California Public Employees' Retirement System

2024 Annual Review of Funding Levels and Risks

November 2024

CalPERS

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Introduction

This report is intended to assist the CalPERS Board of Administration (board), participating employers and other stakeholders in assessing the soundness and sustainability of the Public Employees' Retirement System for ongoing pension plans. It does not address the Terminated Agency Pool or the 1959 Survivor Benefit Program, nor does it address the other systems (Judges' Retirement Systems, Legislators' Retirement System, or the non-pension programs) administered by CalPERS.

The results presented in this report are based on the June 30, 2023 annua actuarial valuations, which have been projected forward to June 30, 2024 based on investment performance of 9.5% for the year ending June 30, 2024. Unless stated otherwise, current, and projected results in the report are based on a long-term discount rate of 6.80% and the demographic assumptions reflecting the 2021 Experience Study.

Results of the June 30, 2023 valuations are summarized in Appendix A.

This report focuses on:

- Reporting the current funded status of the system
- Reviewing prior and expected future funding progress
- Identifying and quantifying investment risks
- Examining other system risks, such as high inflation and mortality
- Discussing risk mitigating activities for the system and employers

The report is organized into the following sections:

- Funding Levels: this section discusses the relationship between assets and liabilities for the Public Employees' Retirement System (PERS) and various sub-groups of the system. Current, historic, and potential future funding levels are shown.
- Identifying and Quantifying Investment Risks: this section outlines the impact future investment performance could have on funding and contribution levels. This is of particular importance because investment performance has a large impact on pension funding and costs.
- Key Non-Investment Risks: this section addresses the potential impact of key non-investment risks (e.g., mortality, inflation, etc.) on the pension system. The topics in this session may change over time to reflect current and expected trends.
- Managing Risks: this section describes areas where risks may be managed. These include assumptions (e.g., expected investment return and inflation), amortization of costs as well as employers making additional payments to fund their pension plans.

Executive Summary

With the higher-than-expected investment return for fiscal year 2023-24, and employers making their required unfunded liability payments, the funded status of the system increased from 71.4% as of June 30, 2023, to an estimated 75% as of June 30, 2024. It's important to note that funded ratios vary among the different plans within the system, with plans for miscellaneous members generally having higher funded ratios than plans for safety members.

The recent improvement in funded status over the past couple of years has decreased the risk that plans will fall to low funding levels over the next 30 years. In addition, other factors including agencies making Additional Discretionary Payments (ADPs) have also helped reduce this risk. As a result of the investment gain for Fiscal Year 2023-24, projected employer contributions (as a % of pay) for many plans are roughly level or decreasing for the near future.

Despite the positive news described above, the system's funded status, and required contribution forecasts can change significantly even within a single year due to unexpected experience. The biggest risk factor for such changes is future investment returns. and other factors such as the possibility that inflation continues to remain higher than our current expectation. With the already high levels of required employer contributions and the possibility of near-term economic challenges, the ability of employers to continue making required contributions is an area of concern for the system and its members. However, with few exceptions, employers are currently up to date with their contribution requirements.

The termination policies and processes currently in place mitigate risk to the system. However, if an employer is under severe financial stress, the termination policies do not fully protect the benefits of members that have served that employer. Ultimately, the members' benefits are only secure if the employer continues to make the required contributions.

All actuarial assumptions and methods are based on the latest Asset Liability Management (ALM) process and associated Experience Study from 2021. These include a discount rate of 6.8%, an inflation assumption of 2.3% and a payroll growth assumption of 2.8%. The next ALM process and Experience Study is currently underway with results of each presented to the board in Fall of 2025 with their impact to be reflected in the June 30, 2025, valuation reports.

This report illustrates the impact of recent events on the retirement system and projects the possible impacts of various factors that are possible in the future. While there is no immediate concern regarding the system's ability to pay required benefits, the possibility of unfavorable events in the near future, such as continued high inflation, and the possibility of economic challenges, lead to concerns that required employer contributions could rise to levels that would be challenging for employers. Understanding these risks and opportunities to manage them is the main focus of this report.

Funding Levels

CalPERS is a conglomeration of multiple plans and several risk sharing pools. While it is informative to review actuarial results of the system as a whole, it is also important to understand that individual "plans" within CalPERS have unique funded status and required contribution results. In general, the assets of one plan are not shared with any other plan.

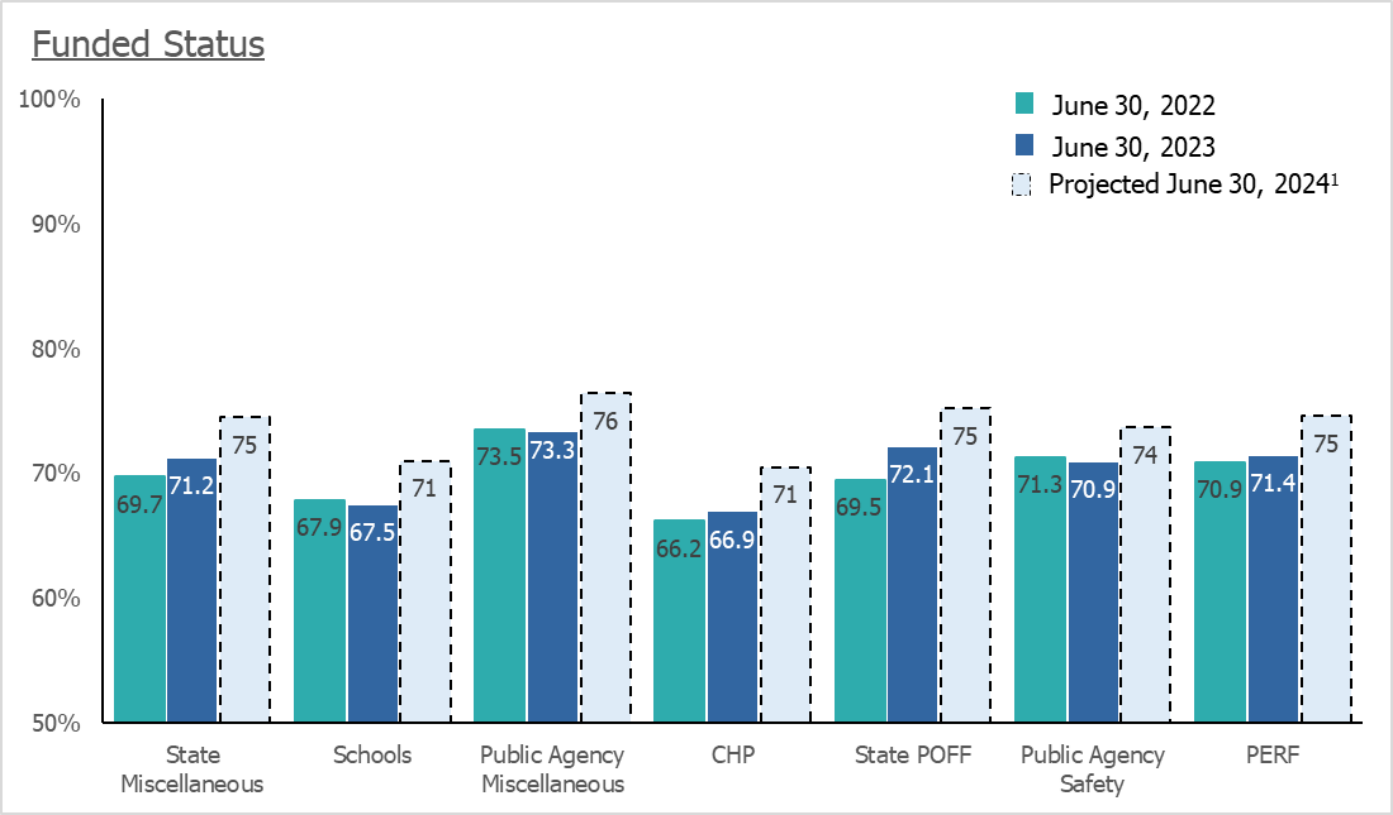
In this section we will discuss current valuation results for the system as a whole, as well as results for various member sub-groups of the system. In addition, a summary and analysis of funding results over the last 10 years as well as results expected during the next 10-years is also provided. This information helps illustrate the effectiveness of the current funding methods as well as the impact of unexpected experience on the funding levels of the system.

More detailed funding results can be found in the appendices as well as on the CalPERS website under Summary of Valuation Results.

Current Funding Levels

The overall level of funding of the system has been more stable over the past two years with annualized returns of 7.8% over that period.

The chart below shows the funding levels of the various components of the Public Employees' Retirement Fund (PERF) as of June 30, 2022, June 30, 2023, and estimated results as of June 30, 2024. Estimates as of June 30, 2024, are based on asset values as of June 30, 2024, and liabilities rolled forward from the most recent valuation date of June 30, 2023, to June 30, 2024.



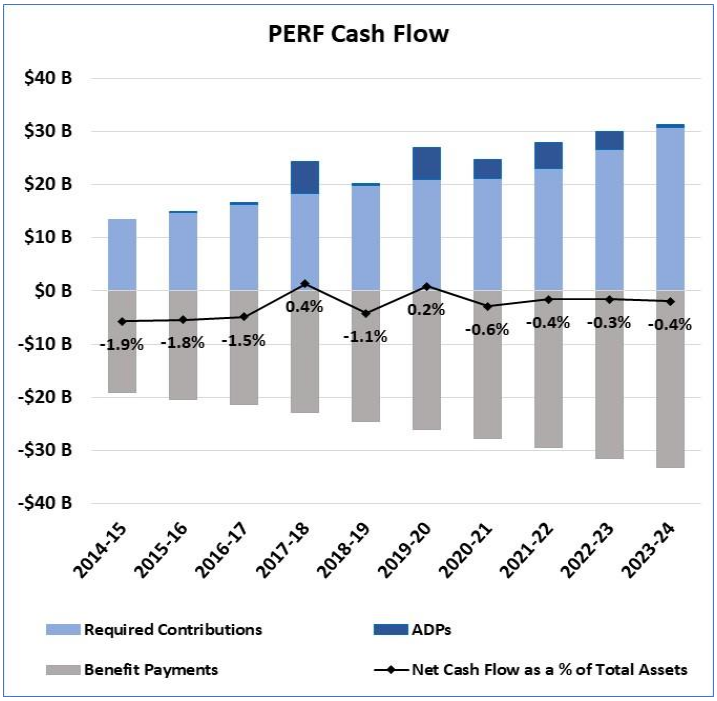
[1]June 30, 2024 projected funded status based on an investment return of 9.5% for FY 2023-24.

The chart above shows that the funded status increased by roughly 4% between June 30, 2022 and June 30, 2024. Based on the results of the funding valuations as of June 30, 2023, the overall funded ratio of the PERF was 71.4% and the estimated PERF funded ratio as of June 30, 2024, is 75%.

10-Year Funding History

A review of funded status and cash flow results during the prior ten years provides valuable information regarding the operation of the system. The charts below provide a ten-year history of cash flow and funded status results for the system as a whole. As mentioned previously, results shown are the aggregation of individual plan results.

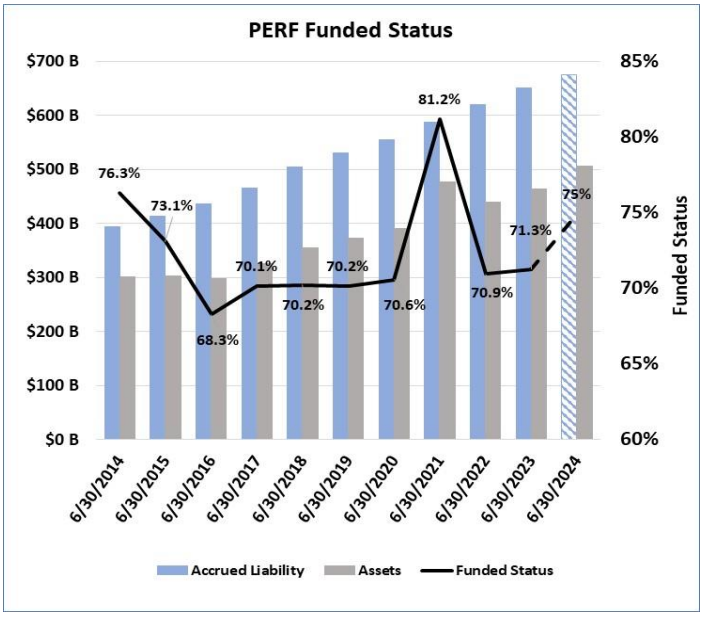
As shown in the chart to the right, benefit payments have consistently increased during this period. This is expected to continue in the future. However, as more PEPRA members retire, the rate of increase will decrease. Actual contributions made over this period also generally increased from one year to the next. While contribution dollars are expected to increase each year due to payroll increases, contributions during this period also increased due to investment losses and changes to actuarial assumptions. Significant ADPs were made in some years as shown above in the dark blue boxes. These ADPs also increased the net cash flow in those years. The two years during which net cash flow was positive were the result of ADPs.



In a prefunded public retirement system, net cash flow generally starts out positive in the early years of the system but becomes negative at some point as the system matures. This is an expected outcome of prefunding and generally not a result to attempt to correct. However, projected levels of negative cash flow should be understood so that invested assets can be managed to maintain the necessary level of liquidity to pay benefits without harming the overall performance of the fund.

The funded status during this 10-year period has been quite volatile. In addition, there has not been an overall improvement in the funded status from the beginning of the period to the end. The large spikes in the previous ten years were primarily caused by favorable or unfavorable investment returns.

Other factors, while not resulting in large annual swings in the funded status, contributed to the overall lack of improvement in the funded status during this period. These factors included 1) changes to actuarial assumptions (especially the lowering of the discount rate from 7.5% to 6.8%), 2) an average investment return of 6.3% (lower than the expected return of 6.8%), and 3) employer contributions determined under the old amortization policy, which in some cases, resulted a slower reduction to unfunded liabilities than would have been determined under the current policy.



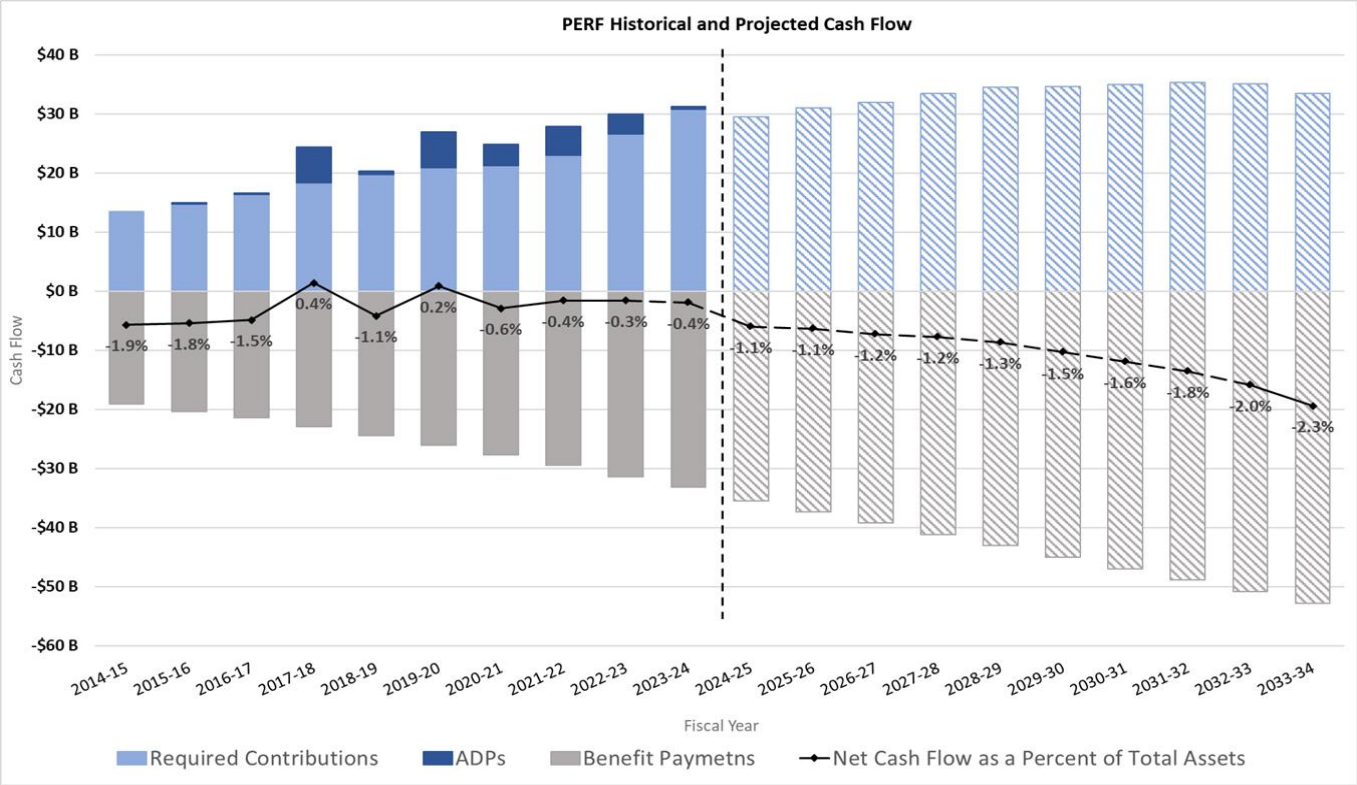
Decreases to the discount rate during this period were necessary given the decline in capital market assumptions. While a change to the discount rate impacts neither the current level of assets nor the amounts of future benefits expected to be paid, it resets the funding target and therefore immediately changes the funded status.

Given actual returns during this period were lower than the current expected return of 6.8%, the higher discount rates at the beginning of the period resulted in overstatement of the actual funded status in these years and lower required employer contributions. Had required contributions been determined using the current 6.8% discount rate assumption, contributions would have been somewhat higher but more stable during this period, and lower in the long-term.

Funding Projections

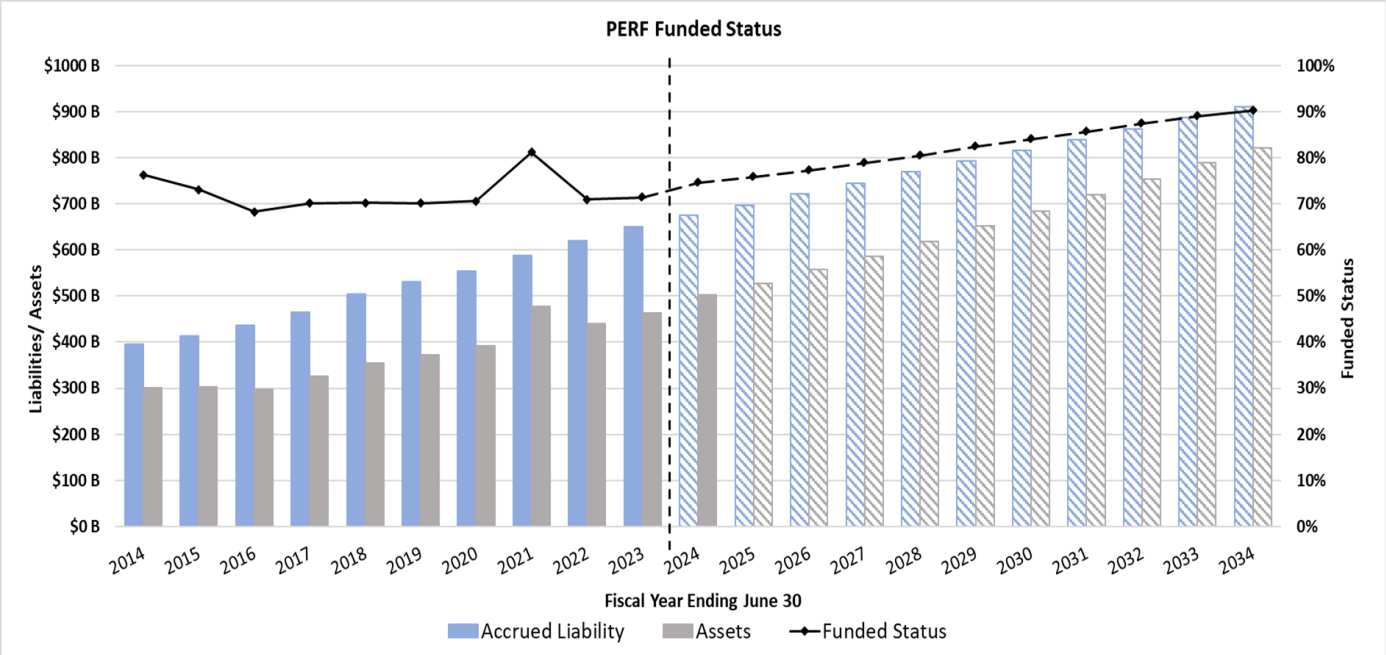
Assuming all future experience exactly matches the current actuarial assumptions, cash flows and funded status projections for the next 10 years are provided in the charts below.

While benefit payments are expected to continue to increase in a relatively consistent fashion, contribution increases are expected to moderate over the next ten years with decreases expected toward the end of this period. This is due to decreasing projected payments toward unfunded liability as plans become better funded. Lower future contributions are expected to increase negative cash flow as shown above. Projected results assume no Additional Discretionary Payments by employers over the next 10 years. Any such payments would result in faster improvement in the funded status and reduce negative cash flow in those years.



While there is no current indication that the current assumptions will need to be materially modified in the next 10 years, all actuarial assumptions will be assessed at least every 4 years and changes will be recommended when necessary. The inflation assumption in particular, will be considered carefully in connection with the next Experience Study.

Absent any changes to actuarial assumptions, provided future experience matches the current assumptions and employers continue to make required annual contributions, it is expected the funded status will improve by approximately 15% over the next 10 years. An additional reason for potentially faster improvement in the funded status during this period is the impact of the current amortization policy which accelerates the pay down of unfunded accrued liabilities compared to the previous amortization policy.



Funded Status - Termination Basis

The term "funded status" as used in the previous charts, is the funded portion of the funding target determined annually for each plan in the actuarial valuation process, reflecting all the actuarial assumptions and methods adopted by the Board of Administration for funding purposes. Alternate funding methods and assumptions yield different funding targets and therefore different funded status results.

If an agency elects to terminate its contract with CalPERS, the employer is required to contribute the amount necessary to fully fund the plan. However, for termination purposes, the funded status of the plan is determined using different actuarial assumptions and methods. Since the employer will no longer be obligated to make up any shortfalls in investment return (or due to other economic or demographic events), CalPERS funds the terminated agency pool on a much more conservative basis to ensure that the affected members' benefits are secure. With the funding of terminated plans based on fixed income assets, the termination discount rate depends on actual market rates of return for such assets on the date of termination. Such rates are lower than the ongoing 6.8% discount rate used for funding purposes (currently around 4.50%) and result in a lower funded status. A typical CalPERS plan that is currently 75% funded based on a 6.8% discount rate, would be around 50-55% funded based on current termination rates. This indicates some additional risk to public agency members, in the form of potential benefit reductions, if their employer were to terminate their plan and be unable to make the required final contribution to fully fund the accrued benefits.

Funded Status – Low Default Risk Basis

The funding approaches used by CalPERS reflect a discount rate based on the long-term expected return of system assets. This approach reflects future expected, but not guaranteed investment returns in the determination of accrued liabilities, and future required contributions necessary to pay all promised benefits.

A new requirement for actuarial valuation reports for pension plans, as mandated by the Actuarial Standards Board (ASB), is the inclusion of a measure of accrued liabilities using a discount rate based on the yields of high-quality fixed income securities. This alternative measure of liabilities does not impact the determination of required contributions and is provided for information purposes only.

The value of providing this alternate liability measure in the actuarial valuation reports is to provide plan sponsors, the board, and other interested parties with additional information regarding the level of future investment returns currently assumed in the determination of the traditional funded status of the system and required contributions. Such information can be useful when assessing current funding policies, possible changes to benefit provisions, and the security of promised benefits.

All CalPERS June 30, 2023, valuations include this newly required liability measure. The discount rate used in these measures was the Standard FTSE Pension Liability Index discount rate as of June 30, 2023. The alternate funded status under this discount rate, referred to in the CalPERS reports as Funded Status – Low-Default-Risk Basis, varies by plan. A typical CalPERS plan that is currently 75% funded based on a 6.8% discount rate, would be around 60% funded based on this measure on that date.

PEPRA Impacts on Funding

The California Public Employees' Pension Reform Act (PEPRA), which took effect in January 2013, changed CalPERS retirement benefits, and placed compensation limits on new members.

One of the objectives of PEPRA was to improve the ability of employers to manage the costs of retirement benefits for their members. While the changes implemented by PEPRA result in a meaningful reduction to benefit costs for members subject to PEPRA, the full impact on employer contributions will take decades to materialize.

Based on the current actuarial assumptions, the average estimated percentage decrease in the annual employer normal cost of benefits due to PEPRA for public agencies is 39% for miscellaneous members and 48% for safety members. While these are significant decreases in the normal cost portion of an employer's contribution, these savings are not fully realized until all active members are PEPRA members. In addition, PEPRA provides no decrease to the portion of an employer's contribution requirement due to paying down unfunded accrued liability.

As of June 30, 2024, the percentage of active members subject to PEPRA is 63.4%. The estimated employer savings due to PEPRA across the system as of June 30, 2024 is estimated to be $5.8 billion.

For additional details regarding the year-by-year PEPRA member counts and the estimated dollar cost savings due to PEPRA (past, and projected 10 years), see Appendix D.

Identifying and Quantifying Investment Risks

This section looks at risks to the retirement system and members due to future investment performance by focusing on three key risk considerations:

1. The funded status and probability that it will fall to very low levels.
2. The risk of increasing contributions due to lower-than-expected average investment returns.
3. The possibility of high contribution increases in a single year due to investment "shocks".

These risks were evaluated in connection with alternate investment scenarios. Other factors can impact the risks of the system but generally not to the same extent as investment returns. However, longevity and high near-term inflation are potentially material risks. Longevity refers to the potential of an individual to live longer than anticipated. This could be due to medical advancements, lifestyle choices and genetics, all of which have an impact on one's lifespan and increase the cost of projected benefits. These risks are discussed separately in later sections of the report.

Shared Risk

Member benefits are paid through the combination of CalPERS investment returns, required employer contributions, and member contributions. While there is a legal requirement for the employer to make the full contribution needed to fund the plan, in extreme circumstances the employer may be unable to do so. In these situations, the employer's financial hardship can become a direct risk to the members and their benefits.

The risks borne by the employers (primarily investment risk) can impact their ability to make required CalPERS contributions. Investment and actuarial policies adopted by the board are always adopted with the purpose of maintaining benefit security for members.

By focusing on the risks to the soundness and sustainability to the overall system, CalPERS can take steps to mitigate risks to both members and employers. Ultimately, pensions are a shared responsibility between members and employers.

Risk of Low Funding Levels

When the funded status of a plan is low, the required employer contributions can become quite high. If required contributions exceed the amount that an employer is able to pay, there is a possibility the employer's CalPERS contract could be terminated which can lead to benefit reductions for members of that plan. Many CalPERS plans are less than 100% funded as of June 30, 2024. This is not a significant cause for concern provided employers continue to make the actuarially determined required contributions. While there is no specific funded status that indicates a retirement plan and its members are in jeopardy, plans

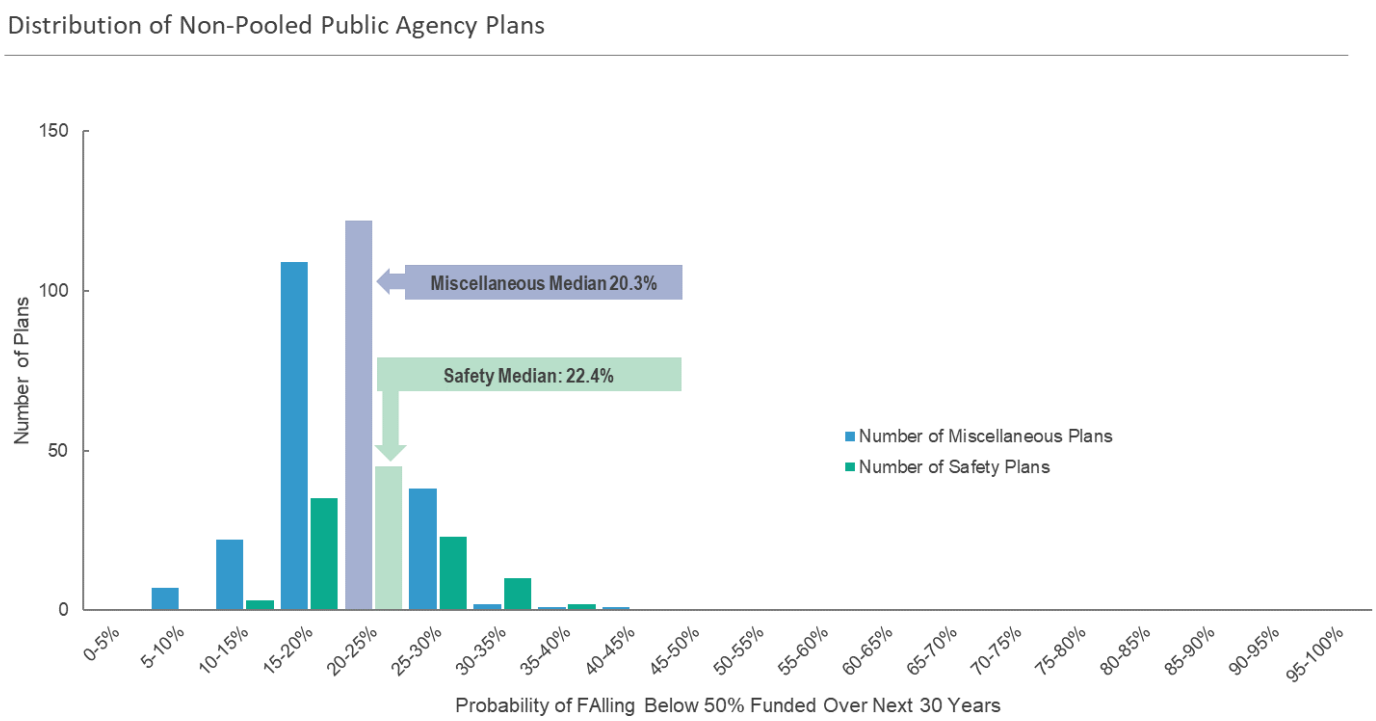
that fall below 50% funded would likely have short-term required contributions that would strain the employer's budget.

The likelihood that a plan falls below 50% funded in the future can be estimated with "Stochastic Modeling". With this type of modeling, alternate future investment scenarios are used to create projected future funded ratios. The results provided in this section are based on the outcomes of 5,000 alternate investment scenarios for all future years provided by the CalPERS Investment office.

Alternate investment return scenarios were developed based on the expected returns and standard deviations of each of the asset classes in the PERF. Assumed correlations along with a covariance matrix between asset classes are also reflected.

Based on stochastic modeling, the State Miscellaneous Plan has a 17.2% probability of falling below 50% funded at some point over the next 30 years. For the School's Pool, the probability is 16.8%. While many factors contribute to these results, the recent investment gain during the fiscal year ending June 30, 2024 was a primary factor in decreases to these percentages. The probability of falling below 50% funded status for CalPERS public agency plans is illustrated in the chart below. The chart shows the numbers of non-pooled plans within various probability ranges of falling below 50% funded. (Pooled plans are expected to have similar results.) For example, 122 miscellaneous plans have a 20%-25% probability of falling below 50% funded over the next 30 years.

Probability of Falling Below 50% Funded (at any point in next 30 years)



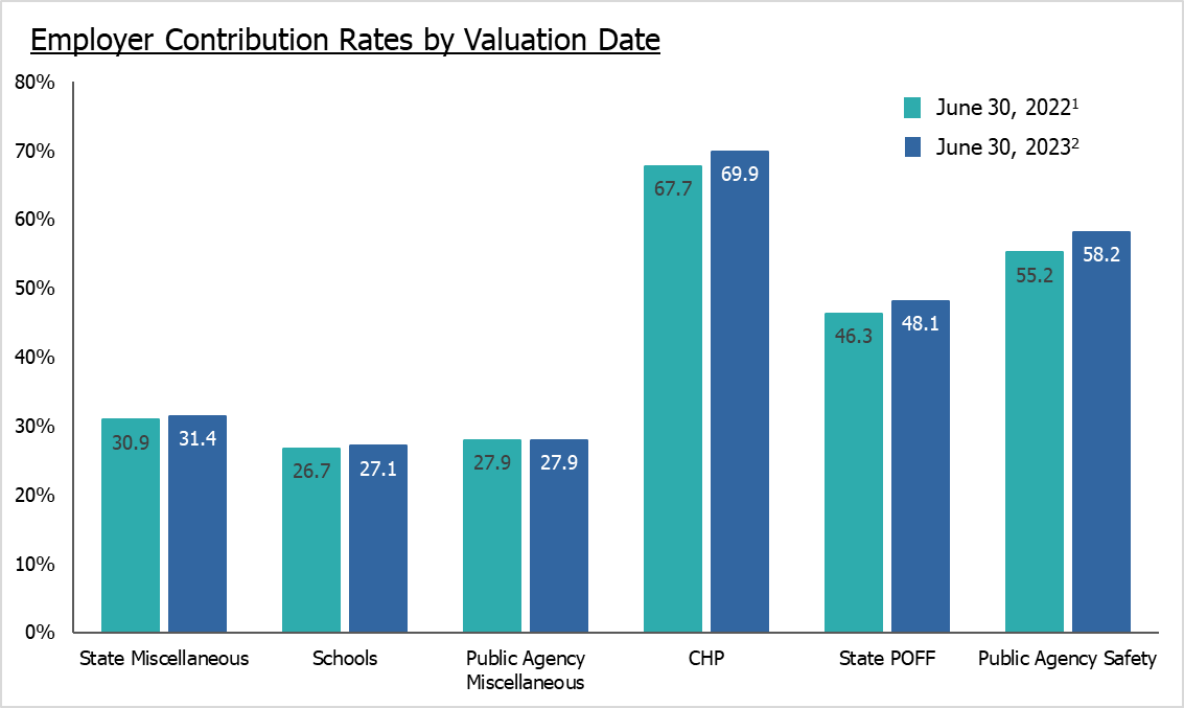
Lower Than Expected Average Investment Returns

While it is believed that the current investment policy and asset allocation will result in average long-term geometric returns of approximately 6.8%, future average returns may be higher or lower. It is also believed that there is an equal likelihood that long-term average returns will be either greater than or lower than 6.8%. Average future returns of greater than 6.8% pose little risk to the system. However, since required contributions for PEPRA members reflect the current 6.8% assumption, it could be considered that PEPRA members overcontributed if the fund earns greater than 6.8% on a long-term basis.

Returns in any year that are lower than the assumed 6.8% result in increases to employer contributions. High employer contribution rates impose significant financial stress and may increase the risk that employers will default and be unable to make their required contributions. Since future employer contributions are one of the funding sources for the benefit payments, a default by the employer would result in increased risk to the members' benefits. The level of financial stress associated with any particular level of contributions will differ by employer.

Current State

Current contribution levels or average contribution levels for public agency plans are shown in the table below. As shown below, employer contribution levels are relatively high, especially for safety plans. Actions to reduce the probability of low funded status or contribution volatility generally result in increases in the contribution levels. It is difficult to assess just how much strain current contribution levels are putting on employers. However, evidence such as collections activities, inquiries regarding extensions to amortization schedules and requests for information regarding termination procedures indicate that some public agencies are under significant strain.

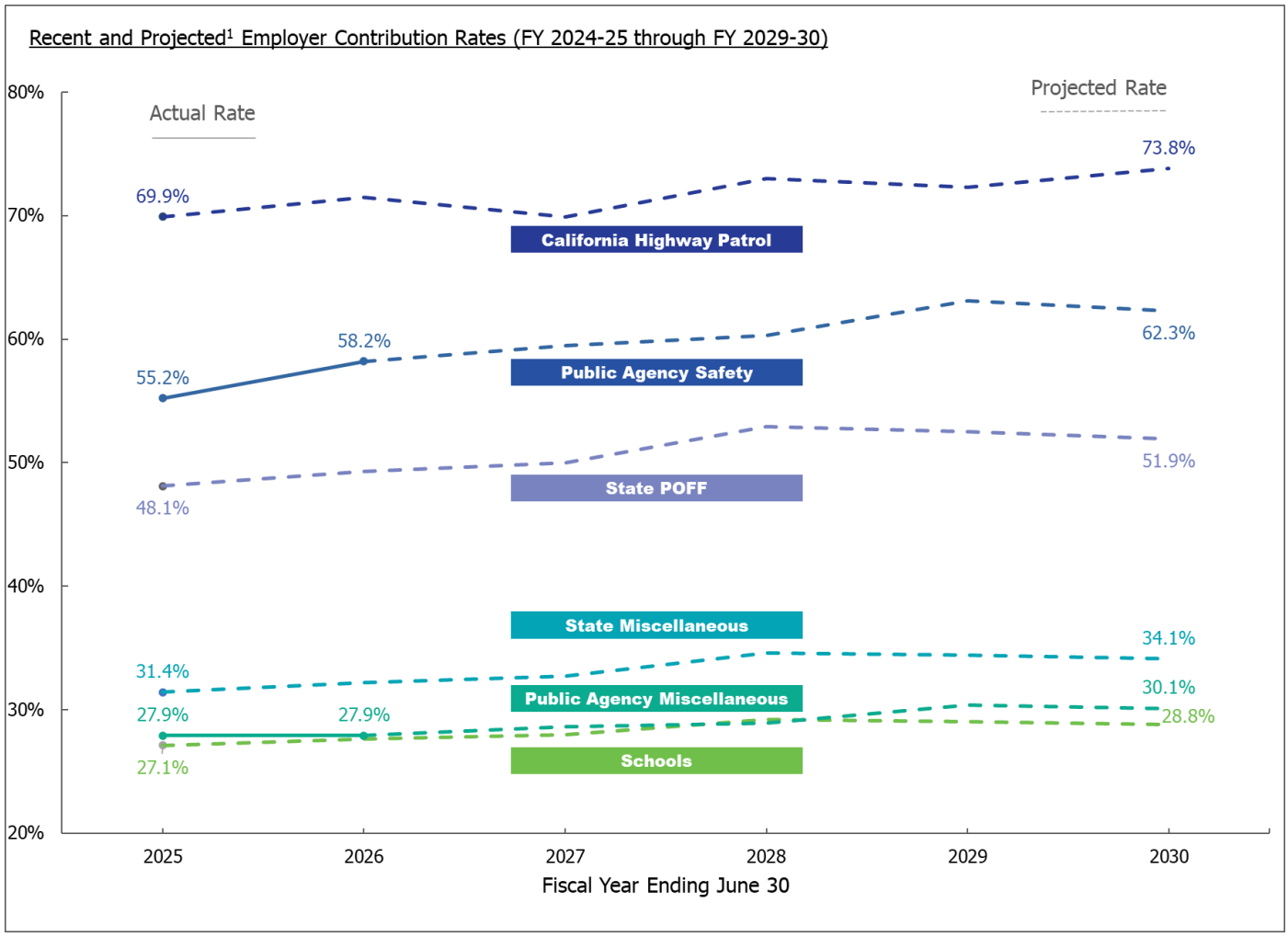


[1]June 30, 2022 valuations for state plans and the schools pool set FY 2023-24 rates and set FY 2024-25 rates for public agencies.
[2]June 30, 2023 valuations for state plans and the schools pool set FY 2024-25 rates and set FY 2025-26 rates for public agencies.

Note, for the above chart the results for Public Agency plans were determined by summing the required dollar contributions for each plan and then dividing by total payroll for all plans.

Expected Future State

Below are projected employer contribution requirements (expressed as percentage of payroll) based on the June 30, 2023, actuarial valuation results projected forward with an investment return of 9.5% for FY 2023-24 and assumed annual investment returns thereafter of 6.8%.



[1]FY 2024-25 state plan and schools pool rates are actual. FY 2024-25 and 2025-26 public agency rates are actual.

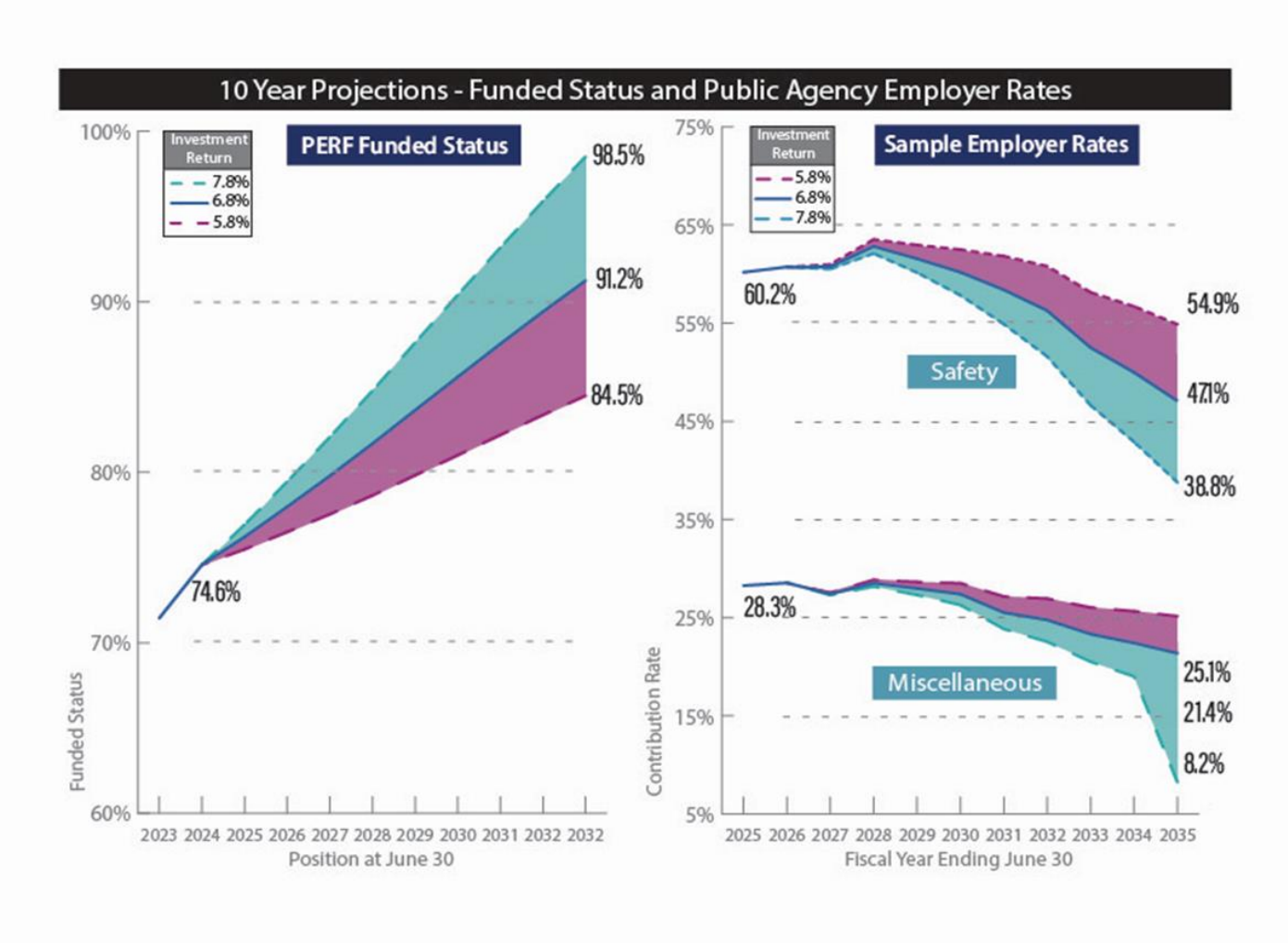
Alternate Investment Scenarios

To the extent future experience deviates from the actuarial assumptions, adjustments are made to the unfunded liability position which result in required contribution increases or decreases from present levels. The factor that is likely to have the largest impact on future contribution requirements is the investment return of the PERF. While actual plan experience in other areas such as mortality, inflation, rates of retirement, pay changes, etc., also impact required contributions, these factors are typically not as volatile as investment return.

The expected long-term investment return of the PERF is 6.8%. If the actual returns every year in the future were 6.8%, the following are expected to occur:

- Required employer contributions over the next few years are expected to be roughly level as a percentage of pay. However, individual plans will likely see slight changes in the near-term required contribution rates depending on their unique circumstances.
- In approximately five years, required employer contributions are expected to decrease. This is due to three separate factors:
    1. the continual decrease in normal cost as Classic members retire or terminate and are replaced by PEPRA members, and
    2. current required payments toward existing unfunded accrued liability bases will be gradually eliminated as individual UAL bases are fully paid-off.
    3. the FY 2023-2024 investment gain is fully phased in.
- In the long-term, required employer contributions will trend toward the employer portion of the normal cost.
- The funded status of all plans would gradually increase to around 100% over the next 20 to 25 years.

The charts below provide the projected funded status of the PERF and sample employer contribution rates for a public agency safety and miscellaneous plan over the next ten years reflecting the assumed 6.8% annual investment return, with alternative annual investment returns of 5.8% and 7.8% to demonstrate the sensitivity of the PERF and the plans to future investment returns.



Over longer periods of 20 years or more, chances are greater the average return will be closer to the expected geometric average of 6.8%. However, based on the current allocation of assets and the expected volatility of the various asset classes, there is a significant possibility that the average return over the next 10 years will fall outside of the range illustrated above of 5.8% to 7.8%.

Investment Shocks

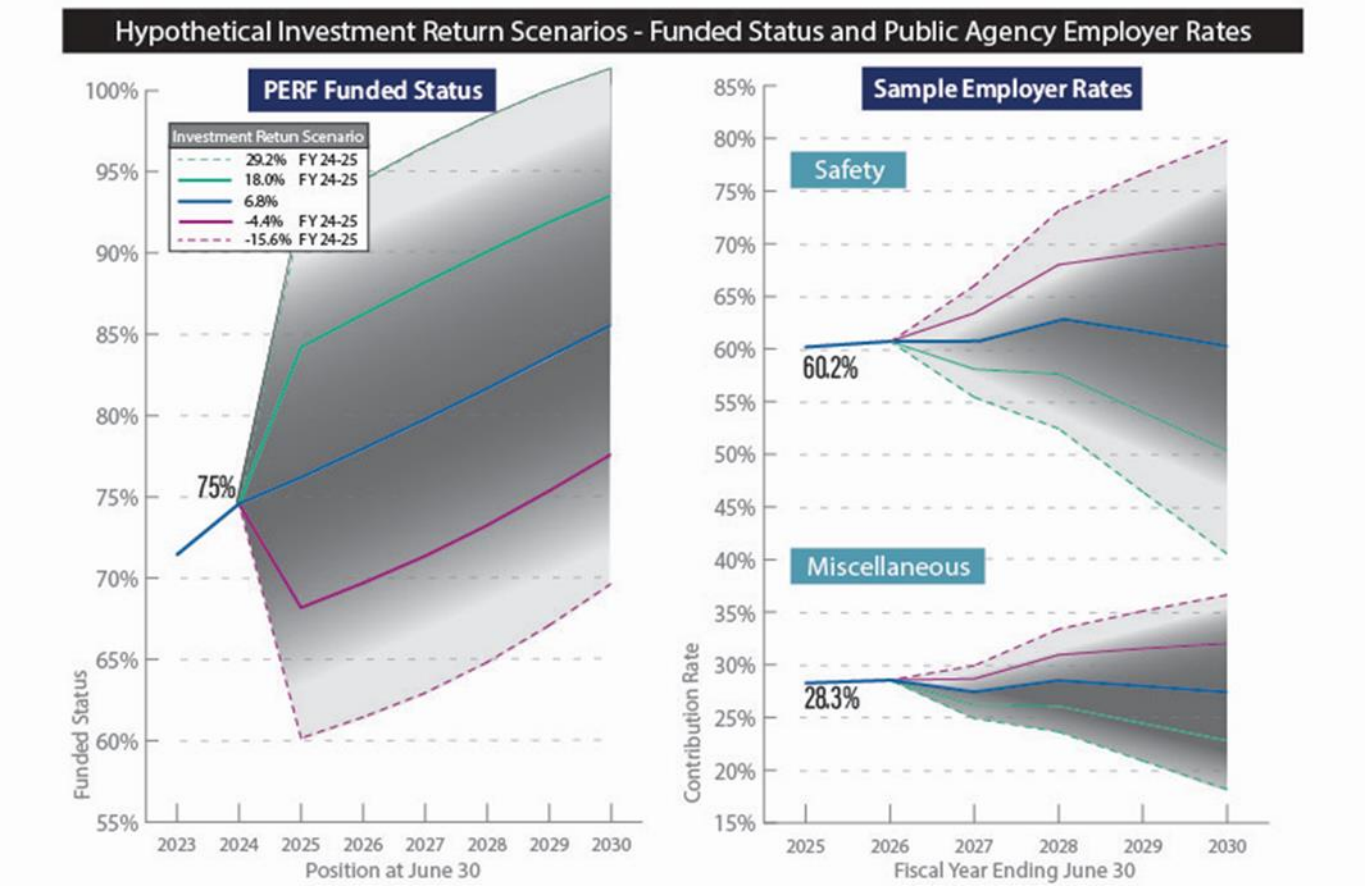
Over periods shorter than 20 years or single year periods, the likelihood of varying from the 6.8% expected return is even greater. For example, there is roughly a 16% chance that in a single year, the investment return will be lower than -4.4% and a 16% chance that it will be greater than 18.0%. These returns are one

standard deviation lower and higher than the expected return of 6.8%. So, while it is more likely that any single year return will be between -4.4% and 18.0% (68% probability), the chance of falling outside this range for one year is not insignificant.

A two standard deviation higher or lower return is much less likely but does have roughly a 5% chance of occurring. The two standard deviation range is -15.6% to 29.2%. Or said another way, a return between -15.6% and 29.2% in any given year has a probability of around 95%. While such "shock" returns are possible and do occur, history has shown that market corrections in the opposite direction typically occur over the following few years. However, such corrections are certainly not guaranteed.

The chart below provides the impact of various "shock" returns in the year ending June 30, 2025 with no assumed future correction. The purpose of the chart is to illustrate the potential impact of a single very good year or very bad year of investment return.

As demonstrated in the chart, funded status is impacted immediately and significantly while changes to required contributions happen more gradually due to the 5-year phase-in of the impact of investment gains and losses. The 5-year phase-in would allow time for a possible correction to occur which would then begin to have the opposite effect on future contributions.


Hypothetical Investment Return Scenarios - Funded Status and Public Agency Employer Rates
PERF Funded Status
Investment Return Scenario
29.2% FY 24-25
18.0% FY 24-25
6.8%
-4.4% FY 24-25
-15.6% FY 24-25
75%
Funded Status
Position at June 30
Sample Employer Rates
Safety
60.2%
Miscellaneous
28.3%
Contribution Rate
Fiscal Year Ending June 30

Key Non-Investment Risks

Mortality

The ultimate cost of a CalPERS members benefit depends on many factors including how long the member lives after retirement. For centuries, life expectancy has been consistently increasing. CalPERS actuaries study the mortality rates of its members, as well as national rates and use this information to project mortality rates into the future. If on average, members live longer than what is projected by the mortality rates used in the actuarial valuations, the cost of benefits increases. This results in downward pressure on funded status results and upward pressure on contribution rates.

Over the period 2020 through 2023, Covid 19 had increased mortality rates significantly, but for the fiscal year ending June 30, 2024 there was a return to the previous expected mortality rates for the system. The upcoming Experience study in 2025 will review recent experience and set appropriate future mortality rates for the system.

However, the demographic impacts of COVID-19 over the last few years will add complexity and uncertainty to the selection of assumptions in the next Experience Study.

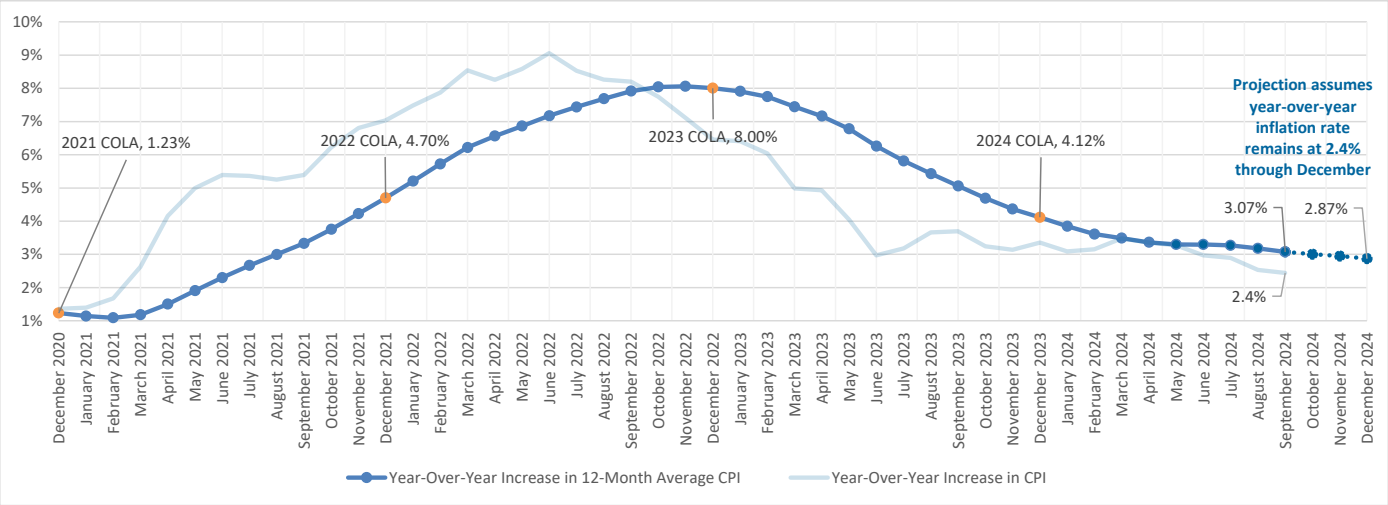
Inflation

Over the last few years, price inflation (or simply inflation) has been significantly higher than the CalPERS long-term assumption of 2.3%. Higher than expected inflation can affect liability measures and investment returns in a number of ways and the impact of inflation alone can be difficult to quantify. The most direct impact of high inflation is that retirees can receive higher than expected Cost-of-Living Adjustments (COLAs), and active employees can receive higher than expected salary increases. In addition, if the higher inflation is expected to persist indefinitely, the assumption can be increased following the next experience study. These three consequences of higher inflation will be analyzed below in turn.

Annual Retiree COLA

The annual increase in an individual retirement allowance depends on four things, the 12-month average of the consumer price index for all urban consumers (CPI-U) published by the Bureau of Labor Statistics, the COLA provision (2%, 3%, 4% or 5%), the Purchasing Power Protection Allowance (PPPA) provision (75% or 80%), and the year of retirement. The chart below shows the increase in the 12-month average of CPI-U since December 2020.

Historical Inflation Used for Annual CalPERS COLA (CPI-U)



Source: Bureau of Labor Statistics, October 10, 2024

This inflation measure rose sharply from February 2021 until November 2022 before falling. As of September 2024, the rate of inflation over the prior 12 months was 2.4%. Since the vast majority of CalPERS retirees are subject to the 2% COLA provision, the recent high inflation means that in the near term, COLAs will generally be capped at 2%. The cap in the annual COLA can be overridden by the PPPA, however, PPPA allowances reflect only a tiny percentage of CalPERS pension payments. At less than 0.03% of annual pension payments, even a relatively large increase in PPPA payments would have minimal impact on pension funding. For the PERF as a whole, the liability loss due to higher-than-expected COLAs and PPPA in the June 30, 2023, Actuarial Valuation was approximately $2 billion or 0.3% of the accrued liability. Significant future actuarial losses due to higher-than-expected COLAs are not expected without significant future increases in inflation.

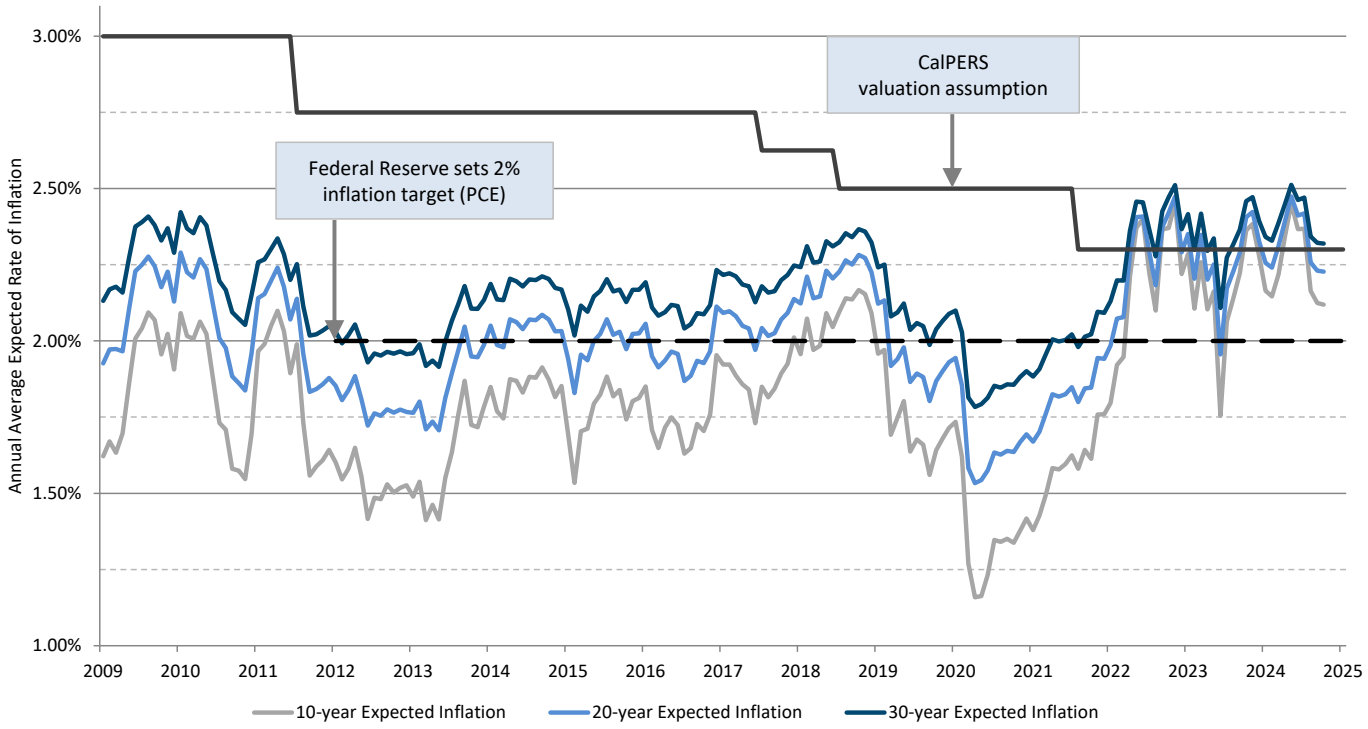
Active Salary Increases Higher than Expected

In the long-run, average salaries for public sector workers tend to keep up with inflation or slightly outpace it. This relationship, however, is far from exact. Due to collective bargaining cycles, even if an employer could increase salaries with inflation, there would be a lag, and when inflation increases as rapidly as it did in 2021 and 2022, an even longer lag may result. Nevertheless, actuarial losses due to salary increases should be anticipated following periods of high inflation, even after inflation has fallen. For the PERF as a whole, the salary loss in the June 30, 2023, Actuarial Valuation was over $5 billion or approximately 0.9% of the accrued liability. This means the PERF funded ratio is approximately 0.9% less than it would have been had that loss not occurred.

Possible Change to the Inflation Assumption

A recommended assumption for price inflation will be included in the 2025 experience study. Because inflation has been higher than expected since the previous experience study it is reasonable to consider whether an increase in the inflation assumption may be recommended. An increase to the price inflation will, all else being equal, increase future assumed salaries and COLAs. If no other assumptions were to change, this could mean higher costs for employers. The following chart shows the Federal Reserve Bank of Cleveland's expected rate of inflation over various time horizons from the 2008-09 Financial Crisis through October 2024. This model uses Treasury yields, inflation data, inflation, swaps, and survey-based measures of inflation expectations.

Expected Annual Inflation 10, 20 and 30-year Time Horizons



Source: Federal Reserve Bank of Cleveland

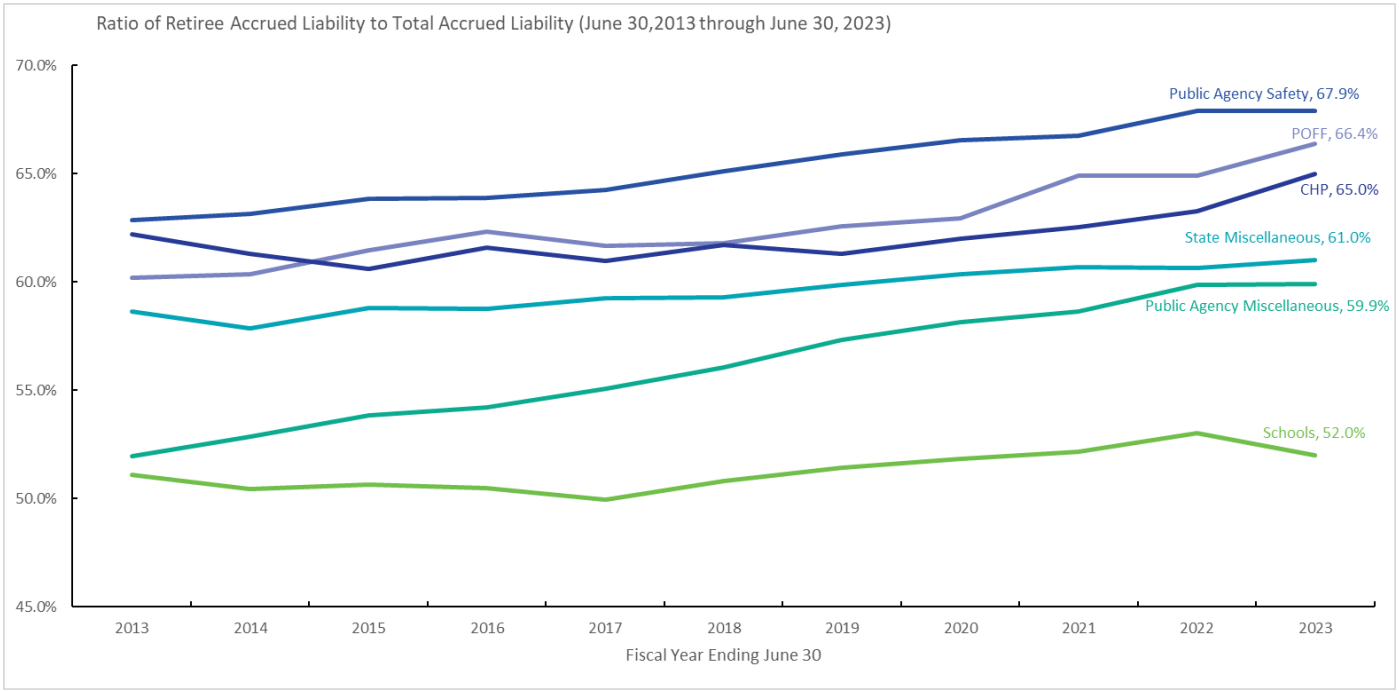
It is important to stress that the inflation assumption is not recommended based on what recent inflation has been, but rather on what future, long-term inflation is expected to be. While the Cleveland Federal Reserve Bank's model shows that expected inflation has indeed increased since the 2021 experience study, it does not show that expected inflation is consistently higher than the current assumption. As of October 2024, the expected average annual inflation over the next 20 years based on this model is approximately 2.23%. It remains to be seen what another year of economic data and a more thorough analysis will show.

Plan Maturity

The maturity of a pension plan can provide useful information regarding its sensitivity to various risks in the future. A variety of risk measures based on plan maturity, can be calculated, and tracked over time for this purpose.

One simple way to look at the maturity level of CalPERS and its plans is to look at the ratio of active members to retirees. A more relevant ratio is a plan's retiree liability to its total liability. A pension plan in its infancy will have a very low ratio of retiree liability to total liability. As the plan matures, the ratio increases. For CalPERS and other retirement systems in the United States, these ratios have been steadily increasing in recent years. However, this measure has flattened out somewhat in the last few years. Certain individual plans may have a significantly lower ratio, particularly if the plan has not been in existence as long.

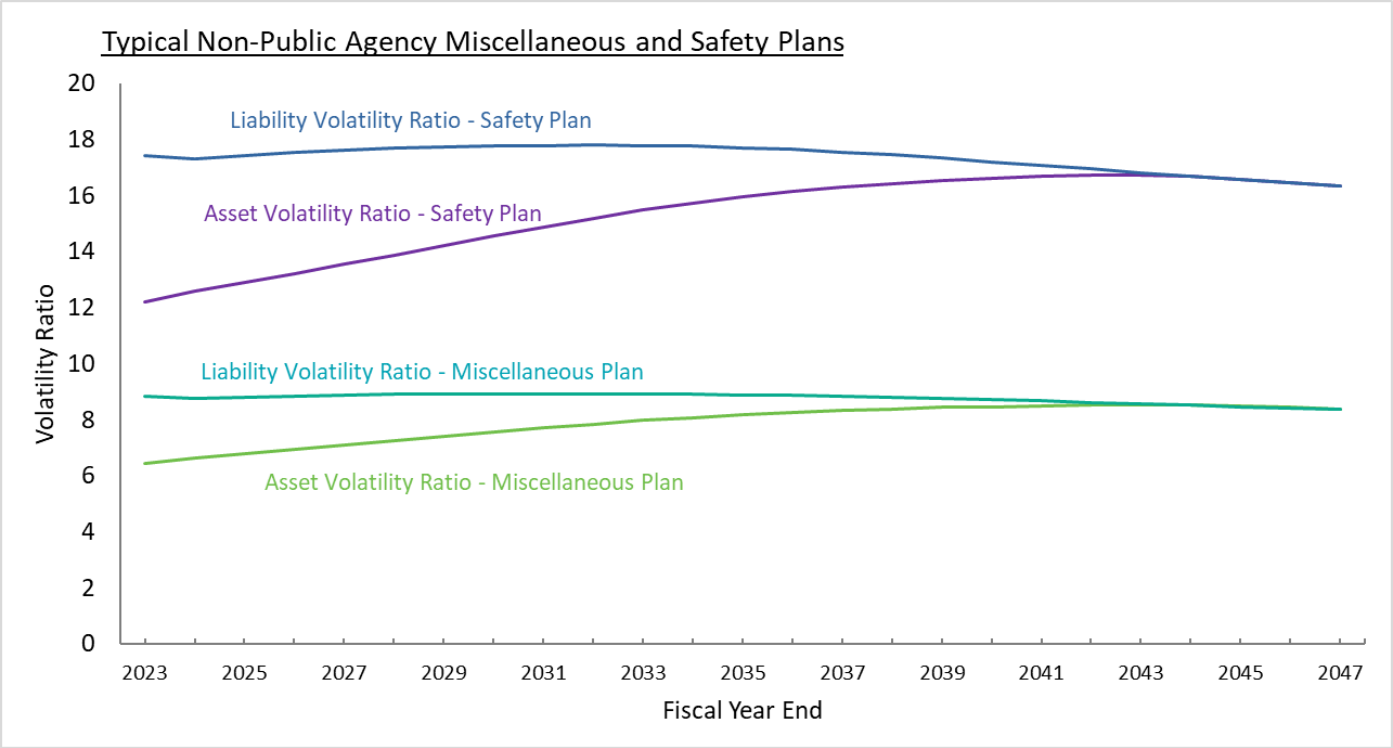
In general, plans with higher retiree liability ratios have a shorter "duration" over which current accrued benefits will be paid. In some cases, particularly when a plan has only retiree liability, the actuary may determine that a shorter amortization period for unfunded liability is appropriate to avoid the depletion of plan assets.



Other measures of plan maturity are the Asset Volatility Ratio (AVR) and the Liability Volatility Ratio (LVR). The AVR is the ratio of assets to payroll, and the LVR is the ratio of liability to payroll. As with the ratio of retiree liability to total liability, these ratios start out low given the low levels of assets and accrued liabilities, then increase over time as service is earned and contributions are made. Plans that have higher asset-to-payroll or liability-to-payroll ratios generally experience more volatile employer contributions (as a percentage of payroll) due to unexpected experience such as investment returns or mortality experience. While many of the individual plans within CalPERS have comparable AVRs and LVRs, there can be significant differences from plan to plan based on several factors such as:

- The age of the plan
- The funded ratio of the plan
- The level of benefits provided by the plan
- Changes to the membership of the plan, for example if fire services are moved from a city to a county, etc.

Projections of these ratios indicates that Liability Volatility Ratios are projected to grow minimally (or decrease) for many CalPERS plans which have already been in existence for a long period of time. However, some public agency plans that were established more recently have lower current LVRs that are projected to grow more significantly in the future. Overall, the results indicate that contribution risks due to factors that impact plan liabilities, such as mortality, salary increases, retirements, etc., are not expected to increase significantly for most plans due to further maturation. However, current LVRs are relatively high which indicates most CalPERS plans already face high contribution volatility.



The projected increases in the AVR are primarily due to fact that the assets are projected to grow to equal the accrued liability as the funded ratio grows toward 100%. The funding policy alone will cause the AVRs to increase above current levels. As the AVR increases, each investment gain or loss will have a higher impact than the last from the perspective of the employer.

As illustrated in the chart above, there will be downward pressure on volatility ratios in the future as liabilities for benefits earned by PEPRA members become a larger portion of total liabilities.

The maturing of a defined benefit retirement system is expected and is not a sign of mismanagement or that corrective action needs to necessarily take place. In fact, it is difficult to reduce plan maturity measures without lowering benefits or settling benefit obligations with retirees through lump sums or annuity purchases. However, it is important to recognize that increasing plan maturity typically leads to increased contribution volatility.

Employers with higher AVRs and MVRs, or those who may be more sensitive to contribution volatility, may wish to create or increase funding toward a stabilization or rainy-day fund such as the California Employers' Pension Prefunding Trust (CEPPT).

Managing Risk

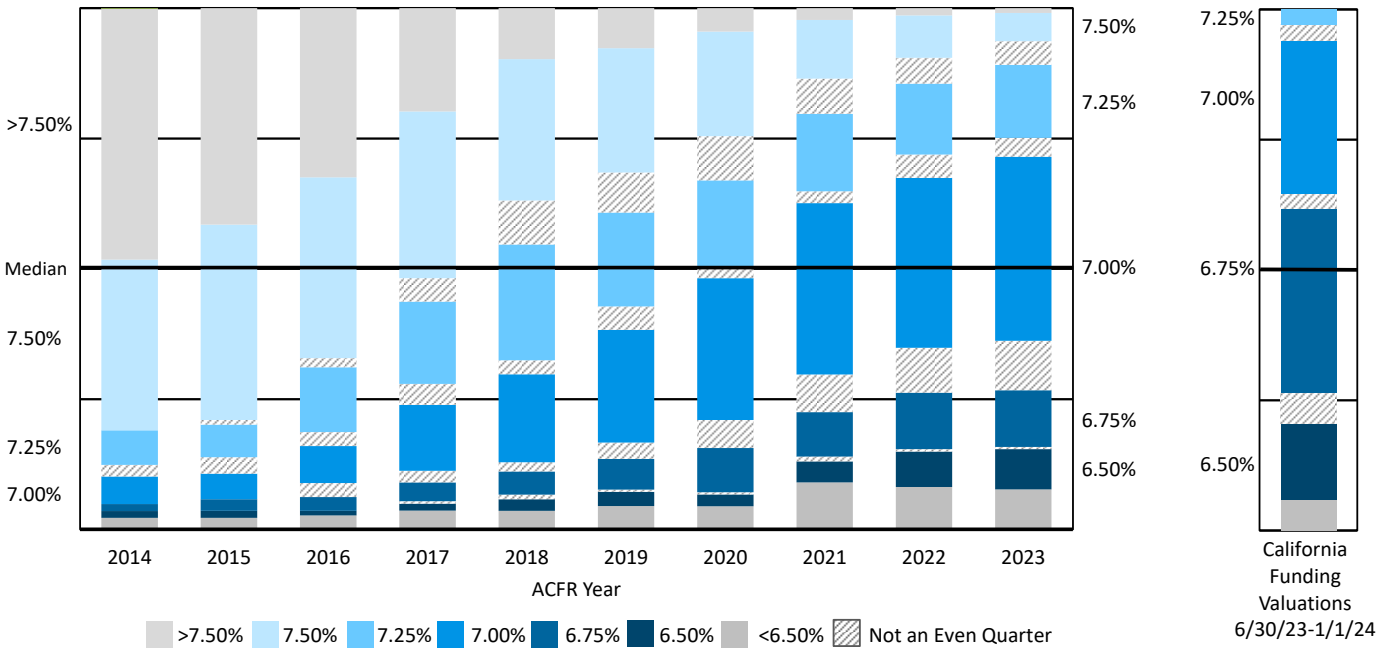
Trend Toward Lower Expected Returns and Discount Rates

For well over a decade, public pension plans have been slowly but consistently reducing their assumptions for the long-term rate of return and discount rate as capital market assumptions have been consistently falling. However, during the last couple of years, interest rates rose, and capital market forecasts improved somewhat. Despite these recent developments, the vast majority of public plans have either maintained their current discount rate or continued to reduce the discount rate. When CalPERS first raised the discount rate above 6.50%, yields on long-term Treasury were well above that, peaking at over 15% in 1981. Interest rates have been in general decline ever since, at least until early 2022. With interest rates below the discount rate, as has been the case for CalPERS since the early 1990s, plans have needed to change their asset allocations to accept a higher level of investment risk (to achieve the same level of expected return) or to accept a lower expected return on investments, or a combination of both.

Beginning in late 2021, price inflation began to increase and then persisted. The Federal Reserve responded by increasing interest rates 11 times from May 2022 until July 2023. With inflation showing signs of cooling, the Federal Reserve began lowering interest rates in September 2024. Up to this point, this period of higher inflation and interest rates does not appear to be significantly impacting long-term economic assumptions.

CalPERS is not alone in facing the changed expectations of what can be achieved in the capital markets. The chart below left shows the change in distribution of public pension investment return assumptions from 2014 through 2023. The survey, which includes over 200 public retirement systems, shows that based on the available 2023 Annual Comprehensive Financial Report (ACFR) data, discount rates ranged from 4.31% to 8.25% with a mean of 6.93% and a median of 7.00%.

Distribution of Public Pension Plan Investment Return Assumptions



Data sources: Left - Center for Retirement Research at Boston College Public Plans Data (left), downloaded August 22, 2024
Right - Actuarial Funding Valuations for each system

Each year from 2014 through 2023 between 9% and 39% of the systems included in the survey reduced their discount rates, with the most recent year being the fewest, 9%. Note that in each of the last five years 2% of the systems in the survey increased the discount rate.

Since the Public Plans Data was compiled from available 2023 ACFR information, which typically reports information from 2022 funding valuations, it is somewhat out of date compared to current funding practices.

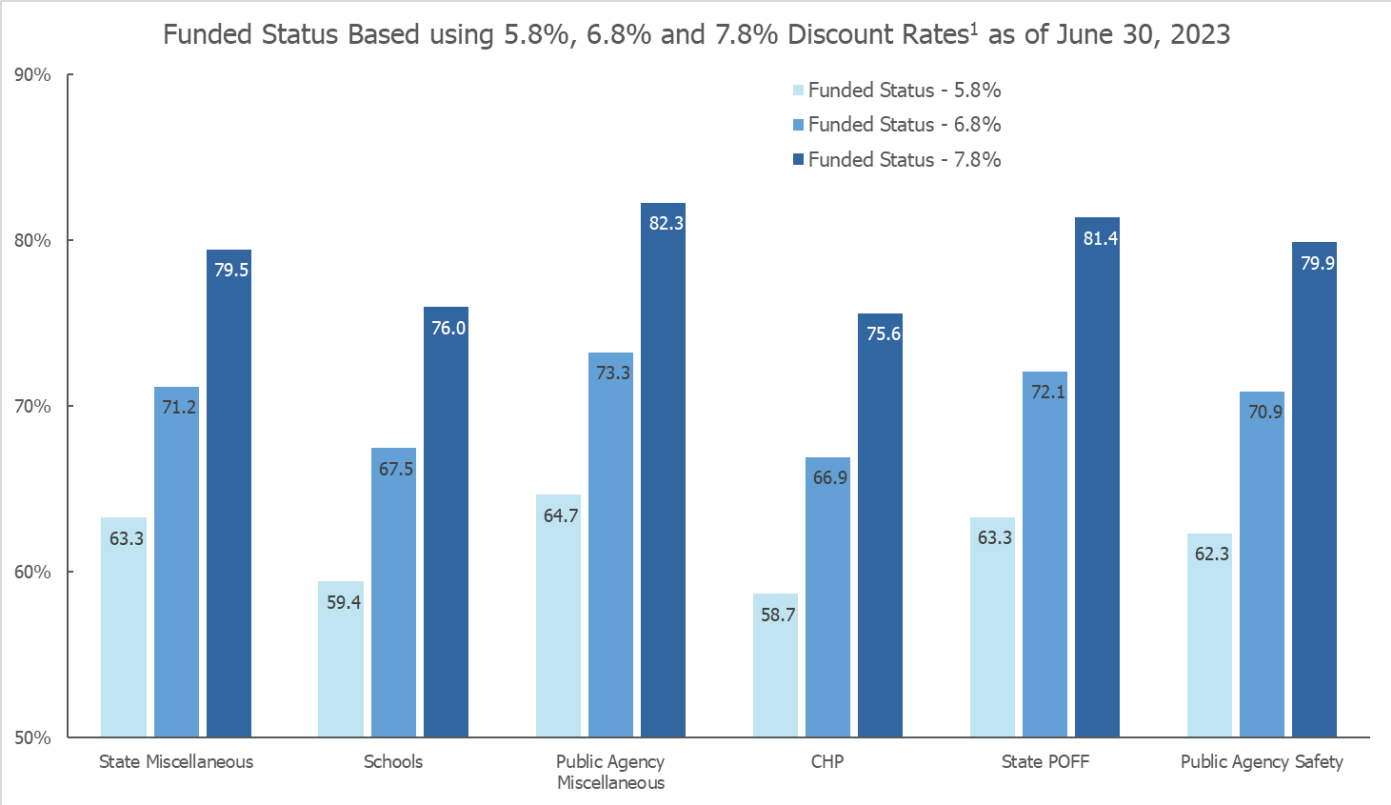
The Actuarial Office performs a more up to date, albeit smaller, survey of public retirement systems in California. The discount rates for 34 state, county and city retirement systems within California were compiled. The chart shown to the right of the Public Plans Data is based on funding valuations with valuation dates ranging from June 30, 2023 through January 1, 2024. The survey found that discount rates ranged from 6.00% to 7.25% (one system each) with a median of 6.75%. Three systems in the survey reduced the discount rate since last year's survey, one each to 6.50%, 6.75% and 7.00% .

It is likely that the reductions in investment return assumptions are the result of the same factors that have influenced changes at CalPERS. As interest rates continued to fall, discount rates only partially followed as investment risk was added to portfolios. Even with interest rates today being higher than they have been in a decade, an asset allocation with a long-term expected return of 6.80%, when yields on long-term

Treasuries are at approximately 4.5%, is far riskier than a portfolio expected to earn 8.50% when those same yields were over 10%.

Given the recent changes in capital market assumptions, and the uncertainty regarding what the actual CalPERS long-term rate of investment return will be, it is informative to consider the current funded status under alternate discount rate assumptions. The chart below provides such results assuming 5.8%, 6.8%, and 7.8% discount rates with no change to the current inflation assumption of 2.3%.

Funded Status based upon 5.8%, 6.8% and 7.8% Discount Rates



[1]Inflation assumption is kept at 2.3% for all scenarios listed. The inflation assumption may increase or decrease along with the discount rate assumption.

Discount rate changes are primarily due to 1) revised expectations of the future returns of utilized asset classes, or 2) decision to raise/lower investment risk by shifting investment allocations toward lower/higher risk return investments. The decision regarding the level of investment risk to target is among the most important decisions made by the system and its board. Excessive risk can lead to significant swings in funded status and contribution requirements as illustrated throughout this report.

The risks of setting a discount rate too high can be looked at two different ways. If discount rates are set higher than the reasonably expected average return, required contributions will be understated with the differences needing to be made up by future generations. Under that scenario, future contributions can rise to levels higher than if the discount rate had been set appropriately. In addition, if discount rates are set based entirely on interest rates and capital market assumptions that are temporarily inflated, systems may be forced to implement a painful reduction in discount rates when interest rates return to equilibrium. Despite the improvement in capital market assumptions during the recent mid-cycle ALM review, the uncertainty surrounding the underlying drivers of these CMAs suggests that caution should be exercised when considering any proposal to change the current discount rate.

Amortization Policy

The goals of a retirement system's amortization policy should be to pay down existing unfunded accrued liability (UAL) over a reasonable amount of time in order to:

- Provide benefit security for plan members
- Maintain intergenerational equity
- Limit contribution volatility to the extent possible

CalPERS current amortization policy adopted by the Board (effective with the June 30, 2019 Actuarial Valuation reports), improved the overall expected outlook for these objectives relative to the previous policy. In particular, due to the shorter amortization periods in the current policy (maximum 20 years), unfunded liabilities are expected to be paid off more quickly which results in improved benefit security for members and intergenerational equity. The potential for contribution volatility continues to exist. However, it can be challenging to further limit volatility without reducing benefit security and intergenerational equity.

Note: The Actuarial Amortization Policy addresses situations where an employer has requested an extension of the amortization of the UAL due to a financial necessity. While these policies can temporarily moderate employer contribution requirements, such employers are required to contribute at least interest on the UAL.

Employers Making Supplemental Payments

Many contracting public agencies have elected to make additional contributions over and above the minimum required contributions, an option that is unfortunately not available to School employers. Education efforts over the last few years have increased employers' awareness of the ability to make such payments and the many advantages of doing so. As part of the education efforts, CalPERS Actuarial Office has been providing the Managing Employer Contribution (MEC) spreadsheet upon employer request and access to the Pension Outlook tool on the CalPERS website. These tools help employers estimate the possible impact of additional contributions to their plans. Over the last five fiscal years ending June 30, 2024, approximately 34% of contracting agencies have made at least one additional contribution.

The primary advantages of additional contributions are:

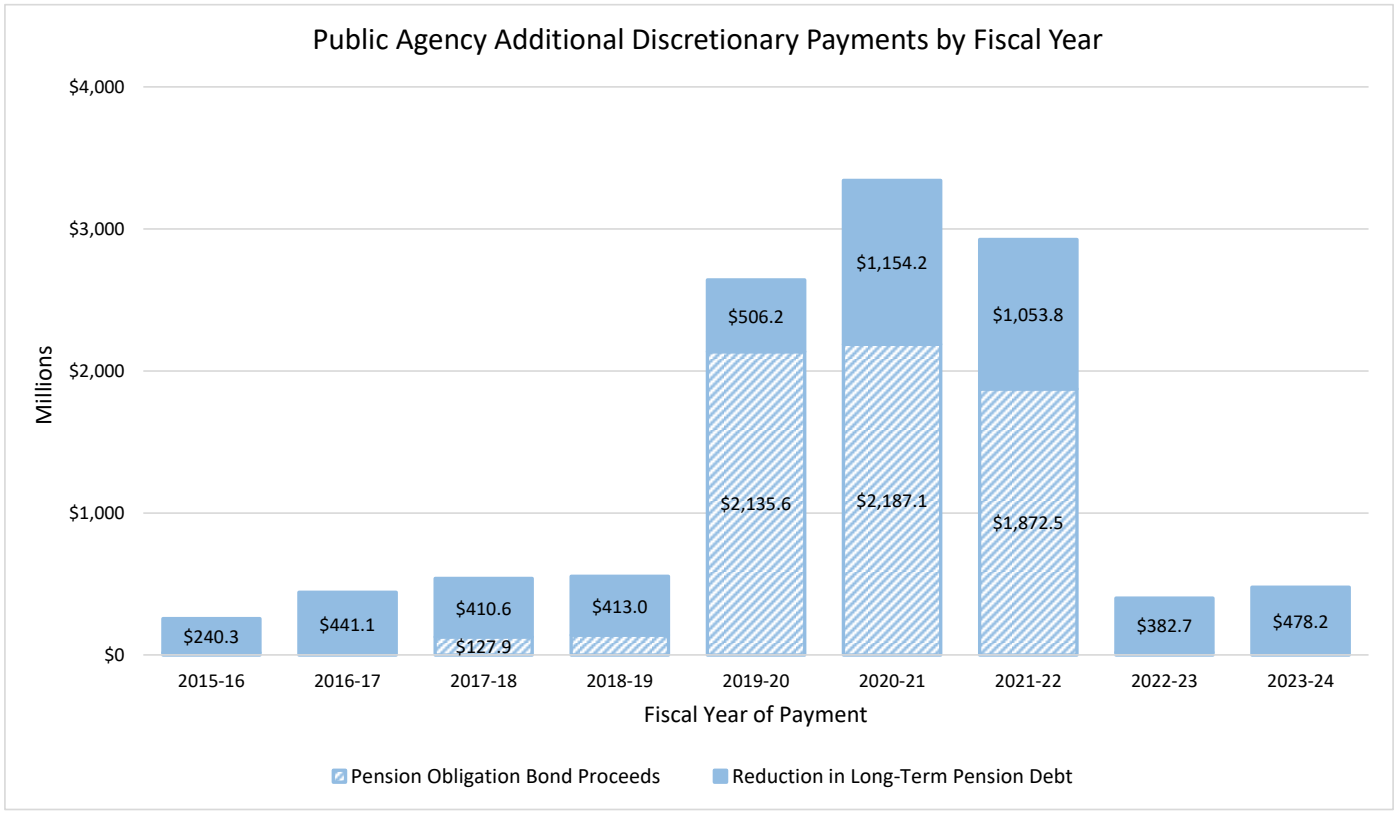
- Expected savings in interest paid and lowering the overall cost of the pension program
- Lower risk of low funded status in the future
- Lower risk of high contributions in the future
- A reduction to net pension liability for financial reporting purposes
- A reduction in pension expense for financial reporting purposes

The form of these additional discretionary payments (ADPs) varies between employers. Some employers make occasional ADPs on an ad hoc basis, for example, if they have a budgetary surplus towards the end of a fiscal year. Other employers have made more regular ADPs on a monthly or quarterly basis, and some even have a formal plan in place to pay off their unfunded liabilities by a specific target date.

The State of California also makes contributions in excess of the actuarially required contributions in order to reduce unfunded liabilities. Some additional contributions have been collectively bargained, some are due to a provision in the California Constitution that requires certain surplus funds be used to reduce State pension debt, and some are discretionary and serve to reduce long-term costs and stabilize contribution rates. In July 2024, the State contributed $337 million to supplement the actuarially required contributions.

In addition to additional discretionary payments, public agencies have also been issuing Pension Obligation Bonds (POBs) with increased frequency, especially during the low interest rate environment for the three fiscal years from 2019-20 to 2021-22. A POB is a taxable bond that some agencies issue to fund the unfunded portion of their pension liabilities by creating a debt to bondholders. Now that interest rates have risen, new POBs are not currently being issued. We are not aware of any POBs being issued by CalPERS public agencies since August 2022. As interest rates settle back down, this activity may resume.

The chart below reflects the total ADPs made by public agencies including the POBs that were issued in order to make those ADPs. The ADPs reduce long-term public agency debt only to the extent they exceed new POB issues. In FY 2023-24, CalPERS public agencies issued no POBs, as far as we know, and ADPs have returned to pre-pandemic levels.



ADP information was provided by the CalPERS Financial Office. POB issuance data was downloaded from the California Debt and Investment Advisory Commission on the California State Treasurer website.

California Employers' Pension Prefunding Trust Program

Many public employers set aside additional pension assets in a trust separate from pension fund. These trusts, known as "Section 115 Trusts" (after Internal Revenue Code Section 115), allow employers to prefund future defined benefit pension system normal costs and unfunded accrued liability (UAL) payments. Section 115 pension trust assets can be used by the employer at any time to reimburse the employer's general fund from which they have made pension contributions. Employers may also make pension contributions directly from a Section 115 pension trust.

The purposes of Section 115 pension trusts include the following:

- Save overall pension costs due to additional prefunding which generates investment income.
- Likely earn higher long-term returns than the State Treasurer's Local Agency Investment Fund or a county treasurer's office.
- Invest with different time horizons and risk levels than the pension fund.
- Retain liquidity on assets dedicated to pension costs.
- Stabilize and subsidize future budgets.
- Create a contingency reserve for difficult times ahead.
- Pay down pension liabilities in a predictable and prudent manner.

One of the most attractive of these Section 115 pension trust purposes from an employer's point of view is the ability to build up a contingency reserve that can be used to satisfy CalPERS contribution requirements during years the employer's budget is strained. This can be an effective way to deal with CalPERS contribution volatility due to fluctuating investment markets.

The unfunded pension liabilities and future pension contribution volatility summarized in the previous sections of this report do not reflect the fact that hundreds of public employers already have Section 115 pension trust funds. Because Section 115 pension trusts can be expensive to set up and administer, CalPERS launched the California Employers' Pension Prefunding Trust (CEPPT) in 2019. The CEPPT was established by Senate Bill 1413 which gives public agency employers that provide a defined benefit pension plan additional low cost and not-for-profit investment vehicles to help manage pension costs. School employers can also utilize Section 115 pension trusts but cannot participate in the CEPPT. Participation in the CEPPT for eligible agencies is voluntary and provides employers with the flexibility to determine the amount of their contributions, reimbursements, and overall funding strategy.

The CEPPT offers two broadly diversified portfolio options, known as Strategy 1 and Strategy 2, with moderate to low risk profiles that are expected to have a net rate of investment return of 5.4% and 4.9%, respectively. As of September 30, 2024, a total of 97 employers have established CEPPT accounts, 96 of which provide their employees with pensions through CalPERS. Total assets under management as of that date was approximately $274 million, with about 76% of the assets invested in Strategy 1.

Conclusion

As of June 30, 2023, the CalPERS Retirement System had experienced a couple years of investment returns below the expected return of 6.8%, and actuarial losses primarily due to high inflation which resulted in unexpected cost of living adjustments for retirees and higher than expected member pay increases. These factors resulted in increased employer contributions along with further increases forecasted for the near future.

The investment return for the year ending June 30, 2024, of approximately 9.5% was higher than expected resulting in actuarial gains that will put downward pressure on required contributions beginning July 1, 2026. This favorable investment return also increased the system funded status to an estimated 75% as of June 30, 2024 (71.4% as of June 30, 2023). Despite the strong investment return last year, employer contributions are currently at relatively high levels due to still large amounts of unfunded accrued liability. In addition, uncertainty within the economy suggests possible economic turmoil in the near future. The ability of employers to continue making required contributions to the system is the area of greatest concern.

For employers facing financial difficulties, the CalPERS amortization policy can be used in some cases to spread amortization payments over a longer period and hence reduce near-term contributions. However, these policies require minimum contributions that may still pose challenges for some agencies. In addition, these policies do not reduce costs but merely delay and increase them.

Various strategies and actions by CalPERS, its Board of Administration, and its employers have improved the sustainability of the system and mitigated certain risks. Among these are:

- The adoption of the current amortization policies that mitigate the risk of the system dropping to dangerously low funding levels.
- Additional contributions made by CalPERS agencies.
- The use of a separate 115 trust by many CalPERS agencies.
- Improved modeling tools that allow CalPERS and its participating employers to forecast future required contributions and funded status under a variety of possible future scenarios.
- The continued improvements in investment policies which maintains favorable investment return expectations and associated volatility.

Over the previous decade, funded status results were volatile and did not materially improve from the beginning of the period. A significant cause of this was overly optimistic assumptions for expected return and discount rate. These assumptions have been reduced considerably over the last 10 years. In order to improve the likelihood of faster funding status improvement over the next 10 years, the board should carefully consider these factors when setting future discount rate assumptions; 1) the likelihood of achieving future investment returns equal to or greater than the selected discount rate, and 2) the repercussions of future investment returns being lower than the selected discount rate.

In addition, we believe the following items should receive a high level of focus going forward.

- Continual focus on the acceptable level of investment risk versus the desire for higher investment returns.
- Monitor the effectiveness of the current investment policy to ensure desired returns relative to the chosen level of risk.
- Continue the focus on educating participating employers on the risks facing the system and providing tools that enhance their ability to manage these risks.
- Stakeholder outreach regarding employers' ability to make required contributions.

CalPERS and its participating employers have taken many positive steps to manage the risks of the system. Increased focus on these risks and opportunities to minimize and manage them, as discussed in this report, will be of utmost importance going forward.

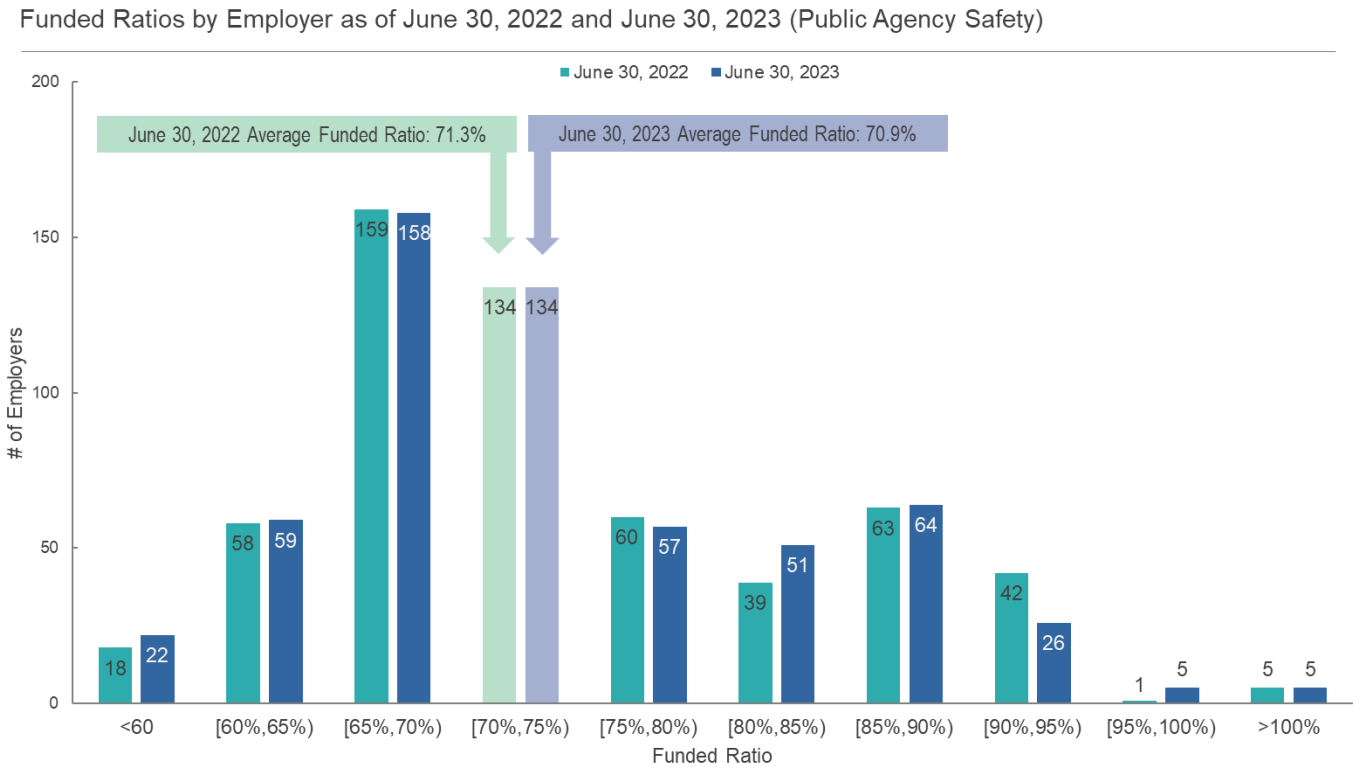
Appendix A – Public Employees' Retirement System (PERS) Summary Statistics

	June 30, 2022	June 30, 2023
Number of Actives[1]	867,844	904,962
Number of Transferred[1]	167,329	175,943
Number of Separated[1]	496,715	524,505
Number of Receiving[1]	922,678	943,641
Payroll	$62.3 billion	$67.8 billion
Entry Age Accrued Liability	$618.8 billion	$650.3 billion
Market Value of Assets	$438.4 billion	$463.5 billion
Unfunded Liability	$180.4 billion	$186.8 billion
Funded Status	70.8%	71.3%
Prior Year Benefit Payments	$29.4 billion	$31.5 billion
Prior Year Employer Contributions	$22.7 billion	$24.2 billion
Prior Year Employee Contributions	$5.2 billion	$5.7 billion

[1]These counts are from the CalPERS actuarial valuation system, which may not match the statistics provided in CalPERS Annual Comprehensive Financial Report (ACFR). For example, the number of receiving displayed in this report is not the count of unique benefit recipients; rather, it is the count of data records in CalPERS actuarial valuations for benefits in pay status. Some individual retirees have multiple records in our data due to having worked at multiple CalPERS agencies. Numbers shown in the ACFR for retirees receiving benefits include individuals just once in the count even if they are receiving benefits from multiple CalPERS agencies.

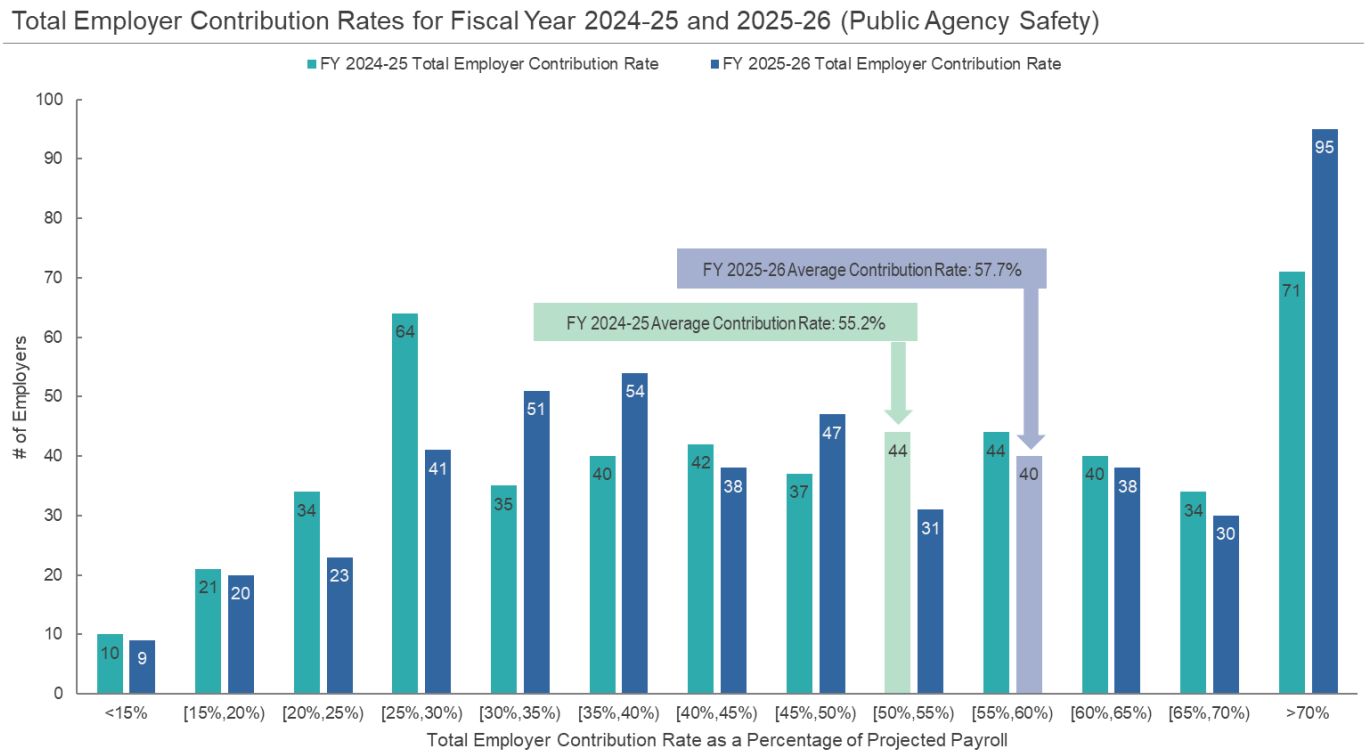
Appendix B – Results of June 30, 2023 Public Agency Valuations for Safety Plans

Public Agency Funded Ratios for Safety Plans

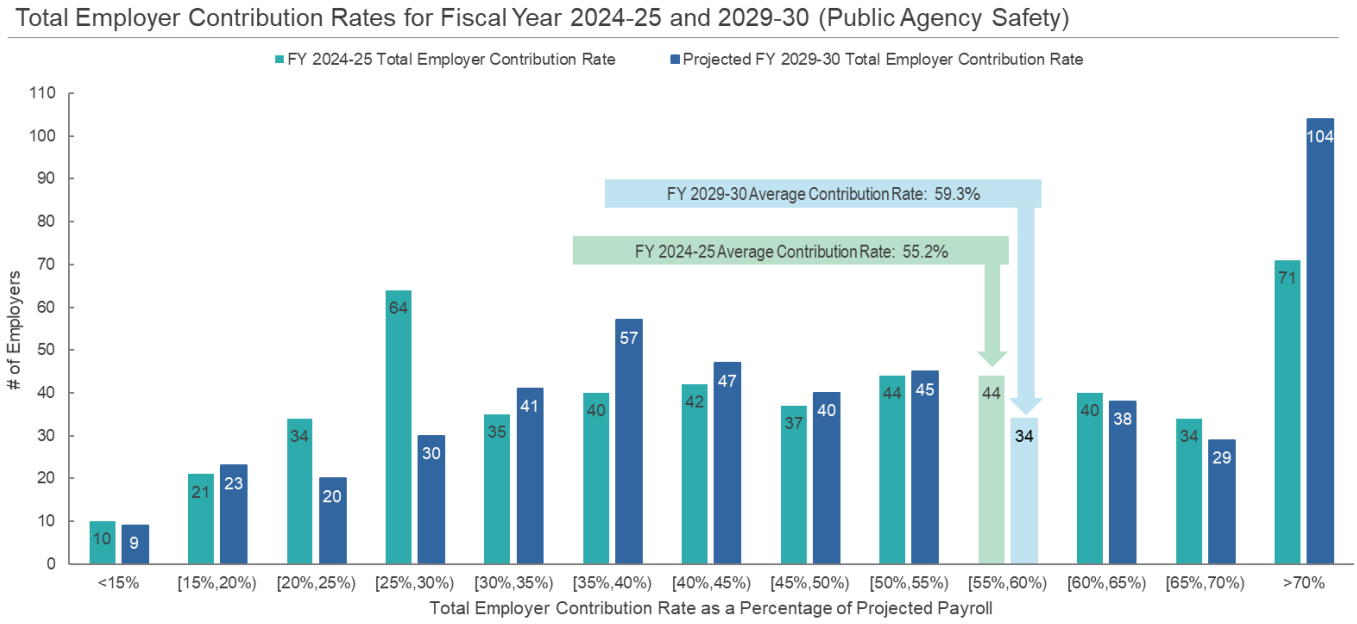


Public Agency Contribution Rates for Safety Plans

The following table displays the total employer contribution rates for public agency safety plans that contract with CalPERS for benefits. These contribution percentages reflect both the required normal cost contribution percentage and the required payment toward any unfunded liability (converted to a percent of payroll).

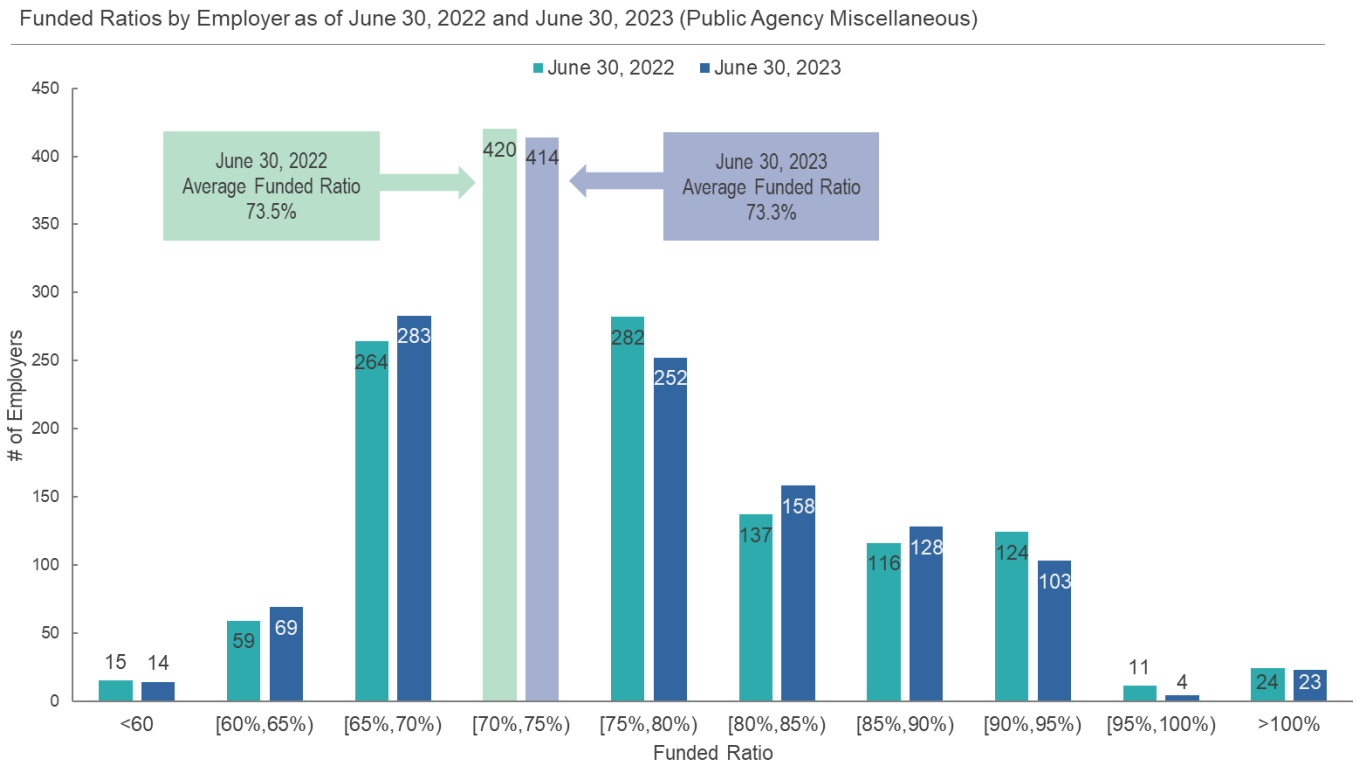


The following table displays the actual and projected total employer contribution rates for public agency safety plans that contract with CalPERS for benefits. These contribution percentages reflect both the required normal cost contribution percentage and the required payment toward any unfunded liability (converted to a percent of payroll). FY 2029-30 rates are based on a projected payroll. For plans with a decreasing number of active members (and therefore decreasing payroll), these contribution percentages can become quite large when the required payment toward unfunded liability becomes a large percentage of the decreasing payroll. In addition, the projected contributions are based on experience through June 30, 2023. There will be additional investment, economic and demographic experience that will impact the projected rates before they become actual rates in the future.



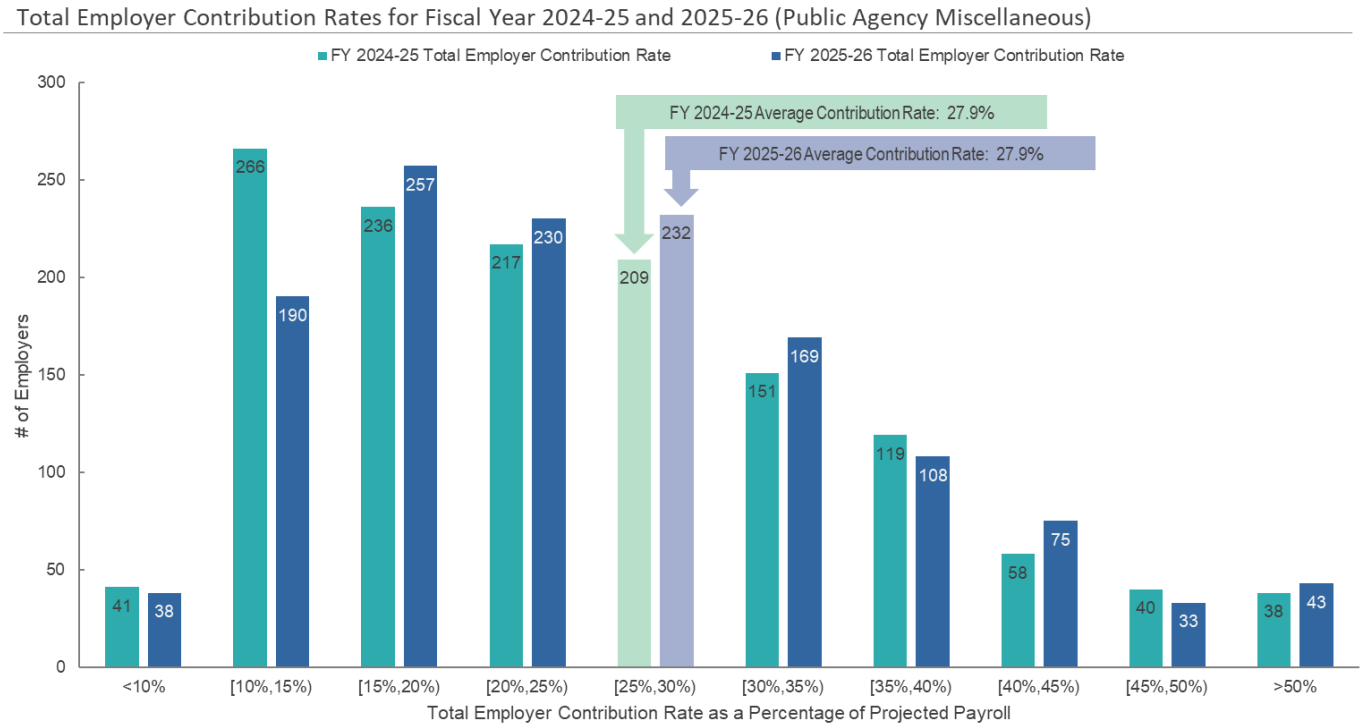
Appendix C – Results of June 30, 2023 Public Agency Valuations for Miscellaneous Plans

Public Agency Funded Ratios for Miscellaneous Plans

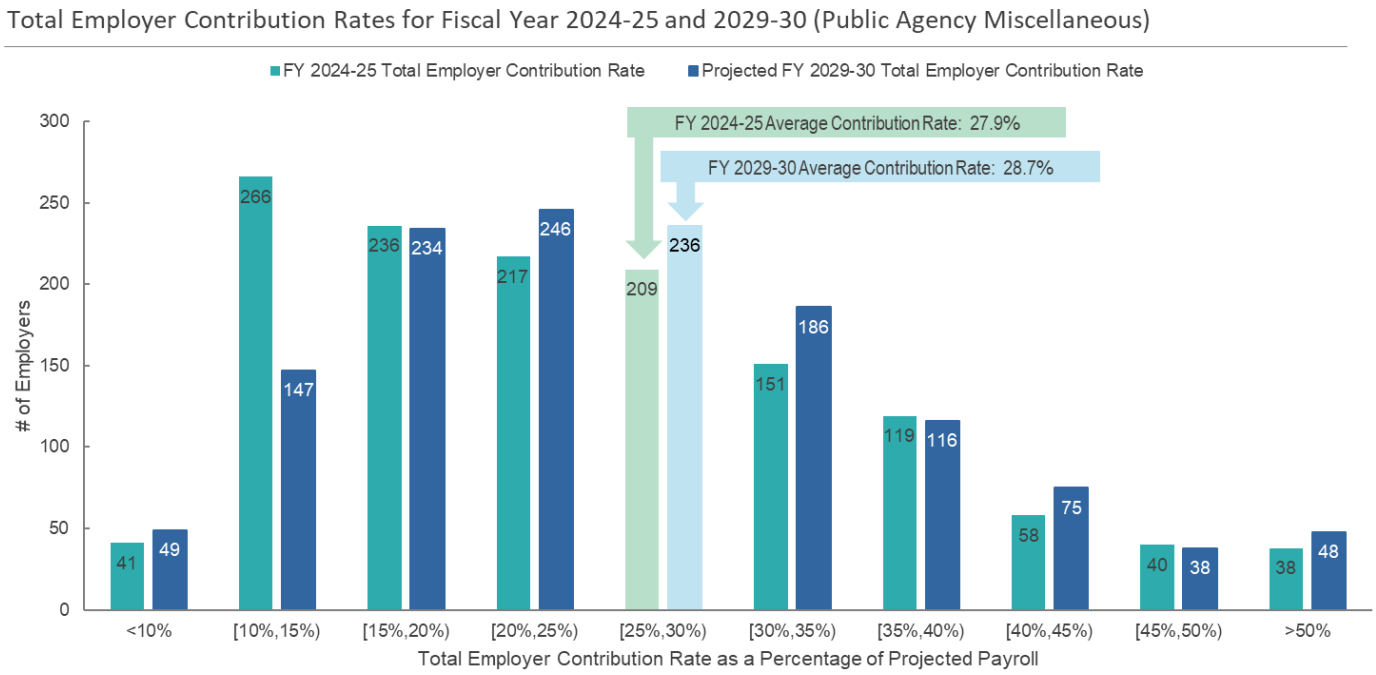


Public Agency Contribution Rates for Miscellaneous Plans

The following table displays the total employer contribution rates for public agency miscellaneous plans that contract with CalPERS for benefits. These contribution percentages reflect both the required normal cost contribution percentage and the required payment toward any unfunded liability (converted to a percent of payroll).

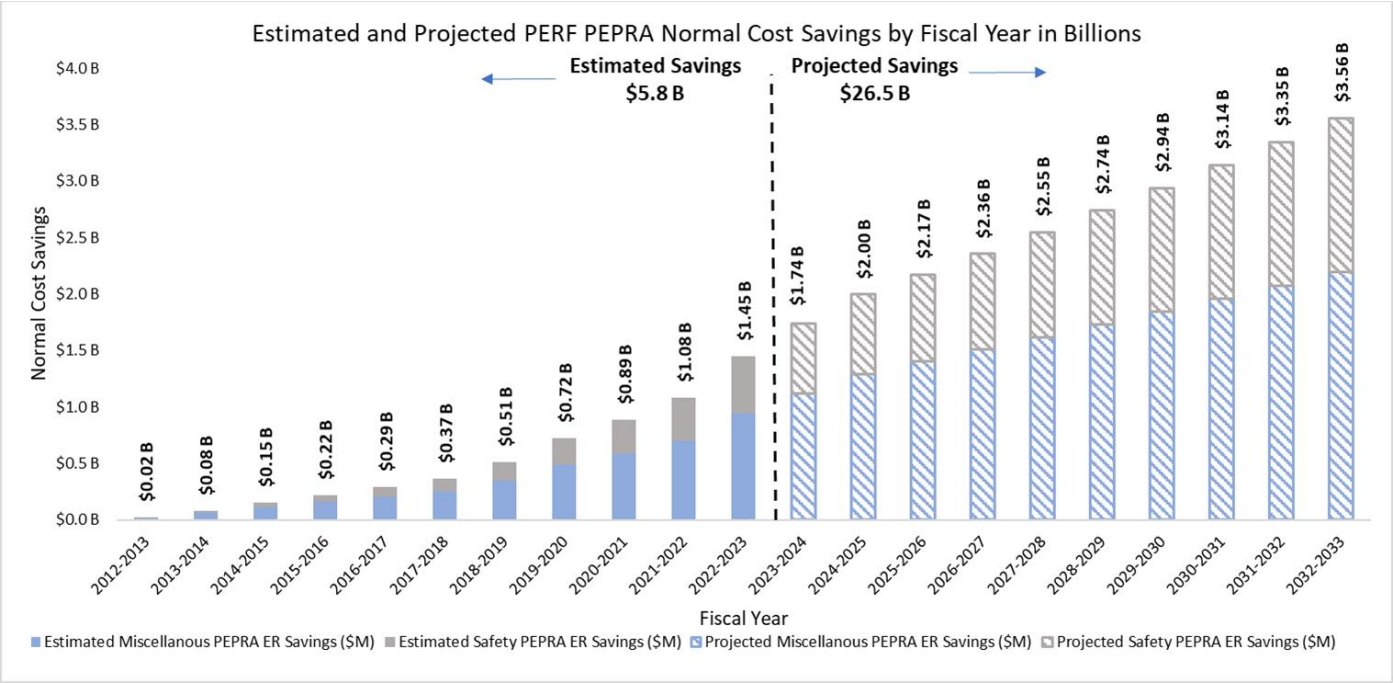


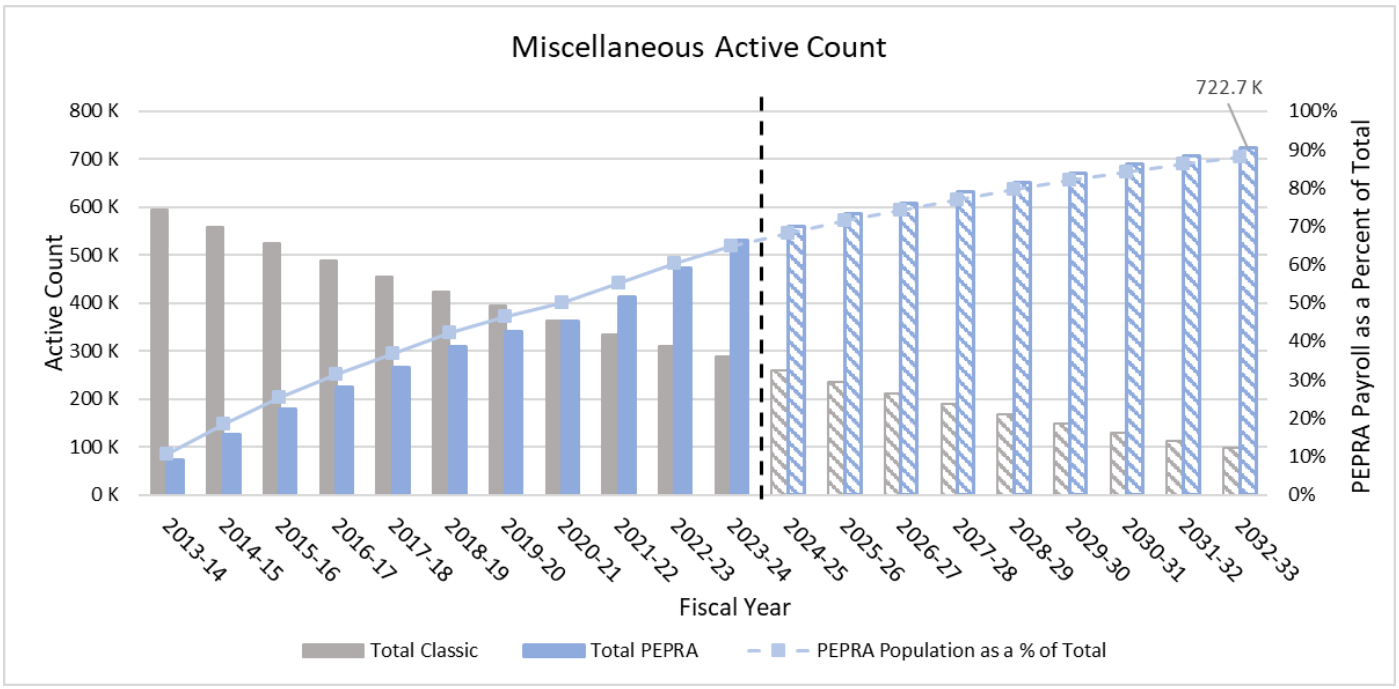
The following table displays the actual and projected total employer contribution rates for public agency miscellaneous plans that contract with CalPERS for benefits. These contribution percentages reflect both the required normal cost contribution percentage and the required payment toward any unfunded liability (converted to a percent of payroll). FY 2029-30 rates are based on a projected payroll. For plans with a decreasing number of active members (and therefore decreasing payroll), these contribution percentages can become quite large when the required payment toward unfunded liability becomes a large percentage of the decreasing payroll. In addition, the projected contributions are based on experience through June 30, 2023. There will be additional investment, economic and demographic experience that will impact the projected rates before they become actual rates in the future.

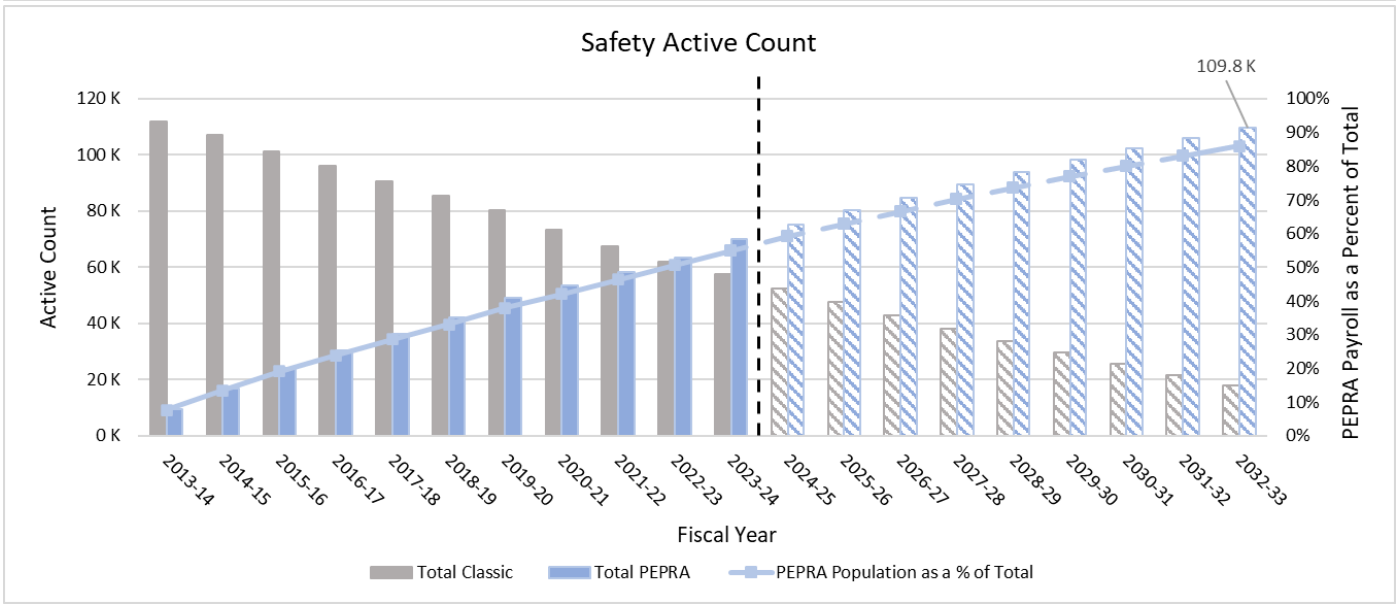


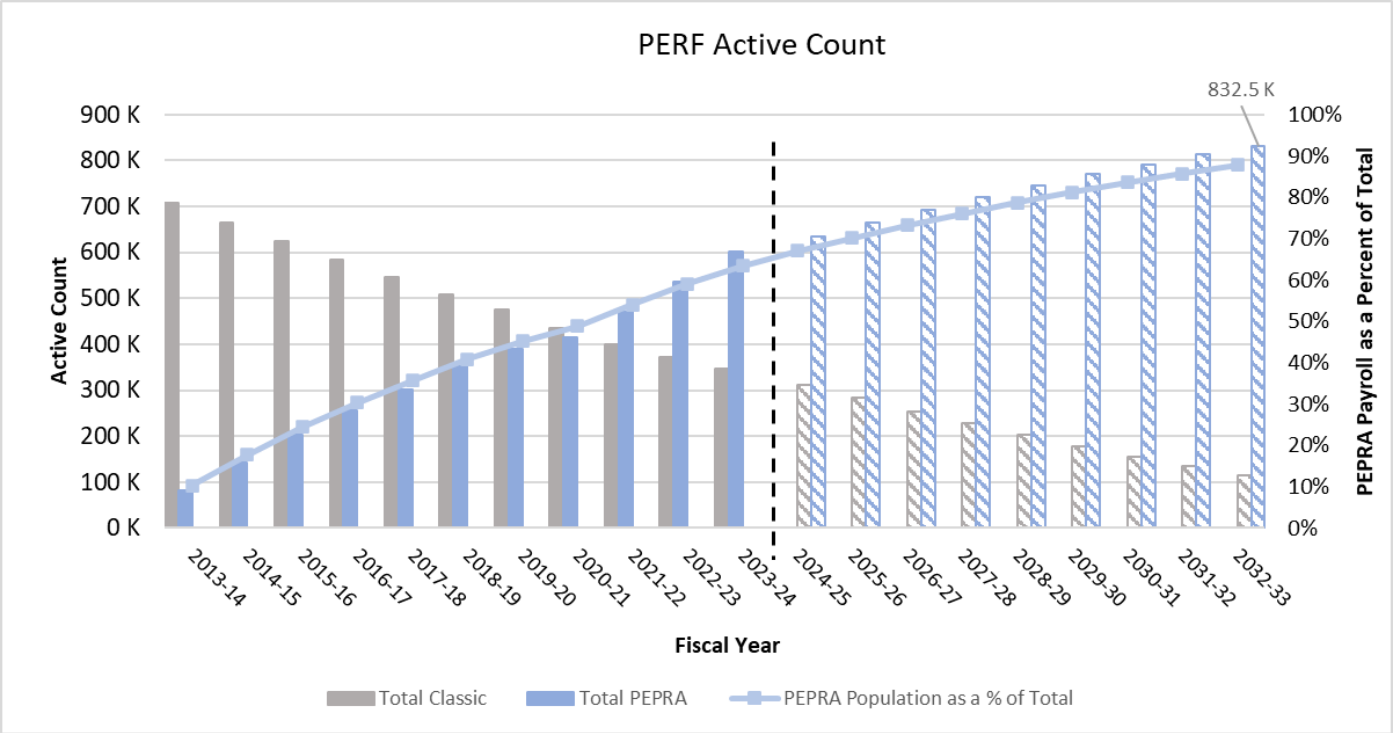
Appendix D – Additional Information on PEPRA Impacts

Plan Type	% PEPRA Members 6/30/2024	% PEPRA Payroll 6/30/2024	Cost Savings Last 10 Years	Cost Savings Next 10 Years
State	58%	47%	$1.7 billion	$8.0 billion
Schools	66%	54%	$1.1 billion	$4.3 billion
Public Agencies	65%	55%	$3.0 billion	$14.2 billion




Miscellaneous Active Count
722.7 K
800 K
700 K
600 K
500 K
400 K
300 K
200 K
100 K
0 K
Active Count
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
PEPRA Payroll as a Percent of Total
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
2024-25
2025-26
2026-27
2027-28
2028-29
2029-30
2030-31
2031-32
2032-33
Fiscal Year
Total Classic
Total PEPRA
PEPRA Population as a % of Total


Safety Active Count
109.8 K
120 K
100 K
80 K
60 K
40 K
20 K
0 K
Active Count
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
PEPRA Payroll as a Percent of Total
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
2024-25
2025-26
2026-27
2027-28
2028-29
2029-30
2030-31
2031-32
2032-33
Fiscal Year
Total Classic
Total PEPRA
PEPRA Population as a % of Total


PERF Active Count
832.5 K
900 K
800 K
700 K
600 K
500 K
400 K
300 K
200 K
100 K
0 K
Active Count
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
PEPRA Payroll as a Percent of Total
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
2024-25
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2026-27
2027-28
2028-29
2029-30
2030-31
2031-32
2032-33
Fiscal Year
Total Classic
Total PEPRA
PEPRA Population as a % of Total

2024 Annual Review of Funding Levels and Risks

November 2024