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San Francisco Employees' Retirement System

San Francisco City and County
Employees' Retirement System

RETIREMENT BOARD MEETING CALENDAR SHEET
March 12, 2025

To: The Retirement Board

Through: Alison Romano
CEO & CIO

From: Anna Langs, CFA, FRM
Managing Director

Kevin Cao, CFA
Associate PM

Date: March 12, 2025

Agenda Item: SFERS Annual Liquidity Management Update

Recommendation:
This is a discussion only item.

Executive Summary:
SFERS Investment Staff monitors and reviews liquidity and cash flows on an ongoing basis. This annual presentation updates the Retirement Board on the current management of SFERS' liquidity. It also highlights that as the Plan matures, liquidity is an increasingly important consideration in establishing strategic asset allocation and its implementation glide path, and in managing through stressed market conditions.

The key conclusions of the report are as follows:
- The SFERS Trust has sufficient liquidity to meet its obligations.
- 2024 actual commitments of $1 billion were less than the projected $2.35 billion due to a slower fund raising environment and overallocation.
- For 2025, Staff is continuing to carefully manage liquidity in this more challenged market environment.
    - Using 10%-percentile assumption of the "No Growth" scenario as liquidity plan for the next fiscal year.
    - Reduced commitment pacing to accommodate additional liquidity needs.
- Staff has adopted a conservative annual commitment pacing for 2025
    - Private Equity - unchanged $1 billion
    - Real Assets – reduce to $550 million from $600 million in 2024
    - Private Credit –$1 billion to account for the end of 2024 commitments of $160 million.
- This reduced commitment pacing is in line with the glide path to reach total target allocation to private assets of 40% from current allocation of 51% over the next 7-10 years.

Background:

SFERS is a large investor in private markets with an aggregate strategic target allocation to Private Equity, Real Assets, and Private Credit of 40%. Relative to this target, SFERS' current allocation to private market strategies is 51% of total plan assets or $18.4 billion. Additionally, SFERS has approximately $7.4 billion in contractual commitments of uncalled capital to private markets managers.

SFERS does not control the timing of when the committed capital is called and when distributions are received. Commitment pacing models are designed to reach and maintain the desired allocation to the asset class. Private investments are primarily structured as self-liquidating funds that draw down and distribute capital opportunistically. The opportunistic nature of private asset classes makes the process of achieving and maintaining target allocations particularly difficult.

SFERS worked closely with Cambridge Associates to evolve its cash flow and commitment pacing forecasts including multiple stress scenarios and stochastic modeling. Private markets liquidity conditions have been stressed over the past 2 years and are expected to improve slightly this year. Cambridge Associates estimated that SFERS' "No Growth" liquidity stress scenario as a 10%-probability event. The "GFC-like" liquidity scenario is a highly stressed test estimated to be a 1%-probability event according to Cambridge Associates' stochastic modeling of SFERS' projected cash flows. In 2024, SFERS' Staff managed liquidity using the conservative "No Growth" stress scenario which allowed Staff to carefully design and execute liquidity and rebalancing plans by selling $2.3 billion from Public Equity and Absolute Return portfolios and adding $1 billion to Fixed Income and $612 million to Cash in order to rebalance toward the new Strategic Asset Allocation (SAA) and pay pension benefits.

Attachment:

Staff Presentation - Annual Liquidity Management Update

Annual Liquidity Management Update

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Managing Director - Asset Allocation, Risk Management, Innovative Solutions

Kevin Cao, CFA
Associate Portfolio Manager - Asset Allocation, Risk Management, Innovative Solutions

March 12, 2025

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SFERS Liquidity Management | Summary

Effective Liquidity Management of the Retirement Fund Is Critical

- SFERS has an extensive process for evaluating liquidity, which includes forecasting cash flows and pacing under different market conditions, reviewing asset allocation and forecasting pension obligations.
- With this framework in place, SFERS has successfully managed liquidity risk over the last several years in what has been a challenging environment.
- Trust liquidity improved significantly in 2024: $2.3 billion net cash raised from Public Equity and Absolute Return in 2024 as planned rebalance towards the new Strategic Asset Allocation to add to Fixed Income and Cash.

SFERS Liquidity Needs are Increasing

- Net cash outflows from SFERS Trust* are expected to increase.
    - In FY2026, estimated net cash outflows for benefit payments are $1.11 billion or 3.1% of SFERS Trust Assets, an almost 3-times increase from 2021's level of $394 million.
    - The annual pension payout rate is projected to increase in 10 years from 3.1% to 4.5%. **
- The payout increase is partly a result of an expected decline in future employer contributions.

* Estimates from Cheiron as of February 2025 incorporate deterministic projections based on 7.2% discount rate.
** Estimates from Cambridge Associates stochastic model as of February 2024.

SFERS Liquidity Management | Summary

Managing Future Liquidity

- To manage liquidity, SFERS has a variety of direct investment tools at its disposal.
  - Manage liquidity profile within asset classes and/or through allocation across asset classes
    - Selectively adjust pacing while maintaining vintage year diversification
    - Evaluate asset allocation between illiquid and liquid assets, taking into account liquidity, diversification and return expectations
  - Manage short-term liquidity needs: Credit Facility, Leverage
  - Opportunistically explore secondary sales, adjust allocations to evergreen vehicles or other mechanisms of liquidity
- While net cash flows from Private Investments (PI) are expected to be positive in >86% of modelled scenarios over the next 10 years*, current conditions require managing liquidity under a stress scenario with net inflows to PI of ~$190 million.
- Given the long tenure of private assets, liquidity available in 5 or 10 years is a function of decisions and allocations made today. SFERS actual commitment pacing to Private Investments in 2024 was reduced by 41% vs 2023.
- Tradeoffs between liquidity, pacing and returns are incorporated into the Asset Liability Study and rebalancing towards SAA.
- In particular, the higher payout rate, resulting from decreased contributions, led to reduced allocation to Private Equity and increased allocations to Cash and Fixed Income.

* Source: Cambridge Associates Commitment Pacing analysis as of February 2025.

Why Liquidity Management is Critical

- Meet benefit payments
- Meet contractually obligated capital calls
- Retain ability to take action when markets are dislocated
- Rebalance to maintain strategic asset allocation and thereby achieve long term return objectives

Key Inputs into Managing Liquidity

Fund liquidity is a function of many factors, including:

- Plan design and level of benefit payments
- Actuarial assumptions
- Asset allocation
- Market conditions under different scenarios

Managing fund liquidity is complex and takes into account:

- Anticipated future benefit payments
- Pacing of Private Investments (Private Equity, Real Assets, and Private Credit):
  - Commitment Size to Private Markets
  - Size and Frequency of Capital Calls and Distributions from Private Investments
- Consideration of a range of market conditions under base case and downside cases
- Asset allocation targets and ranges under different modeling
- Evaluation of asset level liquidity, i.e. how quickly assets can be sold
- Measurement of liquid assets relative to anticipated benefit payments and outflows over a 3-year period using Liquidity Coverage Ratio (LCR)
- Implementation of structures to enhance liquidity, i.e. credit facilities or use of leverage

SFERS Liquidity Management Framework

Annual Process

Forecast Cash Flows for Private Investments

Pacing Schedules and Estimated Cash Flows for Private Equity, Real Assets, and Private Credit

- *Base Case*
- *Stress Scenarios*
- *Stochastic Estimates*

Review Asset Allocation and Asset Level Liquidity

Estimate Capital Needs for Rebalancing including Leverage

Asset Liquidity Analysis
- *Base Case*
- *Stress Scenarios*
- *Stochastic Estimates*

Review Credit Facilities

*Continuously estimate and monitor LCR and MLCR**

Forecast Pension Obligations

Yearly Actuarial Review

Estimated Pension Obligations

- *Base Case*
- *Stress Scenarios*
- *Stochastic Estimates*

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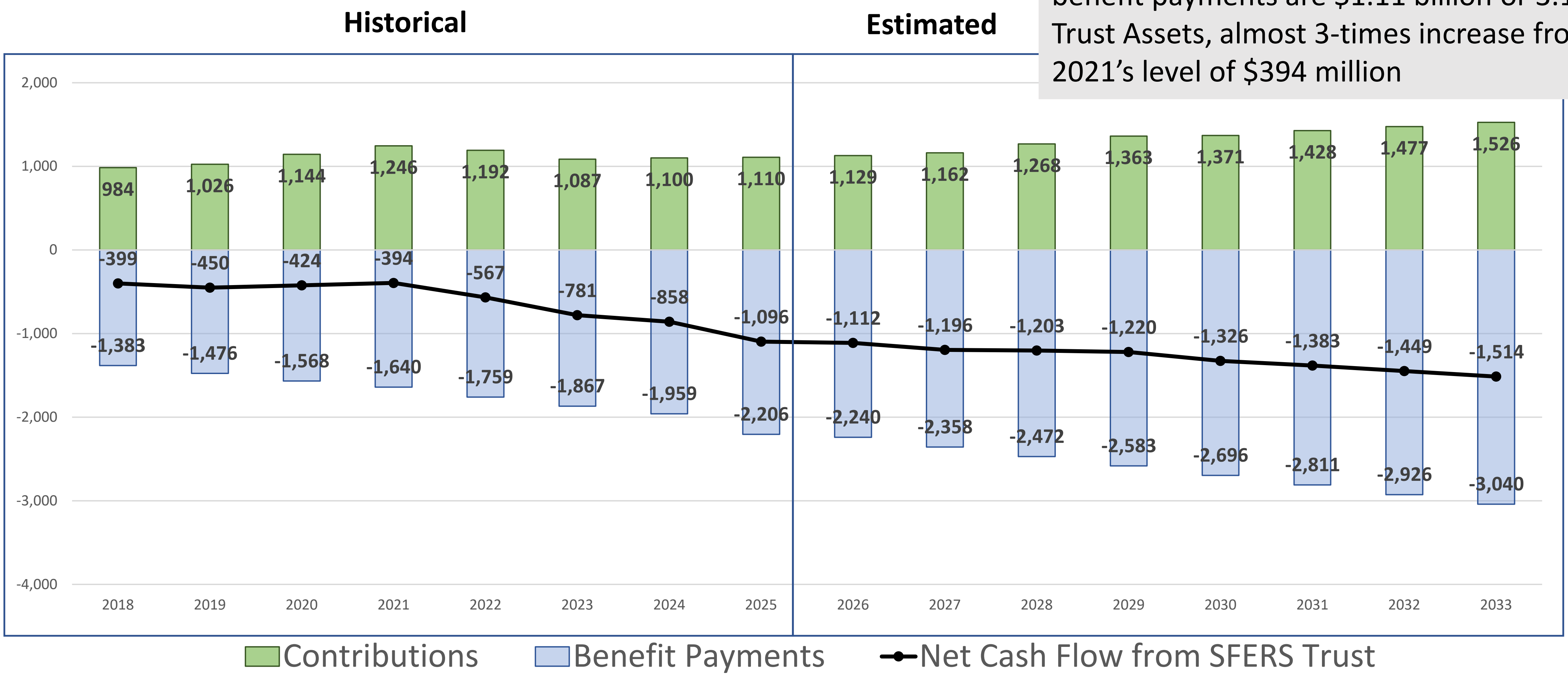
* LCR and MLCR refer to the Liquidity Coverage Ratio and the Modified Liquidity Coverage Ratio that measure whether the plan has enough liquid assets and low-risk liquid assets, respectively, to cover planned cash outflows over the next three years.

Forecasting Pension Benefit Payments

Forecast Pension Needs: Historic and Projected Cash Flows to/from SFERS (in millions)

In FY2025, estimated net cash outflows for benefit payments are $1.11 billion or 3.1% of Trust Assets, almost 3-times increase from 2021’s level of $394 million



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Note: Data, assumptions, methods, and plan provisions based upon Cheiron’s February 2025 projections. Net cash flows are Benefit Payments + Supplemental COLAs + Administrative Expenses - Member and Employer Contributions.

Forecasting Cash Flows for Private Investments

Commitment Pacing

Forecasting Cash Flows for Private Investments | 2024 Summary

- Distributions from Private Investments recovered from extreme conditions but remained below average in 2024.
- SFERS significant allocation to private markets is expected to generate returns in excess of liquid markets but can also contribute to incremental net outflows from liquid to illiquid assets in addition to $1.11 billion net pension payments.
- SFERS Liquidity Management Framework includes tiered contingency planning using “No Growth” and “GFC-like” stress scenarios to manage fund commitments to private markets.
- In 2024, SFERS managed liquidity using “No Growth” rather than “Base Case” scenario which allowed Staff to proactively plan redemptions and carefully rebalance the Public Equity and Absolute Return portfolios.
- In 2024, estimated “No Growth” plan forecasted slight cash needs for Private Investments. SFERS received $282 million net cash inflows from private investments as portfolios matured and market conditions improved.
- Decreased commitment pacing to plan future liquidity needs: SFERS committed 41% less in 2024 vs 2023 due to market environment and overallocation.

*Using “No Growth” scenario from Cambridge Associates cash flow forecast as of February 2025

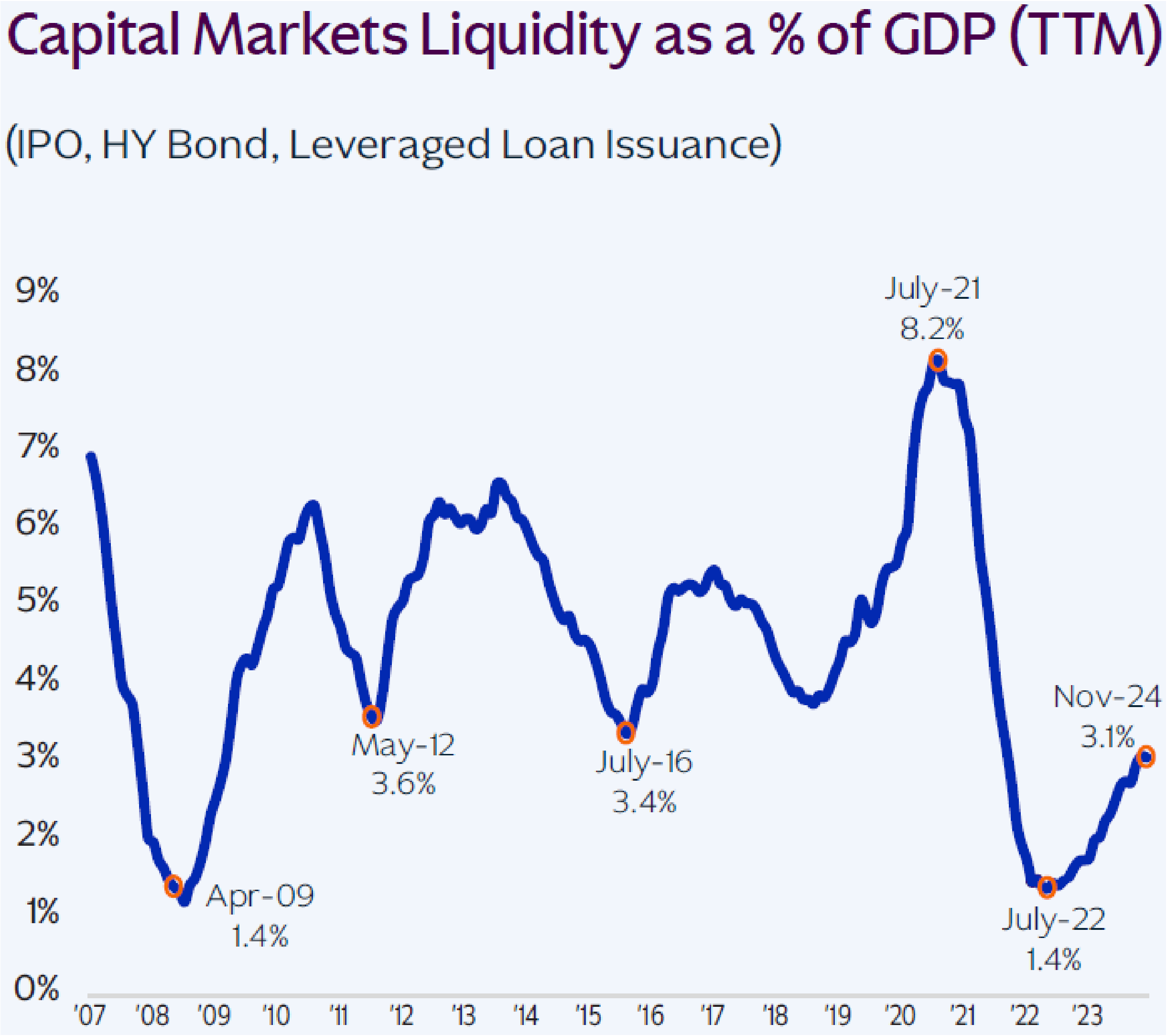
SFERS Liquidity Management | 2025-26 Plan

- Stressed capital markets conditions with reduced distributions but better than in 2023
- Continue to manage liquidity under "No Growth" stress case scenario or a 10%-probability event*
  - Use conservative "No Growth" stress scenario as liquidity plan for the next fiscal year
- Increase 2025 annual commitment pacing by $200mm (9%) to $2.55 billion from $2.35 billion in 2024
  - Private Equity remains at $1 billion
  - Real Assets reduced to $550 million in 2025 from $600 million in 2024
  - Private Credit increased to $1 billion in 2025 from $750 million in 2024 to account for end of the year commitments**

- While net cash flows from Private Investments (PI) are expected to be net positive in >80% of modelled scenarios over the next 10 years, current conditions require managing liquidity under a stress scenario with net inflows to PI of ~$190 million.
- In FY2026, under a highly stressed GFC-like scenario (a 1%-probability event) estimated net cash outflows to fund capital calls from Private Investments could reach $1 billion
- Stress liquidity needs up to $2.1 billion would be met by reducing Public Equities, Public Fixed Income, and Absolute Return
- These scenario analyses demonstrate that market stress could significantly impact SFERS' liquidity and the ability to rebalance underscoring the importance of SFERS diligent and risk aware liquidity management

*"No Growth" stress scenario from Cambridge Associates cash flow forecast as of February 2025.
**2025 Private Credit commitment includes ~$160 million commitments to 2024 vintage year funds.

Capital Market Liquidity | Current Market Liquidity Below Average



Capital market liquidity has recovered from **GFC-like levels** in 2022 but remains below average

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Source: Source: Bloomberg, S&P LSTA, ICE BofAML and KKR Credit Analysis as of November 30, 2024.
Note: Represents total of IPOs, High Yield Bond Issuance, and Leveraged Loan Issuance, as a % of GDP. Data as of November 30, 2024.

Forecasting Cash Flows | Commitment Pacing Models

- Commitment pacing models are designed to reach the desired allocation to the asset class.
- Private investments are structured as self-liquidating funds that draw down and distribute capital opportunistically.
- The opportunistic nature of private asset classes makes the process of achieving and maintaining target allocation particularly difficult.
- The forecasts incorporate many assumptions and are for planning purpose only.

- SFERS Staff worked with Cambridge Associates to incorporate multiple commitment pacing models:
  - Base-case scenario using industry-standard Yale Model
  - No-Growth Stress Test
  - GFC-like Stress Test
  - Stochastic Model using Monte-Carlo Simulations

Note: No Growth and GFC Stress cashflow forecasts from Cambridge Associates incorporates adjustments to commitment pacing.

Forecast Cash Flows | 2025 Forecasted Commitment Pacing

- Projecting $2.55 billion in annual commitment pacing for the three private portfolios
  - Private Equity remains at $1 billion
  - Real Assets reduced to $550 million in 2025 from $600 million in 2024
  - Private Credit increased to $1 billion in 2025 from $750 million in 2024*
- SFERS underwrote $1.03 billion to Private Investments in 2024 vs. average of $2.45 billion in previous 5-years (2019-2023). Slower deployment in 2024 due to market conditions and overallocation.

	Forecasted 2025 ($ mm)	***Forecasted 2024 ($ mm)***	***Actual 2024 ($ mm)***	***Prev. 5 Yr Avg. Commitment ($ mm)***
Private Equity	1,000	1,000	341	1,119
Real Assets	*550*	*600*	*345*	*527*
Private Credit	1,000	750	350	799
TOTAL PRIVATE INVESTMENTS	***2,550***	***2,350***	***1,036***	***2,445***

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Source: Cambridge Associates Commitment Pacing analysis as of February 2025.
*2025 Private Credit commitment pacing includes ~$160 million commitments to 2024 vintage year funds.

Forecast Cash Flows | 2025 Forecasted Cash Flows for Base and Stress Scenarios

- Private Equity, Real Assets, and Private Credit are out of the J-Curve and projected to be cash flow positive in 2025 in the base case
- Estimated net cash outflows to fund capital calls from Private Investments are ~$187 million under "No Growth" or a 10%-probability scenario:
  - Private Credit and Real Assets programs are expected to have close to zero net cash flows*
  - Private Equity portfolio is managed to cash outflows of approximately $140 million*
- Managing liquidity to the "No Growth" scenario with contingency planning for "GFC-like" highly stressed scenario
- Positive net cash flow from Private Investments of $282mm in 2024 vs. average outflow of $279 million over the previous 5 years (2019-2023) as portfolios mature

	Base Case ($mm)		***No Growth ($ mm)***		***GFC Stress ($mm)***		**2024 Actual Cash Flow ($mm)**	**Prev. 5 Yr Avg. Cash Flow ($mm)**
	2025	**2024**	**2025**	**2024**	**2025**	**2024**		
Private Equity	*285*	*853*	*-139*	*107*	*-510*	*-424*	*324*	*-26*
Real Assets	*194*	*226*	*-34*	*-41*	*-228*	*-262*	*-18*	*53*
Private Credit	*231*	*-151*	*-14*	*-266*	*-265*	*-507*	*-24*	*-305*
TOTAL PRIVATE INVESTMENTS	**710**	**928**	**-187**	**-200**	**-1,003**	**-1,193**	**282**	**-279**

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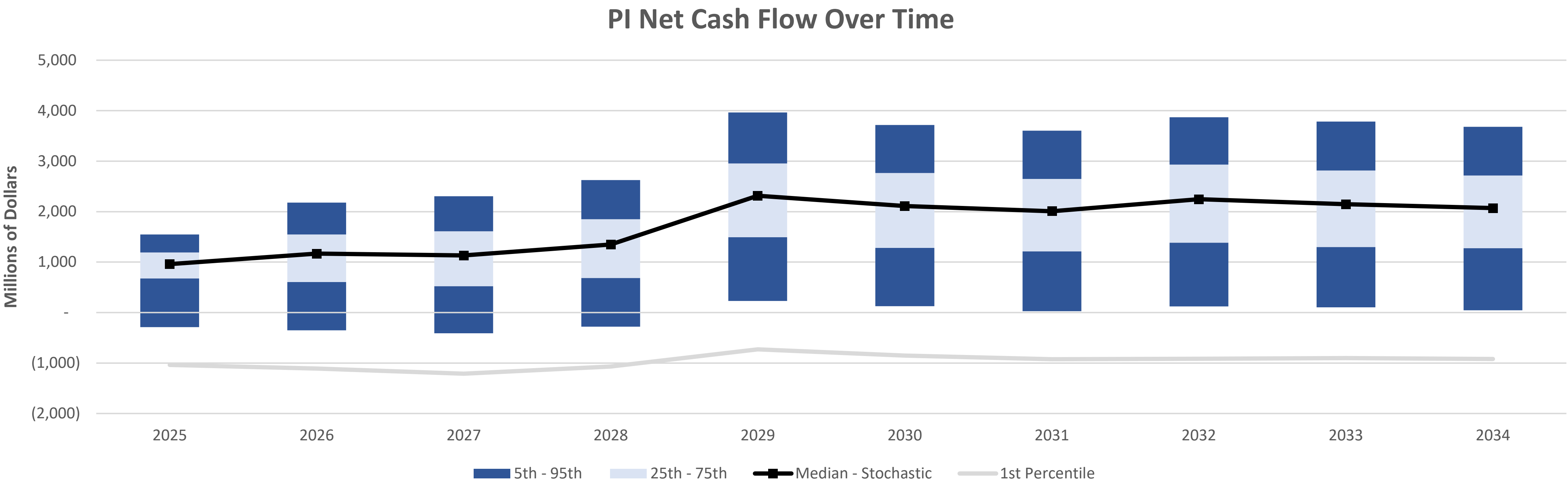
Note: 2024 actual commitment from Cambridge Associates and 2024 Cash Flow data from Aksia. No Growth cashflow forecasts from Cambridge Associates incorporate adjustments to commitment pacing.
*5-Year average ranges from 2019 to 2023.

Private Investments (PI) Cash Flow Forecast| Stochastic Distribution Model



- Net cash inflow of the PI program is expected to increase over time and remain **net positive in >86% of modelled scenarios over the next 10 years**
- PI cash flows are expected to be positive under the median scenario of the stochastic model

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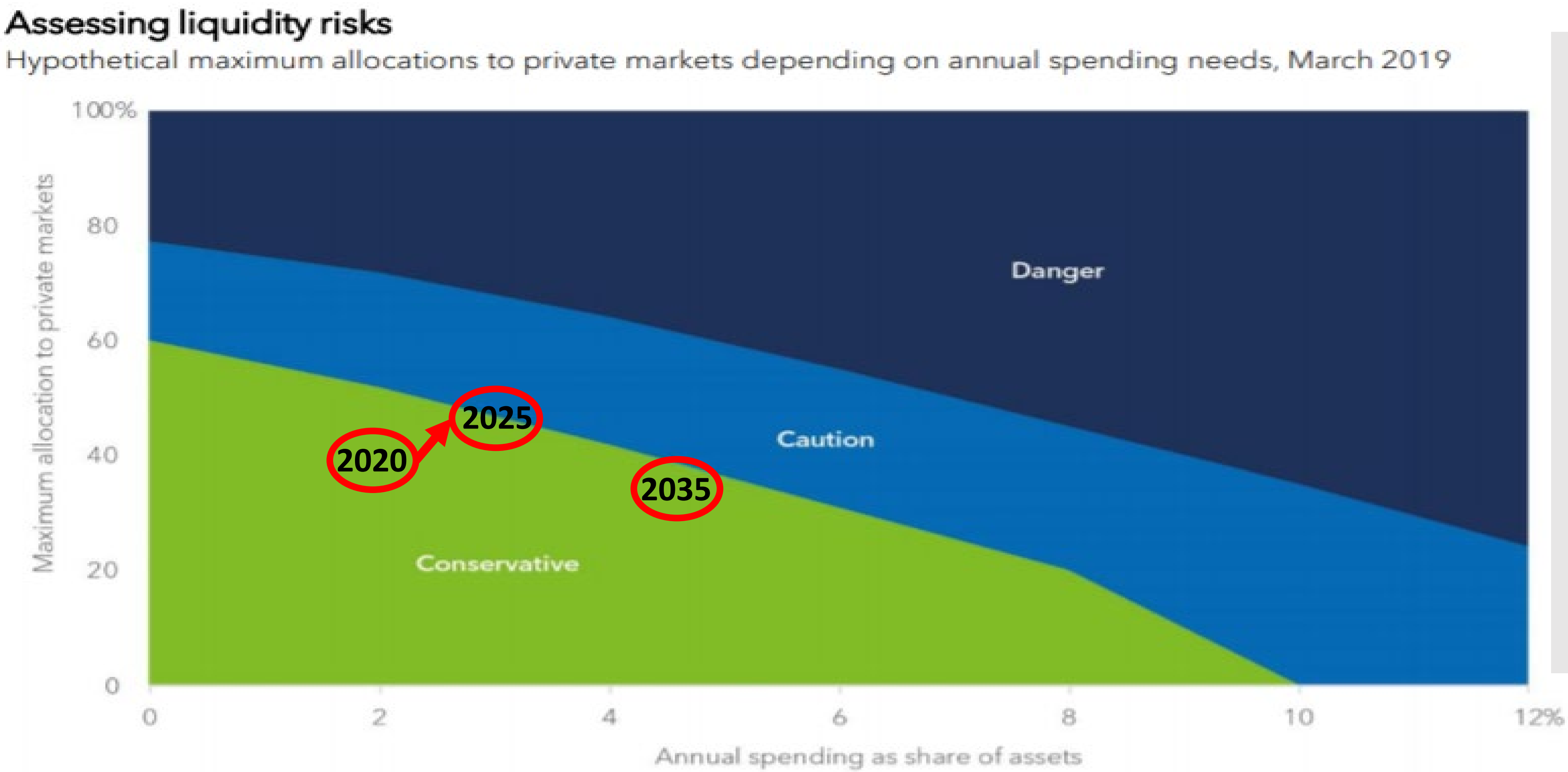
Source: Cambridge Associates.
Note: Stochastic modelling assumptions are detailed in the Appendix

Asset Allocation and Liquidity Risk

Allocation to Privates and Liquidity Risks vs Annual Pension Payout Rates



This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise – or even an estimate - of future performance. Source: BlackRock Investment Institute, March 2019. Notes: The chart shows different ranges for maximum allocations to private market assets depending on a hypothetical portfolio's annual spending needs, expressed as a share of the overall portfolio. The "conservative" zone shows the range of maximum allocations can start at 60% with no spending needs and falls to zero when spending needs reach 10% per year. The "caution" zone shows where maximum allocations would start hitting a 5% risk threshold described above. "Danger" is the zone where the maximum allocations result in a greater than 5% probability. We assume quarterly liquidity needs on the public assets. Annual liquidity needs would reduce the allocation to private markets. See the appendix for full methodology.

In order to manage liquidity risk in line with the projected **higher payout rate in the future,** SFERS in the ALS study reduced its **allocations to private assets and reduced commitment pacing over the last three years**

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Source: BlackRock Investment Institute.
Note: The analysis assumes quarterly liquidity for public assets.

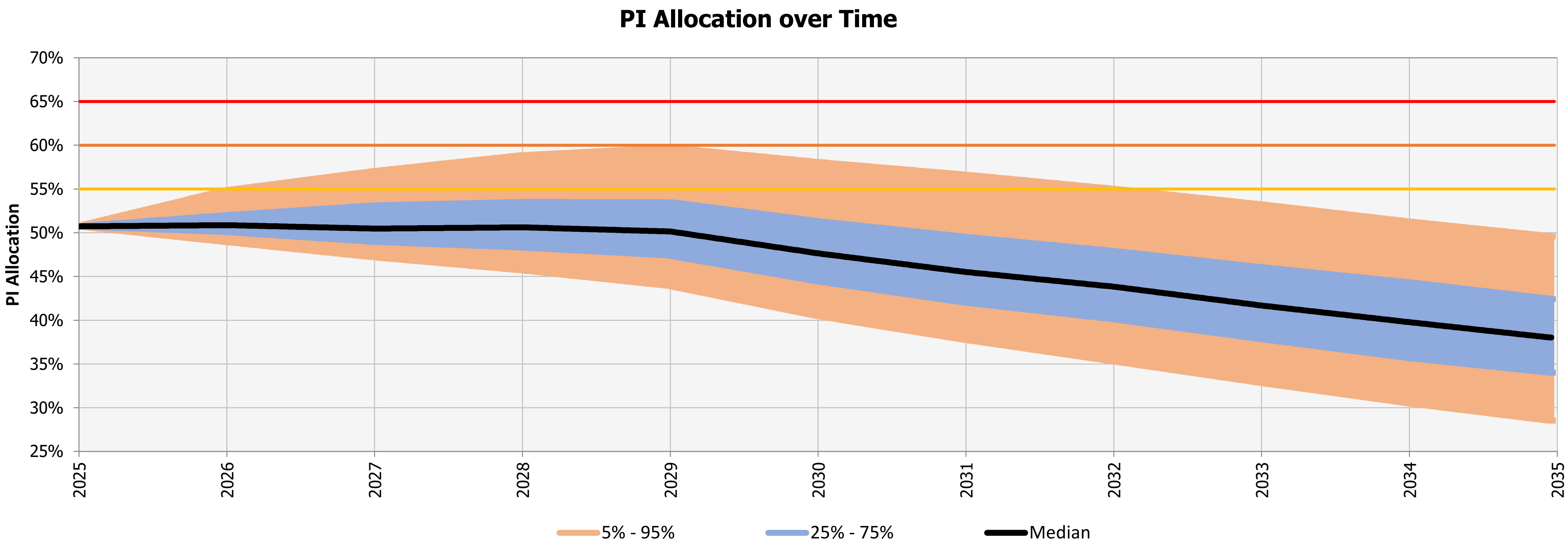
Allocation to Private Investments (PI)| Probability of Reaching Threshold Allocations

YEAR	YELLOW (RISK PI >55%)	ORANGE (RISK PI >60%)	RED (RISK PI >65%)
2026	4.3%	0.1%	0.0%
2027	11.6%	1.3%	0.1%
2028	16.5%	3.4%	0.5%
2029	17.2%	4.5%	0.9%
2030	10.4%	3.1%	0.6%
2031	7.3%	1.8%	0.3%
2032	5.0%	1.3%	0.3%
2033	3.2%	0.8%	0.1%
2034	1.9%	0.4%	0.1%
2035	1.0%	0.2%	0.1%

- To maintain rebalancing flexibility and manage liquidity, SFERS established “Yellow” – 55%, “Orange” – 60%, and “Red” - 65% threshold allocations to Private Investments (PI)
- Probabilities of breaching allocation thresholds are the highest in 2029 due to the lower return assumptions for Public Equities
- Very low probability of reaching 65% threshold and SFERS has adequate liquidity to manage dislocation

Source: Cambridge Associates.
Note: Stochastic modelling assumptions are detailed in the Appendix.

Allocation Ranges to Private Investments (PI) Over Time



- The median of PI allocation is projected to steadily decrease from current 51% to 38% in 2035
- PI allocation is increasing at the 95th percentile over the next four years before steady decreasing
- Under a 95th percentile scenario, the plan can reach 60% PI allocation in 2029 before steadily decreasing

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Source: Cambridge Associates.
Note: Stochastic modelling assumptions are detailed in the Appendix

Asset Allocation And Liquidity Risk | Trade-Offs Among Return, Risk, and Liquidity

Wilshire's Return, Risk, and Liquidity Estimates for SFERS SAA and Portfolios

	Expected Returns (%)		Risk Estimates			Liquidity Scores	
	10-Year	30-Year	Ann Volatility (%)	Growth Factor	Inflation Factor	Overall	Stressed
2024 SAA	7.0	7.9	13.4	6.6	-1.6	49%	11%
2020 SAA (2023)	7.5	8.3	14.8	7.3	-1.3	46%	7%
SFERS as of Dec 24	7.2	8.2	15.1	7.4	-1.5	40%	9%
SFERS as of Dec 23	7.8	8.7	16.0	7.8	-1.2	37%	6%

In 2024 the Retirement Board approved new Strategic Asset Allocation (SAA) that improved liquidity and reduced risk and expected returns

In 2024, Staff rebalanced the portfolio towards the new SAA

- Reduced risk from 16% annualized volatility to 15%
- Reduced Growth Factor from 7.84 to 7.4
- Improved Overall Liquidity score by 10% and Stress Liquidity Score by 50%

Asset Level Liquidity

SFERS Asset Level Liquidity| Summary

- $2.3 billion net cash raised from Public Equity and Absolute Return in 2024 as planned rebalance towards the new Strategic Asset Allocation and benefit payments
- Added $1 billion to Fixed Income and $612 million to Cash in 2024
- Improved Overall Liquidity score by 10% and Stress Liquidity Score by 50% in 2024
- SFERS liquidity available with 12 months (Tier 1-3) is $15.7 billion* (43%) vs. $14.2 billion (41%) a year ago
- A one-standard deviation fully-correlated market downturn can reduce annual liquidity from $15.7 billion to $13.8 billion
- Under more severe market stress markets, SFERS annual liquidity can be reduce to ~$12 billion. While challenging, it is still sufficient to meet SFERS obligations for the next 3 years
- SFERS can deploy Credit Facility and/or Leverage to manage short-term liquidity and rebalancing needs

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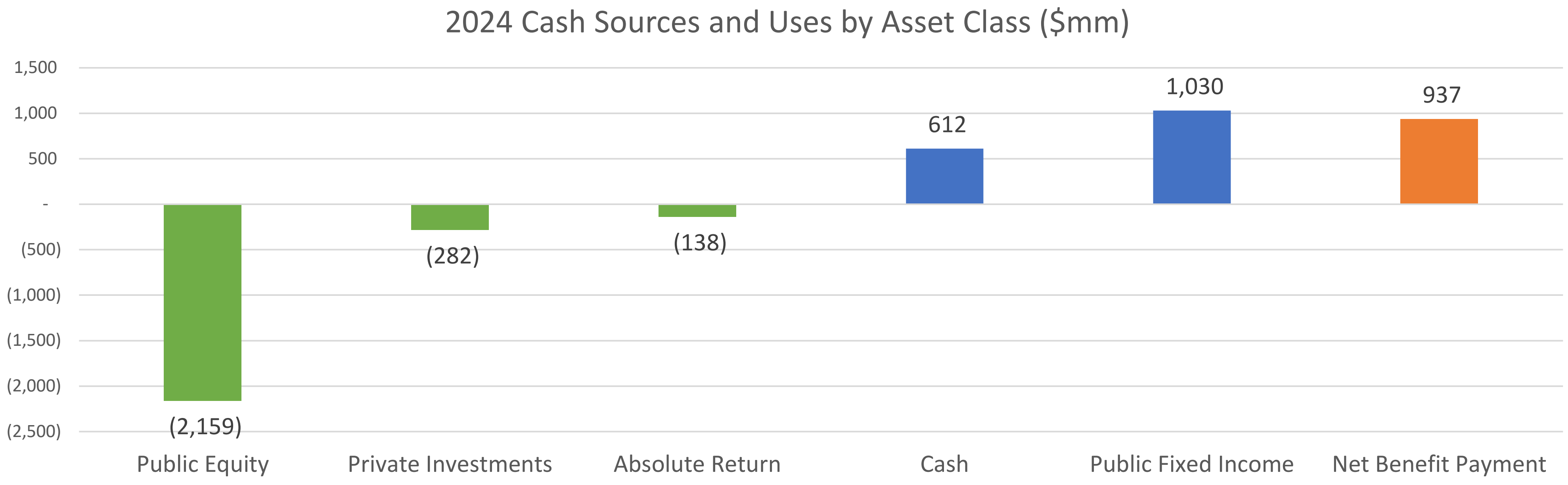
* Preliminary value from BNY Mellon as of February 21, 2025

Asset Allocation And Asset Level Liquidity | Sources and Uses of Liquidity in 2024



Rebalanced to align with the new SAA and provide pension benefits

- Reduced Growth Exposure by selling $2.16 billion of Public Equities
- Received $282mm net distributions from Private Investments, primarily from Private Equity
- Rebalanced Absolute Return portfolio to improve liquidity and reduce Growth exposure
- Improved liquidity by adding $612 million to Cash and $1.03 billion to Fixed Income

Asset Allocation And Asset Level Liquidity | Wilshire's Portfolio Liquidity Scores

Wilshire Liquidity Score	2024 SAA	Interim SAA	SFERS Portfolio Dec 2024	SAA (2020)	SFERS Portfolio Dec 2023	Global 60/40
Overall Liquidity	49%	41%	40%	46%	37%	91%
Stressed Liquidity	11%	11%	9%	7%	6%	36%

Improved Overall Liquidity score by 10% and Stress Liquidity Score by 50%

- SFERS' liquidity metric has materially improved, rising to 40% under the overall metric from less than 37% a year ago and to 9.4% under the stress metric from less than 6% a year ago.
- Wilshire liquidity metric scale from 0% (low liquidity) to 100% (high liquidity)
    - Public asset classes typically range from 90% to 100%
    - Private asset classes are 0% or conservative income distributions *

Source: Wilshire Associates. * The details of Wilshire Liquidity Metrics can be found in Appendix.

Asset Allocation And Asset Level Liquidity | Asset Liquidity Analysis

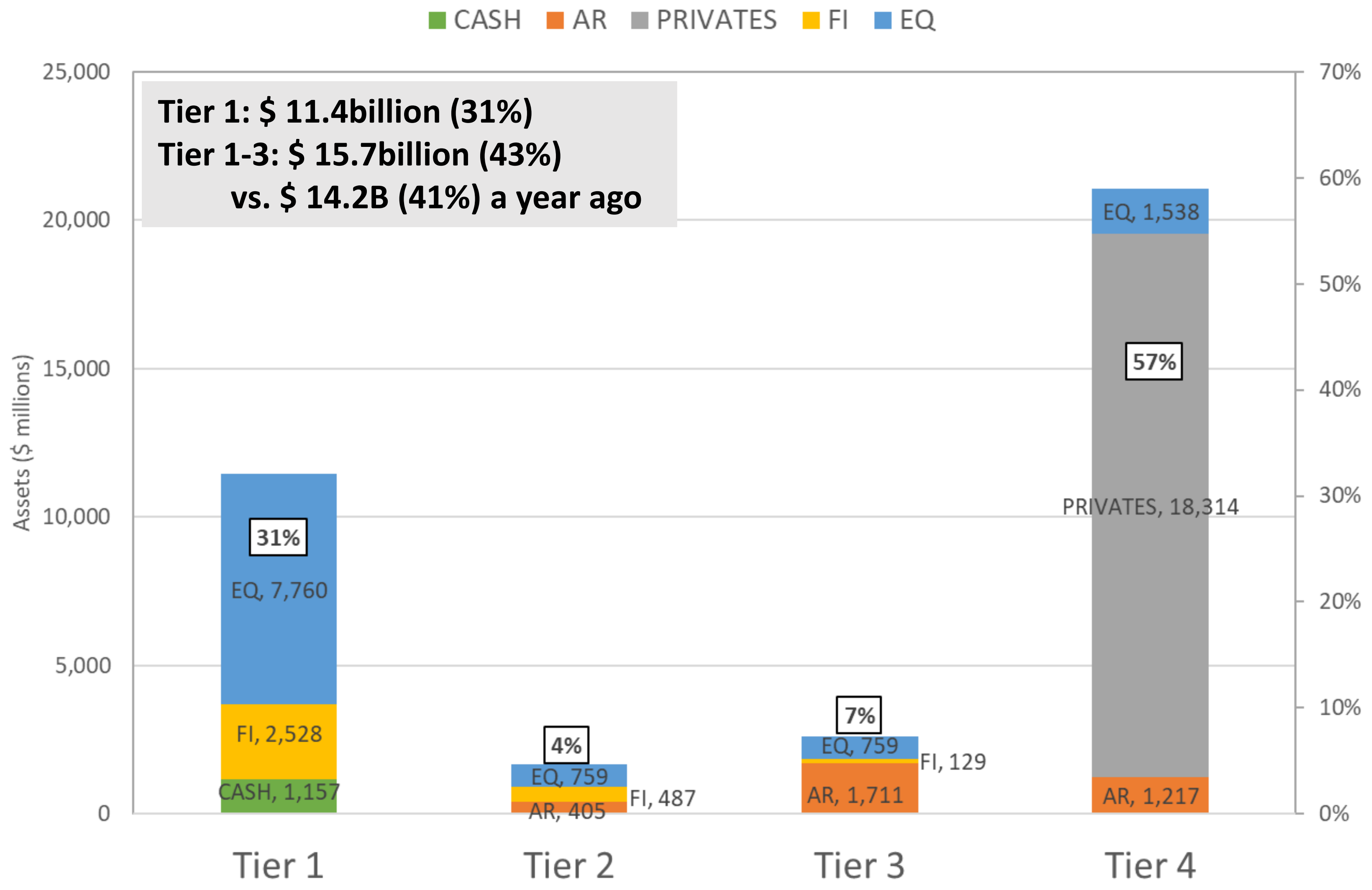
To determine Asset Liquidity, we define **four Liquidity Tiers** based on contractual agreements (including lock-ups and redemption schedules) and instrument liquidity

Liquidity Tier Definition Based on Time to Full Liquidation	
Tier 1	< 1 month
Tier 2	1-3 months
Tier 3	3-12 months
Tier 4	> 1 year

Assumptions:

- All Private Investments (Private Equity, Private Credit, and Real Assets) are Tier 4
- Absolute Return liquidity schedule provided by Blackstone Alternative Asset Management
- International Small Cap and Emerging Market Equities are Tier 2
- High Yield and Emerging Market Fixed Income are Tier 2
- Bank Loans and CMBS are Tier 3

Asset Allocation And Asset Level Liquidity | Normal Conditions – Base Case



Tier 1-3 Liquid Assets Increased from 41% to 43% of NAV over 2024 due to:

Market Performance in Public Markets: SFERS Public Equities up ~17%, Fixed Income up ~ 4.7%, and Absolute Return up~ 11% in 2024

Lagging valuation updates of Privates Assets: Private Equity up ~ +4%, Real Assets down ~-3%, and Private Credit up ~ +10%

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* Preliminary value from BNY Mellon as of February 21, 2025

Asset Allocation And Asset Level Liquidity | Short Term Sources of Liquidity

SFERS Trust holds a large and growing allocation to funds in its PE, RA and PC portfolios, which can opportunistically call large amounts of cash at the same time and with short notice.

To fund unexpected, material capital calls, SFERS Trust can:

- Hold cash in excess of policy target
- Sell other assets to fund capital calls
- Utilize a credit facility
- Increase plan leverage by adjusting synthetic exposure for Public Equity and U.S. Treasuries

Liquidity Option	Benefits	Issues to Consider
Hold Excess Cash	Guarantees liquidity	Potential drag on performance
Sell Liquid Assets	Straightforward, quick execution	Potential to lock in losses in periods of stress or selling underweight asset class
Utilize Credit Facility	Quick access to needed capital	Requires attention to structure and execution
Utilize Leverage	Capital efficient	Potentially increases exposure to risk assets, managing margin risk

Asset Allocation and Liquidity Coverage Ratio

Asset Liquidity Analysis | Funding Liquidity Risk

1. Liquidity Coverage Ratio (LCR)

Does the plan have enough liquid assets to cover cash outflows in the next **3 years**?

$$LCR = \frac{Liquid\ Financial\ Assets + Distributions\ from\ Illiquid\ Assets + Employer\&Employee\ Contributions}{Benefit\ Payment + Plan\ Expenses + Capital\ Calls\ for\ Illiquid\ Assets}$$

LCR Value	Implication
<1	The plan will need to sell illiquid assets to cover cash flows
1	The plan has sufficient liquidity to cover all cash flows
>1	The plan will not be required to sell illiquid assets to cover liquidity needs

2. Modified Liquidity Coverage Ratio (MLCR)

Does the plan need to sell risky liquid assets to cover cash outflows in the next **3 years**?

$$MLCR = \frac{Treasury + Core\ Fixed\ Income + Distributions\ from\ Illiquid\ Assets + Employer\&Employee\ Contributions}{Benefit\ Payment\ \&\ Plan\ Expenses + Capital\ Calls\ for\ Illiquid\ Assets}$$

MLCR Value	Implication
<1	The plan will need to sell liquid assets to cover cash flows
1	The plan has sufficient liquidity to cover all cash flows
>1	The plan has excess liquidity and may consider increasing illiquid allocation

Notes: *Liquid Financial Assets include Tier 1, 2 and 3; Illiquid assets are Tier 4 assets.

Asset Allocation And Asset Level Liquidity | 3-year Liquidity Coverage Ratio (LCR)

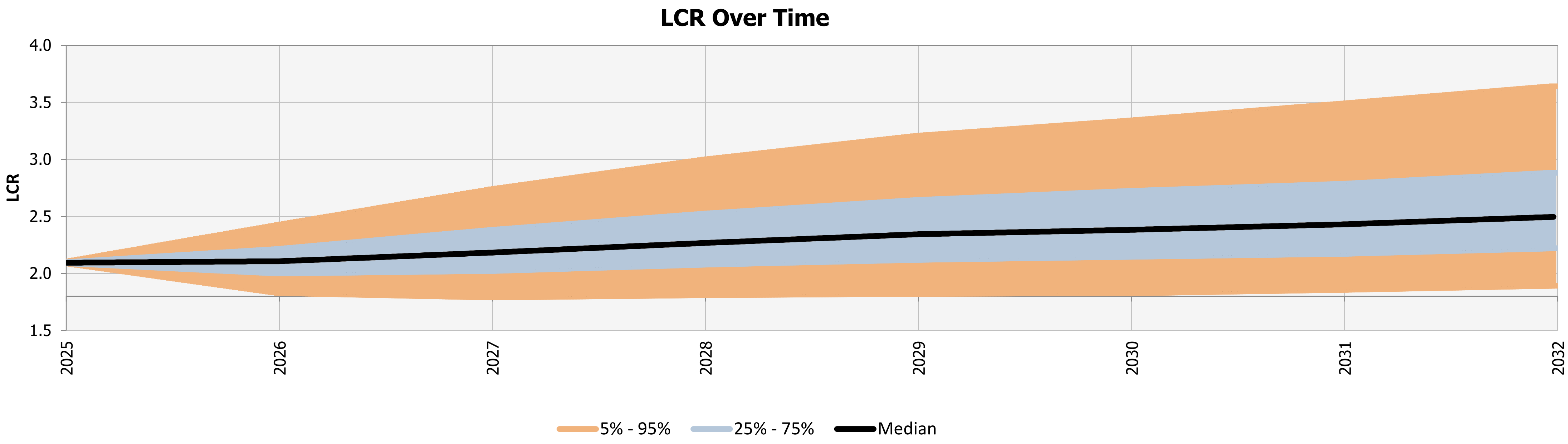
3-Year Liquidity Coverage Ratio (LCR) Under Different Pacing and Asset Liquidity Scenarios

Pacing Scenarios		Asset Liquidity Scenarios***		
		Base	1 stdev down	2 stdev down
	Base	2.09	1.94	1.80
	No Growth	1.87	1.72	1.57
	GFC Stress	1.45	1.34	1.22

- SFERS holds enough liquid assets to meet planned obligations over the next 3 years under normal conditions
  - LCR = 2.09, 2.09x coverage in liquidity available relative to spending needs for the next 3 years.
  - LCR under GFC Stress and 2 stdev market downturn scenario improved to 1.22 from 1.18 last year
- These scenario analyses demonstrate that extreme market stress could significantly impact SFERS' liquidity and the ability to rebalance.

Notes: *Base Case, No Growth, and Stress Scenarios distribution/contribution assumption calculated by Cambridge Associates.
** Assumed Return is applied to Liquid Financial Assets; *** Asset Liquidity Scenarios: 1 and 2 stdev down scenarios represent market downturn with Liquid Financial Assets returns down -1 and -2 standard deviations (annualized volatility estimated by Wilshire), without correlation benefits. **** Liquid Financial Assets as of June 30, 2025 is approximated by deducting $725M from February 21, 2025.

Liquidity Coverage Ratio (LCR) Stochastic Modeling Results



- LCR is very unlikely to fall below 1.5
- Over time the LCR is projected to increase steadily above the current ratio

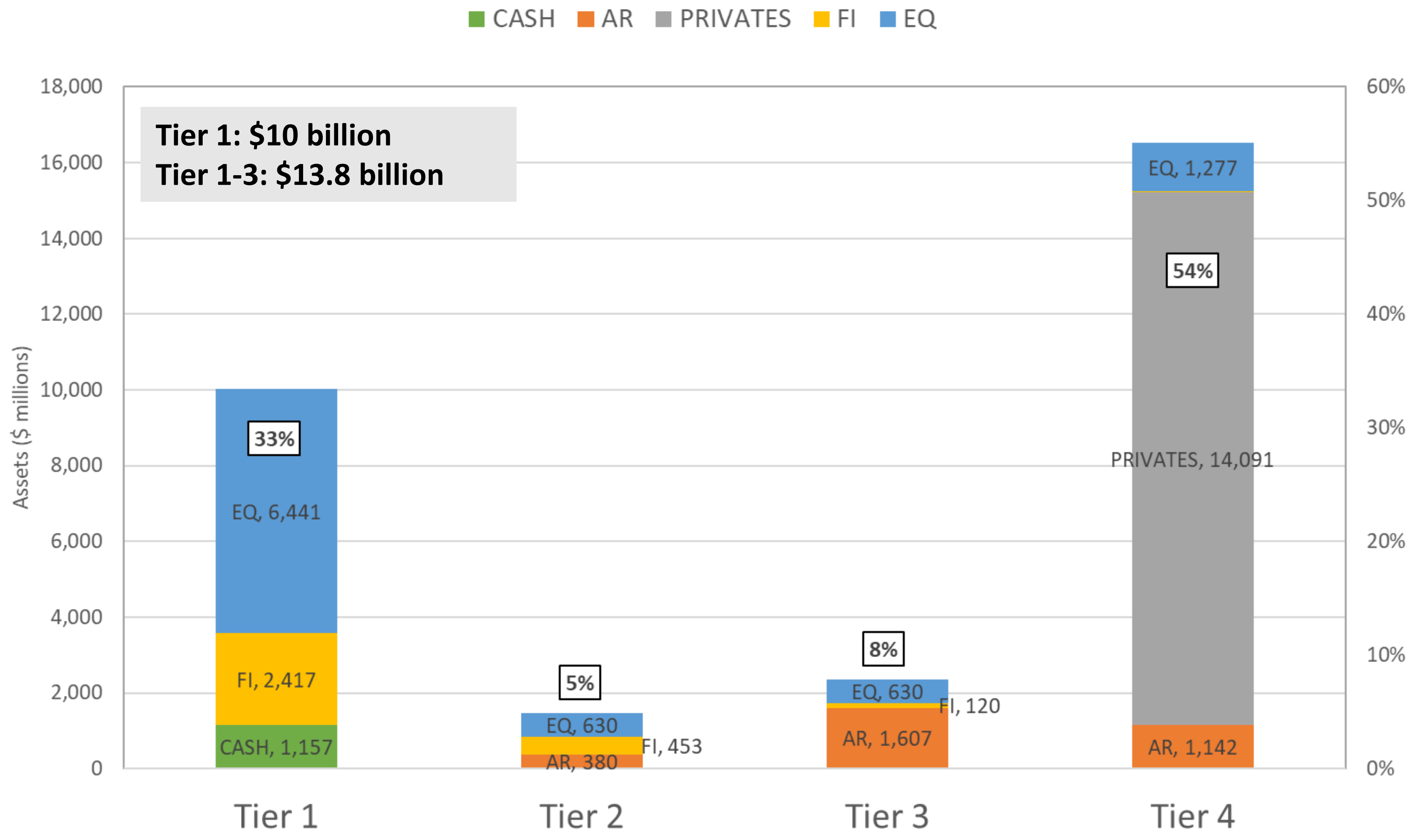
Source: Cambridge Associates.
Note: Stochastic modelling assumptions are detailed in the Appendix

SFERS Liquidity Management | Conclusion

- To meet pension obligations and capital call requirements, SFERS continues to focus on managing liquidity needs using multiple models and stress scenarios
- Reduced commitment pacing is in line with the glide path to reach total target allocation to private assets of 40% from current allocation of 51% over the next 7-10 years
- SFERS has already implemented measures to meet short-term liquidity needs in a capital efficient manner.
    - Increased allocation to Fixed Income including Treasuries and Cash
    - Secured a Credit Facility
    - Judiciously utilized leverage
- SFERS has sufficient liquidity to meet short-term needs, particularly over the next three years
- However, in cases of severe market dislocation, the liquidity becomes more challenged
- Longer term, payouts are expected to increase. SFERS Asset and Liability Study addressed the increased liquidity need by reducing allocation to Private Equity and adding allocation to Cash and Public Credit

Appendix

Asset Liquidity Analysis | Correlated Market Downturn Stress Test



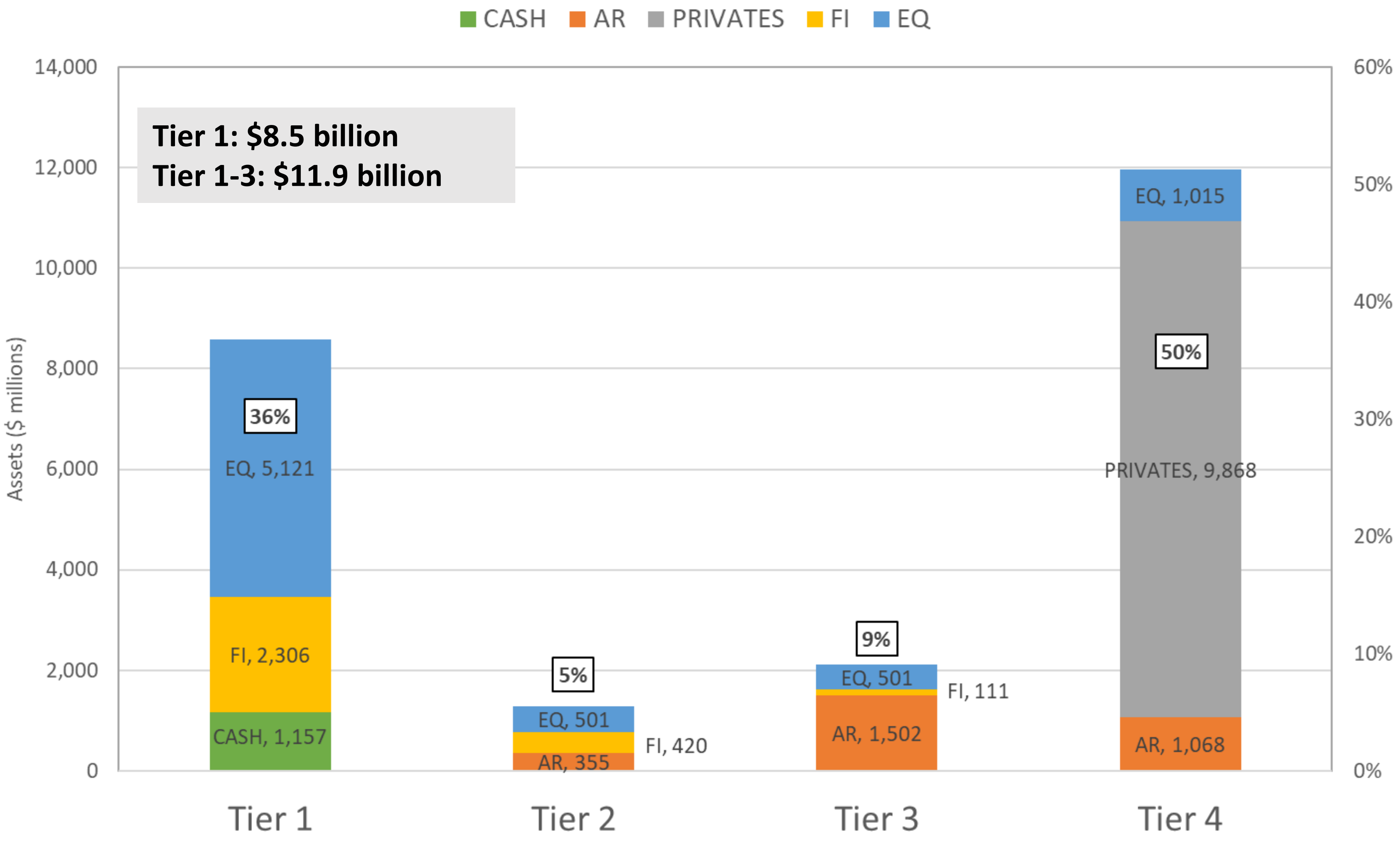
Stress Test Assumptions:

Each Asset Class is marked down in market value using **one standard deviation** (annualized volatility estimate provided by Wilshire)

Correlation of **1** between **all** asset classes (conservative worst-case estimate)

* Preliminary value from BNY Mellon as of February 21, 2025

Asset Liquidity Analysis | Correlated Strong Market Downturn Stress Test



Stress Test Assumptions:

Each Asset Class is marked down in market value using **two standard deviations** (annualized volatility estimate provided by Wilshire)

Correlation of **1** between **all** asset classes (conservative worst-case estimate)

SFERS San Francisco Employees' Retirement System

* Preliminary value from BNY Mellon as of February 21, 2025

Asset Allocation And Asset Level Liquidity | 3-year Modified Liquidity Coverage Ratio (MLCR)

Base Case*

Liquidity Available	Treasuries + Core Fixed Income Assets	4,145,010,513
	Distributions from Illiquids	9,660,000,000
	Employer + Employee Contributions	3,559,382,831
Liquidity Needs	Benefit Payments & Plan Expenses	7,069,922,763
	Capital Calls	7,333,000,000
MLCR		**1.21**

- MLCR = 1.21, 1.21x coverage in modified liquidity relative to spending needs in the next 3 years.
- SFERS does not need to sell risk assets to meet planned obligations in 3 years under normal conditions
- **SFERS' liquidity is compromised in moderate and extreme stress cases**

Drawdown Scenarios and Change in Future Return

		Asset Liquidity Scenarios***		
		Base	1 stdev down	2 stdev down
Assumed Return	0%	1.17	1.17	1.16
	1%	1.18	1.17	1.17
	2%	1.19	1.18	1.17
	3%	1.20	1.19	1.18
	4%	1.21	1.20	1.19
	5%	1.21	1.21	1.20
	6%	1.22	1.21	1.20
	7%	1.23	1.22	1.21

Sensitivity to Contribution & Distribution Changes

		Asset Liquidity Scenarios***		
		Base	1 stdev down	2 stdev down
Pacing Scenarios	Base	1.21	1.20	1.19
	No Growth	0.97	0.97	0.96
	GFC Stress	0.83	0.82	0.81

SFERS San Francisco Employees' Retirement System

Notes: *Base Case, No Growth, and Stress Scenarios distribution/contribution assumption calculated by Cambridge Associates.
** Assumed Return is applied to Liquid Financial Assets; *** Asset Liquidity Scenarios: 1 and 2 stdev down scenarios represent market downturn with Liquid Financial Assets returns down -1 and -2 standard deviations (annualized volatility estimated by Wilshire), without correlation benefits. **** Liquid Financial Assets as of June 30, 2025 is approximated by deducting $ 725M from February 21, 2025.

3-Year Liquidity Coverage Ratios | Base Case Scenario LCR & MLCR

		Base Case	1 stdev down	2 stdev down
Liquidity Available	Treasuries + Core Fixed Income Assets	4,145,010,513	4,019,933,131	3,894,855,749
	Liquid Financial Assets	16,837,914,635	14,745,491,632	12,653,068,628
	Distributions from Illiquids	9,660,000,000	9,660,000,000	9,660,000,000
	Employer + Employee Contributions	3,559,382,831	3,559,382,831	3,559,382,831
Liquidity Needs	Benefit Payments & Plan Expenses	7,069,922,763	7,069,922,763	7,069,922,763
	Capital Calls	7,333,000,000	7,333,000,000	7,333,000,000
LCR		**2.09**	**1.94**	**1.80**
MLCR		**1.21**	**1.20**	**1.19**

SFERS
San Francisco Employees' Retirement System

Notes: *Base Case, No Growth, and Stress Scenarios distribution/contribution assumption calculated by Cambridge Associates.
** Assumed Return is applied to Liquid Financial Assets; *** Asset Liquidity Scenarios: 1 and 2 stdev down scenarios represent market downturn with Liquid Financial Assets returns down -1 and -2 standard deviations (annualized volatility estimated by Wilshire), without correlation benefits. **** Liquid Financial Assets as of June 30, 2025 is approximated by deducting $725M from February 21, 2025.

Wilshire's 2024 Capital Markets and Liquidity Assumptions

Asset Classes	10-Year Expected Return (%)	30-Year Expected Return (%)	Risk (%)	Cash Yield	Factor Exposure: Growth	Factor Exposure: Inflation	Liquidity Market Level (%)	Liquidity Stressed Metric (%)
SAA	7.0	7.9	13.4	2.7	6.6	-1.6	48.8	11.0
Interim SAA	7.2	8.2	14.5	2.4	7.1	-1.6	40.8	11.5
Current (Dec 24)	7.2	8.2	15.1	2.0	7.4	-1.5	39.7	9.4
Global Equity	4.9	6.5	17.0	1.8	8.0	-2.0	85.0	0.0
Private Equity	8.1	9.6	30.9	0.0	14.0	-4.1	0.0	0.0
Public Credit	6.1	6.2	7.0	8.2	2.5	-1.5	90.0	37.5
Private Credit	8.2	8.3	11.9	5.8	4.8	-1.2	18.0	0.0
Treasuries	4.3	4.2	3.1	4.5	-1.2	-2.4	100.0	86.4
Cash	3.6	3.5	0.8	3.6	0.0	0.0	100.0	100.0
Real Assets	7.1	8.1	14.6	2.7	4.5	2.4	0.0	0.0
Absolute Returns	6.3	6.7	6.1	0.0	1.2	1.2	30.0	15.9
Leverage	3.9	3.7	0.8	3.9	0.0	0.0	100.0	100.0

Source: Wilshire Associates, Capital Markets Assumptions as of 12/31/2024

Assumptions for Cambridge Associates' Stochastic Model

- CA has utilized its capital market simulation tool to project future returns of the portfolio to better potential asset allocations and liquidity risks
- The simulation engine runs 5,000 trials and rank-sorts the size of the PI program over the next ten years – all analysis starts with the SFERS's plan profile
- CA projected out ten years' worth of investment returns for SFERS' asset classes
- Included in the projection is a dynamic cash flow stream, by year, for each private investment that changes based on the returns assumed in the model [2]
  - In the case of a shock scenario the commitments are assumed to temporarily drop by up to 15% and the disbursements as a percent of the NAV drops up to 40%
- After each year, the plan is re-balanced and cash is raised as necessary around the private allocation before moving to the next year's return streams
- At the end of the model, the allocation percentage to the private bucket is sorted to showcase the "cone of doubt" of the private portfolio over the next ten years
  - Additionally, CA modeled the 3-year liquidity coverage ratio annually

1 – Cambridge Associates's Dceember 2024 Steady State assumptions are used, details in the appendix
2 – Details of the cash flow streams in the appendix

Cambridge Associates' Stochastic Model: Cone of Doubt Details

Allocation to Private Investments Over Time

YEAR	5TH PERCENTILE	25TH PERCENTILE	MEDIAN	75TH PERCENTILE	95TH PERCENTILE
2025	51%	51%	51%	51%	51%
2026	49%	50%	51%	52%	55%
2027	47%	49%	50%	53%	57%
2028	46%	48%	51%	54%	59%
2029	44%	47%	50%	53%	60%
2030	41%	44%	48%	51%	58%
2031	38%	42%	46%	50%	57%
2032	35%	40%	44%	48%	55%
2033	33%	38%	42%	46%	53%
2034	31%	36%	40%	44%	51%
2035	28%	34%	38%	42%	50%

Liquidity Coverage Ratio Over Time

YEAR	5TH PERCENTILE	25TH PERCENTILE	MEDIAN	75TH PERCENTILE	95TH PERCENTILE
2025	2.1	2.1	2.1	2.1	2.1
2026	1.8	2.0	2.1	2.2	2.4
2027	1.8	2.0	2.2	2.4	2.7
2028	1.8	2.1	2.3	2.5	3.0
2029	1.8	2.1	2.3	2.6	3.2
2030	1.8	2.1	2.4	2.7	3.3
2031	1.8	2.2	2.4	2.8	3.5
2031	1.8	2.2	2.5	2.9	3.6