

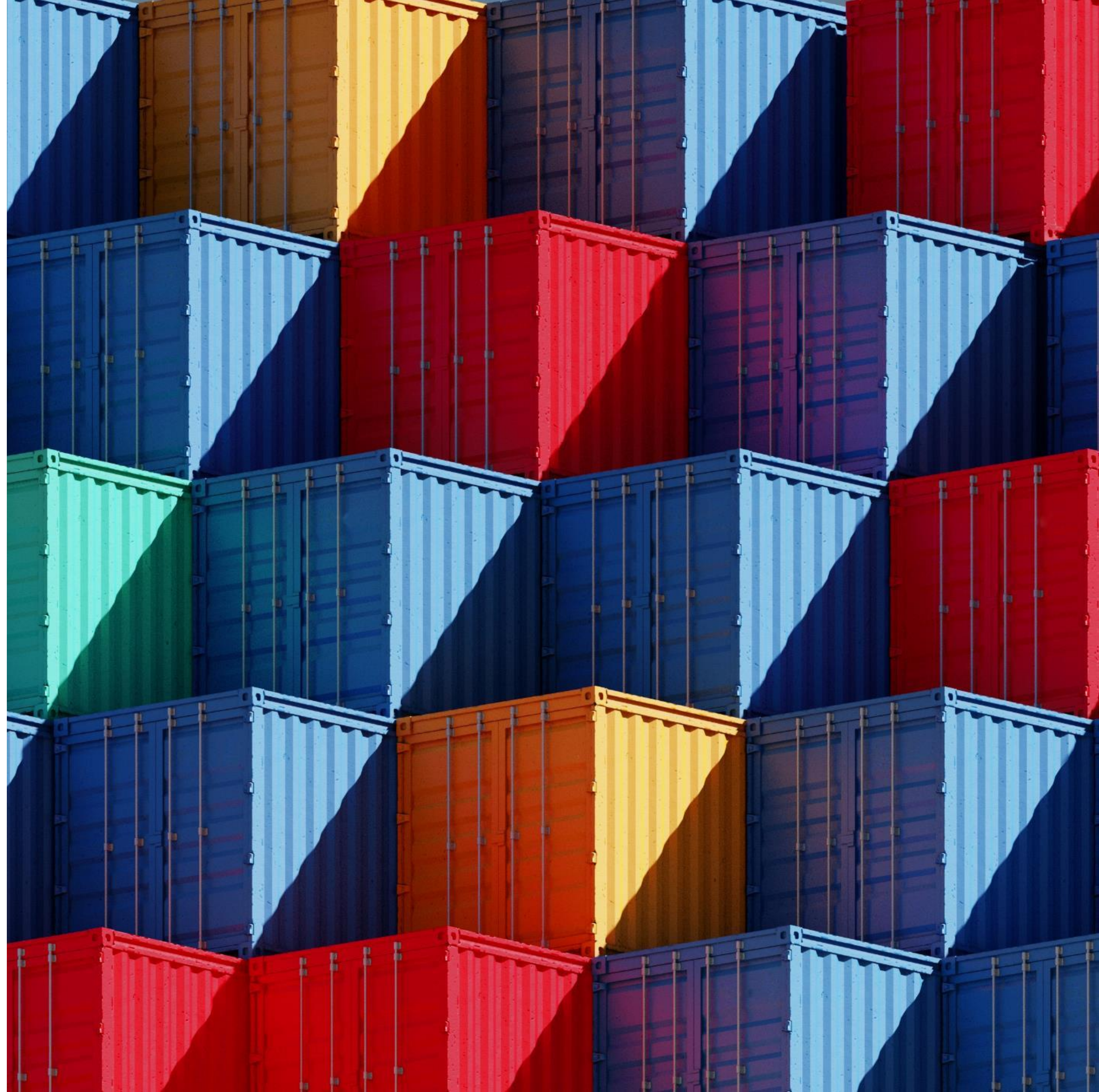


# Asset-Liability Study: Results and Recommendation

Teachers' Retirement System of  
Oklahoma (TRSOK)

February 2025

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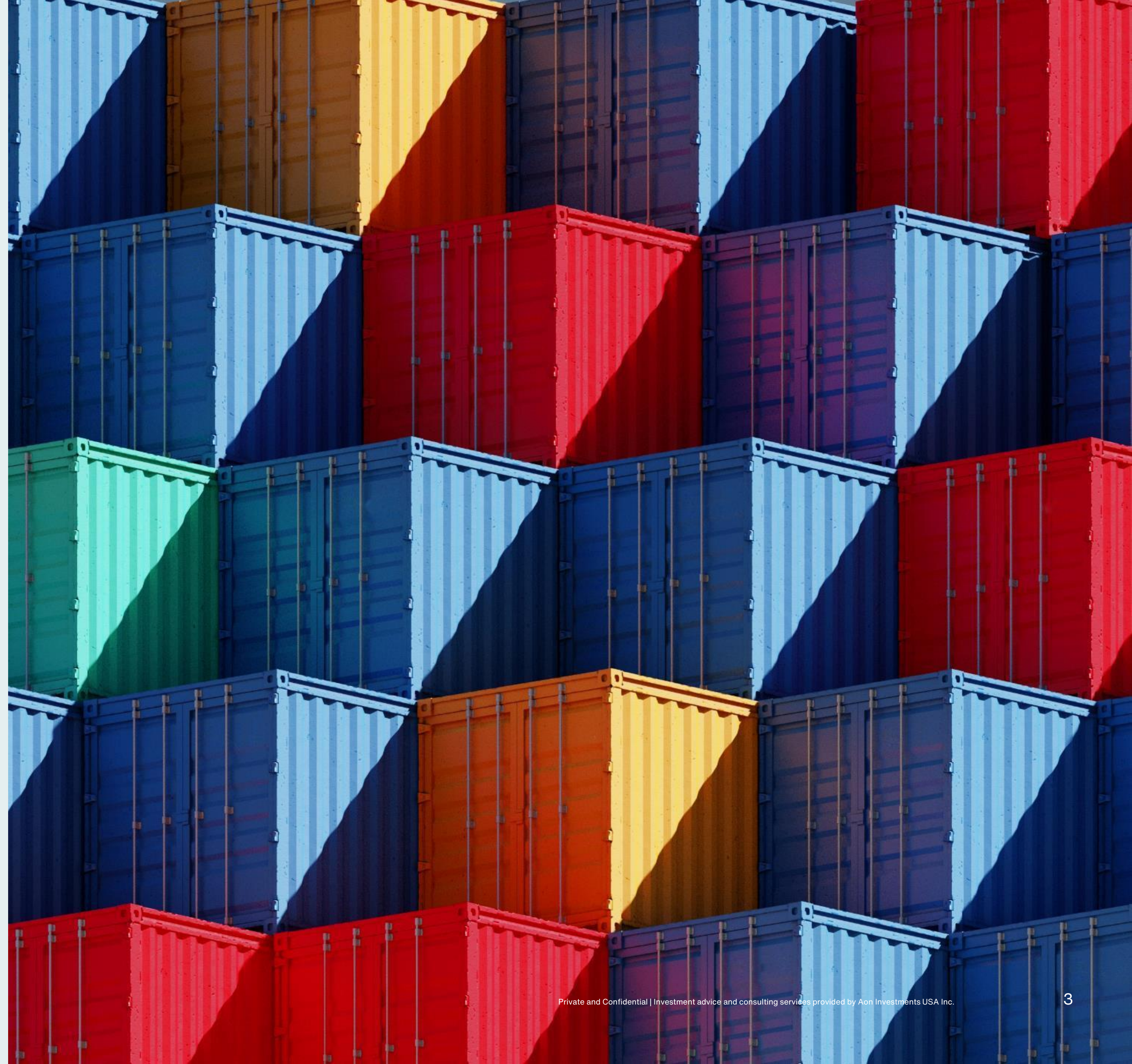
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# 1

## Recap of Asset-Liability Study





# Asset Liability Study Tentative Timeline

Key project steps of asset-liability study

Meeting / Topic	Purpose	Target Dates
<b>Experience Study</b>	<ul style="list-style-type: none"> <li>Conducted by the actuary, reviews reasonableness of assumptions used for pension plans and updates as warranted.</li> </ul>	✓ October 2024
<b>Planning Meeting</b>	<ul style="list-style-type: none"> <li>Provides overview of the pension plan and asset-liability study process</li> <li>Collect feedback on pension-related objectives, assumptions, and constraints</li> </ul>	✓ November 2024
<b>Interim IC Meeting</b>	<ul style="list-style-type: none"> <li>Planning meeting follow-up discussion</li> <li>Focused on liquidity and portfolio analysis to confirm portfolios to study</li> </ul>	✓ January 2025
<b>Results and Recommendation Meeting</b>	<ul style="list-style-type: none"> <li>Provides analysis supporting investment strategy recommendations which are consistent with objectives, assumptions, and constraints</li> <li>Identifies key trade-offs among strategies and potential implementation issues</li> <li>Make recommendations, collect feedback and refine recommendations, if needed</li> </ul>	First Quarter 2025
<b>Post Study: IPS Update / Implementation</b>	<ul style="list-style-type: none"> <li>Implementation plan, including pacing and manager searches, if needed</li> <li>Update Investment Policy Statement</li> </ul>	Post-Study

# Current State Overview

## As of September 30, 2024

**81.3%**

### Estimated funded ratio as of September 30, 2024

- Based on market value of assets using a 7.00% actuarial discount rate

**7.44%**

### 30-year expected return<sup>1</sup>

- Aon's assumption for the current target asset allocation as of September 30, 2024
- Expected return exceeds the actuarial assumed rate of return (7.00%)

**+240 bps**

### Hurdle rate surplus

- Projected asset growth (contributions + investment returns) outpaces projected liability growth, which is expected to improve the near-term funded ratio

**78%**

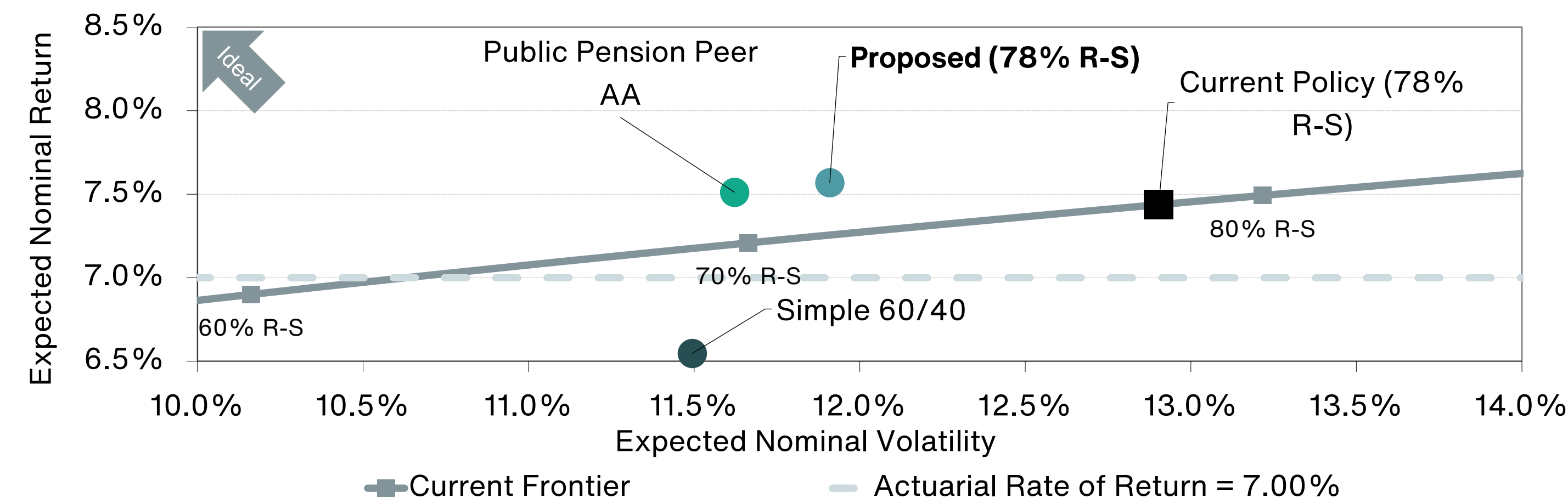
### Current target level of return-seeking asset

- Return-Seeking assets are diversified with public equity, private equity, private credit, and real estate

<sup>1</sup> Expected returns are using Aon's Q4 2024 30-Year Capital Market Assumptions as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Analysis includes \$7.2MM in expenses, assumed to be inclusive of investment consulting fees, paid from trust assets. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages.

# Portfolio Analysis – Risk/Reward Spectrum

Additional diversification is expected to reduce portfolio volatility



## Key Takeaways

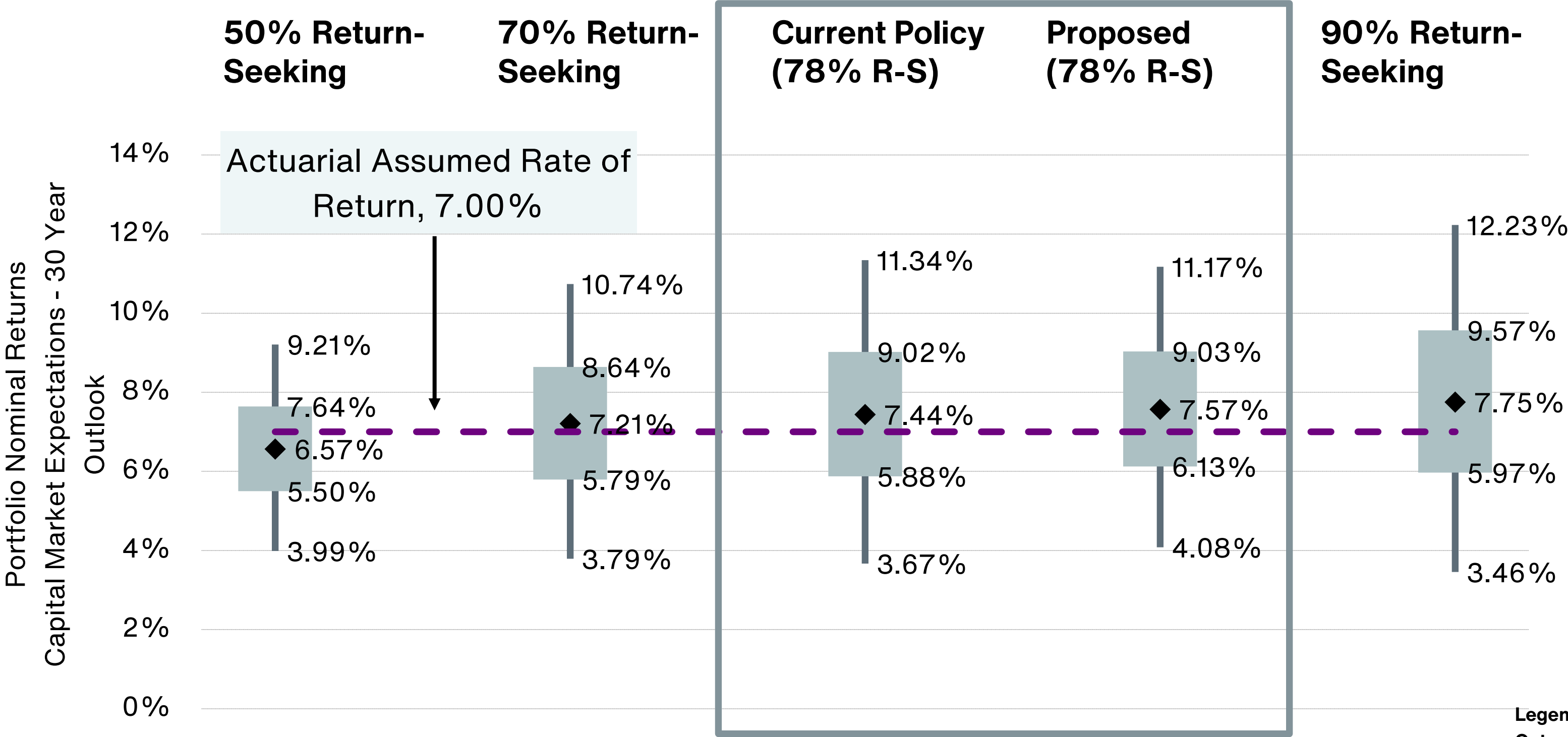
- Current Policy expected return of **7.44%** exceeds the 7.00% actuarial assumed rate of return
- Opportunities exist to reduce volatility while maintaining similar levels of expected returns via additional diversification

Portfolio Metrics				Return-Seeking (R-S) Assets						Risk-Reducing/ Safety Assets		
	Expected Nominal Return <sup>1</sup>	Expected Nominal Volatility	Sharpe Ratio	Public Equity	Private Equity	Liquid Alts	Liquid Return- Seeking Fixed Income	Illiquid Return- Seeking Fixed Income	Open- End Real Assets	Closed- End Real Assets	Core/Core Plus Bonds	
Current Policy (78% R-S)	7.44%	12.90%	0.29	55.0%	8.0%	0.0%	0.0%	5.0%	5.0%	5.0%	22.0%	
<b>Proposed (78% R-S)</b>	<b>7.57%</b>	<b>11.91%</b>	<b>0.32</b>	<b>46.5%</b>	<b>10.0%</b>	<b>0.0%</b>	<b>3.0%</b>	<b>7.5%</b>	<b>6.0%</b>	<b>5.0%</b>	<b>22.0%</b>	
Simple 60/40	6.55%	11.49%	0.25	60.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	
Public Pension Peer AA	7.51%	11.62%	0.33	45.0%	10.0%	5.0%	3.0%	4.0%	7.0%	6.0%	20.0%	

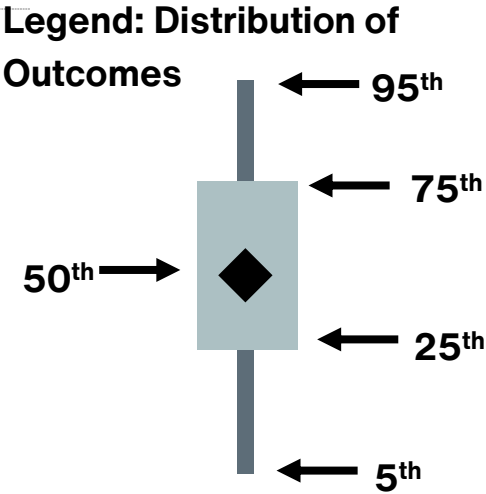
<sup>1</sup> Expected returns are using AIUSA Q3 2024 30-Year Capital Market Assumptions (CMAs) as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns may differ from model returns presented based on your plan's individual fees/expenses. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages. Percentages may not sum to 100% due to rounding.

# Portfolio Analysis – Range of Nominal Returns

Proposed (78% R-S) has a slightly higher expected return<sup>1</sup> and narrower range of future outcomes



<sup>1</sup> Expected returns are using AIUSA Q3 2024 30-Year Capital Market Assumptions (CMAs) as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns may differ from model returns presented based on your plan's individual fees/expenses. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages.



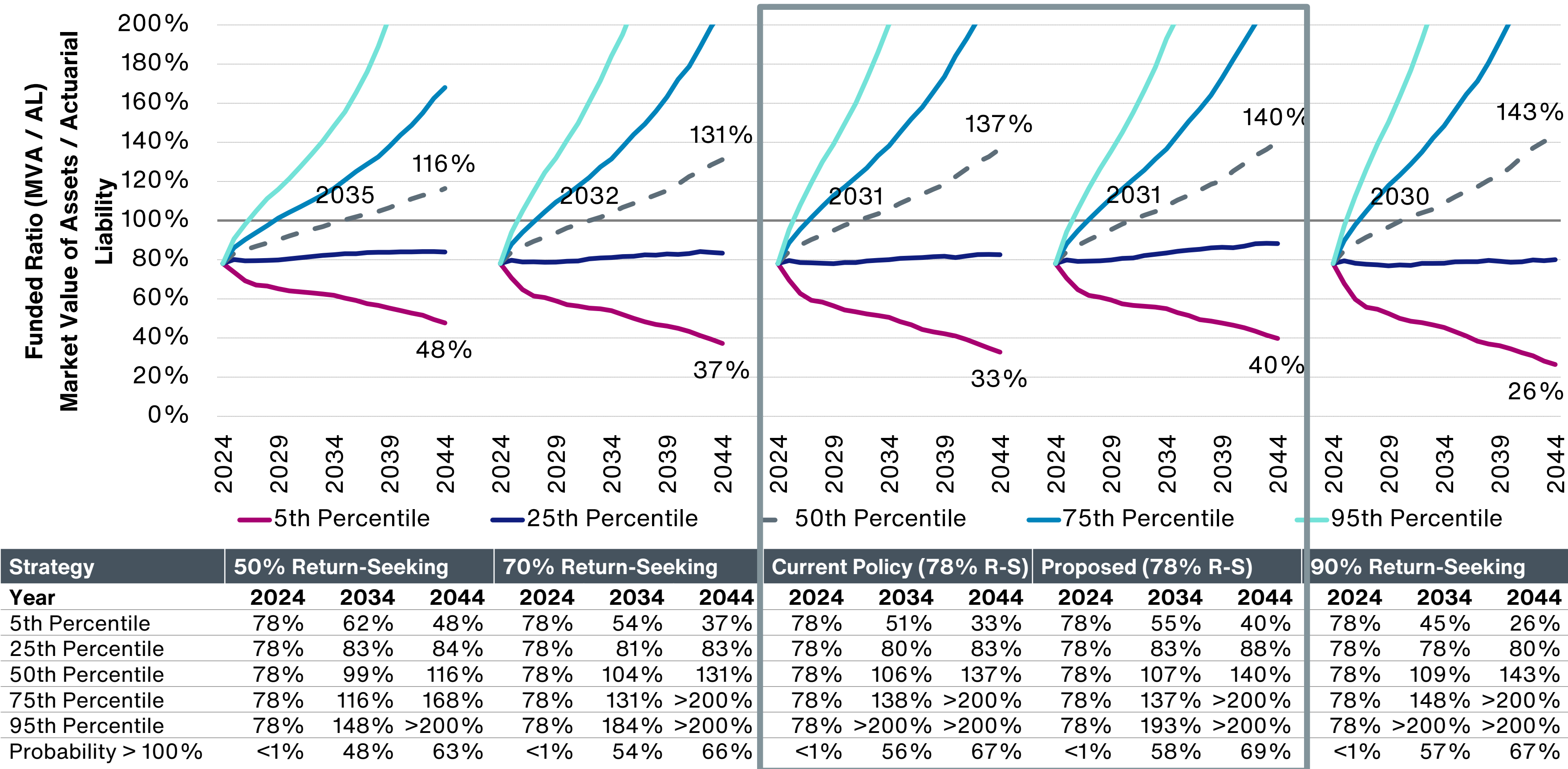
## Key Observations

- Higher allocation to return-seeking assets increases the expected return<sup>1</sup> (50<sup>th</sup> percentile outcome) but with a wider range of outcomes
- The probability of meeting the actuarial rate of return by portfolio is the following:
  - 50% R-S: 39%
  - 70% R-S: 54%
  - **Current (78% R-S): 57%**
  - **Proposed (78% R-S): 60%**
  - 90% R-S: 61%



# Asset-Liability Projection Analysis – Funded Ratio (MVA)

Plan is expected to reach full funding over the projection period;  
additional diversification is expected to mitigate tail-risk



Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.

## Key Observations

- The Current 78% R-S policy is expected to increase the funded ratio over the 20-year horizon
- Lower return-seeking allocations are also expected to have a central expectation (50<sup>th</sup> percentile outcome) of a fully funded plan but with a narrower range of outcomes
- Additional diversification of the return-seeking portfolio is expected to reduce volatility



# Summary Asset Liability Conclusions

## Risk Posture

- Current risk posture of 78% return-seeking assets continues to be appropriate
  - The Plan is projected to trend towards full funding over the next 10 years
  - Higher or lower level of return-seeking assets will speed up or slow down expected time to full funding

## Asset Allocation

- Current return-seeking portfolio is diversified across public equity, private equity, private credit, and real estate
- Proposed portfolio offers greater diversification to new and existing return-seeking asset classes while maintaining the same risk-reducing portfolio
- Proposed diversification expected to smooth the pattern of future results, mitigate downside funded ratio, and reach full funding at the same time as the current portfolio

## Liquidity

- TRSOK has sufficient liquidity in the modeled Base Case, Recession, and Dark Skies economic scenarios for both the Current and Proposed asset allocations
- In a Dark Skies economic scenario, assets are projected to decline, increasing the proportion of illiquid assets
  - Higher allocation to liquid assets dampens the impact, but does not completely solve the problem



# Asset Allocation Policy Recommendation

Aon and the TRSOK Investment Team support adopting the Proposed Portfolio as the long-term policy target with an effective date of July 1, 2025

	Current Policy	Proposed Portfolio	Change from Current
Public Equity	55.0%	46.5%	-8.5%
Private Equity	8.0	10.0	+2.0
Private Debt	5.0	7.5	+2.5
Real Assets	10.0	11.0	+1.0
<i>Real Estate</i>	<i>10.0</i>	<i>8.0</i>	<i>-2.0</i>
<i>Infrastructure</i>		<i>3.0</i>	<i>+3.0</i>
Fixed Income	22.0	25.0	+3.0
<i>FI Risk-reducing (Core Bonds)</i>	<i>22.0</i>	<i>22.0</i>	<i>--</i>
<i>FI Return-seeking (MAC)</i>		<i>3.0</i>	<i>+3.0</i>
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	
Total Return-Seeking Assets	78.0%	78.0%	--
Total Illiquid (%)	23.0	28.5	+5.5
Expected Return <sup>1</sup> (%)	7.44	7.57	+0.13
Expected Risk (%)	12.90	11.91	-0.99
Expected Sharpe Ratio	0.29	0.32	+0.03
Expected Year Reach Full Funding	2031	2031	--
Expected Downside Funded Ratio	33%	40%	+7.0%

## Proposed Policy Highlights

- Maintain return-seeking / risk-reducing mix
- Increase diversification and reduce public equity risk across existing and new asset classes
- Adopt Real Assets Policy target with Real Estate and Infrastructure defined as allowable ranges

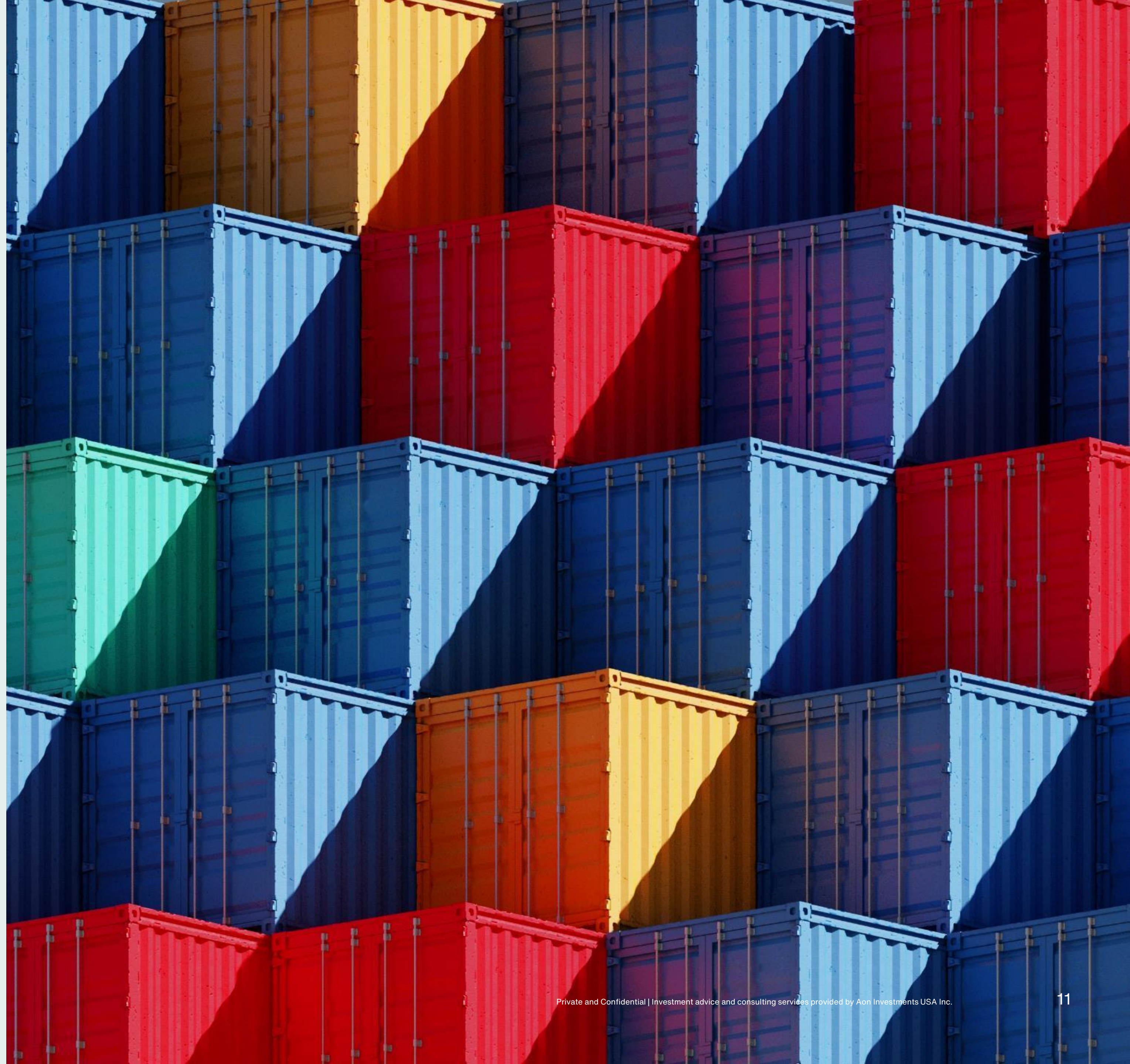
## Expected Portfolio Impact (Proposed – Current)

- Lower risk (-0.99%)
- Higher return (+0.13%)
- More efficient (+0.03 for Sharpe Ratio)
- More illiquids (+5.5%)
- Maintain time to full funding while mitigating downside (+7%)



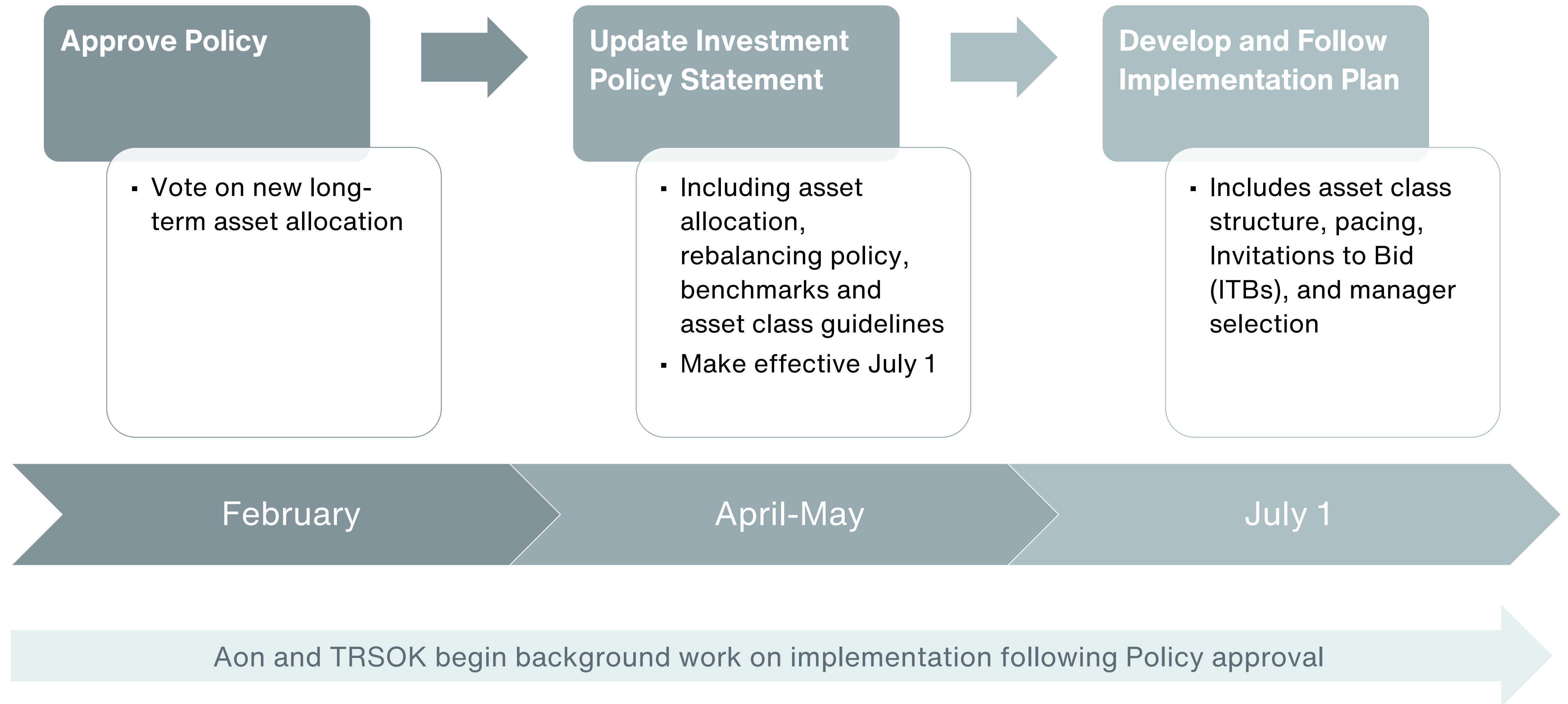
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## Next Steps & Implementation Discussion





# Next Steps





# Next Steps: Asset Class Implementation Actions

## Roles / Responsibilities

Asset Class	Policy Change	Roles/ Responsibilities		
		Board / IC Action	TRSOK Staff	Third-Party Providers
Public Equity	<ul style="list-style-type: none"> <li>-8.5%: will serve as liquid source of funds, as needed</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Manage transition</li> </ul>	<ul style="list-style-type: none"> <li>Aon, Northern Trust, Managers: assist with transitions</li> </ul>
Real Estate	<ul style="list-style-type: none"> <li>-2% (currently underweight new 8% target)</li> </ul>	<ul style="list-style-type: none"> <li>Approve pacing, ITBs, manager selection</li> </ul>	<ul style="list-style-type: none"> <li>Review pacing, ITB development and manager due diligence</li> </ul>	<ul style="list-style-type: none"> <li>Aon: pacing, ITBs and manager due diligence</li> </ul>
Fixed Income	<ul style="list-style-type: none"> <li>No change (restructure asset class)</li> </ul>	<ul style="list-style-type: none"> <li>Approve / Review structure</li> </ul>	<ul style="list-style-type: none"> <li>Review investment structure</li> </ul>	<ul style="list-style-type: none"> <li>Aon: structure review to align with risk-mitigating mandate</li> </ul>
Multi-Asset Credit (MAC)	<ul style="list-style-type: none"> <li>+3% (new asset class)</li> </ul>	<ul style="list-style-type: none"> <li>Approve ITB and manager selection</li> </ul>	<ul style="list-style-type: none"> <li>Manager due diligence</li> </ul>	<ul style="list-style-type: none"> <li>Aon: manager due diligence</li> </ul>
Private Equity	<ul style="list-style-type: none"> <li>+2%</li> </ul>	<ul style="list-style-type: none"> <li>Approve pacing and commitment plan</li> </ul>	<ul style="list-style-type: none"> <li>Review pacing and commitment plan</li> </ul>	<ul style="list-style-type: none"> <li>Franklin Park: develop commitment plan and deploy assets</li> </ul>
Private Debt	<ul style="list-style-type: none"> <li>+2.5%</li> </ul>	<ul style="list-style-type: none"> <li>Approve pacing and commitment plan</li> </ul>	<ul style="list-style-type: none"> <li>Review pacing, structure and commitment plan</li> </ul>	<ul style="list-style-type: none"> <li>Aon: pacing, structure and commitment plan</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>+3.0% (new asset class)</li> </ul>	<ul style="list-style-type: none"> <li>Approve pacing, ITBs, manager selection</li> </ul>	<ul style="list-style-type: none"> <li>Review pacing, ITB development and manager due diligence</li> </ul>	<ul style="list-style-type: none"> <li>Aon: pacing, ITBs and manager due diligence</li> </ul>

# Next Steps: High Level Implementation Plan

The below factors are considered with respect to developing and executing the implementation plan  
Plan is fluid and many actions will occur simultaneously

Implementation Plan	Expected Portfolio Benefit	Implementation Ease	Time to Target
Reduce Public Equity Risk	Strong: Reduces greatest source of risk (volatility)	Easy	Depends on target asset classes
Restructure Fixed Income	Moderate: Reduces risk	Easy	Quick
Add Multi-Asset Credit	Moderate: Diversifies equity risk	Moderate	Quick
Increase Private Debt	Strong: Reduces risk and improves return	Easy	Moderate
Add Infrastructure	Strong: Reduces risk and improves return	Involved	Moderate to Long
Reach Real Estate Target	Light: Diversifies	Moderate	Quick to Moderate
Increase Private Equity	Light: Improves return	Easy	Long



# Next Steps: Tentative Work Plan

## Following Policy Decision, Implementation Will Begin

### Investment Committee / Board Agenda Topics

#### February Meeting

- Approve Asset Allocation Policy
- Discuss & Review Priorities and Implementation Plan
- Approve Real Estate Pacing, Annual Plan and Invitation-to-Bid (ITB)
- Approve Private Equity Pacing and Annual Plan
- Approve Private Debt Allocation Plan

#### April Meeting

- Review updated IPS (asset allocation, rebalancing, benchmarking, and asset class guidelines)
- Approve Private Debt Manager Implementation Plans
- Approve Real Estate Investment

#### May Meeting

- Approve IPS
- Approve Multi-Asset Credit (MAC) structure and ITBs
- Approve Infrastructure pacing, annual plan and ITBs
- Approve Fixed Income Structure

#### July Meeting

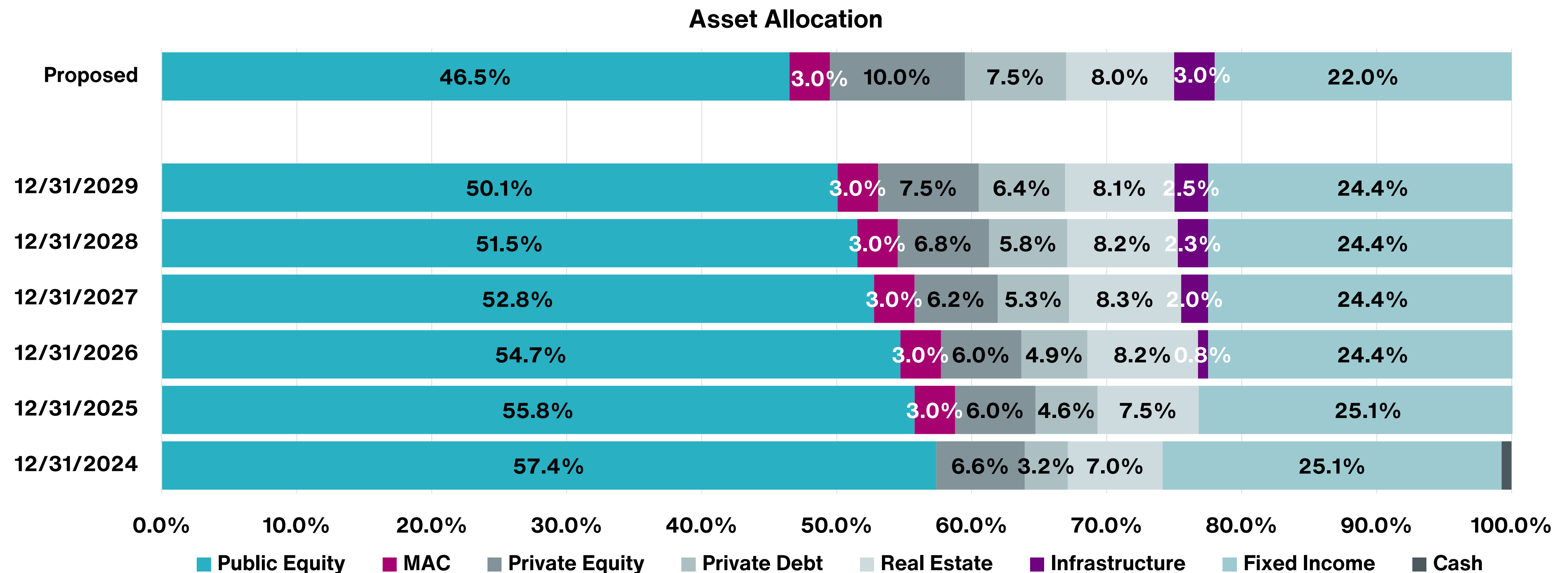
- *Tentative Approve MAC managers*
- *Tentative Approve Fixed Income changes (if any follow-up)*

#### August Meeting

- *Tentative Approve Core Infrastructure managers*

# Next Steps: Path to New Policy Will Be Gradual

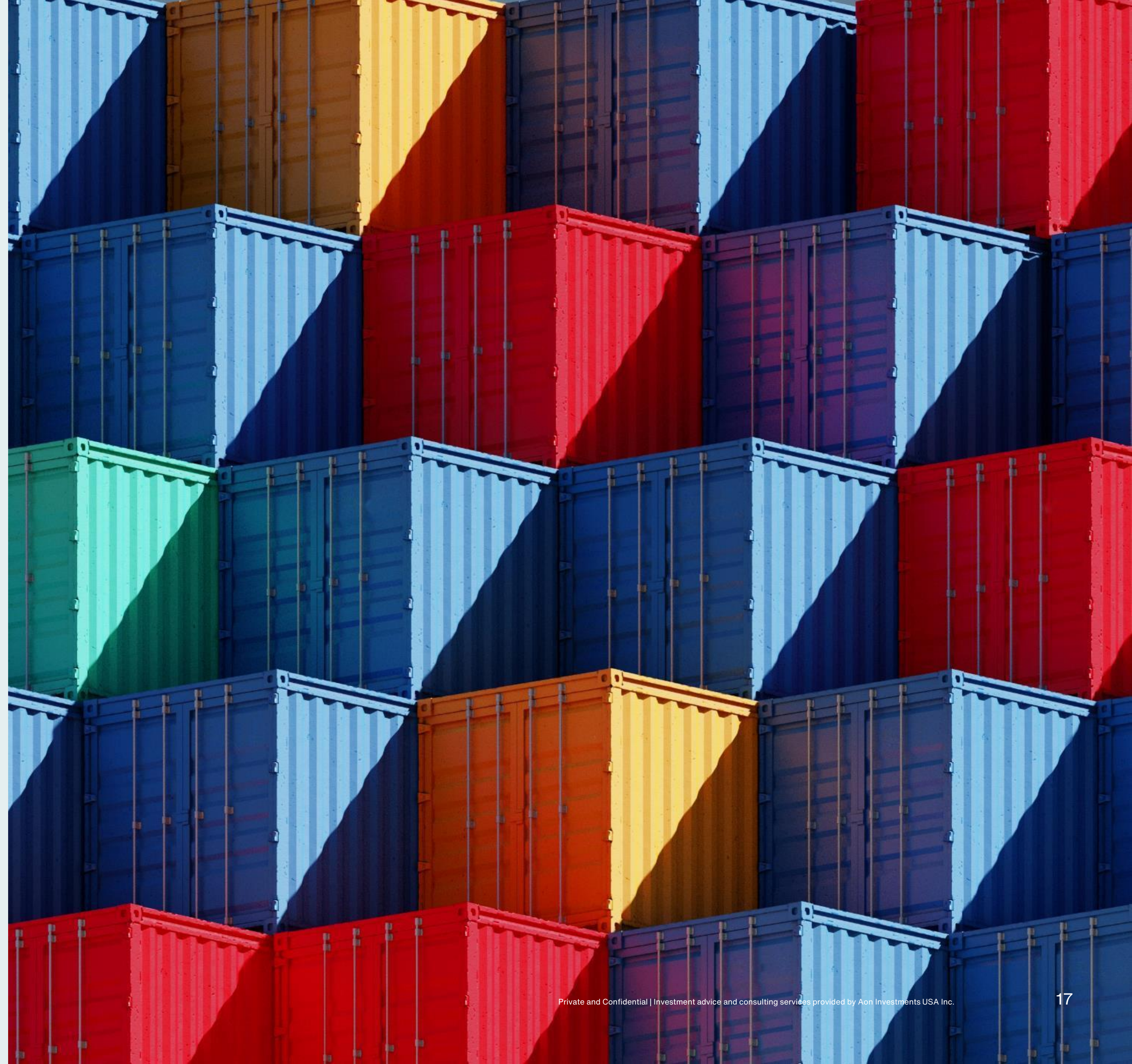
- Based on current assumptions and preliminary pacing analysis, it is expected that TRSOK can mostly reach the Proposed Portfolio over the course of 4-5 years
  - Asset allocation evolution will be gradual and potentially choppy based on markets and opportunities
- Pacing revisited annually to adjust pacing plans to updated circumstances





# 3

## Appendix





# Appendix

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# Actuarial Assumptions and Methods

## Section 3: Appendix



# Actuarial Assumptions and Methods

## Data

- Projections – for liability, normal cost, benefit payments, plan expenses, etc. – were collected from the plan actuary based on the June 30, 2024 actuarial valuation

## Actuarial assumptions:

- Valuation Rate of Interest = 7.00%
- Inflation = 2.50%
- All other assumptions as documented in the Actuarial Valuation Report as of June 30, 2024 unless noted otherwise

## Future contribution amounts/methodology

- Our understanding based on the June 30, 2024 actuarial valuation is the following:
  - Statutory rates are found in the table below
    - If/when the Plan achieves full funding on an actuarial value of asset basis, the State contributions are discontinued

Fiscal Year Ending	Employee%	Employer%	State %	Grant Matching %	Total %
2025 – 2027	7.0%	9.3%	8.1%	0.7%	25.1%
2028+	7.0%	9.3%	7.7%	0.7%	24.7%

## Projection Assumptions

- Estimated asset experience through September 30, 2024 was factored into this analysis

# Additional Asset-Liability Projection Analysis

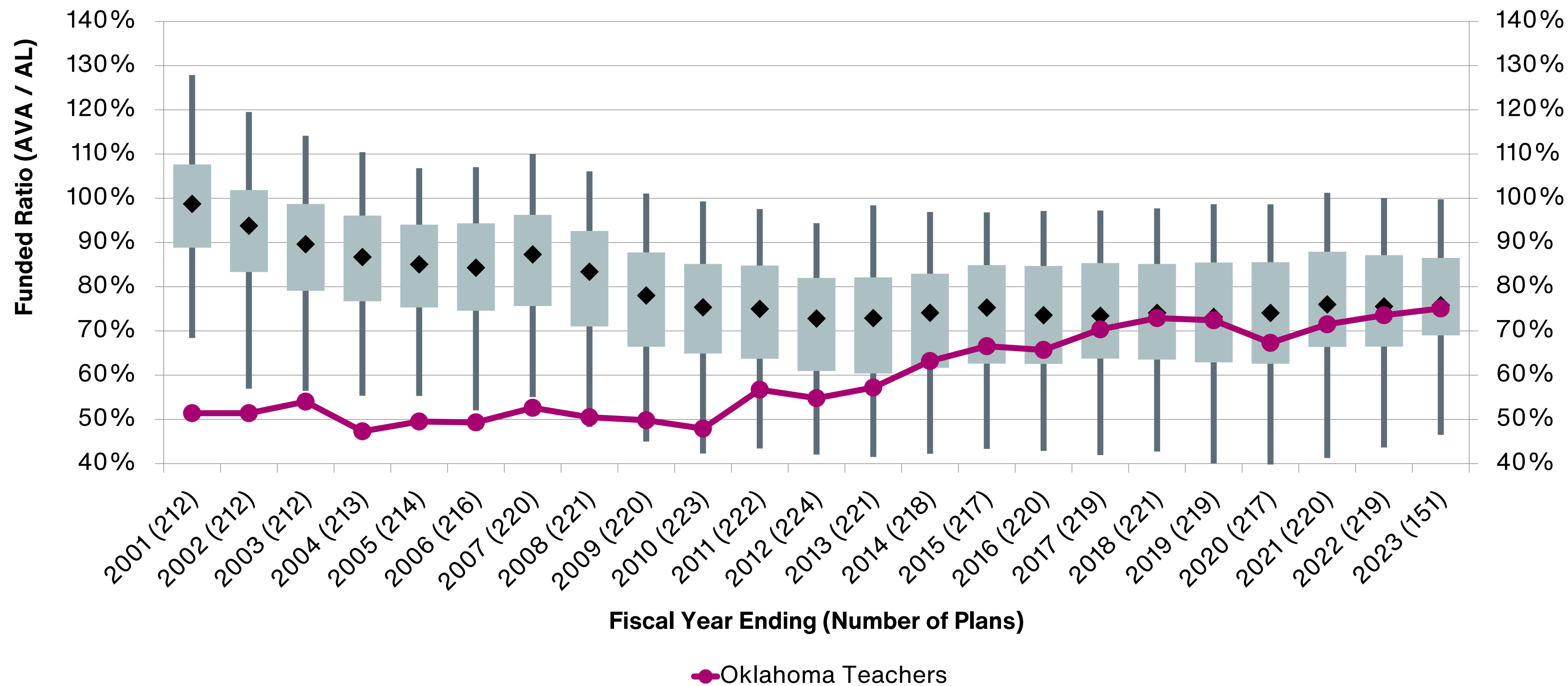
Section 3: Appendix



# Historical Data

TRSOK has made great improvement in funded ratio relative to U.S. public pension peers<sup>1</sup>

Distribution of U.S. Public Pension Funded Ratios



Source: Public Plans Data (publicplansdata.org) as of November 2024  
Number of plans per year are shown in parentheses

## Key Takeaways

- In FYE 2001, actuarial funded ratio was below the 5<sup>th</sup> percentile of U.S. public plans
- In FYE 2023, TRSOK sits near the median of U.S. public pension plans

# Est. Current State Asset-Liability Profile (as of September 30, 2024)

TRSOK projects to have a hurdle rate surplus, increasing near-term funded status

Asset-Liability Snapshot				
Metric (\$, Millions)	As of 6/30/2024		Est. 9/30/2024	
	Value	Fund %	Value	Fund %
Market Value of Assets	\$22,963.6	78.0%	\$24,064.4	81.3%
Actuarial Value of Assets	\$22,675.6	77.0%	\$0.0	
Liability Metrics				
Actuarial Liability (AL) – Funding <sup>1</sup>	\$29,433.6		\$29,598.1	

Asset-Liability Growth Metrics as of 9/30/2024			
Metric (\$, Millions)	Value	% Liability	% Assets
AL Discount Cost	\$2,071.9	7.00%	8.61%
AL Normal Cost	\$641.8	2.17%	2.67%
Plan Expenses	\$7.2	0.02%	0.03%
<b>Total Liability Hurdle Rate</b>	<b>\$2,720.8</b>	<b>9.19%</b>	<b>11.31%</b>
Expected Return on Assets <sup>2</sup>	\$1,789.8	6.05%	7.44%
Total Contributions	\$1,507.9	5.09%	6.27%
<b>Total Exp. Asset Growth</b>	<b>\$3,297.7</b>	<b>11.14%</b>	<b>13.71%</b>
<b>Hurdle Rate (Shortfall)/Surplus</b>	<b>\$576.9</b>	<b>1.95%</b>	<b>2.40%</b>
Est. Benefit Payments	\$1,843.4	6.23%	7.66%

<sup>1</sup> Based on a 7.00% discount rate consistent with the June 30, 2024 actuarial valuation results.

<sup>2</sup> Expected returns are using Aon's Q4 2024 30-Year Capital Market Assumptions as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Analysis includes \$7.2MM in expenses, assumed to be inclusive of investment consulting fees, paid from trust assets. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages. Percentages may not sum to 100% due to rounding.

## Key Takeaways:

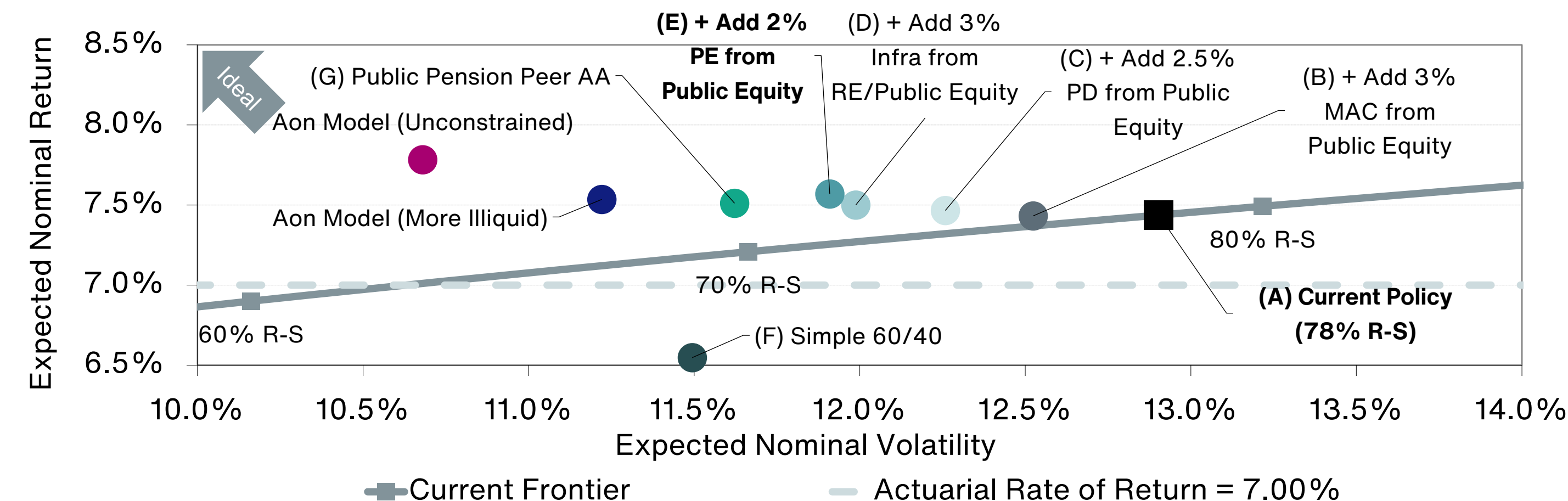
- Pension plan is estimated to be **81.3%** funded on a market value of assets basis as of September30, 2024
- Asset hurdle rate of **11.31%**, via cash funding and investment returns, needed to maintain or improve funded status
- The total expected asset growth rate (EROA plus contributions) exceeds the liability hurdle rate by **240 bps**

Target Asset Allocation as of 9/30/2024		
Metric (\$, Millions)	Value	Alloc %
<b>Return-Seeking</b>		
- Public Equity	\$13,235.4	55%
- Private Equity	\$1,925.2	8%
- Illiquid Return-Seeking Fixed Income	\$1,203.2	5%
- Open-End Real Assets	\$1,203.2	5%
- Closed-End Real Assets	\$1,203.2	5%
- Total	\$18,770.2	78%
<b>Risk-Reducing</b>		
- Core Bonds	\$5,294.2	22%
- Total	\$5,294.2	22%
<b>Total</b>	<b>\$24,064.4</b>	<b>100%</b>



# Portfolio Analysis – Risk/Reward Spectrum

Additional diversification is expected to reduce portfolio volatility



## Key Takeaways

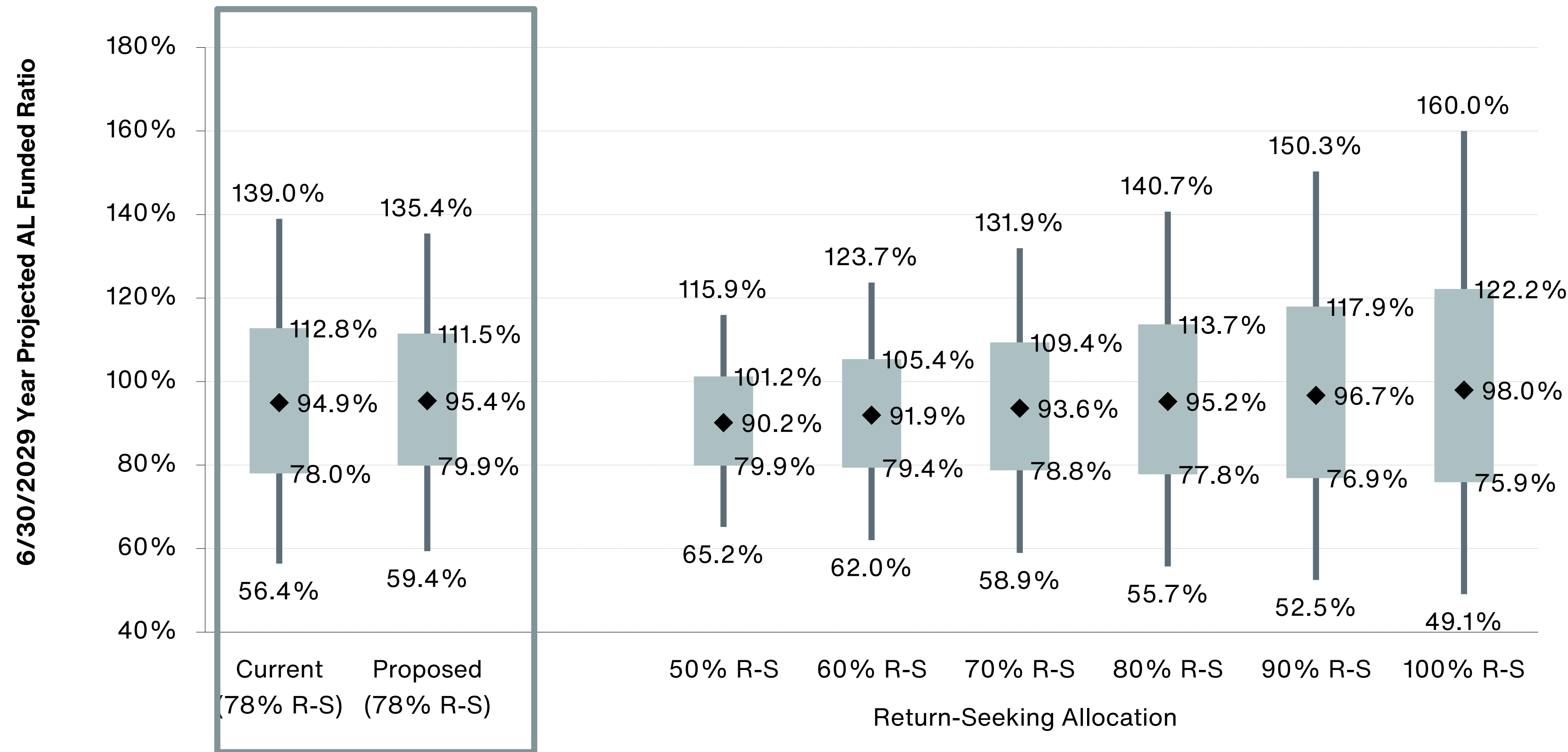
- Current Policy expected return of **7.44%** exceeds the 7.00% actuarial assumed rate of return
- Opportunities exist to reduce volatility while maintaining similar levels of expected returns via additional diversification

Portfolio Metrics				Return-Seeking (R-S) Assets						Risk-Reducing/ Safety Assets		
	Expected Nominal Return <sup>1</sup>	Expected Nominal Volatility	Sharpe Ratio	Public Equity	Private Equity	Liquid Alts	Liquid Return- Seeking Fixed Income	Illiquid Return- Seeking Fixed Income	Open- End Real Assets	Closed- End Real Assets	Core/Core Plus Bonds	
(A) Current Policy (78% R-S)	7.44%	12.90%	0.29	55.0%	8.0%	0.0%	0.0%	5.0%	5.0%	5.0%	22.0%	
(B) + Add 3% MAC from Public Equity	7.43%	12.52%	0.30	<b>52.0%</b>	8.0%	0.0%	<b>3.0%</b>	5.0%	5.0%	5.0%	22.0%	
(C) + Add 2.5% PD from Public Equity	7.47%	12.26%	0.31	<b>49.5%</b>	8.0%	0.0%	3.0%	<b>7.5%</b>	5.0%	5.0%	22.0%	
(D) + Add 3% Infra from RE/Public Equity	7.50%	11.99%	0.32	<b>48.5%</b>	8.0%	0.0%	3.0%	7.5%	<b>6.0%</b>	<b>5.0%</b>	22.0%	
(E) + Add 2% PE from Public Equity	7.57%	11.91%	0.32	<b>46.5%</b>	<b>10.0%</b>	0.0%	3.0%	7.5%	6.0%	5.0%	22.0%	
(F) Simple 60/40	6.55%	11.49%	0.25	60.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	
(G) Public Pension Peer AA	7.51%	11.62%	0.33	45.0%	10.0%	5.0%	3.0%	4.0%	7.0%	6.0%	20.0%	
Aon Model (More Illiquid)	7.54%	11.22%	0.34	43.9%	9.8%	7.3%	4.9%	2.4%	4.9%	4.9%	22.0%	
Aon Model (Unconstrained)	7.78%	10.68%	0.38	34.1%	14.6%	7.3%	4.9%	4.9%	4.9%	7.3%	22.0%	

<sup>1</sup> Expected returns are using AIUSA Q3 2024 30-Year Capital Market Assumptions (CMAs) as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns may differ from model returns presented based on your plan's individual fees/expenses. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages. Percentages may not sum to 100% due to rounding.

# Asset-Liability Projection Analysis – Funded Ratio (MVA)

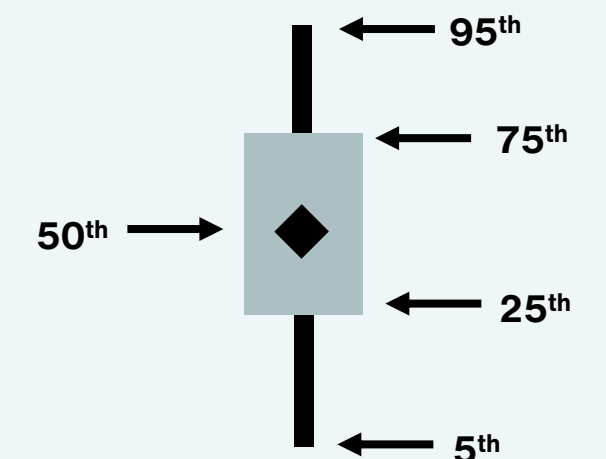
Short-term (5-year) funded ratio sensitivity driven by investment risk



## Key Observations

- Higher risk portfolios are projected to have both more upside and downside potential over a 5-year time horizon
- Similarly, lower risk portfolios will have a narrower range of potential outcomes

Legend: Distribution of Outcomes

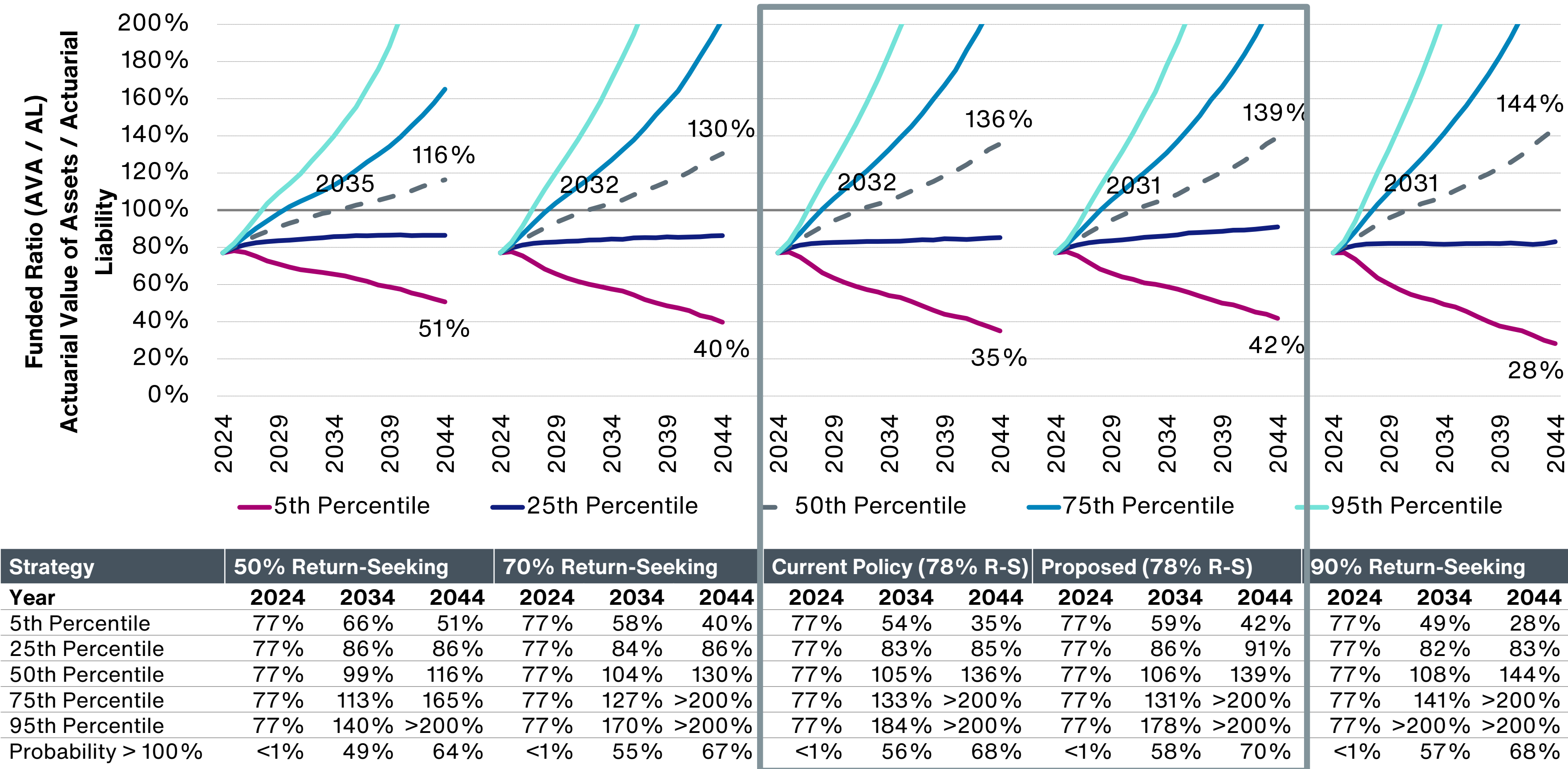


Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.



# Asset-Liability Projection Analysis – Funded Ratio (AVA)

Plan is expected to reach full funding over the projection period;  
additional diversification is expected to mitigate tail-risk



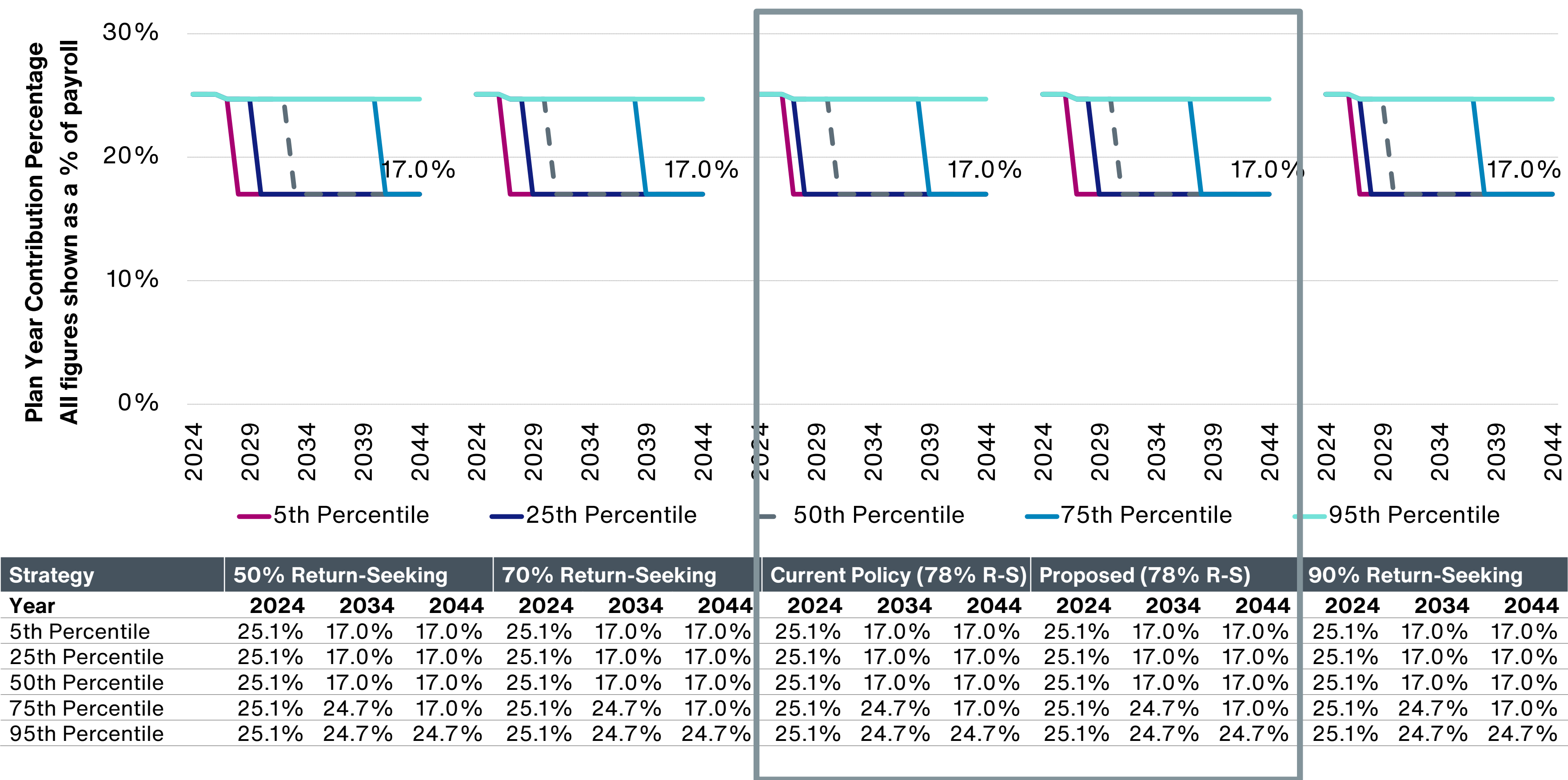
Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.

## Key Observations

- The Current 78% R-S policy is expected to increase the funded ratio over the 20-year horizon
- Lower return-seeking allocations are also expected to have a central expectation (50<sup>th</sup> percentile outcome) of a fully funded plan but with a narrower range of outcomes
- Additional diversification of the return-seeking portfolio is expected to reduce volatility

# Asset-Liability Projection Analysis – Contributions

Net outflow grows as plan is better funded and contributions decrease



Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.

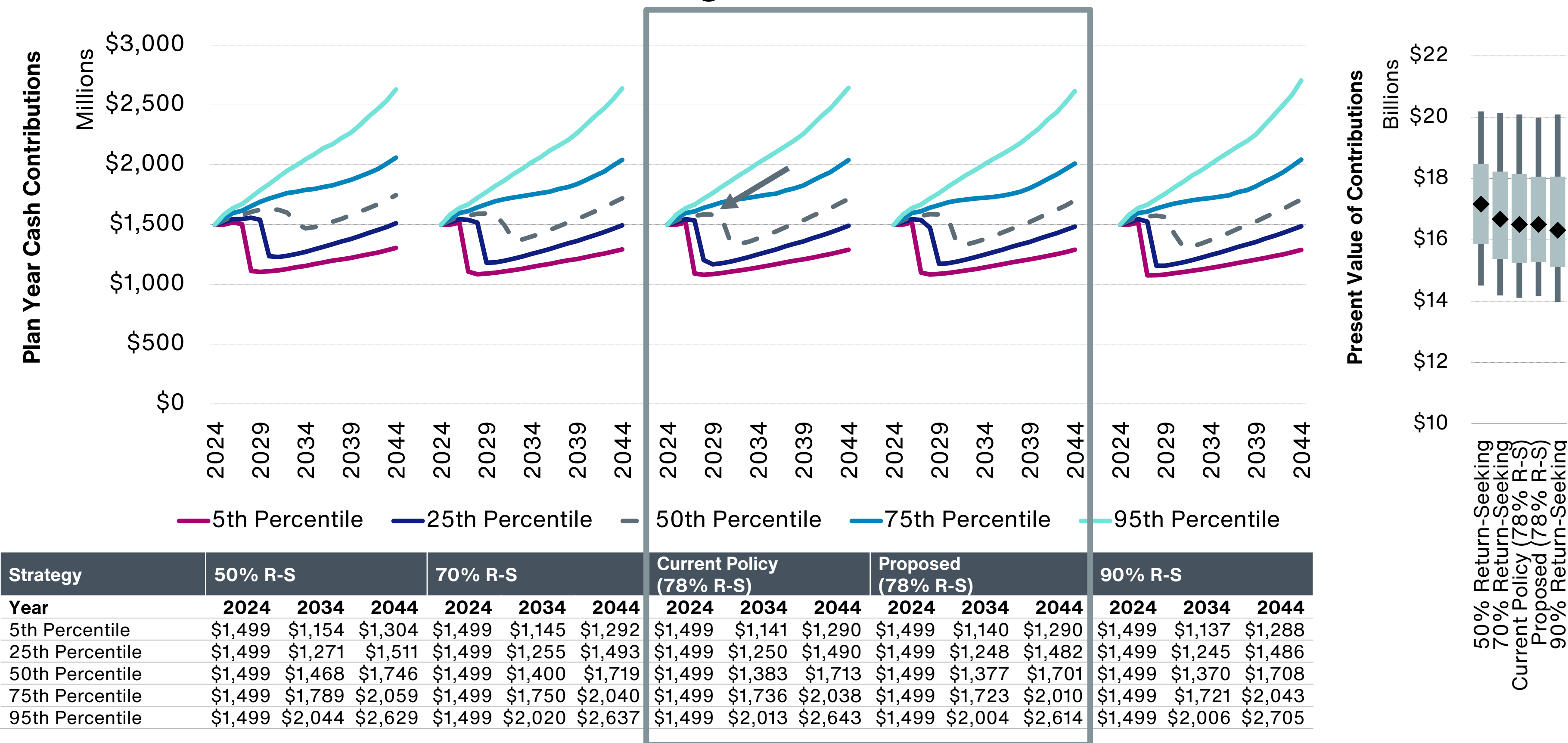
## Key Observations

- Plan contributions consist of employee, employer, and State funds
- At full funding, this analysis assumes that the State funding ceases, causing a drop in the overall contribution rate



# Asset-Liability Projection Analysis – Contributions

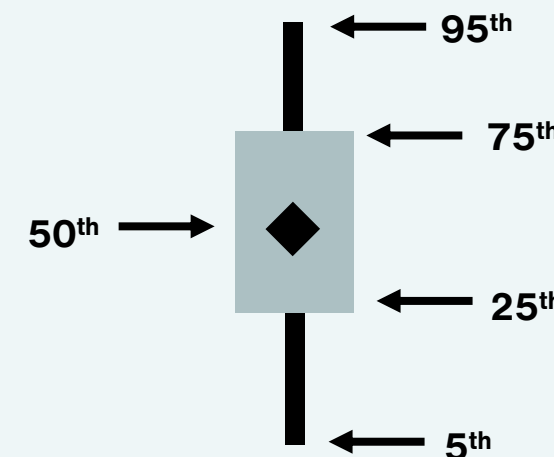
Contributions expected to increase with payroll, dropping slightly when the Plan attains full funding



## Key Observations

- Plan contributions are based on percentages of payroll and expected to increase with payroll growth
- Contributions decrease at full funding where the State portion of the contribution is assumed to cease

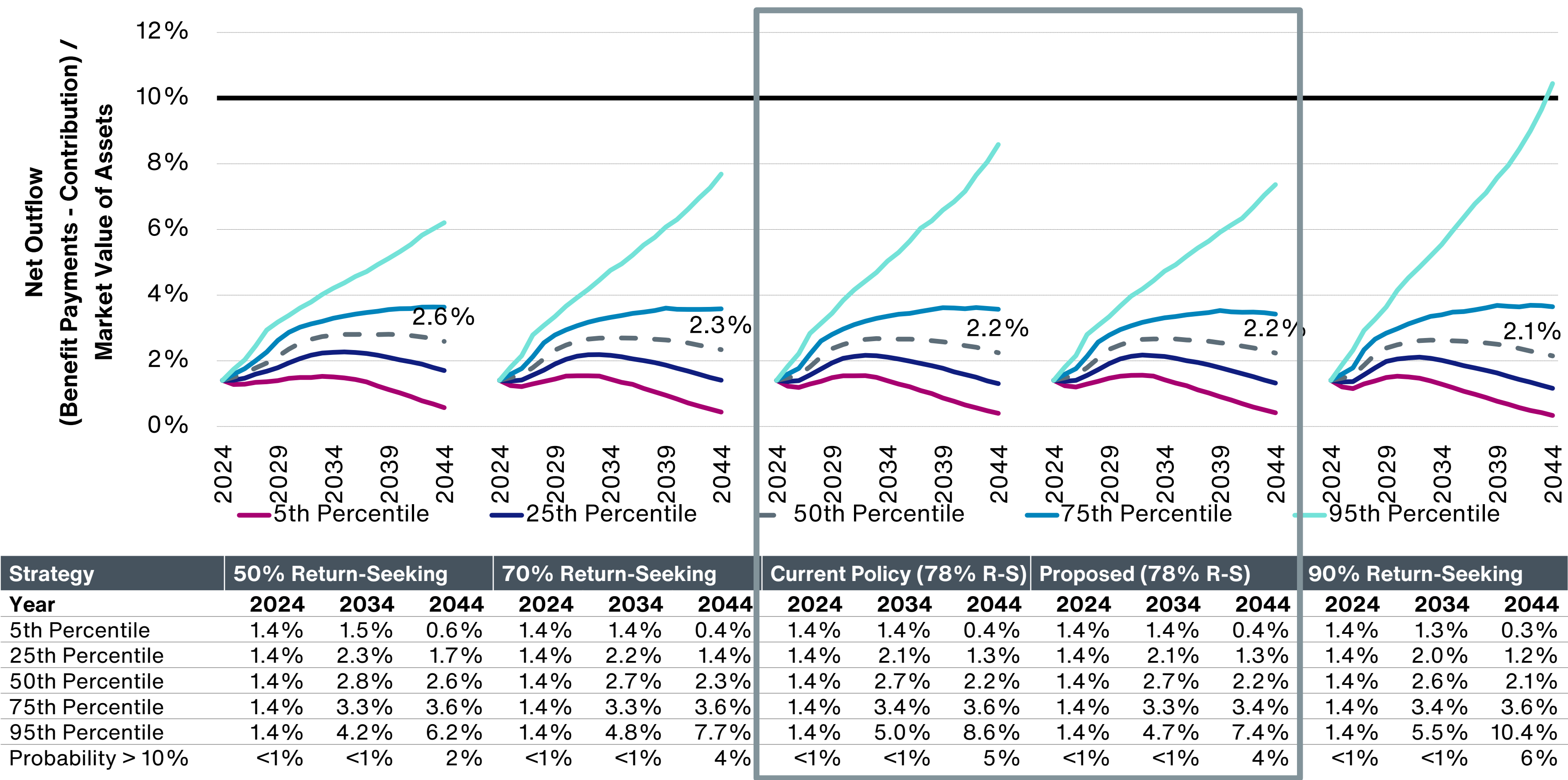
Legend: Distribution of Outcomes



Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.

# Asset-Liability Projection Analysis – Net Outflow

Net outflow grows as plan is better funded and contributions decrease



Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.

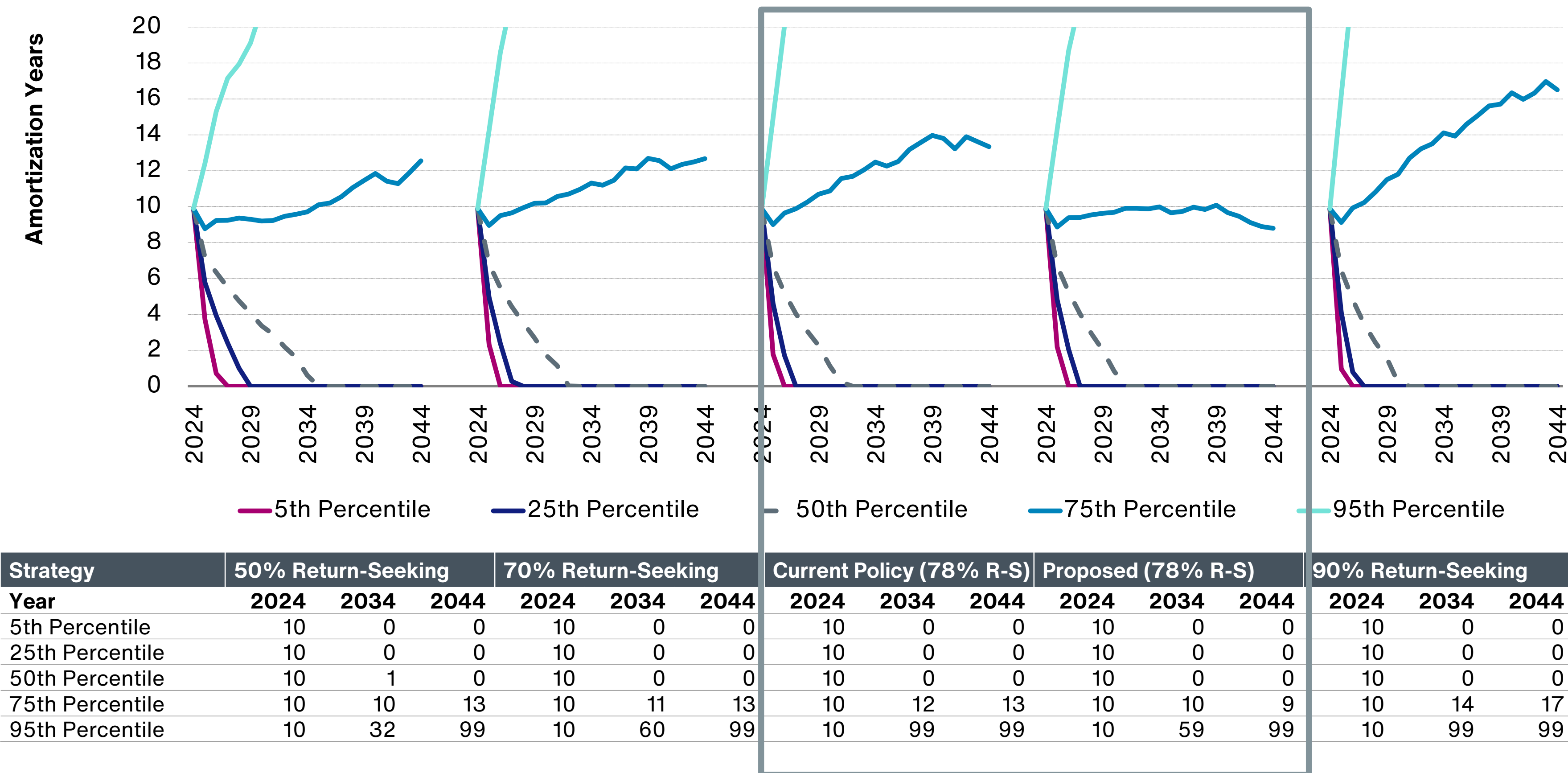
## Key Observations

- Net outflow is consistent across the policies modeled with central expectations (50<sup>th</sup> percentile outcome) in the 1-3% range
- Lower growth portfolios with have slightly higher net outflow due to having lower overall assets
- Net outflows of 10%+ can put stress on fund liquidity over time; however, it is not likely over the projection period



# Asset-Liability Projection Analysis – Amortization Period

Amortization period is expected to decline over the projection period



## Key Observations

- The amortization period is how many years the unfunded actuarial liability (UAL) contributions will need to pay off the UAL
- On a market value of asset basis, the current amortization period is 10 years
- The amortization period will decline as the Plan approaches full funding

Projections assume a constant 7.00% discount rate for pension liabilities for all investment policies studied. Projections in this material include estimated expenses paid from plan assets, provided by the plan actuary, which is assumed to be inclusive of investment management fees. Actual fees and expenses may differ from those presented.

# Summary of Results

Portfolios	Portfolio Metrics (30-year CMAs)			Financial Results			
	Expected Nominal Return <sup>1</sup>	Expected Nominal Volatility	Sharpe Ratio	20-year Ending Funded Ratio (MVA / AL)		20-year Present Value of Contributions	
				Expected <sup>2</sup>	Downside <sup>3</sup>	Expected <sup>2</sup>	Downside <sup>4</sup>
Current Policy (78% R-S)	7.44%	12.90%	0.29	137%	33%	\$16.5	\$20.1
Proposed (78% R-S)	7.57%	11.91%	0.32	140%	40%	\$16.5	\$20.0
<b>Current Frontier</b>							
0% Return-Seeking	4.50%	5.40%	0.15	86%	54%	\$19.0	\$21.1
10% Return-Seeking	4.97%	5.19%	0.24	92%	57%	\$18.7	\$20.7
20% Return-Seeking	5.41%	5.52%	0.31	97%	58%	\$18.3	\$20.5
30% Return-Seeking	5.82%	6.32%	0.34	102%	55%	\$17.9	\$20.3
40% Return-Seeking	6.21%	7.43%	0.34	109%	52%	\$17.5	\$20.2
50% Return-Seeking	6.57%	8.74%	0.33	116%	48%	\$17.2	\$20.2
60% Return-Seeking	6.90%	10.16%	0.31	124%	43%	\$16.9	\$20.2
70% Return-Seeking	7.21%	11.66%	0.30	131%	37%	\$16.7	\$20.1
80% Return-Seeking	7.49%	13.22%	0.29	138%	32%	\$16.5	\$20.1
90% Return-Seeking	7.75%	14.80%	0.27	143%	26%	\$16.3	\$20.1
100% Return-Seeking	7.99%	16.42%	0.26	149%	20%	\$16.2	\$20.1

<sup>1</sup> Expected returns are using AIUSA Q3 2024 30-Year Capital Market Assumptions (CMAs) as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns may differ from model returns presented based on your plan's individual fees/expenses. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages.

<sup>2</sup> Expected = 50th percentile outcome or central expectation across all 5,000 simulations

<sup>3</sup> Downside = 5th percentile outcome across all 5,000 simulations

<sup>4</sup> Downside = 95th percentile outcome across all 5,000 simulations



# Liquidity Analysis Detail

Section 3: Appendix

# Liquidity Analysis Background

## Aon Investments' approach to analysing liquidity risk from alternatives

### Background

- Intended as a stress-testing model
- Develops multi-year projections of assets and spending needs
- Uses different scenarios for economic environments and other relevant events
- Shows how the portfolio's liquidity profile could evolve with a given investment strategy
- Incorporates the profile of the liabilities as well as expected future contributions

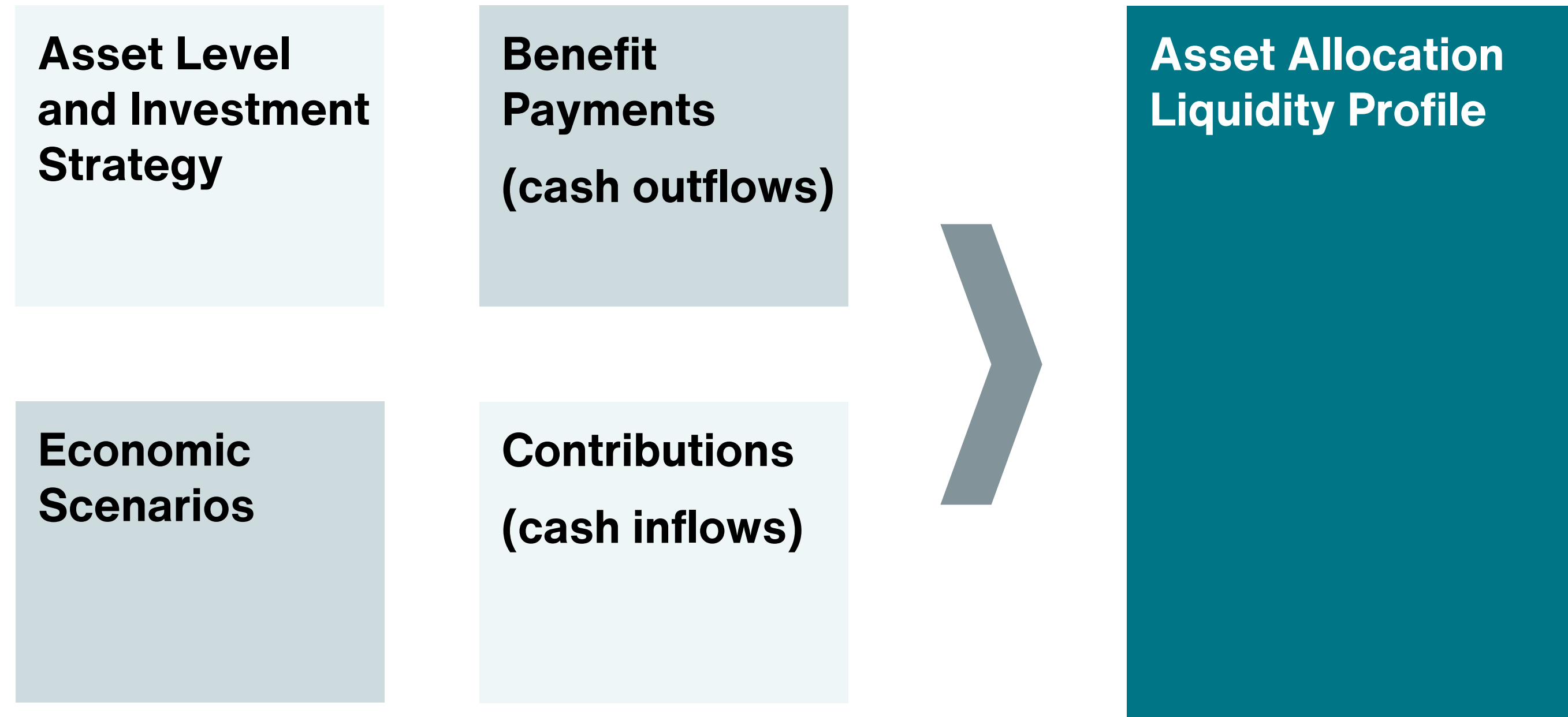
### Assumptions

- Starting assets based on the reported value as of September 30, 2024 (\$24.1B)
- The plan's contribution policy is actuarially-based, leveraging the asset-liability study for projection analysis
- Assumes the portfolio starts at the target asset allocation levels for illiquid assets, maintaining close to the portfolio targets over the next 10 years
- Illiquid asset commitments are assumed to continue under each economic scenario subject to the conditions below:
  - Should actual allocations exceed targets by 10%, future commitments are trimmed 15%
  - Should actual allocations exceed targets by 20%, future commitments are trimmed 30%
- Quasi-liquid assets are assumed to be redeemed under each economic scenario subject to the conditions below:
  - Should actual allocations exceed targets by 20%, 15% of assets are redeemed
  - Should actual allocations exceed targets by 50%, 25% of assets are redeemed
- Base case economic scenario assumptions equal the 10-year capital market assumptions used in the asset-liability projection analysis



# Liquidity Analysis Background

Process inputs and outputs



# Liquidity Analysis Overview

## Background

**Many public sector defined benefit plans use alternative assets to improve the return potential and diversification of their portfolios**

But it is critical to ensure that any illiquidity risk is tolerable

**The specific level of illiquid assets a public pension can hold is dependent on its circumstances – including asset allocation, contribution policy, and level of benefit payments**

We find that most public pension systems can invest in a substantial amount of very illiquid alternative assets, such as closed-end real estate and private equity

**The specific allocation levels tolerable are highly dependent on the plan sponsor's contribution strategy**

A plan sponsor that increases contributions in deep market downturns can hold more illiquid assets than a plan sponsor that contributes a stable amount across different market conditions

**The analysis that follows utilizes TRSOK's current asset-liability profile and circumstances to arrive at an initial assessment of the plans' tolerance for illiquidity**



# Liquidity Analysis Overview

## Background

**TRSOK's liquidity analysis is performed under the modeled Current and Proposed target allocations**

Intended as a stress-testing model, incorporating the profile of the liabilities as well as expected future contributions

Uses different scenarios for economic environments and other relevant events

Shows how the portfolio's liquidity profile could evolve with a given investment strategy

**We categorized investments by liquidity into five buckets**

**Liquid (Risk-Reducing Assets):** Less than 3 months needed for return of capital (e.g., publicly traded securities)

**Liquid (Return-Seeking Assets):** Less than 3 months needed for return of capital (e.g., publicly traded securities)

**Quasi-Liquid:** Typical lock-up of 3–12 months; Conservatively, we assumed a 1-year lock-up in most economic environments, 2 years in a Recession scenario, and 3 years in a Dark Skies scenario (e.g., many hedge funds, open-end real assets)

**Illiquid: Potential lock-up of 5–10 years**, depending on economic environment (e.g., closed-end real assets)

**Illiquid: Potential lock-up of 10+ years** (e.g., typical private equity)

**This is intended to be a conservative approximation of the actual liquidity properties of the assets**

# Liquidity Analysis

## Asset allocation and liquidity category

Liquidity Category	Asset Class	Current Target Allocation (78% R-S)	Proposed (78% R-S)
Liquid (Risk-Reducing Assets)	Core Fixed Income	22.0%	22.0%
	<b>Subtotal</b>	<b>22.0%</b>	<b>22.0%</b>
Liquid (Return-Seeking Assets)	Public Equity	55.0%	46.5%
	Multi-Asset Credit	--	3.0%
	<b>Subtotal</b>	<b>55.0%</b>	<b>49.5%</b>
Quasi-Liquid Assets	Open-End Real Estate	5.0%	4.0%
	Open-End Infrastructure	--	2.0%
	<b>Subtotal</b>	<b>5.0%</b>	<b>6.0%</b>
Illiquid 5-10 Years	Closed-End Real Estate	5.0%	4.0%
	Private Debt	5.0%	7.5%
	<b>Subtotal</b>	<b>10.0%</b>	<b>11.5%</b>
Illiquid 10+ Years	Private Equity	8.0%	10.0%
	Closed-End Infrastructure	--	1.0%
	<b>Subtotal</b>	<b>8.0%</b>	<b>11.0%</b>
Totals	Asset Allocation	100.0%	100.0%
	<b>Quasi + Illiquid Assets</b>	<b>23.0%</b>	<b>28.5%</b>



# Liquidity Analysis

## Economic scenarios

### Base Case Scenario

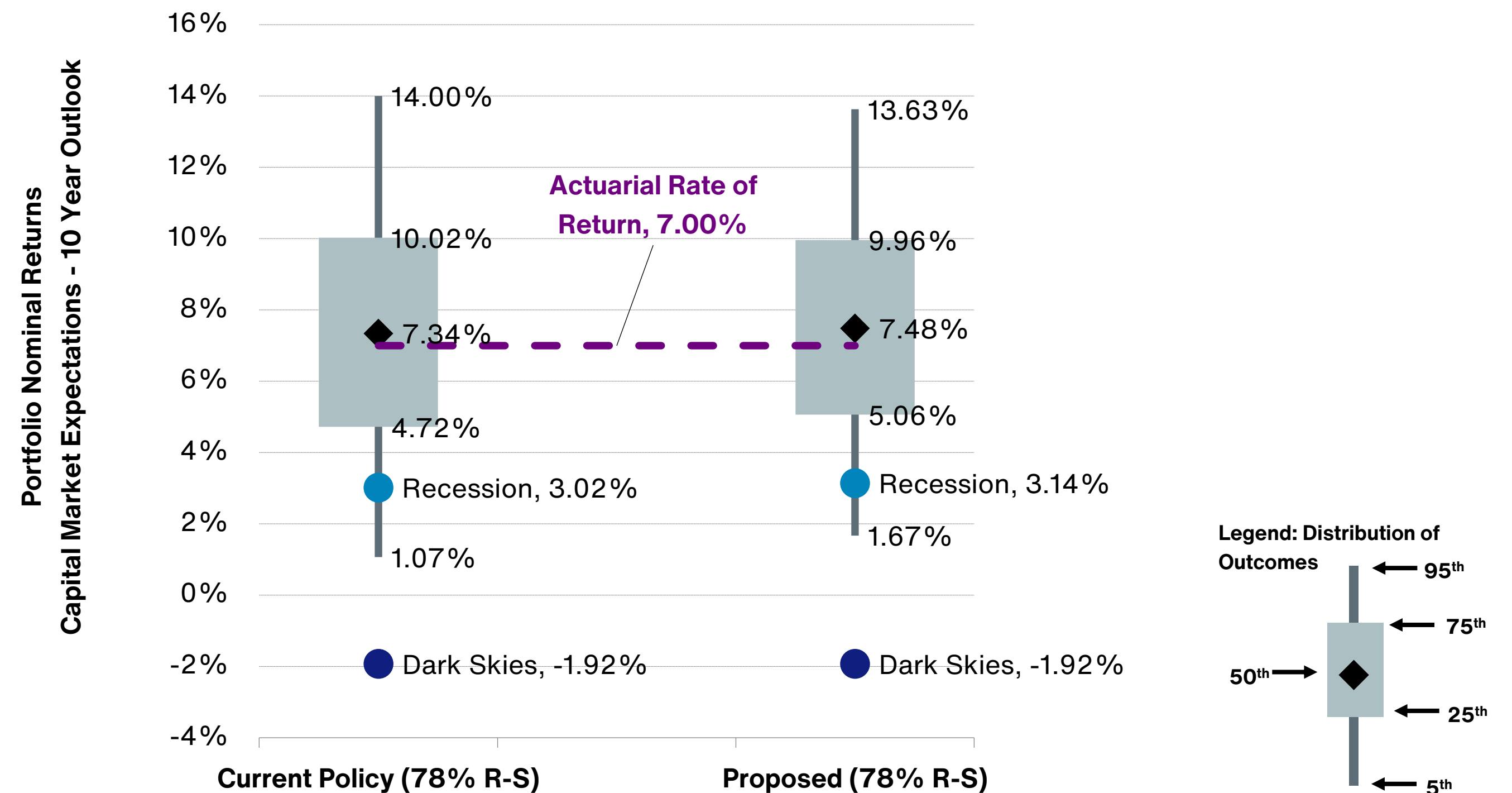
- Markets perform consistent with Aon's Capital Market Assumptions (~50th percentile)

### Recession Scenario

- Somewhat pessimistic outlook for the markets
- Return-seeking assets decline in the first two years with a modest rebound in later years

### Dark Skies Scenario

- Very pessimistic outlook for markets
- Return-seeking assets decline significantly
- The value of public equities declines approximately 50% over three years, without an immediate rebound



**Capital Market Assumptions:** Expected returns are using AIUSA Q3 2024 10-Year Capital Market Assumptions (CMAs) as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns may differ from model returns presented based on your plan's individual fees/expenses. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. See appendix for capital market assumptions disclosure pages.

**Economic Scenario Source:** Aon, as of September 30, 2024. Annual projection starts from September 30, 2024. Projections of general asset class returns and economic conditions are forward-looking expectations by Aon based on informed historical results and internal analysis. Forecasts, estimates and other information contained herein are based upon proprietary research and our framework of analyzing fundamental, valuation and long-term drivers of capital markets. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise - or even estimate - of future performance. Such information is hypothetical in nature, does not reflect actual results, and is not a guarantee of future results. Economic factors and return assumptions depend on current market conditions and, as such, may change over time. Our economic scenario analysis is designed to reflect the typical cost of implementing an investment program. Asset return projections do not include the deduction of management fees and other expenses that may be incurred in managing an investment account.

# Liquidity Analysis – Summary of Results

Sufficient liquidity in base case, recession, and dark skies scenario;  
protracted downturn increases stress

	Asset Allocation			
	Current Policy (78% R-S)		Proposed (78% R-S)	
	Max Illiquid Allocation	Ratio of Max Illiquids to Base Case	Max Illiquid Allocation	Ratio of Max Illiquids to Base Case
Base Case	23%	1.00	29%	1.00
Recession	26%	1.13	33%	1.16
Dark Skies	35%	1.52	44%	1.54

**Note:** This analysis is highly sensitive to the assumed contributions. If TRSOK receives less contributions than assumed, especially in a Dark Skies environment, then illiquid and quasi-liquid investments would drift even further from target and the potential for liquidity issues increases

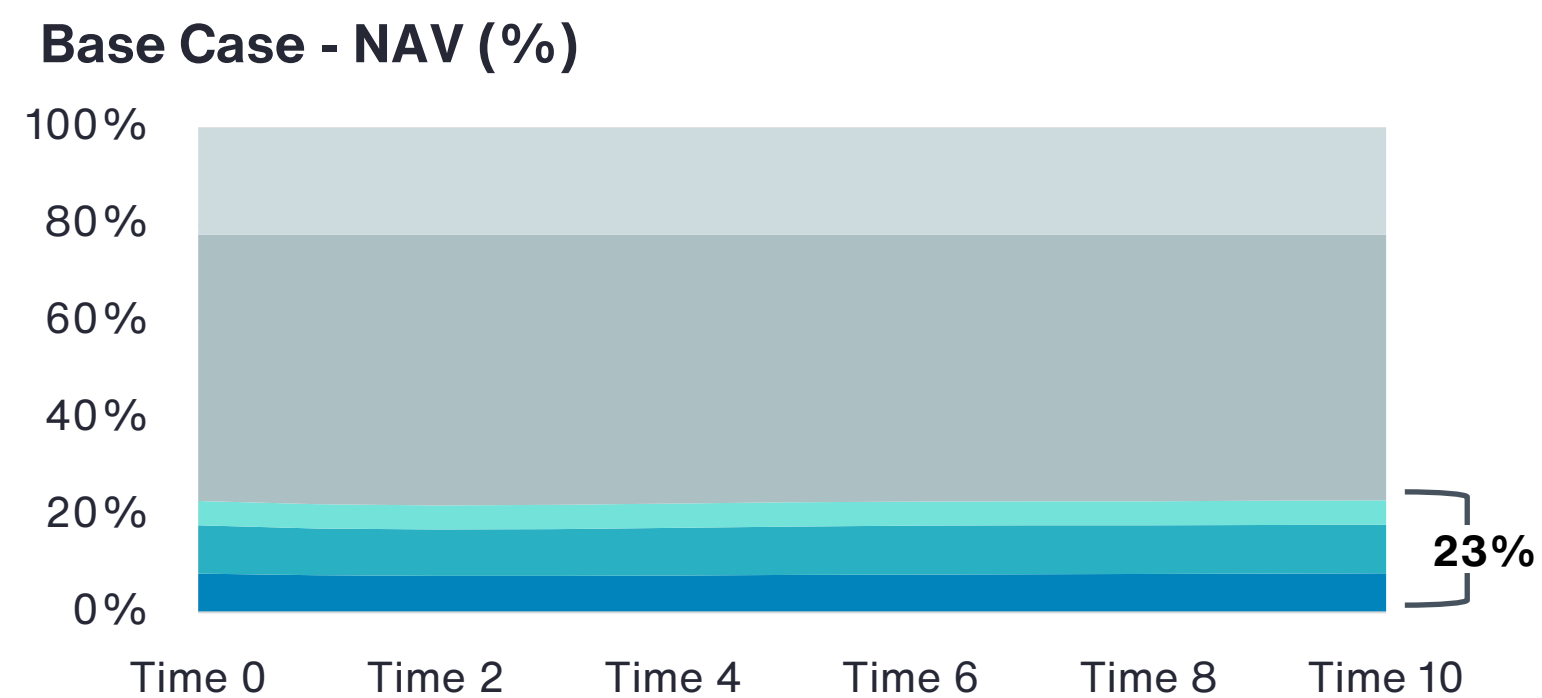
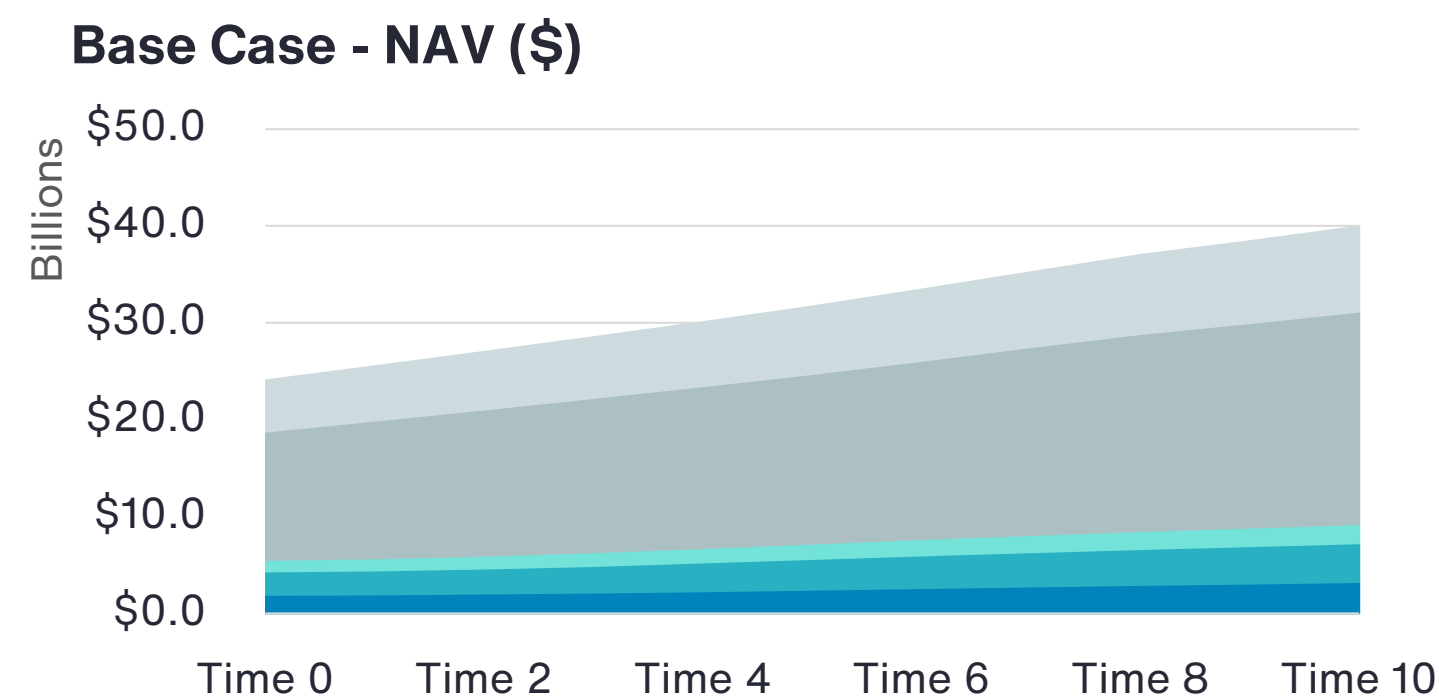
## Key Takeaways

- TRSOK has sufficient liquidity in the modeled Base Case, Recession, and Dark Skies economic scenarios for both the Current and Proposed asset allocations
  - The modeled scenarios show no problems paying benefits to participants
- In a Dark Skies economic scenario, assets are projected to decline increasing the proportion of illiquid assets
  - Potential remedies if the Dark Skies scenario occurs include:
    - Accepting this risk
    - Adjusting the funding policy

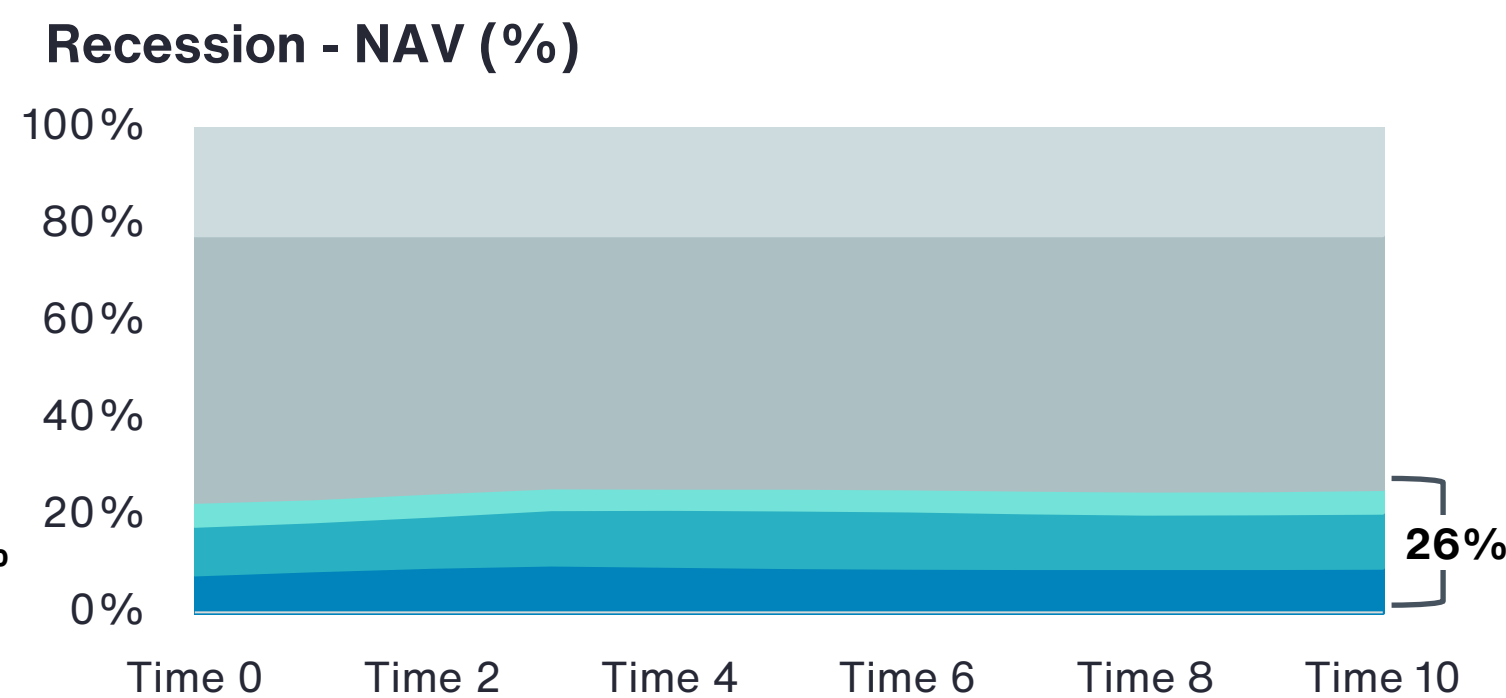
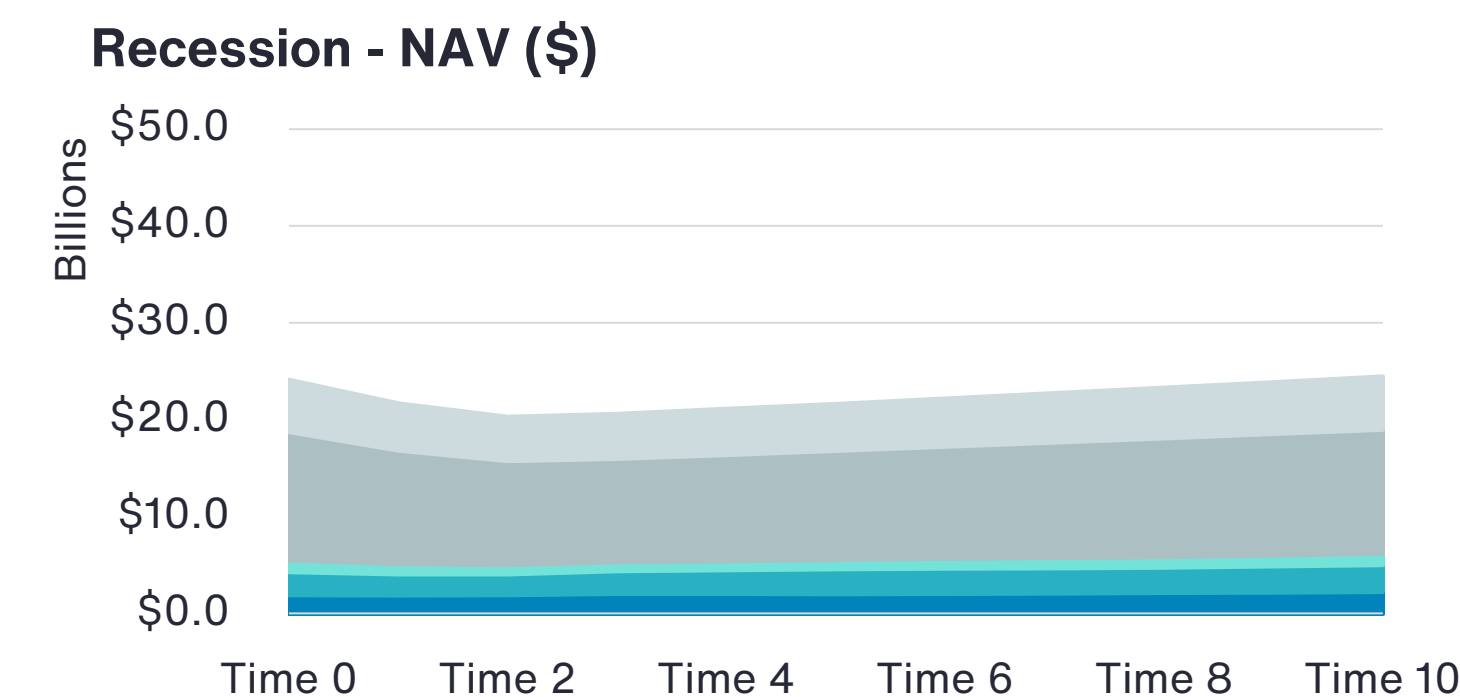
# Liquidity Analysis – Results

Current target allocation (23% illiquid assets)

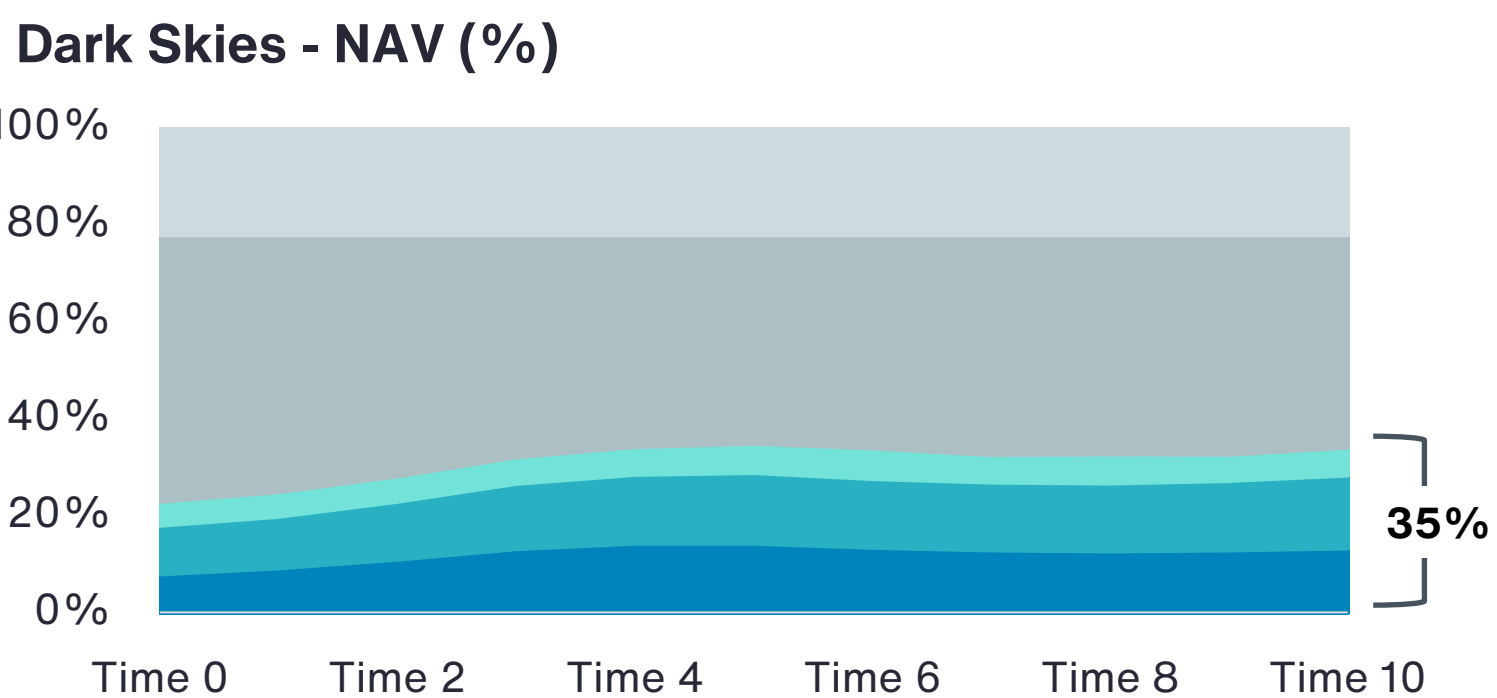
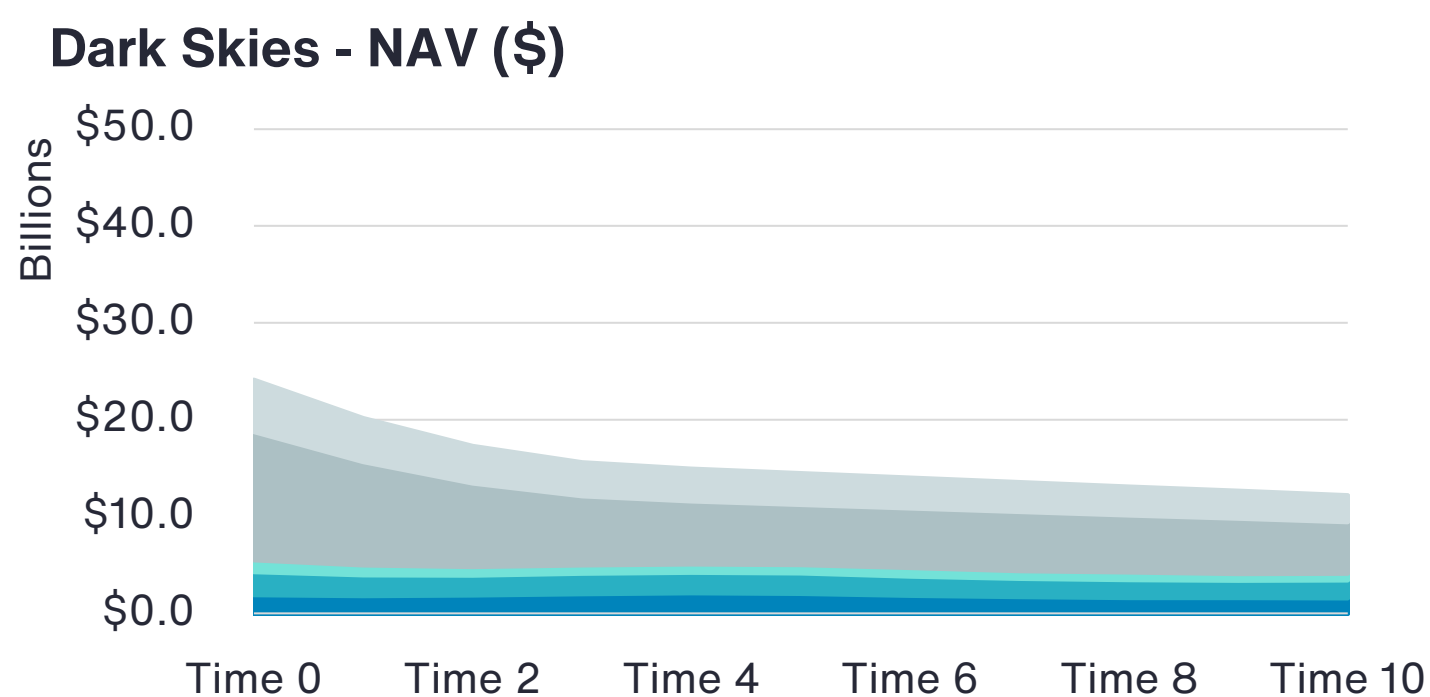
## Base Case



## Recession



## Dark Skies



■ Illiquid: 10+ Years ■ Illiquid: 5-10 Years ■ Quasi-Liquid ■ Liquid (Return-Seeking Assets) ■ Liquid (Risk-Reducing Assets)

Note: Time 0 represents a starting point of September 30, 2024



# Liquidity Analysis – Detailed Results

Current target allocation (23% illiquid assets)

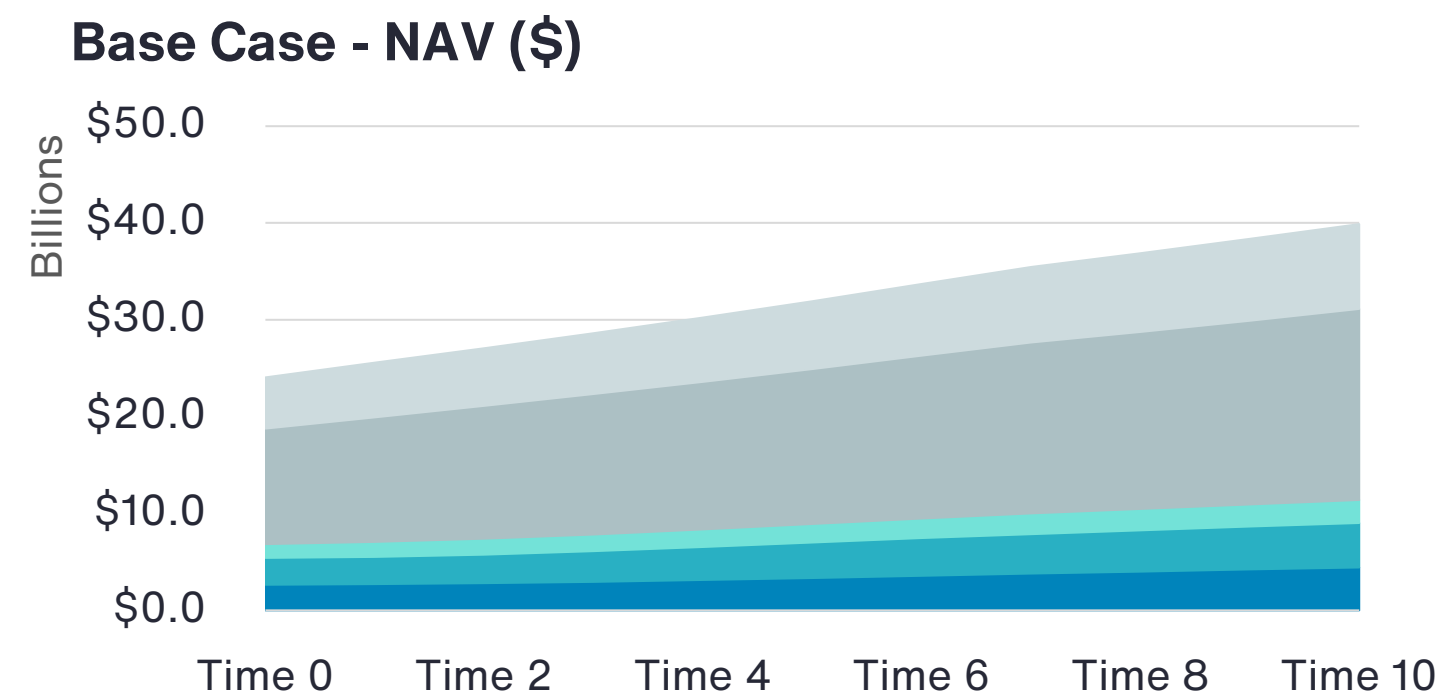
	Base Case				Recession				Dark Skies			
	Total Illiquids	Liquid Assets (in \$MM)	Liquid Assets / Annual Benefit Payments	Net Outflow %	Total Illiquids	Liquid Assets	Liquid Assets / Annual Benefit Payments	Net Outflow %	Total Illiquids	Liquid Assets	Liquid Assets / Annual Benefit Payments	Net Outflow %
Time 0	23%	\$18,530	10.0	1.4%	23%	\$18,530	10.0	1.5%	23%	\$18,530	10.0	1.5%
Time 1	22%	\$19,823	10.2	1.6%	24%	\$16,496	8.5	2.0%	25%	\$15,094	7.8	2.3%
Time 2	22%	\$21,022	10.4	1.7%	25%	\$15,201	7.5	2.5%	28%	\$12,388	6.1	3.2%
Time 3	22%	\$22,173	10.6	1.8%	26%	\$15,195	7.3	2.8%	32%	\$10,563	5.0	4.1%
Time 4	22%	\$23,313	10.7	1.8%	26%	\$15,600	7.2	3.0%	34%	\$9,789	4.5	4.7%
Time 5	23%	\$24,498	10.9	1.8%	26%	\$15,984	7.1	3.2%	35%	\$9,401	4.2	5.2%
Time 6	23%	\$25,770	11.1	1.9%	26%	\$16,433	7.1	3.3%	34%	\$9,220	4.0	5.8%
Time 7	23%	\$27,147	11.4	2.2%	25%	\$16,912	7.1	3.4%	33%	\$9,087	3.8	6.4%
Time 8	23%	\$28,506	11.6	3.3%	25%	\$17,373	7.1	3.5%	33%	\$8,764	3.6	7.0%
Time 9	23%	\$29,566	11.7	3.3%	25%	\$17,777	7.0	3.6%	33%	\$8,476	3.4	7.6%
Time 10	23%	\$30,697	11.9	3.3%	26%	\$18,145	7.0	3.6%	34%	\$8,005	3.1	8.3%

Note: Time 0 represents a starting point of September 30, 2024

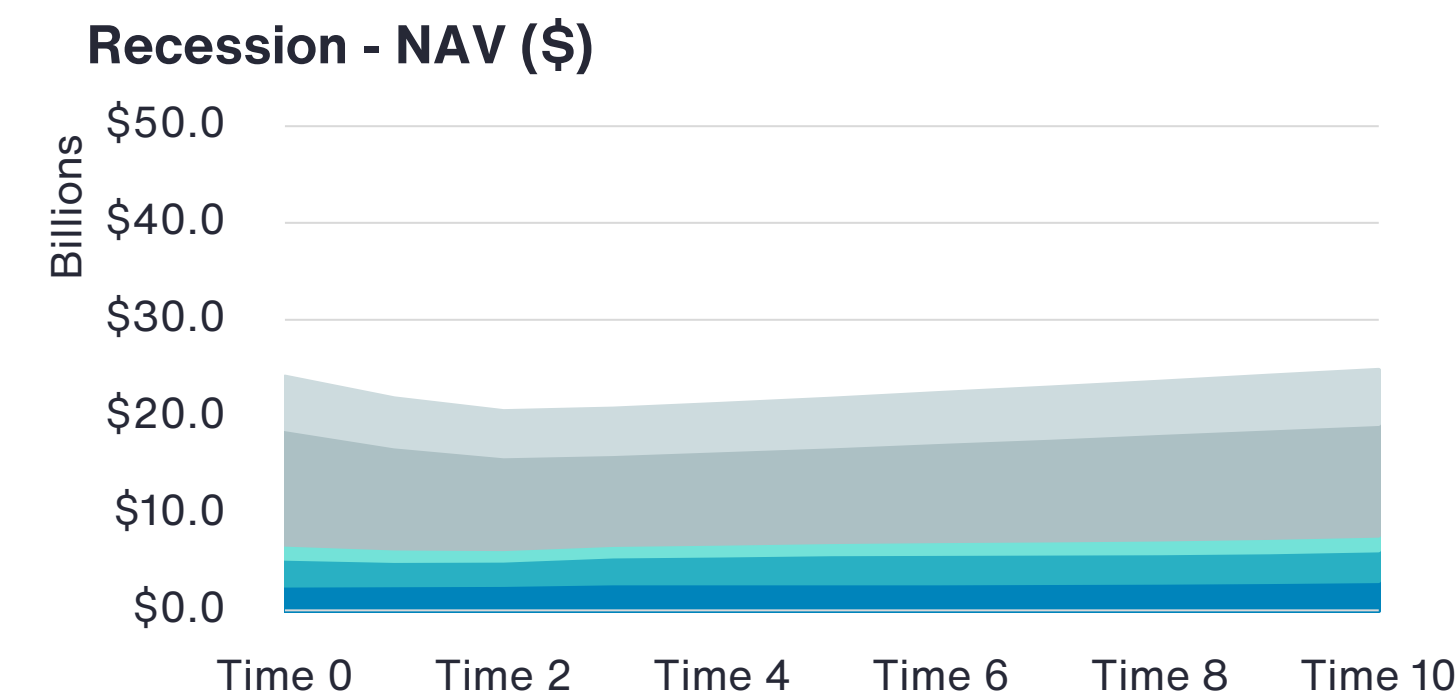
# Liquidity Analysis – Results

## Proposed allocation (28.5% illiquid assets)

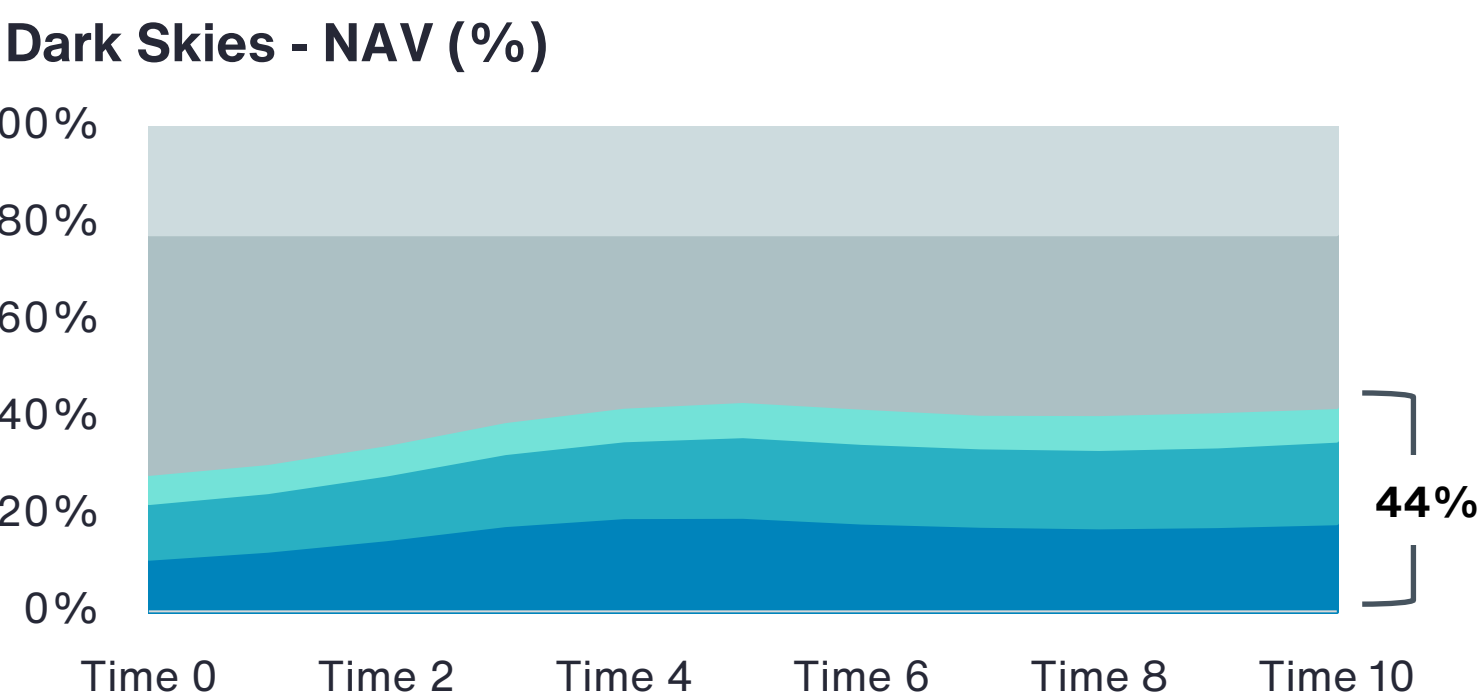
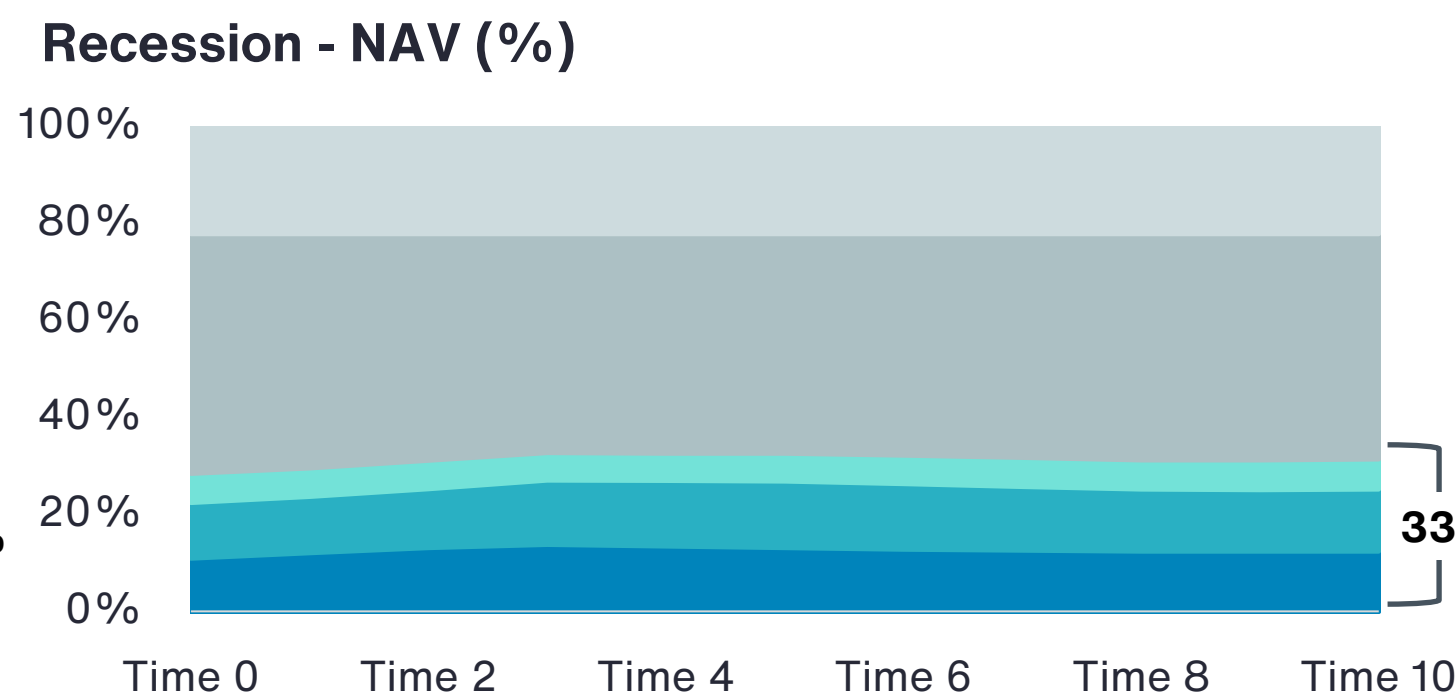
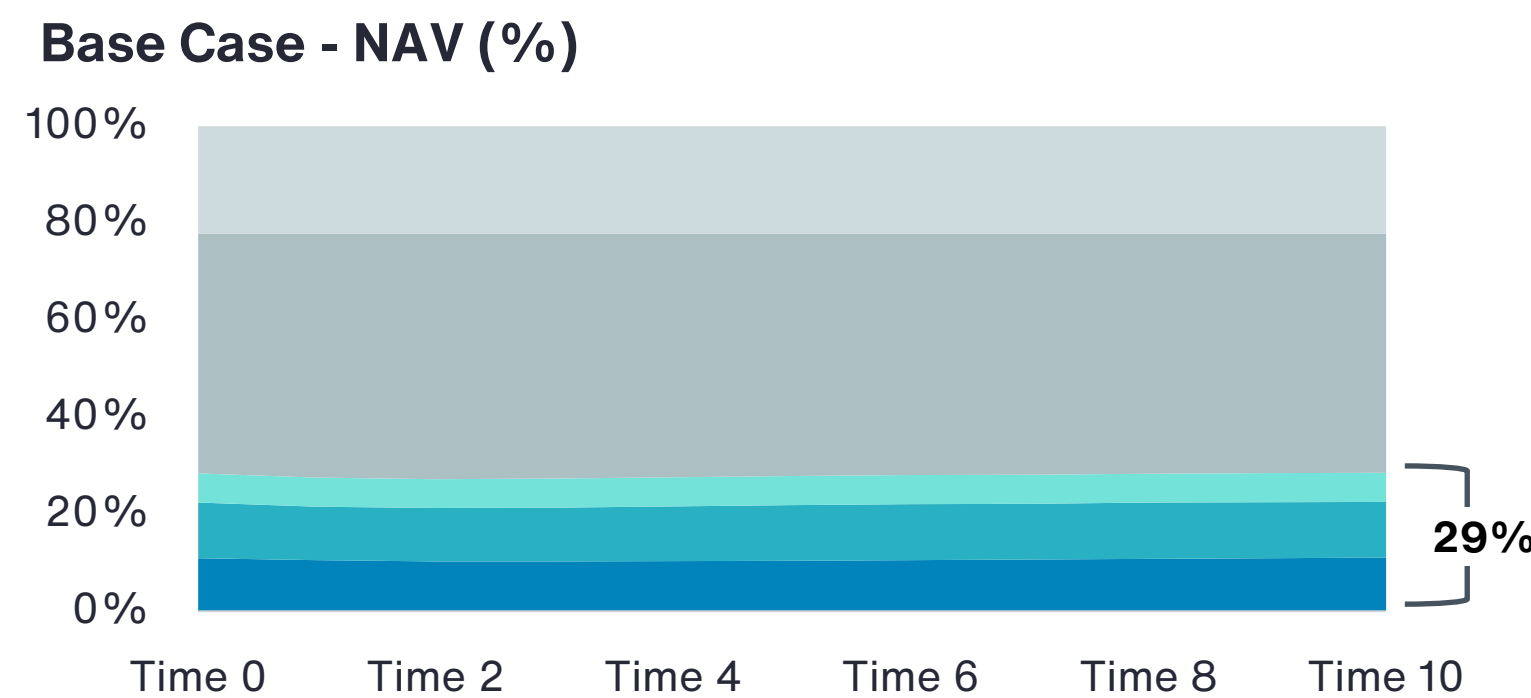
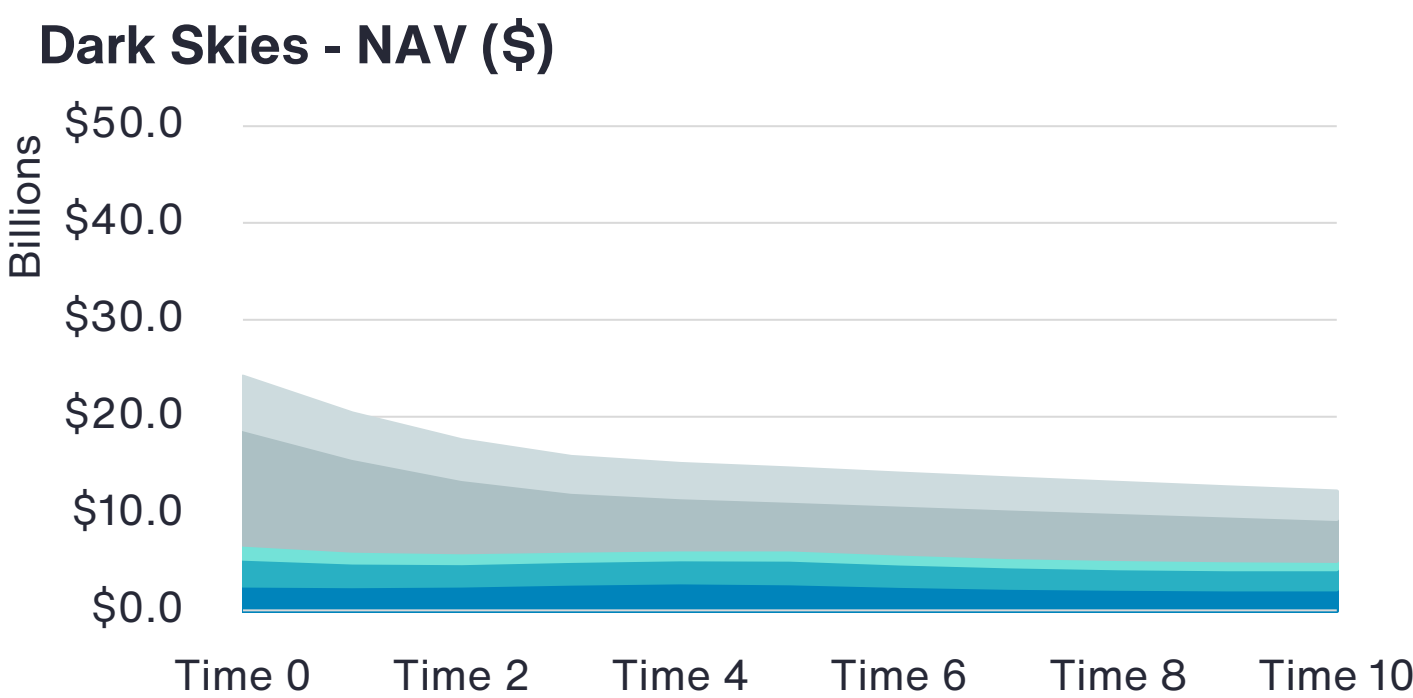
### Base Case



### Recession



### Dark Skies



■ Illiquid: 10+ Years ■ Illiquid: 5-10 Years ■ Quasi-Liquid ■ Liquid (Return-Seeking Assets) ■ Liquid (Risk-Reducing Assets)

Note: Time 0 represents a starting point of September 30, 2024

# Liquidity Analysis – Detailed Results

Proposed allocation (28.5% illiquid assets)

	Base Case				Recession				Dark Skies			
	Total Illiquids	Liquid Assets (in \$MM)	Liquid Assets / Annual Benefit Payments	Net Outflow %	Total Illiquids	Liquid Assets	Liquid Assets / Annual Benefit Payments	Net Outflow %	Total Illiquids	Liquid Assets	Liquid Assets / Annual Benefit Payments	Net Outflow %
Time 0	29%	\$17,206	9.3	1.4%	29%	\$17,206	9.3	1.5%	29%	\$17,206	9.3	1.5%
Time 1	28%	\$18,494	9.5	1.6%	30%	\$15,355	7.9	2.0%	31%	\$14,041	7.2	2.3%
Time 2	27%	\$19,667	9.7	1.7%	31%	\$14,091	7.0	2.4%	35%	\$11,432	5.7	3.1%
Time 3	27%	\$20,775	9.9	1.8%	33%	\$13,950	6.7	2.8%	39%	\$9,565	4.6	4.0%
Time 4	28%	\$21,861	10.1	1.8%	33%	\$14,324	6.6	2.9%	42%	\$8,680	4.0	4.7%
Time 5	28%	\$22,994	10.3	1.8%	33%	\$14,673	6.5	3.1%	44%	\$8,227	3.7	5.2%
Time 6	28%	\$24,224	10.5	2.2%	32%	\$15,143	6.5	3.3%	42%	\$8,136	3.5	5.7%
Time 7	28%	\$25,440	10.7	3.4%	32%	\$15,660	6.6	3.4%	41%	\$8,018	3.4	6.3%
Time 8	28%	\$26,377	10.7	3.4%	31%	\$16,184	6.6	3.5%	41%	\$7,740	3.2	7.0%
Time 9	29%	\$27,388	10.9	3.3%	31%	\$16,604	6.6	3.5%	41%	\$7,406	2.9	7.6%
Time 10	29%	\$28,478	11.0	3.3%	31%	\$16,971	6.6	3.6%	42%	\$7,037	2.7	8.2%

Note: Time 0 represents a starting point of September 30, 2024



# Liquidity Analysis – Policy Shock

## Description

In addition to the economic scenario risk on plan liquidity, an assumption was also made for policy risk – affecting both the assets and liabilities

### Liability Assumption

A 3% one-time COLA payment in FY 2026, estimated to cost \$426MM in additional benefit payments for that year

### Asset Assumption

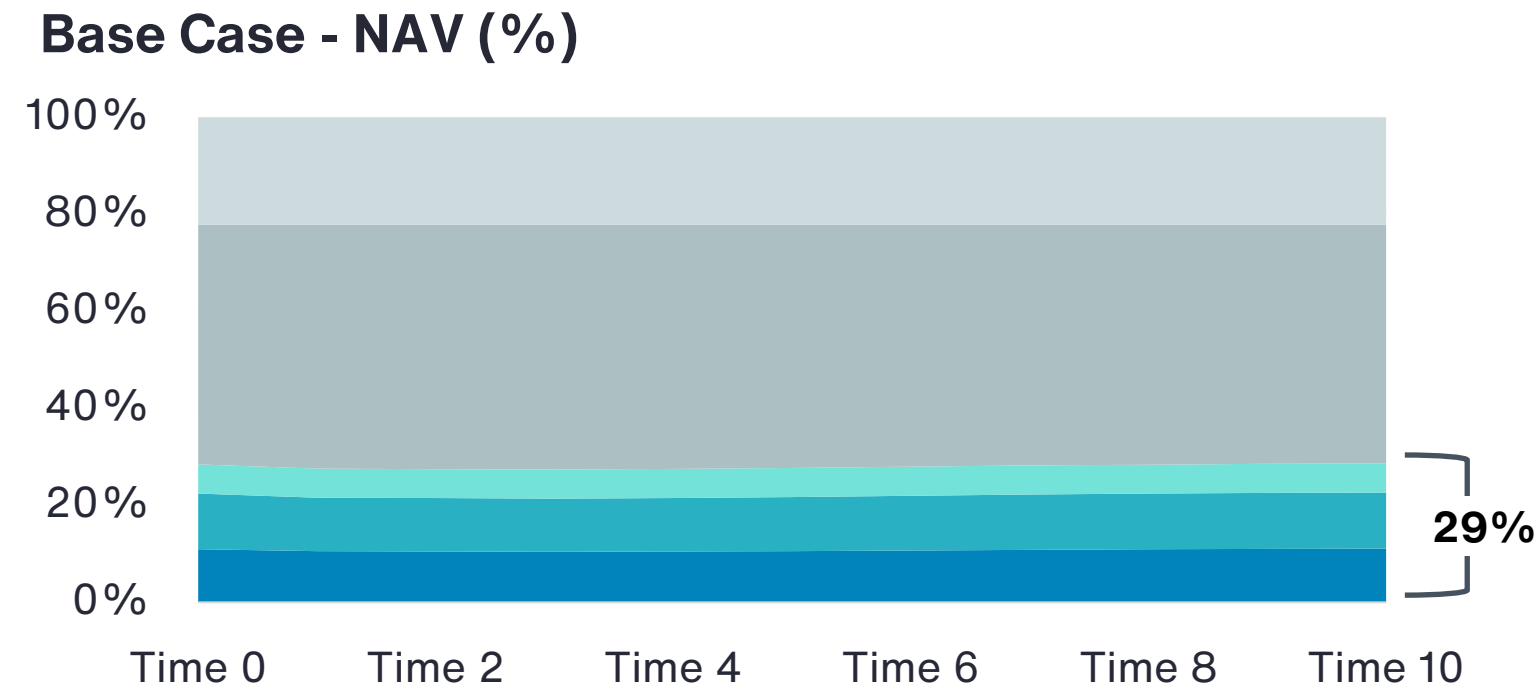
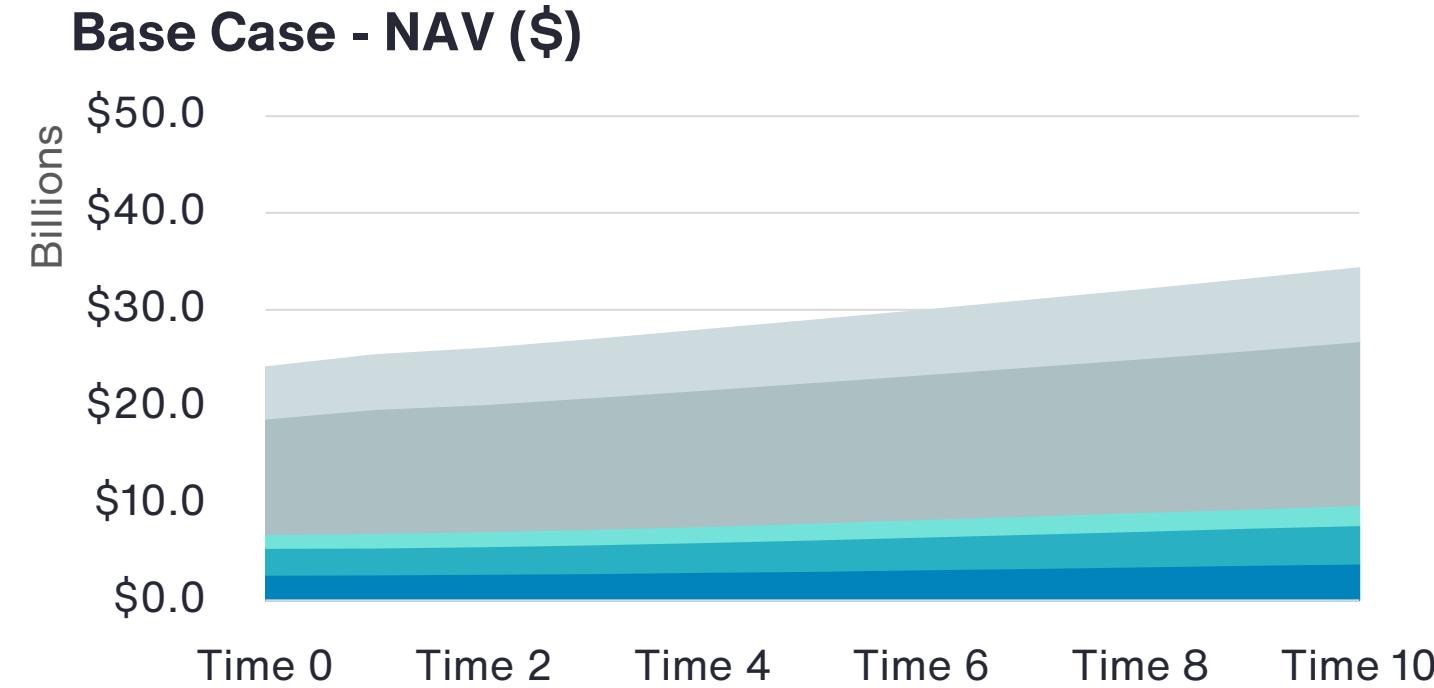
The State portion of total contributions was assumed to cease beginning in FY 2026 leaving only the employee, employer, and grant matching portions as shown below

Fiscal Year Ending	Employee%	Employer%	State %	Grant Matching %	Total %
2026 – 2027	7.0%	9.3%	0% (was 8.1%)	0.7%	17.0% ( was 25.1%)
2028+	7.0%	9.3%	0% (was 7.7%)	0.7%	17.0% (was 24.7%)

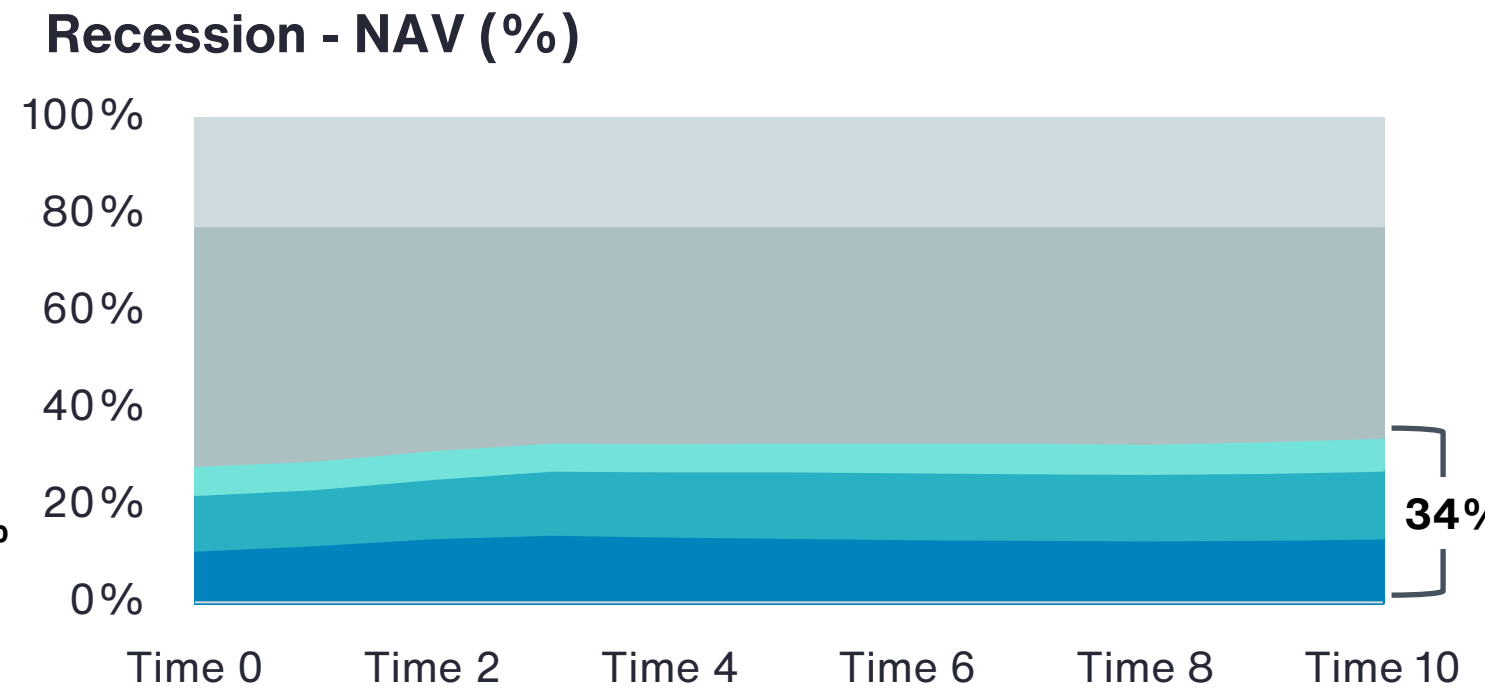
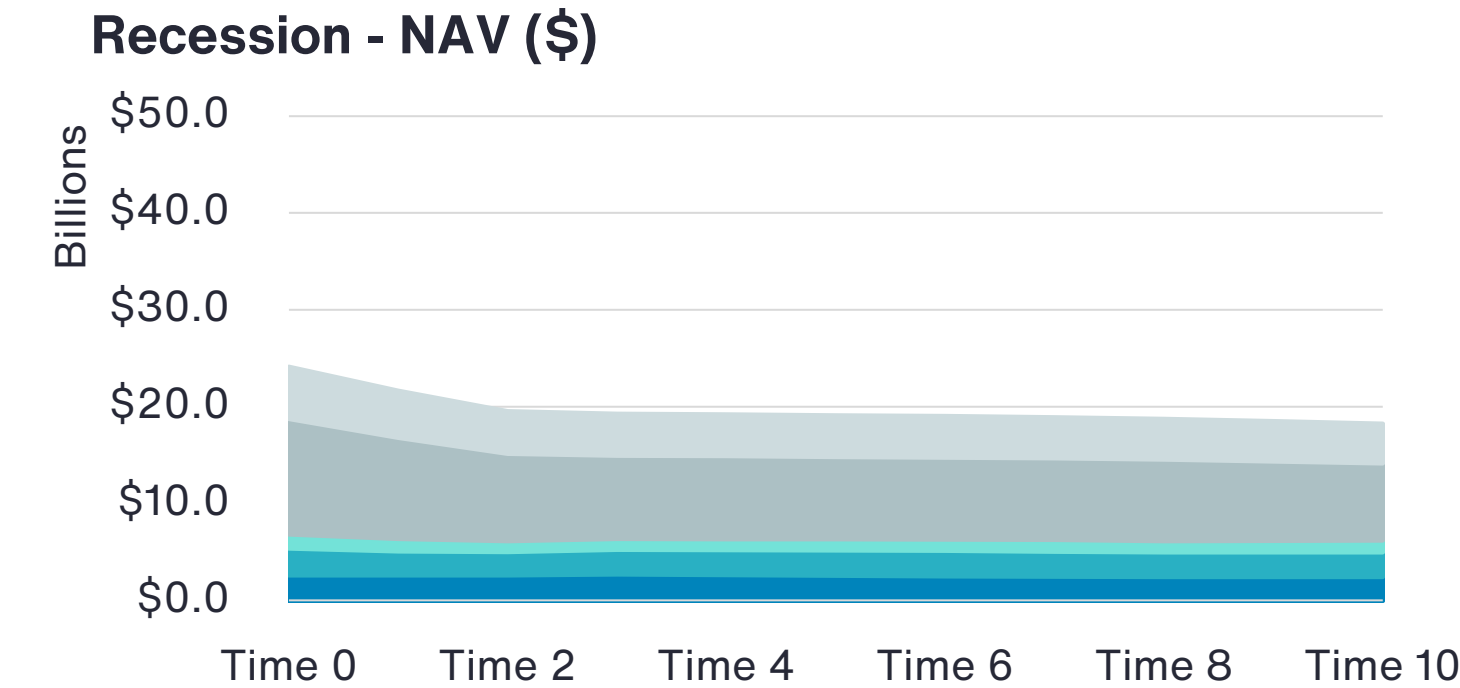
# Liquidity Analysis – Policy Shock

Proposed allocation (28.5% illiquid assets) with estimated ad hoc COLA and suspension of State funding

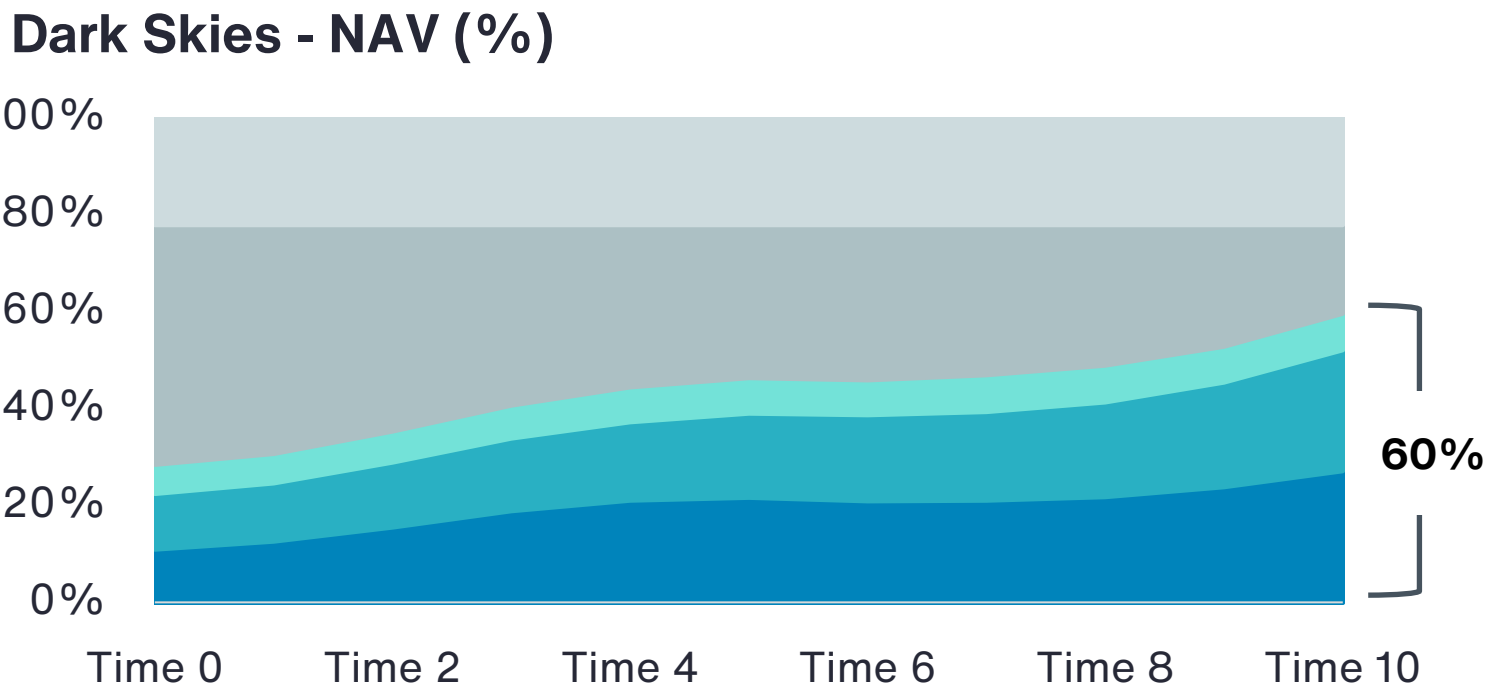
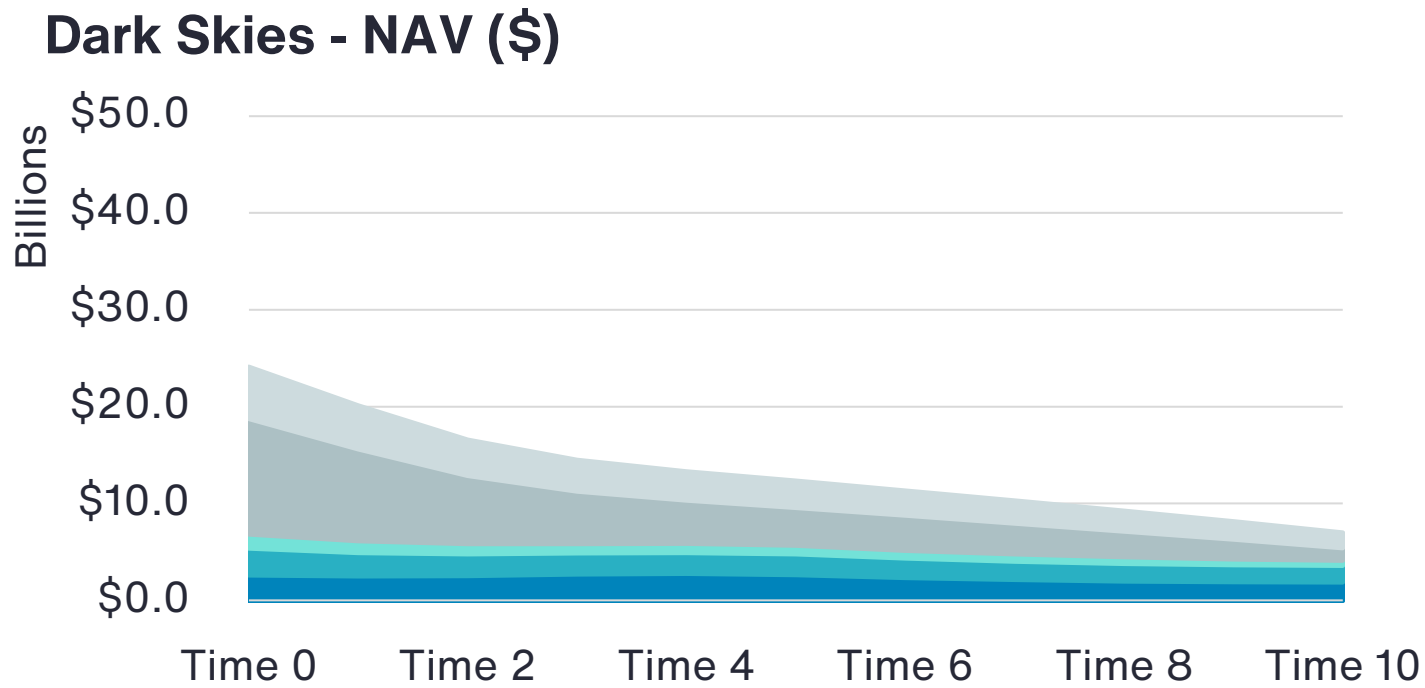
## Base Case



## Recession



## Dark Skies



■ Illiquid: 10+ Years ■ Illiquid: 5-10 Years ■ Quasi-Liquid ■ Liquid (Return-Seeking Assets) ■ Liquid (Risk-Reducing Assets)

Note: Time 0 represents a starting point of September 30, 2024  
Ad hoc COLA of \$426MM was assumed as of July 1, 2025 along with suspension of the State contribution as of the same date

# Liquidity Analysis – Policy Shock

Proposed allocation (28.5% illiquid assets) with estimated ad hoc COLA and suspension of State funding

	Base Case				Recession				Dark Skies			
	Total Illiquids	Liquid Assets (in \$MM)	Liquid Assets / Annual Benefit Payments	Net Outflow %	Total Illiquids	Liquid Assets	Liquid Assets / Annual Benefit Payments	Net Outflow %	Total Illiquids	Liquid Assets	Liquid Assets / Annual Benefit Payments	Net Outflow %
<b>Time 0</b>	29%	\$17,206	8.8	2.4%	29%	\$17,206	8.8	2.4%	29%	\$17,206	8.8	2.4%
<b>Time 1</b>	28%	\$18,331	8.1	4.8%	30%	\$15,208	6.7	5.7%	31%	\$13,902	6.2	6.3%
<b>Time 2</b>	28%	\$18,813	9.3	3.7%	32%	\$13,297	6.6	5.1%	35%	\$10,697	5.3	6.2%
<b>Time 3</b>	27%	\$19,528	9.3	3.7%	33%	\$12,811	6.1	5.5%	41%	\$8,567	4.1	7.6%
<b>Time 4</b>	28%	\$20,202	9.3	3.8%	33%	\$12,800	5.9	5.8%	45%	\$7,366	3.4	8.7%
<b>Time 5</b>	28%	\$20,857	9.3	3.8%	33%	\$12,707	5.7	6.1%	46%	\$6,589	2.9	9.9%
<b>Time 6</b>	28%	\$21,519	9.3	3.8%	33%	\$12,649	5.5	6.5%	46%	\$6,102	2.6	11.3%
<b>Time 7</b>	28%	\$22,200	9.3	3.9%	33%	\$12,569	5.3	6.8%	47%	\$5,430	2.3	13.0%
<b>Time 8</b>	28%	\$22,914	9.3	3.9%	33%	\$12,511	5.1	7.1%	49%	\$4,687	1.9	15.1%
<b>Time 9</b>	29%	\$23,664	9.4	3.9%	34%	\$12,262	4.9	7.4%	53%	\$3,819	1.5	17.8%
<b>Time 10</b>	29%	\$24,455	9.4	3.8%	34%	\$11,945	4.6	7.8%	60%	\$2,812	1.1	21.5%

Note: Time 0 represents a starting point of September 30, 2024  
Ad hoc COLA of \$426MM was assumed as of July 1, 2025 along with suspension of the State contribution as of the same date



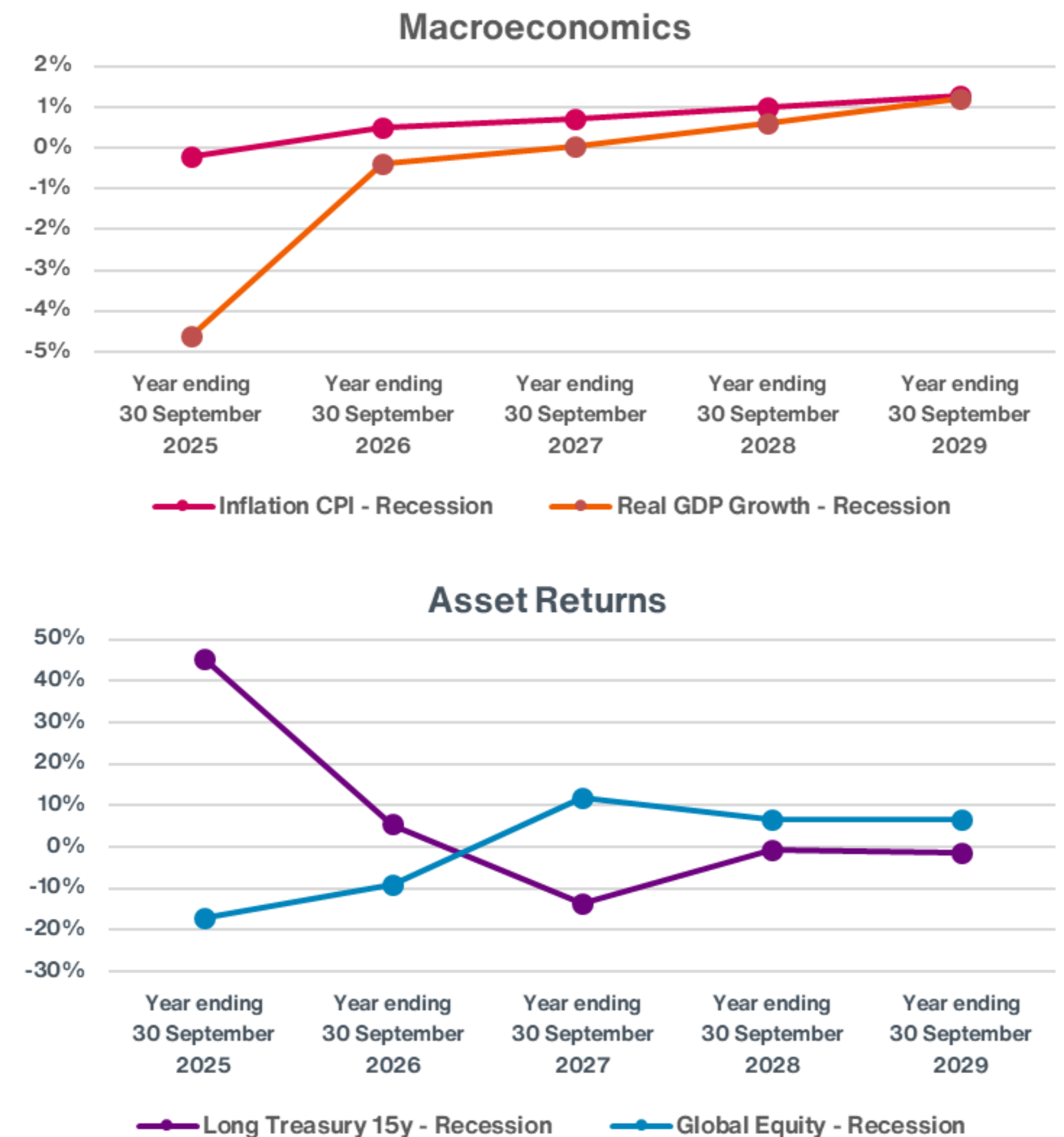
# Recession Scenario

## Description

### The U.S. economy slips into a recession in 2025

- Global growth weakens as a tilt towards more protectionist trade and immigration policies outweighs productivity gains from technological advancements. Weaker global growth, combined with still relatively restrictive monetary policy, lead to a recession in the U.S. in 2025.
- The economic slowdown leads to many large economies, including the U.S., choosing to continue to run large fiscal deficits and accumulate further government debt. Meanwhile, central banks make larger than expected policy rate cuts in an effort to stimulate consumption, increase business investment and support the labour market.
- These policy actions are only somewhat effective as they only improve the demand side of the economy. The U.S. exits recession around two years later, at which point global growth also starts to pick up. Protectionist policies then begin to reverse across the world as their negative economic impact becomes clearer and more widespread.
- Inflation is lower than the base case. However, inflation starts to rise in later years as the post-recession recovery gets underway.
- Treasury yields fall while TIPS yields remain at low levels as the U.S. enters recession. Yields rise in later years as a recovery gets underway. Corporate spreads rise significantly due to the poor economic situation, with increased incidences of downgrades and defaults.
- Most risk assets make losses in the first two years but rebound in later years as the economy recovers.

Source: Aon, as of September 30, 2024. Annual projection starts from September 30, 2024. Projections of general asset class returns and economic conditions are forward-looking expectations by Aon based on informed historical results and internal analysis. Forecasts, estimates and other information contained herein are based upon proprietary research and our framework of analyzing fundamental, valuation and long-term drivers of capital markets. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise - or even estimate - of future performance. Such information is hypothetical in nature, does not reflect actual results, and is not a guarantee of future results. Economic factors and return assumptions depend on current market conditions and, as such, may change over time. Our economic scenario analysis is designed to reflect the typical cost of implementing an investment program. Asset return projections do not include the deduction of management fees and other expenses that may be incurred in managing an investment account.



# Recession Scenario

## Data

Recession Scenario		Time 0	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6	Time 7	Time 8	Time 9	Time 10
Fixed Income Yields	Treasury yield 5y	3.7%	1.4%	1.2%	2.0%	2.5%	3.0%	3.2%	3.3%	3.4%	3.6%	3.7%
	Long Treasury yield 15y	4.2%	1.8%	1.6%	2.8%	3.1%	3.4%	3.5%	3.6%	3.7%	3.7%	3.7%
	TIPS yield 5y	1.5%	-0.3%	-0.4%	0.2%	0.4%	0.7%	0.8%	1.0%	1.1%	1.2%	1.3%
	Long TIPS yield 15y	1.8%	0.0%	-0.1%	0.7%	0.8%	1.0%	1.1%	1.3%	1.4%	1.5%	1.5%
	Breakeven price inflation 15y	2.4%	1.8%	1.7%	2.1%	2.2%	2.4%	2.4%	2.3%	2.3%	2.2%	2.2%
	A Corporate bond yield 5y	4.5%	4.8%	5.0%	5.6%	5.3%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%
	A Corporate spread 5y	0.8%	3.3%	3.8%	3.5%	2.8%	2.4%	2.3%	2.1%	2.0%	1.9%	1.7%
	Long A Corporate bond yield 10y	4.8%	4.4%	4.6%	5.7%	5.4%	5.5%	5.6%	5.6%	5.6%	5.6%	5.6%
	Long A Corporate spread 10y	0.8%	2.8%	3.2%	3.0%	2.5%	2.3%	2.2%	2.1%	2.0%	1.9%	1.8%
Expected Nominal Returns	Equity – U.S.		-15.0%	-8.0%	11.0%	6.0%	6.0%	6.0%	6.0%	6.0%	7.0%	7.0%
	Equity – Global		-17.0%	-9.0%	12.0%	6.0%	6.0%	7.0%	7.0%	7.0%	7.0%	7.0%
	EAFE		-19.0%	-10.0%	12.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
	EM Equity		-28.0%	-16.0%	14.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	7.0%
	Cash		4.0%	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2.0%	3.0%	3.0%
	Core Fixed Income		9.0%	3.0%	1.0%	4.0%	4.0%	5.0%	5.0%	5.0%	5.0%	5.0%
	U.S. Core Real Estate		-14.0%	-8.0%	-3.0%	1.0%	5.0%	5.0%	5.0%	5.0%	6.0%	6.0%
	U.S. Non-Core Real Estate		-18.0%	-11.0%	-3.0%	1.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
	U.S. REITs		-18.0%	-11.0%	-5.0%	0.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
	Private Equity Smoothed		-11.0%	-5.0%	7.0%	7.0%	8.0%	9.0%	10.0%	10.0%	10.0%	10.0%
	Private Credit Smoothed		-8.0%	-8.0%	4.0%	3.0%	4.0%	5.0%	5.0%	5.0%	6.0%	6.0%
	Closed-Ended Infrastructure		-4.0%	0.0%	4.0%	5.0%	8.0%	8.0%	8.0%	8.0%	8.0%	9.0%
	Hedge Funds – Broad		-13.5%	-8.0%	8.5%	7.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
	U.S. High Yield		-14.0%	-11.0%	5.0%	5.0%	4.0%	5.0%	6.0%	6.0%	6.0%	6.0%
	Bank Loans		-10.0%	-7.0%	6.0%	3.0%	3.0%	4.0%	4.0%	4.0%	4.0%	5.0%
	USD Emerging Market Debt		-12.0%	-8.0%	8.0%	6.0%	5.0%	6.0%	6.0%	6.0%	6.0%	7.0%
	Local Emerging Market Debt		-13.0%	-9.0%	7.0%	5.0%	4.0%	5.0%	5.0%	5.0%	6.0%	6.0%

Source: Aon, as of September 30, 2024. Annual projection starts from September 30, 2024. Projections of general asset class returns and economic conditions are forward-looking expectations by Aon based on informed historical results and internal analysis. Forecasts, estimates and other information contained herein are based upon proprietary research and our framework of analyzing fundamental, valuation and long-term drivers of capital markets. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise - or even estimate - of future performance. Such information is hypothetical in nature, does not reflect actual results, and is not a guarantee of future results. Economic factors and return assumptions depend on current market conditions and, as such, may change over time. Our economic scenario analysis is designed to reflect the typical cost of implementing an investment program. Asset return projections do not include the deduction of management fees and other expenses that may be incurred in managing an investment account.

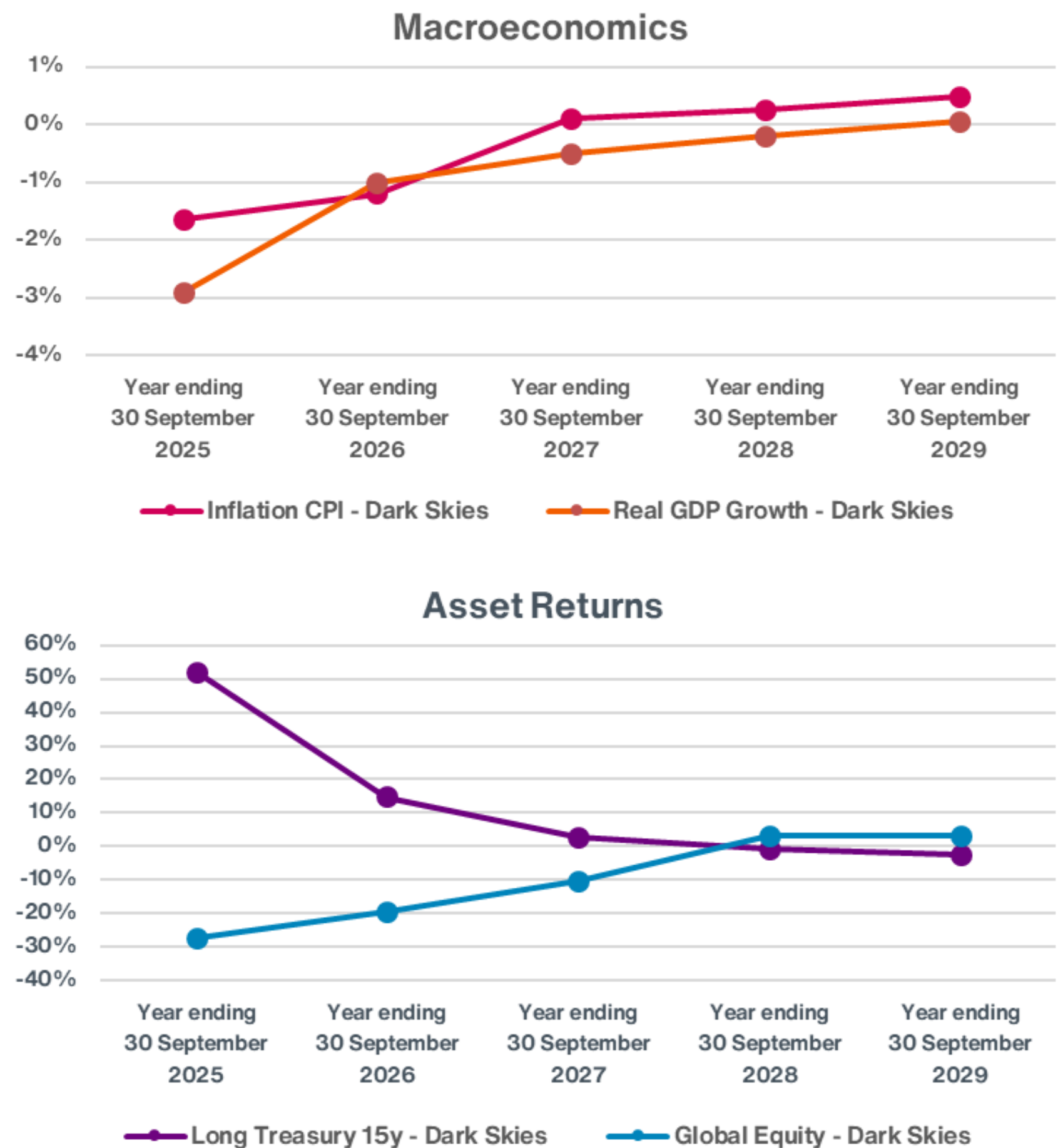
# Dark Skies Scenario

## Description

### A deep recession followed by a longer period of stagnant growth

- Worsening geopolitical instability and central banks' still restrictive monetary policy has a severe impact on global growth leading to an economic depression.
- Global supply chains are disrupted on a prolonged basis due to geopolitical events. China experiences a sharp deterioration in economic growth following an abrupt decoupling from western economies caused by a severe global tilt towards protectionism.
- Failures of smaller banks along with widespread corporate bankruptcies lead to the collapse of some systematically important banks, triggering a new financial crisis, forcing central banks to cut rates to record low levels.
- Fiscal pressures force governments to unwind stimulus measures before economies fully recover.
- Weak demand means inflation falls sharply in 2025 and sluggish growth over the following years keeps inflation below target.
- Treasury yields fall and remain at low levels as the U.S. enters recession. Corporate spreads rise significantly due to the poor economic situation and increased risks of downgrades or defaults.
- Risk assets suffer losses as the economic situation remains poor for a long time, weighing on returns in later years.

Source: Aon, as of September 30, 2024. Annual projection starts from September 30, 2024. Projections of general asset class returns and economic conditions are forward-looking expectations by Aon based on informed historical results and internal analysis. Forecasts, estimates and other information contained herein are based upon proprietary research and our framework of analyzing fundamental, valuation and long-term drivers of capital markets. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise - or even estimate - of future performance. Such information is hypothetical in nature, does not reflect actual results, and is not a guarantee of future results. Economic factors and return assumptions depend on current market conditions and, as such, may change over time. Our economic scenario analysis is designed to reflect the typical cost of implementing an investment program. Asset return projections do not include the deduction of management fees and other expenses that may be incurred in managing an investment account.





# Dark Skies Scenario

## Data

Recession Scenario		Time 0	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6	Time 7	Time 8	Time 9	Time 10
Fixed Income Yields	Treasury yield 5y	3.7%	1.3%	0.0%	-0.1%	0.0%	0.3%	0.6%	0.9%	1.3%	1.6%	1.9%
	Long Treasury yield 15y	4.2%	1.5%	0.6%	0.5%	0.6%	0.8%	1.1%	1.4%	1.7%	1.9%	2.2%
	TIPS yield 5y	1.5%	-0.1%	-1.1%	-1.2%	-1.1%	-0.9%	-0.7%	-0.5%	-0.2%	0.0%	0.2%
	Long TIPS yield 15y	1.8%	-0.3%	-0.9%	-1.0%	-0.9%	-0.7%	-0.5%	-0.3%	0.0%	0.2%	0.4%
	Breakeven price inflation 15y	2.4%	1.7%	1.5%	1.5%	1.5%	1.5%	1.6%	1.7%	1.7%	1.7%	1.7%
	A Corporate bond yield 5y	4.5%	5.7%	5.1%	4.6%	3.7%	3.3%	3.5%	3.7%	3.8%	4.0%	4.2%
	A Corporate spread 5y	0.8%	4.5%	5.1%	4.7%	3.7%	3.0%	2.9%	2.7%	2.6%	2.4%	2.2%
	Long A Corporate bond yield 10y	4.8%	5.0%	4.6%	4.2%	3.6%	3.5%	3.7%	3.9%	4.0%	4.2%	4.4%
	Long A Corporate spread 10y	0.8%	3.6%	4.2%	3.9%	3.2%	2.8%	2.6%	2.5%	2.4%	2.3%	2.2%
Expected Nominal Returns	Equity – U.S.		-25.0%	-18.0%	-9.0%	3.0%	3.0%	4.0%	4.0%	4.0%	5.0%	5.0%
	Equity – Global		-28.0%	-20.0%	-10.0%	3.0%	3.0%	4.0%	4.0%	4.0%	5.0%	5.0%
	EAFE		-30.0%	-21.0%	-11.0%	3.0%	3.0%	3.0%	3.0%	4.0%	4.0%	5.0%
	EM Equity		-43.0%	-32.0%	-18.0%	1.0%	1.0%	2.0%	3.0%	3.0%	4.0%	4.0%
	Cash		4.0%	1.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	2.0%
	Core Fixed Income		7.0%	6.0%	2.0%	2.0%	1.0%	0.0%	0.0%	1.0%	1.0%	2.0%
	U.S. Core Real Estate		-16.0%	-11.0%	-5.0%	0.0%	2.0%	3.0%	3.0%	3.0%	4.0%	4.0%
	U.S. Non-Core Real Estate		-20.0%	-14.0%	-6.0%	0.0%	3.0%	3.0%	4.0%	4.0%	5.0%	5.0%
	U.S. REITs		-23.0%	-17.0%	-8.0%	-2.0%	1.0%	2.0%	2.0%	3.0%	3.0%	4.0%
	Private Equity Smoothed		-18.0%	-13.0%	-6.0%	-1.0%	0.0%	1.0%	3.0%	4.0%	7.0%	8.0%
	Private Credit Smoothed		-20.0%	-23.0%	-21.0%	-11.0%	-2.0%	-1.0%	0.0%	1.0%	2.0%	2.0%
	Closed-Ended Infrastructure		-11.0%	-7.0%	-3.0%	2.0%	5.0%	5.0%	6.0%	6.0%	6.0%	7.0%
	Hedge Funds – Broad		-16.5%	-11.0%	-5.5%	2.0%	2.0%	2.5%	2.5%	3.0%	3.5%	4.0%
	U.S. High Yield		-19.0%	-13.0%	-11.0%	-1.0%	-3.0%	-4.0%	-3.0%	-2.0%	-1.0%	0.0%
	Bank Loans		-23.0%	-19.0%	-12.0%	-1.0%	-1.0%	-1.0%	0.0%	1.0%	1.0%	2.0%
	USD Emerging Market Debt		-19.0%	-13.0%	-8.0%	2.0%	1.0%	1.0%	2.0%	2.0%	3.0%	3.0%
	Local Emerging Market Debt		-20.0%	-14.0%	-9.0%	1.0%	0.0%	0.0%	1.0%	1.0%	2.0%	2.0%

Source: Aon, as of September 30, 2024. Annual projection starts from September 30, 2024. Projections of general asset class returns and economic conditions are forward-looking expectations by Aon based on informed historical results and internal analysis. Forecasts, estimates and other information contained herein are based upon proprietary research and our framework of analyzing fundamental, valuation and long-term drivers of capital markets. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise - or even estimate - of future performance. Such information is hypothetical in nature, does not reflect actual results, and is not a guarantee of future results. Economic factors and return assumptions depend on current market conditions and, as such, may change over time. Our economic scenario analysis is designed to reflect the typical cost of implementing an investment program. Asset return projections do not include the deduction of management fees and other expenses that may be incurred in managing an investment account.

# Capital Market Assumptions

Section 3: Appendix

# Aon's Capital Market Assumptions

## Background

- Long-term (10- and 30-year forecasts) forward-looking assumptions (asset class geometric return, volatility, and correlations)
- Building Block approach, primarily based on consensus expectations and market-based inputs
- Best estimates of annualized returns (50/50 better or worse)
- Market returns: no active management value added (except for certain assets classes, such as hedge funds)
- Net of investment fees
- Updated quarterly





# Summary of Capital Market Assumptions

## As of September 30, 2024

	10-Year CMAs				30-Year CMAs			
	Expected Real Return <sup>1</sup>	Expected Nominal Return <sup>1</sup>	Expected Nominal Volatility	Assumed Global Equity Beta	Expected Real Return <sup>1</sup>	Expected Nominal Return <sup>1</sup>	Expected Nominal Volatility	Assumed Global Equity Beta
<b>Equity</b>								
<b>1</b> Large Cap U.S. Equity	4.6%	6.9%	18.5%	0.98	4.6%	7.0%	19.0%	0.98
<b>2</b> Small Cap U.S. Equity	4.8%	7.1%	24.5%	1.24	5.1%	7.5%	25.2%	1.24
<b>3</b> International Equity (Developed)	4.3%	6.6%	18.8%	0.89	4.4%	6.8%	19.5%	0.90
<b>4</b> Emerging Markets Equity	4.8%	7.1%	22.0%	0.95	4.7%	7.1%	22.4%	0.94
<b>Fixed Income</b>								
<b>5</b> Cash (Gov't)	1.6%	3.8%	1.3%	0.01	1.4%	3.7%	2.1%	0.01
<b>6</b> Core Fixed Income	2.3%	4.5%	5.1%	0.01	2.2%	4.5%	5.4%	0.01
<b>7</b> Long Duration Bonds – Gov't	2.5%	4.8%	10.4%	-0.06	2.2%	4.5%	10.3%	-0.06
<b>8</b> Multi-Asset Credit <sup>2</sup>	4.5%	6.8%	8.8%	0.29	4.5%	6.9%	9.0%	0.29
<b>Alternatives</b>								
<b>9</b> Direct Hedge Funds <sup>2,3</sup>	4.5%	6.8%	5.2%	0.21	4.3%	6.7%	5.6%	0.22
<b>10</b> Core Real Estate	3.7%	6.0%	15.0%	0.28	3.6%	6.0%	15.3%	0.28
<b>11</b> Non-Core Real Estate	5.6%	7.9%	24.9%	0.63	5.3%	7.7%	25.5%	0.63
<b>12</b> Private Equity	7.6%	10.0%	20.0%	0.66	7.6%	10.1%	20.4%	0.65
<b>13</b> Open-End Real Assets	4.8%	7.1%	10.4%	0.23	4.8%	7.2%	10.7%	0.23
<b>14</b> Closed-End Real Assets	6.7%	9.0%	16.1%	0.46	6.6%	9.1%	16.6%	0.46
<b>15</b> Private Debt	5.9%	8.2%	16.0%	0.34	5.4%	7.8%	16.7%	0.34
<b>Inflation</b>								
<b>16</b> Inflation	0.0%	2.2%	1.7%		0.0%	2.3%	1.7%	

<sup>1</sup> Expected returns are using Aon's 10/30-Year Capital Market Assumptions as of 9/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

<sup>2</sup> Alpha incorporated in Expected Nominal Return

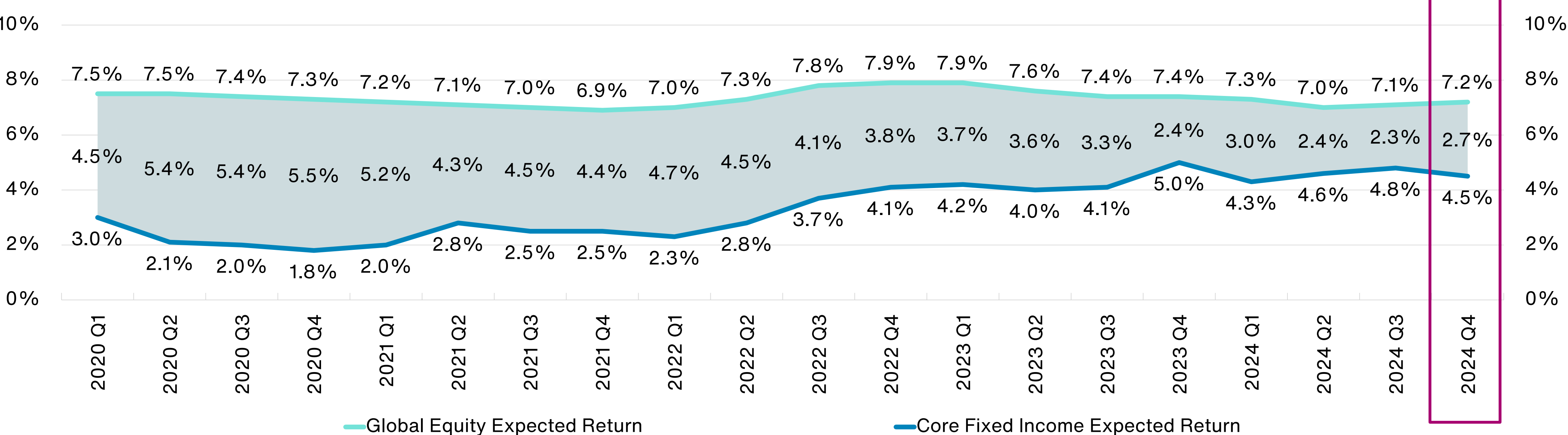
<sup>3</sup> Represents diversified portfolio of Direct hedge fund investments.

# Capital Market Assumptions – Recent Changes

Equity risk premium<sup>1</sup> has decreased due to higher interest rates, fixed income returns

Below is a quarter-over-quarter historical look at the breakdown of the global equity risk premium<sup>1</sup> (defined as global public equity less core fixed income) using Aon’s 30-year CMAs

Breakdown of Global Equity Risk Premium (30Y CMAs)



Time period used for TRSOK’s study

<sup>1</sup> Equity Risk Premium is defined as the excess return earned over bonds that compensates investors for taking on higher risk

# Summary of Capital Market Assumptions

## As of September 30, 2024

Nominal Correlations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>1</b> Large Cap U.S. Equity	<b>1.00</b>	0.93	0.78	0.70	0.09	0.03	-0.10	0.57	0.75	0.33	0.45	0.59	0.39	0.51	0.38	0.08
<b>2</b> Small Cap U.S. Equity	0.93	<b>1.00</b>	0.73	0.66	0.08	0.03	-0.10	0.53	0.69	0.31	0.42	0.57	0.37	0.48	0.36	0.08
<b>3</b> International Equity (Developed)	0.78	0.73	<b>1.00</b>	0.73	0.05	0.02	-0.10	0.55	0.63	0.33	0.43	0.52	0.37	0.47	0.33	0.10
<b>4</b> Emerging Markets Equity	0.70	0.66	0.73	<b>1.00</b>	0.07	0.03	-0.10	0.57	0.58	0.30	0.39	0.50	0.34	0.44	0.32	0.08
<b>5</b> Cash (Gov't)	0.09	0.08	0.05	0.07	<b>1.00</b>	0.41	0.23	0.12	0.22	0.16	0.15	0.10	0.18	0.18	0.01	0.41
<b>6</b> Core Fixed Income	0.03	0.03	0.02	0.03	0.41	<b>1.00</b>	0.74	0.28	0.21	0.06	0.05	0.03	0.07	0.07	0.02	-0.01
<b>7</b> Long Duration Bonds – Gov't	-0.10	-0.10	-0.10	-0.10	0.23	0.74	<b>1.00</b>	-0.15	-0.07	-0.02	-0.04	-0.09	-0.03	-0.04	-0.31	-0.16
<b>8</b> Multi-Asset Credit	0.57	0.53	0.55	0.57	0.12	0.28	-0.15	<b>1.00</b>	0.66	0.19	0.27	0.34	0.23	0.30	0.66	0.12
<b>9</b> Direct Hedge Funds	0.75	0.69	0.63	0.58	0.22	0.21	-0.07	0.66	<b>1.00</b>	0.31	0.39	0.51	0.36	0.45	0.48	0.13
<b>10</b> Core Real Estate	0.33	0.31	0.33	0.30	0.16	0.06	-0.02	0.19	0.31	<b>1.00</b>	0.96	0.31	0.81	0.83	0.15	0.09
<b>11</b> Non-Core Real Estate	0.45	0.42	0.43	0.39	0.15	0.05	-0.04	0.27	0.39	0.96	<b>1.00</b>	0.36	0.79	0.87	0.19	0.09
<b>12</b> Private Equity	0.59	0.57	0.52	0.50	0.10	0.03	-0.09	0.34	0.51	0.31	0.36	<b>1.00</b>	0.36	0.43	0.27	0.07
<b>13</b> Open-End Real Assets	0.39	0.37	0.37	0.34	0.18	0.07	-0.03	0.23	0.36	0.81	0.79	0.36	<b>1.00</b>	0.91	0.18	0.10
<b>14</b> Closed-End Real Assets	0.51	0.48	0.47	0.44	0.18	0.07	-0.04	0.30	0.45	0.83	0.87	0.43	0.91	<b>1.00</b>	0.22	0.11
<b>15</b> Private Debt	0.38	0.36	0.33	0.32	0.01	0.02	-0.31	0.66	0.48	0.15	0.19	0.27	0.18	0.22	<b>1.00</b>	0.08
<b>16</b> Inflation	0.08	0.08	0.10	0.08	0.41	-0.01	-0.16	0.12	0.13	0.09	0.09	0.07	0.10	0.11	0.08	<b>1.00</b>



# Aon Investments' Capital Market Assumptions

## Explanation of Capital Market Assumptions—09/30/2024

The following capital market assumptions were developed by Aon’s Global Asset Allocation Team and represent the long-term capital market outlook (i.e., 30 years) based on data at the end of the third quarter of 2024. The assumptions were developed using a building block approach, reflecting observable inflation and interest rate information available in the fixed income markets as well as Consensus Economics forecast and market data sources including, but not limited to MSCI, FactSet and Bloomberg. Our long-term assumptions for other asset classes are based on historical results, current market characteristics, and our professional judgment. Expected returns are using Aon 30 Year Capital Market Assumptions as of 09/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

### Inflation – Expected Level (2.3%)

Based on Consensus Economics long-term estimates and our near-term economic outlook, we expect U.S. consumer price inflation to be approximately 2.3% during the next 30 years.

Fixed Income		
Cash	1.4%	Over the long run, we expect the real yield on cash and money market instruments to produce a real return of 1.4% in a moderate to low-inflationary environment.
TIPS	1.9%	We expect intermediate duration Treasury Inflation-Protected Securities to produce a real return of about 1.9%.
Core Fixed Income (i.e., Market Duration)	2.2%	We expect intermediate duration Treasuries to produce a real return of about 1.4%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 0.8%, resulting in a long-term real return of 2.2%.

# Aon Investments' Capital Market Assumptions

## Explanation of Capital Market Assumptions—09/30/2024

Fixed Income		
<b>Core Plus Bonds</b>	2.5%	Modeled as 20% 5 duration gov't with real return of 1.4% and 80% 5 duration corporate bonds with real return of 2.5%.
<b>Long Duration Bonds – Government and Credit</b>	2.6%	We expect Treasuries with a duration of ~16 years to produce a real return of 2.2%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 0.4%, resulting in an expected real return of 2.6%.
<b>Long Duration Bonds – Credit</b>	3.1%	We expect Treasuries with a duration of ~16 years to produce a real return of 2.2%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 0.9%, resulting in an expected real return of 3.1%.
<b>Long Duration Bonds – Government</b>	2.2%	We expect Treasuries with a duration of ~16 years to produce a real return of 2.2% during the next 30 years.
<b>High Yield Bonds</b>	3.5%	We expect intermediate duration Treasuries to produce a real return of about 1.4%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 2.1%, resulting in an expected real return of 3.5%.
<b>Bank Loans</b>	3.8%	We expect cash to produce a real return of about 1.4%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults) to be 2.4%, resulting in an expected real return of 3.8%.
<b>Non-U.S. Developed Bonds: 50% Hedged</b>	1.7%	We forecast real returns for non-US developed market bonds to be 1.7% over a 30-year period after adjusting for a 50% currency hedge. We assume a blend of one-third investment grade corporate bonds and two-thirds government bonds. We also produce assumptions for 0% hedged and 100% hedged non-US developed bonds.
<b>Emerging Market Bonds (Sovereign; USD)</b>	3.7%	We forecast real returns for emerging market sovereign bonds denominated in US dollars to be 3.7% over a 30-year period.
<b>Emerging Market Bonds (Corporate; USD)</b>	3.4%	We forecast real returns for emerging market corporate bonds denominated in US dollars to be 3.4% over a 30-year period.

# Aon Investments' Capital Market Assumptions

## Explanation of Capital Market Assumptions—09/30/2024

<b>Emerging Market Bonds (Sovereign; Local)</b>	3.1%	We forecast real returns for emerging market sovereign bonds denominated in local currency to be 3.1% over a 30-year period.
<b>Liquid Return-Seeking Fixed Income Institutional Quality</b>	4.5%	We assume real returns from beta exposure to high yield, bank loans and emerging market debt to add 3.7% plus 0.8% from alpha for institutional quality managers, over a 30-year period.
<b>Liquid Return-Seeking Fixed Income Universe</b>	3.7%	We assume real returns from beta exposure to high yield, bank loans and emerging market debt to add 3.7%. We assume no alpha from universe funds, over a 30-year period.
<b>Private Debt-Direct Lending</b>	5.4%	The base building block is bank loans 3.8% + spread 1.6% (net of management fees and performance incentives). There is 100% leverage included in the assumption with the nominal cost of financing at LIBOR + 2.5%.
<b>Equities</b>		
<b>Large Cap U.S. Equity</b>	4.6%	This assumption is based on 1.03 beta to global equities plus inflation and real cash return
<b>Small Cap U.S. Equity</b>	5.1%	Adding a 0.5% return premium for small cap U.S. equity over large cap U.S. equity results in an expected real return of 5.1%. This return premium is theoretically justified by the higher risk inherent in small cap U.S. equity versus large cap U.S. equity and is also justified by historical data.
<b>Global Equity (Developed &amp; Emerging Markets)</b>	4.8%	We employ a building block process to develop discounted cash flows using the developed and emerging markets that comprise the MSCI All-Country World Index. Our roll-up model produces an expected real return of 4.8% for global equity.
<b>International (Non-U.S.) Equity, Developed Markets</b>	4.4%	This assumption is based on 0.85 beta to global equities plus inflation and real cash return
<b>Emerging Market Stocks</b>	4.7%	This assumption is based on 1.14 beta to global equities plus inflation and real cash return



# Aon Investments' Capital Market Assumptions

## Explanation of Capital Market Assumptions—09/30/2024

Alternative Asset Classes		
<b>Low Beta (Defensive) Hedge Funds</b>	2.3%	Encompasses defensive/low volatility hedge fund strategies with low correlations to risk assets. This assumption represents median manager performance. 1% base fee + 10% performance fee is deducted from the return expectation.
<b>Low Beta (Defensive) Hedge Funds Institutional Quality</b>	3.3%	Represent defensive/low volatility hedge fund strategies with low correlations to risk assets. 1% base fee + 7% performance fee is deducted from return expectations. To use this category the funds must be institutional quality.
<b>High Beta (Return Enhancing) Hedge Funds</b>	3.3%	Encompasses return enhancing/higher volatility hedge fund strategies with higher correlations to risk assets. The assumption represents median manager performance. 1% base fee + 10% performance fee is deducted from the return expectations.
<b>High Beta (Return Enhancing) Hedge Funds Institutional Quality</b>	5.3%	Represents return enhancing/higher volatility hedge fund strategies with higher correlations to risk assets. 1% base fee + 7% performance fee is deducted from return expectations. To use this category the funds must be institutional quality.
<b>Direct Hedge Funds Universe</b>	2.8%	Generic hedge fund investments which represents a portfolio of diversified strategies. We assume 50% defensive/50% return enhancing strategies. 1% base fee + 10% performance fee is deducted from the return expectations.
<b>Direct Hedge Funds Institutional Quality</b>	4.3%	Generic hedge fund investments which represents a portfolio of top-tier diversified strategies. We assume 50% defensive institutional quality/50% return enhancing institutional quality strategies. To use this category the funds must be institutional quality. 1% base fee + 7% performance fee is deducted from the return expectations.
<b>Core Real Estate</b>	3.6%	Our real return assumption for core real estate is based a gross income of about 3.9%, management fees of roughly 1%, 25% leverage and future capital appreciation near the rate of inflation during the next 30 years. We assume a portfolio of equity real estate holdings that is diversified by property and by geographic region.
<b>Non-Core Real Estate</b>	5.3%	Core real estate is levered approximately 100% as the base building block for this assumption. We subtract financing costs for the leverage and 2% management costs. We also assume nominal alpha of 2% over core real estate. We assume a 50/50 mix of value-add and opportunistic investments.
<b>U.S. REITs</b>	4.1%	Our real return assumption for U.S. REITs is based on income of about 4.1% and future capital appreciation near the rate of inflation during the next 30 years. REITs are a sub-set of U.S. small/mid cap equity universe.

# Aon Investments' Capital Market Assumptions

## Explanation of Capital Market Assumptions—09/30/2024

<b>Commodities</b>	1.4%	Our commodity assumption is for a diversified portfolio of commodity futures contracts. Commodity futures returns are composed of three parts: spot price appreciation, collateral return, and roll return (positive or negative change implied by the shape of the future curve). We believe that spot prices will converge with CPI over the long run (i.e., 2.3%). Collateral is assumed to be Gov't cash (1.4%). Also, we believe the roll effect will be -2.3%, resulting in a real return of about 1.4% for commodities.
<b>Private Equity</b>	7.6%	Our private equity assumption reflects a diversified fund of funds with exposure to buyouts and venture capital.
<b>Open-End Infrastructure</b>	5.3%	Our open-end infrastructure assumption assumes a mix of 65% core, 25% value-add and 10% opportunistic strategies. Return formulated through estimates of income and capital growth, leverage, debt costs, taxes and management expenses.
<b>Closed-End Infrastructure</b>	6.4%	Our closed-end infrastructure assumption assumes a mix of 50% value-add, 35% opportunistic and 15% private equity strategies. Return formulated through estimates of income and capital growth, leverage, debt costs, taxes and management expenses.
<b>eLDI</b>	3.5%	Combination of various long credit strategies (1/6 real estate debt, 1/3 securitized debt, 1/6 CMOs, 1/3 private placements).
<b>Open-End Real Assets</b>	4.8%	Combination of 50% Core Real Estate and 50% Open-End Infrastructure
<b>Closed-End Real Assets</b>	6.6%	Combination of 50% Non-Core Real Estate and 50% Closed-End Infrastructure

### Volatility/Correlation Assumptions

Assumed volatilities are formulated with reference to implied volatilities priced into option contracts of various terms, as well as with regard to historical volatility levels. For asset classes which are not marked to market (for example real estate), we “de-smooth” historical returns before calculating volatilities. Importantly, we consider expected volatility trends in the future – in recent years we assumed the re-emergence of an economic cycle and a loss of confidence in central bankers would lead to an increase in volatility. Correlation assumptions are generally similar to actual historical results; however, we do make adjustments to reflect our forward-looking views as well as current market fundamentals.

# About This Material

Section 3: Appendix



# About This Material

This material includes a summary of calculations and consulting related to the finances of the **Teachers' Retirement System of Oklahoma** (TRSOK). The following variables have been addressed:

- Amortization Period, Contributions, Economic Cost, Funded Ratio, Hurdle Rate, Liquidity, Net Outflow

This analysis is intended to assist the Investment Committee with a review of the associated issues and options, and its use may not be appropriate for other purposes. This analysis has been prepared solely for the benefit of the Investment Committee. Any further dissemination of this report is not allowed without the written consent of Aon Investments USA Inc.

Our calculations were generally based on the methodologies identified in the actuary's valuation report for TRSOK. We believe the methodology used in these calculations conforms to the applicable standards identified in the report.

Models are used to develop alternative scenarios based on the underlying valuation model and project financial results under those scenarios. The models were developed by experts outside and within Aon. Where outside models were used, the models were reviewed by experts within Aon. The models were selected as appropriate for these projections by the undersigned.

Experience different than anticipated could have a material impact on the ultimate costs of the benefits. In addition, changes in plan provisions or applicable laws could have a significant impact on cost. Actual experience may differ from our modeling assumptions.

Our calculations were based on data provided by the plan actuary. The actuarial assumptions and methods and plan provisions reflected in these projections are the same as those used for the 2024 fiscal year actuarial valuation for TRSOK as noted in the actuarial reports, except where noted in this report. Unless specifically noted, our calculations do not reflect any other changes or events after June 30, 2024. Reflecting events after June 30, 2024 would impact the results of the projection.

In conducting these projections, we have relied on plan design, demographic and financial information provided by other parties, including the plan's actuary and plan sponsor. While we cannot verify the accuracy of all of the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results.

These projections have been conducted in accordance with generally accepted actuarial principles and practices, including applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board. The undersigned actuary is familiar with the near-term and long-term aspects of pension valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All sections of this report are considered an integral part of the actuarial opinions.

To our knowledge, no colleague of Aon Investments USA Inc. providing services to TRSOK has any direct financial interest or indirect material interest in TRSOK. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this report for TRSOK.

Aon Investments USA Inc.

Phil Kivarkis FSA, CFA

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