

# Affiliate Trust Asset Allocation Review: LRS, JRS, JRS II and CERBT

Trust Level Portfolio Management  
Global Equity, Affiliate Investment Program

05/14/2018

# Affiliate Trust Asset Allocation Review: Investment Committee (IC) Engagements in 2018

*Monday, April 16<sup>th</sup>*  
*Investment Committee*

Asset Allocation Review:

- Supplemental Income Plans (SIP)

*Monday, May 14<sup>th</sup>*  
*Investment Committee*

Asset Allocation Review

- Legislators' Retirement Fund (LRS)
- Judges' Retirement Fund (JRS)
- Judges' Retirement Fund II (JRS II)
- California Employers' Retiree Benefit Trust Fund (CERBT)

*Monday, June 18<sup>th</sup>*  
*Investment Committee*

Asset Allocation Review:

- Health Care Fund (HCF)
- Long-Term Care Fund (LTC)

## Overview of Program Characteristics

## Strategic Asset Allocation and Recommendations

# Affiliate Funds

- Legislators' Retirement System (LRS) Fund
- Judges' Retirement System (JRS) Fund
- Judges' Retirement System II (JRS II) Fund
- California Employers' Retiree Benefit Trust (CERBT) Fund

# Program Overview – Establishment, Purpose, & Status

| Plan   | Established | Purpose   | Status      |
|--------|-------------|---|-------------|
| LRS    | 1947        | Provide defined retirement and ancillary benefits to: <ul style="list-style-type: none"> <li>Members of the Legislature elected prior to November 7, 1990</li> <li>Elected Constitutional and Legislative Statutory Officers elected prior to December 31, 2012</li> </ul>              | Closed Fund |
| JRS    | 1937        | Provide defined retirement and ancillary benefits for State Supreme and Appellate Court Justices, and Superior Court and Municipal Court Judges and Justices elected before November 9, 1994  | Closed Fund |
| JRS II | 1994        | Provide a fully funded retirement and ancillary benefit system for State Supreme and Appellate Court Justices, and Superior Court and Municipal Court Judges and Justices elected on or after November 9, 1994<br><br>Options include a defined benefit plan and a monetary credit plan | Open Fund   |
| CERBT  | 2007        | Allow employers to pre-fund non-pension, post-employment benefits <ul style="list-style-type: none"> <li>Three policy portfolios available for employers to select (Strategy 1, 2, 3) depending on employer risk preferences</li> </ul>   | Open Fund   |

# Program Overviews – Key Statistics

| Program            | Assets Under Management (AUM) (\$ millions) <sup>1</sup> | Employer and Employee Contribution Rate (as % of payroll)   | Participants <sup>2</sup>        |          |         |       | Funded Ratio <sup>3</sup> |
|--------------------|--|---|----------------------------------|----------|---------|-------|---------------------------|
|                    |  |   | Active                           | Inactive | Retired | Total |                           |
| LRS                | \$117  | Employer contribution rate is 38.145%.<br>Employee contribution rates vary. <sup>4</sup>                                    | 8                                | 7        | 232     | 247   | 115.9%                    |
| JRS                | \$48   | 8% for both Employer and Employees.   | 192                              | 8        | 1,861   | 2,061 | 1.50%                     |
| JRS II             | \$1,356  | Employer contribution rate: 24.66%.<br>Classic Employee contribution rate: 8%.<br>PEPRA Employee contribution rate: 16.00%. | 1,511                            | 1        | 161     | 1,673 | 99.3%                     |
| CERBT Total        | \$6,796  | N/A   | Participating Employers: 524     |          |         |       | N/A                       |
| CERBT (strategy 1) | \$5,655  |   | Active Members Covered: 461,592  |          |         |       |                           |
| CERBT (strategy 2) | \$880  |   | Retired Members Covered: 266,978 |          |         |       |                           |
| CERBT (strategy 3) | \$261  |   |                                  |          |         |       |                           |

<sup>1</sup> As of June 30, 2017, source My State Street.

<sup>2</sup> As of June 30, 2017, source Actuarial Valuation reports. CERBT data from program administrators.

<sup>3</sup> As of June 30, 2017, source Actuarial Valuation reports, based on Market Value of Assets.

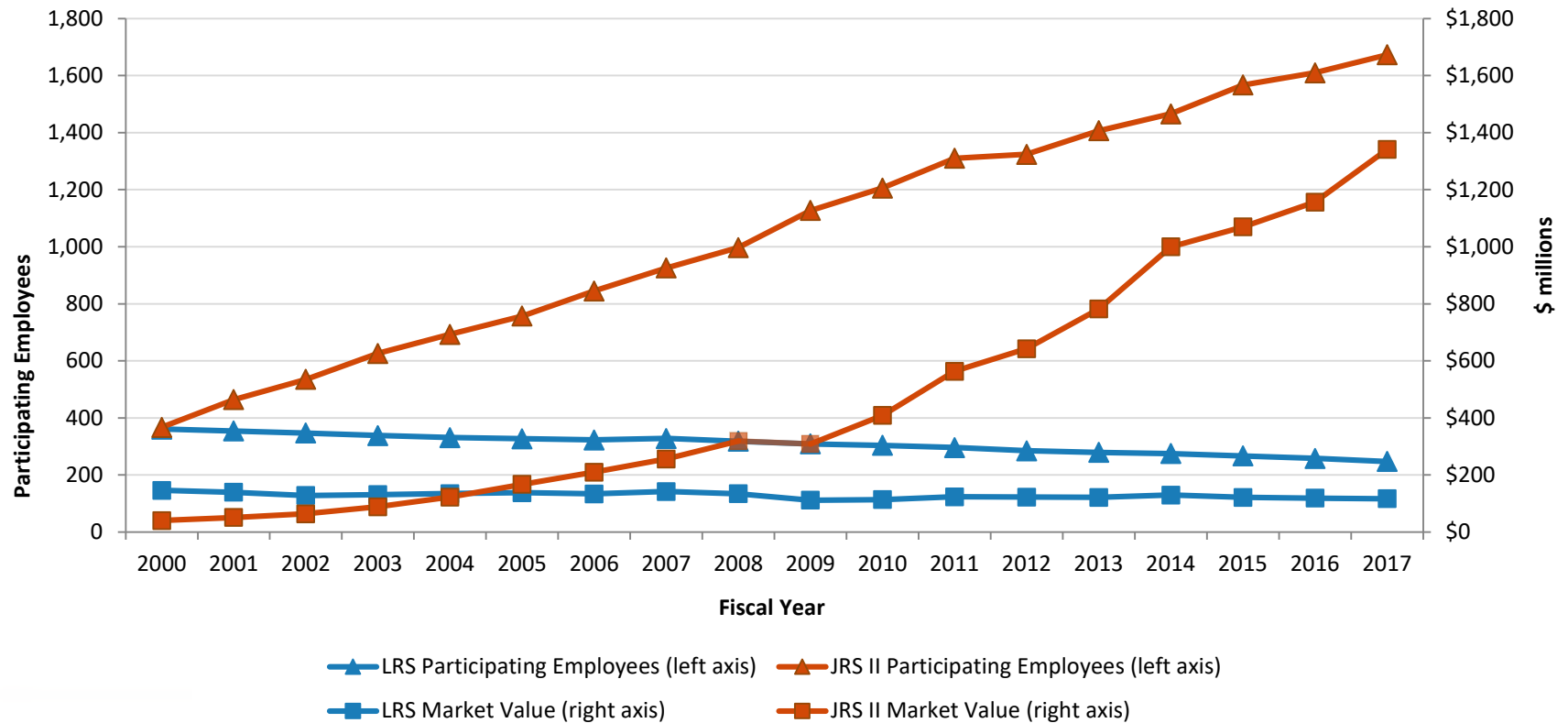
<sup>4</sup> For Legislative and Constitutional Officers, 4% if elected before March 4, 1972, 8% if after.  
For Legislative Statutory Officers, 6.5% if elected before March 4, 1972, 8% if after.

# Program Characteristics – JRS

- The State currently funds JRS through a pay-as-you-go approach<sup>1</sup> since current asset levels are not adequate to meet JRS' expected benefit payouts.
- JRS is a closed system with a funded ratio of 1.50% and an average expected remaining service for current active employees of 4.2 years.
- Assets under management are \$48 million as of June 30, 2017.

# Program Characteristics: Demographic Trends

AUM and Participant Data<sup>1</sup>  
LRS and JRS II as of June 30, 2017



<sup>1</sup> AUM data are from My State Street. Participant data for LRS and JRS II from Actuarial Valuation reports.



# Program Characteristics – Fund Maturity

- A plan can better absorb an investment loss if benefit payments are more distant (members retire later)
- LRS is a very mature plan.
- JRS II is a young pension plan and is well above peers in the number of active participants in relation to retired participants.

Maturity of Plan  
(Active-to-Retired Ratio<sup>1</sup>)

| Year | LRS  | JRS II | PERF <sup>2</sup> | Public Pension Peers <sup>3</sup> |
|------|------|--------|-------------------|-----------------------------------|
| 2008 | 0.05 | 65.20  | 1.78              | 1.98                              |
| 2009 | 0.05 | 69.31  | 1.69              | 1.91                              |
| 2010 | 0.05 | 62.42  | 1.59              | 1.82                              |
| 2011 | 0.06 | 42.67  | 1.50              | 1.72                              |
| 2012 | 0.06 | 34.76  | 1.45              | 1.63                              |
| 2013 | 0.04 | 26.00  | 1.34              | 1.55                              |
| 2014 | 0.04 | 19.61  | 1.02              | 1.48                              |
| 2015 | 0.04 | 15.31  | 1.42              | 1.44                              |
| 2016 | 0.04 | 12.40  | 1.35              | 1.42                              |
| 2017 | 0.03 | 9.39   | 1.33              | --                                |

<sup>1</sup> Source: Actuarial Valuation reports for LRS and JRS II.

<sup>2</sup> Public Employees' Retirement Fund (PERF)

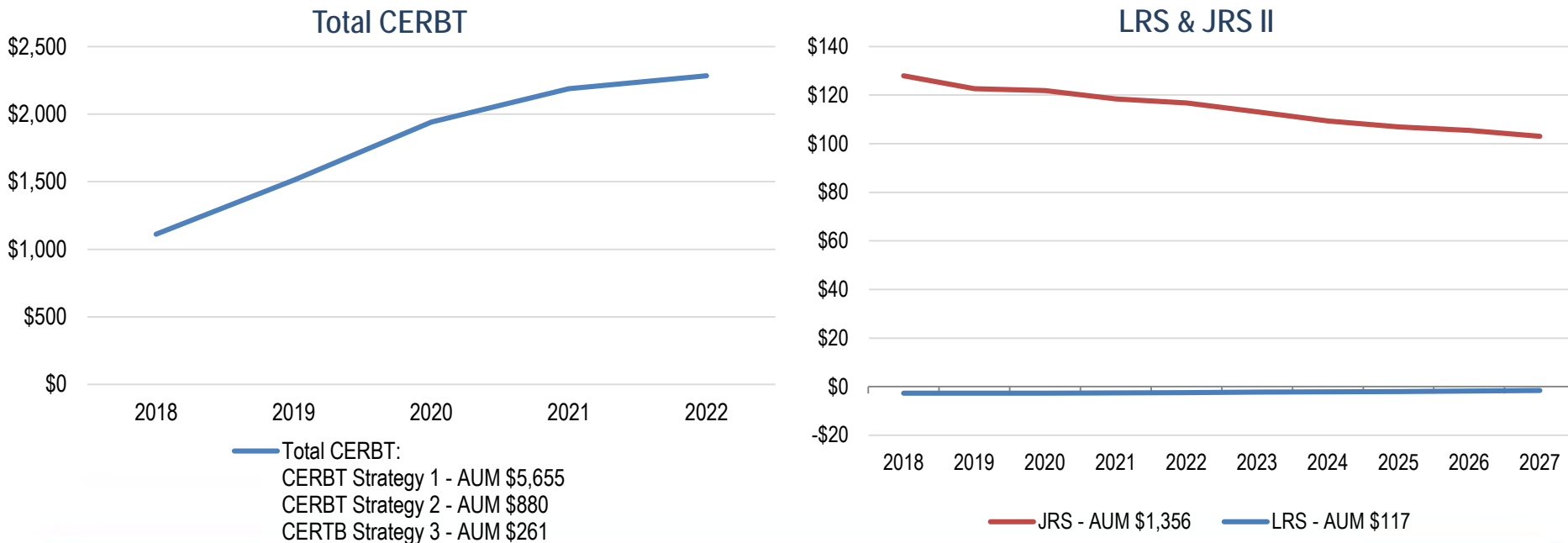
<sup>3</sup> Source: Public Fund Survey (November 2017), Industry Data based on U.S. Public Pension Systems which constitute 85% of all assets under management by U.S. public pension funds.

# Program Characteristics – Forecasted Cash Flows

Cash flows affect a plan’s ability to absorb market shocks and its need to manage liquidity.

- LRS has stable cash outflows.
- JRS II has large but decreasing cash inflows.
- The CERBT strategies have large cash inflows relative to their size.

Cash Flow Forecast for Affiliate Funds (\$ millions)<sup>1</sup>



<sup>1</sup> As of June 30, 2017. Cash flow forecast is calculated by subtracting benefit payments and expenses from contributions plus current investment cash income. Benefit payments and contributions are forecasted based on employer data from Actuarial Valuation reports; investment income is based on the estimated cash yields on current portfolios.

# Program Characteristics – Contribution Rate Sensitivity to Investment Performance

The Asset-to-Payroll Ratio<sup>1</sup>, also known as the Volatility Index, is an indicator of a plan’s contribution rate sensitivity to investment performance.

- LRS contribution rates are highly affected by investment performance.
- JRS II contribution rates are less sensitive to investment performance.

Sensitivity to Investment Performance  
(Asset-to-Payroll Ratio)

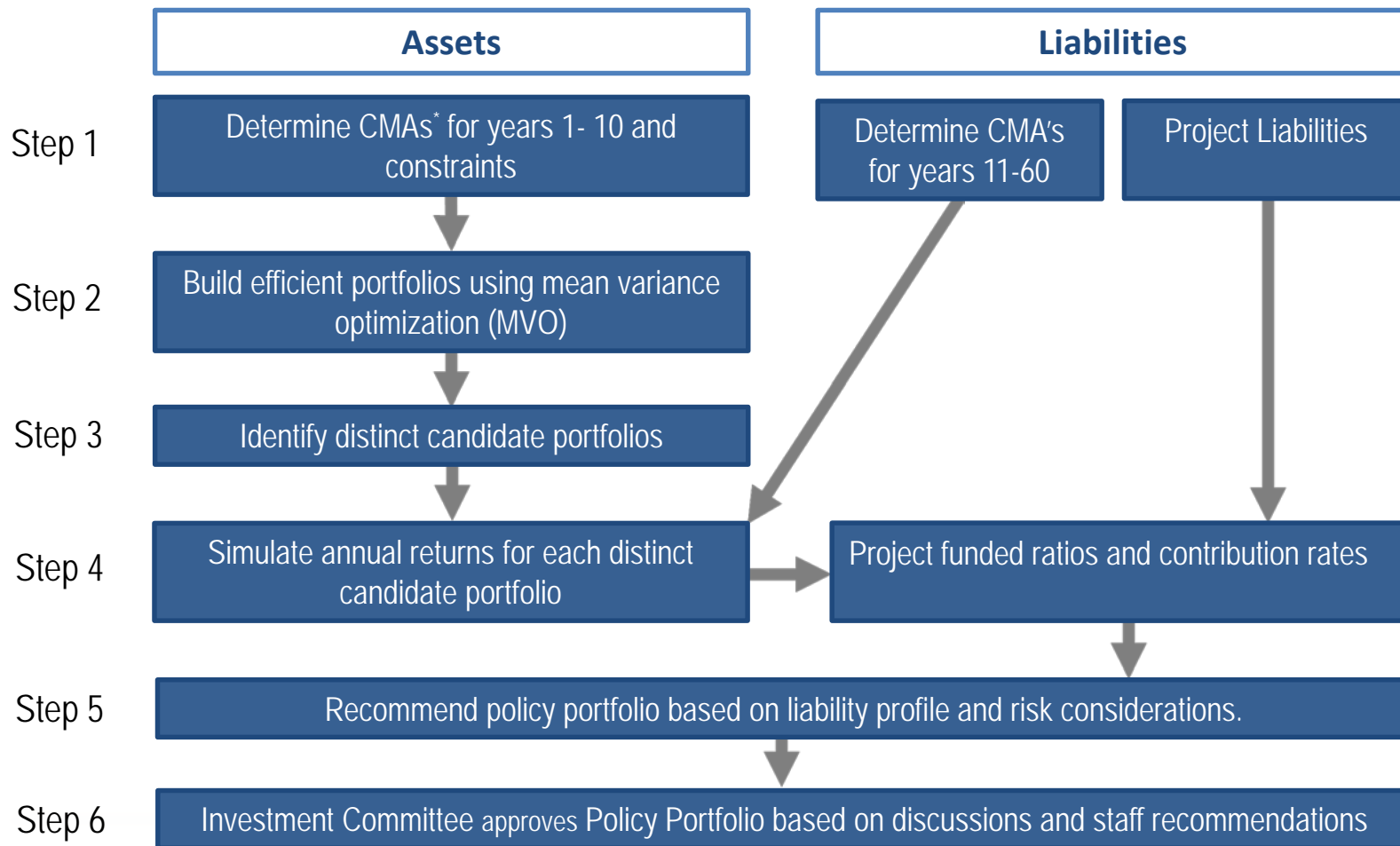
| Year | LRS   | JRS II | PERF |
|------|-------|--------|------|
| 2008 | 60.52 | 1.71   | 5.38 |
| 2009 | 54.36 | 1.49   | 3.97 |
| 2010 | 52.85 | 1.86   | 4.48 |
| 2011 | 54.45 | 2.36   | 5.51 |
| 2012 | 62.03 | 2.68   | 5.56 |
| 2013 | 85.58 | 3.10   | 6.14 |
| 2014 | 86.89 | 3.80   | 6.70 |
| 2015 | 95.26 | 3.75   | 6.37 |
| 2016 | 90.13 | 4.15   | 5.98 |
| 2017 | 96.71 | 4.65   | --   |

<sup>1</sup> Market net asset value to total payroll expenses.

## Overview of Program Characteristics

## Strategic Asset Allocation and Recommendation

# Steps to Obtain Policy Portfolio



\* Capital Market Assumptions (CMAs)

# 2018 CMAs and Constraints for Affiliate Funds

- Global Equity and Commodities CMAs are carried over from the Public Employees’ Retirement System 2017-18 Asset Liability Management process.
- Fixed Income and TIPS<sup>1</sup> CMAs are updated to reflect only domestic securities.
- REITs<sup>2</sup> expected returns are estimated using a Dividend Discount Model.
- Constraints are placed on TIPS, Commodities, REITs given the limitations of MVO.

| 2018 CMAs          | Compound Return | Volatility | Average Return | Constraint |      |
|--------------------|-----------------|------------|----------------|------------|------|
|                    |                 |            |                | Floor      | Cap  |
| Global Equity      | 6.80%           | 17.00%     | 8.14%          | 0%         | 100% |
| Fixed Income       | 3.10%           | 7.83%      | 3.40%          | 0%         | 100% |
| TIPS <sup>1</sup>  | 2.25%           | 5.46%      | 2.40%          | 5%         | 100% |
| Commodities        | 3.50%           | 21.50%     | 5.71%          | 3%         | 100% |
| REITs <sup>2</sup> | 5.50%           | 17.28%     | 6.90%          | 8%         | 100% |

<sup>1</sup> Treasury Inflation-Protected Securities (TIPS)

<sup>2</sup> Real Estate Investment Trusts (REITs)

# Plan Characteristics and Effect on Asset Allocation

| Plan Characteristic    | Description  | Plan Characteristic<br><i>(If it is...)</i> | Implication for Portfolio<br><i>(Then ...)</i> | Affiliate Fund |
|------------------------|--|---|--|----------------|
| Fund Maturity          | A plan’s ability to absorb an investment loss is affected by how distant benefit payments are (members retiring later) | Short Duration                              | Lower risk may be preferable                   | LRS            |
|                        |  | Long Duration                               | Higher risk may be acceptable                  | JRS II         |
| Cash Flows             | Cash flows affect a plan’s ability to absorb market shocks and need to manage liquidity                                | Cash Outflows                               | Lower risk may be preferable                   | LRS            |
|                        |  | Cash Inflows                                | Higher risk may be acceptable                  | JRS II         |
| Asset-to-Payroll Ratio | A plan’s asset-to-payroll ratio affects the sensitivity of employer contribution rate to investment returns            | High Sensitivity                            | Lower risk may be preferable                   | LRS            |
|                        |  | Low Sensitivity                             | Higher risk may be acceptable                  | JRS II         |

# Candidate and Recommended Portfolios

| Asset Allocation of Candidate Portfolios                             |         |       |                |       |       |        |       |        |         |        |       |
|--|---------|-------|----------------|-------|-------|--------|-------|--------|---------|--------|-------|
| Asset Class Component  | P0*     | P1    | P2             | P3    | P4    | P5     | P6    | P7     | P8      | P9     |       |
| Global Equity  | --      | 19%   | 22%            | 28%   | 35%   | 40%    | 46%   | 52%    | 59%     | 68%    |       |
| Fixed Income   | --      | 41%   | 49%            | 54%   | 48%   | 43%    | 37%   | 32%    | 25%     | 16%    |       |
| TIPS <sup>1</sup>  | --      | 28%   | 16%            | 5%    | 5%    | 5%     | 5%    | 5%     | 5%      | 5%     |       |
| Commodities <sup>1</sup>   | --      | 4%    | 5%             | 5%    | 4%    | 4%     | 4%    | 3%     | 3%      | 3%     |       |
| REITs <sup>1</sup>   | --      | 8%    | 8%             | 8%    | 8%    | 8%     | 8%    | 8%     | 8%      | 8%     |       |
| Liquidity  | 100%    | --    | --             | --    | --    | --     | --    | --     | --      | --     |       |
| Expected Compound Return (1-10 yrs.) :                               | 2.00%   | 4.16% | 4.41%          | 4.75% | 5.01% | 5.22%  | 5.43% | 5.61%  | 5.85%   | 6.10%  |       |
| Expected Compound Return (11-60 yrs.) :                              | --      | 6.43% | 6.71%          | 7.06% | 7.30% | 7.49%  | 7.68% | 7.85%  | 8.07%   | 8.28%  |       |
| Expected Volatility :  | 1.00%   | 6.85% | 7.28%          | 7.93% | 8.59% | 9.24%  | 9.98% | 10.72% | 11.83%  | 13.12% |       |
| Expected Blended Return Net of Fees (1-60 yrs.) <sup>2</sup> :       | LRS:    | --    | 4.75%          | 5.00% | 5.32% | 5.55%  | 5.75% | 5.94%  | 6.10%   | 6.32%  | 6.55% |
|  | JRS II: | --    | 5.12%          | 5.38% | 5.71% | 5.95%  | 6.14% | 6.33%  | 6.50%   | 6.72%  | 6.94% |
| Expected Time-Weighted Return Net of Fees (1-60 yrs.) <sup>2</sup> : | CERBT:  | --    | 5.95%          | 6.22% | 6.57% | 6.82%  | 7.01% | 7.20%  | 7.37%   | 7.59%  | 7.82% |
| Recommendation for plans:  | JRS     |       | CERBT 3<br>LRS |       |       | CERBT2 |       | JRS II | CERBT 1 |        |       |

<sup>1</sup> Lower binding constraints exist in some candidate portfolios.

<sup>2</sup> LRS & JRS II expected blended return net of fees is the combination of the short-term (1 to 10 yr.) and the long-term (11 to 60 yr.) expected returns after deducting admin fees. CERBT is compounding 1–10 yr. & 11–60 yr. expected returns, less admin fees. Admin fees for affiliate funds: CERBT: 10 bps, LRS: 25 bps, JRS II: 15 bps.

\* Portfolio P0 only appropriate for pay-as-you-go programs.



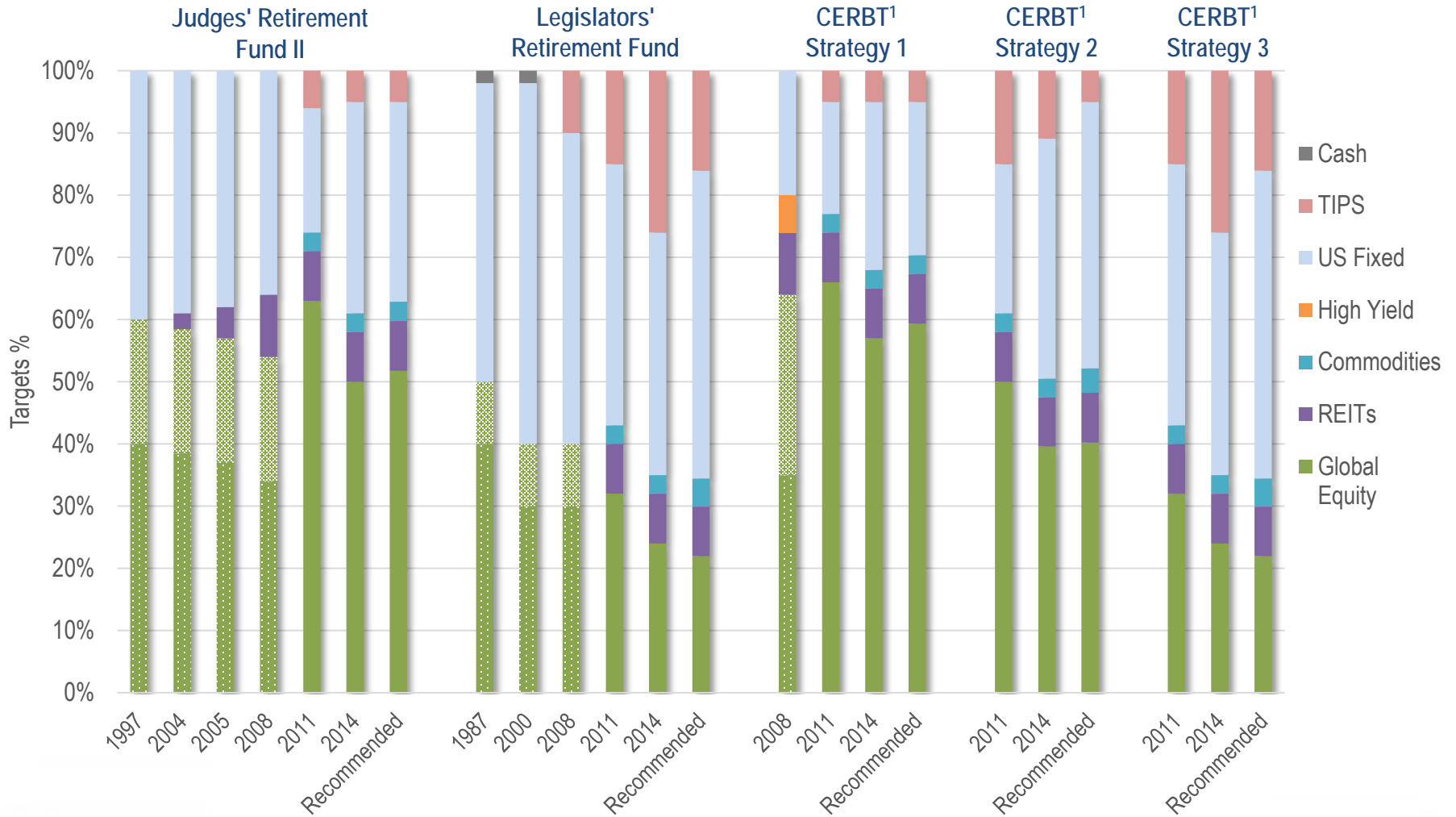
# JRS II Candidate Portfolios & Risk Considerations

## Definitions of Risk Considerations:

- **Funded Ratio:** Probability of the funded ratio falling below 50% in any of the next 30 years
- **Contribution Level:** Probability of the employer contribution rate exceeding 35% in any of the next 30 years
- **Contribution Volatility:** Probability of the year-to-year increase in employer contribution rate exceeding 3.0% in any of the next 30 years

| Risk Considerations     | Lower Risk Candidate Portfolio (P6) | Recommended Candidate Portfolio (P7) | Higher Risk Candidate Portfolio (P8) | Current Policy Portfolio |
|-------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------|
| Funded Ratio            | 0%                                  | 0%                                   | 0%                                   | 0%                       |
| Contribution Level      | 11%                                 | 2%                                   | 2%                                   | 2%                       |
| Contribution Volatility | 3%                                  | 5%                                   | 7%                                   | 4%                       |

# Historical and Recommended Asset Allocation Policies



<sup>1</sup> There was only one asset allocation strategy for the CERBT prior to August 2011. The CERBT was split in 2011 given the diversity of employer plan funded ratios and risk preferences.

# Proposed Asset Class Ranges

| Asset Class   | LRS    | JRS II | CERBT  |
|---------------|--------|--------|--------|
| Global Equity | +/- 5% | +/- 5% | +/- 5% |
| Fixed Income  | +/- 5% | +/- 5% | +/- 5% |
| TIPS          | +/- 3% | +/- 3% | +/- 3% |
| Commodities   | +/- 3% | +/- 3% | +/- 3% |
| REITs         | +/- 5% | +/- 5% | +/- 5% |
| Liquidity     | + 2%   | +2%    | +2%    |

## Objectives:

- Provide flexibility for changing market conditions between portfolio rebalances
- Reduce rebalancing frequency and costs
- Facilitate contribution & distribution activity

# Appendix

# Program Recommendation – JRS

- Staff has evaluated the JRS Program and determined that the current strategic allocation, 100% in Liquidity, should be maintained.
- The existing assets under management provide liquidity necessary to make benefit payments in the event of a delay in the annual State budget approval process.

# Recommended LRS Policy Portfolio and Rationale

| Asset Class Component   | Recommended Portfolio (P2) | Current Portfolio |       | Change  |  |
|---|----------------------------|-------------------|-------|---|--|
| Public Equity   | 22%                        | 24%               |       | -2%   |  |
| Fixed Income  | 50%                        | 39%               |       | 10%   |  |
| TIPS  | 16%                        | 26%               |       | -10%  |  |
| Commodities   | 5%                         | 3%                |       | 2%  |  |
| REITs   | 8%                         | 8%                |       | 0%  |  |
| CMA   | 2018                       | 2014              | 2018  | Recommended vs Current Portfolio with 2014 CMAs | Recommended vs Current Portfolio (2018 CMAs) |
| Expected Compound Return (1-10 years)                         | 4.41%                      | 5.40%             | 4.35% | -0.99%  | 0.05%  |
| Expected Volatility   | 7.28%                      | 7.10%             | 7.21% | 0.18%   | 0.07%  |
| Expected Blended Return Net of Fees <sup>1</sup> (1-60 years) | 5.00%                      | 5.76%             | 4.93% | -0.76%  | 0.06%  |
| Discount Rate   | 5.00%                      | 5.75%             |       | N/A   | N/A  |

- P2 is a conservative portfolio that reflects LRS shorter duration, cash outflows, and high contribution rate sensitivity to investment performance.
- Consistent with 5.00% discount rate approved by the Board.

# Recommended JRS II Policy Portfolio and Rationale

| Asset Class Component   | Recommended Portfolio (P7) | Current Portfolio |        | Change  |  |
|---|----------------------------|-------------------|--------|---|--|
| Public Equity   | 52%                        | 50%               |        | 2%  |  |
| Fixed Income  | 32%                        | 34%               |        | -2%   |  |
| TIPS  | 5%                         | 5%                |        | 0%  |  |
| Commodities   | 3%                         | 3%                |        | 0%  |  |
| REITs   | 8%                         | 8%                |        | 0%  |  |
| CMA   | 2018                       | 2014              | 2018   | Recommended vs Current Portfolio with 2014 CMAs | Recommended vs Current Portfolio (2018 CMAs) |
| Expected Compound Return (1-10 years)                         | 5.61%                      | 6.49%             | 5.55%  | -0.88%  | 0.06%  |
| Expected Volatility   | 10.72%                     | 10.75%            | 10.45% | -0.03%  | 0.27%  |
| Expected Blended Return Net of Fees <sup>1</sup> (1-60 years) | 6.50%                      | 7.05%             | 6.44%  | -0.55%  | 0.06%  |
| Discount Rate   | 6.50%                      | 7.00%             | N/A    | N/A   | N/A  |

- P7 is a moderately aggressive portfolio and reflects the JRS II longer duration, cash inflows, and low contribution rate sensitivity to investment performance.
- P7 exhibits preferable trade-off on risk considerations.
- Consistent with 6.50% discount rate approved by the Board.

# Recommended CERBT 1 Policy Portfolio and Rationale

| Asset Class Component   | Recommended Portfolio (P8) | Current Portfolio |        | Change  |  |
|---|----------------------------|-------------------|--------|---|--|
| Public Equity   | 59%                        | 57%               |        | 2%  |  |
| Fixed Income  | 25%                        | 27%               |        | -2%   |  |
| TIPS  | 5%                         | 5%                |        | 0%  |  |
| Commodities   | 3%                         | 3%                |        | 0%  |  |
| REITs   | 8%                         | 8%                |        | 0%  |  |
| CMA   | 2018                       | 2014              | 2018   | Recommended vs Current Portfolio with 2014 CMAs | Recommended vs Current Portfolio (2018 CMAs) |
| Expected Compound Return (1-10 years)                               | 5.85%                      | 6.71%             | 5.78%  | -0.86%  | 0.07%  |
| Expected Volatility   | 11.83%                     | 11.74%            | 11.48% | 0.09%   | 0.35%  |
| Expected Time-Weighted Return Net of Fees <sup>1</sup> (1-60 years) | 7.59%                      | 7.85%             | 7.53%  | -0.26%  | 0.07%  |

- P8 will have slightly higher return and risk than the current portfolio in anticipation of increasing future cash inflow.

1. Expected Time-Weighted Return Net of Fees is annualized compounding of the short-term (1 to 10 year) and the long-term (11 to 60 year) expected returns after deducting administrative fees.



# Recommended CERBT 2 Policy Portfolio and Rationale

| Asset Class Component   | Recommended Portfolio (P5) | Current Portfolio |       | Change  |  |
|---|----------------------------|-------------------|-------|---|--|
| Public Equity   | 40%                        | 40%               |       | 0%  |  |
| Fixed Income  | 43%                        | 39%               |       | 4%  |  |
| TIPS  | 5%                         | 11%               |       | -6%   |  |
| Commodities   | 4%                         | 3%                |       | 1%  |  |
| REITs   | 8%                         | 8%                |       | 0%  |  |
| CMA   | 2018                       | 2014              | 2018  | Recommended vs Current Portfolio with 2014 CMAs | Recommended vs Current Portfolio (2018 CMAs) |
| Expected Compound Return (1-10 years)                               | 5.22%                      | 6.10%             | 5.12% | -0.88%  | 0.10%  |
| Expected Volatility   | 9.24%                      | 9.24%             | 9.05% | 0.00%   | 0.19%  |
| Expected Time-Weighted Return Net of Fees <sup>1</sup> (1-60 years) | 7.01%                      | 7.28%             | 6.90% | -0.27%  | 0.11%  |

- P5 enables CERBT employers to select a portfolio with similar moderate risk profile as the current portfolio.

1. Expected Time-Weighted Return Net of Fees is annualized compounding of the short-term (1 to 10 year) and the long-term (11 to 60 year) expected returns after deducting administrative fees.

# Recommended CERBT 3 Policy Portfolio and Rationale

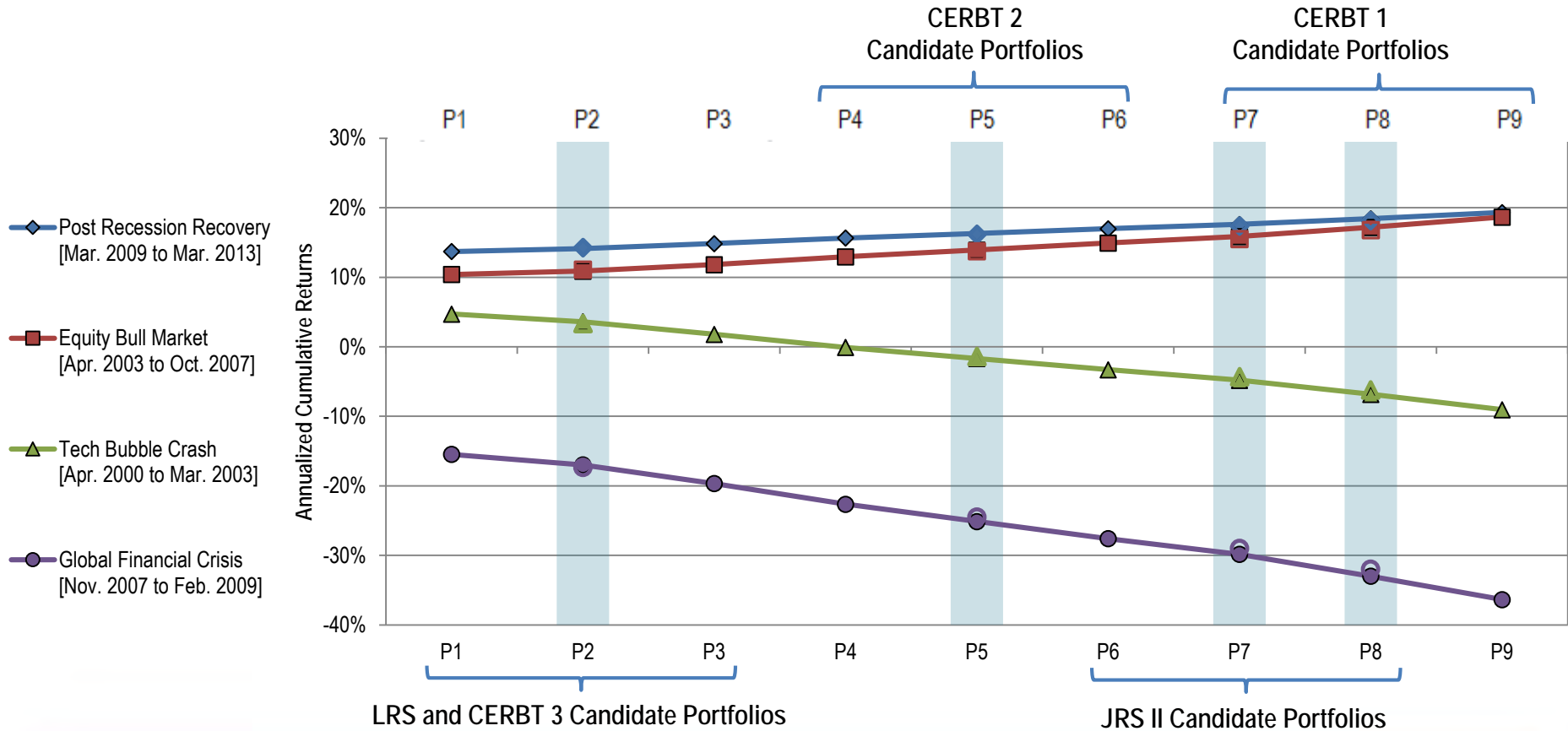
| Asset Class Component   | Recommended Portfolio (P2) | Current Portfolio |       | Change  |  |
|---|----------------------------|-------------------|-------|---|--|
| Public Equity   | 22%                        | 24%               |       | -2%   |  |
| Fixed Income  | 50%                        | 39%               |       | 11%   |  |
| TIPS  | 16%                        | 26%               |       | -10%  |  |
| Commodities   | 5%                         | 3%                |       | 2%  |  |
| REITs   | 8%                         | 8%                |       | 0%  |  |
| CMA   | 2018                       | 2014              | 2018  | Recommended vs Current Portfolio with 2014 CMAs | Recommended vs Current Portfolio (2018 CMAs) |
| Expected Compound Return (1-10 years)                               | 4.41%                      | 5.40%             | 4.35% | -0.99%  | 0.05%  |
| Expected Volatility   | 7.28%                      | 7.10%             | 7.21% | 0.18%   | 0.07%  |
| Expected Time-Weighted Return Net of Fees <sup>1</sup> (1-60 years) | 6.22%                      | 6.69%             | 6.14% | -0.47%  | 0.08%  |

- P2 enables CERBT employers to select a portfolio with a similar low risk profile as the current portfolio.
- P2 diversifies away from the low-yielding TIPS as desired by many participating employers.

1. Expected Time-Weighted Return Net of Fees is annualized compounding of the short-term (1 to 10 year) and the long-term (11 to 60 year) expected returns after deducting administrative fees.

# Stress Test – Cumulative Returns Under Various Economic Scenarios

- Filled markers indicate the 9 candidate portfolios (P1-P9)
- Unfilled markers indicate the 4 current portfolios



# 2017 PERF CMAs and Constraints for PERF

| Asset Class                      | Arithmetic Return | Compound Return | Volatility (Std. Dev) | Correlation   |                |              |            |                 |           | Constraints (%) |     |
|----------------------------------|-------------------|-----------------|-----------------------|---------------|----------------|--------------|------------|-----------------|-----------|-----------------|-----|
|                                  |                   |                 |                       | Global Equity | Private Equity | Fixed Income | Real Asset | Inflation Asset | Liquidity | Floor           | Cap |
| Global Equity                    | 8.14%             | 6.80%           | 17.00%                | 1.00          | 0.81           | 0.01         | 0.59       | 0.39            | 0.00      | 0               | 100 |
| Private Equity                   | 11.26%            | 8.30%           | 25.50%                | 0.81          | 1.00           | 0.00         | 0.48       | 0.33            | 0.00      | 5               | 8   |
| Fixed Income                     | 3.21%             | 3.00%           | 6.58%                 | 0.01          | 0.00           | 1.00         | 0.09       | 0.40            | 0.31      | 15              | 100 |
| Real Asset                       | 6.49%             | 5.75%           | 12.55%                | 0.59          | 0.48           | 0.09         | 1.00       | 0.21            | 0.00      | 9               | 13  |
| Inflation Asset                  | 3.08%             | 2.77%           | 8.00%                 | 0.39          | 0.33           | 0.40         | 0.21       | 1.00            | 0.08      | 0               | 12  |
| Liquidity                        | 2.00%             | 2.00%           | 1.00%                 | 0.00          | 0.00           | 0.31         | 0.00       | 0.08            | 1.00      | 1               | 100 |
| U.S. Inflation Assumption: 2.00% |                   |                 |                       |               |                |              |            |                 |           |                 |     |

# Asset Classes and Corresponding Benchmark Policy for CERBT, JRS, JRS II and LRS<sup>1</sup>

| Asset Class     | LRS                                  | JRS II                               | CERBT                                   | JRS                        |
|-----------------|--------------------------------------|--------------------------------------|---|----------------------------|
| Global Equity   | CalPERS Custom FTSE Global Composite | CalPERS Custom FTSE Global Composite | MSCI ACWI IMI (Net)                     | N/A                        |
| US Fixed Income | Barclays Long Liability Index        | Barclays Long Liability Index        | Barclays Long Liability Index           | N/A                        |
| TIPS            | Bloomberg US TIPS Index              | Bloomberg US TIPS Index              | Bloomberg US TIPS Index                 | N/A                        |
| Commodities     | S&P GSCI Total Return Daily          | S&P GSCI Total Return Daily          | S&P GSCI Total Return Daily             | N/A                        |
| REITs           | FTSE EPRA/NAREIT Developed Index     | FTSE EPRA/NAREIT Developed Index     | FTSE EPRA/NAREIT Developed Liquid (Net) | N/A                        |
| Liquidity       | N/A                                  | N/A                                  | N/A                                     | Short-Term Investment Fund |

<sup>1</sup> CalPERS Statement of Investment Policy for Benchmarks, March 6, 2014