Asset Liability Management: First Reading of Public Employees' Retirement Fund Recommendations

Stephen Gilmore
Chief Investment Officer

Michele Nix
Chief Financial Officer

Scott Terando
Chief Actuary

Investment Committee

November 17, 2025

Today’s Presentation

- The Proposed 2025 Public Employees’ Retirement Fund (PERF) Asset Liability Management (ALM) Recommendations
- Appendix

ALM Review: November 2024 to Now

Our ALM Process is Working as Designed

- Teamwork and Collaboration By the Financial, Investment, and Actuarial Offices
- To Date: Nine Board Education Sessions, Two Stakeholder Webinars and a Variety of Stakeholder Engagements
- Introduced a New Investment Framework: Total Portfolio Approach - A Global Evolution of Strategic Asset Allocation

ALM 2025 Recommendations

Adopt a Total Portfolio Approach (TPA) With:

- Capital Market Assumptions (CMAs)
- Formal Total Fund Risk:
  - 75/25 Equity-Bonds Reference Portfolio (RP)
  - Active Risk Limit of 400 Basis Points

No Change to the Current 6.8% Discount Rate

ALM Recommendation

Adopting a Total Portfolio Approach Means…

No Changes To:

Board authority for setting investment risk and governance model

ALM process:

- 4-year cycle, mid-point review
- Board deliverables of capital market assumptions and expected returns analysis
- Actuarial assumptions and deliverables

Changes Under TPA:

The Board would adopt a new investment governance model that sets formal Total Fund Risk via:

- **A Reference Portfolio**
- **Active Risk Limit**

This replaces adopting a target strategic asset allocation (SAA) and policy ranges for management discretion

In ALM years, the Board would review its formal Total Fund Risk

Why Change to Total Portfolio Approach?

TPA Evolves and Builds on SAA For Better Outcomes

Improved Internal Governance

Adds New Formal Overall Total Fund Risk

Reference Portfolio (RP)

Passive Market Risk Exposure Using Equities & Bonds, Gives Passive Returns

Simplicity

From 11 benchmarks to One Total Fund Benchmark, the Reference Portfolio, For Evaluating Management's Decisions

Better Transparency

Management Decisions are Reported Relative to the Reference Portfolio

Greater Accountability

Management's Decisions and Performance Will Be Clear, More Transparent, Drive Accountability

Investment Decisions For the Whole

Investments Made Based on the Best Value to the Total Portfolio

Taken Together, TPA Leads to Better Performance and System Funding

Investment Reporting

Investment Reporting	Current	Under TPA
1 Annual Fiscal Year End Trust Level Review (TLR)	X	X
7 Stand Alone Annual Program Reviews (APRs)	X	X
New Performance Dashboard into All TLRs		X
Forward Looking In-Depth Business Strategy Reviews (closed session)	X	X
3 Quarterly TLRs	X	X
1 Annual Board Consultant TLR Report	X	X
Ad Hoc Investment Strategy Reports	X	X
Annual Comprehensive Financial Report (ACFR)*	X	X
Annual Investment Performance (AIR) Report*	X	X
Annual Global Investment Performance Standards (GIPS) Report*	X	X

CalPERS

*Standards based reports expect to have additional disclosure and commentary about the shift to TPA.

Reference Portfolio Recommendation

75/25 Equity-Bonds Reference Portfolio

- A component of the Board's Formal Total Fund Risk that:
  - Sets the market risk exposure to earn the passive returns the market gives
  - Becomes the total fund performance benchmark to measure management against
- The 75/25 reference portfolio balances:
  - Our starting point of an approximately 72/28 portfolio with our long run risk tolerance
  - The Board's expressed tolerance for more risk when we have high conviction
  - The increased volatility and drawdown risk that comes with higher equity exposure
  - Minimizing employer cost volatility and maximizing likelihood of improved system funding

Reference Portfolio Index Types

Accessible, Investible, and Operationally Simple

	Proposed	Reasons Why
Equities	**Cap Weighted Global Equities**	• Commonly Used • Market Efficient • Minimizes Turnover/Cost • Continuity: Largest Current PERF Asset Class
Bonds	**US Treasury Bonds (1+ year Maturity)**	• Adds Term Premium & Diversifies From Equities • Industry Standard Interest Rate Exposure • Continuity: Similar Overall Interest Rate Exposure as Current PERF SAA

Capital Market Assumptions

Asset Class	Medium-Term Return Midpoint (5-year)	Range	Long-Term Return Midpoint (20-year)	Range	Volatility Midpoint (20-year)	Range
Global Equity – Cap Weighted	6.2%	4.7% - 7.3%	6.7%	4.7% - 8.5%	16.5%	14.2% - 17.3%
Global Equity – Non-Cap Weighted	6.7%	5.4% - 7.3%	6.6%	6.3% - 7.6%	12.0%	10.3% - 13.7%
Private Equity	8.1%	5.5% - 9.9%	7.6%	4.7% - 11.2%	22.0%	11.0% - 32.1%
U.S. Treasuries	4.4%	3.8% - 4.6%	4.2%	3.0% - 5.0%	4.5%	1.5% - 5.2%
Long U.S. Treasuries	4.8%	4.1% - 5.3%	4.8%	3.9% - 6.1%	10.2%	5.1% - 12.7%
Mortgage-Backed Securities	5.1%	4.7% - 5.4%	4.6%	3.0% - 5.5%	4.3%	3.4% - 6.5%
Investment Grade Corporates	5.6%	4.9% - 6.3%	5.8%	4.4% - 6.9%	9.0%	5.4% - 12.3%
Emerging Market Debt	6.2%	5.6% - 6.9%	6.2%	4.9% - 7.1%	9.9%	8.4% - 12.0%
High Yield	5.7%	5.1% - 6.1%	6.2%	5.3% - 6.7%	8.9%	6.6% - 10.3%
Private Debt	7.9%	6.6% - 9.0%	6.6%	6.2% - 8.2%	11.9%	9.5% - 15.0%
Real Estate	5.9%	1.0% - 8.1%	5.9%	3.5% - 7.8%	12.7%	10.9% - 19.9%
Infrastructure	6.5%	6.2% - 10.0%	6.9%	6.2% - 9.0%	15.0%	9.8% - 25.0%
Liquidity	3.4%	2.8% - 4.0%	3.3%	2.7% - 4.0%	0.7%	0.0% - 5.9%

CalPERS

CMAs are developed from the 3/31/2025 survey of 15 institutional providers and internally reviewed.
CMA correlations in Appendix

Expected Returns By Reference Portfolio

Total Returns Include Reference Portfolio & Use of 300 bps* of Active Risk

Recommendation

Equity / Bonds Asset Mix	Current SAA Portfolio 72/28	70/30	75/25	80/20
Total Projected Return – Survey Median	6.8%	6.8%	6.9%	7.0%
Total Projected Return – Survey Range	5.4%-8.4%	5.0%-8.1%	5.0%-8.3%	5.1%-8.4%
Total Portfolio Volatility	12.0%	11.9%	12.7%	13.5%
Expected Tail Risk (95%)	-25.0%	-23.3%	-25.8%	-28.4%
Max Drawdown – Global Financial Crisis 2007-09	-41%	-40%	-43%	-45%
Loss for Hypothetical $500 bn Portfolio	-$204 bn	-$199 bn	-$213 bn	-$226 bn

300 bps of active risk is used because it is the midpoint of the expected operational range as seen on slide 15

*bps = basis points, or 0.01%
Current portfolio risk is estimated based on a preliminary TPA risk model applied to FY24/25 interim SAA targets

All return estimates are net of fees

Stochastic Analysis – State Miscellaneous Plan

State Miscellaneous Plan (6/30/2024 valuation results)

Current Employer Rate (% payroll)	31.3%
Current Funded Status	74.5%

Reference Portfolio	70/30	75/25	80/20
Discount Rate	6.7%	6.8%	6.8%
Employer Contribution Rates Over Next 10 Years			
Average employer contribution rate	23.2%	22.1%	21.7%
Probability of exceeding 40% in any year	22.1%	22.4%	23.9%
Probability of single year increase > 5%	14.0%	18.2%	21.4%
Funded Status After 10 Years			
Median funded status	96.9%	97.0%	97.8%
Probability of 50% or lower	3.1%	4.1%	5.0%
Probability of 100% or higher	46.3%	46.8%	48.0%

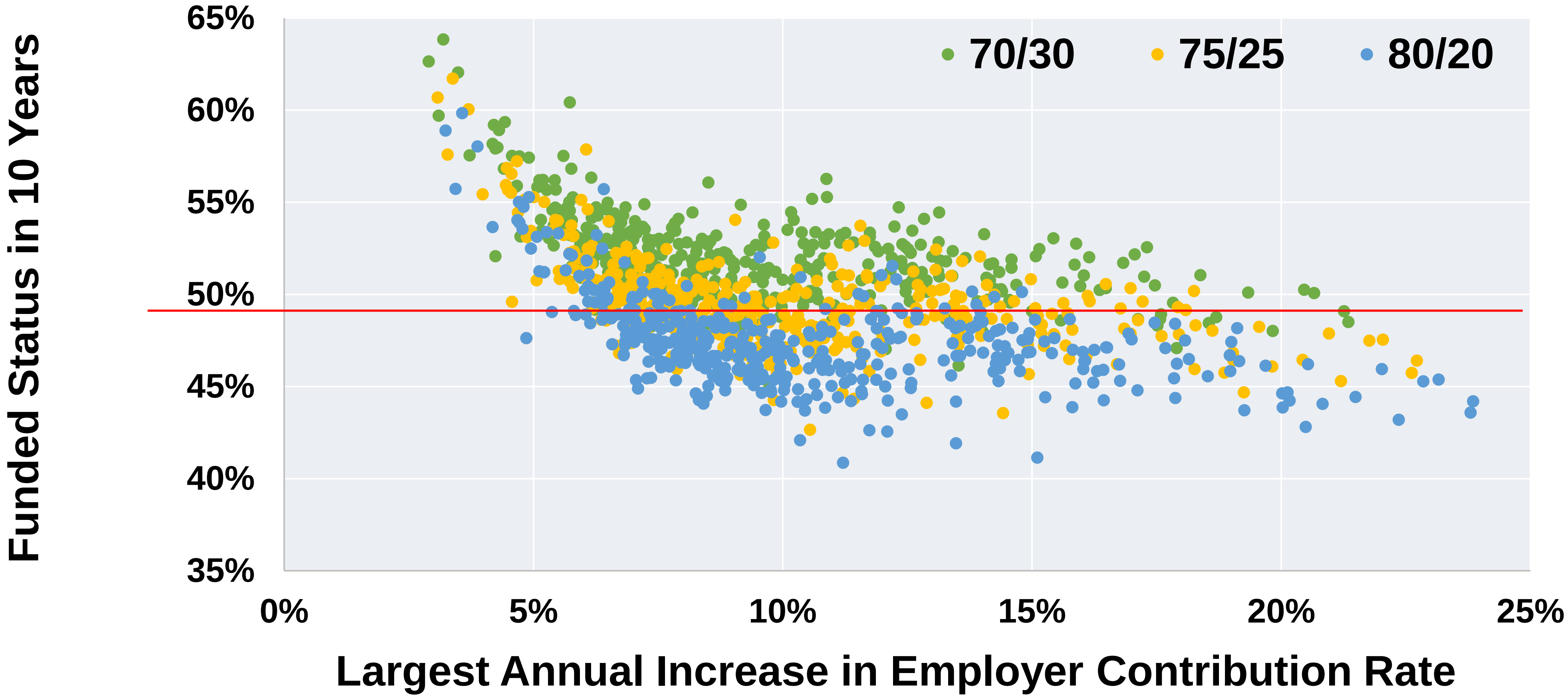
Public Agency Plans | 10 Year Projections

Stochastic Analysis of Largest 420 Public Agency Plans

Median Results						
	Miscellaneous			Safety		
Portfolio	70/30	75/25	80/20	70/30	75/25	80/20
Discount Rate	6.7%	6.8%	6.8%	6.7%	6.8%	6.8%
Funded Status in 10 Years	96.9%	97.1%	97.7%	95.0%	95.0%	95.8%
Cumulative Employer Contributions Over 10 Years (Relative to 75/25 Portfolio)	5.3%	N/A	-1.2%	5.3%	N/A	-1.5%

Public Agency Plans | 10 Year Projections

Stochastic Analysis of Largest 420 Public Agency Plans



Plans Under 50% Funded in 10 Years

70/30: 71
75/25: 275
80/20: 373

5th Percentile Results

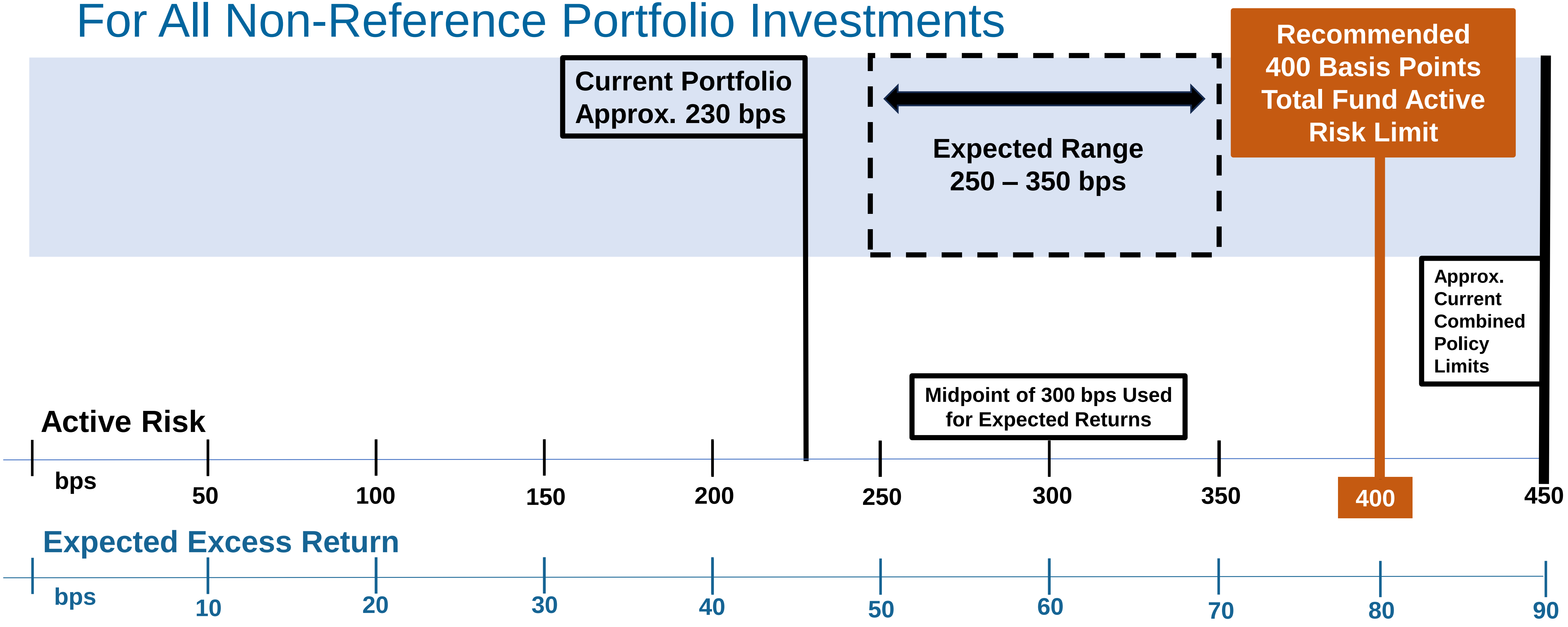
Active Risk Limit Recommendation

➤ **400 Basis Points Total Fund Active Risk Limit**

- Active risk applies to every non-Reference Portfolio investment
- Consolidates existing SAA ranges and policy discretion into a single overall total fund Active Risk Limit
- Simple and transparent reporting of management decisions
- Recommendation is lower than current SAA policy’s combined ranges of approximately 450 basis points
- Expected operating range is 250-350 basis points

Active Risk Limit Recommendation

For All Non-Reference Portfolio Investments



bps = basis points, or 0.01%
Current policy max limit includes ranges across asset classes, liquidity, and leverage

Discount Rate Recommendation

➢ No Change to the Current 6.8% Discount Rate

- 6.8% is appropriate for the recommended 75/25 Reference Portfolio and 400 basis points Active Risk Limit
- Fund experience and investment return expectations are monitored regularly to reassess the appropriateness of the Discount Rate

Other Discount Rate Considerations

- Increasing the discount rate results in immediate reductions to contributions before the higher expected returns are realized
- Actual returns lower than the discount rate jeopardize funded status improvement and increase overall costs to employers

Probability of Achieving Various Average Investment Returns

Discount Rate	70/30		75/25		80/20	
	10-Years	20-Years	10-Years	20-Years	10-Years	20-Years
6.7%	52.1%	53.6%	52.5%	54.8%	53.0%	55.6%
6.8%	51.3%	52.6%	51.7%	53.6%	51.9%	54.5%

The Path to Total Portfolio Approach

Eight Project Workstreams (1-4)

#1 Board Action

Board adopts (1) a simple and investible Reference Portfolio aligned with the long-term return objectives of the plan; and (2) an Active Risk Limit providing management discretion to invest away from the Reference Portfolio.

#2 Internal Governance

Develop comprehensive internal governance and investment decision framework to allocate, measure, monitor, and manage active risk.

#3 Portfolio Construction

Develop a portfolio construction approach that synthesizes strategies, risk factors, cost of liquidity, and investment horizons into a cohesive active risk budgeting framework.

#4 Treasury Management

Develop a framework to manage liquidity and leverage under a TPA and ensure TPA goals align with the Data and Tech Modernization Initiative.

The Path to Total Portfolio Approach

Eight Project Workstreams (5-8)

#5 Policy & Controls

Update policies, procedures, and controls underpinning the successful transition to TPA.

#6 Communication & Engagement

Develop a strategy to guide and support team members through the transition to a TPA by fostering understanding, alignment, and engagement.

#7 Reporting

Implement transparent and consistent reporting mechanisms to ensure clear and accurate communication under a TPA.

#8 Implementation

Operationalize the processes, systems, and frameworks necessary to transition to a TPA.

2025-26 ALM Timeline

Stakeholder Engagement Throughout Cycle

September 2025	October 2025	November 2025
First Read: PERF Recommended Reference Portfolio, Active Risk Limits, Expected Rate of Return, Experience Study, Actuarial Assumptions, Discount Rate *ALM Strategy Closed Session*	Ed Forum State of the System Session	Board Vote: PERF Recommended Reference Portfolio, Active Risk Limits, Expected Rate of Return, Experience Study, Actuarial Assumptions, Discount Rate

December 2025	March 2026	June 2026	July 1, 2026
Stakeholder Webinar December 4	Affiliate Funds ALM First Read: PERF Policy Updates Closed Session: PERF Implementation Strategy	Affiliate Funds ALM Board Vote: PERF Policy Updates Closed Session: PERF Implementation Strategy	**PERF ALM Effective Date**

CalPERS

Appendix

Capital Market Assumptions Correlations

Asset Class Comparisons

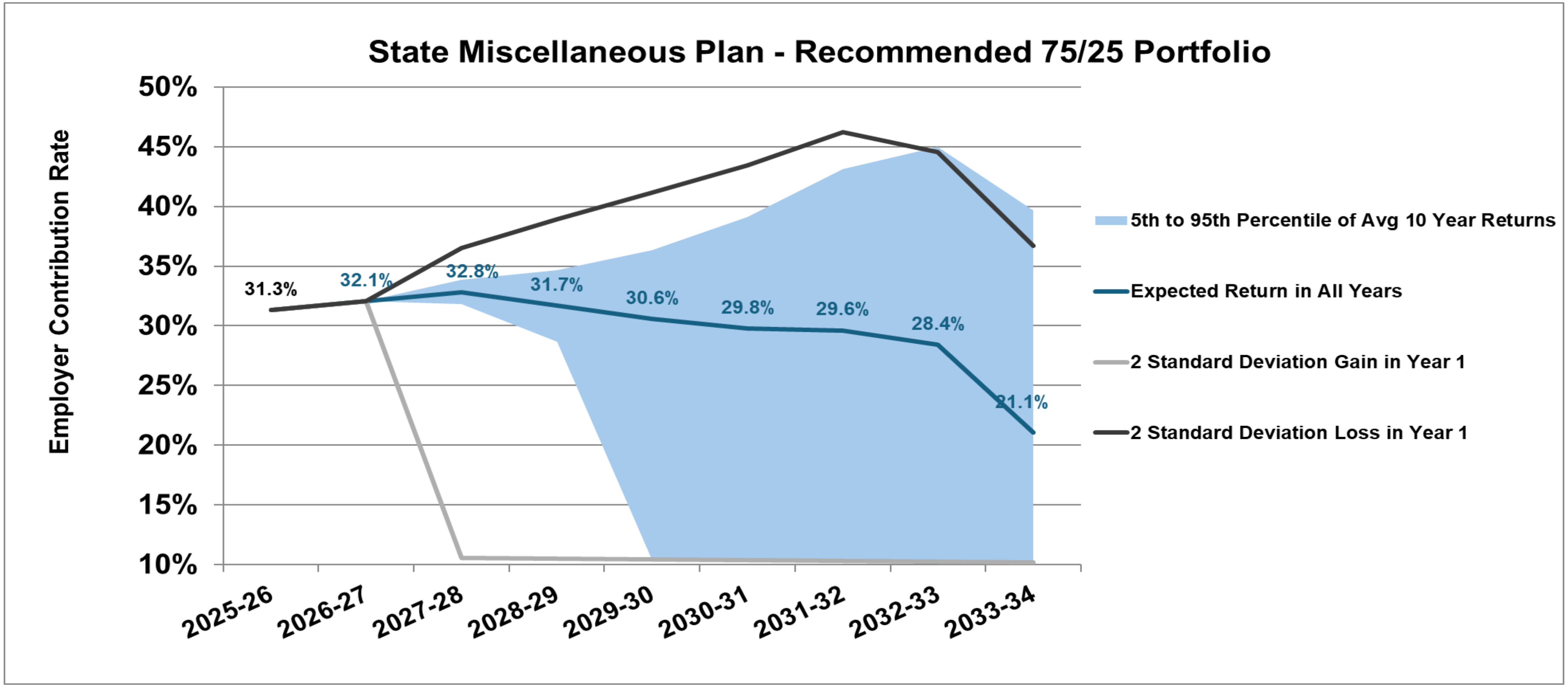
Asset Class	Global Equity Cap Weighted	Global Equity Non-Cap Weighted	Private Equity	U.S. Treasuries	Long U.S. Treasuries	Mortgage-Backed Securities	Investment Grade Corporates	Emerging Market Debt	High Yield	Private Debt	Real Estate	Infrastructure	Liquidity
Global Equity – Cap Weighted	**100%**	88%	84%	-8%	-10%	23%	43%	68%	74%	61%	70%	73%	-1%
Global Equity – Non-Cap Weighted	88%	**100%**	72%	-1%	12%	21%	47%	62%	71%	52%	74%	72%	-4%
Private Equity	84%	72%	**100%**	-9%	-12%	-1%	35%	58%	66%	63%	63%	62%	0%
U.S. Treasuries	-8%	-1%	-9%	**100%**	95%	86%	51%	29%	0%	-15%	9%	-3%	16%
Long U.S. Treasuries	-10%	12%	-12%	95%	**100%**	83%	71%	20%	4%	-18%	9%	-11%	5%
Mortgage-Backed Securities	23%	21%	-1%	86%	83%	**100%**	72%	50%	26%	2%	16%	4%	15%
Investment Grade Corporates	43%	47%	35%	51%	71%	72%	**100%**	73%	62%	16%	27%	21%	1%
Emerging Market Debt	68%	62%	58%	29%	20%	50%	73%	**100%**	76%	51%	55%	50%	2%
High Yield	74%	71%	66%	0%	4%	26%	62%	76%	**100%**	67%	57%	58%	-4%
Private Debt	61%	52%	63%	-15%	-18%	2%	16%	51%	67%	**100%**	55%	55%	-3%
Real Estate	70%	74%	63%	9%	9%	16%	27%	55%	57%	55%	**100%**	57%	0%
Infrastructure	73%	72%	62%	-3%	-11%	4%	21%	50%	58%	55%	57%	**100%**	-3%
Liquidity	-1%	-4%	0%	16%	5%	15%	1%	2%	-4%	-3%	0%	-3%	**100%**

CMA is developed from 3/31/2025 Survey median of 15 institutional Providers and internally reviewed.

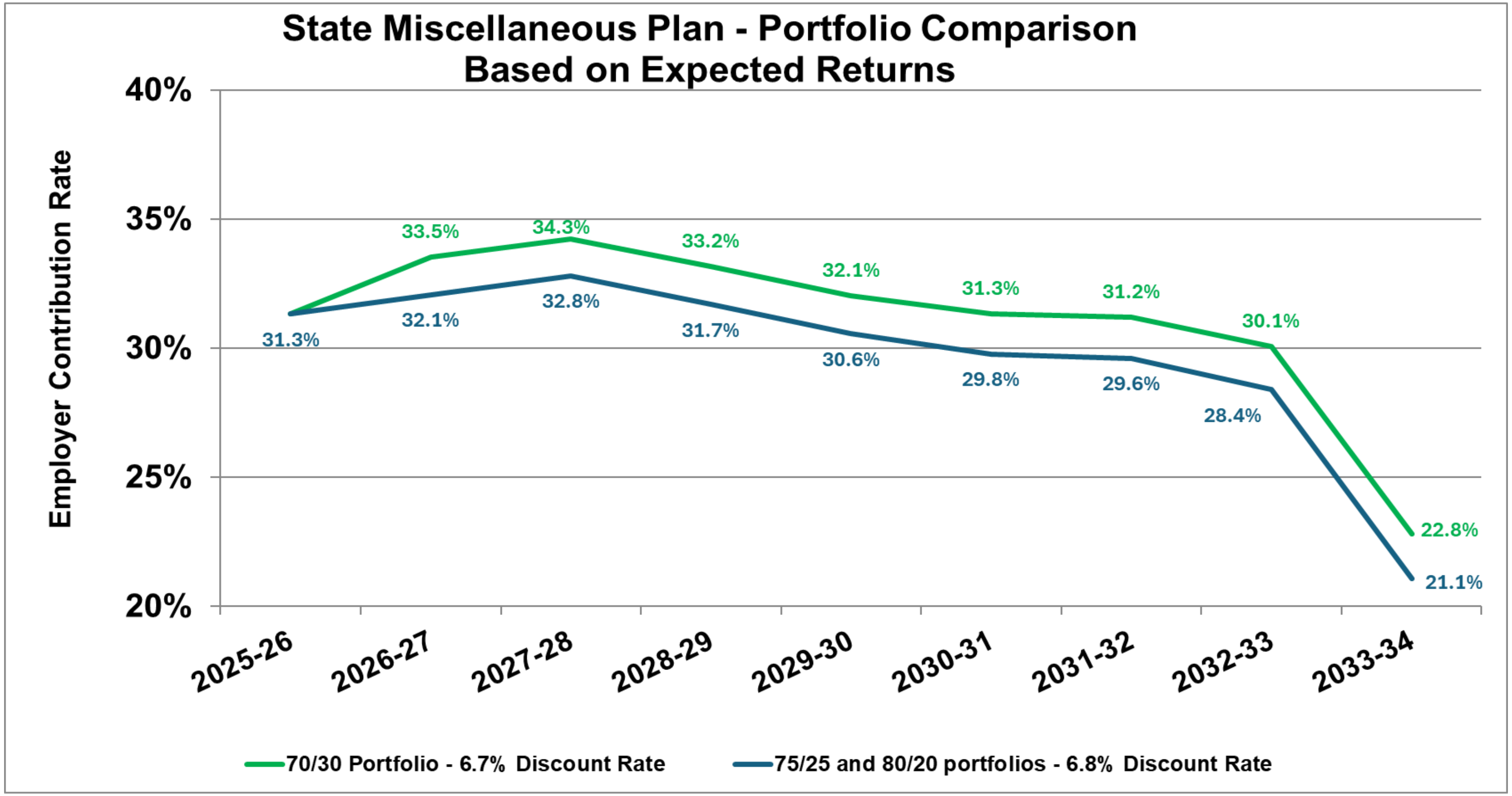
Stochastic Analysis – Schools Pool

School's Pool (6/30/2024 valuation results)			
Current Employer Rate (% payroll)	26.8%		
Current Funded Status	69.6%		
Portfolio	**70/30**	**75/25**	**80/20**
Discount Rate	**6.7%**	**6.8%**	**6.8%**
Employer Contribution Rates Over Next 10 Years			
Average employer contribution rate	20.5%	19.6%	19.3%
Probability of exceeding 40% in any year	8.1%	9.0%	10.5%
Probability of single year increase > 4%	14.4%	17.9%	21.1%
Funded Status After 10 Years			
Median funded status	96.1%	96.3%	96.9%
Probability of 50% or lower	2.5%	3.5%	4.4%
Probability of 100% or higher	45.3%	45.7%	46.6%

Projected Employer Contribution Rates Under Alternate Investment Return Scenarios – Recommended Portfolio



Illustrative Employer Contribution Rate Projections



Possible Impact of 70/30 Portfolio on PEPRA Member Contributions

Estimated Number of Plans and Members to Receive an Increase to PEPRA Member Rates Due to Reducing the Discount Rate to 6.7% *		
	Miscellaneous	Safety
% of Plans	6.9%	18.5%
% of Members	10.7%	25.4%

* These rate increases would be in addition to those caused by the additional assumption changes from the current Experience Study.

Why 6.8% Discount Rate for 80/20 Portfolio?

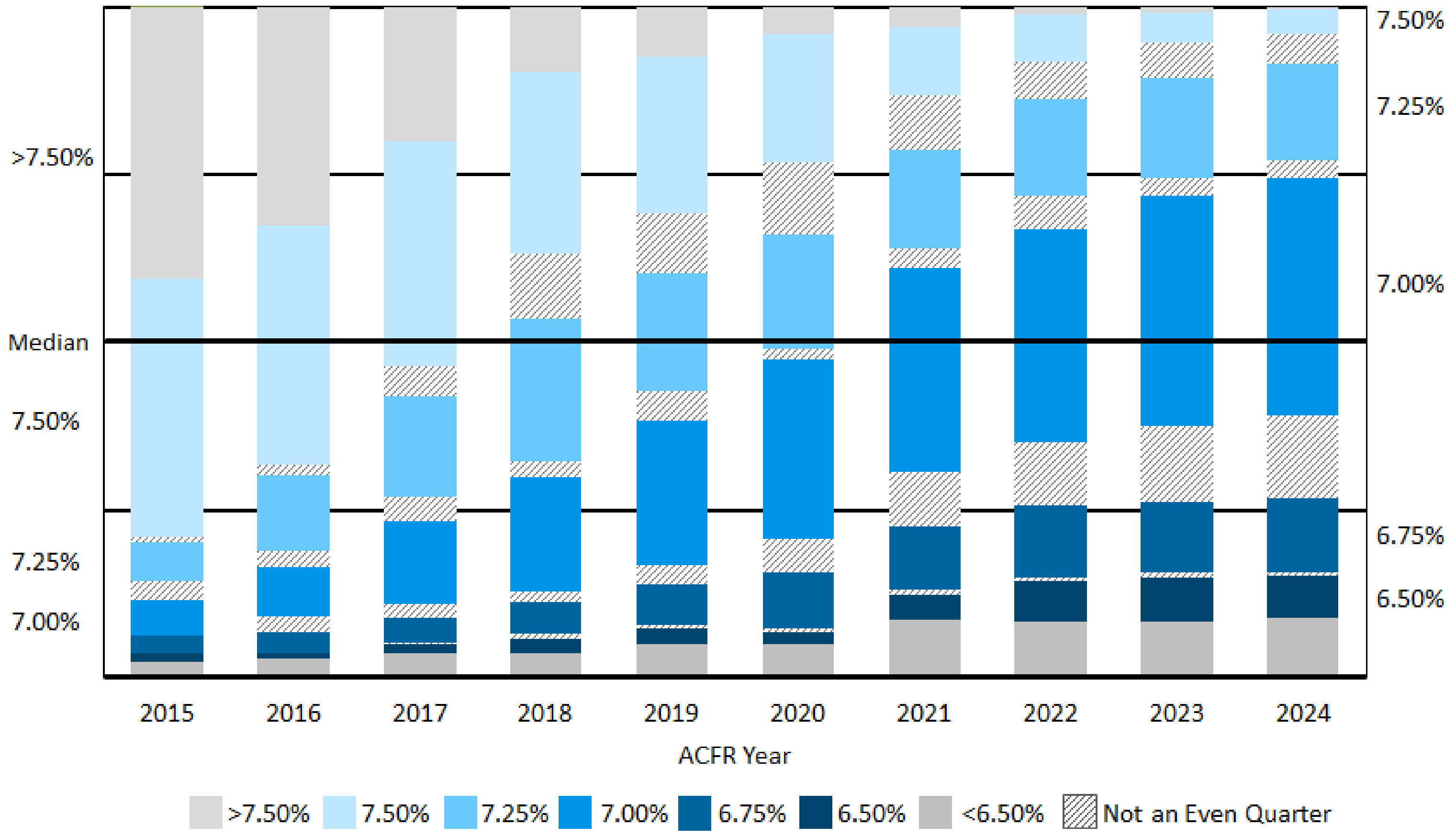
6.8% or 6.9% Discount Rate for 80/20 Portfolio		
State Miscellaneous Plan Results		
Portfolio	**80/20**	**80/20**
Discount Rate (6.8% versus 6.9%)	**6.8%**	**6.9%**
Funded Status in 10 Years (based on a consistent discount rate)		
Median	**97.8%**	**96.1%**
25% Percentile / 75% Percentile	**73.9% 130.1%**	**72.5% 128.0%**
Sum of Employer Contributions Over 10 Years		
Median ($Bill)	**$49.3**	**$47.5**
25% Percentile / 75% Percentile	**$35.8 $67.9**	**$34.2 $66.1**
Total Employer Cost (Contributions + UAL)		
Median ($Bill)	**$58.8**	**$60.3**
25% Percentile / 75% Percentile	**-$11.1 $116.0**	**-$9.5 $116.8**

Retaining the current 6.8% discount rate in connection with the 80/20 portfolio results in higher funded status and lower total employer cost in almost all investment return scenarios versus a 6.9% discount rate.

CalPERS

Survey of Public Pension Plan Discount Rates

- Most recent data from 2024 ACFR
- 248 public systems surveyed
- Mean is 6.9%
- Since prior year
  - 18 reductions
  - 3 increases
  - 16 not yet reported (no change assumed)



Survey of 34 California Public Retirement Systems

- Most recent data valuation reports 6/20/2024 to 1/1/2025
- Mean is 6.76%
- Since prior year 1 reduction (7% to 6.75%)