2025

Annual **Investment Plan**

- Defined Benefit Fund
- Health Care 115 Trust Fund

OPERS

Ohio Public Employees Retirement System
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CHIEF INVESTMENT OFFICER'S LETTER

To My Fellow OPERS Members:

It is a pleasure to report strong results for 2024. At the beginning of the year, U.S. financial markets were primarily focused on inflation, monetary policy, and the economy's ability to sustain growth while avoiding a recession. Despite periods of volatility and uncertainty, U.S. equities surged approximately 24% for the year, achieving back-to-back annual gains of over 20%—a feat last seen during the dot-com boom of the early 2000s.

This robust equity performance significantly contributed to the positive outcomes for OPERS funds. The Defined Benefit Fund posted a solid 8.82% return, surpassing its actuarial return target of 6.90%. Similarly, the Health Care Fund achieved a strong 10.0% return, exceeding its actuarial return target of 6.0%.

Economic and Market Review of 2024

Monetary Policy Shifts

Central banks worldwide shifted toward monetary easing to bolster economic growth amid cooling inflation and slowing labor markets. The U.S. Federal Reserve, after a prolonged period of rate hikes, initiated its first rate cut in September, reducing the federal funds rate by 0.50% to a target range of 4.75% to 5.0%. Additional cuts followed, bringing the rate to 4.25%–4.50% by year-end.

Globally, other major central banks, including the European Central Bank (ECB) and the Bank of England (BOE), also reduced interest rates to stimulate their economies. The ECB cut its main refinancing rate by 0.25% to 2.75% in November 2024, while the BOE lowered its base rate by 0.50% to 3.0% in December 2024. However, the Bank of Japan (BOJ) diverged by increasing its policy rate by 0.25% in October 2024, reflecting its unique economic conditions. These collective actions underscored a global trend toward monetary easing, aiming to support economic stability and growth.

Inflation and Economic Growth

Throughout 2024, the U.S. experienced declining inflation, which supported the Federal Reserve's decision to pivot toward lower interest rates. By December 2024, the annual inflation rate had fallen to 2.8%, down from a peak of 9.0% in June 2022. Meanwhile, economic growth remained robust, expanding at an annualized rate of 2.8%, slightly below the 2.9% recorded in 2023.

The combination of easing inflation and sustained growth created a favorable environment for growth assets such as global equities, private equity and public credit, driving positive returns across nearly all asset classes. These conditions contributed to the strong performance of the OPERS funds.

OPERS Portfolio

Our disciplined investment approach positioned the Funds' assets to capitalize on appreciating growth opportunities while maintaining a resilient, diversified portfolio. By strategically allocating capital to high-performing equity markets and other growth-oriented assets, we achieved strong returns as economic conditions favored expansion. Simultaneously, our commitment to diversification across asset classes - including fixed income, real assets, gold and alternatives - provided stability during periods of volatility. This balanced approach enabled us to generate solid performance while safeguarding both the Defined Benefit and Health Care Funds long-term financial health.

Key Investment Division Initiatives

Each year, the Investments Division undertakes key initiatives to enhance the capabilities and performance of our program. In addition to delivering positive returns for the year, the following initiatives were particularly noteworthy:

- **Private Alternatives System Upgrade:** Successfully implemented an upgraded private alternatives portfolio management system, which strengthened the reporting and oversight of OPERS' private alternatives allocations.
- **New Board Consultant Onboarding:** In April, OPERS Board hired Meketa as its new investment consultant following a comprehensive selection process. Meketa introduced, and the Board adopted, a new functional allocation framework designed to improve portfolio transparency, oversight, and risk assessment. This framework offers the Board a clearer and more intuitive understanding of major risks and the roles of various asset classes within the portfolio.
- **Risk Mitigation Strategies (RMS):** In November, the Board approved the creation of a dedicated Risk Mitigation Strategies composite for the Defined Benefit Fund. These strategies are designed to enhance portfolio resilience by offering defensive characteristics and maintaining low correlations to equity markets. The goal is to reduce drawdown risk and overall volatility throughout a market cycle. Implementation will be a key focus for staff throughout 2025-2026.

Looking Forward

As we enter 2025, market volatility remains a key challenge, driven by historically high equity valuations, shifting economic policies, and global uncertainties. Despite these headwinds, our investment team remains committed to delivering strong, risk-adjusted returns for OPERS members. Through disciplined asset allocation, rigorous risk management, and a focus on long-term fundamentals, we will strive to navigate market fluctuations while identifying opportunities for sustainable growth. Our approach includes diversification across asset classes, active portfolio management, and tactical adjustments to align with evolving economic conditions.

We extend our sincere appreciation to the OPERS Board of Trustees for their diligent oversight of investment strategies, allocation decisions, and ongoing performance monitoring. Additionally, we thank the Board's consultant, Meketa, for their invaluable guidance in structuring our assets to achieve long-term positive results. With the support of these trusted partners, the Investments Division remains steadfast in our fiduciary duty to safeguard and grow the Funds in order to provide a secure retirement for our members

Paul T. Greff
Chief Investment Officer
March 19, 2025

Executive Summary

The following Summary outlines the strategies, asset allocation, and asset class strategies for both OPERS Defined Benefit and Health Care Funds. This Summary also includes initiatives and resources as well as performance and risk expectations.

Fund Strategies

For the Defined Benefit Fund (“DB Fund”) and Health Care Fund (“HC Fund”), Staff is working towards the new asset allocation targets approved as part of the asset liability study conducted by the Board’s retained Investment Advisor, Meketa at the November 2024 and January 2025 Board meetings. Staff expects the DB Fund to complete transition over multiple years (2025-2027) and HC Fund transition to be completed by the end of the year 2025. Within DB Fund, Private Credit sub-asset class may require a longer timeframe to reach its long-term target beyond 2027.

The following table outlines the projected base case returns with ranges for both the Defined Benefit and Health Care Funds. The base case 2025 return expectations are higher than 2024 for both the Defined Benefit and Health Care Funds due to higher expected returns for the Public Equity, and Alternatives Asset Classes.

	Base Case Return	Return Range	Active Return	Tracking Error	Information Ratio
Defined Benefit Fund					
2025*	8.92	-4.50 to 22.34	0.39	0.98	0.40
2024^	7.41	-7.27 to 22.09	0.42	1.05	0.40
2023^	7.86	-7.79 to 23.50	0.39	0.97	0.40
Health Care Fund					
2025*	7.54	-3.04 to 18.12	0.24	0.61	0.40
2024^	6.78	-5.43 to 18.99	0.30	0.75	0.40
2023^	7.26	-5.88 to 20.40	0.26	0.65	0.40

*Source: *2025 Meketa Capital Market Expectations applied to OPERS Strategic Asset Allocation targets*
^2023/2024 NEPC Capital Market Expectations

The active returns shown above incorporate an information ratio of 0.40. This risk-adjusted return metric is a ratio which measures the active return per unit of tracking error (active risk).

Defined Benefit Fund	3 year Alpha Target	1 year Alpha Target
2025	0.23	0.39
2024	0.22	0.42
2023	0.21	0.39
Health Care Fund		
2025	0.15	0.24
2024	0.16	0.30
2023	0.15	0.26

Asset Allocation and Asset Class Strategies

Meketa, OPERS Retirement Board's retained Investment Advisor, has recommended asset allocation changes for the DB Fund and HC Fund in 2025 as part of the comprehensive review of OPERS asset mix and the subsequent asset-liability study. Staff will continue its focus on determining the optimal mix of active, passive, internally managed and externally managed portfolios when implementing the asset allocation changes.

The Public Equity allocation in the Defined Benefit and Health Care Funds seeks to mirror the market- based global weighting between U.S. Equity and Non-U.S. Equity in the MSCI All Country World Index-Investable Market Index ("MSCI ACWI-IMI"). The current asset allocation targets for U.S. Equity and Non-U.S. Equity in the DB and HC Funds are evaluated annually by the Investment Advisor, (refer to pages 6 and 9 for target allocations for the DB and HC Funds).

With regard to the Fixed Income allocation, the following sub-asset classes, namely Core Fixed, Investment Grade Credit, Securitized Debt, TIPS, High Yield and U.S. Treasury are managed utilizing internal Staff. Staff is also continuously reviewing the current mix of external managers within the Emerging Markets Debt and High Yield sub-asset classes to achieve lower fees and higher risk-adjusted returns. The High Yield allocation is increasingly managed internally with the expansion of the High Yield staff, with approximately 40% of the assets now managed internally. This provides improved liquidity, better risk-adjusted returns, and lower fees for the overall High Yield exposure.

Within the Alternatives asset class, the pace of Private Equity commitments is anticipated to align with the program's current allocation, which is nearing its long-term Defined Benefit Fund target of 15%. In the Private Real Estate sub-asset class, Staff will continue its strategy of seeking attractive core and non-core investments to maintain the DB Fund target allocation of 12%. The new Private Credit sub-asset class will require more than three years to reach its long-term target allocation of 4% (as approved as part of the DB Fund asset-liability study) and will be comprised of various private credit strategies.

Within the Risk Mitigation Strategies ("RMS") asset class, the following sub-asset classes, namely Long Duration U.S. Treasury, Trend Following, and Alternative Risk Premia are intended to obtain and manage downside protection of the Funds. They may include index-oriented or actively managed strategies with the expectation that they enhance the existing overall asset mix, portfolio construction and risk-adjusted long-term returns of the Funds.

Staff will continue to monitor the progress and report to the OPERS Retirement Board quarterly along with Meketa's quarterly performance report.

Initiatives

Each year the Investments Division undertakes significant initiatives to enhance the capabilities and performance of the Funds. Completed 2024 strategic initiatives and new 2025 strategic initiatives are highlighted on the next page.

2024 Completed Initiatives

- Conducted thorough research to refine the framework for both strategic and tactical asset allocation within the OPERS Investments program.
- Reviewed the OPERS Derivatives Policy and use of derivatives strategies, including options, with the aim of optimizing asset class returns and mitigating downside risk.
- Finalized the implementation of an upgraded portfolio management system dedicated to Private Alternatives, that produce enhanced reporting and functionality.

2025 Initiatives

- Implement the new long-term asset allocation targets for both the DB and HC Funds.
- Implement the Risk Mitigation Strategies for both the DB and HC Funds to protect the downside of the Funds.

Resources

The Investments Division Staff is comprised of 62 budgeted positions. Two positions are currently vacant.

The Investments Division submitted an estimated operating budget of $23.9 million for 2025. The budget includes the Finance Division's estimate of the 2025 incentive compensation payout, based on the prior year's budget. The budget incorporates the Investments Division's efforts to maintain internal investment management, where appropriate, due to the material cost savings in asset management fees.

Staff estimates the total cost to manage the OPERS asset base at 45.0 basis points or $529.2 million. This is an increase in fees from the prior year primarily due to higher allocations in Private Alternatives. This cost estimate assumes long-term growth in the Fund's asset base, whereas an unanticipated bear market would reduce the absolute dollar cost.

Defined Benefit Fund

Expected Asset Growth – Defined Benefit Fund

The table below summarizes Staff's estimate (base case) of market values and ranges for the Defined Benefit Fund on December 31, 2025. Pessimistic and optimistic cases are also provided for comparison purposes.

	Defined Benefit Fund 2025 Expected Asset Growth Estimated Market Values, Returns and Cash Flows		
	Pessimistic Case	Base Case	Optimistic Case
12/31/24 Market Value ($ billions)	$104.10	$104.10	$104.10
Expected Total Return	-4.50%	8.92%	22.34%
Expected Investment Gain ($ billions)	-$4.68	$9.29	$23.25
Expected Cash Flow ($ billions)	-$3.96	-$3.96	-$3.96
12/31/25 Market Value ($ billions)	$95.46	$109.42	$123.39

The base market value of $104.1 billion for December 31, 2024, is based on the audited financial BNY performance report.

Asset Allocation – Defined Benefit Fund

The 2025 target asset allocation and ranges for the Defined Benefit Fund reflect an estimate by Staff of the expected progress to be made toward the strategic asset allocation targets. Also included are asset allocations for a comparable peer group as of December 2024 (refer to page 27).

Asset Class	12/31/2024 Target	12/31/2025 Target	Range	Peer Group*
Public Equity	**41.0%**	**41.0%**	**33% to 49%**	**37.24%**
U.S. Equity	21.0%	21.0%	16% to 26%	23.86%
Non-U.S. Equity	20.0%	20.0%	15% to 25%	13.39%
Fixed Income	**24.7%**	**21.0%**	**11% to 20%**	**22.21%**
Core Fixed	9.7%	7.0%	3% to 8%	13.27%
Securitized Debt	1.0%	1.0%	0% to 5%	0.00%
Emerging Markets Debt	1.0%	1.0%	0% to 5%	1.81%
High Yield	4.0%	4.0%	0% to 6%	3.86%
TIPS	3.0%	3.0%	0% to 5%	3.27%
U.S. Treasury	3.0%	2.0%	0% to 5%	0.00%
Investment Grade Credit	3.0%	3.0%	0% to 5%	0.00%
Alternatives	**32.3%**	**31.0%**	**24% to 44%**	**36.93%**
Private Equity	15.0%	15.0%	10% to 20%	17.06%
Real Estate	12.0%	12.0%	7% to 17%	10.34%
Hedge Funds	-	0.0%	0% to 1%	2.99%
Opportunistic	2.0%	0.0%	0% to 2%	0.00%
Commodities - All	2.0%	1.0%	0% to 5%	1.06%
Gold	0.0%	1.0%	0% to 5%	0.00%
REITs	1.0%	1.0%	0% to 5%	1.80%
Private Credit	0.3%	1.0%	0% to 8%	3.69%
Risk Parity	**2.0%**	**2.0%**	**0% to 5%**	**0.00%**
RMS	**-**	**5.0%**	**0% to 10%**	**1.11%**
Long Duration U.S. Treasury	-	2.0%	0% to 5%	0.39%
Trend Following	-	2.0%	0% to 5%	0.50%
Alternative Risk Premia	-	1.0%	0% to 5%	0.22%
Other				**2.51%**
Defined Benefit Fund	**100.0%**	**100.0%**		**100.00%**

*The asset allocations are derived from the organizations in the Peer Group Comparison section on page 27 and OPERS data.

FUND STRATEGIES

The traditional asset allocation framework primarily focuses on dividing investments across traditional asset classes (e.g., stocks, bonds, real estate) is well known and easily understood. It focuses on normal market environments and is beneficial for its simplicity in identifying public and private investments when making operational considerations such as liquidity management.

The functional asset allocation framework aligns assets based on their functional role within a portfolio. It is grouped into two strategic classes of growth and diversification. Growth and diversification each are comprised of subcomponents which help to improve portfolio governance, increase transparency and oversight into major risk and roles among portfolio components, and provide easier accommodation of new strategies and implementation flexibility.

The aggregate portfolio does not materially change whether one uses functional framework or asset class framework. Leveraging the strengths of both traditional asset class frameworks and functional frameworks can create a robust and flexible investment strategy.

DB Fund -Traditional Allocation View		
Asset Classes		**AIP 2025**
	Q1 - 2025	**2025 YE**
Public Equity	**41.00%**	**41.00%**
U.S. Equity	21.00%	21.00%
Non-U.S. Equity	20.00%	20.00%
Fixed Income	**24.80%**	**21.00%**
Core Fixed	9.80%	7.00%
Securitized Debt	1.00%	1.00%
Emerging Markets Debt	1.00%	1.00%
High Yield	4.00%	4.00%
TIPS	3.00%	3.00%
U.S. Treasury	3.00%	2.00%
Investment Grade Credit	3.00%	3.00%
Alternatives	**32.20%**	**31.00%**
Private Equity	15.00%	15.00%
Real Estate	12.00%	12.00%
Commodities - All	2.00%	1.00%
Gold	1.00%	1.00%
PE FX Currency	1.00%	
REITs	1.00%	1.00%
Private Credit	0.20%	1.00%
Risk Parity	**2.00%**	**2.00%**
RMS	**0.00%**	**5.00%**
Long Duration U.S. Treasury	0.00%	2.00%
Trend Following	0.00%	2.00%
Alternative Risk Premia	0.00%	1.00%
Total DB Fund	**100.0%**	**100.0%**

DB Fund - Functional Framework		
Asset Classes		**AIP 2025**
	Q1 - 2025	**2025 YE**
Traditional Growth	**42.00%**	**42.00%**
U.S. Equity + REITS	22.00%	22.00%
Equity ex-US	20.00%	20.00%
Aggressive Growth	**19.00%**	**19.00%**
Private Equity	15.00%	15.00%
Non-Core Real Estate	4.00%	4.00%
Stabilized Growth	**19.20%**	**20.00%**
Core Real Estate	8.00%	8.00%
Risk Parity	2.00%	2.00%
Public Credit (IG,HY,EMD & SD)	9.00%	9.00%
Private Credit	0.20%	1.00%
Principal Protection	**12.80%**	**9.00%**
Core Fixed	9.80%	7.00%
U.S. Treasury	3.00%	2.00%
Inflation	**6.00%**	**5.00%**
TIPS	3.00%	3.00%
Commodities - All	2.00%	1.00%
Gold	1.00%	1.00%
Risk Mitigation Strategies	**1.00%**	**5.00%**
Long Duration U.S. Treasury	0.00%	2.00%
Trend Following	0.00%	2.00%
Alternative Risk Premia	1.00%	1.00%
Broad Growth (including REITS)	**80.20%**	**81.00%**
Diversifying Strategies	**19.80%**	**19.00%**
Total DB Fund	**100.0%**	**100.0%**

	Schedule of Expected Performance and Volatility					
	Average Allocation (%)	Active Return Performance Objectives (bps)	Active Return Performance Contribution (bps)	Target Tracking Error (bps)	Tracking Error Range (bps)	Target Information Ratio
U.S. Equity	**21.0%**	14	3	36	0 - 100	0.40
Non-U.S. Equity	**20.0%**	60	12	150	0 - 300	0.40
Fixed Income	**21.0%**	17	4	50	0 - 200	0.34
Alternatives	**31.0%**	68	21	500	250 - 1500	0.14
Risk Parity	**2.0%**	0	0	0	0 - 200	NA
RMS	**5.0%**	0	0	0	0 - 200	NA
Defined Benefit Fund	**100.0%**	**NA**	**39**	**98**	**0 - 300**	**0.40**

The table above shows an anticipated active management contribution of 39 basis points to the Defined Benefit Fund's return for 2025. The estimated tracking error of 98 basis points indicates a 68% probability that the active return will be in a range of -59 basis points to +137 basis points. This interval is calculated by subtracting the tracking error from, and adding the tracking error to, the expected active return.

Return and Risk – Defined Benefit Fund

The performance objectives for the Defined Benefit Fund are to: 1) exceed the return of the Policy benchmark within an appropriately constrained risk framework, net of investment expenses, and 2) exceed the actuarial required rate of return over a reasonably longer time horizon. The Policy benchmark combines designated market indices for asset classes, weighted by asset allocation targets.

The return estimates in the following table were derived from the asset class return expectations developed by the OPERS Retirement Board's retained Investment Advisor, Meketa. The single-point estimate return of 8.92% is comprised of an expected return of 8.53% from the policy mix and an additional contribution of 0.39% from active management, net of fees.

In the following table, Staff divides return and risk into two components.

<u>Policy:</u> The return and risk derived from the policy asset allocation and the intermediate term return and risk forecast of the underlying asset classes.

<u>Active</u>: The return and risk associated with deviations from benchmark allocations at either the asset class level or portfolio level. It reflects the potential impact to relative performance from deviating from the asset class policy allocation targets, from asset class benchmark mismatches, and from individual portfolio active risk.

FUND STRATEGIES

The Policy Return and Active Return are calculated as weighted average of expected returns and expected alphas of each sub-asset class.

2025 Policy Return Assumptions			
Asset Classes	**Pessimistic**	**Base**	**Optimistic**
Public Equity			
U.S. Equity	-10.10%	6.90%	23.90%
Non-U.S. Equity	-10.30%	7.70%	25.70%
Fixed Income			
Core Fixed	0.60%	4.60%	8.60%
Securitized Debt	0.70%	4.70%	8.70%
Emerging Markets Debt	-5.00%	7.00%	19.00%
High Yield	-4.50%	6.50%	17.50%
TIPS	-2.70%	4.30%	11.30%
U.S. Treasury	1.00%	4.00%	7.00%
Investment Grade Credit	-1.80%	5.20%	12.20%
Alternatives			
Private Equity	-15.10%	9.90%	34.90%
Real Estate	-8.60%	6.40%	21.40%
Gold	-15.60%	2.40%	20.40%
Commodities - All	-12.10%	4.90%	21.90%
REITs	-18.40%	5.60%	29.60%
Private Credit	-5.80%	9.20%	24.20%
Risk Parity	**-3.70%**	**6.30%**	**16.30%**
RMS			
Long Duration U.S. Treasury	-7.70%	4.30%	16.30%
Trend Following	-11.20%	3.80%	18.80%
Alternative Risk Premia	-2.20%	4.80%	11.80%
Policy Return	**-4.20%**	**8.53%**	**21.26%**

2025 Total Return Assumptions			
Sources of Return	**Pessimistic**	**Base**	**Optimistic**
Policy	-4.20%	8.53%	21.26%
Active	-0.59%	0.39%	1.37%
Total Return	**-4.50%**	**8.92%**	**22.34%**

2025 Total Risk and Active Risk Assumptions			
Sources of Risk	**Variability Risk**	**Information Ratio**	**Sharpe Ratio***
Policy	12.73%		0.48
Active	0.98%	0.40	
Total Risk	**13.42%**		**0.49**

*The Sharpe Ratio reflects 2.4% (10 year Cash Return) as the risk free rate.

Health Care Fund

Expected Asset Growth – Health Care Fund

The table below summarizes Staff's estimate (base case) of market values and ranges for the Health Care Fund on December 31, 2025. Pessimistic and optimistic cases are also provided for comparison purposes.

	Health Care Fund 2025 Expected Asset Growth Estimated Market Values, Returns and Cash Flows		
	Pessimistic Case	Base Case	Optimistic Case
12/31/24 Market Value ($ billions)	$13.37	$13.37	$13.37
Expected Total Return	-3.04%	7.54%	18.12%
Expected Investment Gain ($ billions)	-$0.41	$1.01	$2.42
Expected Cash Flow ($ billions)	-$0.60	-$0.60	-$0.60
12/31/25 Market Value ($ billions)	$12.36	$13.77	$15.18

The base market value of $13.37 billion for December 31,2024 is based on the audited financial BNY performance report.

Asset Allocation – Health Care Fund

The 2025 target asset allocation and ranges for the Health Care Fund reflect an estimate by Staff of the expected progress to be made toward the strategic asset allocation targets, which are shown below. There is no peer universe of public pension plans with separate health care funds.

Asset Class	12/31/2024 Target	12/31/2025 Target	Range
Public Equity	**50.0%**	**45.0%**	**36% to 54%**
U.S. Equity	25.0%	22.0%	17% to 27%
Non-U.S. Equity	25.0%	23.0%	18% to 28%
Fixed Income	**37.0%**	**37.0%**	**26% to 48%**
Core Fixed	16.0%	15.0%	10% to 19%
Securitized Debt	3.0%	4.0%	0% to 6%
Emerging Markets Debt	1.0%	1.5%	0% to 5%
High Yield	5.0%	7.0%	0% to 10%
TIPS	7.0%	4.0%	0% to 6%
U.S. Treasury	2.0%	2.0%	0% to 5%
Investment Grade Credit	3.0%	3.5%	0% to 5%
Alternatives	**10.0%**	**5.0%**	**3% to 8%**
REITs	5.0%	2.0%	0% to 5%
Hedge Funds	0.0%	0.0%	0% to 1%
Opportunistic	2.0%	0.0%	0% to 2%
Gold	0.0%	1.0%	0% to 5%
Commodities - All	3.0%	2.0%	0% to 5%
Risk Parity	**3.0%**	**3.0%**	**0% to 5%**
RMS	**0.0%**	**10.0%**	**0% to 15%**
Long Duration U.S. Treasury	0.0%	3.4%	0% to 5%
Trend Following	0.0%	3.3%	0% to 5%
Alternative Risk Premia	0.0%	3.3%	0% to 5%
Health Care Fund	**100.0%**	**100.0%**	

FUND STRATEGIES

The traditional asset allocation framework primarily focuses on dividing investments across traditional asset classes (e.g., stocks, bonds, real property estate) is well known and easily understood. It focuses on normal market environments and is beneficial for its simplicity in identifying public and private investments when making operational considerations such as liquidity management.

The functional asset allocation framework aligns assets based on their functional role within a portfolio. It is grouped into two strategic classes of growth and diversification. Growth and diversification each are comprised of subcomponents which help to improve portfolio governance, increase transparency and oversight into major risk and roles among portfolio components, and provide easier accommodation of new strategies and implementation flexibility.

The aggregate portfolio does not materially change whether one uses functional framework or asset class framework. Leveraging the strengths of both traditional asset class frameworks and functional frameworks can create a robust and flexible investment strategy.

HC Fund -Traditional Allocation View		
Asset Classes		AIP 2025
	Q1 - 2025	2025 YE
Public Equity	**50.0%**	**45.0%**
U.S. Equity	25.0%	22.0%
Non-U.S. Equity	25.0%	23.0%
Fixed Income	**37.0%**	**37.0%**
Core Fixed	16.0%	15.0%
Securitized Debt	3.0%	4.0%
Emerging Markets Debt	1.0%	1.5%
High Yield	5.0%	7.0%
TIPS	7.0%	4.0%
U.S. Treasury	2.0%	2.0%
Investment Grade Credit	3.0%	3.5%
Alternatives	**10.0%**	**5.0%**
Commodities - All	3.0%	2.0%
Gold	1.0%	1.0%
PE FX Currency	1.0%	
REITs	5.0%	2.0%
Risk Parity	**3.0%**	**3.0%**
RMS	**0.0%**	**10.0%**
Long Duration U.S. Treasury	0.0%	3.4%
Trend Following	0.0%	3.3%
Alternative Risk Premia	0.0%	3.3%
Total HC Fund	**100.0%**	**100.0%**

HC Fund - Functional Framework		
Asset Classes		AIP 2025
	Q1 - 2025	2025 YE
Traditional Growth	**55.0%**	**47.0%**
U.S. Equity + REITS	30.0%	24.0%
Equity ex-US	25.0%	23.0%
Stabilized Growth	**15.0%**	**19.0%**
Risk Parity	3.0%	3.0%
Public Credit (IG,HY,EMD & SD)	12.0%	16.0%
Principal Protection	**18.0%**	**17.0%**
Core Fixed	16.0%	15.0%
U.S. Treasury	2.0%	2.0%
Inflation	**11.0%**	**7.0%**
TIPS	7.0%	4.0%
Commodities - All	3.0%	2.0%
Gold	1.0%	1.0%
Risk Mitigation Strategies	**1.0%**	**10.0%**
Long Duration U.S. Treasury	0.0%	3.4%
Trend Following	0.0%	3.3%
Alternative Risk Premia	1.0%	3.3%
Broad Growth (including REITS)	**70.0%**	**66.0%**
Diversifying Strategies	**30.0%**	**34.0%**
Total HC Fund	**100.0%**	**100.0%**

	Schedule of Expected Performance and Volatility					
	Average Allocation (%)	Active Return Performance Objectives (bps)	Active Return Performance Contribution (bps)	Target Tracking Error (bps)	Tracking Error Range (bps)	Target Information Ratio
U.S. Equity	**22.0%**	14	3	36	0 - 100	0.40
Non-U.S. Equity	**23.0%**	60	14	150	0 - 300	0.40
Fixed Income	**37.0%**	18	7	50	0 - 200	0.36
Alternatives	**5.0%**	14	1	300	200 - 400	0.05
Risk Parity	**3.0%**	0	0	0	0 - 200	NA
RMS	**10.0%**	0	0	0	0 - 200	NA
Health Care Fund	**100.0%**	**NA**	**24**	**61**	**0 - 300**	**0.40**

The table above shows an anticipated active management contribution of 24 basis points to the Health Care Fund's return for 2025. The estimated tracking error of 61 basis points indicates a 68% probability that the active return will be in a range of -36 basis points to +85 basis points. This interval is calculated by subtracting the tracking error from, and adding the tracking error to, the expected active return.

Return and Risk – Health Care Fund

The performance objectives for the Health Care Fund are to (1) exceed the return of the Policy benchmark within an appropriately constrained risk framework, net of investment expenses, and (2) exceed the actuarial required rate of return over a reasonably longer time horizon. The Policy benchmark combines designated market indices for asset classes, weighted by asset allocation targets.

The return estimates in the following table were derived from the asset class return expectations developed by the OPERS Retirement Board's retained Investment Advisor, Meketa. The single-point estimate return of 7.54% is comprised of an expected return of 7.30% from the policy mix and an additional contribution of 0.24% from active management, net of fees.

In the following table, Staff divides return and risk into two components.

<u>Policy</u>: The return and risk derived from the policy asset allocation and the intermediate-term return and risk forecast of the underlying asset classes.

<u>Active</u>: The return and risk associated with deviations from benchmark allocations at either the asset class level or portfolio level. It reflects the potential impact to relative performance from deviating from the asset class policy allocation targets, from asset class benchmark mismatches and from individual portfolio active risk.

FUND STRATEGIES

The Policy Return and Active Return are calculated as the weighted average of expected returns or expected alphas of each sub-asset class.

2025 Policy Return Assumptions			
Asset Classes	**Pessimistic**	**Base**	**Optimistic**
Public Equity			
U.S. Equity	-10.10%	6.90%	23.90%
Non-U.S. Equity	-10.30%	7.70%	25.70%
Fixed Income			
Core Fixed	0.60%	4.60%	8.60%
Securitized Debt	0.70%	4.70%	8.70%
Emerging Markets Debt	-5.00%	7.00%	19.00%
High Yield	-4.50%	6.50%	17.50%
TIPS	-2.70%	4.30%	11.30%
U.S. Treasury	1.00%	4.00%	7.00%
Investment Grade Credit	-1.80%	5.20%	12.20%
Alternatives			
REITs	-18.40%	5.60%	29.60%
Gold	-15.60%	2.40%	20.40%
Commodities - All	-12.10%	4.90%	21.90%
Risk Parity	**-3.70%**	**6.30%**	**16.30%**
RMS			
Long Duration U.S. Treasury	-7.70%	4.30%	16.30%
Trend Following	-11.20%	3.80%	18.80%
Alternative Risk Premia	0.40%	5.40%	10.40%
Policy Return	**-3.05%**	**7.30%**	**17.99%**

2025 Total Return Assumptions			
Sources of Return	**Pessimistic**	**Base**	**Optimistic**
Policy	-3.05%	7.30%	17.99%
Active	-0.36%	0.24%	0.85%
Total Return	**-3.04%**	**7.54%**	**18.12%**

2025 Total Risk and Risk Attribution Assumptions			
Sources of Risk	**Variability Risk**	**Information Ratio**	**Sharpe Ratio***
Policy	10.52%		0.47
Active	0.61%	0.40	
Total Risk	**10.58%**		**0.49**

*The Sharpe Ratio reflects 2.4% (10 year Cash Return) as the risk free rate.

ASSET CLASS STRATEGIES

Tactical Outlook

The following tactical outlook provides a background and context for the asset class strategies in the Defined Benefit and Health Care Funds.

The following are overviews of the two components of the tactical outlook: the capital markets observations and the asset class outlook. The Investment Advisor, Meketa, retained by the OPERS Retirement Board, provided the outlook for 2025.

Capital Markets Observations

- **Key Market Themes**
  - The current federal administrative plan for expansion of fossil fuel production, tax cuts, and deregulation may boost corporate margins and short-term growth but risk potentially higher deficit spending, regulatory challenges, and inflation. In addition, restrictive immigration and protectionist trade policies could disrupt supply chains, reduce the labor force supply, elevate consumer prices, and reignite inflation.
  - Despite recent rate cuts, the U.S. labor market and economy have remained resilient, while the Fed balances its dual mandate of price stability and maximum employment amidst fiscal measures that may increase economic volatility. Rising yield curve trends reflect market concerns over inflationary impacts of federal policies, and challenges in balancing inflation and growth within a volatile environment.
  - Interest rates should remain high in 2025 as the federal reserve continues to evaluate rising inflation.
  - China's ongoing real estate crisis and weak consumer demand pose ongoing economic challenges. Trade tensions between the U.S. and China have reduced Foreign Direct Investment by 29.1% YoY, while potential additional U.S. tariffs in combination with yuan depreciation may impact U.S. growth and financial stability.
  - We are watching the U.S. federal government for the fiscal challenges it faces in 2025. Roughly 25% of the outstanding debt or $9 trillion is expected to mature this year.
  - The U.S. market faces risks from AI-focused stocks driving indices and elevated P/E ratios. Corporate tax cuts boost EPS artificially, while macroeconomic shocks and diversification concerns persist. Opportunities exist for small caps in a new monetary environment.

Market Outlook

- **U.S. and Non-U.S. Equities**
  - A resilient U.S. economy, a still relatively strong labor market, and the expectation for deregulation and tax cuts serve as tailwinds.
  - U.S. dollar strength remains supportive of domestic equities relative to foreign equities.
  - The uncertain impact of the new administration's policies and concentrated tech stock leadership are areas we are monitoring

- U.S. dollar strength remains a headwind, though the Yen has recently strengthened.
- Many developed foreign market economies have weaker growth projections than the U.S.
- Improvements in corporate governance in Japan, particularly the increasing openness to shareholder activism and takeover bids, are supportive.
- Overall international valuations remain attractive relative to the U.S.

- **Fixed Income**
  - Long-Term Gov't Bonds could benefit from a flight to quality if the economy significantly slows.
  - If the Federal Reserve continues cutting interest rates and the yield curve further steepens, it could make yields on longer-dated Treasuries relatively attractive.
  - The new administration's policies seem likely to increase deficit spending and the need for bond issuance possibly leading to investors demanding higher yields on U.S. debt.
  - A pick-up in inflation could also act as a headwind.
  - Corporate yields are attractive in absolute terms and on a risk-adjusted basis relative to Treasuries due to strong corporate health.
  - Investment grade bonds are more insulated to an economic downturn relative to lower quality corporate bonds.
  - Even though High Yield spreads are narrow compared to longer-term averages, indicating the upside to price appreciation is limited, the income levels from ongoing coupon payments are attractive.
  - Higher interest payments could be a concern for some companies that might have to re-issue debt at higher rates if their current lower interest rate debt matures in 2025.

- **Real Assets**
  - Since March of 2022, the actions of the Federal Reserve aimed at lowering inflation have resulted in debt costs which have more than doubled, constrained debt capital markets, greatly reduced commercial real estate transaction volume, and a broad re-pricing of commercial real estate assets.
  - While occupancy across property type sectors remains healthy, cooling tenant demand coupled with the increasing cost of debt and slowing rent growth has been weighing heavily on commercial real estate property values. In addition, the continued low transaction volume has made it more difficult to determine "fair value".
  - Investors have adjusted their return expectations assuming a higher for longer interest rate environment.

- Some asset owners with maturing debt, expiring interest rate caps, and other situations requiring a refinancing of current debt, could have difficulty obtaining financing and be forced to sell their commercial real estate asset(s), or to give the asset(s) back to the lender. Even if the owner obtains a loan extension, the terms are likely to be far less favorable than the initial loan.
- While interest rate increases and the uncertain economic environment are increasing the likelihood of pocketed distress, the amount of distressed assets that may come to market remains unclear.
- Commercial real estate loan exposure at large banks is generally less than at smaller, and/or regional banks. While some smaller banks and non-bank mortgage lenders may be experiencing stress, the situation is currently not anticipated to be a risk to the entire U.S. banking system.
- Lenders have become more conservative with their underwriting and willingness to make loans.
- As long as the uncertainty surrounding the U.S. economy and capital markets endure, we expect asset values to continue to be under pressure across property types and locations.

- **Private Equity**
  - Private Equity fund raising has been challenged in the recent year and we expect that to continue as we enter 2025 as the markets continue to adjust to higher interest rates and a slowing IPO market. We would not be surprised to see an uptick in the secondary market this year as investors look to get out of existing funds.
  - North America-focused vehicles have continued to represent the highest geographic allocation of funds raised, and we expect that it will not change this year given the new federal administration's policies. Investor appetite for Rest of World should also remain subdued.
  - Overall, Private Equity returns have proven resilient in these markets but remain below the highs of recent years. Performance has been strong in each vintage year since the Global Financial Crisis. The spread between first and third quartile performance in private equity has increased since the Global Financial Crisis.
  - While Private Equity has undergone several quarters of write-downs, we continue to view this class as an attractive allocation and expect returns will continue to improve as we move through 2025. Manager selection and annual pacing studies continue to be key within this market.

- **Private Debt**
  - Based on survey data financial conditions remain relatively loose supporting the Federal Reserve's potential case for a less aggressive approach to easing.
  - The economically critical U.S. housing market faces some headwinds with the U.S. mortgage rate reversing its downward trend, posing a challenge to household formation and prospective home buyers.

  - Lower total yield due to declining base rates and tighter spreads lowered funding costs for borrowers rated single-B, a segment typically targeted by private credit lenders and capital solutions providers.

- We believe in continuing to commit and allocate to Private Debt managers with a focus on manager selection and an annual review of pacing studies. In addition, leverage limits should be reviewed as the market moves continue to be volatile.

- **Risk Mitigating Strategies**
  - High valuations in the U.S. Equity markets and uncertainty surrounding the new federal administrations polices lends itself to look at assets that can protect capital when economic growth slows or turns negative. We continue to have conviction in building all-weather like portfolios to help protect assets during down markets.
  - Given the early indication of the Fed to keep rates higher for longer there has been historical trends that benefit bonds when investors seek a flight to quality.

Performance Expectations – Excess Return Targets

Public Equity

The following table shows the benchmarks and performance objectives for the Public Equity asset class. The benchmark for the U.S. Equity asset class is the Russell 3000 Index with an alpha target of 14 basis points, net of fees. The tracking error target is 36 basis points with a range of 0 to 100 basis points. The performance objective (alpha) and target tracking error for Non-U.S. Equity are 60 basis points and 150 basis points, respectively.

	Public Equity Asset Class Alpha Target and Target Tracking Error				
	Benchmark	Alpha Target (net of fees) (bps)	Target Tracking Error (bps)	Target Information Ratio	Tracking Error Range (bps)
U.S. Equity	*Russell 3000*	14	36	0.40	0 - 100
Non-U.S. Equity	*Custom Benchmark*	60	150	0.40	0 - 300

The custom benchmark for Non-U.S. Equity is composed of 55% MSCI World Index ex U.S. Standard Index; 10% MSCI World Index ex U.S. Small Cap Index; 31% MSCI Emerging Markets Standard Index; and 4% MSCI Emerging Markets Small Cap Index. This structure reflects a strategic overweight to Emerging Markets compared to the Emerging Markets allocation of the MSCI All Country World Index ex U.S. Investable Markets Index ("MSCI ACWI ex U.S. IMI").

Fixed Income

The following table shows the benchmarks and performance objectives for the Fixed Income asset class.

	Internal - Fixed Income Asset Class Alpha Target and Target Tracking Error				
	Benchmark	Alpha Target (net of fees) (bps)	Target Tracking Error (bps)	Target Information Ratio	Tracking Error Range (bps)
Core Fixed	*Bloomberg U.S. Aggregate*	30	75	0.40	0 - 200
Securitized Debt	*Securitized Debt Custom Benchmark**	80	200	0.40	0 - 400
High Yield	*OPERS Custom Bloomberg Very Liquid BB/B High Yield*	30	75	0.40	0 - 150
TIPS	*Bloomberg U.S. TIPS*	0	15	NA	0 - 30
U.S. Treasury	*Bloomberg U.S. Treasury 1-5 Year*	0	15	NA	0 - 30
Investment Grade Credit	*Bloomberg U.S. Corporate Bond*	30	75	0.40	0 - 150

*50% Bloomberg Non-Agency Investment Grade CMBS: BBB Total Return Index Unhedged USD & 50% Bloomberg Non-Agency CMBS Agg Eligible Total Return Index Value Unhedged USD.

External - Fixed Income Asset Class Alpha Target and Target Tracking Error					
	Benchmark	Alpha Target (net of fees) (bps)	Target Tracking Error (bps)	Target Information Ratio	Tracking Error Range (bps)
Core Fixed	*Bloomberg U.S. Aggregate*	36	90	0.40	0 - 200
Emerging Markets Debt	*EMD Custom Benchmark***	46	230	0.20	0 - 800
High Yield	*Bloomberg U.S. Corporate High Yield*	20	100	0.20	0 - 700

**50% JP Morgan Emerging Markets Bond Index Global & 50% JP Morgan Government Bond Index-Emerging Markets Global Diversified.

Cash Management

The cash portfolios are managed with a low-to-moderate risk profile that results in principal preservation while exceeding the performance of the respective benchmarks. The benchmark for the OPERS Short Term Investment Funds ("STIF") is the Bloomberg Tier 1 30-Day Commercial Paper Index.

Securities Lending

In the securities lending program, Staff manages two lending portfolios and utilizes a lending agent to maximize lending revenue. Staff strive to hire agents who provide competitive fee splits, while providing adequate risk controls and expertise in the asset class being loaned. There is a bias toward lending assets in an auction environment, so borrowers are providing maximum revenue in a competitive environment on a regular basis. Staff will continue lending the U.S. Treasury, Agency and a portion of the corporate bond assets in-house. The collateral from the securities lending program is managed internally. The combination of lending revenue and investment income comprise the total securities lending performance. The benchmark for the Securities Lending STIF is the Overnight Bank Funding Rate.

Alternatives

The Alternatives asset class is composed of Private Equity, Real Estate, REITs, Private Credit, Commodities-All, and Gold investment strategies. The Defined Benefit and Health Care Funds invest differently in the Alternatives asset class to meet their unique investment objectives.

The following table summarizes the benchmark, performance objectives and tracking error for the various alternative investment strategies utilized within the Fund.

	Benchmark	Alpha Target (net of fees) (bps)	Target Tracking Error (bps)	Target Information Ratio	Tracking Error Range (bps)
Private Equity	*State Street Private Equity Index (SSPEI)*	100	NA	NA	0 - 1500
Real Estate	*Net NFI-ODCE + 0.85%*	30	NA	NA	0 - 1500
REITs	*DJ U.S. Select RESI*	0	10	NA	0 - 250
Private Credit	*S&P UBS Leveraged Loan*	200	500	0.40	0 - 1500
Commodities - All	*Bloomberg Commodity Total Return*	36	90	0.40	0 - 300
Gold	*Bloomberg Gold Subindex Total Return*	0	25	NA	0 - 50

Risk Parity

Risk Parity is an alternative approach to investment portfolio management, which focuses on the allocation of risk rather than allocation of capital. The Risk Parity approach is underpinned by the expectation that when asset allocations are adjusted to the same risk level, a portfolio can achieve a higher Sharpe ratio and be more resilient to market downturns.

Currently, the Risk Parity asset class is 100% managed in-house. The internal mandate has a volatility target of 10% and is benchmarked to the S&P Global Risk Parity Index – 10% Target Volatility.

Risk Mitigation Strategies

The Risk Mitigation Strategies ("RMS") asset class is comprised of Long Duration U.S. Treasury, Trend Following and Alternative Risk Premia. Each strategy within the RMS asset class has a specific performance benchmark (as outlined in the table below). The overall benchmark for the RMS asset class is a custom benchmark based on the target weights of the underlying sub-asset class allocations. RMS is being implemented as a beta allocation and passive strategy to the total Fund with zero alpha expectations.

Strategy	Benchmark	Alpha Target	Tracking Error Range (bps)
Long Duration U.S. Treasury	*Bloomberg U.S. Treasury 20+ Year Total Return Index*	0	0 - 50
Trend Following	*Market-value weighted composite of the portfolio returns*	0	0 - 50
Alternative Risk Premia	*Market-value weighted composite of the portfolio returns*	0	0 - 50

POLICIES, COMMITTEES, AND RESOURCES

OPERS Retirement Board Policies Governing Investment Activities

The following exhibit illustrates the structure and relationship of the Policies within the OPERS System and its three Investment Funds.

OPERS FUNDS

FUND POLICIES

DEFINED BENEFIT FUND	HEALTH CARE FUND	DEFINED CONTRIBUTION FUND
Investment Objectives and Asset Allocation Policy	**Investment Objectives and Asset Allocation Policy**	**Defined Contribution Fund Policy***

ASSET/SUB-ASSET CLASS POLICIES

Public Equity Policy Fixed Income Policy Private Equity Policy Real Estate Policy Private Credit Policy	Cash Policy Commodities Policy Opportunistic Policy Risk Parity Policy REITs Policy Risk Mitigation Strategies

INVESTMENT-WIDE POLICIES

Broker - Dealer Policy Corporate Governance Policy Derivatives Policy External Investment Managers’ Insurance Policy Iran and Sudan Divestment Policy Material Non-public Information Policy Ohio-Qualified & Minority-Owned Manager Policy Russia Divestment Policy	Personal Trading Policy Responsible Contractor Policy Securities Lending Policy Soft Dollar Policy OFAC Policy Leverage Policy Liquidity Policy Benchmarks Policy

*Defined Contribution Fund has a stand-alone policy and other sub-asset class policies are not applicable.

Staff Committee Structure

The Chief Investment Officer ("CIO") utilizes a variety of committees, working groups and meeting structures to govern the Investments Division's activities. This internal governance arrangement enhances collective inputs, retains institutional knowledge, provides documentation of the due diligence process and other processes, promotes transparency and accountability, and formalizes decision-making processes. These committees are designed to combine structure and flexibility to efficiently bring the appropriate decision makers together on a timely basis and maintain a controlled environment to minimize operational risk.

The following provides an outline of the Investment related committees.

Committee/Meeting	Purpose and Description
Staff Investment Committees *	**Approvals and Decisions**
Broker Review	Monitor/Approve and Evaluate Brokers, Complete ORSC Reports
Counterparty Risk	Set Counterparty Limits and Monitor Counterparty Exposures
DC Funds Staff Investments Committee	Review/Monitor Defined Contribution Fund's Investment Offerings and Performance
Fund Management	Implement Asset Allocation and Investment Strategies, Cash Forecasting, Fund and Portfolio Exposure Metrics, and Set Quarterly Fund Target Benchmark Allocations During Transition, Liquidity Management
Operational Risk Management	Identify and Monitor Operational Risks
Public Markets Committee	Recommend to hire or terminate External Managers and to open or close internally managed portfolios in relation to OPERS Investment Polices
Private Alternatives Committee	Review Private Equity/Real Estate Opportunities for CIO Approval

* Committee has charter and maintains minutes

Staffing

Recruiting and retaining the best and most talented staff is a critical priority for the Investments Division. The following table shows the anticipated full staffing for 2025.

	Target Staffing for Year 2025					
	Office of the CIO	Fund Mgmt.	Risk Mgmt.	Internal Funds	External Funds	Total Invest. Division
2025 Investment Plan Projected Staffing	5	4	5	33	15	62
Current Staffing	5	4	5	33	12	59
Vacant Positions - To be filled in 2025	0	0	0	0	3	3
Year End 2025 Target Staffing	5	4	5	33	15	62

	Current Open and Budgeted Positions	
	Position	Vacant
Private Alternatives	Asst. Portfolio Manager - PE	1
External Management	Sr. Investment Analyst - EPM	1
External Management	Sr. Portfolio Manager - EPM	1
Total		3

Staffing Costs

Assuming full staffing levels in 2025, the chart below details the estimated $23.93 million of salaries, benefits, and incentive compensation for the Investments Division. This represents approximately 2.04 basis points of cost, an increase of 0.10 basis points from the 2024 projection.

	Estimated 2025 Total Compensation Costs ($ millions)				
	Office of the CIO	Internal Mgmt.	External Mgmt.	2025 Projected Total	2024 Projected Total
Salaries	$2.27	$7.28	$2.37	$11.92	$11.28
Benefits	$1.21	$3.80	$1.22	$6.23	$5.75
Incentive Compensation	$1.28	$3.48	$1.03	$5.79	$4.62
Total Compensation	$4.75	$14.56	$4.62	$23.93	$21.65
Average Assets ($ billions)	$117.46	$60.99	$56.47	$117.46	$111.55
Compensation (Basis Points)	0.40	2.39	0.82	2.04	1.94

Operating Budget

The Investments Division's 2025 operating budget (excluding compensation) is $10.91 million. This operating budget reflects an increase of $0.09 million, or 0.8% percent, from the 2024 budget and, as a percentage of assets, is 0.93 basis points as compared to 0.97 basis points in 2024. The decrease in bps is due to the increase in AUM.

	Operating Budget less Total Compensation ($ millions)		
	Internal Mgmt.	External Mgmt.	Total Investments Division
2024 Operating Budget	$7.76	$3.06	$10.82
2025 Operating Budget	$7.76	$3.15	$10.91
Percent Change	0.0%	2.9%	0.8%
Percent of Total	71.1%	28.9%	100.0%
Average Assets ($ billions)	$60.99	$56.47	$117.46
Operating Budget (Basis Points)	1.27	0.56	0.93

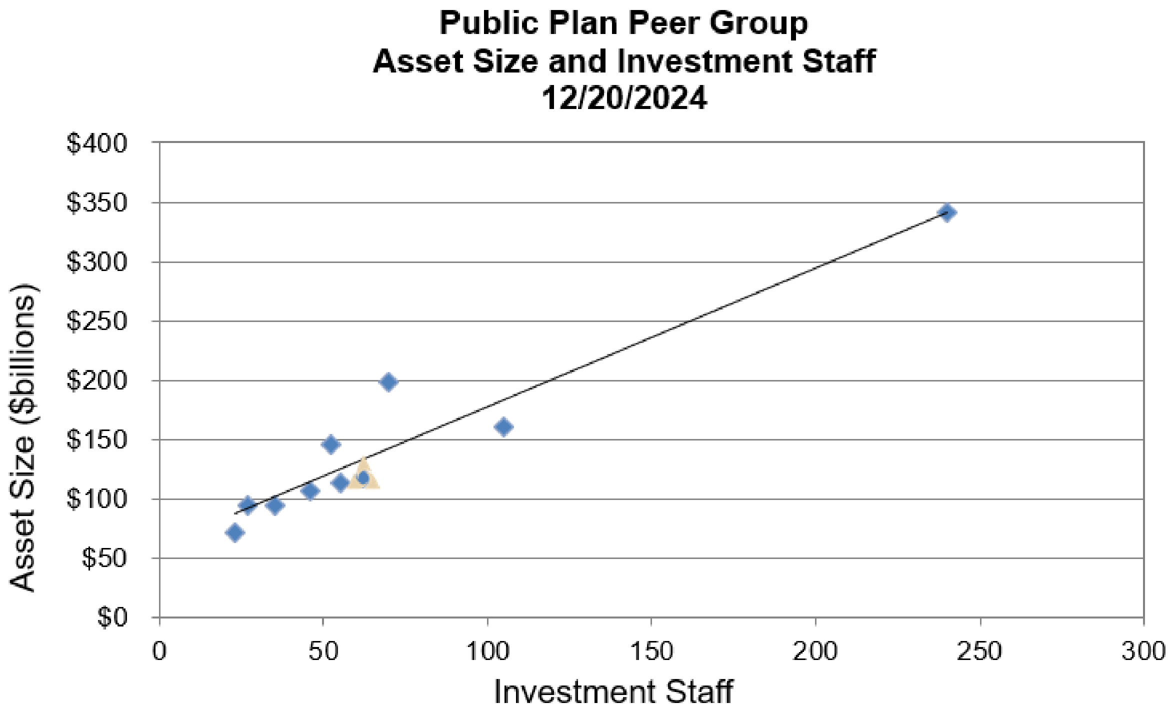
Total Costs

The total costs of the investment program in 2025 are projected to be $529.2 million, or 45.0 basis points of assets under management. External management fees are projected to be $493.2 million in 2025. In 2023 OPERS actual cost of 35.9 basis points (excluding performance fees) was below the CEM Peer benchmark median cost of 39.0 basis points. CEM Benchmarking, Inc. an independent firm that provides an assessment of pension plans, evaluates OPERS investment program relative to a group of comparatively sized peers. CEM Benchmarking excludes the incentive/performance fees for Private Equity and Real Estate in their peer group analysis.

	Estimated 2025 Total Costs ($ millions)			
	Internal Mgmt.	External Mgmt.	Total Investments Division	% of Total
Total Compensation	19.3	4.6	23.9	**4.5%**
Operating Budget less Compensation	7.8	3.1	10.9	**2.1%**
Manager Fees		479.3	479.3	**90.6%**
Custody & Oversight	8.9	6.1	15.1	**2.8%**
Total Costs	**36.0**	**493.2**	**529.2**	**100.0%**
Percent of Total	0.1	0.9		
Average 2024 Asset Size ($ Billions)	61.0	56.5	117.5	
Costs in Basis Points	**5.9**	**87.3**	**NA**	
Costs in Basis Points to Total Fund	**NA**	**NA**	**45.0**	

Peer Group Comparison

The following chart compares the OPERS asset size and Investment Staff to its peer group as of December 20, 2024.



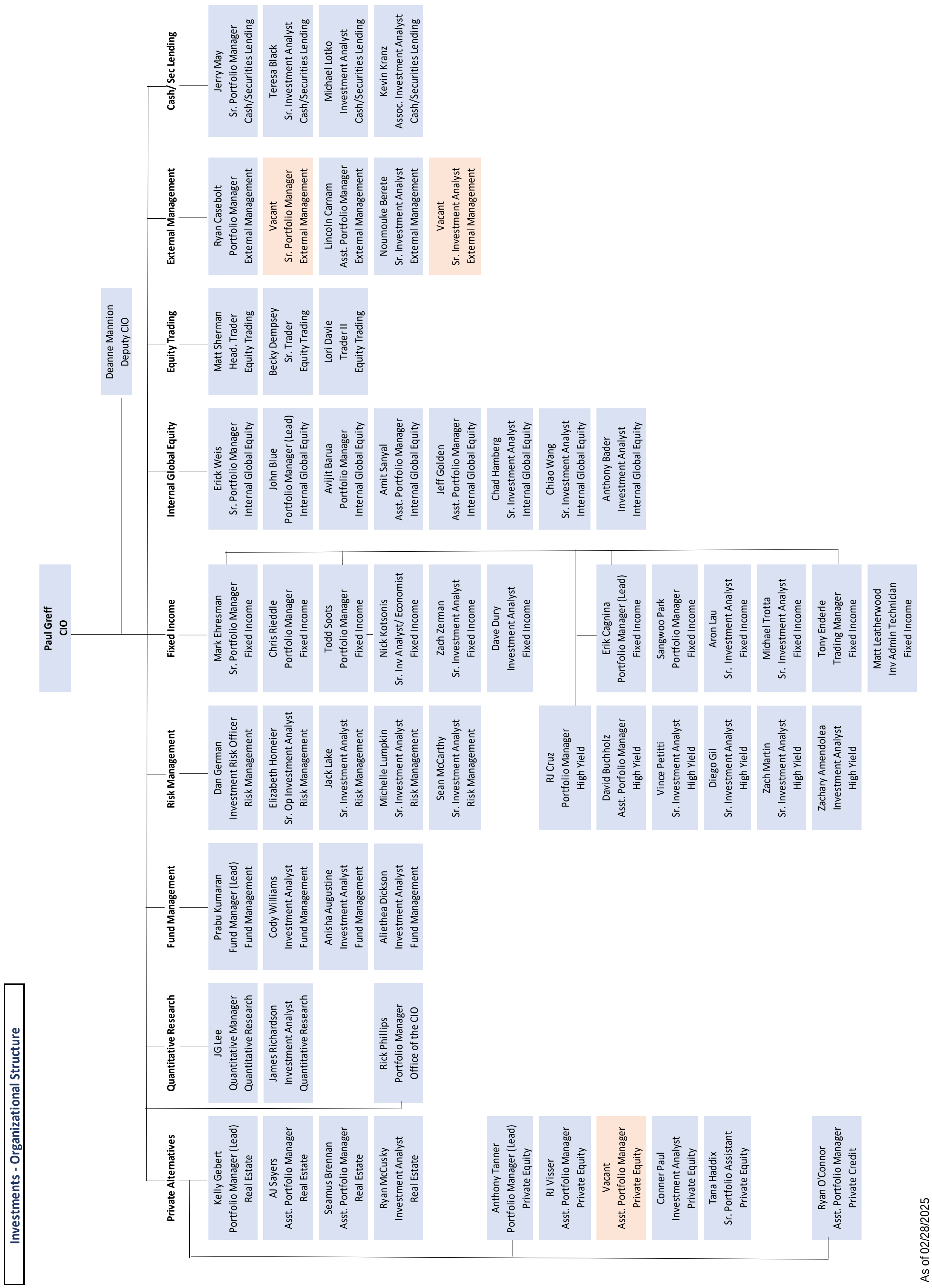
The following table lists the public pension peer group referenced in the chart.

Public Plan Peer Group (as of 12/20/2024)			
Peers	**Asset Size ($ millions)**	**Investment Staff**	**Asset Size per Investment Staff**
California State Teachers' Retirement System	$341,400	240	$1,423
State Board of Administration of Florida	$198,200	82	$2,417
State of Wisconsin Investment Board	$160,200	105	$1,526
New York State Teachers' Retirement System	$145,500	52	$2,798
Ohio Public Employees Retirement System	**$117,400**	**62**	**$1,894**
Virginia Retirement System	$113,900	55	$2,071
Michigan Retirement System	$107,600	46	$2,339
Oregon Public Employees' Retirement Fund	$94,500	27	$3,500
Minnesota State Board of Investments	$93,700	35	$2,677
Teachers' Retirement System of the State of Illinois	$71,400	23	$3,104
Average	**$144,380**	73	**$2,375**

Source: PFDE (Pension Fund Data Exchange), OPERS

*Staffing data sourced from PFDE is as of 12/20/2024

APPENDIX


Investments - Organizational Structure
Paul Greff
CIO
Deanne Mannion
Deputy CIO
Private Alternatives
Kelly Gebert
Portfolio Manager (Lead)
Real Estate
AJ Sayers
Asst. Portfolio Manager
Real Estate
Seamus Brennan
Asst. Portfolio Manager
Real Estate
Ryan McCusky
Investment Analyst
Real Estate
Anthony Tanner
Portfolio Manager (Lead)
Private Equity
RJ Visser
Asst. Portfolio Manager
Private Equity
Vacant
Asst. Portfolio Manager
Private Equity
Conner Paul
Investment Analyst
Private Equity
Tana Haddix
Sr. Portfolio Assistant
Private Equity
Ryan O'Connor
Asst. Portfolio Manager
Private Credit
Quantitative Research
JG Lee
Quantitative Manager
Quantitative Research
James Richardson
Investment Analyst
Quantitative Research
Rick Phillips
Portfolio Manager
Office of the CIO
Fund Management
Prabu Kumaran
Fund Manager (Lead)
Fund Management
Cody Williams
Investment Analyst
Fund Management
Anisha Augustine
Investment Analyst
Fund Management
Aliethea Dickson
Investment Analyst
Fund Management
Risk Management
Dan German
Investment Risk Officer
Risk Management
Elizabeth Homeier
Sr. Op Investment Analyst
Risk Management
Jack Lake
Sr. Investment Analyst
Risk Management
Michelle Lumpkin
Sr. Investment Analyst
Risk Management
Sean McCarthy
Sr. Investment Analyst
Risk Management
RJ Cruz
Portfolio Manager
High Yield
David Buchholz
Asst. Porfolio Manager
High Yield
Vince Petitti
Sr. Investment Analyst
High Yield
Diego Gil
Sr. Investment Analyst
High Yield
Zach Martin
Sr. Investment Analyst
High Yield
Zachary Amendolea
Investment Analyst
High Yield
Fixed Income
Mark Ehresman
Sr. Portfolio Manager
Fixed Income
Chris Rieddle
Portfolio Manager
Fixed Income
Todd Soots
Portfolio Manager
Fixed Income
Nick Kotsonis
Sr. Inv Analyst/ Economist
Fixed Income
Zach Zerman
Sr. Investment Analyst
Fixed Income
Dave Dury
Investment Analyst
Fixed Income
Erik Cagnina
Portfolio Manager (Lead)
Fixed Income
Sangwoo Park
Portfolio Manager
Fixed Income
Aron Lau
Sr. Investment Analyst
Fixed Income
Michael Trotta
Sr. Investment Analyst
Fixed Income
Tony Enderle
Trading Manager
Fixed Income
Matt Leatherwood
Inv Admin Technician
Fixed Income
Internal Global Equity
Erick Weis
Sr. Portfolio Manager
Internal Global Equity
John Blue
Portfolio Manager (Lead)
Internal Global Equity
Avijit Barua
Portfolio Manager
Internal Global Equity
Amit Sanyal
Asst. Portfolio Manager
Internal Global Equity
Jeff Golden
Asst. Portfolio Manager
Internal Global Equity
Chad Hamberg
Sr. Investment Analyst
Internal Global Equity
Chiao Wang
Sr. Investment Analyst
Internal Global Equity
Anthony Bader
Investment Analyst
Internal Global Equity
Equity Trading
Matt Sherman
Head. Trader
Equity Trading
Becky Dempsey
Sr. Trader
Equity Trading
Lori Davie
Trader II
Equity Trading
External Management
Ryan Casebolt
Portfolio Manager
External Management
Vacant
Sr. Portfolio Manager
External Management
Lincoln Carnam
Asst. Portfolio Manager
External Management
Noumouke Berete
Sr. Investment Analyst
External Management
Vacant
Sr. Investment Analyst
External Management
Cash/ Sec Lending
Jerry May
Sr. Portfolio Manager
Cash/Securities Lending
Teresa Black
Sr. Investment Analyst
Cash/Securities Lending
Michael Lotko
Investment Analyst
Cash/Securities Lending
Kevin Kranz
Assoc. Investment Analyst
Cash/Securities Lending
As of 02/28/2025