemental COLA. Then, the five-year amortization of the Supplemental COLA creates an increase in contribution rates that is not entirely offset by the investment gains until after the five-year period.

To illustrate the impact of the Supplemental COLA on the employer contribution rate, the chart on the following page shows the estimated FYE 2025 contribution rate assuming actual rates of

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

investment return vary from -15% to 30% with all other actuarial assumptions being met. The expected employer contribution rate for FYE 2025 ranges from 13.7% to 18.4%, a relatively narrow range compared to the extremely wide range of investment returns.

There is downward pressure on the FYE 2025 employer contribution rate due to the 20% recognition of the net FYE 2021 and 2022 investment gains. As shown in the chart, a return of approximately 7.0% starts to generate a Supplemental COLA, and a return of approximately 8.3% or greater generates a full Supplemental COLA. A return of 20.5% reaches 100% funding based on the Actuarial Value of Assets, which extends the amortization of the Supplemental COLA from 5 years to 20 years.

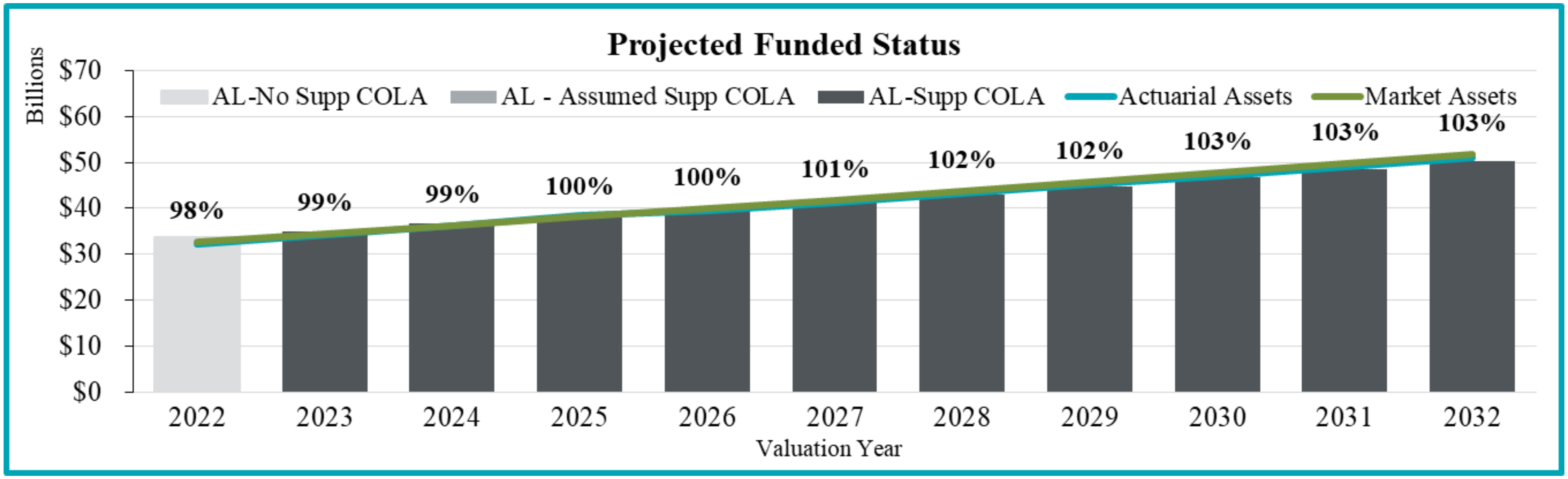


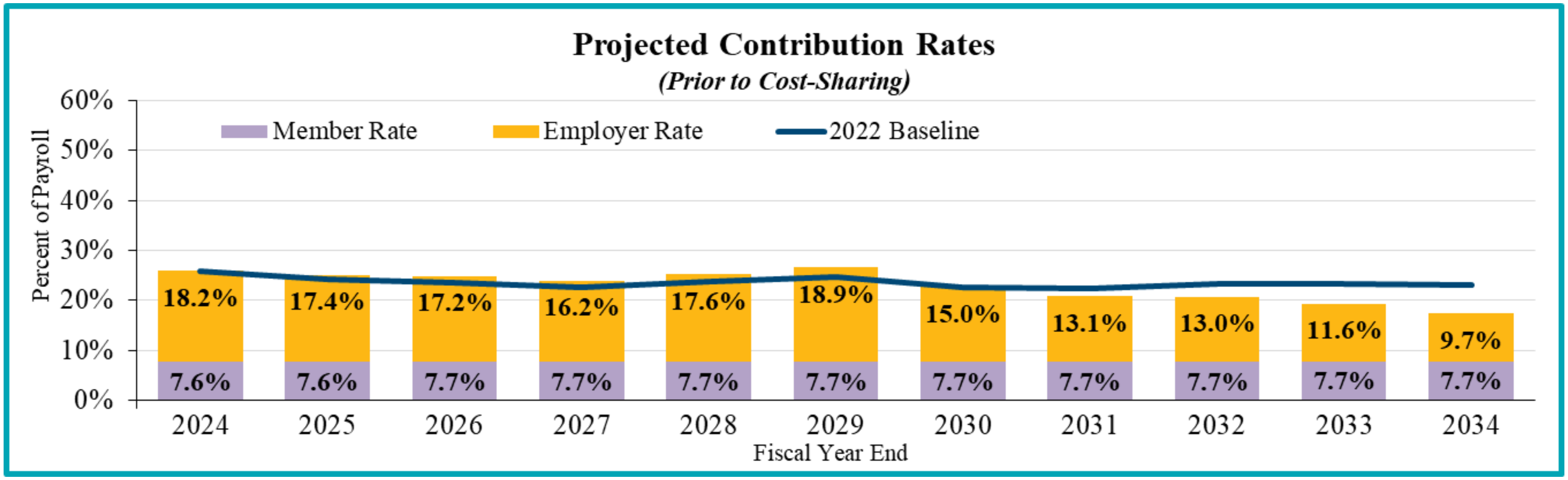
The impact of future Supplemental COLAs on contribution rates and funded status is the worst when the investment returns are just large enough to generate a Supplemental COLA. To illustrate this potential risk and how the amortization method manages it, the projections on the following page assume 8.00% returns each year, which produces a full Supplemental COLA in each year.

These projections illustrate that the 5-year amortization while less than 100% funded manages the risk of future Supplemental COLAs relatively well. The contributions remain very close to the baseline level, and the funded status also remains relatively stable.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Supplemental COLA Risk Stress Test: 8.00% return FYE 2023-2032





SECTION III – CERTIFICATION

The purpose of this report is to present the July 1, 2022 Actuarial Valuation of the City and County of San Francisco Employees' Retirement System (SFERS or the System). This report is for the use of the System and its auditors in setting contribution levels and preparing financial reports in accordance with applicable law and annual report requirements.

In preparing our report, we relied on information, some oral and some written, supplied by the System. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with the Actuarial Standard of Practice No. 23.

All demographic assumptions and the price and wage inflation assumptions were adopted at the December 9, 2020 Board meeting based on our recommendations. Please refer to the demographic experience study report dated August 2020 for the rationale for the demographic assumptions and the December 9, 2020 Board presentation for the rationale for the economic assumptions. The discount rate and amortization policy changes were adopted at the November 10, 2021 Board meeting. We believe all the assumptions are reasonable for the purposes of the measurement.

The measures, including funding ratios, in this report are for the purpose of establishing contribution rates. These measures are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Future actuarial measurements may differ significantly from the current measurements 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; and, changes in plan provisions or applicable law.

Cheiron utilizes ProVal actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have a basic understanding of ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this valuation.

Deterministic projections in this report were developed using P-scan, a proprietary tool used to illustrate the impact of changes in assumptions, methods, plan provisions, or actual experience (particularly investment experience) on the future financial status of the System. P-scan uses standard roll-forward techniques that implicitly assume a stable active population. Assumed Supplemental COLAs are included in these projections.

Stochastic projections in this presentation were developed using R-scan, our proprietary tool for assessing the probability of different outcomes based on the range of potential investment returns. We relied on Cheiron colleagues for the development of the model. The stochastic projections of investment returns assume that each future year's investment return is independent from all other years and is identically distributed according to a lognormal distribution. The

SECTION III – CERTIFICATION

standard deviation used in the stochastic projection of investment returns was provided by the System's investment consultant.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This report was prepared for the System for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

William R. Hallmark, ASA, EA, FCA, MAAA	Anne D. Harper, FSA, EA, MAAA
Consulting Actuary	Principal Consulting Actuary

SECTION IV – ASSETS

SFERS uses and discloses two different asset measurements which are presented in this section of the report: Market value and Actuarial Value of Assets. The market value represents the value of the assets if they were liquidated on the valuation date. The Actuarial Value of Assets is a value that attempts to smooth annual investment return performance over multiple years to reduce the impact of investment volatility on SFERS contribution rates.

This section includes the following information on SFERS assets:

- Statement of changes in the Market Value of Assets during the year,
- Development of the Actuarial Value of Assets, and
- Discussion of investment performance for the year.

Changes in the Market Value of Assets

Table IV-1
Change in Market Value of Assets
(Amounts in thousands)

		FYE 2021	FYE 2022
1.	Market Value, Beginning of Year	$ 26,620,218	$ 35,673,834
2.	Additions		
	a. Employer Contributions	836,559	768,463
	b. Member Contributions	409,398	423,471
	c. Total Additions: (2a. + 2b.)	$ 1,245,957	$ 1,191,934
3.	Net Investment Income	9,447,669	(2,308,320)
4.	Benefits and Administrative Expenses	(1,640,010)	(1,758,924)
5.	Net Increase/(Decrease): (2c.+3.+4.)	$ 9,053,616	$ (2,875,310)
6.	**Market Value, End of Year**	**$ 35,673,834**	**$ 32,798,524**
7.	Estimated Rate of Return on Market Value	35.8%	-6.5%

Actuarial Value of Assets

To determine on-going contribution requirements, most pension funds utilize an Actuarial Value of Assets that differs from the Market Value of Assets. The Actuarial Value of Assets is intended to smooth year-to-year investment returns to reduce the volatility of contribution rates.

The actuarial value is calculated by recognizing 20% of the variance of each of the prior five years of actual investment returns compared to the expected return on the Actuarial Value of Assets. The expected return on the Actuarial Value of Assets is determined using SFERS actual cash flows and the assumed rate of return. See Appendix B for further explanation of the asset valuation method.

SECTION IV – ASSETS

Table IV-2
Development of Actuarial Value of Assets for 7/1/2022
(Amounts in thousands)

			Total
1.	Actuarial Value of Assets (AVA) as of 7/1/2021	$	30,043,222
2.	Non-Investment Cash Flow for FYE 2022		(566,990)
3.	Expected Return on AVA for FYE 2022		2,171,201
4.	Expected Actuarial Value as of 7/1/2022: (1+2+3)	$	31,647,433
5.	Actual Return on Market Value of Assets in FYE 2022		(2,308,320)
6.	Actual Return Above Expected in 2021-2022: (5 - 3)		(4,479,521)
7.	Recognition of Returns Above / (Below) Expected		
	a. 2021-2022 (20% of 6.)		(895,904)
	b. 2020-2021		1,491,276
	c. 2019-2020		(182,627)
	d. 2018-2019		39,545
	e. 2017-2018		175,751
	f. Total: (7a. + 7b. + 7c. + 7d. + 7e.)	$	628,041
8.	**Actuarial Value as of 7/1/2022: (4 + 7f.)**	**$**	**32,275,474**
9.	Market Value as of 7/1/2022	$	32,798,524
10.	Ratio of Actuarial Value to Market Value: (8 / 9)		98.4%
11.	Estimated Rate of Return on Actuarial Value		9.3%

Investment Performance

The internal rate of return on the Market Value of Assets, net of investment expenses, was -6.5% for the plan year ending June 30, 2022. This return compares to an assumed rate of return of 7.20% and resulted in actual investment returns that are approximately $4.5 billion less than the expected return on the Actuarial Value of Assets.

On an Actuarial Value of Assets basis, the return for the plan year ending June 30, 2022 was 9.3% compared to the assumed return of 7.20%. This return produced an investment gain on the Actuarial Value of Assets of $628 million for the plan year ending June 30, 2022.

SECTION V – MEASURES OF LIABILITY

This section presents detailed information on liability measures for SFERS for funding purposes, including:

- Present value of all future benefits,
- Normal cost,
- Actuarial Liability, and
- Analysis of changes in the Unfunded Actuarial Liability during the year.

These measures are developed for the purpose of establishing contribution rates and are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Present Value of Future Benefits

The present value of future benefits represents the amount of money today that is expected to be needed to pay all benefits of SFERS both earned as of the valuation date and those to be earned in the future by current plan members under the current plan provisions if all assumptions are met. Table V-1 below shows the present value of future benefits as of July 1, 2021 and July 1, 2022.

Table V-1
Present Value of Future Benefits
(Amounts in thousands)

	July 1, 2021	July 1, 2022	% Change
Present Value of Future Benefits			
Actives	$ 17,993,081	$ 18,692,979	3.9%
Terminated Vested	669,126	797,020	19.1%
Members Receiving Benefits	19,558,857	20,715,121	5.9%
Total	$ 38,221,064	$ 40,205,120	5.2%

Normal Cost

Under the Entry Age Actuarial Cost Method, the present value of future benefits for each individual is spread over the individual's expected working career as a level percentage of the individual's expected pay. The normal cost is the amount attributed to the next year of service. Table V-2 on the next page shows the normal cost as of the valuation date separately for each tier of benefits for Police, Fire, and Miscellaneous employees.

SECTION V – MEASURES OF LIABILITY

Table V-2
Normal Cost by Group as of July 1, 2022
(Amounts in thousands)

	Police	Fire	Miscellaneous	Total
Normal Cost by Benefit Tier				
Old	$ 0	$ 0	$ 64	$ 64
New	52,119	38,456	242,332	332,907
Prop D	985	2,958	27,727	31,670
Prop C	47,524	37,936	281,820	367,280
Total	$ 100,628	$ 79,350	$ 551,943	$ 731,921

Actuarial Liability

The Actuarial Liability is calculated by taking the present value of all future benefits and subtracting the present value of future normal costs as determined under the Entry Age Actuarial Cost Method. The Actuarial Liability represents the amount of money today that is expected to be needed to pay for benefits attributed to service prior to the valuation date if all assumptions are met. Table V-3 below shows the Actuarial Liability as of the valuation date separately for Police, Fire, and Miscellaneous employees.

Table V-3
Actuarial Liability by Group as of July 1, 2022
(Amounts in thousands)

	Police	Fire	Miscellaneous	Total
Actuarial Liability				
Actives	$ 1,681,699	$ 1,302,327	$ 9,095,398	$ 12,079,424
Terminated Vested	43,621	20,586	732,813	797,020
Members Receiving Benefits				
Retirees	2,731,416	1,916,093	12,143,635	16,791,144
Disabled	859,797	1,049,363	478,249	2,387,409
Beneficiaries	411,720	337,787	787,061	1,536,568
Total Members Receiving Benefits	4,002,933	3,303,243	13,408,945	20,715,121
Total Actuarial Liability	**$ 5,728,253**	**$ 4,626,156**	**$ 23,237,156**	**$ 33,591,565**

Changes in Unfunded Actuarial Liability

The Unfunded Actuarial Liability (UAL) is the difference between the Actuarial Liability and the Actuarial Value of Assets. The UAL of any retirement plan is expected to change at each subsequent valuation for a variety of reasons. Table V-4 below presents key changes in the UAL since the last valuation.

Table V-4
Development of 2022 Experience Gain/(Loss)
(Amounts in millions)

Item		Cost
1. Unfunded Actuarial Liability (UAL) at July 1, 2021	$	1,862.1
2. Middle of year expected actuarial liability payment		(370.9)
3. Interest to end of year on 1. and 2.		121.0
4. Prop A - Pre96 Retiree Supplemental COLAs		48.0
5. Expected UAL at July 1, 2022 (1+2+3+4)	$	1,660.2
6. Actual Unfunded Liability at July 1, 2022		1,316.1
7. Experience Gain: (5-6)	$	344.1
8. Portion of difference due to:		
a. Investment experience on actuarial value	$	628.0
b. Salaries more than expected		(240.6)
c. Old Safety Basic COLA more than expected		(83.3)
d. Retirements		(52.5)
e. Terminations, mortality, and disability experience		(15.7)
f. New entrants		(34.7)
g. Contributions (rate delay, payroll changes, and expense gain)		129.0
h. Other experience		13.9
i. Total gain	$	344.1

SECTION V – MEASURES OF LIABILITY

Table V-5 below shows a five-year history of sources of liability gain and loss. Higher salary increases than expected, new entrants, terminations, and retirements have been the primary sources of losses while COLAs for the old safety groups have been the primary sources of gains.

Table V-5
Historical Sources of Liability (Gain) or Loss
(Amounts in Thousands)

	Year Ending June 30,					
Source	**2018**	**2019**	**2020**	**2021**	**2022**	**Total**
Salary Increases	$ (53,729)	$ 45,993	$ 114,500	$ 169,789	$ 240,602	$ 517,155
Retirement	20,226	32,398	3,918	39,765	52,504	148,811
Termination	22,919	47,547	19,838	29,126	(5,829)	113,601
Mortality	10,721	1,112	4,590	(1,492)	12,143	27,074
Disability	5,585	10,387	10,327	16,369	9,370	52,038
New Entrants	39,173	41,251	45,006	24,142	34,713	184,285
Old Safety COLAs	(29,632)	(22,131)	(86,577)	(19,826)	83,279	(74,887)
Other	(8,717)	28,851	691	12,171	(13,886)	19,110
Total	$ 6,546	$ 185,408	$ 112,293	$ 270,044	$ 412,896	$ 987,187

SECTION VI – CONTRIBUTIONS

The contribution allocation procedure employed by SFERS has three components to the total contribution: the normal cost determined under the Entry Age Actuarial Cost Method, administrative expenses, and the contribution toward the Unfunded Actuarial Liability.

The normal cost shown in the prior section is divided by the projected payroll for the year for each benefit tier to determine the normal cost rate for that tier. The aggregate normal cost rate is the weighted average of the normal cost rate for each tier based on the expected payroll for that tier for the fiscal year to which the contribution rate applies. Finally, the normal cost rate is reduced by the member contribution rate to produce the employer normal cost rate.

Assumed administrative expenses of 0.60% of payroll are added to the contribution rate.

The difference between the Actuarial Liability determined under the Entry Age Actuarial Cost Method and the Actuarial Value of Assets is the Unfunded Actuarial Liability (UAL). The UAL is made up of unamortized portion of prior Charter amendments, plus the impact of accumulated experience, assumption changes, and method changes.

Table VI-1 on the following page develops the employer's contribution rate for FYE 2023 prior to any cost-sharing adjustments. The employer pays the composite contribution rate on the payroll for all employees. The contribution rates shown for Police, Fire, and Miscellaneous are for illustrative purposes only.

SECTION VI – CONTRIBUTIONS

Table VI-1
Development of the Net Employer Contribution Rate as of July 1, 2022 for FYE 2024
(Amounts in millions)

	FYE 2024 Police	FYE 2024 Fire	FYE 2024 Misc.	FYE 2024 TOTAL	FYE 2023 TOTAL
1. Total Normal Cost Rate	29.46%	30.72%	16.26%	**18.33%**	**18.31%**
2. Member Contribution Rate	8.33%	8.37%	7.50%	**7.63%**	**7.62%**
3. Employer Normal Cost Rate (1 - 2)	21.13%	22.35%	8.76%	**10.70%**	**10.69%**
4. UAL Components					
a. Proposition balance	$ 38.7	$ 31.2	$ 460.6	**$ 530.5**	**$ 576.0**
b. Other UAL	67.2	51.0	667.4	**785.6**	**1,286.1**
c. Total UAL (4a+4b)	$ 105.9	$ 82.2	$ 1,128.0	**$ 1,316.1**	**$ 1,862.1**
5. Amortization Payments					
a. Proposition balance	2.09%	2.36%	2.54%	**2.49%**	**3.54%**
b. Other UAL	4.45%	4.45%	4.45%	**4.45%**	**6.52%**
c. Total Amortization (5a+5b)	6.54%	6.81%	6.99%	**6.94%**	**10.06%**
6. Administrative Expenses	0.60%	0.60%	0.60%	**0.60%**	**0.60%**
7. Net Employer Contribution Rate (3+ 5c+6)	28.27%	29.76%	16.35%	**18.24%**	**21.35%**

SECTION VI – CONTRIBUTIONS

Table VI-2 shows the estimated member and employer contributions adjusted for the cost-sharing provisions under Proposition C. The adjustments are based on the applicable table in the Charter for an employer contribution rate of 18.24% and the hourly pay rates shown in the table below.

Table VI-2
Employee and Employer Contribution Rates By Employee Group for FYE 2024
(Amounts in thousands)

Hire Date	Hourly Pay	Estimated Payroll FYE 2024	Base Rates Employee	Base Rates Employer	Adjusted Rates Employee	Adjusted Rates Employer	Cost Sharing Adjustment
Police and Fire							
< 11/2/1976	All	$ 0	7.00%	18.24%	10.00%	15.24%	3.00%
11/2/1976 - 6/30/2010	All	269,010	7.50%	18.24%	10.50%	15.24%	3.00%
> 6/30/2010	< $66	273,555	9.00%	18.24%	11.00%	16.24%	2.00%
> 6/30/2010	>= $66	76,791	9.00%	18.24%	11.50%	15.74%	2.50%
Miscellaneous							
< 11/2/1976	< $33	$ 0	8.00%	18.24%	8.00%	18.24%	0.00%
< 11/2/1976	$33 - $66	185	8.00%	18.24%	10.00%	16.24%	2.00%
< 11/2/1976	>= $66	106	8.00%	18.24%	10.50%	15.74%	2.50%
>= 11/2/1976	< $33	212,404	7.50%	18.24%	7.50%	18.24%	0.00%
>= 11/2/1976	$33 - $66	2,013,691	7.50%	18.24%	9.50%	16.24%	2.00%
>= 11/2/1976	>= $66	1,267,894	7.50%	18.24%	10.00%	15.74%	2.50%
Estimated Total Plan		**$ 4,113,635**	**7.63%**	**18.24%**	**9.75%**	**16.12%**	**2.12%**
Estimated Contribution Amounts			**$ 313,870**	**$ 750,327**	**$ 401,079**	**$ 663,118**	**$ 87,209**

SECTION VI – CONTRIBUTIONS

Table VI-3 below provides the amortization schedules for the changes to the Actuarial Liability due to changes to the Charter. Each Charter change prior to 2014 is amortized over 20 years from the date it was first recognized in the valuation. Effective with the July 1, 2014 valuation, any new changes to active member benefits are amortized over a closed 15-year period, and any new changes to inactive or retired member benefits, including Supplemental COLAs which are shown in Table VI-4, are amortized over a closed 5-year period. However, the Board elected to amortize the increase in the Unfunded Actuarial Liability due to Proposition A over a 10-year period. All amortization payments increase each year at the ultimate assumed wage inflation rate.

Table VI-3
Development of the Proposition Amortization Rate as of July 1, 2022 for FYE 2024
(dollars in thousands)

	Remaining	Police		Fire		Miscellaneous		Total	
Propositions	Period	Balance	Payment	Balance	Payment	Balance	Payment	Balance	Payment
5.0% Credited Interest on EE ctrbs	2	(136)	(77)	(65)	(37)	(12,478)	(7,054)	(12,679)	(7,168)
2004 Prop E - New Safety LOD Bfts	3	2,241	861	3,148	1,209	0	(1)	5,389	2,069
2003 Prop F - Misc 3+3 Early Ret Bfts	3	0	0	0	0	6,780	2,603	6,780	2,603
(extended) - Misc 3+3 Early Ret Bfts	4	0	0	0	0	4,935	1,447	4,935	1,447
(extended) - Misc 3+3 Early Ret Bfts	5	0	0	0	0	2,619	626	2,619	626
2008 Prop B - New Misc Ret Bfts and Compound COLA	6	36,496	6,501	28,088	5,073	458,670	90,892	523,398	102,610
2022 Prop A - Pre-96 Supplemental COLAs	10	11,670	1,525	7,843	1,025	28,524	3,726	48,037	6,276
Proposition Total		**$ 38,673**	**$ 7,357**	**$ 31,243**	**$ 6,317**	**$ 460,598**	**$ 88,585**	**$ 530,514**	**$ 102,259**
Expected FYE 2024 Payroll			**$ 352,117**		**$ 267,238**		**$ 3,494,280**		**$ 4,113,635**
Amortization Rate			**2.09%**		**2.36%**		**2.54%**		**2.49%**

SECTION VI – CONTRIBUTIONS

Effective July 1, 2014, any new sources of UAL due to actuarial gains and losses, assumption changes, or method changes are amortized over a closed, layered 20-year period. In addition, the UAL as of July 1, 2013 not attributable to Propositions was re-amortized over a closed 19-year period as of July 1, 2014.

Effective with the July 1, 2021 valuation, the remaining amortization periods for assumption changes prior to July 1, 2021 and all prior actuarial gains and losses (including the gain for 2021) were reduced to 5 years. Furthermore, if the System becomes fully funded based on the Actuarial Value of Assets, any unexpected changes in the surplus would be amortized over a rolling 20-year period.

Table VI-4 on the next page shows all the Non-Proposition amortizations under the new amortization policy. All amortization schedules are determined on a level percent of pay basis which means that for the duration of the amortization schedule, the payment amount increases each year at the assumed wage inflation rate.

SECTION VI – CONTRIBUTIONS

Table VI-4
Development of the Non-Proposition Amortization Rate as of July 1, 2022 for FYE 2024
(dollars in thousands)

Amortization Bases	Remaining Period	Outstanding Balance	Amortization Payment
2013 Non-Proposition UAL	4	$ 2,016,129	$ 591,326
2014 Actuarial Gain	4	(679,412)	(199,269)
2014 Assumption Change	4	120,186	35,250
2015 Actuarial Gain	4	(617,674)	(181,162)
2015 Assumption Change	4	977,234	286,619
2013 Supplemental COLA	11	178,515	21,579
2016 Actuarial Loss	4	22,401	6,570
2017 Actuarial Gain	4	(326,374)	(95,724)
2017 Assumption and Method Change	4	41,373	12,135
2018 Actuarial Gain	4	(326,097)	(95,643)
2018 Supplemental COLA	1	49,390	54,819
2018 Assumption Change	4	247,579	72,614
2019 Actuarial Loss	4	144,810	42,472
2019 Supplemental COLA	2	65,794	37,198
2020 Actuarial Loss	4	130,722	38,340
2020 Assumption Changes	4	(496,405)	(145,594)
2021 Actuarial Gain	4	(1,340,336)	(393,116)
2021 Supplemental COLA	4	222,155	65,157
2021 Assumption Change	19	699,635	56,106
2022 Actuarial Gain	20	(344,048)	(26,647)
Total Non-Proposition UAL		**$ 785,577**	**$ 183,030**
Expected FYE 2024 Payroll			**$ 4,113,635**
Amortization Rate			**4.45%**

SECTION VII – ACTUARIAL SECTION OF THE ANNUAL REPORT

The Government Finance Officers Association (GFOA) maintains a checklist of items to be included in a System's Annual Comprehensive Financial Report in order to receive recognition for excellence in financial reporting. We understand that SFERS' includes these exhibits in their Annual Report. The following Tables VII-1 through VII-3 are exhibits listed by the GFOA, and they recommend showing 10 years of experience in each of these exhibits. Table VII-1 presents an Analysis of Financial Experience for the valuation year, Table VII-2 presents the Schedule of Funded Liabilities by Type, Table VII-3 shows the Schedule of Funding Progress and Table VII-4 shows the Retirees added and removed from the Rolls.

In the table below, non-recurring items include changes in assumptions and changes in plan provisions.

Table VII-1
Analysis of Financial Experience
(Amounts in thousands)

Gain or (Loss) for Year Ending	(A) Investment Income	(B) Contribution Income[1]	(C) Combined Liability Experience	(D) (A)+(B)+(C) Gain or (Loss) From Experience	(E) Non-Recurring Items[2]	(F) (D)+(E) Composite Gain or (Loss) During Year
July 1, 2022	$ 628,041	$ 128,903	$ (412,896)	$ 344,048	$ (48,037)	$ 296,011
July 1, 2021	1,750,143	113,249	(270,044)	1,593,348	(965,694)	627,654
July 1, 2020	(6,409)	(37,023)	(112,293)	(155,725)	591,355	435,630
July 1, 2019	58,561	(46,222)	(185,408)	(173,069)	(140,998)	(314,067)
July 1, 2018	408,925	19,028	(35,783)	392,170	(498,554)	(106,384)
July 1, 2017	405,685	(55,038)	45,496	396,143	(250,285)	145,858
July 1, 2016	(51,452)	58,461	(34,514)	(27,505)	(429,336)	(456,841)
July 1, 2015	545,506	97,444	127,610	770,560	(1,048,350)	(277,790)
July 1, 2014	749,173	(41,626)	157,931	865,478	(153,100)	712,378
July 1, 2013	(579,555)	(65,637)	9,873	(635,319)	0	(635,319)

[1] *Due to Payroll Changes, One-Year Lag, and Expenses.*

[2] *Includes Assumption, Method, and Benefit Changes as well as Supplemental COLAs.*

SECTION VII – ACTUARIAL SECTION OF THE ANNUAL REPORT

Table VII-2
Schedule of Funded Liabilities by Type
(Amounts in millions)

Valuation Date July 1,	(A) Active Member Contributions	(B) Retirees, Beneficiaries, and Inactives	(C) Remaining Active Members' Liabilities	Actuarial Value of Assets	Portion of Actuarial Liabilities Covered by Reported Assets (A)	(B)	(C)
2022	$ 4,232	$ 21,512	$ 7,847	$ 32,275	100%	100%	83%
2021 [1]	4,104	20,228	7,573	30,043	100%	100%	75%
2020 [2]	3,916	18,621	6,963	26,696	100%	100%	60%
2019	3,675	18,074	7,050	25,248	100%	100%	50%
2018 [1]	3,496	17,024	6,816	23,866	100%	100%	49%
2017 [3]	3,325	15,847	6,535	22,185	100%	100%	46%
2016 [4]	3,175	14,941	6,288	20,655	100%	100%	40%
2015 [5]	2,995	13,931	6,045	19,653	100%	100%	45%
2014 [6]	2,825	12,901	5,397	18,012	100%	100%	42%
2013	2,633	12,257	5,335	16,303	100%	100%	26%

[1] *Reflects revised discount rate.*

[2] *Reflects revised demographic and wage inflation assumptions.*

[3] *Reflects revised wage inflation assumption.*

[4] *Reflects 2013 and 2014 Retroactive Supplemental COLA benefits for Post96 Retirees.*

[5] *Reflects revised demographic assumptions.*

[6] *Reflects revised discount rate and wage inflation.*

SECTION VII – ACTUARIAL SECTION OF THE ANNUAL REPORT

Table VII-3
Schedule of Funding Progress
(in thousands)

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Liability (AL)	Unfunded AL	Funded Ratio	Covered Payroll	Unfunded AL as a % of Covered Payroll
July 1, 2022	$ 32,275,474	$ 33,591,565	$ 1,316,091	96%	$ 3,984,150	33%
July 1, 2021	30,043,222	31,905,275	1,862,053	94%	3,828,797	49%
July 1, 2020	26,695,844	29,499,918	2,804,074	90%	3,703,103	76%
July 1, 2019	25,247,549	28,798,581	3,551,032	88%	3,549,936	100%
July 1, 2018	23,866,027	27,335,417	3,469,390	87%	3,385,517	102%
July 1, 2017	22,185,244	25,706,090	3,520,846	86%	3,242,468	109%
July 1, 2016	20,654,703	24,403,882	3,749,179	85%	3,062,422	122%
July 1, 2015	19,653,338	22,907,892	3,254,554	86%	2,820,968	115%
July 1, 2014	18,012,088	21,122,567	3,110,479	85%	2,640,153	118%
July 1, 2013	16,303,397	20,224,776	3,921,379	81%	2,535,963	155%

Table VII-4
Schedule of Retirees and Beneficiaries Added to and Removed from Retirement Payroll

	Added to Rolls		Removed from Rolls		Rolls at End of Year		% Increase	Avearge
FYE	Member Count*	Annual Allowance	Member Count*	Annual Allowance	Member Count*	Annual Allowance	in Annual Allowance	Annual Allowance
2022	1,872	$103,981,941	1,007	$45,948,001	31,719	$1,795,472,441	6.1%	$56,606
2021	1,722	97,495,262	996	43,909,238	30,854	1,691,633,291	6.5%	54,827
2020	1,470	74,777,425	816	34,764,875	30,128	1,587,981,080	4.9%	52,708
2019	1,770	83,661,179	957	36,959,870	30,778	1,513,436,081	6.3%	49,173
2018	1,797	84,574,963	959	36,284,323	29,965	1,424,324,641	6.9%	47,533
2017	1,769	80,214,008	928	35,082,179	29,127	1,332,430,263	6.8%	45,746
2016	1,657	72,049,646	856	30,384,191	28,286	1,247,230,245	7.8%	44,094
2015	1,564	63,136,134	931	29,314,643	27,485	1,157,081,680	4.8%	42,099
2014	1,588	65,923,470	770	25,170,856	26,852	1,103,959,803	5.6%	41,113
2013	1,577	66,437,220	733	22,406,077	26,034	1,045,547,799	6.4%	40,161

** Member count as of FYE 2020 reflects combining records for members who have both a Safety and Miscellaneous benefit.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-1
Active Member Data - By Group

	July 1, 2022	July 1, 2021	% Change
Total			
Count	33,199	33,644	-1.3%
Average Current Age	47.3	47.2	0.1
Average Service	10.9	11.0	-0.1
Annual Pensionable Earnings	$ 3,708,897,220	$ 3,586,532,188	3.4%
Average Pensionable Earnings	$ 111,717	$ 106,602	4.8%
Police			
Count	2,269	2,475	-8.3%
Average Current Age	41.4	40.9	0.5
Average Service	13.0	12.4	0.6
Annual Pensionable Earnings	$ 315,938,119	$ 332,503,625	-5.0%
Average Pensionable Earnings	$ 139,241	$ 134,345	3.6%
Fire			
Count	1,664	1,599	4.1%
Average Current Age	42.9	43.9	-1.0
Average Service	12.3	13.3	-1.0
Annual Pensionable Earnings	$ 237,555,937	$ 228,221,528	4.1%
Average Pensionable Earnings	$ 142,762	$ 142,728	0.0%
Miscellaneous			
Count	29,266	29,570	-1.0%
Average Current Age	48.0	47.9	0.1
Average Service	10.7	10.7	0.0
Annual Pensionable Earnings	$ 3,155,403,164	$ 3,025,807,035	4.3%
Average Pensionable Earnings	$ 107,818	$ 102,327	5.4%

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Active Member Data - By Charter
July 1, 2022

	Police	Fire	Miscellaneous	Total
Member Counts				
Old	0	1	7	8
New	1,036	682	11,832	13,550
Prop D	19	51	1,380	1,450
Prop C*	1,214	930	16,047	18,191
Total	2,269	1,664	29,266	33,199
Annual Pensionable Earnings				
Old	$ 0	$ 175,327	$ 725,069	$ 900,396
New	163,678,759	119,142,755	1,363,959,456	1,646,780,970
Prop D	2,775,521	7,957,279	146,542,921	157,275,721
Prop C*	149,483,839	110,280,576	1,644,175,718	1,903,940,133
Total	$ 315,938,119	$ 237,555,937	$ 3,155,403,164	$ 3,708,897,220

**Police includes Sherriffs Plan (Charter A8.608) and Miscellaneous Safety Plan (Charter A8.610) members.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-3
Non-Active Member Data - Total System

	July 1, 2021	July 1, 2022	Change
Retired			
Count	24,147	24,964	3.4%
Average Age	71.5	71.6	0.1
Average Annual Benefit*	$ 56,052	$ 57,831	3.2%
Disabled			
Count	2,507	2,485	-0.9%
Average Age	69.6	69.9	0.3
Average Annual Benefit*	$ 72,329	$ 75,773	4.8%
Beneficiaries			
Count	4,200	4,270	1.7%
Average Age	77.8	77.8	0.0
Average Annual Benefit*	$ 37,299	$ 40,159	7.7%
Payee Average			
Count	30,854	31,719	2.8%
Average Age	72.2	72.3	0.1
Average Annual Benefit*	$ 54,822	$ 56,857	3.7%
Inactives			
Count	11,126	12,085	8.6%
Average Age	47.6	47.6	0.0
Total Contribution Balance with Interest	$ 346,437,842	$ 420,865,353	21.5%
Average Contribution Balance with Interest	$ 31,138	$ 34,825	11.8%

** Benefits provided in June 30 valuation data, plus estimated Basic COLA effective July 1, 2022 and increased in accordance with Proposition A for affected members. If applicable, limited by Section 415(b) of the Internal Revenue Code.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-4
Non-Active Member Data - Old Safety

	July 1, 2022					
Charter Section	**Prop H**	**8.559 8.585**	**8.595 8.596**	**Total**	**July 1, 2021**	**Change**
Retired						
Count	3	548	317	868	902	-3.8%
Average Age	89.7	81.5	74.2	78.8	78.1	0.7
Average Annual Benefit*	$ 30,964	$ 105,075	$ 151,265	$ 121,688	$ 112,645	8.0%
Disabled						
Count	30	345	140	515	547	-5.9%
Average Age	85.2	81.1	74.8	79.6	78.9	0.7
Average Annual Benefit*	$ 50,695	$ 108,188	$ 157,690	$ 118,295	$ 110,359	7.2%
Beneficiaries						
Count	84	598	58	740	760	-2.6%
Average Age	83.7	82.4	71.1	81.7	81.6	0.1
Average Annual Benefit*	$ 41,509	$ 96,523	$ 128,712	$ 92,801	$ 82,188	12.9%
Payee Average						
Count	117	1,491	515	2,123	2,209	-3.9%
Average Age	84.2	81.7	74.0	80.0	79.5	0.5
Average Annual Benefit*	$ 43,594	$ 102,365	$ 150,472	$ 110,796	$ 101,600	9.1%
Inactives						
Count	0	0	2	2	2	0.0%
Average Age	N/A	N/A	76.5	76.5	75.5	1.0
Total Contribution Balance with Interest	N/A	N/A	$ 3,031	$ 3,031	$ 2,914	4.0%
Average Contribution Balance with Interest	N/A	N/A	$ 1,515	$ 1,515	$ 1,457	4.0%

* *Benefits provided in June 30 valuation data, plus estimated Basic COLA effective July 1, 2022 and increased in accordance with Proposition A for affected members. If applicable, limited by Section 415(b) of the Internal Revenue Code.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-5
Non-Active Member Data - New Safety (includes Prop D and C)

	July 1, 2021	July 1, 2022	Change
Retired			
Count	1,989	2,172	9.2%
Average Age	64.1	64.1	0.0
Average Annual Benefit*	$ 117,391	$ 119,041	1.4%
Disabled			
Count	671	699	4.2%
Average Age	64.0	64.5	0.5
Average Annual Benefit*	$ 115,396	$ 118,658	2.8%
Beneficiaries			
Count	155	171	10.3%
Average Age	63.0	64.5	1.5
Average Annual Benefit*	$ 74,800	$ 78,048	4.3%
Payee Average			
Count	2,815	3,042	8.1%
Average Age	64.0	64.2	0.2
Average Annual Benefit*	$ 114,570	$ 116,649	1.8%
Inactives			
Count	376	474	26.1%
Average Age	42.4	41.4	-1.0
Total Contribution Balance with Interest	$ 21,523,590	$ 32,598,500	51.5%
Average Contribution Balance with Interest	$ 57,244	$ 68,773	20.1%

** Benefits provided in June 30 valuation data, increased in accordance with Proposition A for affected members. If applicable, limited by Section 415(b) of the Internal Revenue Code*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-6
Non-Active Member Data - Miscellaneous

	July 1, 2021	July 1, 2022	Change
Retired			
Count	21,256	21,924	3.1%
Average Age	71.9	72.1	0.2
Average Annual Benefit*	$ 47,911	$ 49,238	2.8%
Disabled			
Count	1,289	1,271	-1.4%
Average Age	68.6	69.0	0.4
Average Annual Benefit*	$ 33,771	$ 34,958	3.5%
Beneficiaries			
Count	3,285	3,359	2.3%
Average Age	77.7	77.7	0.0
Average Annual Benefit*	$ 25,144	$ 26,633	5.9%
Payee Average			
Count	25,830	26,554	2.8%
Average Age	72.5	72.7	0.2
Average Annual Benefit*	$ 44,310	$ 45,695	3.1%
Inactives			
Count	10,748	11,609	8.0%
Average Age	47.7	47.9	0.2
Total Contribution Balance with Interest	$ 324,911,338	$ 388,263,822	19.5%
Average Contribution Balance with Interest	$ 30,230	$ 33,445	10.6%

** Benefits provided in June 30 valuation data, increased in accordance with Proposition A for affected members.*
If applicable, limited by Section 415(b) of the Internal Revenue Code

APPENDIX A – MEMBERSHIP INFORMATION

Table A-7
Distribution of Active Members as of July 1, 2022
Count By Age/Service - Total System

	Years of Service										
Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	119	80	1	0	0	0	0	0	0	0	200
25 to 29	338	751	190	0	0	0	0	0	0	0	1,279
30 to 34	453	1,378	1,332	78	0	0	0	0	0	0	3,241
35 to 39	361	1,393	1,997	652	112	0	0	0	0	0	4,515
40 to 44	313	1,129	1,735	867	597	106	0	0	0	0	4,747
45 to 49	211	834	1,283	823	733	538	76	0	0	0	4,498
50 to 54	183	779	1,094	730	804	975	462	75	1	0	5,103
55 to 59	130	545	871	647	696	935	523	291	50	1	4,689
60 to 64	64	315	677	454	479	642	304	258	119	11	3,323
65 to 69	27	106	245	213	192	203	93	67	58	13	1,217
70 and up	6	38	61	60	51	68	40	19	24	20	387
Total Count	2,205	7,348	9,486	4,524	3,664	3,467	1,498	710	252	45	33,199

Table A-8
Distribution of Active Members as of July 1, 2022
Average Salary By Age/Service - Total System

	Years of Service										
Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	$ 68,566	$ 64,003	$ 86,273	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 66,830
25 to 29	83,468	88,964	106,254	0	0	0	0	0	0	0	90,080
30 to 34	96,042	96,089	110,656	121,514	0	0	0	0	0	0	102,681
35 to 39	95,472	99,744	112,611	123,181	140,350	0	0	0	0	0	109,485
40 to 44	100,831	102,059	113,933	123,680	135,230	135,734	0	0	0	0	115,190
45 to 49	93,548	97,000	111,682	121,843	133,005	135,489	139,015	0	0	0	116,752
50 to 54	97,361	96,057	106,260	111,496	128,520	135,779	150,146	154,766	182,604	0	118,981
55 to 59	90,220	95,048	105,575	106,234	117,705	124,693	137,131	136,289	130,121	173,686	115,332
60 to 64	106,679	93,645	104,427	105,925	113,410	111,163	119,359	129,175	115,835	99,697	109,929
65 to 69	77,872	93,562	101,838	96,201	107,611	105,179	123,821	122,807	106,212	101,448	104,105
70 and up	84,455	88,386	95,693	100,489	102,677	112,629	117,250	130,590	121,029	129,979	106,726
Avg. Salary	$ 92,801	$ 96,463	$ 109,973	$ 115,392	$ 125,387	$ 125,939	$ 136,277	$ 134,231	$ 117,214	$ 115,306	$ 111,717

APPENDIX A – MEMBERSHIP INFORMATION

Table A-9
Distribution of Active Members as of July 1, 2022
Count By Age/Service - Police

	Years of Service										
Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	1	10	0	0	0	0	0	0	0	0	11
25 to 29	1	121	69	0	0	0	0	0	0	0	191
30 to 34	3	107	291	15	0	0	0	0	0	0	416
35 to 39	1	50	234	117	49	0	0	0	0	0	451
40 to 44	0	32	101	85	137	32	0	0	0	0	387
45 to 49	0	11	30	32	84	104	23	0	0	0	284
50 to 54	0	5	18	16	43	116	107	14	0	0	319
55 to 59	1	8	13	6	25	48	45	18	1	0	165
60 to 64	0	1	4	2	4	11	8	4	1	0	35
65 to 69	0	1	1	0	0	0	5	0	1	0	8
70 and up	0	0	0	0	1	0	1	0	0	0	2
Total Count	7	346	761	273	343	311	189	36	3	0	2,269

Table A-10
Distribution of Active Members as of July 1, 2022
Average Salary By Age/Service - Police

	Years of Service										
Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	$ 80,545	$ 95,304	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 93,962
25 to 29	80,545	101,705	119,067	0	0	0	0	0	0	0	107,866
30 to 34	107,906	103,379	127,526	137,077	0	0	0	0	0	0	121,518
35 to 39	80,545	103,281	128,736	146,183	155,255	0	0	0	0	0	133,215
40 to 44	0	113,968	131,012	146,483	153,060	158,251	0	0	0	0	143,058
45 to 49	0	107,463	134,096	150,197	149,856	162,137	157,956	0	0	0	151,741
50 to 54	0	144,741	137,186	145,463	153,168	154,923	174,602	221,408	0	0	162,570
55 to 59	144,490	136,636	164,913	143,049	149,465	146,644	172,682	190,868	182,265	0	160,024
60 to 64	0	152,824	149,187	152,982	153,017	145,302	162,617	196,001	182,353	0	158,092
65 to 69	0	89,814	118,314	0	0	0	148,648	0	148,030	0	137,425
70 and up	0	0	0	0	166,468	0	150,182	0	0	0	158,325
Avg. Salary	$ 101,406	$ 105,125	$ 128,822	$ 146,185	$ 152,379	$ 156,060	$ 170,796	$ 203,315	$ 170,882	$ 0	$ 139,241

APPENDIX A – MEMBERSHIP INFORMATION

Table A-11
Distribution of Active Members as of July 1, 2022
Count By Age/Service - Fire

	Years of Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up	Total
Under 25	12	4	0	0	0	0	0	0	0	0	16
25 to 29	44	50	16	0	0	0	0	0	0	0	110
30 to 34	34	100	105	2	0	0	0	0	0	0	241
35 to 39	28	76	164	39	5	0	0	0	0	0	312
40 to 44	11	24	112	44	59	9	0	0	0	0	259
45 to 49	6	11	46	37	57	62	4	0	0	0	223
50 to 54	0	3	13	16	47	133	73	14	1	0	300
55 to 59	0	3	2	7	21	68	42	13	2	0	158
60 to 64	0	0	2	2	6	20	4	4	2	0	40
65 to 69	0	0	0	0	0	1	0	2	0	0	3
70 and up	0	1	0	0	0	0	0	0	0	1	2
Total Count	135	272	460	147	195	293	123	33	5	1	1,664

Table A-12
Distribution of Active Members as of July 1, 2022
Average Salary By Age/Service - Fire

	Years of Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up	Total
Under 25	$ 72,811	$ 89,247	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 76,920
25 to 29	78,893	93,833	129,683	0	0	0	0	0	0	0	93,071
30 to 34	80,396	97,539	131,939	127,597	0	0	0	0	0	0	110,357
35 to 39	79,277	100,355	138,802	154,806	157,241	0	0	0	0	0	126,391
40 to 44	87,654	106,486	140,121	153,777	178,548	161,949	0	0	0	0	146,608
45 to 49	73,759	105,617	128,929	151,494	167,478	172,838	148,451	0	0	0	152,450
50 to 54	0	90,203	137,367	156,646	160,995	172,797	189,574	214,743	182,604	0	173,798
55 to 59	0	155,112	138,113	152,065	155,654	172,020	207,048	179,807	190,109	0	178,391
60 to 64	0	0	173,881	184,872	172,113	169,286	179,031	203,912	217,883	0	177,586
65 to 69	0	0	0	0	0	99,274	0	170,611	0	0	146,832
70 and up	0	45,000	0	0	0	0	0	0	0	175,327	110,163
Avg. Salary	$ 79,296	$ 99,000	$ 136,361	$ 153,773	$ 167,872	$ 171,802	$ 193,861	$ 196,993	$ 199,718	$ 175,327	$ 142,762

APPENDIX A – MEMBERSHIP INFORMATION

Table A-13
Distribution of Active Members as of July 1, 2022
Count By Age/Service - Miscellaneous

	Years of Service										
Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	106	66	1	0	0	0	0	0	0	0	173
25 to 29	293	580	105	0	0	0	0	0	0	0	978
30 to 34	416	1,171	936	61	0	0	0	0	0	0	2,584
35 to 39	332	1,267	1,599	496	58	0	0	0	0	0	3,752
40 to 44	302	1,073	1,522	738	401	65	0	0	0	0	4,101
45 to 49	205	812	1,207	754	592	372	49	0	0	0	3,991
50 to 54	183	771	1,063	698	714	726	282	47	0	0	4,484
55 to 59	129	534	856	634	650	819	436	260	47	1	4,366
60 to 64	64	314	671	450	469	611	292	250	116	11	3,248
65 to 69	27	105	244	213	192	202	88	65	57	13	1,206
70 and up	6	37	61	60	50	68	39	19	24	19	383
Total Count	2,063	6,730	8,265	4,104	3,126	2,863	1,186	641	244	44	29,266

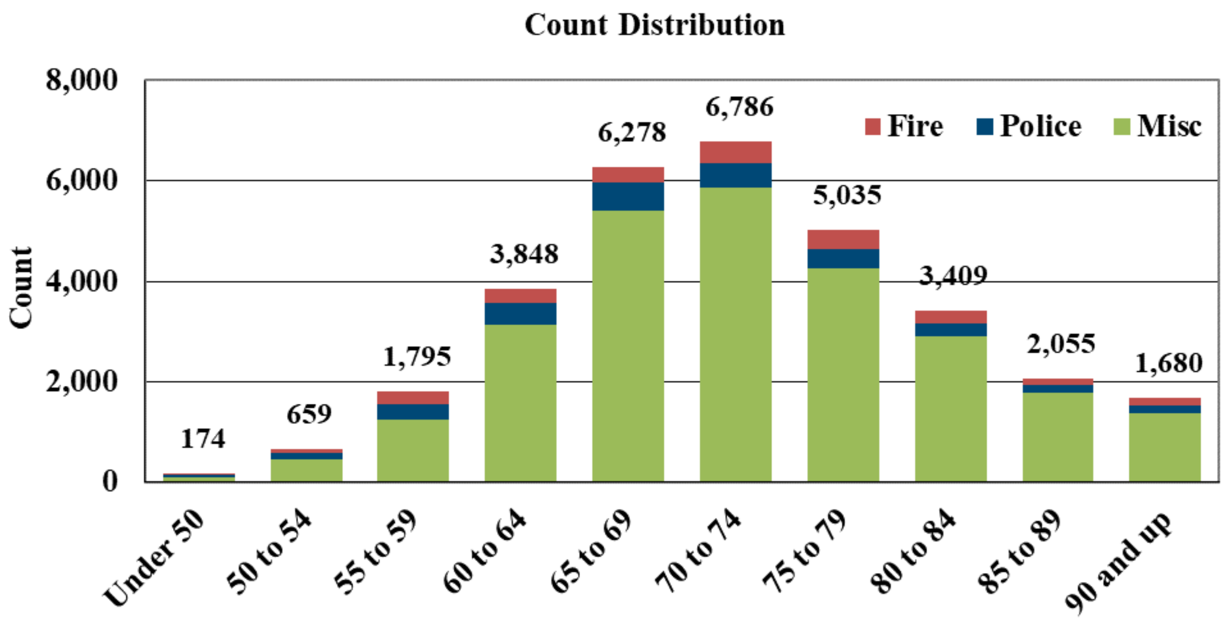
Table A-14
Distribution of Active Members as of July 1, 2022
Average Salary By Age/Service - Miscellaneous

	Years of Service										
Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	$ 67,973	$ 57,731	$ 86,273	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 64,171
25 to 29	84,165	85,887	94,264	0	0	0	0	0	0	0	86,270
30 to 34	97,236	95,299	103,023	117,487	0	0	0	0	0	0	98,933
35 to 39	96,883	99,568	107,565	115,269	126,302	0	0	0	0	0	105,227
40 to 44	101,311	101,605	110,872	119,259	122,766	121,018	0	0	0	0	110,576
45 to 49	94,127	96,741	110,468	119,185	127,294	121,814	129,355	0	0	0	112,268
50 to 54	97,361	95,764	105,356	109,683	124,898	125,939	130,661	117,050	0	0	112,212
55 to 59	89,799	94,088	104,598	105,379	115,258	119,478	126,727	130,334	126,459	173,686	111,361
60 to 64	106,679	93,456	103,953	105,365	112,321	108,646	117,357	126,910	113,502	99,697	108,577
65 to 69	77,872	93,598	101,770	96,201	107,611	105,208	122,411	121,336	105,478	101,448	103,778
70 and up	84,455	89,559	95,693	100,489	101,401	112,629	116,406	130,590	121,029	127,593	106,438
Avg. Salary	$ 93,655	$ 95,916	$ 106,769	$ 111,969	$ 119,775	$ 117,974	$ 124,804	$ 127,120	$ 114,864	$ 113,942	$ 107,818

APPENDIX A – MEMBERSHIP INFORMATION

Table A-15
Distribution of Retirees, Disabled Members, and Beneficiaries as of July 1, 2022
Count

Age	Police	Fire	Misc	Total
Under 50	56	21	97	174
50 to 54	123	83	453	659
55 to 59	312	234	1,249	1,795
60 to 64	428	278	3,142	3,848
65 to 69	564	299	5,415	6,278
70 to 74	476	445	5,865	6,786
75 to 79	371	403	4,261	5,035
80 to 84	259	248	2,902	3,409
85 to 89	155	113	1,787	2,055
90 and up	149	148	1,383	1,680
Total	2,893	2,272	26,554	31,719

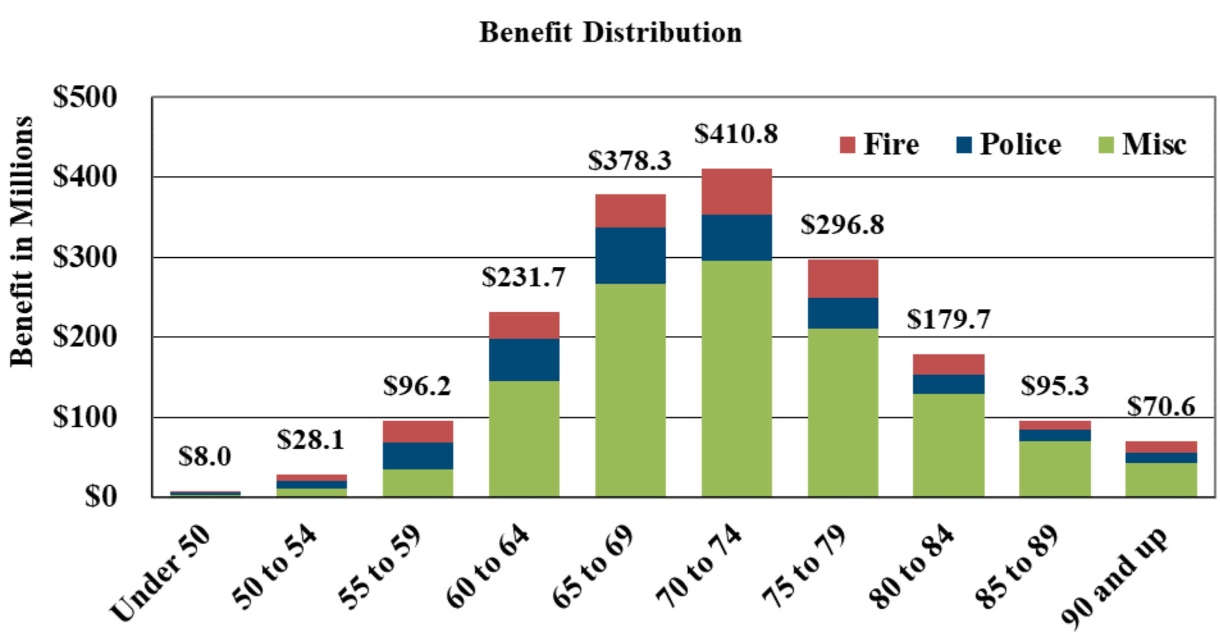


APPENDIX A – MEMBERSHIP INFORMATION

Table A-16
Distribution of Retirees, Disabled Members, and Beneficiaries as of July 1, 2022
Annual Benefit *

Age	Police	Fire	Misc	Total
Under 50	$ 3,941,203	$ 1,545,970	$ 2,496,711	$ 7,983,884
50 to 54	9,910,985	7,897,723	10,276,603	28,085,311
55 to 59	34,282,512	27,374,920	34,603,294	96,260,726
60 to 64	53,601,987	32,880,834	145,230,351	231,713,173
65 to 69	71,073,477	40,516,275	266,847,902	378,437,654
70 to 74	56,763,342	57,950,186	296,568,874	411,282,401
75 to 79	38,289,203	48,412,544	211,085,281	297,787,028
80 to 84	24,320,647	27,076,890	130,093,793	181,491,329
85 to 89	14,447,465	11,743,126	71,130,888	97,321,479
90 and up	12,821,266	15,215,370	45,059,632	73,096,268
Total	$ 319,452,088	$ 270,613,837	$ 1,213,393,329	$ 1,803,459,254

** Benefits used in the July 1, 2022 actuarial valuation*



APPENDIX A – MEMBERSHIP INFORMATION

Table A-17
Summary and Reconciliation of Participant Data
Total System

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2021	**33,644**	**2,575**	**1,060**	**7,491**	**2,507**	**24,147**	**4,200**	**75,624**
New Entrants	2,670	0	0	4	0	0	0	2,674
Returned to Work	248	(58)	(5)	(179)	0	(6)	0	0
Vested Terminations	(630)	631	0	0	0	(1)	0	0
Reciprocals	(19)	0	19	0	0	0	0	0
Non Vested Terminations	(1,001)	0	0	1,001	0	0	0	0
Refund/Withdrawal	(421)	(23)	(3)	(224)	0	0	0	(671)
Changes in Inactive Status	0	18	9	(27)	0	0	0	0
Retirements	(1,246)	(128)	(56)	(5)	0	1,435	0	0
Disabilities	(15)	(4)	(4)	0	64	(41)	0	0
Benefit Ceased*	(31)	(5)	(1)	(1)	(86)	(646)	(269)	(1,039)
New Continuants & Dissolutions	0	0	0	0	0	46	339	385
New Split Benefits	0	0	0	0	0	30	0	30
Other Adjustments	0	0	0	0	0	0	0	0
Participants as of 7/1/2022	**33,199**	**3,006**	**1,019**	**8,060**	**2,485**	**24,964**	**4,270**	**77,003**

* *Includes deaths and benefits that were terminated or suspended*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-18
Summary and Reconciliation of Participant Data
Police

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2021	**2,475**	**84**	**23**	**187**	**564**	**1,715**	**522**	**5,570**
New Entrants	38	0	0	0	0	0	0	38
Returned to Work	5	(3)	0	(2)	0	0	0	0
Vested Terminations	(68)	68	0	0	0	0	0	0
Reciprocals	(1)	0	1	0	0	0	0	0
Non Vested Terminations	(34)	0	0	34	0	0	0	0
Refund/Withdrawal	(25)	0	0	(7)	0	0	0	(32)
Changes in Inactive Status	0	0	2	(2)	0	0	0	0
Retirements	(112)	(7)	0	0	0	119	0	0
Disabilities	(9)	0	0	0	19	(10)	0	0
Benefit Ceased*	0	(1)	(1)	0	(14)	(34)	(34)	(84)
New Continuants & Dissolutions	0	0	0	0	0	11	34	45
New Split Benefits	0	0	0	0	0	1	0	1
Transferred In (From Fire)	0	0	0	0	0	0	0	0
Transferred In (From Misc)	0	0	0	0	0	0	0	0
Transferred Out (To Fire)	0	0	0	0	0	0	0	0
Transferred Out (To Misc)	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0
Participants as of 7/1/2022	**2,269**	**141**	**25**	**210**	**569**	**1,802**	**522**	**5,538**

* *Includes deaths and benefits that were terminated or suspended*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-19
Summary and Reconciliation of Participant Data
Fire

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2021	**1,599**	**35**	**20**	**29**	**654**	**1,176**	**393**	**3,906**
New Entrants	177	0	0	4	0	0	0	181
Returned to Work	0	0	0	0	0	0	0	0
Vested Terminations	(15)	15	0	0	0	0	0	0
Reciprocals	(1)	0	1	0	0	0	0	0
Non Vested Terminations	(7)	0	0	7	0	0	0	0
Refund/Withdrawal	(1)	0	0	(4)	0	0	0	(5)
Changes in Inactive Status	0	0	0	0	0	0	0	0
Retirements	(86)	(5)	(1)	0	0	92	0	0
Disabilities	(2)	0	0	0	17	(15)	0	0
Benefit Ceased*	0	(1)	0	0	(26)	(21)	(34)	(82)
New Continuants & Dissolutions	0	0	0	0	0	5	30	35
New Split Benefits	0	0	0	0	0	1	0	1
Transferred In (From Misc)	0	0	0	0	0	0	0	0
Transferred In (From Police)	0	0	0	0	0	0	0	0
Transferred Out (To Misc)	0	0	0	0	0	0	0	0
Transferred Out (To Police)	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0
Participants as of 7/1/2022	**1,664**	**44**	**20**	**36**	**645**	**1,238**	**389**	**4,036**

* *Includes deaths and benefits that were terminated or suspended*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-20
Summary and Reconciliation of Participant Data
Miscellaneous

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2021	**29,570**	**2,456**	**1,017**	**7,275**	**1,289**	**21,256**	**3,285**	**66,148**
New Entrants	2,455	0	0	0	0	0	0	2,455
Returned to Work	243	(55)	(5)	(177)	0	(6)	0	0
Vested Terminations	(547)	548	0	0	0	(1)	0	0
Reciprocals	(17)	0	17	0	0	0	0	0
Non Vested Terminations	(960)	0	0	960	0	0	0	0
Refund/Withdrawal	(395)	(23)	(3)	(213)	0	0	0	(634)
Changes in Inactive Status	0	18	7	(25)	0	0	0	0
Retirements	(1,048)	(116)	(55)	(5)	0	1,224	0	0
Disabilities	(4)	(4)	(4)	0	28	(16)	0	0
Benefit Ceased*	(31)	(3)	0	(1)	(46)	(591)	(201)	(873)
New Continuants & Dissolutions	0	0	0	0	0	30	275	305
New Split Benefits	0	0	0	0	0	28	0	28
Transferred In (From Fire)	0	0	0	0	0	0	0	0
Transferred In (From Police)	0	0	0	0	0	0	0	0
Transferred Out (To Fire)	0	0	0	0	0	0	0	0
Transferred Out (To Police)	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0
Participants as of 7/1/2022	**29,266**	**2,821**	**974**	**7,814**	**1,271**	**21,924**	**3,359**	**67,429**

* *Includes deaths and benefits that were terminated or suspended*

APPENDIX A – MEMBERSHIP INFORMATION

Data Assumptions and Methods

In preparing our valuation results, we relied on information supplied by the SFERS staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. Our methodology for obtaining the data used for the valuation is based upon the following assumptions and practices:

- Service for members on the "Active" data file was calculated using the field "Yrs Svc." Service buyback that has been paid for is added to the "Yrs Svc" field. Service buyback that is under contract, but not paid in full, as of the valuation date is assumed to be paid in full per the contract and this service is reflected in the projected benefit. An adjusted date of hire is retroactively calculated from the valuation date.

- Valuation Salary for the fiscal year ending 6/30/2022 is equal to "Cvd Pay" reported for full-time members hired before the beginning of the previous plan year, and the maximum of "Cvd Pay" and "Calc Pay," which is an annualized pay rate, reported for new hires. A minimum of $45,000 annual pay is used for all active members. Valuation Salary projected forward is the Valuation Salary for the prior fiscal year increased for merit according to our assumptions and for wage inflation in accordance with the latest Memorandum Of Understanding (MOUs):

    - Miscellaneous active members
        - 5.25% as of July 1, 2022
        - 2.50% as of July 1, 2023
        - 2.25% as of January 6, 2024
    - Police active members
        - 6.0% as of July 1, 2022 (2% deferred from July 1, 2020, 1% deferred from January 1, 2021, and 3% effective July 1, 2022)
    - Fire active members
        - 6.0% as of July 1, 2022 (3% deferred from July 1, 2020 and 3% effective July 1, 2022)

- Salary used to determine benefit amounts for active part-time members ("Sch" = "P") is calculated as the greater of "Cvd Pay" and "Calc Pay." The annual projected service for part-time members is the same as the service accrual in the previous year. For all other members, Valuation Salary is used to determine benefit amounts.

- Benefits in the valuation data for members in pay status for the Miscellaneous and New Safety Charters include the Basic COLAs effective July 1, 2022.

- The Basic COLAs effective July 1, 2022 for the Old Safety Charter retirees were estimated based on data provided by SFERS and included in the July 1, 2022 benefit.

APPENDIX A – MEMBERSHIP INFORMATION

- Benefit increases for members who retired before November 6, 1996 were provided by SFERS in a separate data file and included in determining the July 1, 2022 valuation liabilities.

- No Supplemental COLA benefits were granted as of July 1, 2022. Thus, there were no adjustments made to the benefits provided in the valuation data for a Supplemental COLA.

- Records on the "Active" data file are considered to be Active if they have a status of "AM" or "RT" which mean active, no "Job End Date or the "Job End Date" is after 6/30/2022, and do not have a retiree record and their "Cvd Pay" is greater than $0.

- For accounts having duplicate records based on Social Security Number in the "Active" data file, the records are added together for fields "Cvd Pay," "Contribs," "Interest," "Shortage," "Short Int," and "Yrs Svc." The other data in the record is determined by the record which is considered open ("Plan Stat" = "O") with the most recent "Membership Date."

- Records on the "Active" data file are considered to be Inactive if they have a status of "VM," which means vested or they have a status of "AM" but their "Job End Date" is prior to 6/30/2022, or their "Cvd Pay" is $0. If these inactive members have less than 5 years of service (non-vested), they are assumed to receive a lump sum distribution on the valuation date. If these inactive members have 5 or more years of service (vested), they are assumed to have elected a deferred benefit and to retire at age 55 for non-reciprocal Miscellaneous and Safety Prop C members. The assumed retirement age for reciprocal Miscellaneous members is 60. The assumed retirement age for Safety non-Prop C members is 51.

- For Safety members, the deferred benefit is estimated using Final Average Compensation multiplied by years of service (including service purchased) multiplied by the appropriate age factor. For Miscellaneous members, the deferred benefit at retirement is 200% of the member's contribution account balance with interest as of the valuation date projected with the assumed interest crediting rate to the assumed retirement age and then divided by the appropriate annuity factor from Table 12 of the Operating Tables. When there are deferred vested Miscellaneous Prop C members, their deferred benefit will be calculated the same except 200% will be replaced by 150%.

- Members on the "Inactive" data file are assumed to have elected a refund and receive a lump sum distribution on the valuation date if their "Withdrawal Date" is on or after the valuation date. If their "Withdrawal Date" is before the valuation date, they are assumed to have taken a full refund prior to the valuation date.

- Records on the "Retiree" file are considered in pay status if their benefit is not suspended or terminated.

APPENDIX A – MEMBERSHIP INFORMATION

- Members may retire and receive benefits under multiple Charter sections (e.g., a police officer can have two benefits, one for the service during the academy training which is considered Miscellaneous service and a second benefit for all other service as a police officer). For active members who are reported with a Safety benefit and a Miscellaneous benefit with less than two years of service, their benefits are added together and valued as a single record under the Safety Charter section. For all other members who are reported with multiple benefits, we value each component of the member's benefit separately under the applicable Charter section. Consequently, the active member counts reported in this valuation are slightly higher than the actual number of members due to some individual members being reported under multiple groups.

- We assume any member reported in last year's "Retiree" file and not in this year's file is deceased without a beneficiary and is removed from the valuation data.

- We assume all deceased members with payments continuing to a beneficiary have been reported in the "Retiree" file.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

All demographic assumptions and the price and wage inflation assumptions were adopted at the December 9, 2020 Board meeting based on our recommendations. Please refer to the demographic experience study report dated August 2020 for the rationale for the demographic assumptions and the presentation dated December 9, 2020 for the rationale for the price and wage inflation assumptions. The discount rate was adopted at the November 10, 2021 Board meeting. Please refer to the October 13, 2021 Board presentation for the rationale for the discount rate. We believe all assumptions are reasonable for the purpose of the measurement.

1. Discount Rate

SFERS assets are assumed to earn 7.20% net of investment expenses.

2. Price Inflation

Consumer Price Inflation: 2.50% compounded annually

3. Wage Inflation

Bargained increases through July 1, 2023 followed by 3.25% compounded annually thereafter.

4. Amortization Payment Increase Rate

Amortization payments increase at the rate of 3.25% compounded annually

5. Administrative Expenses

Administrative expenses are assumed to equal 0.60% of payroll.

6. Interest Credited to Member Contributions

4.50%, compounded annually.

7. 401(a)(17) Maximum Compensation Limit

The compensation limit in Section 401(a)(17) of the Internal Revenue Code is assumed to increase with price inflation. In the valuation, compensation limits are only applied to members of new plans created by Proposition C for whom compensation is limited to a percentage of the 401(a)(17) compensation limit.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

8. 415(b) Maximum Benefit Limit

The 415(b) limits have been applied to active members' current and future benefits. The 415(b) limit is assumed to increase with price inflation. The 415(b) limit has also been applied to the retiree members who were in excess of the 415(b) limit in 2021. The projected increase in the 415(b) limit for retirees is the same increase as their Basic COLA which depends on their Charter.

9. Salary Increase Rate

Wage inflation component: Bargained increases through July 1, 2022 for Safety members and through January 6, 2024 for Miscellaneous members, followed by 3.25% compounded annually thereafter.

Table B-1
Current Bargained Wage Increases

Date of Increase	Police	Fire	Misc
6/30/2022	3.0%	3.0%	N/A
7/1/2022	3.0%	3.0%	5.3%
7/1/2023	N/A	N/A	2.5%
1/6/2024	N/A	N/A	2.3%

The additional merit component:

Table B-2
Salary Merit Increases - Sample Rates

Years of Service	Police	Fire	Muni Drivers	Craft	Misc
0	7.50%	14.00%	16.00%	3.75%	5.50%
1	6.75	10.00	11.00	3.00	4.50
2	6.00	8.00	6.50	2.40	3.75
3	5.25	6.00	3.50	1.80	3.25
4	4.50	5.00	1.75	1.50	2.75
5	3.75	4.00	1.25	1.20	2.25
10	1.50	1.50	0.30	0.50	1.10
15	0.50	0.50	0.00	0.50	0.55
20 & over	0.50	0.50	0.00	0.50	0.30

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Extra covered wages in the last year before service retirement are assumed to be as follows:

Table B-3	
Safety	3.0%
Muni Drivers	4.5%
Craft Workers	3.0%
Miscellaneous	2.0%

10. Cost-of-Living Increase in Benefits

Basic COLA

Old Plans – Miscellaneous	2.0% per year
New Plans – Police, Fire, and Miscellaneous	2.0% per year
Old Plans – Police and Fire, Charters 8.559 and 8.585	3.6% per year
Old Plans – Police and Fire, Charters 8.595 and 8.596	2.5% per year
Old Plans – Police and Fire, pre-7/1/75 dates of retirement	1.9% per year

Old Safety COLA assumptions are based on the following formula rounded up to one decimal place:

$$(\text{Wage Inflation} + \text{Ultimate Merit}) \div 2 \times \text{Factor}$$

For retirements after 6/30/75, the Factor represents the ratio of the average salary for the last position held to the average pension benefit.

For Charters 8.559 and 8.585, the factor is 1.9
For Charters 8.595 and 8.596, the factor is 1.3
For pre-7/1/75 dates of retirement, the factor is 1.0

Supplemental COLA

For purposes of the actuarial valuation and the determination of contribution rates for FYE 2024, future Supplemental COLAs are assumed to be 0%.

For purposes of the projections, in years when the return equals the assumption, future Supplemental COLAs are assumed to be granted approximately:

- 50% of the time for members who are eligible for a Supplemental COLA regardless of the System's funded status, and
- 50% for FYE 2024 gradually decreasing to 35% for FYE 2037 and later for members who are eligible for a Supplemental COLA only if the System is also 100% funded.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

In years when the return differs from the assumption, Supplemental COLAs are estimated based on the investment return.

11. Rates of Termination of Employment

Sample rates of termination by age and service for Miscellaneous members are shown below.

Table B-4
Misc. Rates of Termination by Age and Service Years

Service	Age: Under 30	Age: 30 to 39	Age: 40 & over
0	38.00%	24.00%	20.00%
1	20.00	12.00	9.00
2	14.00	9.00	6.00
3	10.00	7.00	4.80
4	7.50	6.50	4.60
5	6.75	6.00	4.40
10	3.75	3.75	3.75
15	2.25	2.25	2.25
20+	1.00	1.00	1.00

Sample rates of termination by service for Police, Fire, Muni Drivers, and Craft members are shown below.

Table B-5
Rates of Termination

Service	Police	Fire	Muni Drivers	Craft
0	8.00%	2.50%	12.00%	9.50%
1	5.00	1.00	5.00	6.50
2	2.00	1.00	4.00	5.75
3	1.50	1.00	3.50	4.50
4	1.00	1.00	3.25	3.50
5	1.00	1.00	3.00	3.25
10	0.75	0.50	2.50	1.75
15	0.50	0.25	2.50	1.75
20+	0.50	0.25	2.50	1.75

When members are eligible to retire, it is assumed that their termination rates are zero. 20% of Miscellaneous and 40% of Safety terminating employees are assumed to

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

subsequently work for a reciprocal employer and receive pay increases equal to the wage inflation assumption.

In estimating termination benefits for Miscellaneous members, it is assumed that employee contribution rates are, on average, not changed by the floating contribution rate provisions of Proposition C.

12. Member Refunds

Non-vested terminated members are assumed to receive a refund of their contributions with interest. Sample rates of refund for terminated vested members are shown below.

Table B-6
Vested Terminated Rates of Refund

Service	Police & Fire	Miscellaneous
5	24.0%	20.0%
6	20.0	15.0
7	16.0	12.0
8	12.0	10.0
9	8.0	9.0
10	4.0	8.5
15	0.0	6.0
20	0.0	0.0

In estimating refund amounts, it is assumed that future employee contribution rates are, on average, not changed by the floating contribution rate provisions of Proposition C.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

13. Rates of Disability

Sample disability rates of active participants are provided below. 100% of safety and 0% of Miscellaneous disabilities are assumed to be duty related.

Table B-7
Rates of Disability at Selected Ages

Age	Police	Fire	Muni Drivers	Craft	Misc Females	Misc Males
30	0.05%	0.04%	0.01%	0.01%	0.01%	0.01%
35	0.14	0.09	0.06	0.06	0.04	0.04
40	0.35	0.24	0.11	0.11	0.07	0.08
45	0.44	0.42	0.17	0.20	0.15	0.11
50	0.90	0.84	0.45	0.40	0.40	0.28
55	3.30	3.50	1.35	0.75	0.55	0.45
60	5.75	7.30	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00

Table B-8
Level of duty disability benefits
(if projected to be disabled before service retirement eligibility)

Police	55% of pay
Fire	55% of pay

14. Base Rates of Mortality for Healthy Lives

The mortality rates used in the valuation are developed from a base table that is projected generationally from the base year of that table using the mortality projection scale described below. Base mortality tables are developed by multiplying a published table by an adjustment factor that was developed in the experience study for the period ending June 30, 2019. The base mortality tables for healthy lives are described on the following page.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Table B-9

	Published Table	Adjustment Factor Male	Adjustment Factor Female
Non-Annuitants			
Miscellaneous	PubG-2010 Employee	0.834	0.866
Safety	PubS-2010 Employee	1.011	0.979
Retirees			
Miscellaneous	PubG-2010 Retiree	1.031	0.977
Safety	PubS-2010 Retiree	0.947	1.044
Beneficiaries			
Miscellaneous	PubG-2010 Retiree	1.031	0.977
Safety	PubG-2010 Retiree	1.031	0.977

For active members, 25% of Safety deaths and 0% of Miscellaneous deaths are assumed to be duty related.

15. Base Rates of Mortality for Retired Disabled Lives

For disabled annuitant mortality, separate base tables are developed for males and females and for Miscellaneous and Safety members by multiplying a published table by an adjustment factor that was developed in the experience study for the period ending June 30, 2019. The base mortality tables for disabled annuitant lives are described below.

Table B-10

	Published Table	Adjustment Factor Male	Adjustment Factor Female
Disabled Annuitants			
Miscellaneous	PubG-2010 Disabled	1.045	1.003
Safety	PubS-2010 Disabled	0.916	0.995

16. Mortality Projection Scale

The mortality rates shown in the base tables above are projected generationally from the base year using the MP-2019 projection scale.

17. Rates of Retirement

Rates of retirement are based on age and service according to the tables on the following pages. Separate rates are used for members hired on or after January 7, 2012 under Charter Sections A8.603 and above (Prop C).

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Table B-11
Police Rates of Retirement

	Other than Prop C Years of Service			Prop C Years of Service		
Age	< 25	25 - 29	30 +	< 25	25 - 29	30 +
50	1.50%	5.00%	5.00%	1.50%	5.00%	5.00%
51	1.50	5.00	15.00	1.50	5.00	10.00
52	2.00	7.50	20.00	2.00	7.50	20.00
53	5.00	20.00	40.00	5.00	15.00	25.00
54	7.50	22.00	50.00	7.50	17.50	30.00
55	7.50	35.00	50.00	7.50	20.00	35.00
56	7.50	26.00	40.00	7.50	24.00	35.00
57	10.00	28.00	45.00	10.00	26.00	40.00
58	10.00	30.00	45.00	10.00	35.00	60.00
59	15.00	25.00	45.00	15.00	25.00	45.00
60	20.00	34.00	45.00	20.00	34.00	45.00
61	10.00	36.00	40.00	10.00	36.00	40.00
62	15.00	36.00	40.00	15.00	36.00	40.00
63	12.50	36.00	40.00	12.50	36.00	40.00
64	12.50	36.00	40.00	12.50	36.00	40.00
65 & over	100.00	100.00	100.00	100.00	100.00	100.00

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Table B-12
Fire Rates of Retirement

	Other than Prop C Years of Service			Prop C Years of Service		
Age	< 25	25 - 29	30 +	< 25	25 - 29	30 +
50	2.00%	5.00%	5.00%	2.00%	2.00%	2.00%
51	1.00	5.00	5.00	1.00	2.00	2.00
52	2.00	5.00	5.00	2.00	5.00	5.00
53	3.00	5.00	15.00	3.00	5.00	12.50
54	7.50	20.00	35.00	7.50	12.50	20.00
55	7.50	25.00	35.00	7.50	15.00	25.00
56	7.50	20.00	35.00	7.50	15.00	30.00
57	12.50	20.00	35.00	12.50	15.00	30.00
58	12.50	20.00	25.00	12.50	30.00	35.00
59	12.50	25.00	25.00	12.50	25.00	25.00
60	15.00	25.00	35.00	15.00	25.00	35.00
61	15.00	40.00	40.00	15.00	40.00	40.00
62	15.00	40.00	40.00	15.00	40.00	40.00
63	15.00	20.00	25.00	15.00	20.00	25.00
64	20.00	20.00	25.00	20.00	20.00	25.00
65 & over	100.00	100.00	100.00	100.00	100.00	100.00

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Table B-13
Muni Drivers Rates of Retirement

	Other than Prop C Years of Service			Prop C Years of Service		
Age	**< 20**	**20 - 29**	**30 +**	**< 20**	**20 - 29**	**30 +**
50	0.00%	1.00%	1.50%	0.00%	0.00%	0.00%
51	0.00	1.00	1.50	0.00	0.00	0.00
52	0.00	1.00	1.50	0.00	0.00	0.00
53	0.00	1.00	1.50	0.00	1.00	1.50
54	0.00	1.00	1.50	0.00	1.00	1.50
55	0.00	4.00	5.00	0.00	1.00	5.00
56	0.00	4.00	5.00	0.00	1.00	5.00
57	0.00	4.00	5.00	0.00	2.00	5.00
58	0.00	4.00	5.00	0.00	2.00	5.00
59	0.00	4.00	5.00	0.00	2.00	5.00
60	10.00	10.00	20.00	5.00	10.00	15.00
61	12.50	25.00	30.00	7.50	12.50	20.00
62	20.00	32.50	35.00	10.00	15.00	30.00
63	15.00	30.00	30.00	10.00	20.00	25.00
64	15.00	30.00	30.00	10.00	25.00	25.00
65	27.50	30.00	35.00	27.50	30.00	40.00
66	27.50	30.00	35.00	27.50	30.00	35.00
67	27.50	30.00	35.00	27.50	30.00	35.00
68	27.50	30.00	35.00	27.50	30.00	35.00
69	27.50	30.00	35.00	27.50	30.00	35.00
70 & over	100.00	100.00	100.00	100.00	100.00	100.00

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Table B-14
Craft Rates of Retirement

	Other than Prop C Years of Service			Prop C Years of Service		
Age	< 20	20 - 29	30 +	< 20	20 - 29	30 +
50	0.00%	1.50%	1.50%	0.00%	0.00%	0.00%
51	0.00	1.50	1.50	0.00	0.00	0.00
52	0.00	1.50	1.50	0.00	0.00	0.00
53	0.00	2.50	4.00	0.00	1.50	1.50
54	0.00	2.50	4.00	0.00	1.50	1.50
55	0.00	2.50	5.00	0.00	1.50	2.50
56	0.00	3.00	5.00	0.00	1.50	2.50
57	0.00	3.00	5.00	0.00	2.00	2.50
58	0.00	3.00	5.00	0.00	2.00	5.00
59	0.00	8.00	20.00	0.00	2.00	10.00
60	7.50	12.00	32.50	5.00	7.50	15.00
61	10.00	20.00	35.00	7.50	12.50	20.00
62	20.00	30.00	37.50	17.50	25.00	30.00
63	10.00	25.00	30.00	10.00	17.50	25.00
64	17.50	25.00	30.00	10.00	17.50	25.00
65	25.00	27.50	30.00	25.00	30.00	40.00
66	27.50	30.00	32.50	27.50	30.00	32.50
67	27.50	30.00	32.50	27.50	30.00	32.50
68	15.00	25.00	30.00	15.00	25.00	30.00
69	15.00	25.00	30.00	15.00	25.00	30.00
70 & over	100.00	100.00	100.00	100.00	100.00	100.00

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Table B-15
Miscellaneous Rates of Retirement

	Other than Prop C Years of Service			Prop C Years of Service		
Age	< 20	20 - 29	30 +	< 20	20 - 29	30 +
50	0.00%	2.75%	3.50%	0.00%	0.00%	0.00%
51	0.00	2.50	3.50	0.00	0.00	0.00
52	0.00	2.50	3.50	0.00	0.00	0.00
53	0.00	3.25	3.50	0.00	3.25	3.25
54	0.00	4.00	4.00	0.00	4.00	4.00
55	0.00	4.00	5.50	0.00	4.00	4.00
56	0.00	4.25	6.75	0.00	4.25	4.25
57	0.00	4.50	8.75	0.00	4.50	4.50
58	0.00	5.00	10.00	0.00	5.00	7.50
59	0.00	8.75	20.00	0.00	8.75	10.00
60	9.00	11.50	30.00	7.50	10.00	12.50
61	13.25	20.00	35.00	10.00	15.00	15.00
62	20.00	30.00	35.00	17.50	25.00	25.00
63	16.00	22.50	30.00	12.50	17.50	20.00
64	16.00	22.50	30.00	12.50	17.50	20.00
65	20.00	30.00	30.00	25.00	40.00	40.00
66	25.00	30.00	35.00	25.00	30.00	35.00
67	25.00	30.00	35.00	25.00	30.00	35.00
68	20.00	30.00	30.00	20.00	30.00	30.00
69	20.00	30.00	30.00	20.00	30.00	30.00
70	25.00	25.00	30.00	25.00	25.00	30.00
71	25.00	25.00	30.00	25.00	25.00	30.00
72	25.00	25.00	30.00	25.00	25.00	30.00
73	25.00	25.00	30.00	25.00	25.00	30.00
74	25.00	25.00	30.00	25.00	25.00	30.00
75 & over	100.00	100.00	100.00	100.00	100.00	100.00

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

The assumed retirement age for inactive terminated vested members and actives who are expected to terminate is shown below.

Table B-16 Deferred Retirement Age		
	Non-Prop C	**Prop C**
Safety	51	55
	Non-Reciprocal	**Reciprocal**
Miscellaneous	55	60

18. Family Composition

The percentage assumed to be married (including assumption for Domestic Partners, 1994 Proposition H) is shown below. Spouses of male members are assumed to be three years younger than the member and spouses of female members are assumed to be two years older than the member.

Table B-17 Percentage Married	
Safety Males	80%
Safety Females	60
Miscellaneous Males	75
Miscellaneous Females	55

19. Deferred Member Benefit Amount

The benefit was estimated based on information provided by SFERS staff. The data used to estimate the deferred benefit were date of birth, date of hire, date of termination, and last pay. Based on the data provided, service credit, highest average salary, and deferred retirement age were estimated. The estimates were used to compute the retirement benefit, upon which the liabilities are based. For those members without sufficient data or service, accumulated member contribution balances, with interest, were used as the Actuarial Liability.

20. Timing of Contributions

Employer and employee contributions are made throughout the year.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

21. Changes Since Last Valuation

None.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Contribution Allocation Procedure

The contribution allocation procedure primarily consists of an actuarial cost method, an asset smoothing method, and an amortization method as described below. All components of the contribution allocation procedure were established prior to the July 1, 2008 actuarial valuation except the amortization method, which was most recently modified by the Board at their November 10, 2021 meeting.

1. Actuarial Cost Method

The Entry Age Actuarial Cost Method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of hire and assumed termination of employment. The normal costs calculated relate only to current member payroll. The Actuarial Liability is the difference between the present value of future benefits and the present value of future normal cost.

2. Asset Valuation Method

For the purposes of determining the Employer's contribution to SFERS, we use the Actuarial Value of Assets. The asset adjustment method dampens the volatility in asset values that could occur because of the fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process.

The actuarial value is calculated by recognizing 20% of each of the past five years of actual investment returns compared to the expected return (7.20% for the year ending 2022, 7.40% for the years ending 2019-2021, and 7.50% for the year ending 2018) on the actuarial asset value. The expected return on Actuarial Value of Assets is determined using SFERS actual cash flows and the assumed return. The balance of the actual investment experience is recognized in a similar fashion in future years.

This asset smoothing method started with the market value as of July 1, 2004.

3. Amortization Method

Any Charter change prior to July 1, 2014 has been amortized over 20 years from the date it was first recognized in the valuation. After July 1, 2014, any changes to active member benefits are amortized over a closed 15-year period, and any new changes to inactive or retired member benefits, including Supplemental COLAs, are amortized over a closed five-year period.

The UAL not attributable to Charter changes as of July 1, 2013, was amortized over a closed 19-year period as of July 1, 2014. Any sources of UAL due to actuarial gains and

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

losses, assumption changes, or method changes are amortized over closed, layered 20-year periods.

If the System becomes 100% funded based on the Actuarial Value of Assets, any subsequent unexpected changes in the UAL are amortized over a rolling 20-year period until the System is no longer 100% funded.

Effective with the July 1, 2021 valuation, the remaining amortization periods for assumption changes prior to July 1, 2021 and all prior actuarial gains and losses (including the gain for 2021) were reduced to 5 years.

All amortization payment amounts increase each year at the assumed wage inflation rate.

4. Changes Since Last Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(OLD POLICE AND FIRE)

I. Old Police and Fire Members – Charter Sections 8.559 and 8.595 (Police) and 8.585 and 8.596 (Fire)

1. Membership Requirement

Charter Sections 8.559 and 8.585
Police Officers and Firefighters who became members before November 2, 1976 and retired on or before December 31, 2002 without electing membership in another Section.

Charter Sections 8.595 and 8.596
Active members on November 5, 2002 in Section 8.559 (Police) or Section 8.585 (Fire) who elected to switch to Section 8.595 (Police) or Section 8.596 (Fire) by December 31, 2002.

2. Final Compensation

Monthly salary earnable at the final rank held at termination date, or monthly salary at next lower rank if final rank held for less than one year.

3. Credited Service

One year of service credit is given for each fiscal year with 10 or more full months worked. A partial year (fraction with the numerator equal to months including partial months, and the denominator equal to 10) is given for each fiscal year with less than 10 full months worked.

4. Member Contributions

a. Member:
7.0% of salary, excluding overtime and most premium pay. These contributions are credited with interest annually as determined by the Board.

Charter Sections 8.585, 8.595, and 8.596
Depending on the employer contribution rate, the member contribution rate can increase or decrease by up to 6% of pay.

b. Employer:

The Employer contributes the remaining amounts necessary to maintain the soundness of the Retirement System. Any decrease in the member contribution rate is paid by the City.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(OLD POLICE AND FIRE)

5. Service Retirement

Eligibility

Age 50 with 25 years of Credited Service.

Benefit – Member

Charter Sections 8.559 and 8.585
55% of Final Compensation plus an additional 4% of Final Compensation for each year of credited service in excess of 25 years, subject to a maximum of 75% of Final Compensation.

Charter Sections 8.595 and 8.596
A specified percent of Final Compensation based on the member's age at retirement (factors shown in Table C-1 below) for each year of Credited Service, subject to a maximum of 90% of Final Compensation.

Table C-1
City and County of San Francisco Employees' Retirement System
Sections 8.595 (Police) and 8.596 (Fire) – Service Retirement Factors

Retirement Age	Retirement Factors
50	2.40%
51	2.52%
52	2.64%
53	2.76%
54	2.88%
55 or above	3.00%

Benefit – Survivor

75% of the service retirement benefit paid to a qualified survivor.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(OLD POLICE AND FIRE)

6. Non-Industrial Disability

Eligibility

10 years of Credited Service.

Benefit – Member

At least 10 but less than 25 years of Credited Service:
1.5% of Final Compensation for each year of Credited Service between 10 and 25 years, subject to a minimum of 33.3% and a maximum of 75% of Final Compensation for Charter Sections 8.559 and 8.585 or 90% of Final Compensation for Charter Sections 8.595 and 8.596.

At least 25 years of Credited Service:
Service retirement benefit determined at date of disability.

Benefit – Survivor

75% of the disability retirement benefit paid to a qualified survivor.

7. Industrial Disability

Eligibility

No age or service requirement.

Benefit – Member

If Not Eligible for Service Retirement:
Final Compensation times a percentage of disability, subject to a minimum of 50% and a maximum of 90%, as determined by the Workers' Compensation Appeals Board. Once the member becomes eligible for service retirement, assuming that member earned service and salary increases during the period of disability, the benefit is recalculated using the service and salary rate for the current rank held. The recalculated benefit is based on a minimum of 55% of Final Compensation.

If Eligible for Service Retirement:
Service retirement benefit determined at date of disability, but not less than 55% of Final Compensation.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (OLD POLICE AND FIRE)

Benefit – Survivor

If Not Eligible for Service Retirement:
100% of the disability retirement benefit paid to a qualified survivor. Once the member would have become eligible for service retirement, assuming that member earned service and salary increases from the date of disability to the eligible service retirement date, the benefit is recalculated at 100% of the service retirement benefit, using the service and salary at the eligible service retirement date, not less than 55% of Final Compensation.

If Eligible for Service Retirement:
100% of the disability retirement benefit paid to a qualified survivor, not less than 55% of Final Compensation.

8. Death while an Active Employee

If Death is due to a Non-Work-Related Cause:

a. Less than 10 Years of Credited Service, or No Qualified Survivor – Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus six months' salary to a designated beneficiary.

b. At least 10 but less than 25 years of Credited Service – Monthly continuation allowance to a qualified survivor equal to the non-industrial disability benefit the member would have been entitled to on the date of death, subject to a minimum of 33.3% of compensation at the time of death.

c. At Least 25 Years of Credited Service but Less than Age 50 – Monthly continuation allowance to a qualified survivor equal to 75% of the monthly service retirement benefit the member would have received had the member been age 50 and retired on the date of death.

d. Eligible for Service Retirement – Monthly continuation allowance to a qualified survivor equal to 75% of the monthly service retirement benefit the member would have received had the member been retired on the date of death.

If Death is due to a Work-Related Cause:

a. No Qualified Survivor – Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus six months' salary to a designated beneficiary. If the death is of a violent nature, an additional lump sum equivalent benefit equal to 12 months' salary is payable.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (OLD POLICE AND FIRE)

b. Qualified Survivor and Not Eligible for Service Retirement – Monthly continuation allowance to a qualified survivor equal to the salary at the date of death. Once the member would have become eligible for service retirement, assuming that member earned service and salary increases from the date of death to the eligible service retirement date, the benefit is recalculated at 100% of the service retirement benefit, using the service and salary at the eligible service retirement date, such allowance shall not be less than 55% of Final Compensation.

c. Qualified Survivor and Eligible for Service Retirement – Monthly continuation allowance to a qualified survivor equal to 100% of the monthly service retirement benefit the member would have received had the member been retired on the date of death, but such allowance shall not be less than 55% of Final Compensation.

9. Withdrawal Benefits

Less than five years of Credited Service:
Lump sum benefit equal to the accumulated employee contributions with interest.

Five or more years of Credited Service:
The member may choose one of the following:

a. Lump sum benefit equal to the accumulated employee contributions with interest.

b. ***Charter Sections 8.559 and 8.585:*** Retirement benefit first payable at age 50 equal to 55% of Final Compensation at termination, multiplied by a service fraction, the numerator being the Credited Service of the member at termination, and a denominator of 25.

   Charter Sections 8.595 and 8.596: A specified percent of Final Compensation based on the member's age at retirement (factors shown in Table C-1) for each year of Credited Service, subject to a maximum of 90% of Final Compensation.

   Cost-of-living adjustments are prorated if the member's accrued service is less than 25 years. COLA will be multiplied by a fraction where the denominator is 25 and the numerator is equal to service at date of termination.

10. Additional Post-retirement Death Benefit

A death benefit payable as a lump sum equal to $100 for each full year of Credited Service, subject to a maximum of $3,000, will be paid to a qualified survivor upon the member's death.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(OLD POLICE AND FIRE)

11. Post-retirement Cost-of-Living Benefit

Basic

Monthly benefits are adjusted by 50% of the actual dollar increase or decrease (50% of the percentage increase or decrease for members under Proposition H) in the salary rank or position the member's Final Compensation used to calculate the monthly benefit was based on. A member's monthly benefit will never decrease below its original amount.

Supplemental

Effective July 1 of each fiscal year, if the Retirement System was fully funded based on the Market Value of Assets for the previous year and there are sufficient "excess" investment earnings on the Retirement fund for the previous fiscal year-end, the adjustment could be increased to 3.5% of that member's current monthly benefit less the amount of the Basic COLA above. If "excess" earnings are insufficient to fund a 3.5% increase, then to the extent of "excess" earnings, benefits are increased in increments of 0.5% up to a maximum of 3.5%. For members who worked after November 6, 1996, and before Proposition C passed in 2012, the Supplemental COLA is payable if there are "excess" investment earnings regardless of whether or not the System was fully funded.

12. Changes in this Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(NEW POLICE AND FIRE)

II. New Police and Fire Members – Charter Sections (Police) 8.586, 8.597, 8.602, and 8.605; (Fire) 8.588, 8.598, 8.601, and 8.604; (Sheriff's Department) 8.608; (Miscellaneous Safety) 8.610

1. Membership Requirement

Charter Sections 8.586 and 8.588
Police Officers and Firefighters who became members on or after November 2, 1976.

Charter Sections 8.597 and 8.598
Active members on January 1, 2003 in Section 8.586 (Police) or Section 8.588 (Fire) who had elected to switch to Section 8.597 (Police) or Section 8.598 (Fire) by December 31, 2002; or, new members becoming active on or after January 1, 2003 in Section 8.597 (Police) or Section 8.598 (Fire).

Charter Sections 8.601 and 8.602
Persons who become members of the fire or police department on or after July 1, 2010 and prior to January 7, 2012.

Charter Sections 8.604 and 8.605
Persons who become members of the fire or police department on or after January 7, 2012.

Charter Section 8.608
Sheriff, undersheriffs, and all deputized personnel of the sheriff's department hired on or after January 7, 2012.

Charter Section 8.610
Miscellaneous Safety members hired on or after January 7, 2012.

2. Final Compensation

Charter Sections 8.586, 8.588, 8.597, and 8.598
Average monthly total compensation earnable during any 12 months of Credited Service which average compensation is the highest.

(Pre 1998 – 3 year average of monthly compensation)

Charter Sections 8.601 and 8.602
Average monthly total compensation earnable during the higher of any two consecutive fiscal years of earnings or the twenty-four months of earnings immediately prior to retirement.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(NEW POLICE AND FIRE)

Charter Sections 8.604, 8.605, 8.608, and 8.610
Average monthly total compensation earnable during the higher of any three consecutive fiscal years of earnings or the thirty-six months of earnings immediately prior to retirement. Compensation for any fiscal year shall not include remuneration that exceeds 75% of the IRC 401(a)(17) compensation limit.

3. Credited Service

One year of service credit is given for each fiscal year with 10 or more full months worked. A partial year (fraction with the numerator equal to months including partial months, and the denominator equal to 10) is given for each fiscal year with less than 10 full months worked.

4. Member Contributions

a. Member:

Charter Sections 8.586, 8.588, 8.597, and 8.598
7.5% of salary, excluding overtime and most premium pay. These contributions are credited with interest annually as determined by the Board.

Depending on the employer contribution rate, the member contribution rate can increase or decrease by up to 6% of pay.

Charter Sections 8.601, 8.602, 8.604, 8.605, 8.608, and 8.610
9.0% of salary, excluding overtime and most premium pay. These contributions are credited with interest annually as determined by the Board.

Depending on the employer contribution rate, the member contribution rate can increase or decrease by up to 4% of pay if the base pay rate is less than $48 per hour or up to 5% of pay if the base pay rate is at or greater than $48 per hour.

b. Employer:

The Employer contributes the remaining amounts necessary to maintain the soundness of the Retirement System. Any decrease in the member contribution rate is paid by the City.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(NEW POLICE AND FIRE)

5. Service Retirement

Eligibility

Age 50 with 5 years of Credited Service. ***(Pre 1998 – 50 with 25 years of Credited Service)***

Benefit – Member

Charter Sections 8.586 and 8.588
The monthly service retirement benefit is the greater of i) and ii) below, subject to a maximum of 75% of Final Compensation ***(Pre 1998 – 70%)***

i) 2% of Final Compensation for each of the first 25 years of service plus an additional 3% of Average Compensation for each year of Credited Service in excess of 25 years; ***(Pre 1998 – benefit is calculated under i) only);***

ii) A specified percent of Final Compensation based on the member's age at retirement (factors shown in Table C-2 below) for each year of Credited Service.

Table C-2
City and County of San Francisco Employees' Retirement System
Sections 8.586 (Police) and 8.588 (Fire) – Service Retirement Factors

Retirement Age	Retirement Factors
50	2.00%
51	2.14%
52	2.28%
53	2.42%
54	2.56%
55 or above	2.70%

APPENDIX C – SUMMARY OF PLAN PROVISIONS (NEW POLICE AND FIRE)

Charter Sections 8.597, 8.598, 8.601, and 8.602

A specified percent of Final Compensation based on the member's age at retirement (factors shown in Table C-3 below) for each year of Credited Service, subject to a maximum of 90% of Final Compensation.

Table C-3
City and County of San Francisco Employees' Retirement System
Sections 8.597 and 8.601 (Police), 8.598 and 8.602 (Fire)
Service Retirement Factors

Retirement Age	Retirement Factors
50	2.40%
51	2.52%
52	2.64%
53	2.76%
54	2.88%
55 or above	3.00%

Charter Sections 8.604, 8.605, and 8.608

A specified percent of Final Compensation based on the member's age at retirement (factors shown in Table C-4 below) for each year of Credited Service, subject to a maximum of 90% of Final Compensation.

Table C-4
City and County of San Francisco Employees' Retirement System
Sections 8.605 (Police), 8.604 (Fire) and 8.608 (Sheriff's Department) – Service Retirement Factors

Retirement Age	Retirement Factors
50	2.20%
51	2.30%
52	2.40%
53	2.50%
54	2.60%
55	2.70%
56	2.80%
57	2.90%
58 and above	3.00%

APPENDIX C – SUMMARY OF PLAN PROVISIONS (NEW POLICE AND FIRE)

Charter Sections 8.610

A specified percent of Final Compensation based on the member's age at retirement (factors shown in Table C-5 below) for each year of Credited Service, subject to a maximum of 90% of Final Compensation.

Table C-5
City and County of San Francisco Employees' Retirement System
Section 8.610 (Miscellaneous Safety) – Service Retirement Factors

Retirement Age	Retirement Factors
50	1.800%
51	1.912%
52	2.020%
53	2.132%
54	2.244%
55	2.356%
56	2.468%
57	2.590%
58 or above	2.700%

<u>Benefit – Survivor</u>

50% of the service retirement benefit paid to a qualified survivor.

6. Non-Industrial Disability

<u>Eligibility</u>

10 years of Credited Service.

<u>Benefit – Member</u>

1.5% of Average Compensation for each year of Credited Service, subject to a minimum of 33.3% of Final Compensation, subject to a maximum of 75% of Final Compensation for Charter Sections 8.586 and 8.588 or 90% of Final Compensation for all other Charter Sections.

<u>Benefit – Survivor</u>

50% of the disability retirement benefit paid to a qualified survivor.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (NEW POLICE AND FIRE)

7. Industrial Disability

Eligibility

No age or service requirement.

Benefit – Member

Less than age 50 with 25 Years of Service:
Final Compensation times a percentage of disability, subject to a minimum of 50% and a maximum of 90%, as determined by the Workers' Compensation Appeals Board. If the member is age 50 with 5 years of service, the disability benefit is the service retirement allowance, but not less than 50% of Final Compensation. Once the member becomes eligible for qualified service retirement, assuming that member earned service and salary increases during the period of disability, the benefit is recalculated using the service and salary rate for the rank held at retirement. The recalculated benefit is based on a minimum of 50% of Final Compensation (not to exceed 90% of Final Compensation for Charter Sections 8.597, 8.598, 8.601, 8.602, 8.608, and 8.610).

Age 50 with 25 Years of Service:
The service retirement allowance, but not less than 50% of Final Compensation.

Benefit – Survivor

75% of the disability retirement benefit paid to a qualified survivor.

8. Death while an Active Employee

If Death is Due to a Non-Work-Related Cause:

a. Less than 10 Years of Credited Service, or No Qualified Survivor – Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus six months' salary to a designated beneficiary.

b. At least 10 but less than 25 years of Credited Service – Monthly continuation allowance to a qualified survivor equal to the non-industrial disability benefit the member would have been entitled to on the date of death, subject to a minimum of 33.3% of Average Compensation at the time of death.

c. At Least 25 Years of Credited Service but Less than Age 50 – Monthly continuation allowance to a qualified survivor equal to 50% of the monthly service retirement benefit the member would have received had the member been age 50 and retired on the date of death.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (NEW POLICE AND FIRE)

d. Age 50 with 25 Years of Credited Service – Monthly continuation allowance to a qualified survivor equal to 50% of the monthly service retirement benefit the member would have received had the member been retired on the date of death.

If Death is Due to a Work-Related Cause:

a. No Qualified Survivor – Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus six months' salary to a designated beneficiary. For Charter Sections 8.586 and 8.588, if the death is of a violent nature, an additional lump sum equivalent benefit equal to 12 months' salary is payable.

b. Qualified Survivor and Less than Age 50 with 25 Years of Service – Monthly continuation allowance to a qualified survivor equal to 100% ***(Pre 1998 – 75%)*** of Final Compensation at the date of death. Once the member would have completed 25 years of service and attained age 50, assuming that member earned service and salary increases from the date of death to the eligible service retirement date, the benefit is recalculated at 100% of the service retirement benefit, using the service and salary at the eligible service retirement date. Such allowance shall not be less than 50% of Final Compensation (For Chapter Sections 8.597, 8.598, 8.601, 8.602, 8.608, and 8.610 not to exceed 90% of Final Compensation).

c. Qualified Survivor and Age 50 with 25 Years of Service – Monthly continuation allowance to a qualified survivor equal to 100% ***(Pre 1998 – 75%)*** of the monthly service retirement benefit the member would have received had the member been retired on the date of death, not less than 50% of Final Compensation.

9. Withdrawal Benefits

Less than five years of Credited Service:
Lump sum benefit equal to the accumulated employee contributions with interest.

Five or more years of Credited Service:
The member may choose one of the following:

a. Lump sum benefit equal to the accumulated refund all of employee contributions with interest.

b. ***Charter Sections 8.586 and 8.588*****:** Retirement benefit first payable at age 50 equal to 2% of Final Compensation at termination for each year of credited service of the member at the date of termination.

   Charter Sections 8.597, 8.598, 8.601, 8.602, 8.604, 8.605, 8.608, and 8.610**:** A specified percent of Final Compensation at termination based on the member's age at retirement (factors shown in Table C-3, C-4, and C-5) for each year of Credited Service, subject to a maximum of 90% of Final Compensation, payable at age 50.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(NEW POLICE AND FIRE)

10. Additional Post-retirement Death Benefit

A death benefit payable as a lump sum equal to $100 for each full year of Credited Service, subject to a maximum of $3,000, will be paid to a qualified survivor upon the member's death.

11. Post-retirement Cost-of-Living Benefit

Basic

Monthly benefits are increased or decreased each July 1 by a maximum of 2% per year of the initial monthly benefit. A member's monthly benefit will never decrease below its original amount. Effective July 1, 2009, monthly benefits are increased or decreased by a maximum of 2% of the prior year's monthly benefit.

Supplemental

Effective July 1 of each fiscal year, if the Retirement System was fully funded based on the Market Value of Assets for the previous year and there are sufficient "excess" investment earnings on the Retirement fund for the previous fiscal year-end, the adjustment could be increased to 3.5% of that member's current monthly benefit less the amount of the Basic COLA above. If "excess" earnings are insufficient to fund a 3.5% increase, then to the extent of "excess" earnings, benefits are increased in increments of 0.5% up to a maximum of 3.5%. For members who worked after November 6, 1996, and before Proposition C passed in 2012, the Supplemental COLA is payable if there are "excess" investment earnings regardless of whether or not the System was fully funded.

12. Changes in this Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (MISCELLANEOUS)

III. Miscellaneous Members – Charter Sections 8.509, 8.587, 8.600, and 8.603

1. **Membership Requirement**

Charter Section 8.509
Employees and Officers, other than Police Officers or Firefighters, who became members before November 2, 1976 and continued as a member without interruption.

Charter Section 8.587
Active Employees and Officers, other than Police Officers or Firefighters, who were members under Section A8.584, and members under A8.587, whose accumulated contributions were in the retirement fund on November 7, 2000 and were not retired. After November 7, 2000, all full-time employees, certified Civil Service employees, or temporary employees who work more than 1,040 hours in any 12-month period; excluding all Police Officers and Firefighters.

Charter Section 8.600
Employees and Officers, other than Police Officers or Firefighters, who become employed on or after July 1, 2010, and prior to January 7, 2012.

Charter Section 8.603
Employees and Officers, other than Police Officers or Firefighters, who become employed on or after January 7, 2012.

2. **Average Final Compensation**

Charter Sections 8.509 and 8.587
Average monthly compensation earned during any year of Credited Service which average compensation is the highest.

Charter Section 8.600
Average monthly compensation earned during the higher of any two consecutive fiscal years of earnings or the twenty-four months of earnings immediately prior to retirement.

Charter Section 8.603
Average monthly compensation earned during the higher of any three consecutive fiscal years of earnings or the thirty-six consecutive months of earnings immediately prior to retirement. Compensation for any fiscal year shall not include remuneration that exceeds 85% of the IRC 401(a)(17) compensation limit.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (MISCELLANEOUS)

3. Credited Service

One year of service credit is given for each fiscal year with 10 or more full months worked. A partial year (fraction with the numerator equal to months including partial months, and the denominator equal to 10) is given for each fiscal year with less than 10 full months worked. (Exception: for Charter 8.509 members, in the year of retirement, the denominator in the fraction is equal to 12).

4. Member Contributions

a. Member:

Charter 8.509
8.0% of salary.

Charter 8.587, 8.600, and 8.603
7.5% of salary, excluding overtime and most premium pay.

Depending on the employer contribution rate and the base rate of pay of the member beginning on July 1, 2012, the member contribution rate can increase or decrease by up to maximum percentage of pay shown in the following table:

Hourly Rate of Pay*	Maximum Increase / Decrease in Contribution Rate
< $24	0%
$24 - $48	4%
>= $48	5%

**Adjusted each fiscal year by the percentage increase in the cost-of-living during the previous calendar year, based on the San Francisco-Oakland-San José CPI-U Index, but not to exceed 3.5%.*

These contributions are credited with interest annually as determined by the Board.

If the member elects Social Security, the contributions to the System may be reduced by the amount contributed to Social Security (excluding the Medicare portion). Retirement benefits are actuarially reduced by the shortage, which is the difference between contributions paid at the 8%/7.5% rate and contributions actually paid, plus plan interest.

b. Employer:

The Employer contributes the remaining amounts necessary to maintain the soundness of the Retirement System. Any decrease in the member contribution rate is paid by the City.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (MISCELLANEOUS)

5. Service Retirement

Eligibility

Charter Section 8.509, 8.587, and 8.600
Age 50 with 20 years of Credited Service, or age 60 with 10 years of Credited Service.

Charter Section 8.603
Age 53 with 20 years of Credited Service, age 60 with 10 years of Credited Service, or age 65.

Benefit – Member

Charter Section 8.509, 8.587, and 8.600
The monthly service retirement benefit is the greater of i) and ii) below, subject to a maximum of 75% of Average Final Compensation.

i) A specified percent of Average Final Compensation based on the member's age at retirement (factors shown in Table C-6 below) for each year of Credited Service, effective January 11, 2009.

Table C-6
City and County of San Francisco Employees' Retirement System
Section 8.509, 8.587, and 8.600 Member Service Retirement Factors

Retirement Age	Retirement Factors	Retirement Age	Retirement Factors
50	1.0%	57	1.7%
51	1.1%	58	1.8%
52	1.2%	59	1.9%
53	1.3%	60	2.1%
54	1.4%	61	2.2%
55	1.5%	62 or above	2.3%
56	1.6%		

ii) The actuarial equivalent of twice the member's accumulated contributions with interest.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (MISCELLANEOUS)

Charter Section 8.603

The monthly service retirement benefit is a specified percent of Average Final Compensation based on the member's age at retirement subject to a maximum of 75% of Average Final Compensation (factors shown in Table C-7 below).

Table C-7
City and County of San Francisco Employees' Retirement System
Section 8.603 Member Service Retirement Factors

Retirement Age	Retirement Factors	Retirement Age	Retirement Factors
53	1.000%	60	1.756%
54	1.108%	61	1.864%
55	1.216%	62	1.972%
56	1.324%	63	2.080%
57	1.432%	64	2.188%
58	1.540%	65 or above	2.300%
59	1.648%		

Benefit – Survivor

50% of the service retirement benefit paid to a qualified survivor.

6. Disability

Eligibility

10 years of Credited Service.

Benefit – Member

1.8% of Average Final Compensation for each year of Credited Service, maximum of 75% of Average Final Compensation. If the benefit is less than 40% of Average Final Compensation, additional Credited Service had the member worked to age 60 can be added to the current Credited Service, in order to adjust the benefit to 40% of Average Final Compensation.

Benefit – Survivor

50% of the disability retirement benefit paid to a qualified survivor.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(MISCELLANEOUS)

7. Death while an Active Employee

If Not Eligible for Service Retirement:
Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus six months' salary to a designated beneficiary. If the death is of a violent nature and job-related, an additional lump sum equivalent benefit equal to 12 months' salary is payable.

If Eligible for Service Retirement:
A qualified spouse may elect i) or ii) below:

i) Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus six months' salary to a designated beneficiary.

ii) A benefit equal to 50% of the service retirement benefit the member would have received had the member retired for service on the date of death.

8. Withdrawal Benefits

Charter 8.509 members with less than 10 years of Credited Service or less than $1,000 in accumulated contributions and Charter 8.587, 8.600, and 8.603 members with less than five years of Credited Service:

Lump sum benefit equal to the accumulated employee contributions with interest.

Charter 8.509 members with 10 or more years of Credited Service or accumulated contributions exceeding $1,000 and Charter 8.587and 8.600 members with five or more years of Credited Service:

The member may choose one of the following:

i) Lump sum benefit equal to the accumulated refund all of employee contributions with interest.
ii) A deferred retirement benefit payable on or after age 50 equal to the actuarial equivalent of twice the member's accumulated contributions with interest as of the retirement date.

Charter 8.603 members with five or more years of Credited Service:

The member may choose one of the following:

i) Lump sum benefit equal to the accumulated refund all of employee contributions with interest.
ii) A deferred retirement benefit payable on or after age 53 equal to the actuarial equivalent of 150% of the member's accumulated contributions with interest as of the retirement date.

APPENDIX C – SUMMARY OF PLAN PROVISIONS (MISCELLANEOUS)

9. Additional Post-retirement Death Benefit

A death benefit payable as a lump sum equal to $100 for each full year of Credited Service, subject to a maximum of $3,000, will be paid to a qualified survivor upon the member's death.

10. Post-retirement Cost-of-Living Benefit

Basic
Monthly benefits are adjusted each July 1 by the accumulated change in the Consumer Price Index to the nearest 1%, with a maximum increase or decrease of 2% per year of the prior year's monthly benefit. A member's monthly benefit will never decrease below its original amount.

Supplemental
Effective July 1 of each fiscal year, if the Retirement System was fully funded based on the Market Value of Assets for the previous year and there are sufficient "excess" investment earnings on the Retirement fund for the previous fiscal year-end, the adjustment could be increased to 3.5% of that member's current monthly benefit less the amount of the Basic COLA above. If "excess" earnings are insufficient to fund a 3.5% increase, then to the extent of "excess" earnings, benefits are increased in increments of 0.5% up to a maximum of 3.5%. For members who worked after November 6, 1996, and before Proposition C passed in 2012, the Supplemental COLA is payable if there are "excess" investment earnings regardless of whether or not the System was fully funded.

11. Changes in this Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(COST SHARING PROVISIONS)

IV. Cost Sharing Provisions – Adjusted Contribution Rates

The table below shows the adjustment to the employee contribution rate based on the calculated net employer contribution rate. There are three different adjustment schedules which apply to different groups of employees.

	Adjustment to Employee Contribution Rate		
Net Employer Contribution Rate	Group 1	Group 2	Group 3
0.00% – 0.00%	-4.00%	-5.00%	-6.00%
0.01% – 1.00%	-4.00%	-4.50%	-5.00%
1.01% – 2.50%	-3.75%	-4.25%	-4.75%
2.51% – 4.00%	-3.50%	-4.00%	-4.50%
4.01% – 5.50%	-2.50%	-3.00%	-3.50%
5.51% – 7.00%	-2.00%	-2.50%	-3.00%
7.01% – 8.50%	-1.50%	-2.00%	-2.00%
8.51% – 10.00%	-1.00%	-1.50%	-1.50%
10.01% – 11.00%	-0.50%	-0.50%	-0.50%
11.01% – 12.00%	0.00%	0.00%	0.00%
12.01% – 13.00%	0.50%	0.50%	0.50%
13.01% – 15.00%	1.00%	1.50%	1.50%
15.01% – 17.50%	1.50%	2.00%	2.00%
17.51% – 20.00%	2.00%	2.50%	3.00%
20.01% –22.50%	2.50%	3.00%	3.50%
22.51% – 25.00%	3.50%	4.00%	4.50%
25.01% – 27.50%	3.50%	4.00%	4.50%
27.51% – 30.00%	3.75%	4.25%	4.75%
30.01% – 32.50%	3.75%	4.25%	4.75%
32.51% – 35.00%	4.00%	4.50%	5.00%
35.01% +	4.00%	5.00%	6.00%

Group 1: Miscellaneous members earning between $24 per hour and $48 per hour, and Police or Fire members hired after June 30, 2010 earning less than $48 per hour.

Group 2: Miscellaneous members earning $48 per hour or more, and Police or Fire members hired after June 30, 2010 earning $48 per hour or more.

There is no adjustment for Miscellaneous members earning less than $24 per hour.

The hourly rates shown above are for the fiscal year ending 2013. Each fiscal year these hourly rates are adjusted by the percentage increase, not to exceed 3.5%, in the cost-of-living during the previous calendar year determined by the CPI-U for San Francisco-Oakland-Hayward, CA.

Group 3: Police and Fire members hired before July 1, 2010.

APPENDIX C – SUMMARY OF PLAN PROVISIONS
(COST SHARING PROVISIONS)

Note: The summary of major plan provisions is designed to outline principal plan benefits. If the SFERS staff should find the plan summary not in accordance with the actual provisions, the actuary should immediately be alerted so the proper provisions are valued.

APPENDIX D – PROJECTION DETAILS

Historical and Projected Employer Contribution Rates By Scenario
Before Cost-Sharing Adjustments

		1-Year Shock		5-Year Moderate		5-Year Significant	
FYE	Baseline	Negative	Positive	Negative	Positive	Negative	Positive
2014	21.21%						
2015	23.18%						
2016	19.24%						
2017	18.83%						
2018	20.07%						
2019	19.81%						
2020	21.78%						
2021	23.40%						
2022	20.92%						
2023	18.75%						
2024	18.24%	18.24%	18.24%	18.24%	18.24%	18.24%	18.24%
2025	16.66%	18.56%	13.07%	16.43%	17.03%	17.16%	16.18%
2026	15.86%	20.63%	8.21%	15.98%	14.97%	18.14%	12.19%
2027	14.88%	23.20%	3.81%	16.56%	12.68%	20.73%	6.80%
2028	16.14%	27.46%	1.25%	19.39%	11.51%	26.08%	1.20%
2029	17.07%	31.35%	0.00%	22.44%	9.38%	32.01%	0.00%
2030	14.81%	30.49%	0.00%	23.46%	3.36%	35.25%	0.00%
2031	14.68%	30.73%	0.00%	26.15%	1.66%	39.53%	0.00%
2032	15.55%	30.91%	0.00%	28.40%	0.85%	42.80%	0.00%
2033	15.60%	30.97%	0.00%	30.06%	0.69%	44.99%	0.00%
2034	15.43%	30.81%	0.00%	31.00%	1.03%	46.06%	0.00%

APPENDIX D – PROJECTION DETAILS

Historical and Projected Funded Ratio Based on Market Assets By Scenario
Before Cost-Sharing Adjustments

		1-Year Shock		5-Year Moderate		5-Year Significant	
Valuation	Baseline	Negative	Positive	Negative	Positive	Negative	Positive
2012	78.9%						
2013	84.1%						
2014	94.3%						
2015	88.9%						
2016	82.6%						
2017	87.2%						
2018	89.8%						
2019	90.6%						
2020	90.2%						
2021	111.8%						
2022	97.6%	97.6%	97.6%	97.6%	97.6%	97.6%	97.6%
2023	98.2%	77.1%	123.6%	93.8%	101.6%	88.0%	108.2%
2024	98.5%	76.7%	124.6%	89.7%	105.4%	78.8%	119.9%
2025	98.6%	76.4%	125.0%	85.4%	109.3%	70.2%	132.8%
2026	98.5%	76.2%	124.9%	81.2%	113.3%	62.3%	147.1%
2027	98.4%	76.4%	124.4%	77.1%	117.3%	55.3%	162.7%
2028	98.5%	77.0%	123.5%	76.8%	117.4%	55.1%	163.1%
2029	98.6%	78.0%	122.6%	76.9%	117.3%	55.6%	163.5%
2030	98.5%	79.0%	121.6%	77.1%	116.5%	56.4%	164.0%
2031	98.4%	80.1%	120.6%	77.6%	115.5%	57.8%	164.6%
2032	98.4%	81.2%	119.6%	78.4%	114.5%	59.5%	165.2%

APPENDIX D – PROJECTION DETAILS

Historical and Projected UAL Based on Market Assets By Scenario
Before Cost-Sharing Adjustments
(Amounts in millions)

		1-Year Shock		5-Year Moderate		5-Year Significant	
FYE	Baseline	Negative	Positive	Negative	Positive	Negative	Positive
2012	4,100						
2013	3,213						
2014	1,202						
2015	2,543						
2016	4,249						
2017	3,296						
2018	2,777						
2019	2,720						
2020	2,880						
2021	(3,769)						
2022	793	793	793	793	793	793	793
2023	618	7,979	(8,276)	2,152	(559)	4,160	(2,892)
2024	553	8,430	(8,967)	3,714	(1,987)	7,630	(7,285)
2025	547	8,895	(9,488)	5,435	(3,578)	11,127	(12,562)
2026	571	9,294	(9,826)	7,265	(5,311)	14,567	(18,795)
2027	641	9,596	(9,975)	9,160	(7,185)	17,879	(26,083)
2028	652	9,701	(9,997)	9,613	(7,494)	18,623	(27,244)
2029	612	9,597	(9,939)	9,938	(7,716)	19,111	(28,414)
2030	678	9,499	(9,855)	10,220	(7,638)	19,440	(29,649)
2031	751	9,351	(9,741)	10,362	(7,448)	19,531	(30,953)
2032	777	9,150	(9,597)	10,367	(7,180)	19,403	(32,330)

APPENDIX E – GLOSSARY OF TERMS

1. **Actuarial Liability**

   The Actuarial Liability is the difference between the present value of all future system benefits and the present value of total future normal costs. This is also referred to by some actuaries as the "accrued liability" or "actuarial accrued liability."

2. **Actuarial Assumptions**

   Estimates of future experience with respect to rates of mortality, disability, turnover, retirement rate or rates of investment income, and salary increases. Demographic actuarial assumptions (rates of mortality, disability, turnover, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

3. **Accrued Service**

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

4. **Actuarial Equivalent**

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

5. **Actuarial Cost Method**

   A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of a retirement system benefit between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

6. **Actuarial Gain (Loss)**

   The difference between actual experience and actuarial assumption anticipated experience during the period between two actuarial valuation dates.

7. **Actuarial Present Value**

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

APPENDIX E – GLOSSARY OF TERMS

8. Amortization

Paying off an interest-discounted amount with periodic payments of interest and principal – as opposed to paying off with a lump sum payment.

9. Normal Cost

The actuarial present value of retirement system benefits allocated to the current year by the actuarial funding method.

10. Unfunded Actuarial Liability (UAL)

The Unfunded Actuarial Liability represents the difference between Actuarial Liability and valuation assets. This value is sometimes referred to as "unfunded actuarial accrued liability."

Most retirement systems have Unfunded Actuarial Liabilities. They typically arise each time new benefits are added and each time experience losses are realized.

The existence of unfunded actuarial accrued liability is not in itself an indicator of poor funding. Also, Unfunded Actuarial Liabilities do not represent a debt that is payable today. What is important is the ability of the plan sponsor to amortize the Unfunded Actuarial Liability and the trend in its amount (after due allowance for devaluation of the dollar).

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