Classic Values, Innovative Advice

City and County of San Francisco Employees' Retirement System

July 1, 2020 Actuarial Valuation Report

Produced by Cheiron

June 2021

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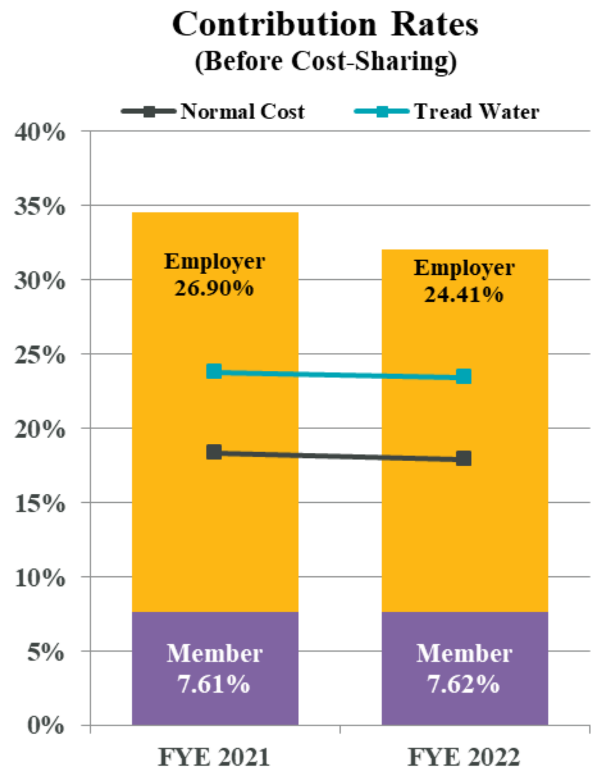

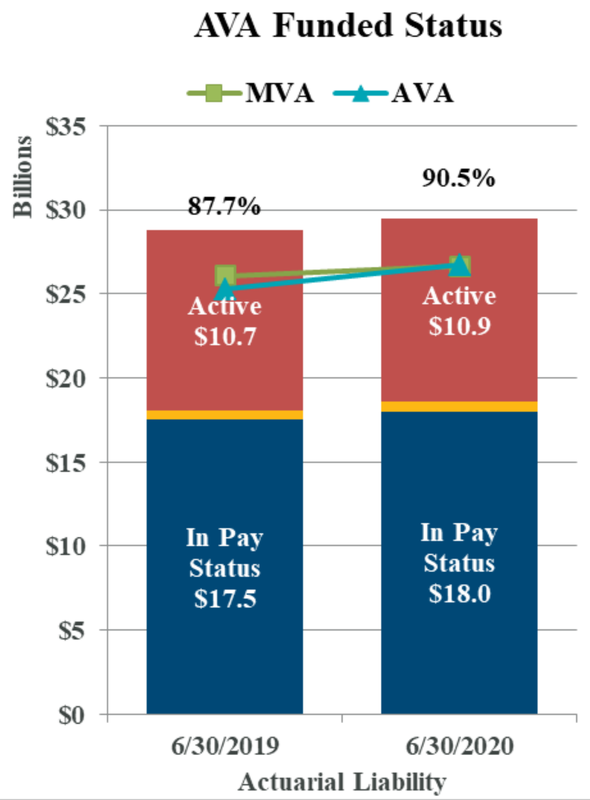

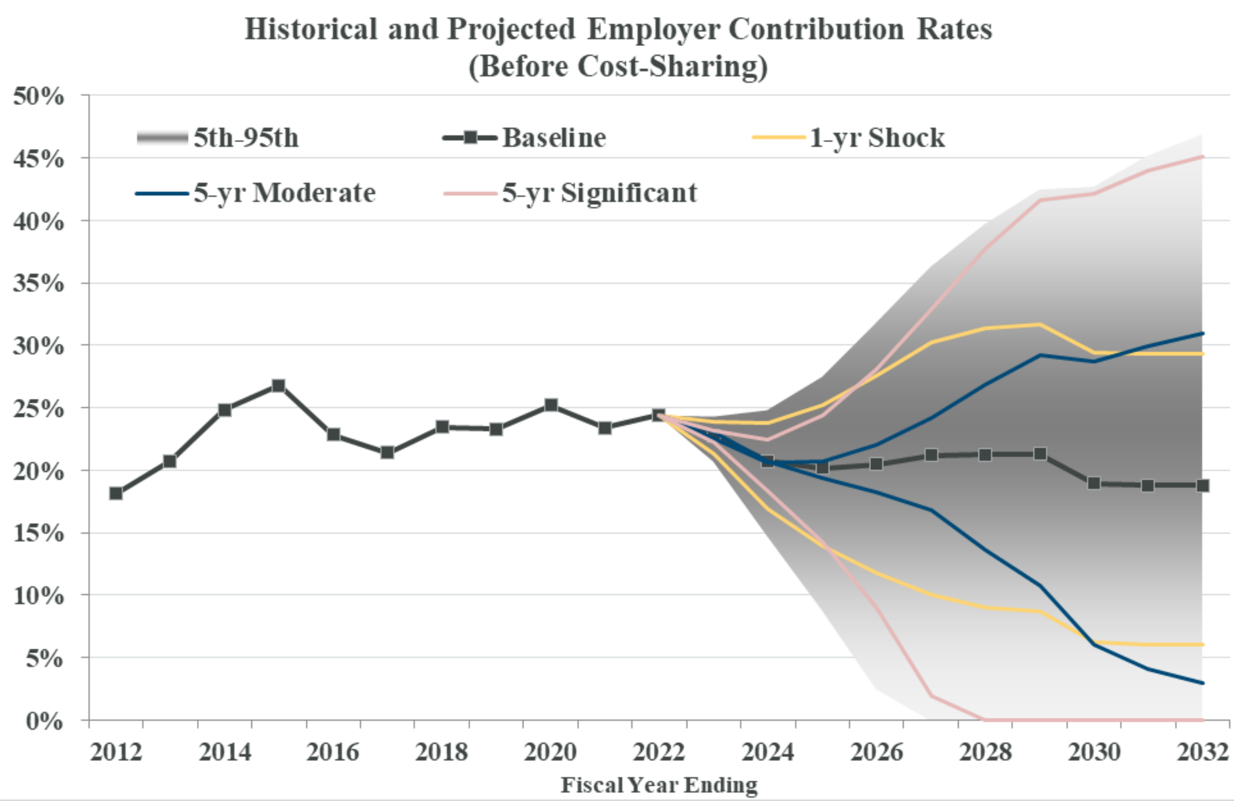

SECTION I – BOARD SUMMARY

Key Findings of the July 1, 2020 Valuation

The key results of the July 1, 2020 actuarial valuation are as follows:

- The employer contribution rate decreased from 26.90% for FYE 2021 to 24.41% for FYE 2022 before any cost-sharing adjustments[1]. After the cost-sharing adjustments, the estimated employer contribution rate decreased from 23.49% to 20.88%. 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 employee contribution rates in FYE 2022 after the cost-sharing adjustment will remain the same as they are in FYE 2021. That is, there is no change to the cost-sharing adjustments. The average employee contribution rate after cost-sharing adjustments is estimated to be 11.15%.

- The funded ratio based on the Market Value of Assets (MVA) decreased from 90.6% to 90.2%, and the Unfunded Actuarial Liability (UAL) increased from $2.72 billion to $2.88 billion. On an actuarial value basis (AVA), the funded ratio increased from 87.7% to 90.5%, and the Unfunded Actuarial Liability decreased from $3.55 billion to $2.80 billion.

- The return on the Market Value of Assets for the year ended June 30, 2020 was approximately 3.74% resulting in an actuarial loss of about $913 million that will be recognized over the next five years. The return on the Actuarial Value of Assets was 7.37%, which recognizes 20% of the FYE 2020 gain as well as deferred investment gains and losses from previous years, and results in an actuarial loss of about $6 million.

- Economic assumptions were reviewed and a demographic experience study was performed for the period July 1, 2014 to June 30, 2019. Wage inflation, price inflation, and all demographic assumption changes were adopted at the December 9, 2020 Board meeting based on our analysis. At a special Board meeting on April 28, 2021, the Board elected to retain the discount rate of 7.4%. The assumption changes reduced the Actuarial Liability by approximately $591.4 million and the employer contribution rate by about 1.2% of pay.

[1]*The cost-sharing adjustments are dependent on the employer contribution rate, the employee group and the level of pay based on the applicable table in the Charter. The FYE 2022 cost-sharing adjustment is 3.53%, 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, 2020 compared to July 1, 2019.

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

Valuation Date		July 1, 2020		July 1, 2019	% Change
Actuarial Liability	$	29,499.9	$	28,798.6	2.4%
Actuarial Value of Assets	$	26,695.8	$	25,247.6	5.7%
Unfunded Actuarial Liability (actuarial value)		2,804.1		3,551.0	-21.0%
Funding Ratio (actuarial value)		90.5%		87.7%	2.8%
Market Value of Assets	$	26,620.2	$	26,078.6	2.1%
Unfunded Liability (market value)		2,879.7		2,720.0	5.9%
Funding Ratio (market value)		90.2%		90.6%	-0.3%
Expected Payroll	$	3,703.1	$	3,549.9	4.3%
Interest on UAL (MVA basis)	$	205.6	$	194.2	5.9%
Interest Cost as Percent of Payroll		5.6%		5.5%	0.1%

The Actuarial Liability increased by approximately $0.7 billion. The Actuarial Value of Assets, which is used as the basis to set contribution rates, increased by approximately $1.4 billion reflecting smoothed investment returns and contributions offset by benefits and expenses paid during the year. SFERS' Unfunded Actuarial Liability decreased by approximately $0.7 billion based on the Actuarial Value of Assets.

The Market Value of Assets increased approximately $0.5 billion. SFERS' UAL based on the Market Value of Assets increased approximately $0.2 billion.

The interest cost on the UAL – based on the Market Value of Assets – increased by $11 million. As a result, approximately 5.6% of payroll is necessary to pay the interest on the UAL, which is a slight increase from 5.5% of payroll 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 normal cost under the Entry Age Normal Cost Method,
- The expected administrative expenses, and
- An amortization payment on the Unfunded Actuarial Liability.

The Charter (as amended by Proposition C effective July 1, 2012) requires employees to pay a portion of the net employer contribution rate. The portion each employee pays depends on the net 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 2022	FYE 2021	Absolute Change
Contribution Rates Before Adjustments			
Net Employer Contribution Rate	24.41%	26.90%	-2.49%
Est. Aggregate Employee Contribution Rate	7.62%	7.61%	0.01%
Total Contribution Rate	32.03%	34.51%	-2.48%
Estimated Payroll	$ 3,823.5	$ 3,674.2	$ 149.3
Estimated Net Employer Contributions	933.5	988.5	(55.0)
Contribution Rates After Adjustments			
Net Employer Contribution Rate	20.88%	23.49%	-2.61%
Est. Aggregate Employee Contribution Rate	11.15%	11.02%	0.13%
Total Contribution Rate	32.03%	34.51%	-2.48%
Estimated Payroll	$ 3,823.5	$ 3,674.2	$ 149.3
Estimated Net Employer Contributions	798.3	863.1	(64.8)
Total Contribution Rate			
Normal Cost Rate	17.29%	17.72%	-0.43%
Administrative Expense Rate	0.60%	0.60%	0.00%
UAL Rate			
Interest on Market Value UAL	5.55%	5.47%	0.08%
Principal on UAL	8.59%	10.72%	-2.13%
Total UAL Rate	14.14%	16.19%	-2.05%
Total Contribution Rate	32.03%	34.51%	-2.48%

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The net employer contribution rate before applying the cost-sharing adjustments decreased 2.49% of payroll from 26.90% to 24.41% for the fiscal year ending June 30, 2022. The cost-sharing adjustment is estimated to decrease the employer contribution and increase the aggregate employee contributions by about 3.53% of payroll. Thus, the estimated employer contribution rate after cost sharing is 20.88% for FYE 2022. The cost-sharing adjustments will remain at this level as long as the employer contribution rate before adjustment is between 22.51% and 27.50%.

SFERS Membership

As shown in Table I-3 below, membership in SFERS increased in total by 2.1%. Active membership increased 0.9%, terminated vested membership increased 6.0%, and members receiving benefits increased by 2.2%. Total payroll increased by 4.3% for active members. The average pay per active member increased 3.4%.

Table I-3
Membership Total

	July 1, 2020	July 1, 2019[2]	% Change
Actives	34,521	34,202	0.9%
Terminated Vested	10,549	9,955	6.0%
Members Receiving Benefits	30,128	29,490	2.2%
Total SFERS Members	75,198	73,647	2.1%
Active Member Payroll (thousands)[1]	$ 3,703,100	$ 3,549,940	4.3%
Average Pay per Active	$ 107,300	$ 103,800	3.4%

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

[2] *Members Receiving Benefits as of July 1, 2019 has been restated to reflect combining records for members who have both a Safety and Miscellaneous benefit.*

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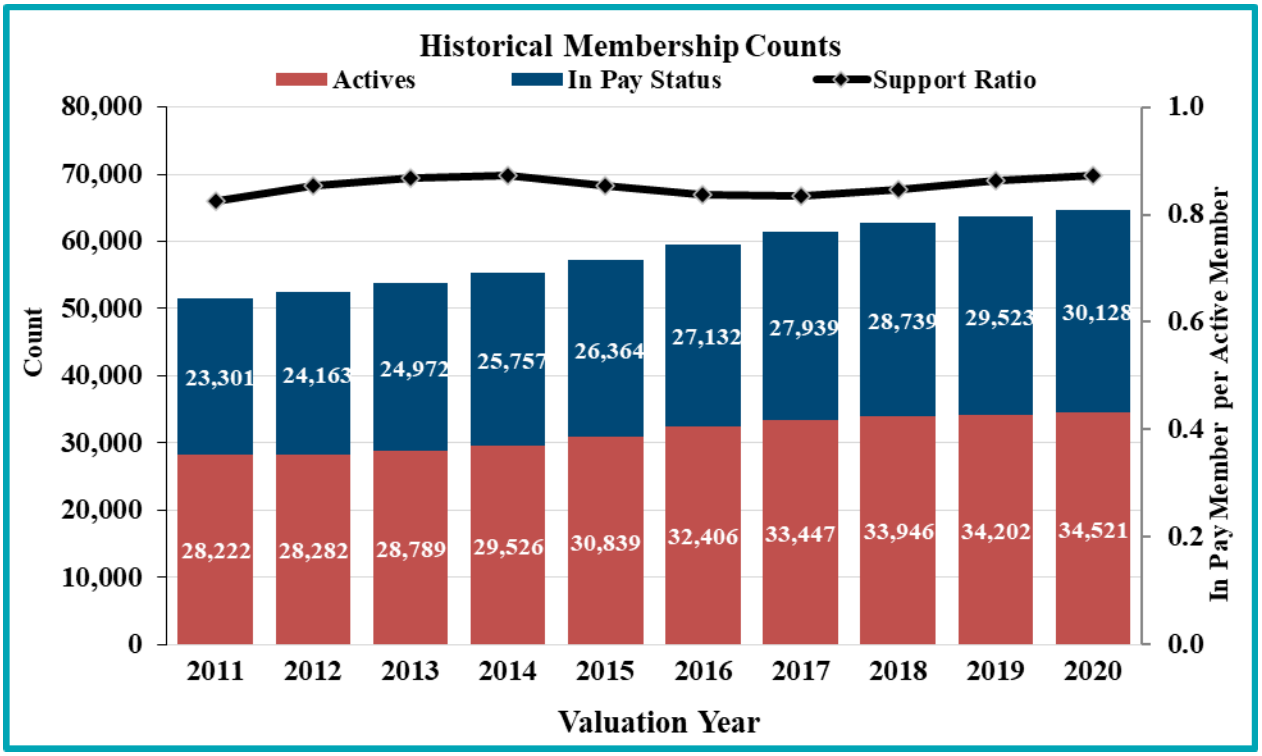
The chart below shows the historical trend in membership counts over the last 10 years. This trend can be an important indicator of growing plan maturity and sensitivity to investment returns, assumption changes, and other changes to the System. In particular, if the ratio of retirees to active members 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, there was a moderate increase in this ratio immediately following the Great Recession when active membership declined while the number of retirees grew. However, the ratio has remained relatively stable over the last decade. Growth in the number of retirees has slightly outpaced the growth in active membership and as a result the support ratio has gradually increased from 0.83 to 0.87 over this period demonstrating a relatively stable population of members.



Contribution Reconciliation

The SFERS contribution rate for FYE 2022 before cost-sharing adjustments decreased from 26.90% to 24.41% of membership payroll. Table I-4 shows sources for the change in the net employer contribution rate. The amortization charges for a Miscellaneous Prop C Charter amendment were completed resulting in a 1.18% decrease in the employer contribution rate. Economic and demographic assumption changes further reduced the contribution rate by 1.19%. The remainder of the decrease was due to the impact of the increased payroll offset by liability and investment experience.

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

	Normal Cost[1]	UAL Payment	Total
FYE 2021 Net Employer Contribution Rate	10.71%	16.19%	26.90%
Fully paid 2000 Prop C - New Misc Ret Bfts	0.00%	-1.18%	-1.18%
Payroll increase more than assumed	0.00%	-0.35%	-0.35%
Investment loss on actuarial value of assets	0.00%	0.01%	0.01%
Economic and demographic assumption changes	-0.35%	-0.84%	-1.19%
Liability experience and other changes	-0.09%	0.31%	0.22%
Total Change	-0.44%	-2.05%	-2.49%
FYE 2022 Net Employer Contribution Rate	10.27%	14.14%	24.41%

[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 retired prior to November 6, 1996 (Pre-97 Retirees) or were hired after Proposition C passed in 2012, the Supplemental COLA is only payable if the System was 100% funded based on the Market Value of Assets in the prior year. For the Post '96 Retirees, the projections assume 50% of a full Supplemental COLA each year (0.75% for most members). For the Pre-97 Retirees, the probability is much smaller than 50% in the short term since the System is only 90.2% funded based on the Market Value of Assets.

The top chart on the following page compares the Market Value of Assets to the Actuarial Liability for the historical period from 2010 to 2020 and the projected period from 2021 to 2030 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 light gray bar with a black 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 74% funded as of July 1, 2010, shortly after the market decline. Since then, investment returns and contribution increases offset by some assumption changes and the impact of actual Supplemental COLAs have increased funding ratios, reaching 90% as of July 1, 2020.

The bottom chart on the next page shows historical and projected contribution rates for the fiscal years ending 2012 through 2032. 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 2019 actuarial valuation.

The employer contribution rate increased significantly from fiscal year ending 2012 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. This increase has been driven primarily by Supplemental COLAs. The contribution rate decreased for FYE 2022 primarily due to assumption changes and the completion of the amortization payments for a charter amendment. After FYE 2022, employer contributions are expected to continue to decline over the next few years due to the completion of the amortization payments for propositions from 2002. In addition, the amortization payments for some of the recent Supplemental COLAs will have been completed while the amortization credits for the investment gains that created them will continue.

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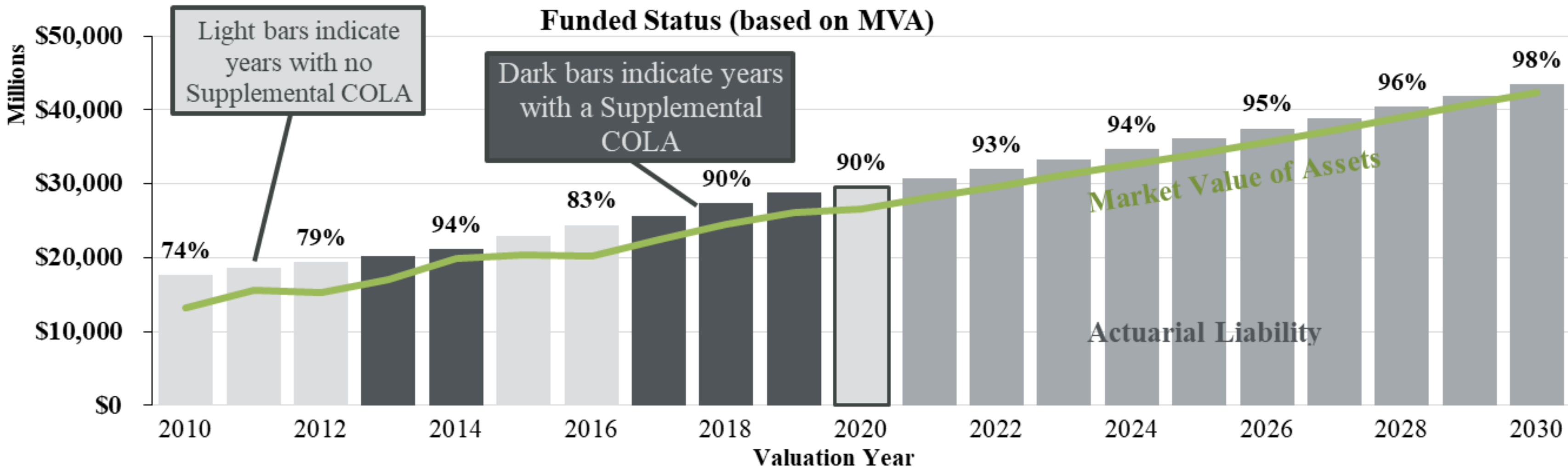

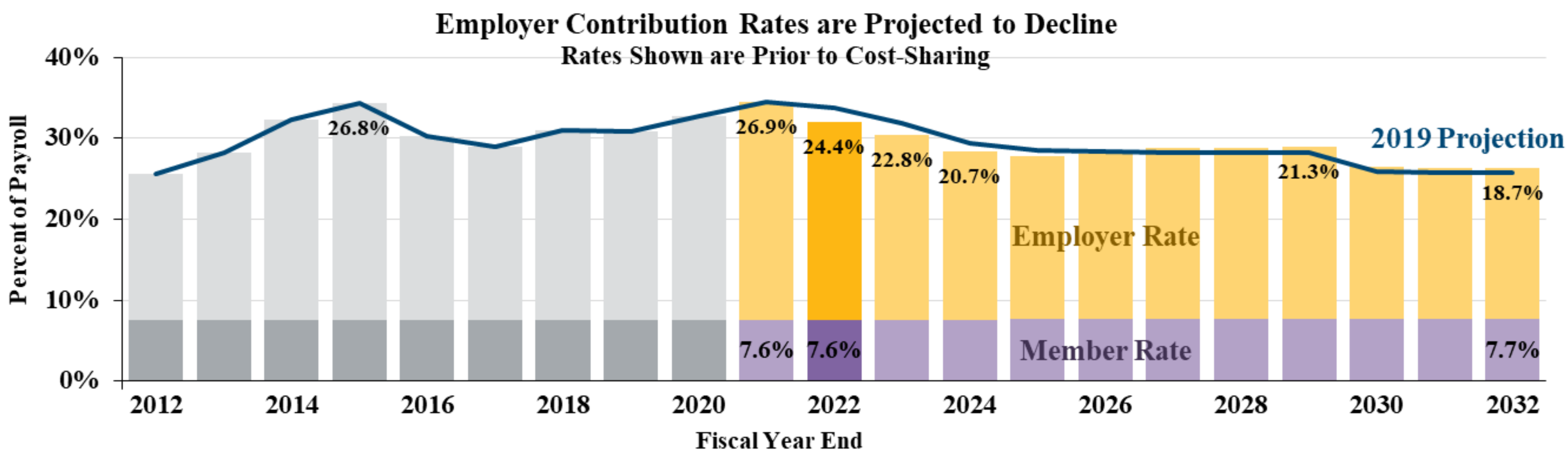

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

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 a number of 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.

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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.

SFERS Historical Changes in UAL 2011-2020

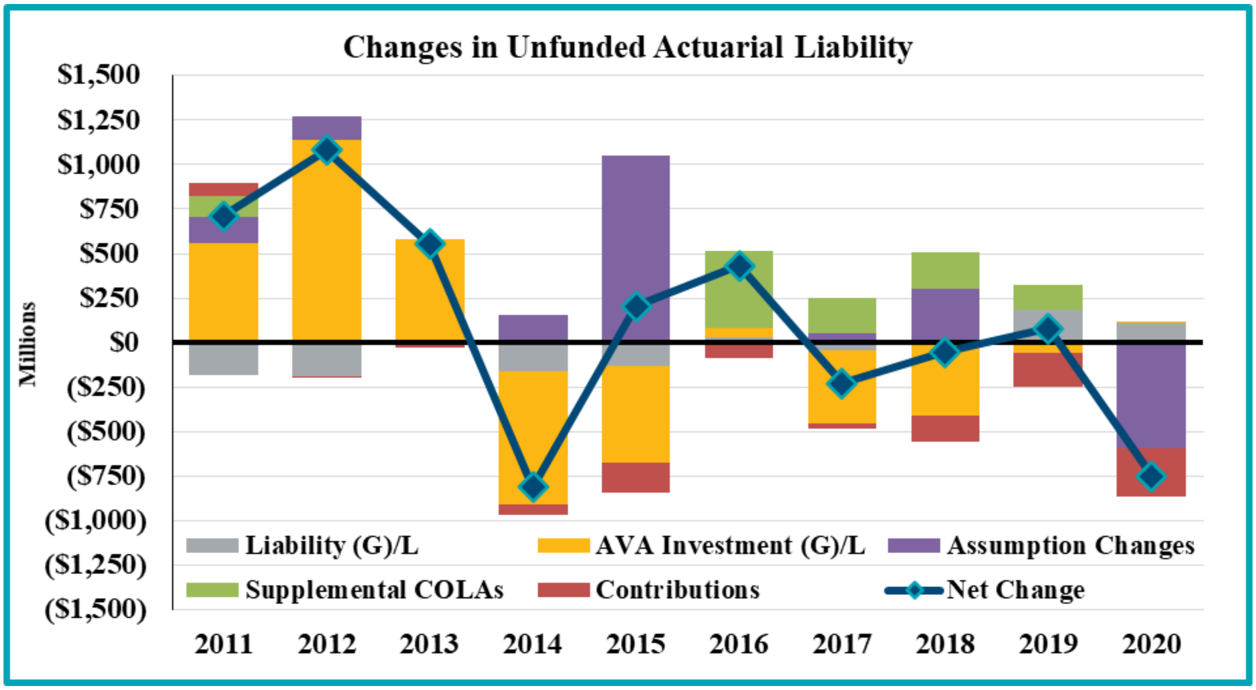

Table II-1
Changes in Unfunded Actuarial Liability
(Amounts in millions)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Discount Rate	**7.66%**	**7.58%**	**7.58%**	**7.50%**	**7.50%**	**7.50%**	**7.50%**	**7.40%**	**7.40%**	**7.40%**	
Source											
AVA (G)/L	$ 559.6	$ 1,135.0	$ 579.6	$ (749.2)	$ (545.5)	$ 51.5	$ (405.7)	$ (408.9)	$ (58.6)	$ 6.4	**$ 164.2**
Liability (G)/L	(183.5)	(187.1)	(9.9)	(157.9)	(127.6)	34.5	(45.5)	6.5	185.4	112.3	**(372.8)**
Assumptions/Methods	148.8	135.5	0.0	153.1	1,048.4	0.0	50.2	297.7	0.0	(591.4)	**1,242.3**
Supplemental COLAs	112.6	0.0	0.0	0.0	0.0	429.3	200.1	200.8	141.0	0.0	**1,083.8**
Contributions[1]	73.8	(2.8)	(14.5)	(56.9)	(168.2)	(83.7)	(27.4)	(147.5)	(186.2)	(274.2)	**(887.6)**
Total UAL Change	**$ 711.3**	**$ 1,080.6**	**$ 555.2**	**$ (810.9)**	**$ 207.1**	**$ 431.6**	**$ (228.3)**	**$ (51.4)**	**$ 81.6**	**$ (746.9)**	**$ 1,229.9**

[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 our identification of investment returns, Supplemental COLAs, and interest rates that drive assumption changes as the primary risks to the System.

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On a smoothed asset basis, the investment gains and losses (gold bars) from 2011 to 2013 reflect material investment losses driven by the market decline of 2008 and 2009, which was spread over the five successive years. Recent market experience has primarily produced gains. Over the 10-year period, investment losses added approximately $164 million to the UAL.

On the liability side (gray bars), SFERS has experienced net gains reducing the UAL by approximately $260 million over the 10-year period.

Assumption and method changes (purple bars) over the last 10 years have increased the UAL by about $1.2 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.

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. Over the 10-year period, Supplemental COLAs increased the UAL by about $1.1 billion.

Each year, 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 $1.0 billion, and during 2020, contributions decreased the UAL by about $311 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.

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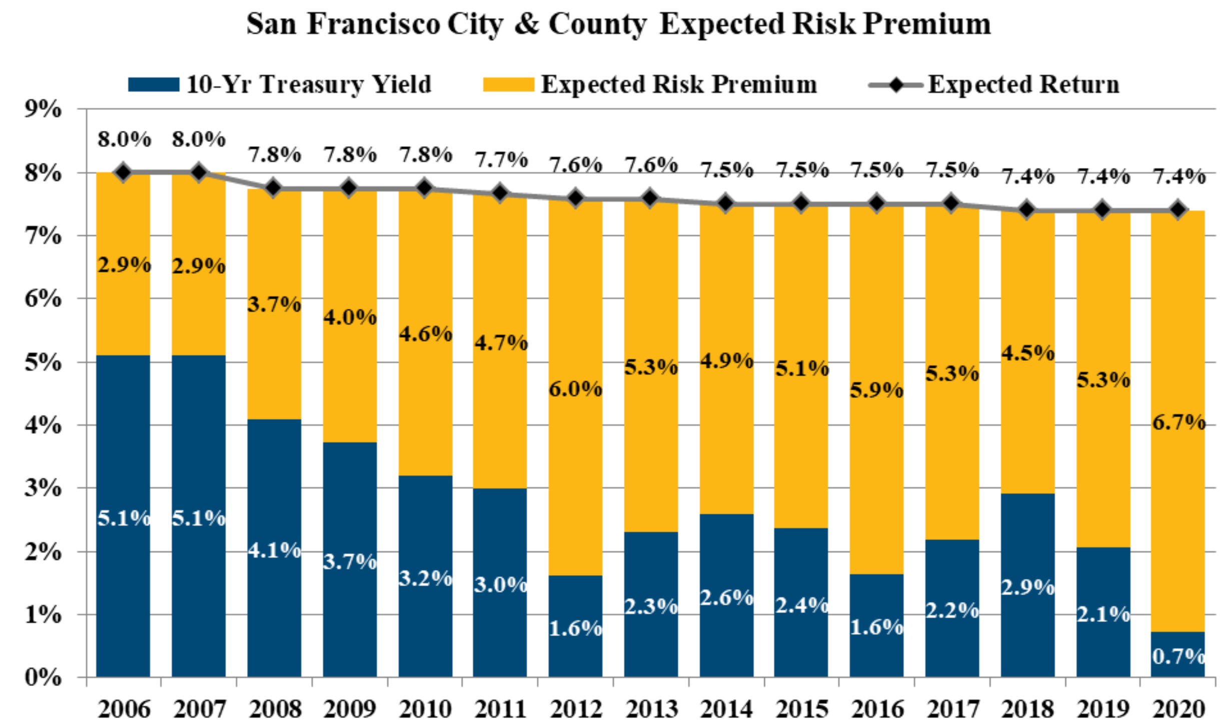
The chart below shows the yield on a 10-year Treasury security compared to the System's assumed rate of return. The difference is a simple measure of the investment risk premium. From 2006 to 2020, the yield on the 10-year Treasury declined from about 5.1% to 0.7%. As interest rates declined, the System 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 8.0% to 7.4% and increased its expected risk premium 380 basis points from 2.9% to 6.7%. If interest rates remain this low, there will be continued pressure to reduce the discount rate.



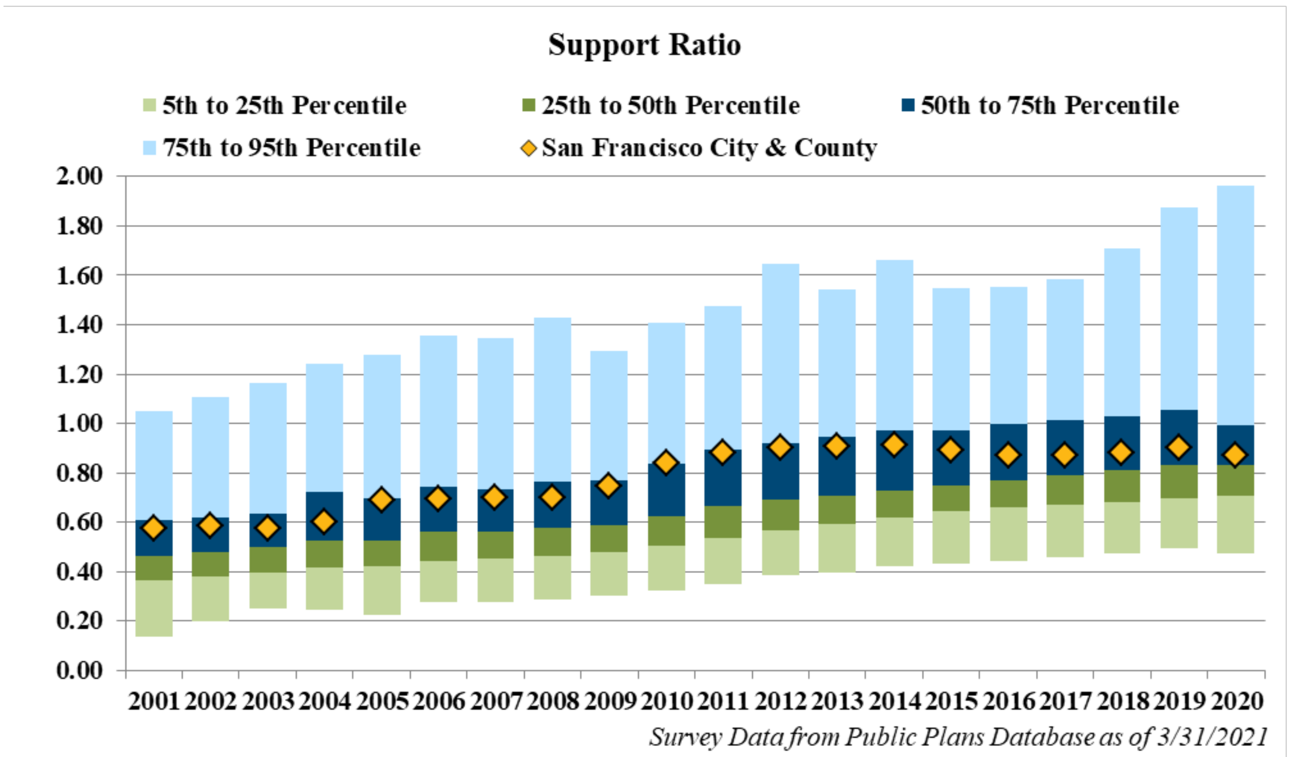
Plan Maturity Measures

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 the Public Plans Database 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.

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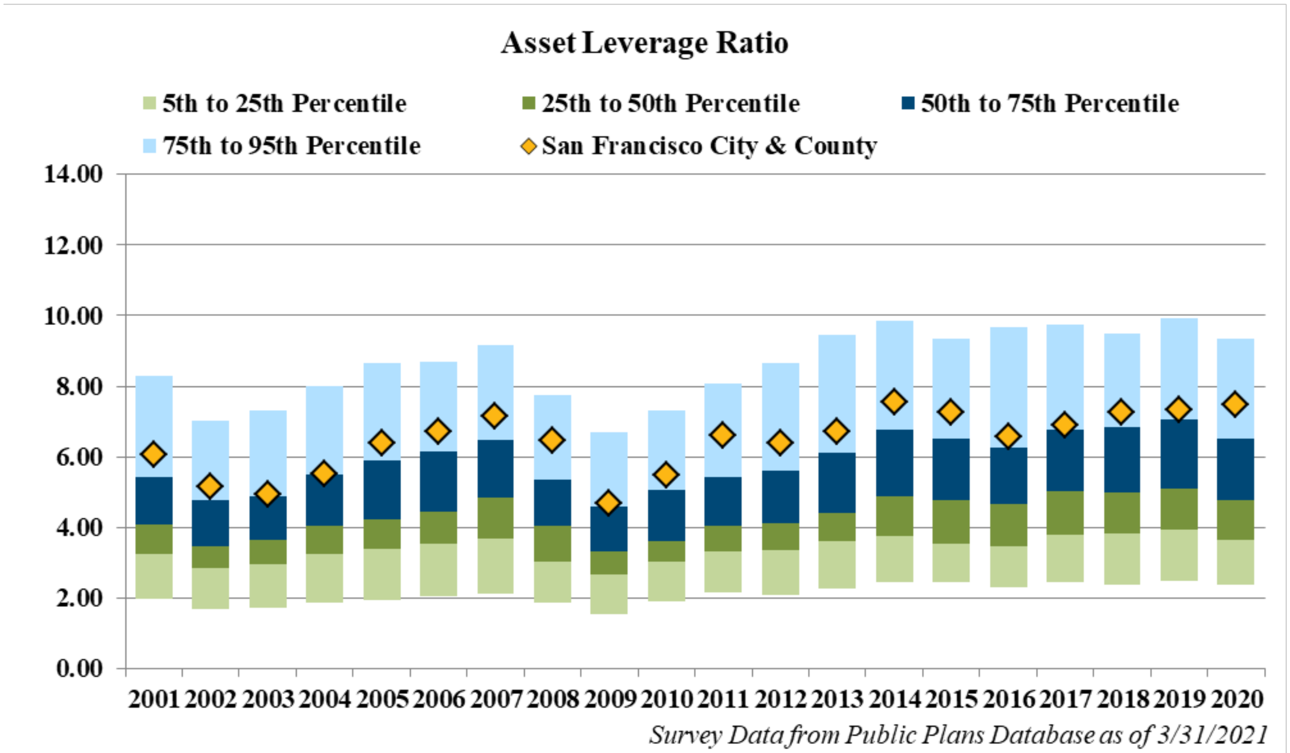
Leverage Ratios

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.



As SFERS becomes better funded, the asset leverage ratio will increase, and if it was 100% funded, the leverage ratio would equal the liability leverage ratio. The liability leverage ratio indicates how sensitive the system is to experience gains and losses or assumption changes. For example, an assumption change that increases the Actuarial Liability by 5% would add a liability equivalent to about 50% of payroll if the liability leverage ratio is 10.0.

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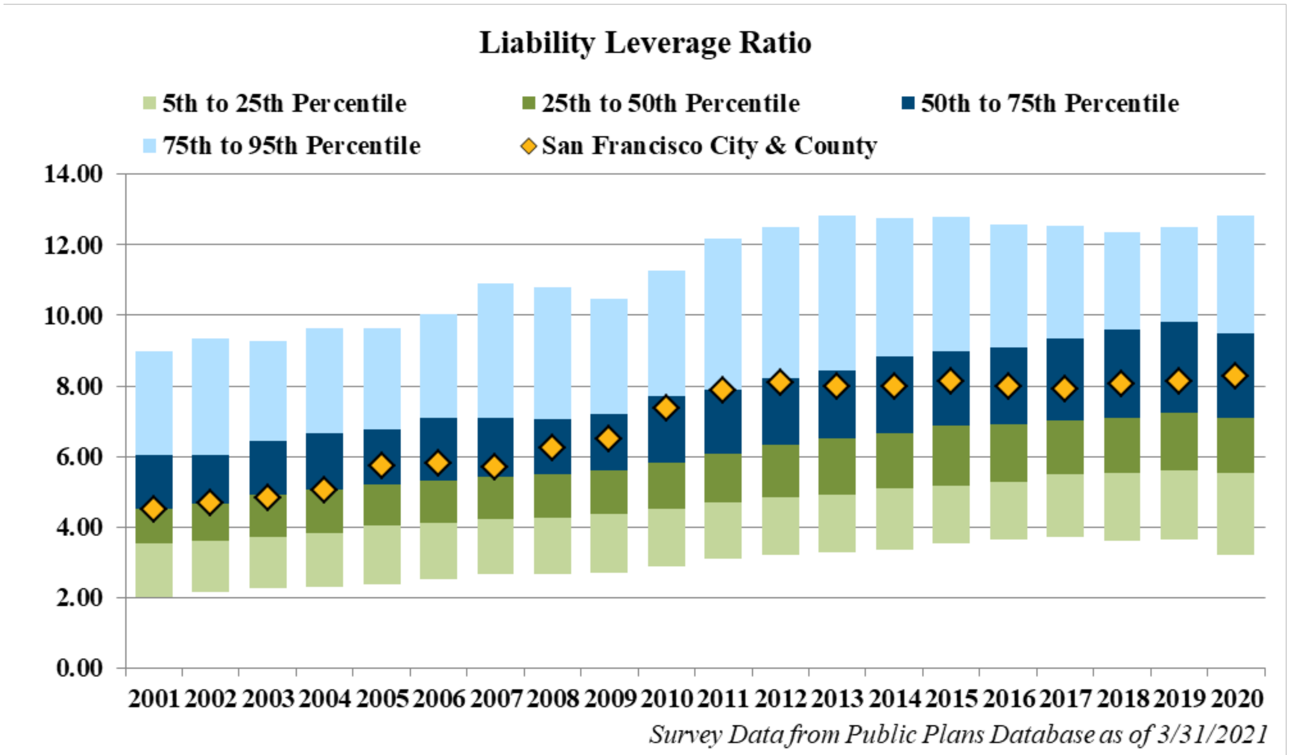

The two previous charts above compare the distribution from the 5th to 95th percentile of asset and liability leverage ratios for the plans in the Public Plans Database to SFERS (yellow diamonds).

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 7.6 in 2014, similar to the current ratio of 7.5. This level indicates that SFERS is more sensitive to investment returns than 75% of public plans.

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. This level means that SFERS is more sensitive to the impact of assumption changes than the majority of public plans.

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 = 7.5%, standard deviation = 11.8% (1 year), 15.2% - (5 year)).

Distribution of Expected Average Annual Returns		
Percentile	1 Year	5 Year
5%	-10.1%	-3.0%
25%	-0.1%	3.1%
50%	7.5%	7.5%
75%	15.7%	12.1%
95%	28.6%	19.1%

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
2021	-10.10%	28.60%	3.10%	12.10%	-3.00%	19.10%
2022	7.40%	7.40%	3.10%	12.10%	-3.00%	19.10%
2023	7.40%	7.40%	3.10%	12.10%	-3.00%	19.10%
2024	7.40%	7.40%	3.10%	12.10%	-3.00%	19.10%
2025	7.40%	7.40%	3.10%	12.10%	-3.00%	19.10%
2026+	7.40%	7.40%	7.40%	7.40%	7.40%	7.40%

The charts on the following pages show the projections under each of these theoretical scenarios. The contribution charts include a blue line representing the 2020 baseline projections shown in the Board Summary (on page 9) to facilitate the comparison between the particular 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 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

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

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.

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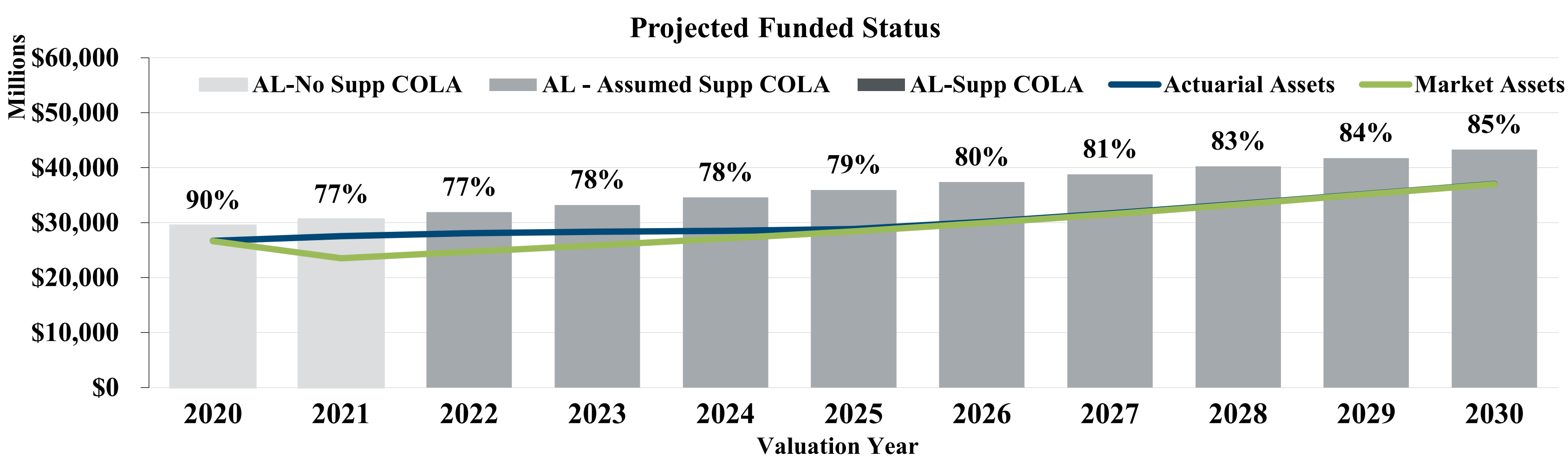
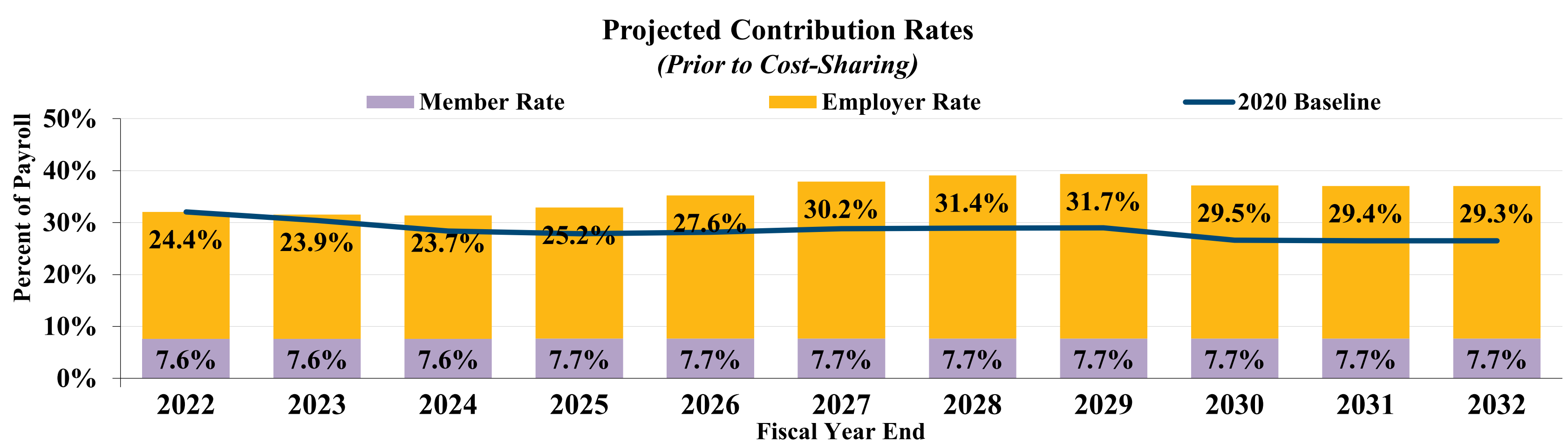
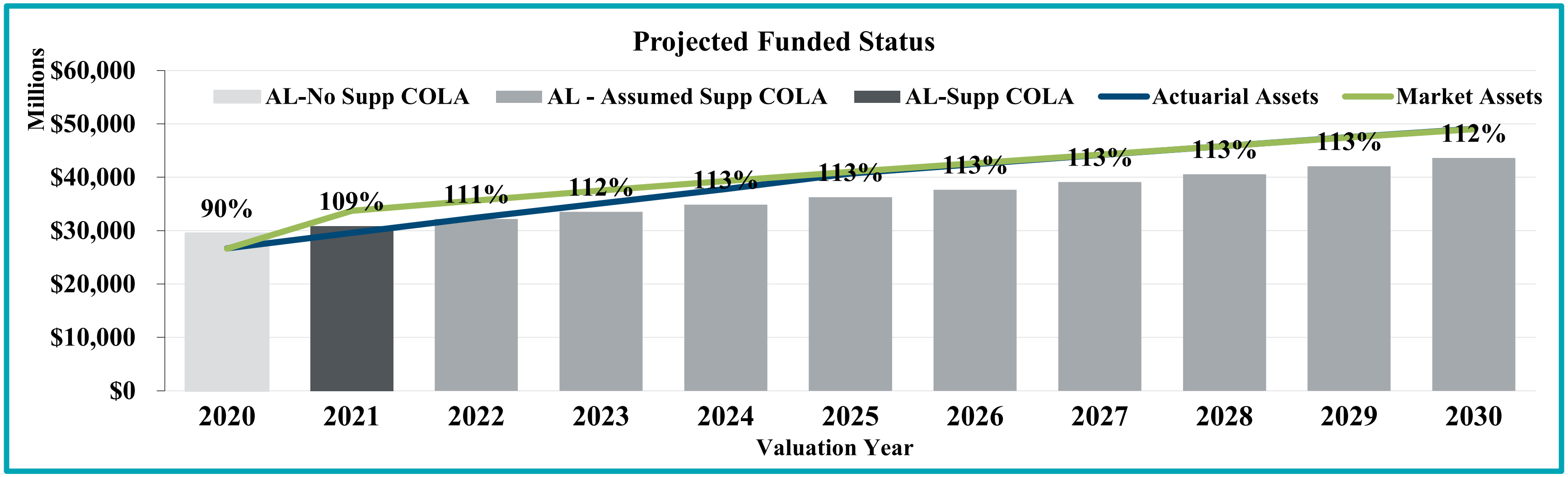
One-Year Negative Shock Scenario: -10.1% return FYE 2021, 7.4% after

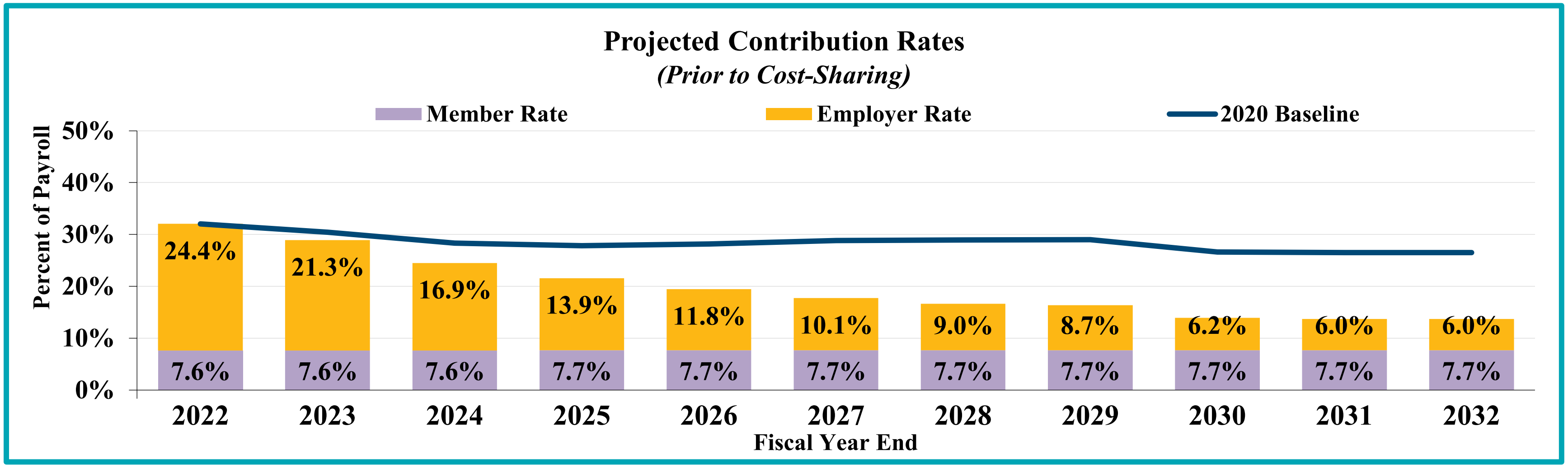




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

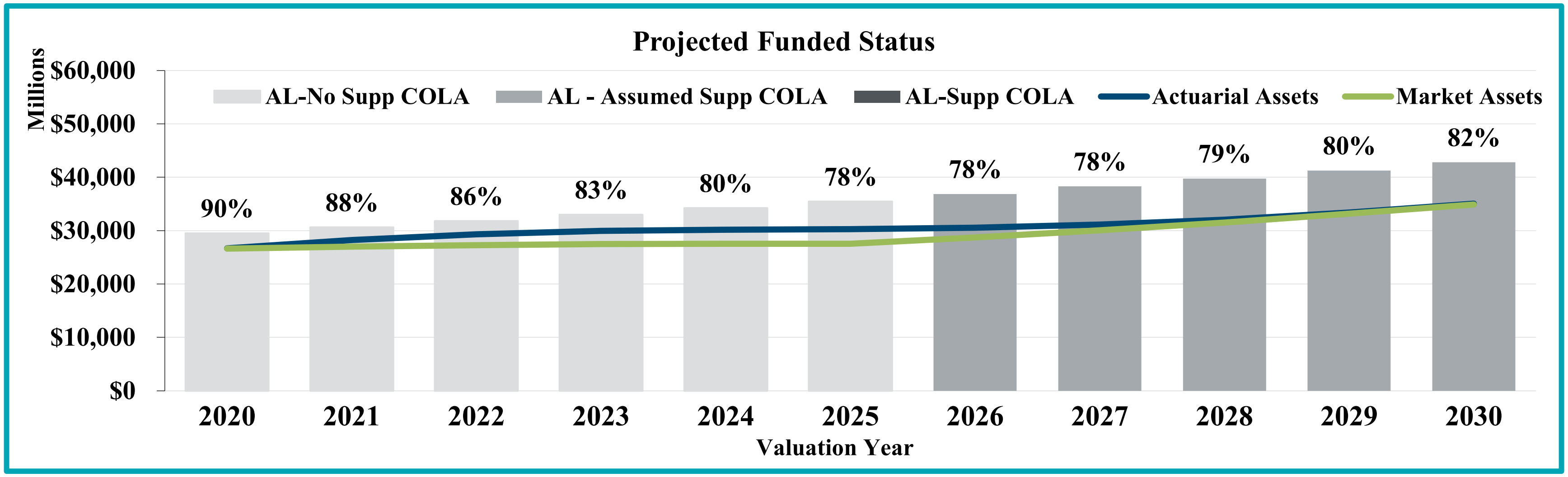
One-Year Positive Shock Scenario: 28.6% return FYE 2021, 7.4% after

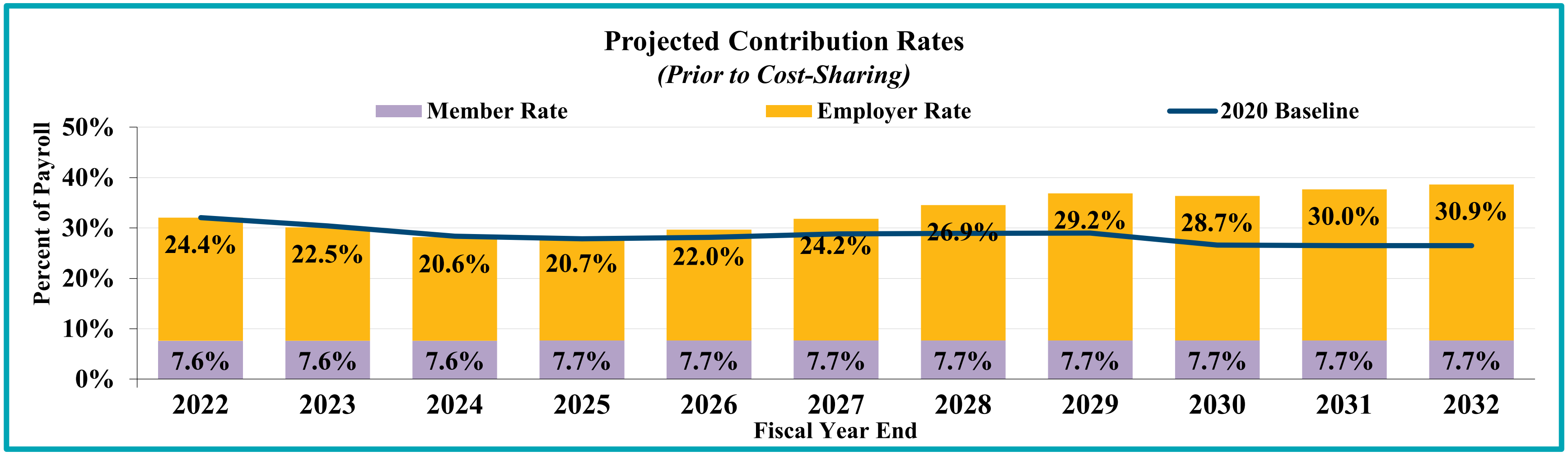




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

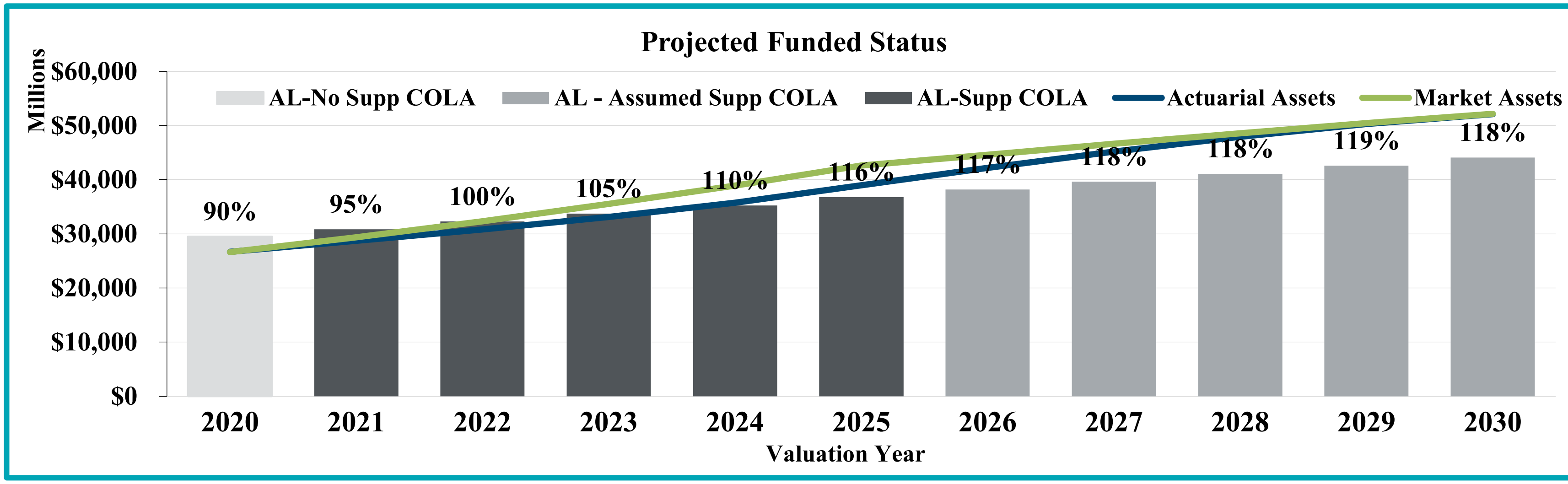
Five-Year Moderate Negative Scenario: 3.1% return FYE 2021-2025, 7.4% after

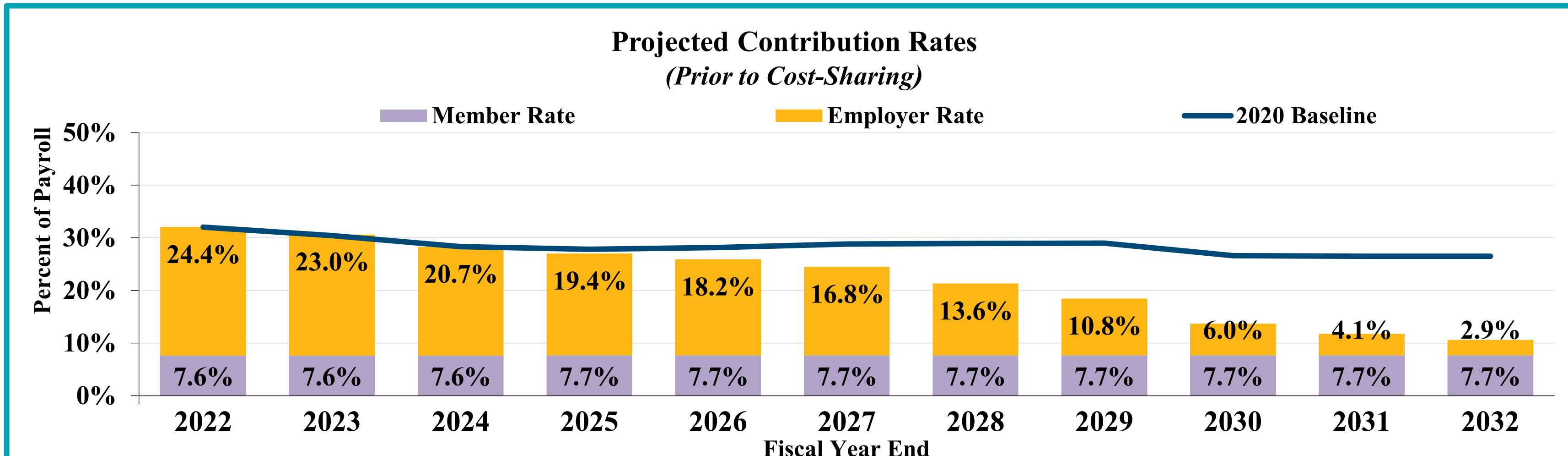




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

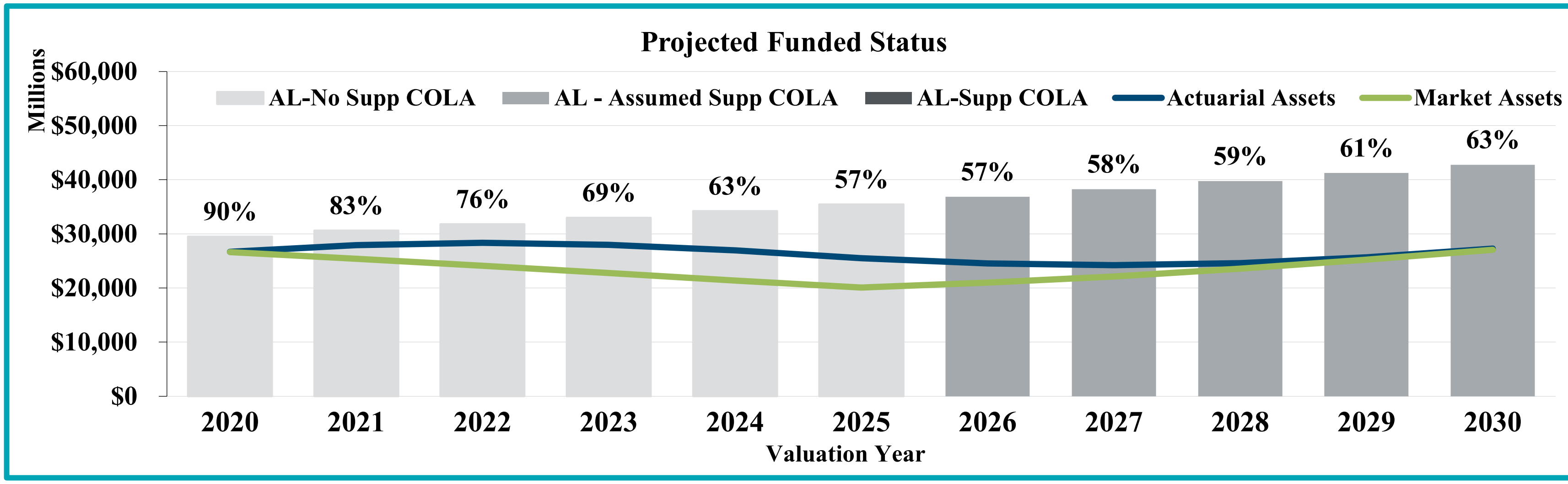
Five-Year Moderate Positive Scenario: 12.1% return FYE 2021-2025, 7.4% after

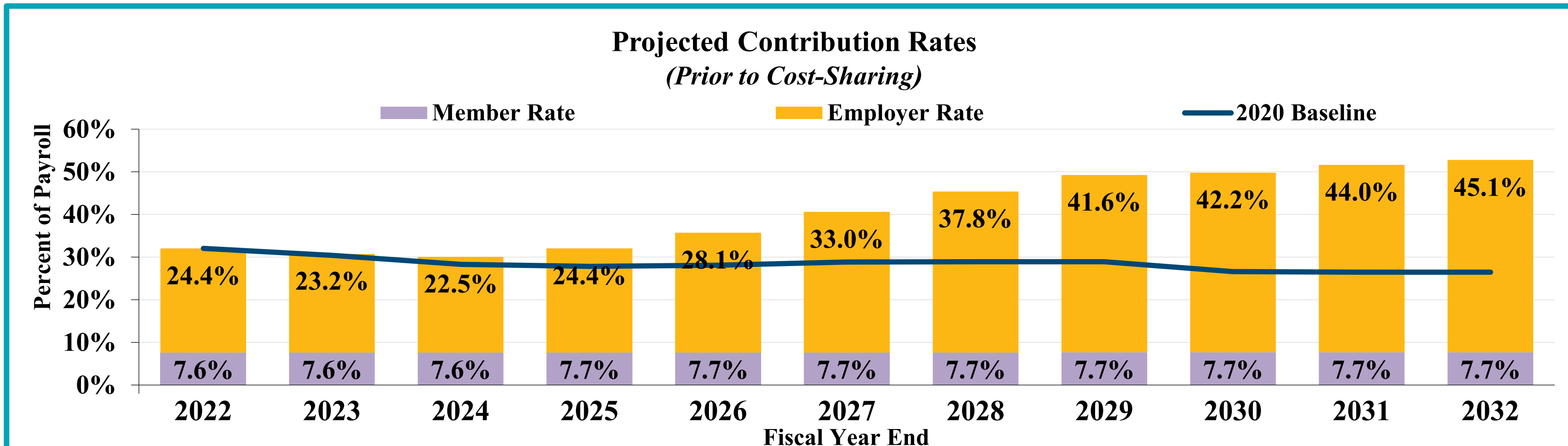




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

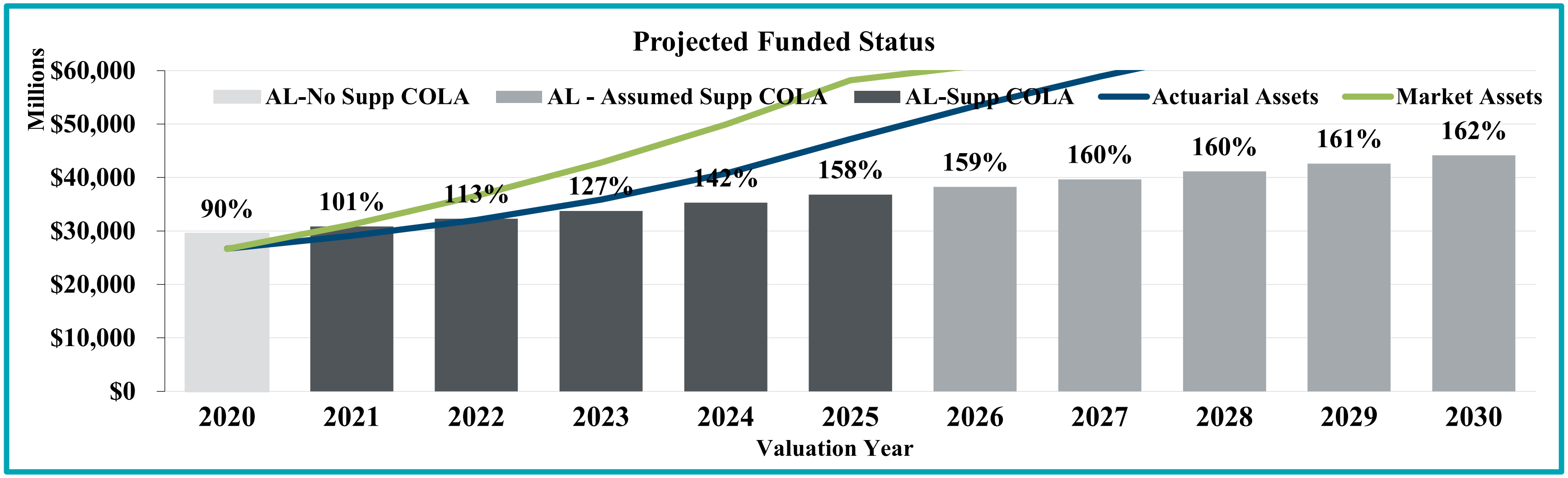
Five-Year Significant Negative Scenario: -3.0% return FYE 2021–2025, 7.4% after

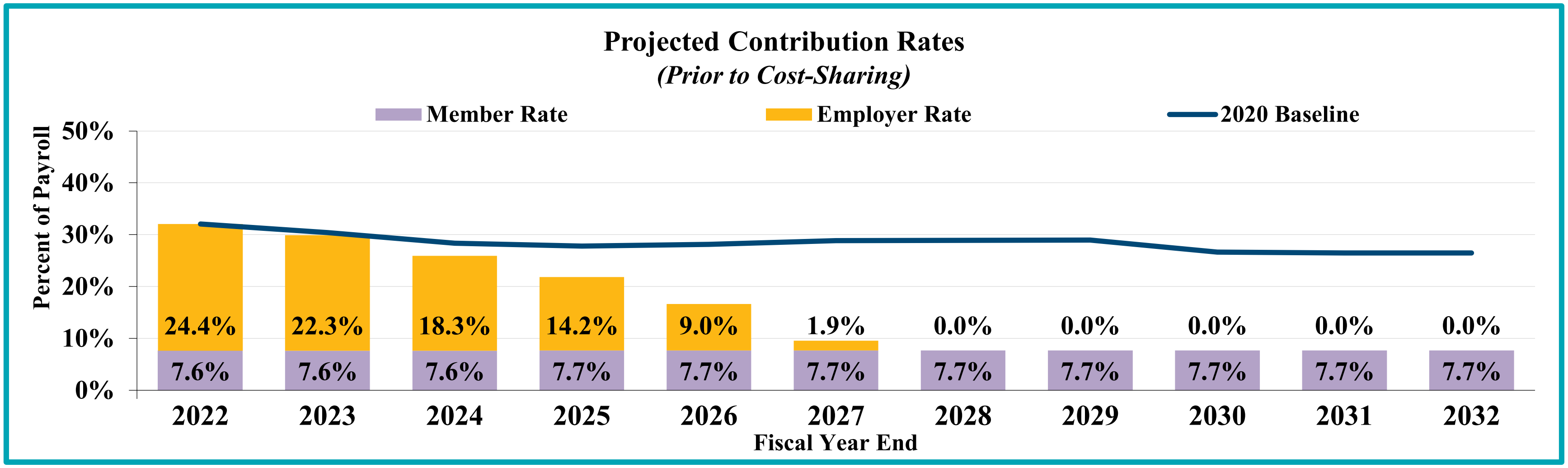




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Positive Scenario: 19.1% return FYE 2021-2025, 7.4% after





SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

The scenarios show that actual future investment returns have a significant impact on future contribution rates. The 5-year positive economic scenarios all result in the payment of Supplemental COLAs to both Pre-96 and Post '96 Retirees. The employer contribution rates decrease in FYE 2023 and continue to decline quickly and steadily for the remainder of the projection period. The five-year significant positive scenario (19.1%) shows a steady decline in the employer contribution rate to 0.0% by FYE 2028, while both the five-year positive moderate (12.1%) and one-year positive shock (28.6%) scenarios show more gradual declines to 2.9% and 6.0% respectively by FYE 2032.

Even the negative economic scenarios show slight decreases in the employer contribution rates over the next two years before contributions rise again. The completion of payments on several amortizations in each of the next three years creates significant downward pressure on contribution rates. The one-year negative shock (-10.1%) shows slight rate decreases for the next two years before the employer rate climbs to its peak in FYE 2029 of 31.7%. The five-year moderate negative scenario (3.1%) produces rate decreases over the next two years, decreasing to 20.6% in FYE 2024 before it increases to 30.9% in FYE 2032. Finally, the five-year significant negative scenario (-3.0%) produces gradually decreasing rates over the next two years to 22.5% before the employer rate escalates to 45.1% in FYE 2032.

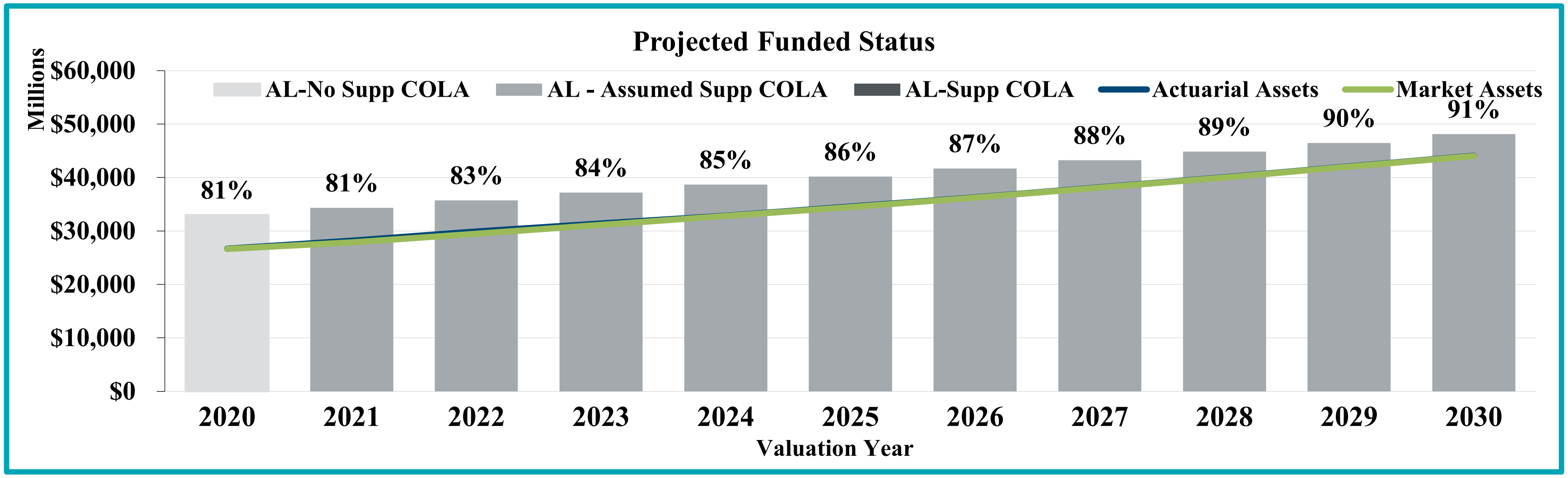
The investment returns used in the projections above were selected solely to illustrate the impact of investment volatility on the pattern of funded status and employer contribution rates. They are not intended to be predictive of actual future contribution rates or funded status or even to represent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

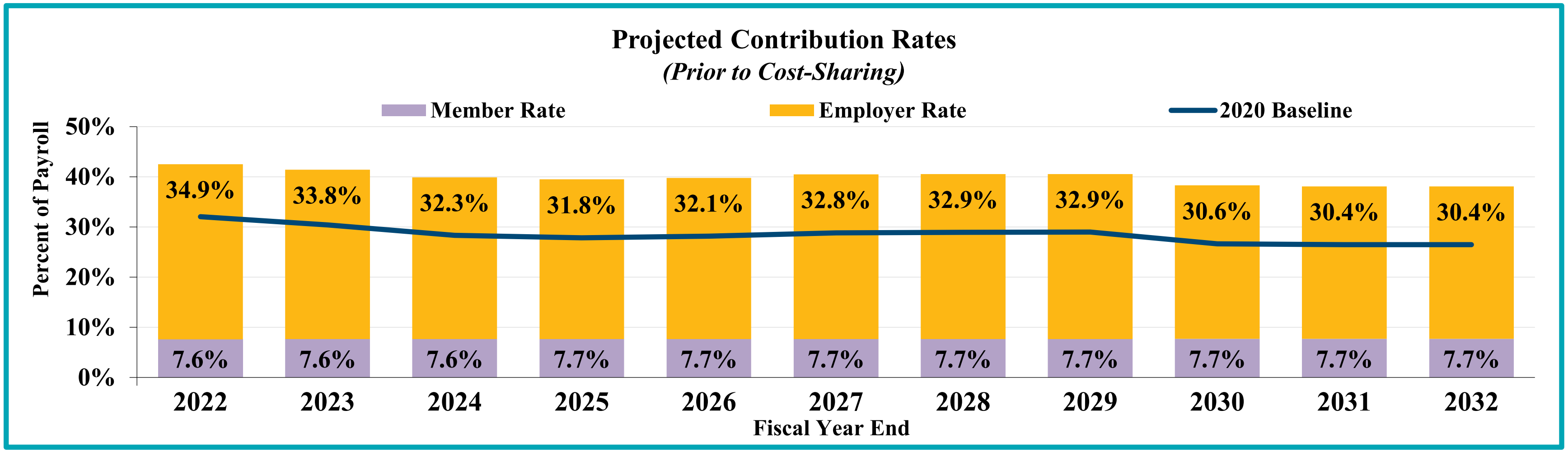
Interest Rate and Discount Rate Change Risk – Sensitivity Testing

As shown above, assumption changes over the last decade have increased the UAL by approximately $1.2 billion, with decreases in the discount rate from 7.75% to 7.40% accounting for approximately $735 million 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 remain at 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 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 the following pages 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

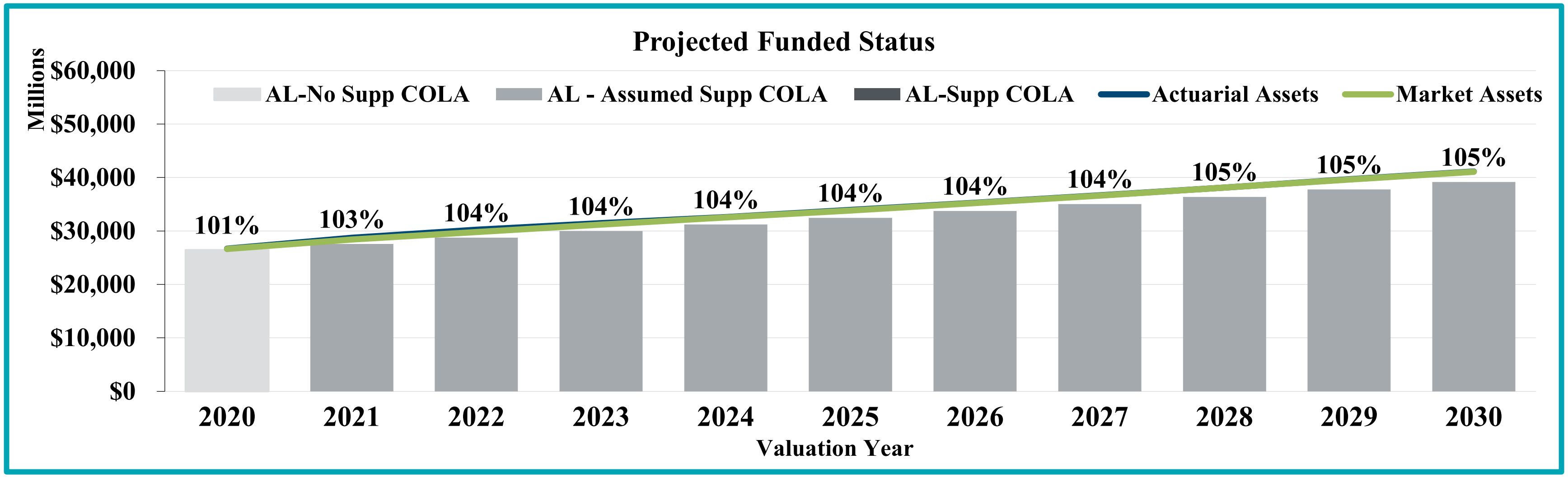
Discount Rate Sensitivity Testing – 100 Basis Point Reduction – 6.40%

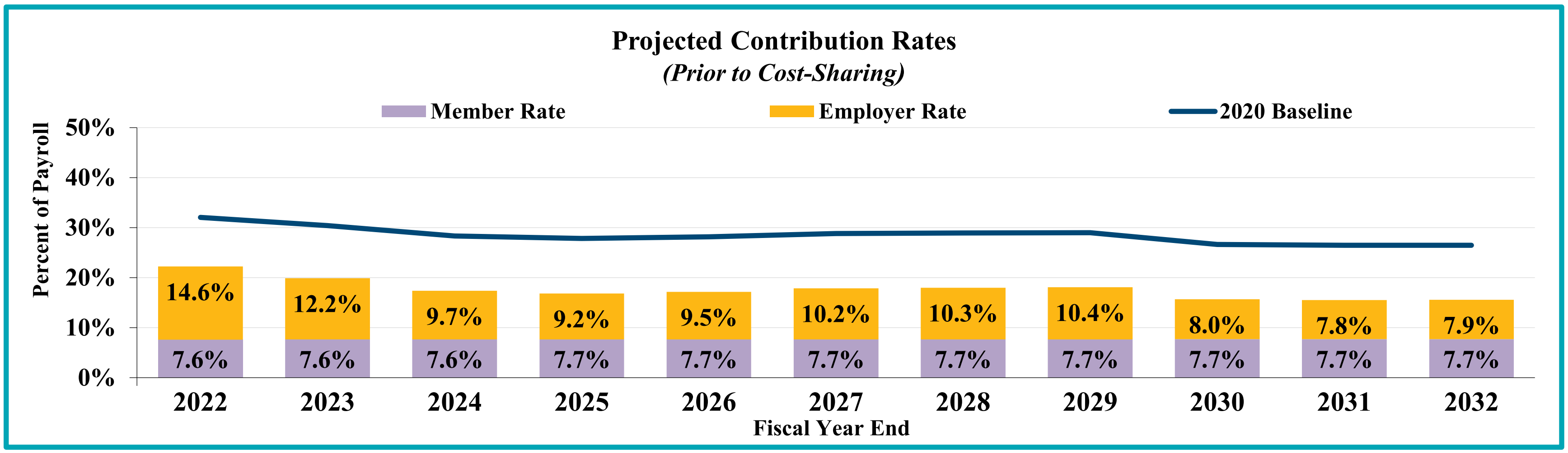




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Discount Rate Sensitivity Testing – 100 Basis Point Increase – 8.40%





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 retired prior to November 6, 1996 or were hired after Proposition C passed in 2012, the Supplemental COLA is only payable if the System was 100% funded the prior year.

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	$ 29,499.9	$ 31,525.8	6.9%
Actuarial Value of Assets	$ 26,695.8	$ 26,695.8	0.0%
Unfunded Actuarial Liability (actuarial value)	2,804.1	4,830.0	72.2%
Funding Ratio (actuarial value)	90.5%	84.7%	-5.8%
Market Value of Assets	$ 26,620.2	$ 26,620.2	0.0%
Unfunded Liability (market value)	2,879.7	4,905.6	70.4%
Funding Ratio (market value)	90.2%	84.4%	-5.8%

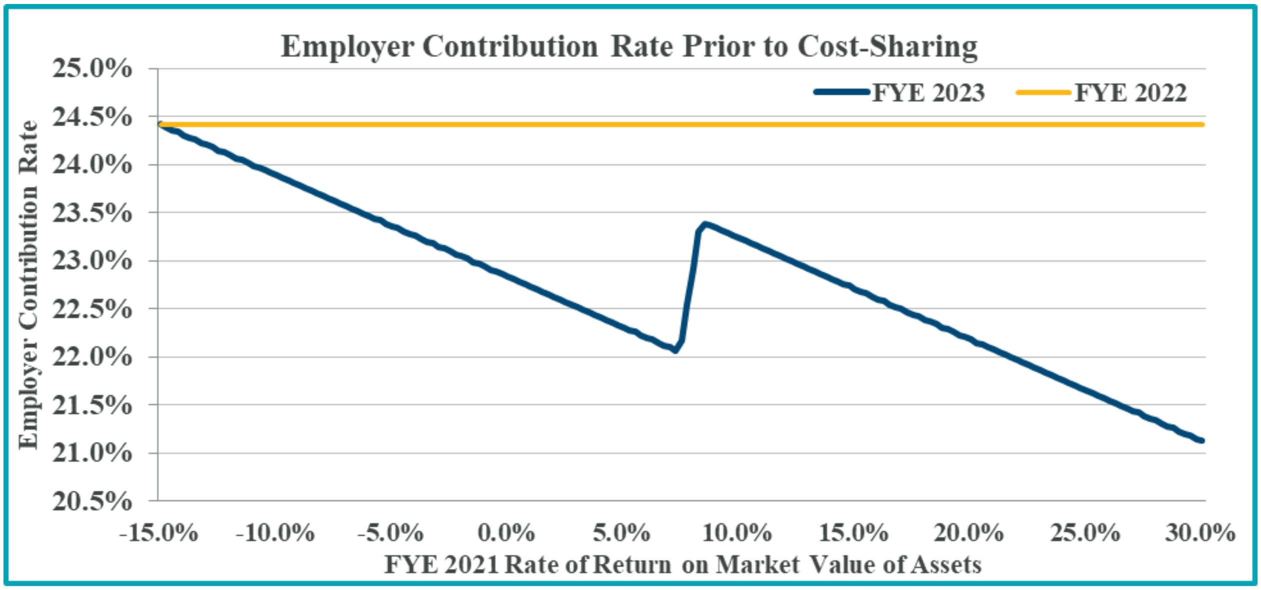
While current contributions rates do not anticipate any future Supplemental COLAs, when a Supplemental COLA is granted, the increase in Actuarial Liability is amortized over five years, increasing contribution rates. The higher than expected investment returns that generate a Supplemental COLA are smoothed 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 2023 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 2023 ranges from 21.1% to 24.4%, a relatively narrow range compared to the extremely wide range of investment returns.

There is downward pressure on the FYE 2023 employer contribution rate due to the completion of payments on the UAL from the 2014 Supplemental COLA of approximately 1.6% of pay. As shown in the chart, a return of approximately 7.4% starts to generate a Supplemental COLA, and a return of approximately 8.33% or greater generates a full Supplemental COLA.

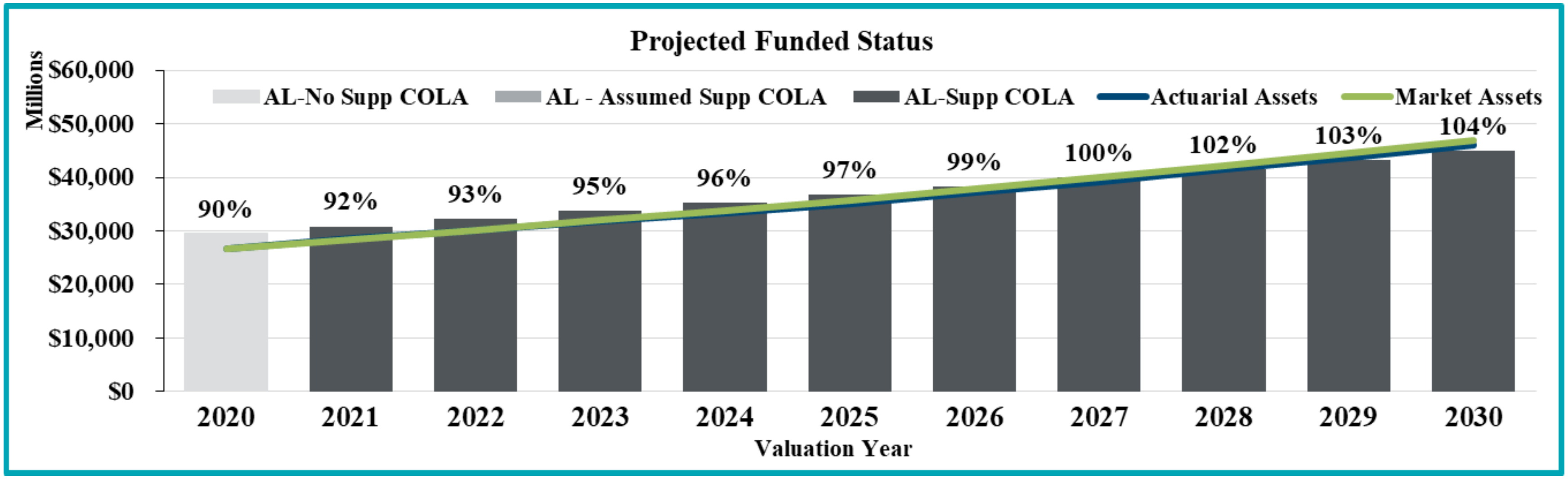


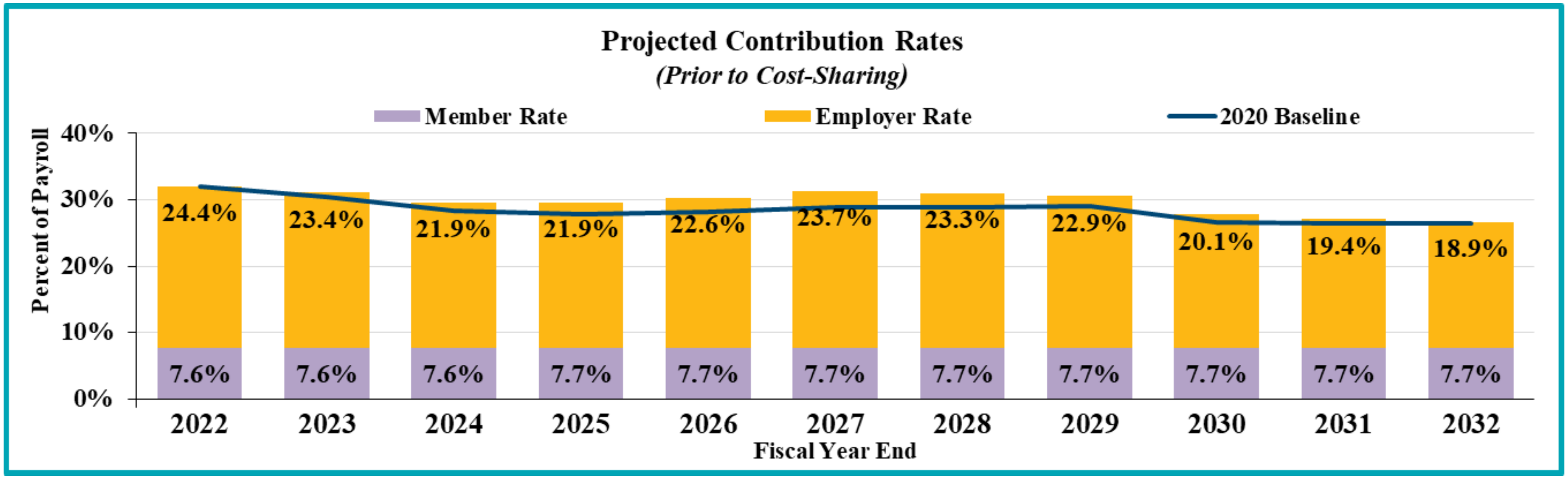
The impact of future Supplemental COLAs on contribution rates and funded status is the worst when the investment returns are just large enough to generate a Supplemental COLA. To illustrate this potential risk and how the amortization method manages it, the projections on the following page assume 8.33% returns each year.

These projections illustrate that the 5-year amortization method manages the risk of future Supplemental COLAs relatively well. There is a chance that contributions increase slightly above the baseline level in the short-term, but the risk is limited both in scope and duration. Also, there is significant progress in the funded status of the plan reaching 100% funding by 2027.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Supplemental COLA Risk Stress Test: 8.33% return FYE 2021-2030





SECTION III – CERTIFICATION

The purpose of this report is to present the July 1, 2020 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 was adopted at the April 28, 2021 Board meeting. We believe all of 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.

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

SECTION III – CERTIFICATION

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

William R. Hallmark, ASA, EA, FCA, MAAA
Consulting Actuary

Anne Harper

Anne D. Harper, FSA, EA, MAAA
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 2020	FYE 2019
1.	Market Value, Beginning of Year	$ 26,078,649	$ 24,557,966
2.	Additions		
	a. Employer Contributions	742,985	645,056
	b. Member Contributions	400,649	380,980
	c. Total Additions: (2a. + 2b.)	$ 1,143,634	$ 1,026,036
3.	Net Investment Income	966,282	1,970,312
4.	Benefits and Administrative Expenses	(1,568,347)	(1,475,665)
5.	Net Increase/(Decrease): (2c.+3.+4.)	$ 541,569	$ 1,520,683
6.	**Market Value, End of Year**	**$ 26,620,218**	**$ 26,078,649**
7.	Estimated Rate of Return on Market Value	3.7%	8.1%

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 7/1/2020
(Amounts in thousands)

			Total
1.	Actuarial Value as of 7/1/2019	$	25,247,549
2.	Non-Investment Cash Flow for FYE 2020		(424,713)
3.	Expected Return for FYE 2020		1,879,417
4.	Expected Actuarial Value as of 7/1/2020: (1+2+3)	$	26,702,253
5.	Actual Return in FYE 2020		966,282
6.	Actual Return Above Expected in 2019-2020: (5 - 3)		(913,135)
7.	Recognition of Returns Above / (Below) Expected		
	a. 2019-2020 (20% of 6.)		(182,627)
	b. 2018-2019		39,545
	c. 2017-2018		175,751
	d. 2016-2017		226,198
	e. 2015-2016		(265,276)
	f. Total: (7a. + 7b. + 7c. + 7d. + 7e.)	$	(6,409)
8.	**Actuarial Value as of 7/1/2020: (4 + 7f.)**	**$**	**26,695,844**
9.	Market Value as of 7/1/2020	$	26,620,218
10.	Ratio of Actuarial Value to Market Value: (8 / 9)		100.3%
11.	Estimated Rate of Return on Actuarial Value		7.37%

Investment Performance

The internal rate of return on the Market Value of Assets, net of investment expenses, was 3.74% for the plan year ending June 30, 2020. This return compares to an assumed rate of return of 7.40% and resulted in actual returns that are approximately $913 million 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, 2020 was 7.37% compared to the assumed return of 7.40%. This return produced an overall SFERS investment loss on the Actuarial Value of Assets of $6 million for the plan year ending June 30, 2020.

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, 2020 and July 1, 2019.

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

	July 1, 2020	July 1, 2019	% Change
Present Value of Future Benefits			
Actives	$ 16,536,203	$ 16,274,051	1.6%
Terminated Vested	606,081	586,750	3.3%
Members Receiving Benefits	18,014,526	17,487,027	3.0%
Total	$ 35,156,810	$ 34,347,828	2.4%

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, 2020
(Amounts in thousands)

	Police	Fire	Miscellaneous	Total
Normal Cost by Benefit Tier				
Old	$ 0	$ 0	$ 108	$ 108
New	54,913	41,179	237,920	334,012
Prop D	991	2,551	25,342	28,884
Prop C	40,254	25,129	213,534	278,917
Total	$ 96,158	$ 68,859	$ 476,904	$ 641,921

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, 2020
(Amounts in thousands)

	Police	Fire	Miscellaneous	Total
Actuarial Liability				
Actives	$ 1,650,630	$ 1,288,380	$ 7,940,302	$ 10,879,312
Terminated Vested	27,827	18,890	559,364	606,081
Members Receiving Benefits				
Retirees	2,336,902	1,556,329	10,616,017	14,509,248
Disabled	739,626	1,000,257	458,037	2,197,920
Beneficiaries	356,626	282,777	667,954	1,307,357
Total Members Receiving Benefits	3,433,154	2,839,363	11,742,008	18,014,525
Total Actuarial Liability	**$ 5,111,611**	**$ 4,146,633**	**$ 20,241,674**	**$ 29,499,918**

SECTION V – MEASURES OF LIABILITY

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 2020 Experience Gain/(Loss)
(Amounts in millions)

Item	Cost
1. Unfunded Actuarial Liability at July 1, 2019	$ 3,551.0
2. Middle of year expected actuarial liability payment	(553.8)
3. Interest to end of year on 1. and 2.	242.6
4. UAL decrease due to changes in Actuarial Assumptions	(591.4)
5. Expected Unfunded Actuarial Liability at July 1, 2020 (1+2+3+4)	$ 2,648.4
6. Actual Unfunded Liability at July 1, 2020	2,804.1
7. Experience (Loss:) (5 - 6)	$ (155.7)
8. Portion of difference due to:	
a. Investment experience on actuarial value	$ (6.4)
b. Salaries more than expected	(114.5)
c. Old Safety Basic COLA less than expected	86.6
d. Retirements	(3.9)
e. Terminations	(19.8)
f. New entrants	(45.0)
g. Contributions (rate delay, payroll changes, and expense gain)	(37.0)
h. Mortality and disability experience	(14.9)
i. Other experience	(0.8)
j. Total Loss	(155.7)

Table V-5 on the next page shows a five-year history of sources of liability gain and loss. New entrants, termination rates, and retirement rates have been the primary sources of losses while COLAs for the old safety groups have been the primary sources of gains.

SECTION V – MEASURES OF LIABILITY

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

Source	Year Ending June 30, 2016	2017	2018	2019	2020	Total
Salary Increases	$ 4,894	$ (80,610)	$ (53,729)	$ 45,993	$ 114,500	$ 31,048
Retirement	34,095	27,735	20,226	32,398	3,918	118,372
Termination	27,843	20,742	22,919	47,547	19,838	138,889
Mortality	13,952	(6,205)	10,721	1,112	4,590	24,170
Disability	10,256	(912)	5,585	10,387	10,327	35,643
New Entrants	18,757	19,793	39,173	41,251	45,006	163,980
Old Safety COLAs	(64,771)	(64,299)	(29,632)	(22,131)	(86,577)	(267,410)
Other	(10,512)	38,260	(8,717)	28,851	691	48,573
Total	$ 34,514	$ (45,496)	$ 6,546	$ 185,408	$ 112,293	$ 293,265

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 below develops the employer's contribution rate for FYE 2022 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.

Table VI-1
Development of the Net Employer Contribution Rate as of July 1, 2020 for FYE 2022
(Amounts in millions)

	FYE 2022				FYE 2021
	Police	Fire	Miscellaneous	TOTAL	TOTAL
1. Total Normal Cost Rate	27.78%	28.95%	15.23%	**17.29%**	**17.72%**
2. Member Contribution Rate	8.25%	8.21%	7.50%	**7.62%**	**7.61%**
3. Employer Normal Cost Rate (1.- 2.)	19.53%	20.74%	7.73%	**9.67%**	**10.11%**
4. a. UAL - Proposition balance	$ 70.6	$ 68.9	$ 519.2	**$ 658.7**	**$ 769.8**
b. Other UAL	200.4	138.5	1,806.5	**2,145.4**	**2,781.2**
c. Total UAL (4a.+4b.)	$ 271.0	$ 207.4	$ 2,325.7	**$ 2,804.1**	**$ 3,551.0**
5. a. Amortization of Proposition UAL	7.49%	11.17%	2.54%	**3.56%**	**4.74%**
b. Amortization of Other UAL	10.58%	10.58%	10.58%	**10.58%**	**11.45%**
c. Total Amortization (5a.+5b.)	18.07%	21.75%	13.12%	**14.14%**	**16.19%**
6. Administrative Expenses	0.60%	0.60%	0.60%	**0.60%**	**0.60%**
7. Net Employer Contribution Rate (3.+5c.+6.)	38.20%	43.09%	21.45%	**24.41%**	**26.90%**

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 24.41% and the hourly pay rates shown in the table below.

Table VI-2
Employee and Employer Contribution Rates By Employee Group for FYE 2022
(Amounts in thousands)

Hire Date	Hourly Pay	Estimated Payroll FYE 2022	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%	24.41%	11.50%	19.91%	4.50%
11/2/1976 - 6/30/2010	All	308,164	7.50%	24.41%	12.00%	19.91%	4.50%
> 6/30/2010	< $62	243,460	9.00%	24.41%	12.50%	20.91%	3.50%
> 6/30/2010	>= $62	52,428	9.00%	24.41%	13.00%	20.41%	4.00%
Miscellaneous							
< 11/2/1976	< $31	$ 0	8.00%	24.41%	8.00%	24.41%	0.00%
< 11/2/1976	$31 - $62	550	8.00%	24.41%	11.50%	20.91%	3.50%
< 11/2/1976	>= $62	113	8.00%	24.41%	12.00%	20.41%	4.00%
>= 11/2/1976	< $31	223,877	7.50%	24.41%	7.50%	24.41%	0.00%
>= 11/2/1976	$31 - $62	1,872,377	7.50%	24.41%	11.00%	20.91%	3.50%
>= 11/2/1976	>= $62	1,122,485	7.50%	24.41%	11.50%	20.41%	4.00%
Estimated Total Plan		**$ 3,823,454**	**7.62%**	**24.41%**	**11.15%**	**20.88%**	**3.53%**
Estimated Contribution Amounts			**$ 291,347**	**$ 933,305**	**$ 426,315**	**$ 798,337**	**$ 134,968**

Dollar Amounts in Thousands

Table VI-3 on the following page provides the payment schedules to amortize the changes to the Actuarial Liability as a result of changes to the Charter. Each Charter change is amortized over 20 years from the date it is 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, are amortized over a closed 5-year period. 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 ultimate assumed wage inflation rate.

SECTION VI – CONTRIBUTIONS

Table VI-3
Development of the Proposition Amortization Rate as of July 1, 2020 for FYE 2022
(dollars in thousands)

Propositions	Remaining Period	Police Outstanding Balance	Police Amortization Payment	Fire Outstanding Balance	Fire Amortization Payment	Miscellaneous Outstanding Balance	Miscellaneous Amortization Payment	Total Outstanding Balance	Total Amortization Payment
6.25% Credited Interest on EE ctrbs	2	21	12	5	3	2,940	1,668	2,966	1,683
2002 Prop H - Safety Ret Bfts	2	37,391	21,219	39,751	22,557	0	0	77,142	43,776
5.0% Credited Interest on EE ctrbs	4	(246)	(73)	(117)	(34)	(22,542)	(6,648)	(22,905)	(6,755)
2004 Prop E - New Safety LOD Bfts	5	3,375	812	4,740	1,140	0	0	8,115	1,952
2003 Prop F - Misc 3+3 Early Ret Bfts	5	0	0	0	0	10,210	2,455	10,210	2,455
Liability of 2003 Prop F (extended) - Misc 3+3 Early Ret Bfts	6	0	0	0	0	6,689	1,366	6,689	1,366
Liability of 2003 Prop F (extended) - Misc 3+3 Early Ret Bfts	7	0	0	0	0	3,314	591	3,314	591
2008 Prop B - New Misc Ret Bfts and Compound COLA	8	30,017	4,774	24,494	3,896	518,670	82,498	573,181	91,168
Proposition Total		**$ 70,558**	**$ 26,744**	**$ 68,873**	**$ 27,562**	**$ 519,281**	**$ 81,930**	**$ 658,712**	**$ 136,236**
Expected FYE 2022 Payroll			**$ 357,235**		**$ 246,816**		**$ 3,219,403**		**$ 3,823,454**
Amortization Rate			**7.49%**		**11.17%**		**2.54%**		**3.56%**

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. Table VI-4 below 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.

Table VI-4
Development of the Non-Proposition Amortization Rate as of July 1, 2020 for FYE 2022
(dollars in thousands)

Amortization Bases	Remaining Period	Outstanding Balance	Amortization Payment
2013 Non-Proposition UAL	13	$ 2,469,621	$ 264,951
2014 Actuarial Gain	14	(827,414)	(83,922)
2014 Assumption Change	14	146,367	14,846
2015 Actuarial Gain	15	(748,485)	(72,131)
2015 Assumption Change	15	1,184,192	114,120
2013 Supplemental COLA	13	190,994	20,491
2014 Supplemental COLA	1	55,962	62,287
2016 Actuarial Loss	16	27,027	2,485
2017 Actuarial Gain	17	(392,297)	(34,556)
2017 Supplemental COLA	2	93,718	53,183
2017 Assumption and Method Change	17	49,730	4,381
2018 Actuarial Gain	18	(390,657)	(33,072)
2018 Supplemental COLA	3	133,809	51,613
2018 Assumption Change	18	296,595	25,109
2019 Actuarial Loss	19	172,965	14,115
2019 Supplemental COLA	4	118,864	35,055
2020 Actuarial (Gain)/Loss	20	155,725	12,282
2020 Assumption Changes	20	(591,355)	(46,640)
Total Non-Proposition UAL		**$ 2,145,361**	**$ 404,597**
Expected FYE 2022 Payroll			**$ 3,823,454**
Amortization Rate			**10.58%**

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 Comprehensive Annual 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, 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)
July 1, 2012	(1,135,013)	(55,440)	187,116	(1,003,337)	(135,527)	(1,138,864)
July 1, 2011	(559,587)		183,528	(376,059)	(261,317)	(637,376)

[1] *Due to Payroll Changes, One-Year Lag, and Expenses (Not determined prior to the July 1, 2012 valuation).*

[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)
2020 [1]	$ 3,916	$ 18,621	$ 6,963	$ 26,696	100%	100%	60%
2019	3,675	18,074	7,050	25,248	100%	100%	50%
2018 [2]	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%
2012 [6]	2,451	11,658	5,285	16,028	100%	100%	36%
2011 [6]	2,364	10,987	5,248	16,313	100%	100%	56%

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

[2] *Reflects revised discount rate.*

[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, 2020	$ 26,695,845	$ 29,499,918	$ 2,804,073	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%
July 1, 2012	16,027,683	19,393,854	3,366,171	83%	2,393,842	141%
July 1, 2011	16,313,120	18,598,728	2,285,608	88%	2,360,413	97%

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
2011	1,672	$66,575,560	880	$24,641,442	24,292	$ 905,053,471	8.5%	$37,257
2012	1,769	70,868,367	871	26,958,609	25,190	982,250,287	8.5%	38,994
2013	1,577	66,437,220	733	22,406,077	26,034	1,045,547,799	6.4%	40,161
2014	1,588	65,923,470	770	25,170,856	26,852	1,103,959,803	5.6%	41,113
2015	1,564	63,136,134	931	29,314,643	27,485	1,157,081,680	4.8%	42,099
2016	1,657	72,049,646	856	30,384,191	28,286	1,247,230,245	7.8%	44,094
2017	1,769	80,214,008	928	35,082,179	29,127	1,332,430,263	6.8%	45,746
2018	1,797	84,574,963	959	36,284,323	29,965	1,424,324,641	6.9%	47,533
2019	1,770	83,661,179	957	36,959,870	30,778	1,513,436,081	6.3%	49,173
2020	1,470	74,777,425	816	34,764,875	30,128	1,587,981,080	4.9%	52,708

** 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, 2020	July 1, 2019	% Change
Total			
Count	34,521	34,202	0.9%
Average Current Age	46.7	46.6	0.1
Average Service	10.6	10.6	0.0
Annual Pensionable Earnings	$ 3,583,266,358	$ 3,378,714,262	6.1%
Average Pensionable Earnings	$ 103,800	$ 98,787	5.1%
Police			
Count	2,534	2,471	2.5%
Average Current Age	40.8	40.6	0.2
Average Service	12.3	12.1	0.2
Annual Pensionable Earnings	$ 336,710,528	$ 312,984,374	7.6%
Average Pensionable Earnings	$ 132,877	$ 126,663	4.9%
Fire			
Count	1,660	1,675	-0.9%
Average Current Age	43.9	43.7	0.2
Average Service	13.4	13.3	0.1
Annual Pensionable Earnings	$ 230,760,703	$ 222,140,313	3.9%
Average Pensionable Earnings	$ 139,012	$ 132,621	4.8%
Miscellaneous			
Count	30,327	30,056	0.9%
Average Current Age	47.4	47.3	0.1
Average Service	10.4	10.3	0.1
Annual Pensionable Earnings	$ 3,015,795,127	$ 2,843,589,575	6.1%
Average Pensionable Earnings	$ 99,443	$ 94,610	5.1%

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Active Member Data - By Charter
July 1, 2020

	Police	Fire	Miscellaneous	Total
Member Counts				
Old	0	2	13	15
New	1,267	868	13,979	16,114
Prop D	21	53	1,500	1,574
Prop C*	1,246	737	14,835	16,818
Total	2,534	1,660	30,327	34,521
Annual Pensionable Earnings				
Old	$ 0	$ 371,293	$ 1,250,801	$ 1,622,094
New	193,892,379	142,111,710	1,485,196,861	1,821,200,950
Prop D	3,067,008	7,572,025	147,337,627	157,976,660
Prop C*	139,751,141	80,705,675	1,382,009,838	1,602,466,654
Total	$ 336,710,528	$ 230,760,703	$ 3,015,795,127	$ 3,583,266,358

** Police includes 261 members in the Sheriffs Plan (Charter A8.608) and 112 members in the Miscellaneous Safety Plan (Charter A8.610)*

APPENDIX A – MEMBERSHIP INFORMATION

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

	July 1, 2020	July 1, 2019[2]	Change
Retired			
Count	23,519	22,934	2.6%
Average Age	71.3	71.1	0.2
Average Annual Benefit[1]	$ 53,684	$ 52,422	2.4%
Disabled			
Count	2,523	2,529	-0.2%
Average Age	69.5	69.3	0.2
Average Annual Benefit[1]	$ 69,852	$ 67,078	4.1%
Beneficiaries			
Count	4,086	4,027	1.5%
Average Age	77.8	77.5	0.3
Average Annual Benefit[1]	$ 36,504	$ 35,149	3.9%
Payee Average			
Count	30,128	29,490	2.2%
Average Age	72.1	71.8	0.3
Average Annual Benefit[1]	$ 52,708	$ 51,320	2.7%
Inactives			
Count	10,549	9,955	6.0%
Average Age	47.3	47.1	0.2
Total Contribution Balance with Interest	$ 315,944,777	$ 294,295,619	7.4%
Average Contribution Balance with Interest	$ 29,950	$ 29,563	1.3%

[1] *Benefits provided in June 30 valuation data; there was no Basic COLA effective July 1, 2020 for the Old Safety COLA groups. If applicable, limited by Section 415(b) of the Internal Revenue Code.*

[2] *Member data as of July 1, 2019 has been restated to reflect combining records for 1,284 Retired and 4 Disabled members who have both a Safety and Miscellaneous benefit.*

APPENDIX A – MEMBERSHIP INFORMATION

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

Charter Section	July 1, 2020 Prop H	July 1, 2020 8.559 8.585	July 1, 2020 8.595 8.596	July 1, 2020 Total	July 1, 2019[2]	Change
Retired						
Count	3	603	329	935	964	-3.0%
Average Age	87.7	80.1	72.2	77.3	76.8	0.5
Average Annual Benefit[1]	$ 25,412	$ 95,738	$ 142,287	$ 111,891	$ 107,805	3.8%
Disabled						
Count	42	400	144	586	619	-5.3%
Average Age	85.3	79.6	72.8	78.4	77.7	0.7
Average Annual Benefit[1]	$ 42,162	$ 100,965	$ 149,992	$ 108,798	$ 103,791	4.8%
Beneficiaries						
Count	102	623	46	771	782	-1.4%
Average Age	84.2	81.9	69.0	81.4	81.1	0.3
Average Annual Benefit[1]	$ 34,725	$ 86,656	$ 116,267	$ 81,552	$ 77,705	5.0%
Payee Average						
Count	147	1,626	519	2,292	2,365	-3.1%
Average Age	84.6	80.6	72.1	79.0	78.4	0.6
Average Annual Benefit[1]	$ 36,660	$ 93,544	$ 142,119	$ 100,895	$ 96,802	4.2%
Inactives						
Count	0	0	2	2	2	0.0%
Average Age	N/A	N/A	74.5	74.5	73.5	1.0
Total Contribution Balance with Interest	N/A	N/A	$ 2,802	$ 2,802	$ 2,694	4.0%
Average Contribution Balance with Interest	N/A	N/A	$ 1,401	$ 1,401	$ 1,347	4.0%

[1] *Benefits provided in June 30 valuation data; there was no Basic COLA effective July 1, 2020.*
If applicable, limited by Section 415(b) of the Internal Revenue Code.

[2] *Member data as of July 1, 2019 has been restated to reflect combining records for members who have both a Safety and Miscellaneous benefit.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-5 Non-Active Member Data - New Safety (includes Prop D and C)	July 1, 2020	July 1, 2019[2]	Change
Retired			
Count	1,830	1,760	4.0%
Average Age	63.9	63.3	0.6
Average Annual Benefit[1]	$ 113,068	$ 111,158	1.7%
Disabled			
Count	628	585	7.4%
Average Age	63.9	63.5	0.4
Average Annual Benefit[1]	$ 111,630	$ 108,877	2.5%
Beneficiaries			
Count	144	130	10.8%
Average Age	62.3	61.3	1.0
Average Annual Benefit[1]	$ 71,680	$ 68,207	5.1%
Payee Average			
Count	2,602	2,475	5.1%
Average Age	63.8	63.3	0.5
Average Annual Benefit[1]	$ 110,430	$ 108,363	1.9%
Inactives			
Count	356	317	12.3%
Average Age	42.2	44.1	-1.9
Total Contribution Balance with Interest	$ 19,504,067	$ 17,817,385	9.5%
Average Contribution Balance with Interest	$ 54,787	$ 56,206	-2.5%

[1] *Benefits provided in June 30 valuation data. If applicable, limited by Section 415(b) of the Internal Revenue Code.*

[2] *Member data as of July 1, 2019 has been restated to reflect combining records for members who have both a Safety and Miscellaneous benefit.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-6
Non-Active Member Data - Miscellaneous

	July 1, 2020	July 1, 2019[2]	Change
Retired			
Count	20,754	20,210	2.7%
Average Age	71.7	71.5	0.2
Average Annual Benefit[1]	$ 45,825	$ 44,665	2.6%
Disabled			
Count	1,309	1,325	-1.2%
Average Age	68.2	67.9	0.3
Average Annual Benefit[1]	$ 32,373	$ 31,473	2.9%
Beneficiaries			
Count	3,171	3,115	1.8%
Average Age	77.6	77.2	0.4
Average Annual Benefit[1]	$ 23,954	$ 23,086	3.8%
Payee Average			
Count	25,234	24,650	2.4%
Average Age	72.3	72.0	0.3
Average Annual Benefit[1]	$ 42,379	$ 41,229	2.8%
Inactives			
Count	10,191	9,636	5.8%
Average Age	47.4	47.2	0.2
Total Contribution Balance with Interest	$ 296,437,908	$ 276,475,540	7.2%
Average Contribution Balance with Interest	$ 29,088	$ 28,692	1.4%

[1] *Benefits provided in June 30 valuation data. If applicable, limited by Section 415(b) of the Internal Revenue Code.*

[2] *Member data as of July 1, 2019 has been restated to reflect combining records for members who have both a Safety and Miscellaneous benefit.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-7
Distribution of Active Members as of July 1, 2020
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	146	127	0	0	0	0	0	0	0	0	273
25 to 29	355	1,204	168	0	0	0	0	0	0	0	1,727
30 to 34	412	2,069	1,110	94	0	0	0	0	0	0	3,685
35 to 39	356	1,950	1,654	677	71	1	0	0	0	0	4,709
40 to 44	264	1,365	1,354	905	481	96	0	0	0	0	4,465
45 to 49	220	1,065	1,033	875	779	579	90	1	0	0	4,642
50 to 54	190	934	898	802	834	925	495	73	2	0	5,153
55 to 59	110	719	778	703	766	928	582	302	91	0	4,979
60 to 64	61	397	532	508	558	595	321	263	138	7	3,380
65 to 69	11	130	203	183	191	176	85	70	58	22	1,129
70 and up	8	31	54	57	66	68	28	33	20	14	379
Total Count	2,133	9,991	7,784	4,804	3,746	3,368	1,601	742	309	43	34,521

Table A-8
Distribution of Active Members as of July 1, 2020
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	$ 62,448	$ 67,468	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 64,784
25 to 29	83,609	83,525	100,541	0	0	0	0	0	0	0	85,197
30 to 34	86,661	88,993	104,171	109,184	0	0	0	0	0	0	93,819
35 to 39	94,908	92,917	107,198	120,792	127,249	112,811	0	0	0	0	102,613
40 to 44	90,599	92,694	107,160	116,657	126,782	123,831	0	0	0	0	106,155
45 to 49	87,651	90,939	103,983	116,176	123,039	129,759	147,624	128,429	0	0	109,779
50 to 54	86,371	91,414	95,231	108,394	114,073	125,560	146,508	140,340	236,754	0	110,374
55 to 59	82,827	94,058	95,602	102,561	109,362	115,688	129,842	126,291	109,754	0	108,062
60 to 64	91,450	91,670	97,034	102,532	99,746	106,263	109,930	121,864	107,623	92,853	102,782
65 to 69	74,373	94,159	89,836	94,574	103,971	101,515	127,659	112,001	112,189	103,130	100,792
70 and up	56,763	68,901	97,351	92,288	96,434	115,054	113,236	113,554	101,376	121,133	100,098
Avg. Salary	$ 86,200	$ 90,241	$ 102,434	$ 110,939	$ 113,896	$ 118,631	$ 131,596	$ 124,192	$ 109,539	$ 107,319	$ 103,800

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Table A-9
Distribution of Active Members as of July 1, 2020
Count By Age/Service - Police

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	18	0	0	0	0	0	0	0	0	19
25 to 29	10	264	58	0	0	0	0	0	0	0	332
30 to 34	4	188	240	25	0	0	0	0	0	0	457
35 to 39	0	99	159	183	12	0	0	0	0	0	453
40 to 44	1	36	62	130	83	19	0	0	0	0	331
45 to 49	0	10	37	64	95	102	45	0	0	0	353
50 to 54	0	15	8	27	55	86	158	12	1	0	362
55 to 59	0	13	15	8	26	45	60	10	0	0	177
60 to 64	0	4	1	2	1	8	13	5	4	0	38
65 to 69	0	1	0	2	0	1	5	1	1	0	11
70 and up	0	0	0	0	0	0	1	0	0	0	1
Total Count	16	648	580	441	272	261	282	28	6	0	2,534

Table A-10
Distribution of Active Members as of July 1, 2020
Average Salary By Age/Service - Police

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	$ 90,202	$ 92,360	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 92,247
25 to 29	89,262	98,384	116,085	0	0	0	0	0	0	0	101,202
30 to 34	86,561	100,313	123,110	140,087	0	0	0	0	0	0	114,340
35 to 39	0	100,540	126,111	145,996	155,633	0	0	0	0	0	129,338
40 to 44	96,179	101,926	128,708	144,419	151,849	158,124	0	0	0	0	139,358
45 to 49	0	107,756	131,622	144,549	148,190	151,720	160,844	0	0	0	147,281
50 to 54	0	119,615	132,602	145,210	146,681	152,529	173,117	174,511	244,596	0	159,259
55 to 59	0	162,649	147,436	145,261	150,541	144,026	163,349	180,867	0	0	155,327
60 to 64	0	139,496	97,275	148,058	106,431	145,200	144,114	165,455	169,934	0	147,366
65 to 69	0	75,816	0	125,288	0	138,160	150,658	141,255	148,583	0	137,062
70 and up	0	0	0	0	0	0	145,148	0	0	0	145,148
Avg. Salary	$ 89,078	$ 101,447	$ 125,087	$ 144,840	$ 149,401	$ 150,874	$ 167,246	$ 173,976	$ 178,819	$ 0	$ 132,877

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Table A-11
Distribution of Active Members as of July 1, 2020
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	3	5	0	0	0	0	0	0	0	0	8
25 to 29	7	78	6	0	0	0	0	0	0	0	91
30 to 34	22	136	60	4	0	0	0	0	0	0	222
35 to 39	11	105	126	34	10	0	0	0	0	0	286
40 to 44	4	41	90	31	48	15	0	0	0	0	229
45 to 49	0	13	35	37	68	79	12	0	0	0	244
50 to 54	1	10	13	24	64	129	93	19	0	0	353
55 to 59	0	1	6	4	29	60	62	12	0	0	174
60 to 64	0	1	0	4	10	14	7	9	1	0	46
65 to 69	0	1	0	0	0	1	0	1	1	1	5
70 and up	0	0	0	0	0	0	1	0	0	1	2
Total Count	48	391	336	138	229	298	175	41	2	2	1,660

Table A-12
Distribution of Active Members as of July 1, 2020
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	$ 66,820	$ 89,305	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 80,873
25 to 29	66,820	91,511	106,725	0	0	0	0	0	0	0	90,615
30 to 34	68,872	95,951	128,455	149,271	0	0	0	0	0	0	103,013
35 to 39	58,886	101,047	134,077	140,184	176,404	0	0	0	0	0	121,264
40 to 44	67,863	95,550	134,233	154,180	162,959	156,020	0	0	0	0	136,296
45 to 49	0	102,495	139,743	154,237	155,440	160,856	182,274	0	0	0	153,258
50 to 54	104,243	91,703	147,913	149,145	152,459	164,487	181,687	188,791	0	0	164,260
55 to 59	0	105,236	134,967	134,466	153,231	161,494	182,896	177,139	0	0	166,963
60 to 64	0	166,999	0	182,784	151,514	151,188	169,965	190,841	191,829	0	165,849
65 to 69	0	45,000	0	0	0	153,486	0	162,759	159,742	202,522	144,702
70 and up	0	0	0	0	0	0	153,991	0	0	168,771	161,381
Avg. Salary	$ 66,809	$ 96,491	$ 133,768	$ 149,987	$ 156,647	$ 161,834	$ 181,528	$ 185,196	$ 175,786	$ 185,646	$ 139,012

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Table A-13
Distribution of Active Members as of July 1, 2020
Count By Age/Service - Miscellaneous

Age	Years of Service: 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	142	104	0	0	0	0	0	0	0	0	246
25 to 29	338	862	104	0	0	0	0	0	0	0	1,304
30 to 34	386	1,745	810	65	0	0	0	0	0	0	3,006
35 to 39	345	1,746	1,369	460	49	1	0	0	0	0	3,970
40 to 44	259	1,288	1,202	744	350	62	0	0	0	0	3,905
45 to 49	220	1,042	961	774	616	398	33	1	0	0	4,045
50 to 54	189	909	877	751	715	710	244	42	1	0	4,438
55 to 59	110	705	757	691	711	823	460	280	91	0	4,628
60 to 64	61	392	531	502	547	573	301	249	133	7	3,296
65 to 69	11	128	203	181	191	174	80	68	56	21	1,113
70 and up	8	31	54	57	66	68	26	33	20	13	376
Total Count	2,069	8,952	6,868	4,225	3,245	2,809	1,144	673	301	41	30,327

Table A-14
Distribution of Active Members as of July 1, 2020
Average Salary By Age/Service - Miscellaneous

Age	Years of Service: 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	$ 62,160	$ 62,110	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 62,139
25 to 29	83,789	78,251	91,516	0	0	0	0	0	0	0	80,745
30 to 34	87,676	87,231	96,760	94,831	0	0	0	0	0	0	90,021
35 to 39	96,057	91,996	102,527	109,332	110,267	112,811	0	0	0	0	98,220
40 to 44	90,929	92,345	104,021	110,242	115,877	105,534	0	0	0	0	101,573
45 to 49	87,651	90,633	101,617	112,010	115,584	117,958	116,997	128,429	0	0	103,884
50 to 54	86,276	90,946	94,109	105,768	108,128	115,220	115,869	108,659	228,911	0	102,101
55 to 59	82,827	92,778	94,263	101,882	106,067	110,799	118,321	122,162	109,754	0	104,040
60 to 64	91,450	90,990	97,033	101,711	98,787	104,622	107,057	118,495	105,115	92,853	101,388
65 to 69	74,373	94,686	89,836	94,235	103,971	101,005	126,222	110,824	110,690	98,397	100,237
70 and up	56,763	68,901	97,351	92,288	96,434	115,054	110,441	113,554	101,376	117,469	99,652
Avg. Salary	$ 86,627	$ 89,157	$ 98,988	$ 106,126	$ 107,903	$ 111,052	$ 115,169	$ 118,405	$ 107,718	$ 103,498	$ 99,443

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Table A-15
Distribution of Retirees, Disabled Members, and Beneficiaries as of July 1, 2020
Count

Age	Police	Fire	Misc	Total
Under 50	48	13	98	159
50 to 54	87	57	478	622
55 to 59	272	208	1,283	1,763
60 to 64	489	257	3,275	4,021
65 to 69	520	356	5,270	6,146
70 to 74	453	456	5,540	6,449
75 to 79	321	329	3,666	4,316
80 to 84	236	205	2,670	3,111
85 to 89	164	132	1,678	1,974
90 and up	140	151	1,276	1,567
Total	2,730	2,164	25,234	30,128

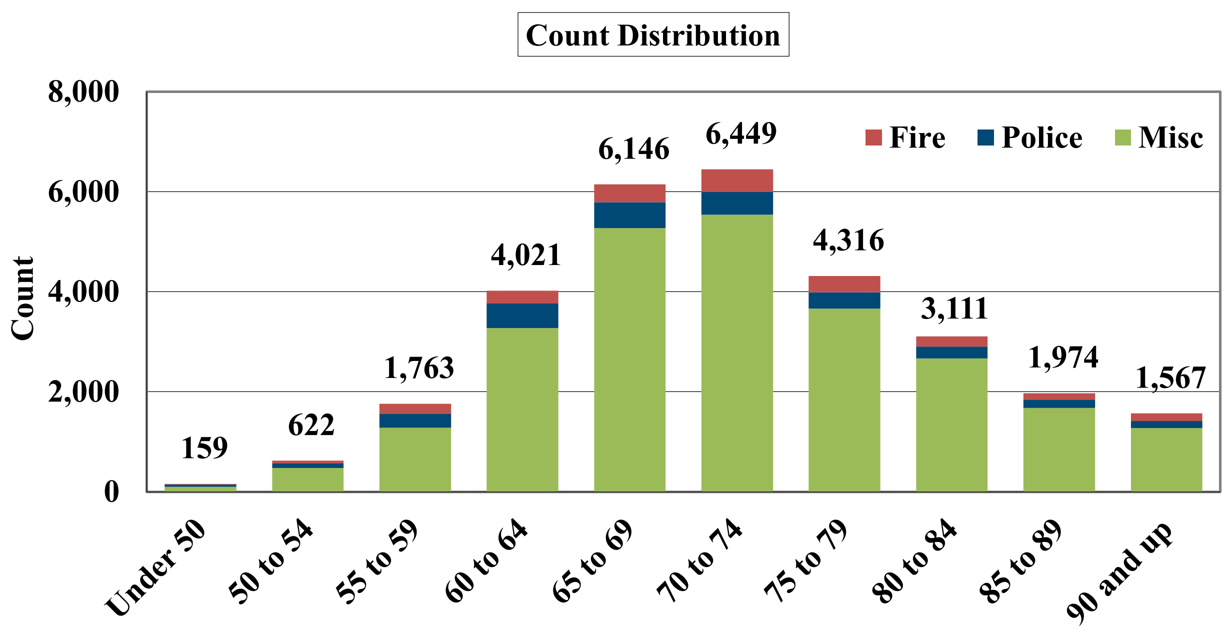

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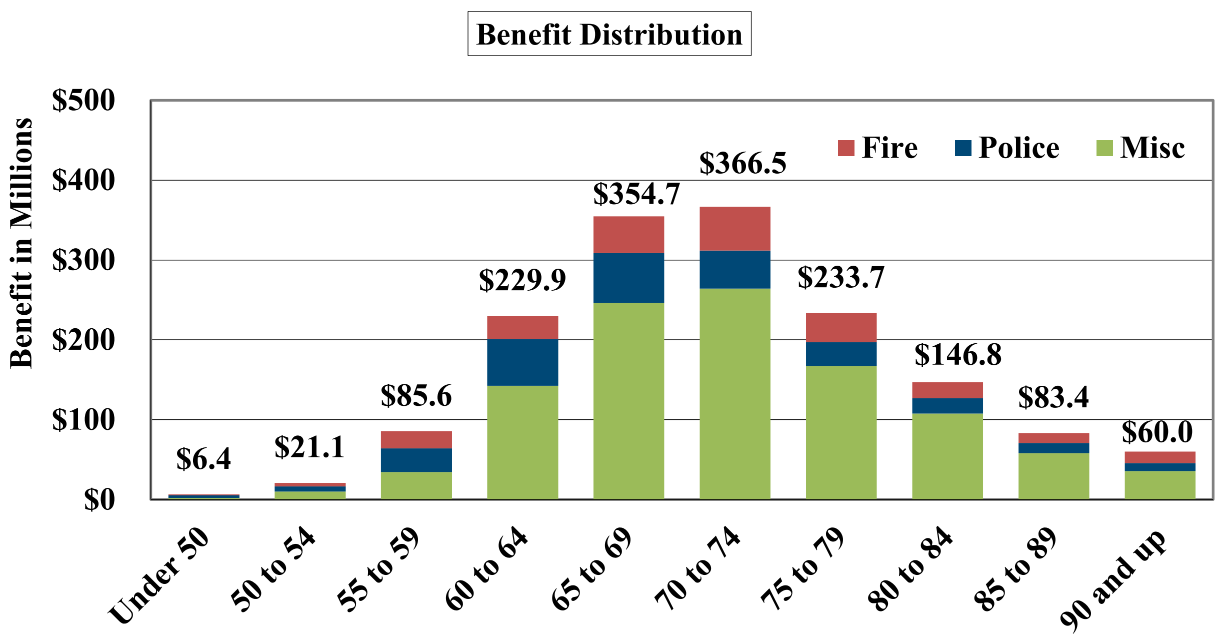
Table A-16
Distribution of Retirees, Disabled Members, and Beneficiaries as of July 1, 2020
Annual Benefit *

Age	Police	Fire	Misc	Total
Under 50	$ 3,219,451	$ 870,544	$ 2,266,501	$ 6,356,496
50 to 54	6,308,413	4,528,263	10,230,296	21,066,972
55 to 59	29,431,346	21,601,899	34,564,430	85,597,676
60 to 64	58,198,074	29,017,048	142,687,905	229,903,027
65 to 69	62,516,054	45,915,796	246,267,593	354,699,443
70 to 74	47,524,278	54,610,525	264,375,530	366,510,332
75 to 79	29,504,367	36,596,881	167,556,741	233,657,989
80 to 84	19,394,076	19,836,101	107,564,487	146,794,664
85 to 89	12,607,562	12,543,663	58,236,542	83,387,767
90 and up	10,207,951	14,158,175	35,640,587	60,006,714
Total	$ 278,911,573	$ 239,678,895	$ 1,069,390,612	$ 1,587,981,080

** Benefits used in the July 1, 2020 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 7/1/2019	**34,202**	**2,371**	**1,044**	**6,540**	**2,533**	**24,218**	**4,027**	**74,935**
New Entrants	2,543	0	0	295	0	0	0	2,838
Returned to Work	209	(70)	(4)	(132)	0	(3)	0	0
Vested Terminations	(344)	344	0	0	0	0	0	0
Reciprocals	(10)	(13)	67	(44)	0	0	0	0
Non Vested Terminations	(622)	13	0	609	0	0	0	0
Refund/Withdrawal	(433)	(22)	(2)	(240)	0	0	0	(697)
Retirements	(988)	(107)	(32)	(4)	0	1,131	0	0
Disabilities	(15)	(10)	0	0	82	(57)	0	0
Benefit Ceased*	(21)	(46)	(2)	(6)	(88)	(545)	(196)	(904)
New Continuants	0	0	0	0	0	0	250	250
New Dissolutions	0	0	0	0	0	48	0	48
Duplicate Adjustments	0	0	0	0	(4)	(1,284)	0	(1,288)
Other Adjustments	0	1	0	(1)	0	11	5	16
Participants as of 7/1/2020	**34,521**	**2,461**	**1,071**	**7,017**	**2,523**	**23,519**	**4,086**	**75,198**

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

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Table A-18
Summary and Reconciliation of Participant Data
Police

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2019	**2,471**	**68**	**16**	**153**	**532**	**1,651**	**523**	**5,414**
New Entrants	174	0	0	16	0	0	0	190
Returned to Work	3	(1)	0	(2)	0	0	0	0
Vested Terminations	(29)	29	0	0	0	0	0	0
Reciprocals	(1)	(1)	5	(3)	0	0	0	0
Non Vested Terminations	(19)	0	0	19	0	0	0	0
Refund/Withdrawal	(16)	0	0	(6)	0	0	0	(22)
Retirements	(45)	0	(1)	0	0	46	0	0
Disabilities	(3)	(4)	0	0	29	(22)	0	0
Benefit Ceased*	(1)	(9)	0	(3)	(16)	(26)	(25)	(80)
New Continuants	0	0	0	0	0	0	29	29
New Dissolutions	0	0	0	0	0	8	0	8
Duplicate Adjustments	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	(1)	0	1	0	0
Participants as of 7/1/2020	**2,534**	**82**	**20**	**173**	**545**	**1,658**	**527**	**5,539**

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

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Table A-19
Summary and Reconciliation of Participant Data
Fire

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2019	**1,675**	**39**	**22**	**21**	**672**	**1,073**	**389**	**3,891**
New Entrants	61	0	0	2	0	0	0	63
Returned to Work	0	0	0	0	0	0	0	0
Vested Terminations	(3)	3	0	0	0	0	0	0
Reciprocals	0	0	0	0	0	0	0	0
Non Vested Terminations	(6)	0	0	6	0	0	0	0
Refund/Withdrawal	(7)	0	0	(1)	0	0	0	(8)
Retirements	(58)	(2)	(1)	0	0	61	0	0
Disabilities	(2)	(1)	0	0	20	(17)	0	0
Benefit Ceased*	0	(6)	0	0	(23)	(18)	(19)	(66)
New Continuants	0	0	0	0	0	0	17	17
New Dissolutions	0	0	0	0	0	8	0	8
Duplicate Adjustments	0	0	0	0	0	0	0	0
Other Adjustments	0	1	0	0	0	0	1	2
Participants as of 7/1/2020	**1,660**	**34**	**21**	**28**	**669**	**1,107**	**388**	**3,907**

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

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Table A-20
Summary and Reconciliation of Participant Data
Miscellaneous

	Active	Vested Terminated	Reciprocal	Non-Vested Terminated	Disabled	Retired	Beneficiaries	Totals
Participants as of 7/1/2019	**30,056**	**2,264**	**1,006**	**6,366**	**1,329**	**21,494**	**3,115**	**65,630**
New Entrants	2,308	0	0	277	0	0	0	2,585
Returned to Work	206	(69)	(4)	(130)	0	(3)	0	0
Vested Terminations	(312)	312	0	0	0	0	0	0
Reciprocals	(9)	(12)	62	(41)	0	0	0	0
Non Vested Terminations	(597)	13	0	584	0	0	0	0
Refund/Withdrawal	(410)	(22)	(2)	(233)	0	0	0	(667)
Retirements	(885)	(105)	(30)	(4)	0	1,024	0	0
Disabilities	(10)	(5)	0	0	33	(18)	0	0
Benefit Ceased*	(20)	(31)	(2)	(3)	(49)	(501)	(152)	(758)
New Continuants	0	0	0	0	0	0	204	204
New Dissolutions	0	0	0	0	0	32	0	32
Duplicate Adjustments	0	0	0	0	(4)	(1,284)	0	(1,288)
Other Adjustments	0	0	0	0	0	10	4	14
Participants as of 7/1/2020	**30,327**	**2,345**	**1,030**	**6,816**	**1,309**	**20,754**	**3,171**	**65,752**

* *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 6/30/2020 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
        - 1.5% as of July 1, 2020 (3.0% effective December 26, 2020)
        - 2.0% as of July 1, 2021 (0.5% effective June 30, 2021)
    - Police active members
        - 0.0% as of July 1, 2020
        - 3.0% as of July 1, 2021 (3.0% effective July 1, 2021)
        - 5.0% as of July 1, 2022 (2.0% effective on June 30, 2022, deferred from December 26, 2020, and 3.0% effective July 1, 2022)
    - Fire active members
        - 0.0% as of July 1, 2020
        - 3.0% as of July 1, 2021 (3.0% effective July 1, 2021)
        - 4.0% as of July 1, 2022 (1.0% effective on June 30, 2022, deferred from December 26, 2020, and 3.0% 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, 2020. There were no Basic COLAs effective from July 1, 2020 through June 30, 2021 for the Old Safety COLA groups.

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- No Supplemental COLA benefits were granted as of July 1, 2020. Thus, there were no adjustments to 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 6/30/2020, 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 6/30/2020, 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.

- 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 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

APPENDIX A – MEMBERSHIP INFORMATION

multiple benefits, we value each component of the member's benefit separately under the applicable Charter section. Consequently, the 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. The discount rate was adopted at the April 28, 2021 Board meeting. Please refer to the economic assumption review presentation dated December 9, 2020 for the rationale for the economic assumptions. We believe all assumptions are reasonable for the purpose of the measurement.

1. **Discount Rate**

   SFERS assets are assumed to earn 7.40% net of investment expenses.

2. **Price Inflation**

   Consumer Price Inflation: 2.50% compounded annually

3. **Wage Inflation**

   Bargained increases through July 1, 2022 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.

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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 2020. 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 followed by 3.25% compounded annually thereafter.

Table B-1
Bargained Wage Increases through July 1, 2022

Effective Date	Police	Fire	Misc
12/26/2020	0.0%	0.0%	3.0%
6/30/2021	0.0%	0.0%	0.5%
7/1/2021	3.0%	3.0%	
6/30/2022	2.0%	1.0%	
7/1/2022	3.0%	3.0%	

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 2022, 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
- 0.0% through FYE 2021 gradually increasing to 50% for FYE 2035 and later for members who are eligible for a Supplemental COLA 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

	Age		
Service	Under 30	30 to 39	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

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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 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.

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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

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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 on the next page. 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.

21. Changes Since Last Valuation

Wage Inflation: From 3.50% for all years to bargained increases through July 1, 2022 followed by 3.25% compounded annually thereafter.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Consumer Price Inflation: 2.75% to 2.50% compounded annually

Details of all demographic assumption changes can be found in the demographic experience study report for the period covering July 1, 2014 to June 30, 2019. The assumptions were adopted at the December 9, 2020 Board meeting.

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 adopted by the Board at their August 13, 2014 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 (7.40% for the years ending 2019-2020 and 7.50% for the years ending 2016-2018 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 7/1/2014 has been amortized over 20 years from the date it was first recognized in the valuation. After 7/1/2014, 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.

Prior to 7/1/2014, the portion of the UAL not attributable to charter changes was amortized over a rolling 15-year period. After 7/1/2014, any sources of UAL due to actuarial gains and losses, assumption changes, or method changes are amortized over a closed, layered 20-year periods. 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.

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.

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%

Benefit – Survivor

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

6. Non-Industrial Disability

Eligibility

10 years of Credited Service.

Benefit – Member

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.

Benefit – Survivor

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%		

<u>Benefit – Survivor</u>

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

6. **Disability**

<u>Eligibility</u>

10 years of Credited Service.

<u>Benefit – Member</u>

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.

<u>Benefit – Survivor</u>

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 1- 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-San José.

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 – 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 D – 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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