ASSET-LIABILITY STUDY UPDATE

EMPLOYEES' RETIREMENT SYSTEM OF RHODE ISLAND

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ASSET/LIABILITY STUDY UPDATE

- At the August SIC meeting, a preliminary set of alternative portfolio mixes was reviewed.
- Today's discussion includes additional portfolio mixes for discussion.
- NEPC has also prepared a liquidity analysis based on the current target portfolio.
- An updated study timeline is included on the following slide.

ASSET/LIABILITY STUDY TIMELINE

Step/Milestone	Timing
Asset/Liability Study Kickoff Discussion	February – COMPLETE
NEPC Coordinates with Plan Actuary on Data Needs	February – COMPLETE
Preliminary Capital Market Assumption Discussion	March – COMPLETE
Finalize Capital Market Assumptions	April – COMPLETE
NEPC Receives Actuarial Forecasts	June – COMPLETE
NEPC Prepares Baseline Forecast Results	July – COMPLETE
Discussion of Baseline Output and Scenario Analysis	July – COMPLETE
Discuss Alternative Portfolios and Preliminary Findings	August – COMPLETE
Continue Discussion of Alternative Portfolios and Review Liquidity Study	**September – Today's Discussion**
NEPC and State of RI Staff Prepare Recommendation	September / October
Final Recommendation Delivered to SIC	October SIC Meeting
Portfolio Implementation Discussion	Post-A/L Study

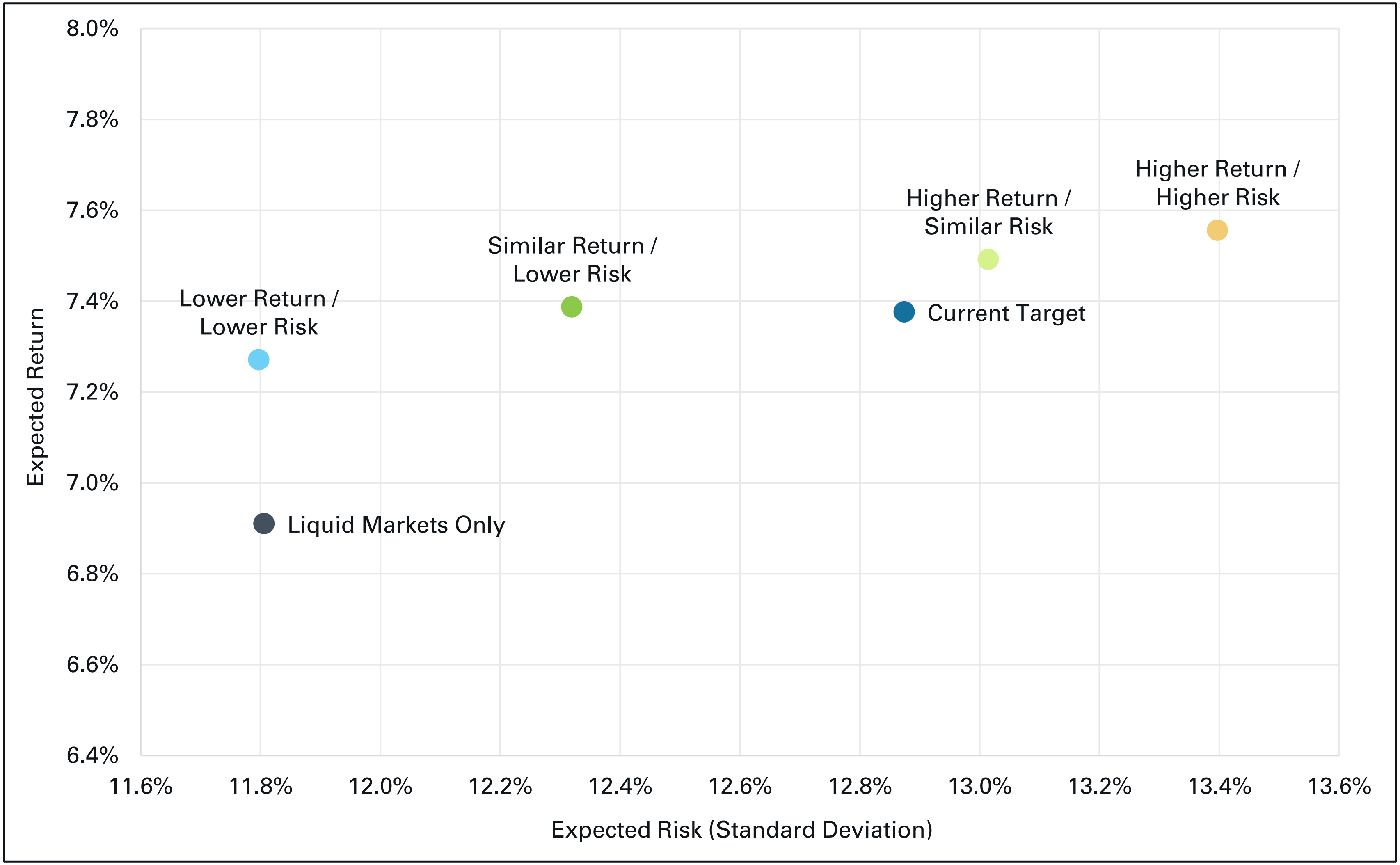
Note: Timing is estimated and subject to change.

DISCUSSION OF ALTERNATIVE PORTFOLIOS

ALTERNATIVE PORTFOLIO OVERVIEW

- **Following the August SIC meeting, NEPC developed additional alternative portfolio mixes based on the feedback we received.**
- **We have developed five portfolios for discussion. These portfolios were based on both qualitative and quantitative considerations.**
- **The first four mixes include all asset classes and include both lower returning and higher returning portfolios (relative to the current target).**
- **The final mix includes liquid asset classes only and is intended to show the return/risk impact from owning illiquid investments. This portfolio is for illustrative purposes only.**
- **The objective of today's discussion is to build consensus around one or two final portfolio mixes which we can then use to generate the full asset/liability modeling output.**

PORTFOLIO ALLOCATIONS – RETURN/RISK



10-Year Geometric Returns based on Average Arithmetic Return and NEPC Expected Risk. See appendix for details.

PORTFOLIO ALLOCATION DETAIL

		Current Target	Lower Return Lower Risk	Similar Return Lower Risk	Higher Return Similar Risk	Higher Return Higher Risk	Liquid Markets Only
Growth	**Global Equity**	**40.0%**	**32.5%**	**35.0%**	**42.0%**	**42.0%**	**55.0%**
	Private Equity	12.5%	12.5%	12.5%	13.5%	13.5%	0.0%
	Non-Core Real Estate	2.5%	2.5%	2.5%	1.5%	2.5%	0.0%
	Private Growth	**15.0%**	15.0%	15.0%	15.0%	16.0%	0.0%
	TOTAL GROWTH	**55.0%**	**47.5%**	**50.0%**	**57.0%**	**58.0%**	**55.0%**
Income	Equity Options	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Liquid Credit	3.0%	5.0%	6.0%	5.0%	5.0%	6.0%
	EMD (Blended)	2.0%	0.0%	0.0%	0.0%	0.0%	2.0%
	CLO Mezz/Equity	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Private Credit	3.0%	4.0%	5.0%	5.0%	5.0%	0.0%
	TOTAL INCOME	**12.0%**	**13.0%**	**15.0%**	**14.0%**	**14.0%**	**12.0%**
Stability	Long Treasuries	5.0%	7.0%	5.0%	8.0%	4.0%	5.0%
	Systematic Trend	5.0%	5.0%	5.0%	5.0%	4.0%	5.0%
	CPC	**10.0%**	**12.0%**	**10.0%**	**13.0%**	**8.0%**	**10.0%**
	Core Real Estate	4.0%	4.0%	4.0%	3.0%	4.0%	0.0%
	Private Real Assets (ex-Real Estate)	4.0%	4.0%	4.0%	3.0%	4.0%	0.0%
	Inflation Protection	**8.0%**	**8.0%**	**8.0%**	**6.0%**	**8.0%**	**0.0%**
	Inv. Grade Fixed (ex-Treasuries)	6.5%	11.0%	8.5%	4.0%	5.0%	14.5%
	Absolute Return	6.5%	6.5%	6.5%	4.0%	5.0%	6.5%
	Strategic Cash	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Volatility Protection	**15.0%**	**19.5%**	**17.0%**	**10.0%**	**12.0%**	**23.0%**
	TOTAL STABILITY	**33.0%**	**39.5%**	**35.0%**	**29.0%**	**28.0%**	**33.0%**
	TOTAL PORTFOLIO	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	EXPECTED RETURN - ARITHMETIC	**8.1%**	**7.8%**	**8.0%**	**8.2%**	**8.3%**	**7.5%**
	EXPECTED RETURN - GEOMETRIC	**7.4%**	**7.3%**	**7.4%**	**7.5%**	**7.6%**	**6.9%**
	EXPECTED RISK	**12.9%**	**11.8%**	**12.3%**	**13.0%**	**13.4%**	**11.8%**
	EXPECTED SHARPE RATIO	**0.38**	**0.39**	**0.39**	**0.38**	**0.38**	**0.36**
	% LIQUID (DAILY/WEEKLY/MONTHLY)	**66%**	**65%**	**64%**	**68%**	**64%**	**92%**
	% ILLIQUID (QUARTERLY+)	**35%**	**36%**	**37%**	**32%**	**36%**	**9%**

Increase in allocation relative to Current Target

Decrease in allocation relative to Current Target

10-Year Geometric Returns based on Average Arithmetic Return and NEPC Expected Risk. See appendix for details.

Illiquid asset classes = Private Equity, Non-Core Real Estate, CLO Mezz/Equity, Private Credit, Core Real Estate, Private Real Assets, Absolute Return

LIQUIDITY STUDY

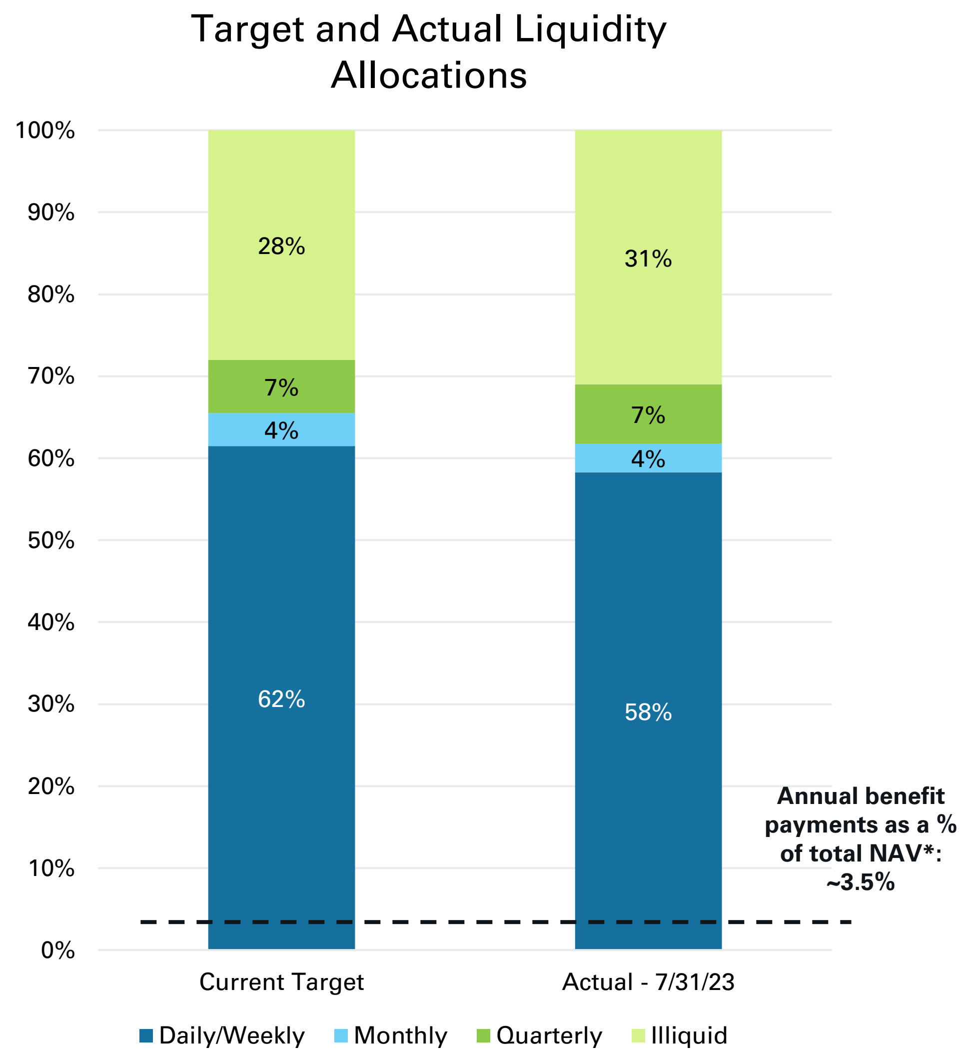
LIQUIDITY STUDY OVERVIEW

- **As demonstrated earlier, investment programs can benefit from holding a portion of plan assets in illiquid investments**
  - Return expectations are typically higher than public market asset classes and correlations can be low to publicly traded assets
- **Investing in illiquid assets, however, adds another dimension to liquidity management**
  - Will there be enough liquidity to manage future cash flows?
  - Will asset losses decrease the total asset base to the extent that there is a liquidity problem?
  - What if capital is called more rapidly in the illiquid program?
  - Will there need to be forced sales of distressed assets?
  - Will assets believed to be liquid be less so when liquidity is most needed?
- **Our liquidity study attempts to show how the investment program would respond under different economic environments**

NEPC

EXISTING LIQUIDITY PROFILE

- **69% of the Plan's assets have regular liquidity provisions (daily / monthly / quarterly liquidity).**
  - These assets are available for regular liquidity needs such as benefit payments, expenses, rebalancing, and capital calls
- **The remaining 31% of assets are relatively illiquid with most of these assets having multi-year lock-up's**
  - As a result, these assets have intermittent distributions (hard to plan around) and while they could be sold in secondary markets, it would likely come at steep discount
- **Translated into market value, $6.2 billion of the current portfolio has daily/weekly liquidity. $3.3 billion has worse than annual liquidity.**



See appendix for liquidity mapping. *Net of contributions based on an average over the next 15 years

CURRENT PORTFOLIO INCOME PROJECTIONS

- **With interest rates at multi-decade highs, the income generated by the portfolio has improved. Income generated by the portfolio provides a natural source of liquidity.**
- **We estimate the total annual yield generated by the portfolio is 1.9% ($202M annually). The fixed income portfolio is yielding approximately 5.8% ($99M annually).**

Fund Name	7/31/23 MV ($MM)	7/31/23 % of Pfl.	Yield - %	Yield - $
SSGA Russell 3000 Index*	$1,516.4	14.2%	1.43%	$21,684,732
SSGA MSCI EAFE Index*	$590.5	5.5%	3.10%	$18,304,799
SSGA MSCI Canada Index*	$69.2	0.6%	3.17%	$2,193,126
SSGA Emerging Market Index*	$441.5	4.1%	3.09%	$13,641,164
SSGA QVM*	$1,516.3	14.2%	1.96%	$29,719,459
Total Public Equity	**$4,133.8**	**38.6%**		**$85,543,280**
PIMCO LT Credit	$90.8	0.8%	6.10%	$5,538,090
Loomis Credit Asset SMA	$88.6	0.8%	5.96%	$5,282,271
Advent Balanced Convertible	$90.6	0.8%	2.31%	$2,093,975
Wellington EMD	$176.0	1.6%	6.78%	$11,934,444
Neuberger CLO Equity Mezz	$97.5	0.9%	12.24%	$11,938,080
Sycamore Tree CLO*	$122.8	1.1%	8.41%	$10,323,661
Fidelity Corporate Bonds	$291.1	2.7%	5.77%	$16,795,974
Loomis Securitized Bond	$283.1	2.6%	5.66%	$16,023,382
Bloomberg US Treasury Long TR*	$465.1	4.3%	4.13%	$19,209,017
Total Fixed Income	**$1,705.7**	**15.9%**		**$99,138,893**
Strategic Cash / Other**	$325.2	3.0%	5.42%	$17,624,036
Equity Options	$201.2	1.9%	N/A	$0
Systematic Trend	$471.2	4.4%	N/A	$0
Hedge Funds	$765.1	7.2%	N/A	$0
Private Equity	$1,747.3	16.3%	N/A	$0
Private Credit	$332.5	3.1%	N/A	$0
Core Real Estate	$372.4	3.5%	N/A	$0
Non-Core Real Estate	$229.4	2.2%	N/A	$0
Private Real Assets ex Real Estate	$412.2	3.9%	N/A	$0
Total Portfolio	**$10,695.9**	**100.0%**	**1.89%**	**$202,306,210**

Source: FactSet, manager factsheets, eVestment. *Denotes index dividend yield or YTM was used as proxy. All other yields based on specific strategy yields.

**Includes strategic cash as well as operating cash and the overlay fund. Yield is proxied by 90-day T-Bills Yield.

LIQUIDITY RISK MODELLING

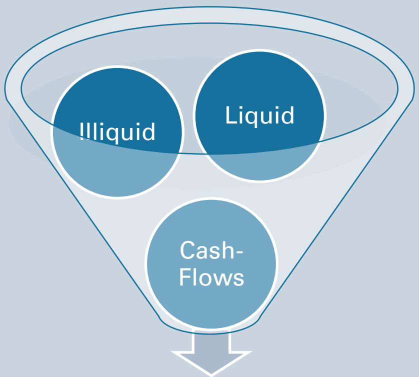
Analyze multi-year liquidity across various market environments

Build Model

- **Asset Allocations Assumptions**
  - Current asset class mixes
  - Both Liquid & Illiquid Assets
  - Capital market forecasts
- **Liability Projections**
  - Contributions /Benefit Payments /Plan Expense
- **Private Markets Cashflows**
  - Estimate Existing and Future Commitments
- **Liquidity Risk Estimates**
  - Different economic environments to calculate Liquidity Ratios and NAVs

Run Simulation

- **Simulations based on existing portfolio allocations**



Simulation Results

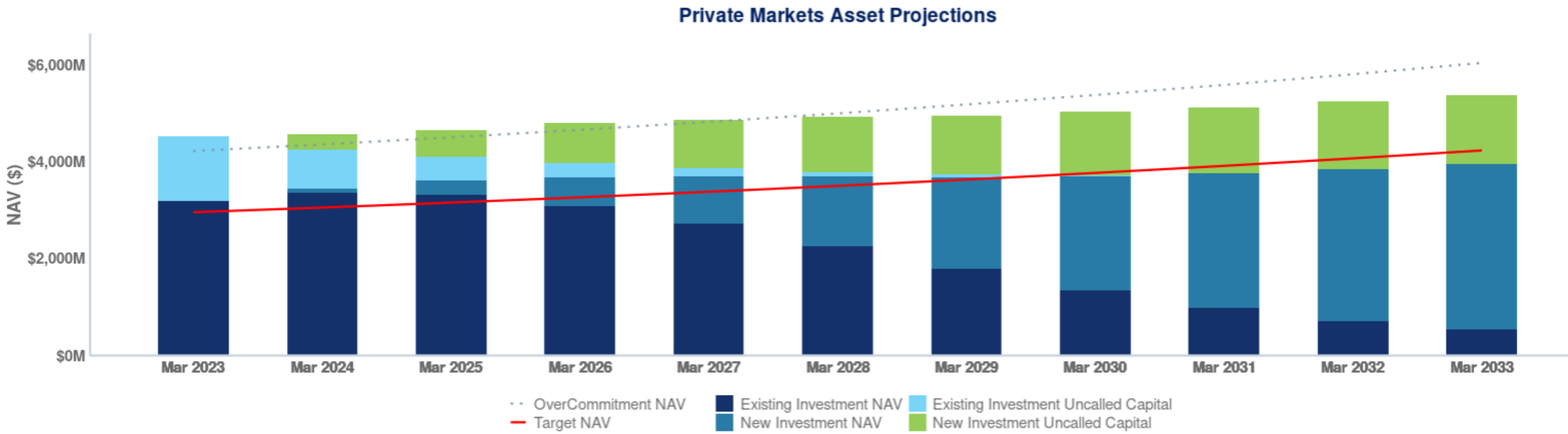
- **Multi-year forecast across different economic environments**
- **Probability distributions**
  - *All liquidity metrics*
  - *Illiquid NAV*

Analyze Results

- **Measure results across key risk metric**
  - How will portfolio value develop over time?
  - How does portfolio look like from liquidity perspective?
- **Calculate Probabilities**
  - Probability of breaching IPS thresholds?
  - Probability of reaching uncomfortable liquidity levels in any given year?

PRIVATE MARKET ASSET PROJECTIONS

Private Markets Portfolio Projections



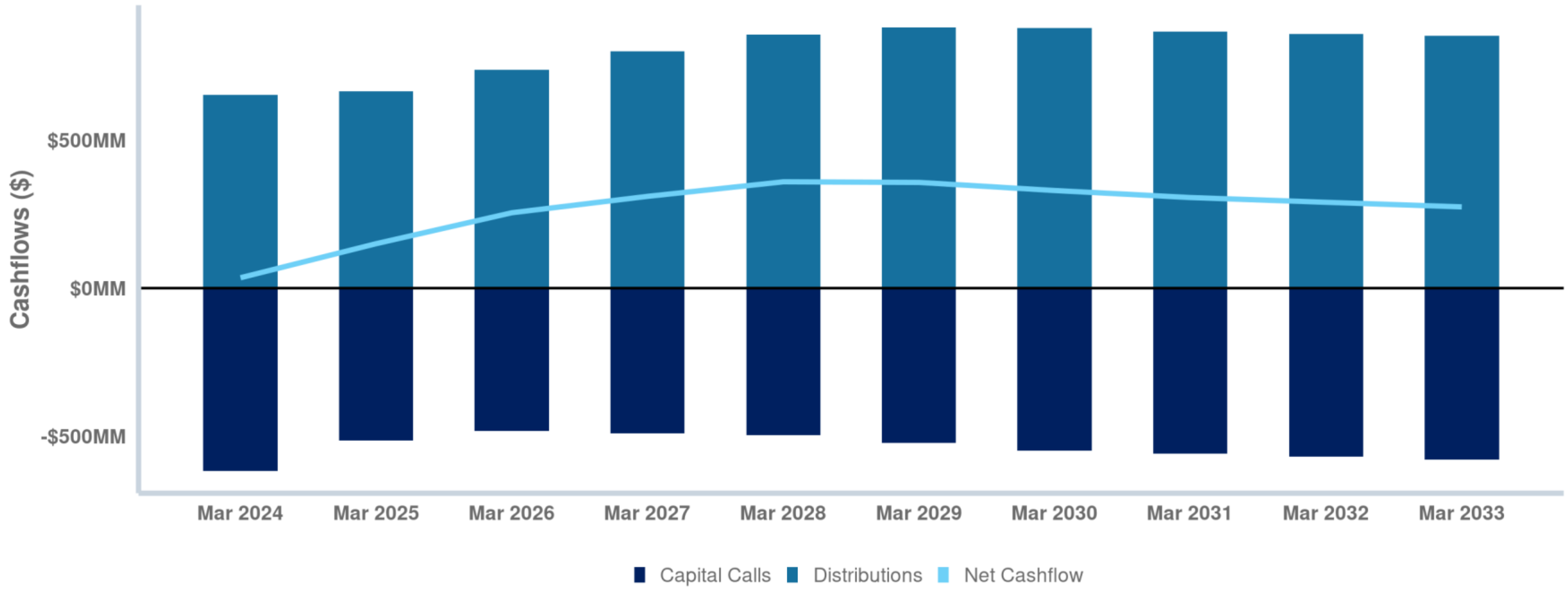
Projection Summary

Description	Mar 2023	Mar 2024	Mar 2025	Mar 2026	Mar 2027	Mar 2028	Mar 2029	Mar 2030	Mar 2031	Mar 2032	Mar 2033
Net Asset Value (NAV)	$3,192.4	$3,446.8	$3,606.6	$3,677.2	$3,702.1	$3,685.2	$3,675.2	$3,698.8	$3,755.8	$3,841.1	$3,956.6
Uncalled Capital	$1,335.5	$1,124.2	$1,048.8	$1,121.0	$1,163.6	$1,227.4	$1,276.3	$1,326.3	$1,365.7	$1,396.9	$1,417.9
NAV + Uncalled Capital	$4,527.9	$4,571.0	$4,655.5	$4,798.2	$4,865.6	$4,912.6	$4,951.4	$5,025.1	$5,121.4	$5,238.1	$5,374.5
Target NAV	$2,953.7	$3,049.9	$3,151.9	$3,260.2	$3,375.0	$3,496.9	$3,362.6	$3,763.4	$3,909.0	$4,063.4	$4,227.3
NAV (%)	30.3%	31.6%	32.0%	31.6%	30.7%	29.5%	28.4%	27.5%	26.9%	26.5%	26.2%
NAV + Uncalled Capital (%)	42.9%	42.0%	41.4%	41.2%	40.4%	39.3%	38.2%	37.4%	36.7%	36.1%	35.6%
Target Allocation (%)	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%

Projections include portfolio expected return plus contributions minus benefit payments.

PRIVATE MARKET CASH FLOW PROJECTIONS

Base Case – Private Markets Projected Capital Calls & Distributions



Projected Cashflows (in millions)

Description	Mar 2024	Mar 2025	Mar 2026	Mar 2027	Mar 2028	Mar 2029	Mar 2030	Mar 2031	Mar 2032	Mar 2033
Capital Calls	-$617.5	-$514.5	-$482.5	-$490.7	-$496.8	-$523.3	-$548.2	-$559.4	-$567.9	-$578.5
Distributions	$652.7	$664.6	$737.0	$800.6	$855.8	$880.4	$877.9	$865.4	$857.8	$852.9
Net Cash Flow	$35.2	$150.2	$254.6	$309.9	$359.1	$357.0	$329.7	$306.0	$289.9	$274.4

Projections include portfolio expected return plus contributions minus benefit payments.

DETERMINISTIC CASH FLOW ANALYSIS

- **The analysis presented in the table shows various cash flow scenarios under different economic environments.**
- **Capital calls and distributions are based on NEPC forecasts with input from Rhode Island's private market consultants.**
- **More detailed scenario analysis is included on the following slides.**

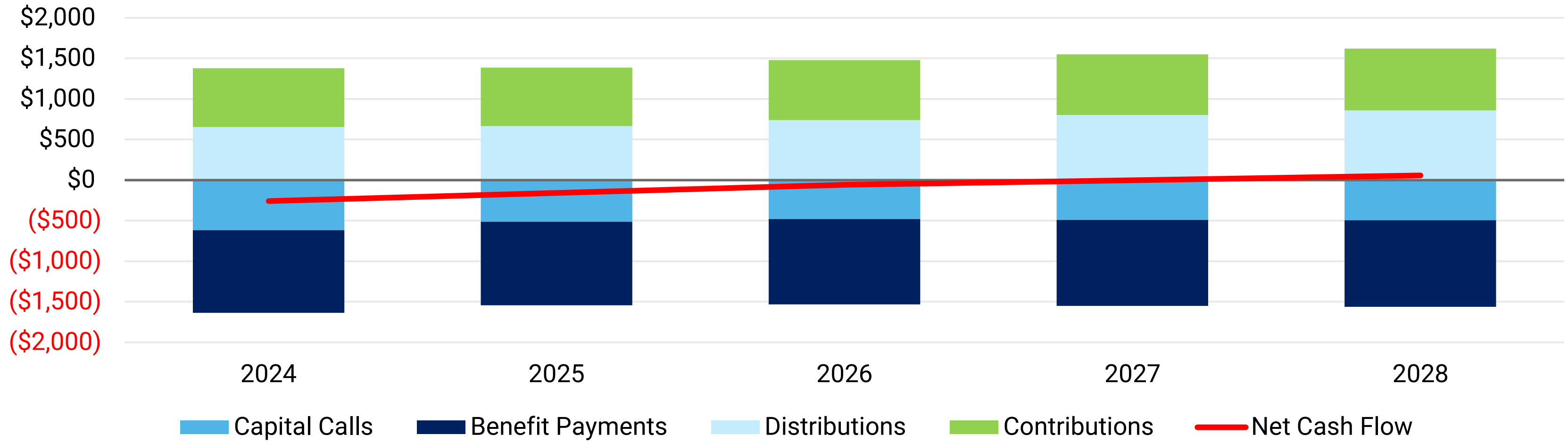
	Steady State	Liquidity Squeeze	Liquidity Stress
Plan NAV	$10.5 billion	$9.5 billion	$8.4 billion
Change in Plan NAV relative to Steady State	N/A	-10%	-20%
Benefit Payments	-$1,050 million	-$1,050 million	-$1,050 million
Plan Contributions	+$750 million	+$750 million	+$750 million
Capital Calls	-$525 million	-$500 million	-$475 million
Distributions	+$750 million	+$650 million	+$500 million
Net Cash Flow	-$75 million	-$150 million	-$275 million
NCF as a % of Plan NAV	-0.7%	-1.6%	-3.3%
Estimated Annual Portfolio Income	+$200 million	+$100 million	+$50 million
Plan Liquid NAV*	$7.4 billion	$6.1 billion	$5.0 billion

The information in the table above is estimated and subject to change.
*Assumes 70% liquid assets in Steady State, 65% liquid assets in Liquidity Squeeze and 60% liquid assets in Liquidity Stress.

TOTAL PORTFOLIO CASH FLOW PROJECTIONS

BASE CASE

Projected Benefit Payments, Contributions, Capital Calls & Distributions



Projected Cashflows (in millions)

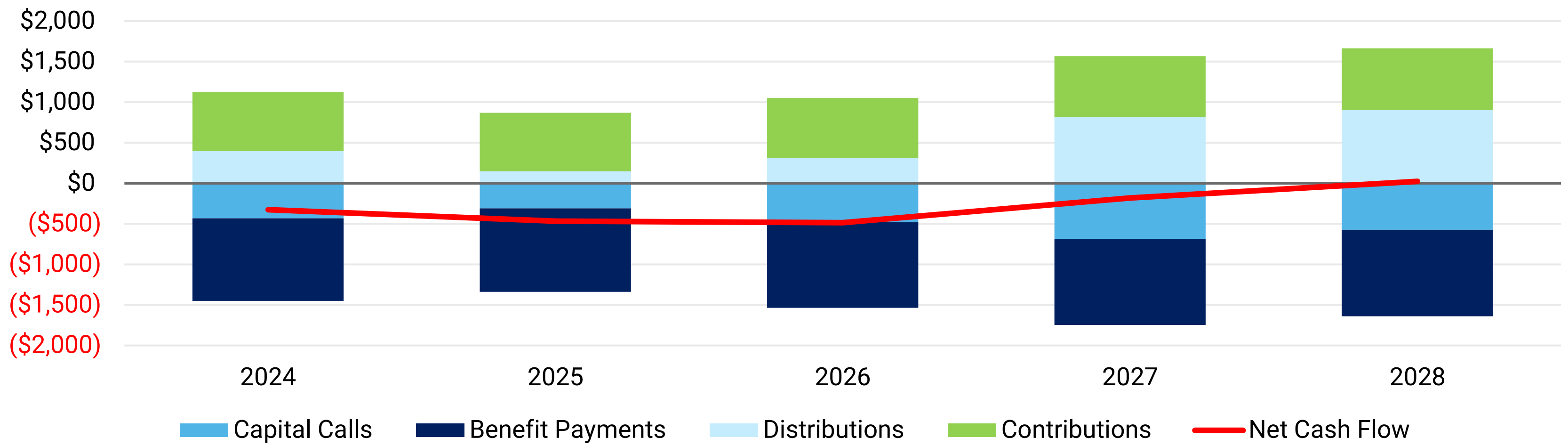
Description	2024	2025	2026	2027	2028
Capital Calls	($617.5)	($514.5)	($482.5)	($490.7)	($496.8)
Distributions	$652.7	$664.6	$737.0	$800.6	$855.8
Benefit Payments	($1,019.4)	($1,029.6)	($1,052.2)	($1,062.3)	($1,064.4)
Contributions	$725.2	$720.8	$739.6	$749.7	$762.1
Net Cash Flow	($259.0)	($158.6)	($58.1)	($2.7)	$56.8
Total Plan NAV	$10,892.3	$11,256.8	$11,643.4	$12,053.7	$12,489.0
Liquid Asset NAV	$7,445.6	$7,650.1	$7,966.2	$8,351.6	$8,803.7

Projections include portfolio expected return plus contributions minus benefit payments.

TOTAL PORTFOLIO CASH FLOW PROJECTIONS

DEPRESSION

Projected Benefit Payments, Contributions, Capital Calls & Distributions



Projected Cashflows (in millions)

Description	2024	2025	2026	2027	2028
Capital Calls	($432.3)	($308.3)	($482.8)	($686.6)	($575.8)
Distributions	$398.1	$147.9	$310.7	$817.9	$901.2
Benefit Payments	($1,019.4)	($1,029.6)	($1,052.2)	($1,062.3)	($1,064.4)
Contributions	$725.2	$720.8	$739.6	$749.7	$762.1
Net Cash Flow	($328.4)	($469.3)	($484.8)	($181.3)	$23.2

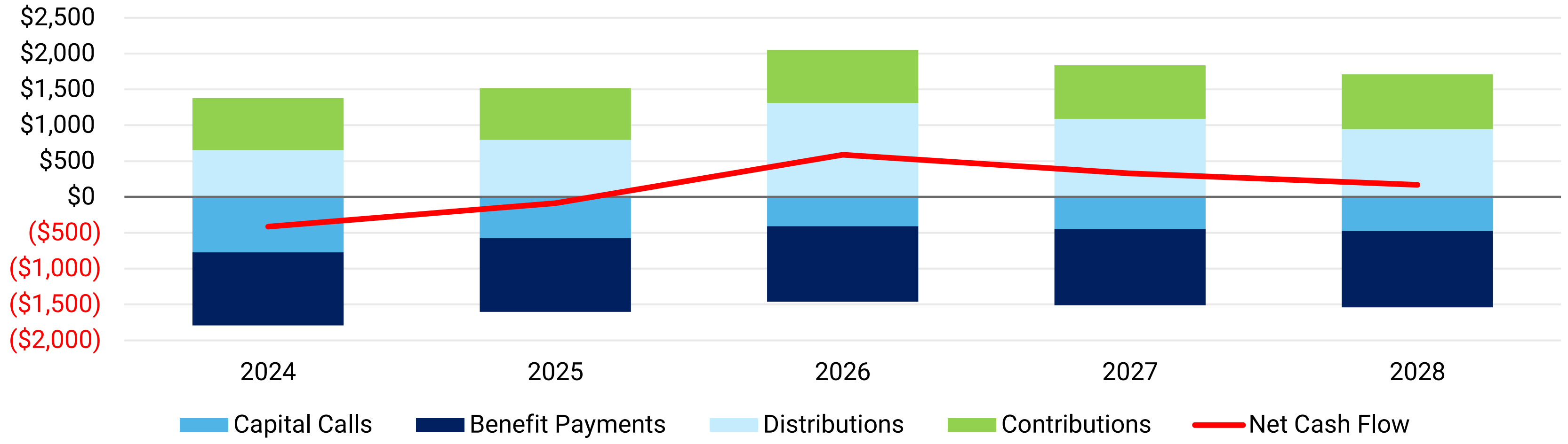
Total Plan NAV	$8,105.3	$7,417.1	$7,631.8	$7,847.7	$8,855.2
Liquid Asset NAV	$5,570.0	$4,658.9	$4,385.8	$4,393.8	$5,130.4

Projections include portfolio expected return plus contributions minus benefit payments.

TOTAL PORTFOLIO CASH FLOW PROJECTIONS

EXPANSION

Projected Benefit Payments, Contributions, Capital Calls & Distributions



Projected Cashflows (in millions)

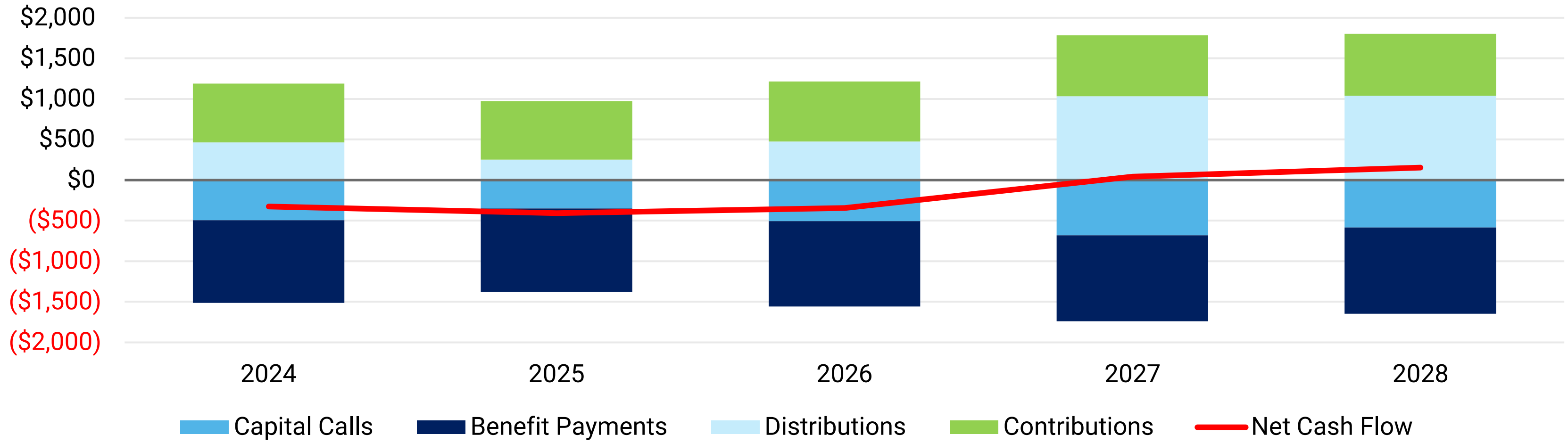
Description	2024	2025	2026	2027	2028
Capital Calls	($771.9)	($574.4)	($409.5)	($448.6)	($474.4)
Distributions	$652.7	$795.7	$1,309.9	$1,087.8	$946.2
Benefit Payments	($1,019.4)	($1,029.6)	($1,052.2)	($1,062.3)	($1,064.4)
Contributions	$725.2	$720.8	$739.6	$749.7	$762.1
Net Cash Flow	($413.4)	($87.5)	$587.8	$326.6	$169.5
Total Plan NAV	$12,791.1	$14,327.9	$15,085.3	$14,812.5	$15,445.7
Liquid Asset NAV	$8,752.4	$9,904.6	$11,155.9	$11,362.5	$12,184.0

Projections include portfolio expected return plus contributions minus benefit payments.

TOTAL PORTFOLIO CASH FLOW PROJECTIONS

RECESSION

Projected Benefit Payments, Contributions, Capital Calls & Distributions



Projected Cashflows (in millions)

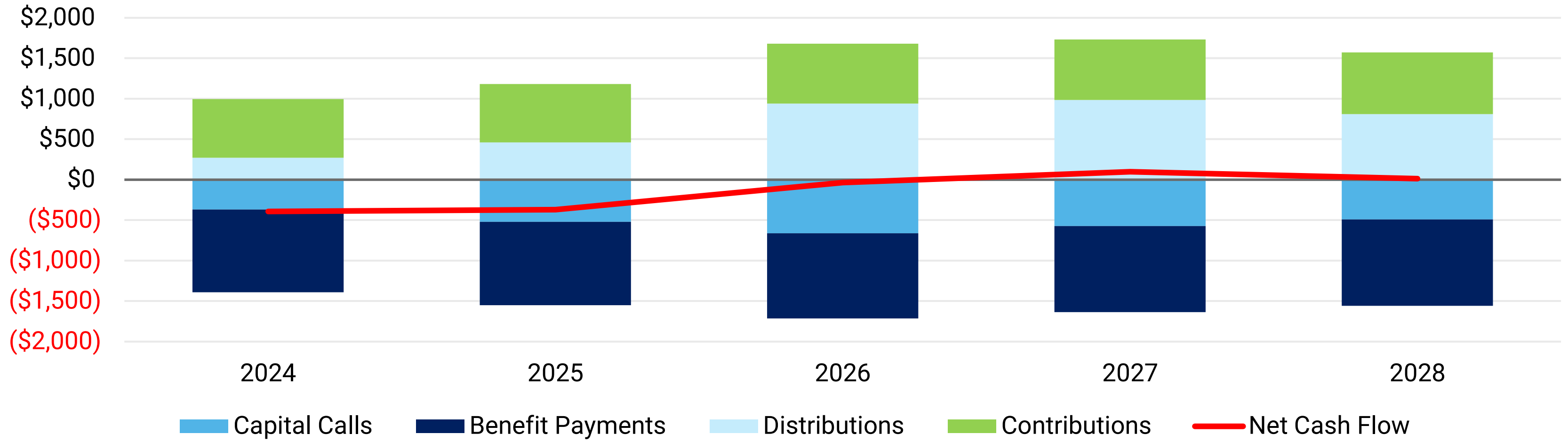
Description	2024	2025	2026	2027	2028
Capital Calls	($494.0)	($349.6)	($506.5)	($680.6)	($583.9)
Distributions	$461.7	$250.4	$474.5	$1,033.1	$1,038.7
Benefit Payments	($1,019.4)	($1,029.6)	($1,052.2)	($1,062.3)	($1,064.4)
Contributions	$725.2	$720.8	$739.6	$749.7	$762.1
Net Cash Flow	($326.5)	($408.0)	($344.6)	$39.9	$152.5
Total Plan NAV	$9,748.8	$9,266.5	$9,603.1	$10,016.7	$10,471.9
Liquid Asset NAV	$6,658.8	$5,945.0	$5,946.9	$6,302.0	$6,814.4

Projections include portfolio expected return plus contributions minus benefit payments.

TOTAL PORTFOLIO CASH FLOW PROJECTIONS

STAGFLATION

Projected Benefit Payments, Contributions, Capital Calls & Distributions

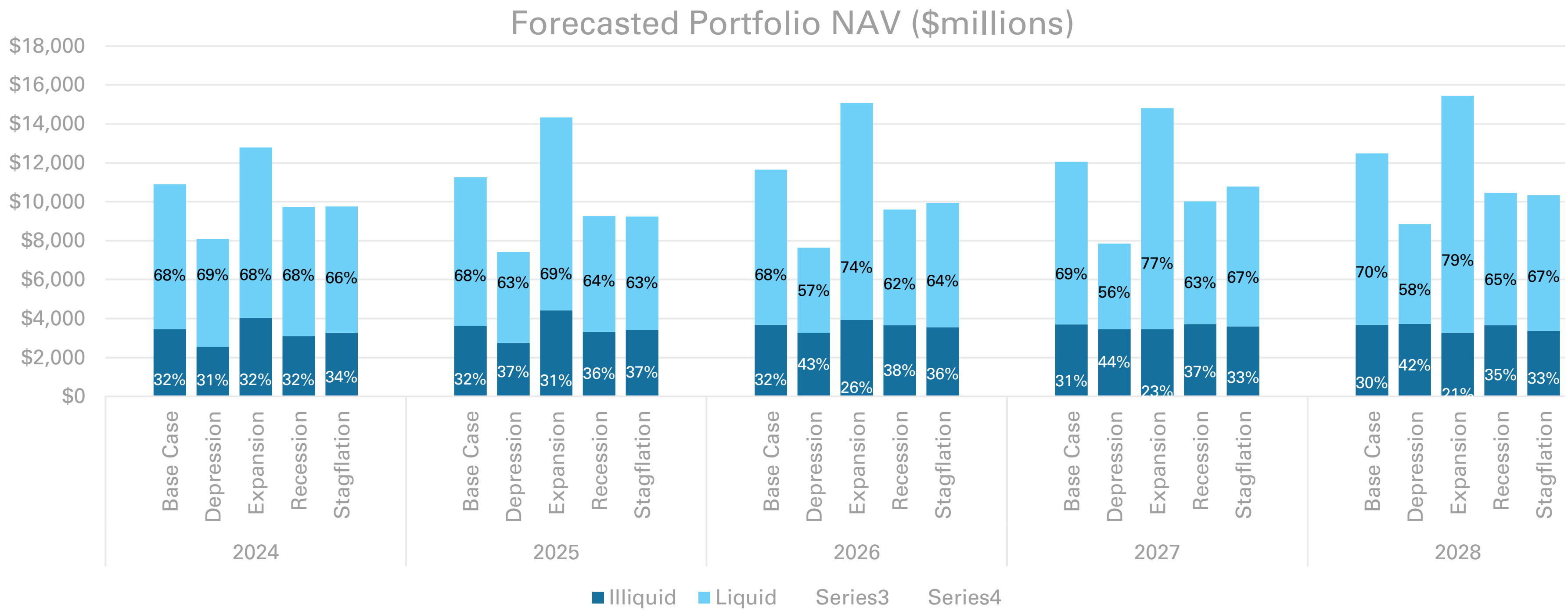


Projected Cashflows (in millions)

Description	2024	2025	2026	2027	2028
Capital Calls	($370.5)	($520.6)	($664.1)	($573.4)	($493.9)
Distributions	$270.7	$459.9	$940.6	$983.2	$808.7
Benefit Payments	($1,019.4)	($1,029.6)	($1,052.2)	($1,062.3)	($1,064.4)
Contributions	$725.2	$720.8	$739.6	$749.7	$762.1
Net Cash Flow	($394.0)	($369.6)	($36.1)	$97.2	$12.5
Total Plan NAV	$9,761.5	$9,236.0	$9,947.4	$10,777.4	$10,337.3
Liquid Asset NAV	$6,489.0	$5,820.6	$6,391.4	$7,187.2	$6,970.9

Projections include portfolio expected return plus contributions minus benefit payments.

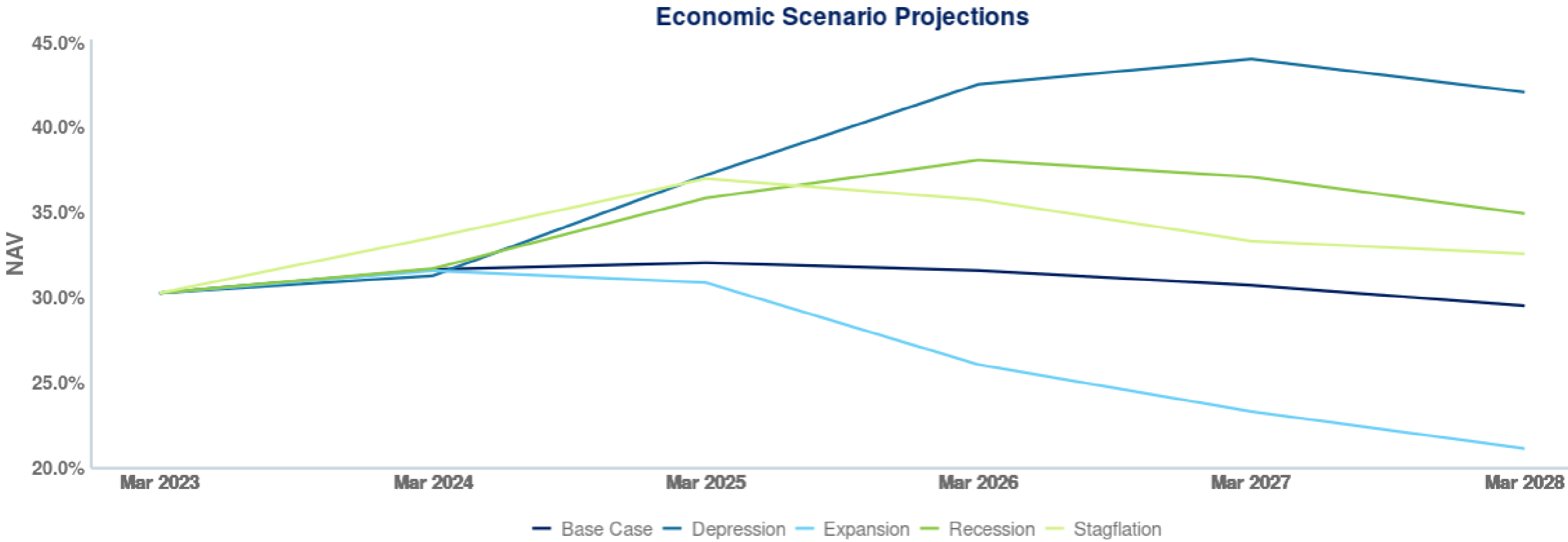
LIQUIDITY SCENARIO SUMMARY – NAV



- **NEPC modeled five economic scenarios (see appendix for details) to see the impact on the private markets portfolio.**
- **The above chart shows the total portfolio forecasted NAV over the next five years under each scenario along with the split between liquid and illiquid assets.**

Projections include portfolio expected return plus contributions minus benefit payments.

LIQUIDITY SCENARIO SUMMARY – NAV



- **The chart above shows the same five economic scenarios, but focuses on the total percentage of portfolio assets.**
- **In the depression scenario, private market assets could represent >40% of total portfolio assets.**
- **The recession and stagflation scenarios also result in elevated private market allocations (~30-40%).**

Projections include portfolio expected return plus contributions minus benefit payments.

LIQUIDITY REPORTING & MONITORING

- **We believe measuring and reporting liquidity regularly is critical.**
- **NEPC believes that clients should adopt "liquidity guardrails" for different portfolio metrics. The metrics that can be tracked include:**
  - % of Total Portfolio NAV in Privates
  - Annual Commitment / Total Pool NAV
  - Uncalled Capital / Monthly Liquidity
  - Uncalled Capital + Benefit Payments as % of Monthly Liquidity
  - Uncalled Capital / Total NAV
- **These metrics should be adjusted based on the size of the private markets program and any other client specific considerations.**
- **A sample set of guideposts is shown below. These metrics can be customized for the State of Rhode Island plan.**

Annual Commitment Rate	**Acceptable**	**Monitor Closely**	**Watch for Liquidity**
Annual Commitment / Total Pool NAV	<5%	5-6%	>7%

Liquidity Guardrails	**Acceptable**	**Monitor Closely**	**Watch for Liquidity**
Uncalled Capital / Monthly Liquidity	<40%	40-60%	>60%
(Uncalled Capital + Spending) / Monthly Liquidity	<50%	50-70%	>70%
Uncalled Capital / Total Pool NAV	<15%	15-20%	>20%

Source: NEPC

SUMMARY

- **The plan currently has ~70% of asset with regular liquidity provisions.**
- **The Plan is likely to benefit from building to a diversified allocation of illiquid assets:**
  - Private investments are expected to provide returns in excess of public markets
  - Illiquid investments have an attractive diversification profile with a low correlation to other public asset classes
  - Programs are most effective when implemented with appropriate vintage year diversification
- **Both the current target and the alternative portfolios presented appear well-positioned to seek the benefits of a diversified allocation to private markets.**

APPENDIX

ERSRI FINAL ASSET CLASS ASSUMPTIONS

		Current Target	10-Year Arithmetic Returns: NEPC	Meketa	Cliffwater	Average	10-Year Geometric Return*	NEPC Expected Risk
Growth	**Global Equity**	**40.0%**	**7.7%**	**10.1%**	**8.8%**	**8.9%**	**7.5%**	**18.1%**
Growth	Private Equity	12.5%	11.8%	12.5%	12.3%	12.2%	9.6%	25.7%
Growth	Non-Core Real Estate	2.5%	6.7%	8.1%	12.5%	9.1%	7.7%	18.5%
Growth	**Private Growth**	**15.0%**	**10.9%**	**11.8%**	**12.3%**	**11.7%**	**9.5%**	**23.4%**
Growth	**TOTAL GROWTH**	**55.0%**	**8.3%**	**10.6%**	**9.9%**	**9.6%**	**8.2%**	**18.9%**
Income	Equity Options	2.0%	6.5%	7.4%	5.0%	6.3%	5.8%	11.1%
Income	Liquid Credit	3.0%	7.7%	8.5%	7.5%	7.9%	7.5%	9.5%
Income	EMD (Blended)	2.0%	7.9%	7.1%	7.1%	7.4%	6.7%	12.6%
Income	CLO Mezz/Equity	2.0%	6.1%	8.7%	7.1%	7.3%	7.1%	7.6%
Income	Private Credit	3.0%	9.4%	10.3%	9.6%	9.8%	9.2%	11.8%
Income	**TOTAL INCOME**	**12.0%**	**7.7%**	**8.6%**	**7.5%**	**7.9%**	**7.5%**	**9.3%**
Stability	Long Treasuries	5.0%	4.6%	4.9%	4.2%	4.6%	4.0%	11.8%
Stability	Systematic Trend	5.0%	6.2%	5.3%	4.1%	5.2%	4.8%	9.3%
Stability	**CPC**	**10.0%**	**5.4%**	**5.1%**	**4.2%**	**4.9%**	**4.6%**	**7.8%**
Stability	Core Real Estate	4.0%	5.0%	4.9%	7.1%	5.7%	4.7%	15.0%
Stability	Private Real Assets (ex-Real Estate)	4.0%	7.2%	7.8%	8.0%	7.7%	7.0%	12.4%
Stability	**Inflation Protection**	**8.0%**	**6.1%**	**6.4%**	**7.6%**	**6.7%**	**6.1%**	**11.8%**
Stability	Inv. Grade Fixed (ex-Treasuries)	6.5%	5.8%	5.3%	5.6%	5.6%	5.3%	7.7%
Stability	Absolute Return	6.5%	6.9%	5.6%	5.3%	5.9%	5.6%	8.6%
Stability	Strategic Cash	2.0%	4.0%	3.1%	2.5%	3.2%	3.2%	0.6%
Stability	**Volatility Protection**	**15.0%**	**6.0%**	**5.1%**	**5.0%**	**5.4%**	**5.2%**	**6.1%**
Stability	**TOTAL STABILITY**	**33.0%**	**5.8%**	**5.4%**	**5.4%**	**5.5%**	**5.4%**	**6.5%**
	TOTAL PORTFOLIO	**100.0%**	**7.4%**	**8.6%**	**8.1%**	**8.1%**	**7.4%**	**12.9%**

*10-Year Geometric Returns based on Average Arithmetic Return and NEPC Expected Risk.
Based on NEPC's 12/31/2023 assumptions, Meketa's 2023 assumptions, and Cliffwater's 2023 assumptions.

NEPC

LIQUIDITY MAPPING

		Current Target	Actual - 7/31/23	Liquidity Category
Growth	**Global Equity**	**40.0%**	**38.6%**	Daily/Weekly
	Private Equity	12.5%	16.3%	Illiquid
	Non-Core Real Estate	2.5%	2.1%	Illiquid
	Private Growth	**15.0%**	**18.4%**	
	TOTAL GROWTH	**55.0%**	**57.0%**	
Income	Equity Options	2.0%	1.9%	Monthly
	Liquid Credit	3.0%	2.5%	Daily/Weekly
	EMD (Blended)	2.0%	1.6%	Monthly
	CLO Mezz/Equity	2.0%	2.1%	Illiquid
	Private Credit	3.0%	3.1%	Illiquid
	TOTAL INCOME	**12.0%**	**11.2%**	
Stability	Long Treasuries	5.0%	4.3%	Daily/Weekly
	Systematic Trend	5.0%	4.4%	Daily/Weekly
	CPC	**10.0%**	**8.7%**	
	Core Real Estate	4.0%	3.5%	Illiquid
	Private Real Assets (ex-Real Estate)	4.0%	3.9%	Illiquid
	Inflation Protection	**8.0%**	**7.4%**	
	Inv. Grade Fixed (ex-Treasuries)	6.5%	5.4%	Daily/Weekly
	Absolute Return	6.5%	7.2%	Quarterly
	Strategic Cash	2.0%	3.1%	Daily/Weekly
	Volatility Protection	**15.0%**	**15.7%**	
	TOTAL STABILITY	**33.0%**	**31.8%**	

SCENARIO ANALYSIS: REGIME CHANGES

NEPC scenario analysis highlights the impact of shifting economic and market regimes on the portfolio and potential asset allocation mixes

- Risk asset returns are informed by credit returns which are based on changes in real rate, inflation, and credit spreads experienced across market regimes

Expansion

Informed by rising interest rates, moderately rising inflation, elevated positive real rates, spread tightening, and increasing growth

Stagflation

Informed by rising interest rates, rising inflation, depressed negative real rates, spread widening, and slowing growth

Overextension

Informed by rising interest rates, high inflation, negative real rates, spread tightening, and increasing growth

Recession

Informed by depressed interest rate levels, falling inflation, depressed positive real rates, spread widening and slowing growth

Depression

Informed by negative interest rates, deflation, severe credit defaults and downgrades, and negative growth

SCENARIO ANALYSIS: REGIME RETURNS

Expansion Scenario Return*

Cash: 2.7%
Treasuries: 5.4%
Long Treasuries: 8.5%
US TIPS: 5.1%
US IG Credit: 8.1%
High Yield Bonds: 8.0%
US Large-Cap Equity: 10.2%
Emerging Market Equity: 17.9%
Commodities: 12.1%

Depression Scenario Return*

Cash: 0.8%
Treasuries: 5.4%
Long Treasuries: 10.0%
US TIPS: 5.4%
US IG Credit: 7.0%
High Yield Bonds: 2.1%
US Large-Cap Equity: -8.1%
Emerging Market Equity: -22.8%
Commodities: 12.9%

Overextension Scenario Return*

Cash: 5.4%
Treasuries: 4.0%
Long Treasuries: 2.6%
US TIPS: 7.0%
US IG Credit: 4.7%
High Yield Bonds: 5.8%
US Large-Cap Equity: 2.3%
Emerging Market Equity: 4.5%
Commodities: 13.4%

Recession Scenario Return*

Cash: 1.2%
Treasuries: 5.0%
Long Treasuries: 8.5%
US TIPS: 4.8%
US IG Credit: 7.3%
High Yield Bonds: 8.2%
US Large-Cap Equity: -2.9%
Emerging Market Equity: -5.0%
Commodities: 11.2%

Stagflation Scenario Return*

Cash: 6.4%
Treasuries: 2.6%
Long Treasuries: -1.6%
US TIPS: 9.5%
US IG Credit: 3.1%
High Yield Bonds: 7.0%
US Large-Cap Equity: -2.4%
Emerging Market Equity: -3.9%
Commodities: 23.5%

Scenario returns are a 5 year annualized returns

NEPC DISCLOSURES

Past performance is no guarantee of future results.

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The projection of liabilities in this report uses standard actuarial projection methods and does not rely on actual participant data. Asset and liability information was received from the plan's actuary, and other projection assumptions are stated in the report.

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