Trust Level Portfolio Management
Annual Program Review

Eric Baggesen
Managing Investment Director

August 19, 2019
### Annual Program Review Outline

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Executive Summary</strong></td>
<td>3-4</td>
</tr>
<tr>
<td>Executive Summary: Trust Level Portfolio Management (TLPM)</td>
<td>3</td>
</tr>
<tr>
<td>Major Accomplishments (2018-2019) and Initiatives (2019-2020)</td>
<td>4</td>
</tr>
<tr>
<td><strong>I. Program Overview</strong></td>
<td>5-9</td>
</tr>
<tr>
<td>Program Role</td>
<td>6-7</td>
</tr>
<tr>
<td>Investment Beliefs</td>
<td>8</td>
</tr>
<tr>
<td>Governance &amp; Sustainability Integration</td>
<td>9</td>
</tr>
<tr>
<td><strong>II. Investment Review</strong></td>
<td>10-17</td>
</tr>
<tr>
<td>Investment Objective</td>
<td>11</td>
</tr>
<tr>
<td>Investment Performance for Period Ending June 30, 2019</td>
<td>12-14</td>
</tr>
<tr>
<td>Portfolio Positioning – Strategic Asset Allocation</td>
<td>15-17</td>
</tr>
<tr>
<td><strong>III. Business Review</strong></td>
<td>18-24</td>
</tr>
<tr>
<td>Business Philosophy</td>
<td>19</td>
</tr>
<tr>
<td>Investment Office Organization Chart</td>
<td>20</td>
</tr>
<tr>
<td>Functional Organization Chart</td>
<td>21</td>
</tr>
<tr>
<td>Staffing Overview</td>
<td>22</td>
</tr>
<tr>
<td>Business Overview</td>
<td>23</td>
</tr>
</tbody>
</table>
Executive Summary | Trust Level Portfolio Management (TLPM)

1. Progressed Transition to Total Fund Behavior
   • Enabled new Chief Investment Officer’s vision: Portfolio, Processes, People, Performance
   • Aligned business model with Total Fund Objectives
   • Integrated and leveraged cross-Enterprise/INV0 diversity of talent and skill

2. Completed Strategic Asset Allocation Transition
   • Maintained disciplined, organized approach to Asset Liability Management (ALM) decision making
   • Aligned activities with CalPERS 2017-2022 Strategic Plan to strengthen long-term sustainability of the Fund
   • Maintained 7% discount rate while balancing market opportunity set and funded status
   • Navigated successful transition to segments

3. Initiated Total Fund Investment Strategy Review
   • Conducted comprehensive and disciplined active risk review
   • Maintained 100% focus on Total Fund investment performance
   • Aimed to appropriately budget risk dependent on conviction of skill or competitive advantage
Executive Summary | Accomplishments & Initiatives

2018-2019 Major Accomplishments
• Completed transition to Board-adopted (December, 2017) strategic asset allocation policy targets
• Advanced investment risk mitigation strategies to better protect Total Fund from a market drawdown
• Initiated Emerging Manager Program alignment and Total Fund accountability within TLPM
• Initiated transition to centralized support services model

2019-2020 Major Initiatives
• Complete Investment Strategy Review to improve Total Fund risk/return objectives
• Deliver ALM Mid-Cycle Capital Market Outlook and Strategic Asset Allocation Review to the Board
• Advance capital allocation framework through trust-level liquidity and leverage management
• Support Chief Investment Officer’s vision to focus 100% of TLPM’s time, energy, and commitment on investment performance, the investment activities that better enable the Total Fund to achieve risk-aware investment objectives, and a culture of accountability
I. Program Overview

II. Investment Review

III. Business Review
Program Role | Execute CalPERS Strategic Plan

CalPERS 2017-22 Strategic Goal
Strengthen the long-term sustainability of the pension fund, cultivate a risk-intelligent organization, and reduce cost and complexity.

Investment Office Mission (Generate Returns to Pay Benefits)
Manage portfolio in a cost effective, transparent, and risk-aware manner

Vision
• Investment Beliefs and CalPERS Core Values: principles underlying our investment decisions
• Operate with a focus on repeatable, predictable, and scalable portfolios and practices
• Seek alignment of interests with our primary stakeholders, our business partners, and ourselves
• Use clearly articulated performance, risk, and cost metrics to evaluate our value-add to the funds
• Investment and business activities are supported by a solid platform of effective risk management and controls
Program Role | Implement Portfolio Priorities

Specific to CalPERS, implementable, and will influence portfolio construction:

1. Protect the Funded Ratio
   *(mitigate severe drawdowns)*

2. Stabilize Employer Contribution Rates
   *(manage overall volatility)*

3. Achieve Long-term Required Rate of Return
   *(over the long run, but not in every market environment)*
# Investment Beliefs | Alignment and Integration

The Investment Beliefs are not a checklist to be applied by rote to every decision. They are a guide for making judgmental decisions that often require balancing multiple, inter-related decision factors.

<table>
<thead>
<tr>
<th>Short Name</th>
<th>Investment Belief</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Liabilities</td>
<td>Liabilities must influence the asset structure</td>
</tr>
<tr>
<td>2 Long-Term Horizon</td>
<td>A long time investment horizon is a responsibility and an advantage</td>
</tr>
<tr>
<td>3 Stakeholders</td>
<td>CalPERS investment decisions may reflect wider stakeholder views</td>
</tr>
<tr>
<td>4 Three Forms of Capital</td>
<td>Long-term value creation requires effective management of three forms of capital: financial, physical, and human</td>
</tr>
<tr>
<td>5 Accountability</td>
<td>CalPERS must articulate its investment goals and performance measure, and ensure clear accountability for their execution</td>
</tr>
<tr>
<td>6 Strategic Allocation</td>
<td>Strategic asset allocation is the dominant determinant of portfolio risk and return</td>
</tr>
<tr>
<td>7 Risk Reward</td>
<td>CalPERS will take risk only where we have a strong belief we will be rewarded</td>
</tr>
<tr>
<td>8 Costs Matter</td>
<td>Costs matter and need to be effectively managed</td>
</tr>
<tr>
<td>9 Multi-faceted Risk</td>
<td>Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error</td>
</tr>
<tr>
<td>10 Resources / Process</td>
<td>Strong processes and teamwork and deep resources are needed to achieve CalPERS goals and objectives</td>
</tr>
</tbody>
</table>
Governance & Sustainability | TLPM Integration

TLPM external investment manager expectations include:

1. Exercise best judgment to integrate environmental, social, and governance (ESG) considerations into their investment philosophy, strategies, and processes.

2. Conduct quarterly performance assessments to report on and describe any changes to how ESG considerations are integrated into the Firm’s investment philosophy or strategy.
II. Investment Review

- Program Overview
- Investment Review
- Business Review
Investment Objective

TLPM is managed in alignment with the CalPERS Total Fund Investment Policy investment objectives as follows:

1. A rate of total return sufficient to meet or exceed the actuarial expected rate of return within prudent levels of risk and liquidity;

2. Sufficient diversification to minimize the risk of significant loss in any single investment and preserve capital to the extent possible;

3. Adherence to the asset class policy ranges approved by the Committee, with any rebalancing being performed efficiently and prudently;

4. Adequate liquidity to meet cash needs; and

5. Positive returns through any active asset allocation decisions subject to policy ranges and risk limits.
## Performance | Public Employees’ Retirement Fund (PERF)

For Period Ending June 30, 2019

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Ending Market Value (bil)</th>
<th>% of Total Fund Assets</th>
<th>Interim Policy Weight %¹</th>
<th>10-Yr</th>
<th>5-Yr</th>
<th>3-Yr</th>
<th>1-Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Net Return</td>
<td>BM Return</td>
<td>Excess Bps</td>
<td>Net Return</td>
</tr>
<tr>
<td>Growth</td>
<td>$ 212.4</td>
<td>57.4%</td>
<td>58.00%</td>
<td>11.6%</td>
<td>12.1%</td>
<td>(49)</td>
<td>7.1%</td>
</tr>
<tr>
<td>Public Equity</td>
<td>$ 185.9</td>
<td>50.2%</td>
<td>50.0%</td>
<td>11.1%</td>
<td>10.9%</td>
<td>20</td>
<td>6.7%</td>
</tr>
<tr>
<td>Cap Weighted</td>
<td>$ 131.4</td>
<td>35.5%</td>
<td>35.0%</td>
<td>11.0%</td>
<td>10.8%</td>
<td>20</td>
<td>6.5%</td>
</tr>
<tr>
<td>Factor Weighted</td>
<td>$ 54.6</td>
<td>14.7%</td>
<td>15.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Private Equity</td>
<td>$ 26.5</td>
<td>7.1%</td>
<td>8.0%</td>
<td>14.0%</td>
<td>16.6%</td>
<td>(254)</td>
<td>9.6%</td>
</tr>
<tr>
<td>Income</td>
<td>$ 106.3</td>
<td>28.7%</td>
<td>28.0%</td>
<td>6.6%</td>
<td>5.2%</td>
<td>137</td>
<td>4.1%</td>
</tr>
<tr>
<td>Long Spread</td>
<td>$ 56.7</td>
<td>15.3%</td>
<td>10.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Long Treasury</td>
<td>$ 37.8</td>
<td>10.2%</td>
<td>15.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High Yield</td>
<td>$ 11.7</td>
<td>3.2%</td>
<td>3.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Real Assets</td>
<td>$ 40.9</td>
<td>11.0%</td>
<td>13.0%</td>
<td>4.1%</td>
<td>8.4%</td>
<td>(430)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Inflation²</td>
<td>$ 0.0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Liquidity</td>
<td>$ 3.7</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.1%</td>
<td>1.2%</td>
<td>(9)</td>
<td>1.3%</td>
</tr>
<tr>
<td>Trust Level³</td>
<td>$ 7.0</td>
<td>1.9%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Fund</td>
<td>$ 370.3</td>
<td>100.0%</td>
<td>100.0%</td>
<td>9.1%</td>
<td>9.5%</td>
<td>(33)</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

1. Interim policy weight reflects the weights in effect at the beginning of the first day of the subsequent month.
2. As of February 2019, the Inflation program has been liquidated and subsequently linked historical returns are no longer meaningful.
3. Trust Level includes Multi Asset Class, Completion Overlay, Risk Mitigation, Absolute Return Strategies, Plan Level Transition and other Total Fund level portfolios.
Performance | PERF Excess Return Drivers
For Period Ending June 30, 2019

5 Year (-23 bps annualized excess return)
- Negative contribution from private assets
- Negative contribution from underweights to private assets requiring proxying with publics
+ Positive contribution from public assets, predominantly Income

1 Year (-42 bps excess return)
- Negative contribution from Real Assets, Public Equity, Trust Level and from Allocation Management
+ Positive contribution from Private Equity & Income
## Performance | Trust Level Program

For Period Ending June 30, 2019

<table>
<thead>
<tr>
<th>Program</th>
<th>Ending Market Value (MM)</th>
<th>% of Program Assets</th>
<th>5 Yr Net Return</th>
<th>3 Yr Net Return</th>
<th>1 Yr Net Return</th>
<th>3 Mo. Net Return</th>
<th>1 Mo Net Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Equity - Emerging Mgrs</td>
<td>3,479</td>
<td>49%</td>
<td>8.90</td>
<td>(175)</td>
<td>(2.81)</td>
<td>(236)</td>
<td>2.78</td>
</tr>
<tr>
<td>External MAC</td>
<td>2,619</td>
<td>37%</td>
<td>4.26</td>
<td>(122)</td>
<td>5.55</td>
<td>(279)</td>
<td>3.89</td>
</tr>
<tr>
<td>Completion Overlay (Pilot)</td>
<td>572</td>
<td>8%</td>
<td>7.35</td>
<td>17</td>
<td>3.53</td>
<td>(8)</td>
<td>4.54</td>
</tr>
<tr>
<td>Absolute Return Strategies</td>
<td>184</td>
<td>3%</td>
<td>(3.02)</td>
<td>(909)</td>
<td>(6.65)</td>
<td>(1,314)</td>
<td>(2.42)</td>
</tr>
<tr>
<td>Risk Mitigation</td>
<td>175</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.34</td>
</tr>
<tr>
<td>Volatility Premia</td>
<td>7</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Plan Level</td>
<td>6</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Fund Level</strong></td>
<td><strong>7,042</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Strategic Asset-Liability Management | 4-Year ALM Cycle Milestones

ALMAC coordinates planning of the Board’s Asset Liability Management (ALM) Policy’s 4-Year cycle. TLPM implements the Investment Committee’s mandate to conduct the strategic asset allocation (SAA) review, set the target rate of return, and select the asset allocation mix.

Five Milestones Describe the Board’s role in:

- **Mid Cycle Review: Capital Markets Outlook/Investment & SAA Review**
  - June 2020

- **Review/Adopt Capital Market Assumptions Review**
  - June 2021

- **Conduct ALM Workshop**
  - Nov 2021

- **Adopts Strategic Asset Allocation**
  - Feb 2022

- **Effective Date: Board Adopted Strategic Asset Allocation Transition Plan & Implementation**
  - July 2022
Strategic Asset Allocation | CalPERS Historical Allocation

Discount Rate, 10yr Rolling Return, and 10yr US Treasury Yield

Rate and Return %

Asset Allocation %

Data Source:
- June 30, 2019 Preliminary Asset Allocation, Rolling Return derived from internal calculations using position data from State Street.
- Treasury Yield is Bloomberg 10YR US Treasury Constant Maturity Rate (H1ST10Y Index).
- Total Plan Level includes Multi-Asset Class, Absolute Return Strategies, transition, and plan level portfolios. These assets do not have targets because they are not components of the Total Fund Policy benchmark.
Strategic Asset Allocation | Policy Targets and Ranges

<table>
<thead>
<tr>
<th>Asset Class / Segment</th>
<th>Policy Weight</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth – Public Equity</td>
<td>50%</td>
<td>+/- 7%</td>
</tr>
<tr>
<td>Public Equity - Cap Weighted</td>
<td>35%</td>
<td>-</td>
</tr>
<tr>
<td>Public Equity - Factor Weighted</td>
<td>15%</td>
<td>-</td>
</tr>
<tr>
<td>Growth - Private Equity</td>
<td>8%</td>
<td>+/- 4%</td>
</tr>
<tr>
<td>Income</td>
<td>28%</td>
<td>+/- 6%</td>
</tr>
<tr>
<td>Long Treasury</td>
<td>10%</td>
<td>-</td>
</tr>
<tr>
<td>Long Spread</td>
<td>15%</td>
<td>-</td>
</tr>
<tr>
<td>High Yield</td>
<td>3%</td>
<td>-</td>
</tr>
<tr>
<td>Real Assets</td>
<td>13%</td>
<td>+/- 5%</td>
</tr>
<tr>
<td>Inflation</td>
<td>0%</td>
<td>+3% / 0%</td>
</tr>
<tr>
<td>Liquidity</td>
<td>1%</td>
<td>+3% / -6%</td>
</tr>
</tbody>
</table>
III. Business Review

Program Overview

Investment Review

Business Review
TLPM Business Philosophy
Committed to enhanced transparency, accountability, and the highest ethical standards

**People**
To meet beneficiary and employer needs through trust-level investment decision making
- Earning the respect of Enterprise and Investment Office partners
- Maintaining relevance and connection to strategic planning

**Operational Effectiveness**
To support innovative thought leadership to advance disciplined asset allocation processes
- Implementing sustainable, risk-aware strategic and dynamic asset allocation strategies

**Performance**
To deliver targeted, risk-adjusted investment returns over the long-term
- Recognizing Asset allocation as the dominant determinant of portfolio risk and return
- Maintaining broad diversification to minimize the effect of short-term losses

**Collaboration**
To engage strong processes, teamwork and diverse resources
- Convening people and teams within the Investment Office and across the Enterprise
- Leveraging the diversity of talent, education, experience, perspective, and skill at all levels
Investment Office Organization Chart

Yu (Ben) Meng
Chief Investment Officer

Dan Bienvenue
(Interim) Chief Operating Investment Officer

Global Fixed Income
Arnie Phillips
MID

Trust Level Portfolio Management
Eric Baggesen
MID

Global Equity
Dan Bienvenue
MID

Opportunistic Strategies
Kevin Winter
MID

Real Estate
Paul Mouchakkaa
MID

Private Equity
Greg Ruiz
MID

Research & Strategy Group
(Interim) Kevin Winter
(Vacant) MID

Sustainable Investments
Beth Richtman
MID

Investment Servicing
Matthew Flynn
ID

Investment Controls and Operational Risk
Kit Crocker
ID

Investment Risk and Performance
Michael Krimm
ID

Private Asset Analytics
Christine Gogan
ID
Functional Organization Chart

Trust Level Portfolio Management

Eric Baggesen
Managing Investment Director

- Strategic Asset Allocation
- Dynamic Asset Allocation
- Investment Manager Engagement
- Business Planning Strategic Management & Support Services
- Portfolio Strategy Research & Development
Staffing Overview

Total Program: 62 FTE

Trust Level Portfolio Management Staff
- 1 Managing Investment Director (MID)
- 2 Investment Directors (ID)
- 7 Investment Managers (IM)
- 3 Associate Investment Managers (AIM)
- 15 Investment Officers (5-IO3s, 5-IO2s, 5-IO1s)
- 34 Support Staff Classifications (6-SSMs, 9-AGPAs, 6-SSAs, 2 OTs, 11-SCs)

Structural Updates
- Transitioned 2 GFI Staff to TLPM
- Transitioned IMEP from COIO Reporting Line to TLPM
- Centralized Support Service Teams within TLPM

Current Vacancies: 6 FTE

Recruitments
- 2 Investment Officer Positions  Target Start Date: By 9/30/19
- 4 Support Staff Positions  Target Start Date: By 9/30/19
<table>
<thead>
<tr>
<th>Business Overview</th>
<th>TLPM Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trust Level Portfolio Management</strong></td>
<td>Responsible for delivering targeted, risk-adjusted, total fund investment returns over the long-term, anchored by the belief that strategic asset allocation is the dominant determinant of portfolio risk and return.</td>
</tr>
<tr>
<td><strong>Strategic Asset-Liability Management</strong></td>
<td>Implement Public Employees' Retirement Fund (PERF) and Affiliate Funds' strategic Asset-Liability Management Policy in coordination with the System's Actuarial and Finance Offices, manage Strategic Asset Allocation exposures within ranges.</td>
</tr>
<tr>
<td><strong>Dynamic Asset Allocation</strong></td>
<td>Manage multi-asset class strategies which encompass investment risk mitigation, strategic exposures, liquidity and leverage management, replication, rebalancing, and strategic overlay capabilities.</td>
</tr>
<tr>
<td><strong>Portfolio Research &amp; Development</strong></td>
<td>Ongoing examination of macro-economic factors, long-term trends in capital markets, enhancing CalPERS' ability to model valuation factors, liabilities, regime shifts, and sustainability (ESG) issues that may impact the Total Fund.</td>
</tr>
<tr>
<td><strong>Investment Manager Engagement</strong></td>
<td>Manage external investment manager selection and assessment process including CalPERS Emerging and Transition Manager Program</td>
</tr>
<tr>
<td><strong>Total Fund Business &amp; Analytical Services</strong></td>
<td>Deliver high-quality business, analytical, and administrative customer service among INVO Asset Class/Programs and across the Enterprise</td>
</tr>
</tbody>
</table>