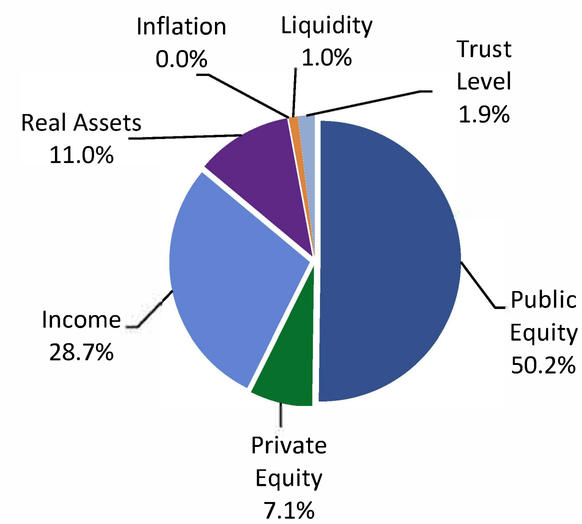
# Public Employees Retirement Fund (PERF)
**As of June 30, 2019**

## Asset Allocation

| Asset Allocation | EMV (bil) | Current Allocation (%) | Interim Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| **Public Equity** | **$ 185.9** | **50.2%** | **50.0%** | **0.2%** | ± 7% |
| Cap Weighted | $ 131.4 | 35.5% | 35.0% | 0.5% | |
| Factor Weighted | $ 54.6 | 14.7% | 15.0% | (0.3%) | |
| **Private Equity** | **$ 26.5** | **7.1%** | **8.0%** | **(0.9%)** | ± 4% |
| **Income** | **$ 106.3** | **28.7%** | **28.0%** | **0.7%** | ± 6% |
| Long Spread | $ 56.7 | 15.3% | 15.0% | 0.3% | |
| Long Treasury | $ 37.8 | 10.2% | 10.0% | 0.2% | |
| High Yield | $ 11.7 | 3.2% | 3.0% | 0.2% | |
| **Real Assets** | **$ 40.9** | **11.0%** | **13.0%** | **(2.0%)** | ± 5% |
| **Inflation[2]** | **$ 0.0** | **0.0%** | **0.0%** | **0.0%** | + 3%/ 0% |
| **Liquidity** | **$ 3.7** | **1.0%** | **1.0%** | **0.0%** | + 3%/ - 6% |
| **Trust Level[3]** | **$ 7.0** | **1.9%** | **-** | **1.9%** | - |
| **Total PERF** | **$ 370.3** | **100.0%** | **100.0%** | **0.0%** | |

| | |
|---|---|
| **TAP[4]** | **$ 0.2** |
| **Total PERF Plus TAP** | **$ 370.5** |

### Current Total Fund Allocation




## Performance Summary

| Performance Summary | 10-Yr Net Return | 10-Yr BM Return | 10-Yr Excess Bps | 5-Yr Net Return | 5-Yr BM Return | 5-Yr Excess Bps | 3-Yr Net Return | 3-Yr BM Return | 3-Yr Excess Bps | 1-Yr Net Return | 1-Yr BM Return | 1-Yr Excess Bps | 5-Yr Realized Infomation Ratio[5] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Public Equity** | **11.1%** | **10.9%** | **20** | **6.7%** | **6.7%** | **(8)** | **12.3%** | **12.5%** | **(25)** | **6.1%** | **6.2%** | **(16)** | **(0.3)** |
| Cap Weighted | 11.0% | 10.8% | 20 | 6.5% | 6.5% | (9) | 11.9% | 12.2% | (27) | 5.1% | 5.3% | (20) | (0.3) |
| Factor Weighted | - | - | - | - | - | - | - | - | - | 13.4% | 13.5% | (10) | - |
| **Private Equity** | **14.0%** | **16.6%** | **(254)** | **9.6%** | **10.3%** | **(80)** | **12.5%** | **14.1%** | **(156)** | **7.7%** | **4.0%** | **368** | - |
| **Income** | **6.6%** | **5.2%** | **137** | **4.1%** | **3.5%** | **56** | **3.3%** | **2.7%** | **62** | **9.6%** | **9.3%** | **31** | 1.2 |
| Long Spread | - | - | - | - | - | - | - | - | - | 9.5% | 9.0% | 49 | - |
| Long Treasury | - | - | - | - | - | - | - | - | - | 10.5% | 10.5% | (3) | - |
| High Yield | - | - | - | - | - | - | - | - | - | 8.4% | 8.0% | 40 | - |
| **Real Assets** | **4.1%** | **8.4%** | **(430)** | **7.5%** | **8.6%** | **(111)** | **6.4%** | **6.8%** | **(42)** | **3.7%** | **6.5%** | **(283)** | - |
| **Inflation[2]** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | **NM** | - |
| **Liquidity** | **1.1%** | **1.2%** | **(9)** | **1.3%** | **1.2%** | **10** | **1.7%** | **1.3%** | **37** | **2.6%** | **2.2%** | **45** | - |
| **Trust Level[3]** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total PERF** | **9.1%** | **9.5%** | **(33)** | **5.8%** | **6.1%** | **(23)** | **8.8%** | **9.0%** | **(21)** | **6.7%** | **7.1%** | **(42)** | - |
| **TAP[4]** | - | - | - | **3.7%** | - | - | **2.4%** | - | - | **7.0%** | - | - | - |

[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.

[4] Terminated Agency Pool (TAP) funded in July 2013 and exists to provide benefit payments to members who are employees of agencies that have terminated their contract with CalPERS.

[5] Information Ratio is excess return divided by realized tracking error. This presents a perspective on risk adjusted performance. The metric is not meaningful for illiquid assets where realized volatility tends to be muted by valuation based pricing and benchmark issues.

# Public Employees Retirement Fund (PERF)
## As of June 30, 2019

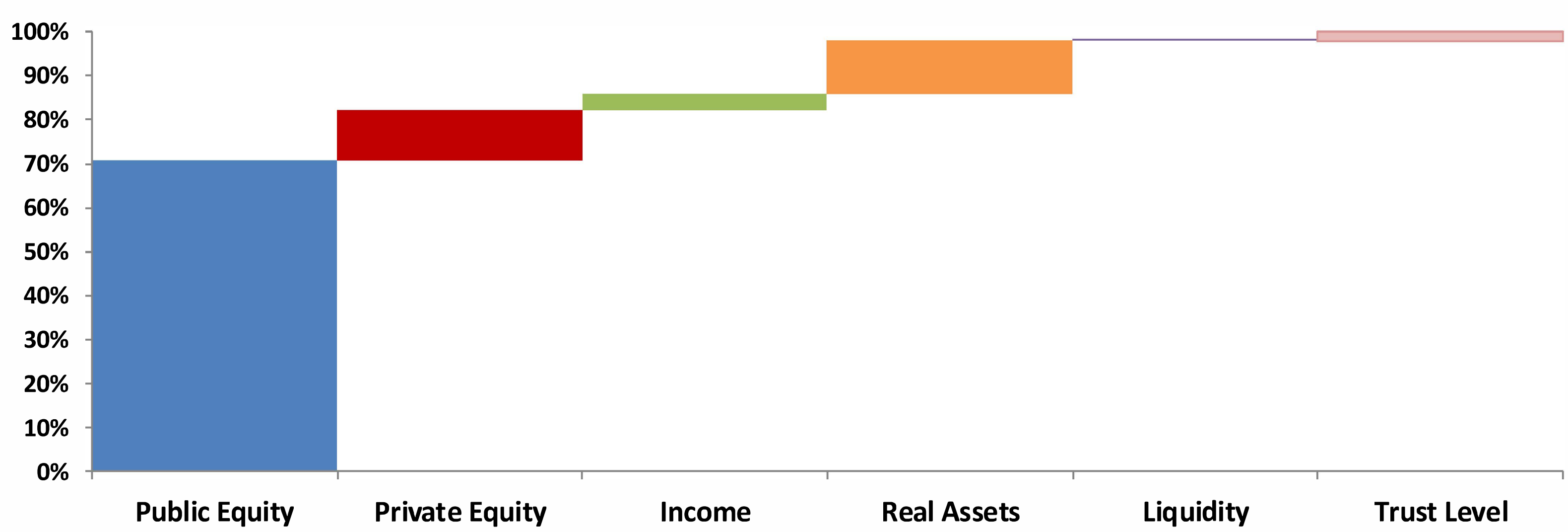
### Total PERF Risk

| Risk Measure | 6/30/2019 | 5/31/2019 | Explanation of Risk Measures: |
|---|---|---|---|
| **Forecast Volatility** | | | The total (absolute) volatility is the annualized standard deviation of the PERF's total return distribution and is indicative of the plan's short-term return dispersion given the current enviroment. The metric is model-based and could underestimate potential drawdowns. |
| Portfolio | 7.7% | 7.8% | |
| Benchmark | 7.9% | 7.9% | |
| **Forecast Tracking Error** | | | Forecast tracking error is the annualized standard deviation of the differential return between the portfolio and an equal investment in the benchmark. |
| Portfolio | 0.5% | 0.5% | |

| June 30, 2019 | Portfolio Volatility | | Tracking Error | |
|---|---|---|---|---|
| | Projected | Realized | Projected | Realized |
| Asset Class | Annualized Projected Volatility (%) | 5-Year Realized Volatility (%)[1] | Annualized Projected Tracking Error (%) | 5-Year Realized Tracking Error (%)[1] |
| **Public Equity** | **11.2%** | **11.5%** | **0.2%** | **0.3%** |
| Cap Weighted | 12.2% | 11.8% | 0.3% | 0.3% |
| Factor Weighted | 9.2% | - | 0.0% | - |
| **Private Equity** | **14.8%** | **4.2%** | **4.3%** | **8.7%** |
| **Income** | **4.6%** | **4.7%** | **0.2%** | **0.5%** |
| Long Spread | 4.1% | - | 0.3% | - |
| Long Treasury | 7.2% | - | 0.3% | - |
| High Yield | 3.6% | - | 0.1% | - |
| **Real Assets** | **11.1%** | **3.5%** | **2.1%** | **3.5%** |
| **Liquidity** | **0.1%** | **0.7%** | **0.0%** | **0.4%** |
| **Trust Level** | **8.7%** | - | **1.8%** | - |
| **Total PERF** | **7.7%** | **6.2%** | **0.5%** | **1.0%** |

[1]Realized Volatility and Tracking Error for private asset classes are computed from quarterly net returns

### Contribution to Total PERF Volatility



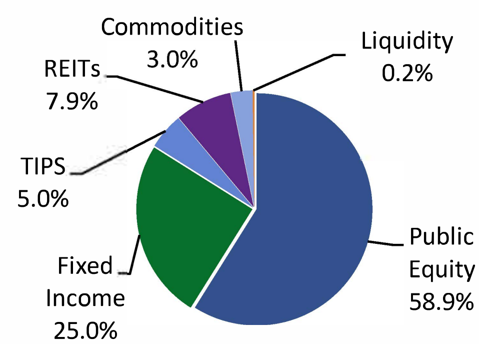
# Affiliate Investment Program

## CERBT Strategy 1 Fund (CERBT 1) & CERBT Strategy 2 Fund (CERBT 2)
**As of June 30, 2019**

### Asset Allocation, Performance & Realized Risk Summary - CERBT 1

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Public Equity | $ 4,640.9 | 58.9% | 59% | (0.1%) | ± 5% |
| Fixed Income | $ 1,967.0 | 25.0% | 25% | (0.0%) | ± 5% |
| TIPS | $ 392.2 | 5.0% | 5% | (0.0%) | ± 3% |
| REITs | $ 619.9 | 7.9% | 8% | (0.1%) | ± 5% |
| Commodities | $ 236.7 | 3.0% | 3% | 0.0% | ± 3% |
| Liquidity | $ 20.3 | 0.2% | 0% | 0.2% | + 2% |
| **Total CERBT 1** | **$ 7,876.9** | **100.0%** | **100.0%** | **0.0%** | |

**Current Allocation**



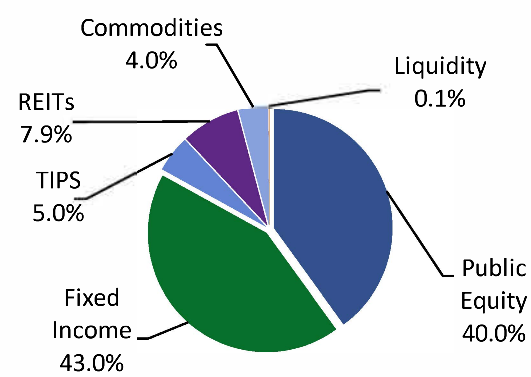

| Performance Summary[2] | 10-Yr | | | 5-Yr | | | 3-Yr | | | 1-Yr | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps |
| Public Equity | 10.7% | 10.4% | 24 | 6.4% | 6.0% | 36 | 11.8% | 11.4% | 36 | 4.9% | 4.6% | 31 |
| Fixed Income | 6.8% | 5.7% | 115 | 4.6% | 4.0% | 55 | 3.5% | 2.9% | 58 | 10.2% | 10.1% | 4 |
| TIPS | - | - | - | 1.7% | 1.8% | (3) | 2.1% | 2.1% | 2 | 4.8% | 4.8% | (3) |
| REITs | 11.5% | 11.1% | 46 | 5.4% | 4.5% | 84 | 5.0% | 4.2% | 85 | 9.1% | 8.1% | 104 |
| Commodities | - | - | - | (13.3%) | (13.3%) | 2 | 1.7% | 1.6% | 13 | (11.5%) | (11.5%) | (1) |
| **Total CERBT 1** | **9.4%** | **9.1%** | **33** | **5.0%** | **4.7%** | **38** | **8.2%** | **7.8%** | **39** | **6.2%** | **6.0%** | **18** |

**5-Yr Realized Volatility:** **8.0%** **5-Yr Realized Tracking Error:** **0.1%**

### Asset Allocation, Performance & Realized Risk Summary - CERBT 2

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Public Equity | $ 519.6 | 40.0% | 40% | (0.0%) | ± 5% |
| Fixed Income | $ 558.7 | 43.0% | 43% | 0.0% | ± 5% |
| TIPS | $ 64.8 | 5.0% | 5% | (0.0%) | ± 3% |
| REITs | $ 102.4 | 7.9% | 8% | (0.1%) | ± 5% |
| Commodities | $ 52.2 | 4.0% | 4% | 0.0% | ± 3% |
| Liquidity | $ 1.4 | 0.1% | 0% | 0.1% | + 2% |
| **Total CERBT 2** | **$ 1,299.0** | **100.0%** | **100.0%** | **0.0%** | |

**Current Allocation**




| Performance Summary[2] | 10-Yr | | | 5-Yr | | | 3-Yr | | | 1-Yr | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps |
| Public Equity | - | - | - | 6.4% | 6.0% | 34 | 11.8% | 11.4% | 37 | 4.9% | 4.6% | 32 |
| Fixed Income | - | - | - | 4.6% | 4.0% | 54 | 3.5% | 2.9% | 58 | 10.2% | 10.1% | 3 |
| TIPS | - | - | - | 1.7% | 1.8% | (4) | 2.1% | 2.1% | 4 | 4.9% | 4.8% | 6 |
| REITs | - | - | - | 5.4% | 4.5% | 82 | 5.0% | 4.2% | 88 | 9.2% | 8.1% | 110 |
| Commodities | - | - | - | (13.2%) | (13.3%) | 17 | 1.9% | 1.6% | 34 | (10.9%) | (11.5%) | 57 |
| **Total CERBT 2** | **-** | **-** | **-** | **4.6%** | **4.2%** | **35** | **6.8%** | **6.4%** | **39** | **7.0%** | **6.9%** | **11** |

**5-Yr Realized Volatility:** **6.4%** **5-Yr Realized Tracking Error:** **0.2%**

[1] Allocations approved by the Board at the May 2018 IC Meeting

[2] Liquidity is for operational purposes rather than a strategic allocation target and is not included in the performance summary table due to negligible impact on performance

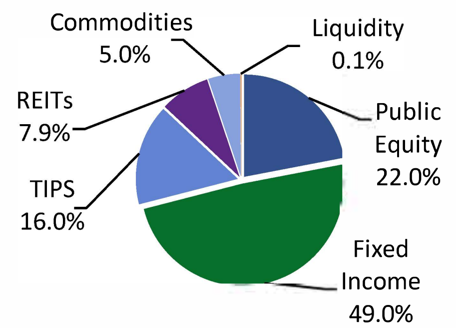
# Affiliate Investment Program

## CERBT Strategy 3 Fund (CERBT 3) & Legislators' Retirement System Fund (LRF)
**As of June 30, 2019**

### Asset Allocation, Performance & Realized Risk Summary - CERBT 3

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Public Equity | $ 137.4 | 22.0% | 22% | (0.0%) | ± 5% |
| Fixed Income | $ 306.1 | 49.0% | 49% | 0.0% | ±5% |
| TIPS | $ 99.6 | 16.0% | 16% | (0.0%) | ± 3% |
| REITs | $ 49.2 | 7.9% | 8% | (0.1%) | ± 5% |
| Commodities | $ 31.3 | 5.0% | 5% | 0.0% | ± 3% |
| Liquidity | $ 0.9 | 0.1% | 0% | 0.1% | + 2% |
| **Total CERBT 3** | **$ 624.6** | **100.0%** | **100.0%** | **0.0%** | |

**Current Allocation**



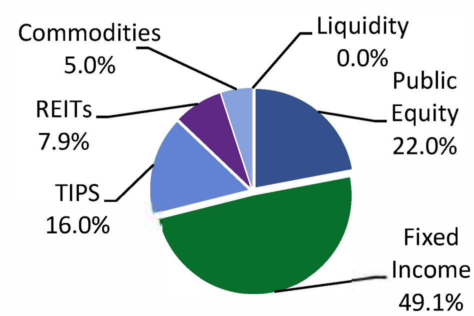

| Performance Summary[2] | 10-Yr Net Return | 10-Yr BM Return | 10-Yr Excess Bps | 5-Yr Net Return | 5-Yr BM Return | 5-Yr Excess Bps | 3-Yr Net Return | 3-Yr BM Return | 3-Yr Excess Bps | 1-Yr Net Return | 1-Yr BM Return | 1-Yr Excess Bps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public Equity | - | - | - | 6.4% | 6.0% | 34 | 11.8% | 11.4% | 34 | 4.9% | 4.6% | 34 |
| Fixed Income | - | - | - | 4.5% | 4.0% | 49 | 3.4% | 2.9% | 54 | 10.1% | 10.1% | 1 |
| TIPS | - | - | - | 1.8% | 1.8% | 0 | 2.1% | 2.1% | 4 | 4.9% | 4.8% | 6 |
| REITs | - | - | - | 5.3% | 4.5% | 81 | 5.0% | 4.2% | 82 | 9.2% | 8.1% | 118 |
| Commodities | - | - | - | (12.9%) | (13.3%) | 42 | 2.3% | 1.6% | 71 | (10.3%) | (11.5%) | 119 |
| **Total CERBT 3** | **-** | **-** | **-** | **4.0%** | **3.7%** | **33** | **5.3%** | **5.0%** | **34** | **7.2%** | **7.1%** | **10** |

**5-Yr Realized Volatility:** **5.1%** **5-Yr Realized Tracking Error:** **0.2%**

### Asset Allocation, Performance & Realized Risk Summary - LRF

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Public Equity | $ 25.2 | 22.0% | 22% | 0.0% | ± 5% |
| Fixed Income | $ 56.2 | 49.1% | 49% | 0.1% | ± 5% |
| TIPS | $ 18.3 | 16.0% | 16% | (0.0%) | ± 3% |
| REITs | $ 9.0 | 7.9% | 8% | (0.1%) | ± 5% |
| Commodities | $ 5.8 | 5.0% | 5% | 0.0% | ± 3% |
| Liquidity | $ 0.0 | 0.0% | 0% | 0.0% | + 2% |
| **Total LRF** | **$ 114.4** | **100.0%** | **100.0%** | **0.0%** | |

**Current Allocation**




| Performance Summary[2] | 10-Yr Net Return | 10-Yr BM Return | 10-Yr Excess Bps | 5-Yr Net Return | 5-Yr BM Return | 5-Yr Excess Bps | 3-Yr Net Return | 3-Yr BM Return | 3-Yr Excess Bps | 1-Yr Net Return | 1-Yr BM Return | 1-Yr Excess Bps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public Equity | 10.9% | 10.8% | 11 | 6.6% | 6.4% | 18 | 12.2% | 11.9% | 24 | 5.0% | 4.6% | 44 |
| Fixed Income | 6.8% | 5.7% | 114 | 4.6% | 4.0% | 53 | 3.4% | 2.9% | 56 | 10.1% | 10.1% | (1) |
| TIPS | 3.6% | 3.6% | (6) | 1.7% | 1.8% | (1) | 2.1% | 2.1% | 5 | 4.9% | 4.8% | 6 |
| REITs | - | - | - | 5.9% | 5.7% | 18 | 5.6% | 5.2% | 33 | 9.0% | 8.1% | 96 |
| Commodities | - | - | - | (12.9%) | (13.3%) | 43 | 2.1% | 1.6% | 58 | (10.4%) | (11.5%) | 110 |
| **Total LRF** | **7.7%** | **7.2%** | **50** | **4.1%** | **3.8%** | **24** | **5.5%** | **5.2%** | **32** | **7.3%** | **7.1%** | **22** |

**5-Yr Realized Volatility:** **5.1%** **5-Yr Realized Tracking Error:** **0.2%**

[1] Allocations approved by the Board at the May 2018 IC Meeting

[2] Liquidity is for operational purposes rather than a strategic allocation target and is not included in the performance summary table due to negligible impact on performance

# Affiliate Investment Program

## Judges' Retirement Fund (JRF) & Judges Retirement System Fund II (JRF II)
### As of June 30, 2019

### Asset Allocation, Performance & Realized Risk Summary - JRF

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Cash | $ 15.8 | 100.0% | 100% | 0.0% | ± 0% |
| **Total JRF** | **$ 15.8** | **100.0%** | **100%** | **0.0%** | |

**Current Allocation**

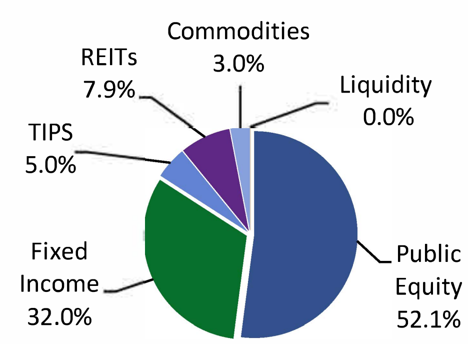

| Performance Summary | 10-Yr | | | 5-Yr | | | 3-Yr | | | 1-Yr | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps |
| Cash | 0.6% | 0.5% | 8 | 1.0% | 0.9% | 14 | 1.5% | 1.4% | 16 | 2.4% | 2.3% | 10 |
| **Total JRF** | **0.6%** | **0.5%** | **8** | **1.0%** | **0.9%** | **14** | **1.5%** | **1.4%** | **16** | **2.4%** | **2.3%** | **10** |

**5-Yr Realized Volatility:** **0.2%** **5-Yr Realized Tracking Error:** **0.0%**

### Asset Allocation, Performance Realized Risk Summary - JRF II

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Public Equity | $ 882.7 | 52.1% | 52% | 0.1% | ± 5% |
| Fixed Income | $ 543.3 | 32.0% | 32% | 0.0% | ± 5% |
| TIPS | $ 84.6 | 5.0% | 5% | (0.0%) | ± 3% |
| REITs | $ 133.8 | 7.9% | 8% | (0.1%) | ± 5% |
| Commodities | $ 51.1 | 3.0% | 3% | 0.0% | ± 3% |
| Liquidity | $ 0.0 | 0.0% | 0% | 0.0% | + 2% |
| **Total JRF II** | **$ 1,695.5** | **100.0%** | **100.0%** | **0.0%** | |

**Current Allocation**




| Performance Summary[2] | 10-Yr | | | 5-Yr | | | 3-Yr | | | 1-Yr | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps |
| Public Equity | 10.8% | 10.7% | 11 | 6.6% | 6.4% | 17 | 12.2% | 11.9% | 24 | 5.0% | 4.6% | 44 |
| Fixed Income | 6.8% | 5.7% | 115 | 4.6% | 4.0% | 54 | 3.5% | 2.9% | 59 | 10.2% | 10.1% | 6 |
| TIPS | - | - | - | 1.7% | 1.8% | (4) | 2.1% | 2.1% | 2 | 4.8% | 4.8% | (1) |
| REITs | 12.0% | 11.9% | 7 | 5.9% | 5.7% | 18 | 5.6% | 5.2% | 33 | 9.0% | 8.1% | 98 |
| Commodities | - | - | - | (13.1%) | (13.3%) | 23 | 1.7% | 1.6% | 18 | (11.4%) | (11.5%) | 6 |
| **Total JRF II** | **9.4%** | **9.1%** | **32** | **5.0%** | **4.8%** | **25** | **8.0%** | **7.6%** | **36** | **6.7%** | **6.4%** | **33** |

**5-Yr Realized Volatility:** **7.4%** **5-Yr Realized Tracking Error:** **0.2%**

[1] Allocations approved by the Board at the May 2018 IC Meeting

[2] Liquidity is for operational purposes rather than a strategic allocation target and is not included in the performance summary table due to negligible impact on performance

# Affiliate Investment Program

## Health Care Fund (HCF) & Long-Term Care Fund (LTCF)
**As of June 30, 2019**

### Asset Allocation, Performance & Realized Risk Summary - HCF

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Fixed Income | $ 478.2 | 100.0% | 100% | 0.0% | ± 0% |
| **Total HCF** | **$ 478.2** | **100.0%** | **100%** | **0.0%** | |

**Current Allocation**

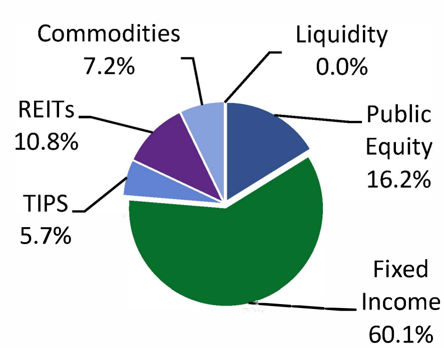

| Performance Summary | 10-Yr | | | 5-Yr | | | 3-Yr | | | 1-Yr | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps |
| Fixed Income | 4.5% | 3.9% | 59 | 3.1% | 2.9% | 16 | 2.3% | 2.3% | 3 | 7.9% | 7.9% | (0) |
| **Total HCF** | **4.5%** | **3.9%** | **59** | **3.1%** | **2.9%** | **16** | **2.3%** | **2.3%** | **3** | **7.9%** | **7.9%** | **(0)** |

**5-Yr Realized Volatility:** 3.0%  **5-Yr Realized Tracking Error:** 0.2%

### Asset Allocation, Performance & Realized Risk Summary - LTCF

| Asset Allocation | EMV (mil) | Current Allocation (%) | Policy Weight (%)[1] | Variance (%) | Policy Range |
|---|---|---|---|---|---|
| Public Equity | $ 770.9 | 16.2% | 15% | 1.2% | ± 4% |
| Fixed Income | $ 2,869.0 | 60.1% | 60% | 0.1% | ± 5% |
| TIPS | $ 272.0 | 5.7% | 6% | (0.3%) | ± 2% |
| REITs | $ 515.0 | 10.8% | 11% | (0.2%) | ± 4% |
| Commodities | $ 342.9 | 7.2% | 8% | (0.8%) | ± 2% |
| Liquidity | $ 0.0 | 0.0% | 0% | 0.0% | ± 2% |
| **Total LTCF** | **$ 4,769.9** | **100.0%** | **100.0%** | **0.0%** | |

**Current Allocation**




| Performance Summary[2] | 10-Yr | | | 5-Yr | | | 3-Yr | | | 1-Yr | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps | Net Return | BM Return | Excess Bps |
| Public Equity | 10.8% | 10.6% | 19 | 6.3% | 6.0% | 31 | 11.7% | 11.4% | 32 | 4.9% | 4.6% | 31 |
| Fixed Income | 6.3% | 5.7% | 68 | 4.1% | 4.0% | 1 | 2.9% | 2.9% | 3 | 10.2% | 10.1% | 3 |
| TIPS | 3.6% | 3.6% | (6) | 1.8% | 1.8% | (0) | 2.1% | 2.1% | (1) | 4.8% | 4.8% | (1) |
| REITs | 11.6% | 11.1% | 48 | 5.3% | 4.5% | 81 | 5.0% | 4.2% | 84 | 9.1% | 8.1% | 104 |
| Commodities | - | - | - | (13.3%) | (13.3%) | (1) | 1.4% | 1.6% | (17) | (11.5%) | (11.5%) | (3) |
| **Total LTCF** | **7.0%** | **6.7%** | **30** | **3.4%** | **3.3%** | **11** | **4.2%** | **4.2%** | **1** | **7.1%** | **7.2%** | **(8)** |

**5-Yr Realized Volatility:** 5.1%  **5-Yr Realized Tracking Error:** 0.3%

[1] Allocations approved by the Board at the June 2018 IC Meeting

[2] Liquidity is for operational purposes rather than a strategic allocation target and is not included in the performance summary table due to negligible impact on performance

# Affiliate Investment Program

## Supplemental Income Plan (SIP)
### As of June 30, 2019

### Asset Allocation - SIP

| Asset Allocation | EMV (mil) | Global Equity Actual | Global Equity Policy | Global Equity Policy Range | US Fixed Income Actual | US Fixed Income Policy | US Fixed Income Policy Range | Real Assets Actual | Real Assets Policy | Real Assets Policy Range | Cash and Cash Equivalents Actual | Cash and Cash Equivalents Policy | Cash and Cash Equivalents Policy Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target Income Fund | $ 102.5 | 30.0% | 30.0% | ± 4% | 60.0% | 60.0% | ± 4% | 5.0% | 5.0% | ± 1% | 5.0% | 5.0% | ± 1% |
| Target 2015 Fund | $ 89.2 | 37.0% | 37.0% | ± 4% | 54.0% | 54.0% | ± 4% | 5.0% | 5.0% | ± 1% | 4.0% | 4.0% | ± 1% |
| Target 2020 Fund | $ 166.3 | 50.0% | 50.0% | ± 4% | 43.0% | 43.0% | ± 4% | 4.0% | 4.0% | ± 1% | 3.0% | 3.0% | ± 1% |
| Target 2025 Fund | $ 167.6 | 62.0% | 62.0% | ± 4% | 32.0% | 32.0% | ± 4% | 4.0% | 4.0% | ± 1% | 2.0% | 2.0% | ± 1% |
| Target 2030 Fund | $ 144.8 | 75.0% | 75.0% | ± 4% | 20.0% | 20.0% | ± 2% | 4.0% | 4.0% | ± 1% | 1.0% | 1.0% | ± 1% |
| Target 2035 Fund | $ 84.4 | 87.0% | 87.0% | ± 4% | 10.0% | 10.0% | ± 2% | 3.0% | 3.0% | ± 1% | 0.0% | 0.0% | ± 0.25% |
| Target 2040 Fund | $ 75.9 | 92.0% | 92.0% | ± 4% | 5.0% | 5.0% | ± 1% | 3.0% | 3.0% | ± 1% | 0.0% | 0.0% | ± 0.25% |
| Target 2045 Fund | $ 40.0 | 92.0% | 92.0% | ± 4% | 5.0% | 5.0% | ± 1% | 3.0% | 3.0% | ± 1% | 0.0% | 0.0% | ± 0.25% |
| Target 2050 Fund | $ 19.7 | 92.0% | 92.0% | ± 4% | 5.0% | 5.0% | ± 1% | 3.0% | 3.0% | ± 1% | 0.0% | 0.0% | ± 0.25% |
| Target 2055 Fund | $ 8.6 | 92.0% | 92.0% | ± 4% | 5.0% | 5.0% | ± 1% | 3.0% | 3.0% | ± 1% | 0.0% | 0.0% | ± 0.25% |
| Target 2060 Fund | $ 1.9 | 92.0% | 92.0% | ± 4% | 5.0% | 5.0% | ± 1% | 3.0% | 3.0% | ± 1% | 0.0% | 0.0% | ± 0.25% |
| SSgA STIF | $ 105.8 | 0.0% | 0.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - | 100.0% | 100.0% | - |
| SIP US ST Bond Core | $ 35.4 | 0.0% | 0.0% | - | 100.0% | 100.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - |
| SIP US Bond Core | $ 59.4 | 0.0% | 0.0% | - | 100.0% | 100.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - |
| SIP Real Asset Core | $ 7.3 | 0.0% | 0.0% | - | 0.0% | 0.0% | - | 100.0% | 100.0% | - | 0.0% | 0.0% | - |
| SIP Russell All Cap Core | $ 558.6 | 100.0% | 100.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - |
| SIP Glbl All Cap EX-US | $ 67.6 | 100.0% | 100.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - | 0.0% | 0.0% | - |

### Performance Summary - SIP

| Performance Summary | 10-Yr Net Return | 10-Yr BM Return | 10-Yr Excess Bps | 5-Yr Net Return | 5-Yr BM Return | 5-Yr Excess Bps | 3-Yr Net Return | 3-Yr BM Return | 3-Yr Excess Bps | 1-Yr Net Return | 1-Yr BM Return | 1-Yr Excess Bps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target Income Fund | 5.5% | 5.5% | (9) | 3.3% | 3.1% | 11 | 4.2% | 4.1% | 8 | 6.5% | 6.4% | 10 |
| Target 2015 Fund | 6.6% | 6.7% | (13) | 3.2% | 3.1% | 11 | 4.1% | 4.0% | 8 | 6.1% | 6.0% | 10 |
| Target 2020 Fund | 7.1% | 7.2% | (9) | 3.1% | 3.0% | 11 | 4.5% | 4.4% | 7 | 5.4% | 5.3% | 11 |
| Target 2025 Fund | 7.9% | 8.0% | (6) | 3.7% | 3.6% | 12 | 5.8% | 5.8% | 6 | 5.1% | 5.0% | 13 |
| Target 2030 Fund | 8.6% | 8.7% | (7) | 3.9% | 3.8% | 11 | 6.6% | 6.6% | 4 | 4.5% | 4.4% | 12 |
| Target 2035 Fund | 9.2% | 9.4% | (13) | 4.2% | 4.1% | 12 | 7.6% | 7.6% | 2 | 4.0% | 3.9% | 13 |
| Target 2040 Fund | 9.7% | 9.8% | (10) | 4.6% | 4.5% | 13 | 8.7% | 8.7% | 0 | 3.9% | 3.8% | 14 |
| Target 2045 Fund | 10.0% | 10.1% | (11) | 5.1% | 5.0% | 13 | 9.7% | 9.7% | (1) | 4.3% | 4.1% | 14 |
| Target 2050 Fund | 9.9% | 10.1% | (12) | 5.1% | 5.0% | 13 | 9.7% | 9.7% | (1) | 4.3% | 4.1% | 14 |
| Target 2055 Fund | - | - | - | 5.1% | 5.0% | 14 | 9.7% | 9.7% | (1) | 4.3% | 4.1% | 13 |
| Target 2060 Fund | - | - | - | - | - | - | - | - | - | - | - | - |
| SSgA STIF | - | - | - | 1.1% | 0.9% | 19 | 1.6% | 1.4% | 24 | 2.7% | 2.3% | 37 |
| SIP US ST Bond Core | - | - | - | 1.3% | 1.5% | (12) | 1.5% | 1.6% | (11) | 4.2% | 4.3% | (7) |
| SIP US Bond Core | - | - | - | 3.0% | 2.9% | 6 | 2.3% | 2.3% | 2 | 7.9% | 7.9% | 6 |
| SIP Real Asset Core | - | - | - | (0.2%) | (0.1%) | (11) | 4.0% | 4.2% | (17) | 1.9% | 2.0% | (17) |
| SIP Russell All Cap Core | - | - | - | 10.2% | 10.2% | 4 | 14.0% | 14.0% | (1) | 9.0% | 9.0% | 2 |
| SIP Glbl All Cap EX-US | - | - | - | 2.5% | 2.2% | 22 | 9.2% | 9.2% | 1 | 0.6% | 0.3% | 33 |

# Affiliate Investment Program
## Supplemental Income Plan (SIP)

### As of June 30, 2019

### Realized Risk - SIP

| Realized Risk | Annualized 5-Yr Realized Volatility | Tracking Error[1] |
|---|---|---|
| Target Income Fund | 3.4% | 0.1% |
| Target 2015 Fund | 3.8% | 0.1% |
| Target 2020 Fund | 4.9% | 0.1% |
| Target 2025 Fund | 6.3% | 0.1% |
| Target 2030 Fund | 7.7% | 0.1% |
| Target 2035 Fund | 9.1% | 0.2% |
| Target 2040 Fund | 10.1% | 0.2% |
| Target 2045 Fund | 10.5% | 0.2% |
| Target 2050 Fund | 10.5% | 0.2% |
| Target 2055 Fund | 10.5% | 0.2% |
| Target 2060 Fund | - | - |
| SSgA STIF | 0.3% | 0.1% |
| SIP US ST Bond Core | 0.9% | 0.0% |
| SIP US Bond Core | 3.0% | 0.1% |
| SIP Real Asset Core | 8.5% | 0.2% |
| SIP Russell All Cap Core | 12.3% | 0.1% |
| SIP Glbl All Cap EX-US | 12.4% | 0.3% |

[1] Due to the impact of Fair Value Pricing adjustment, the tracking error is based on a rolling 12 month calculation

# CalPERS Trust Level

## Trust Level Benchmarks

**As of June 30, 2019**

**Public Employee's Retirement Fund and Affiliate Investment Program Policy Benchmarks**

| Trust | Asset Class Benchmark | Policy Benchmark |
|---|---|---|
| **Public Employees Retirement Fund** | **Public Equity%Cap Weighted** | Custom FTSE All World, All Cap Equity |
| | **Public Equity - Factor Weighted** | MSCI ACWI Select Factor Weighted Index |
| | **Private Equity** | Custom FTSE All World, All Cap Equity% 150bps, Quarter Lag |
| | **Income - Long Spread** | Custom Bloomberg Barclays Long Spread |
| | **Income - Long Treasury** | Custom Bloomberg Barclays Long Government |
| | **Income - High Yield** | Custom Bloomberg Barclays High Yield |
| | **Real Assets** | MSCI/PREA U.S. ACOE Quarterly Property Fund Index (Unfrozen) |
| | **Inflation** | 50 % Bloomberg Barclays Inflation Linked U.S.% 25% Universal Government Inflation Linked Index ex-U.S. + 25% S&P GSCI TR |
| | **Liquidity** | 30-Day Treasury Bill |
| **Judge's Retirement System Fund** | **Cash** | 91-day Treasury Bill |
| **Judge's Retirement System II Fund** | **Global Equity** | MSCI ACWI IMI (Net) |
| | **U.S. Fixed Income** | Bloomberg Barclays Long Liability Index |
| | **TIPS** | Bloomberg Barclays U.S. TIPs Index, Series L |
| | **Commodities** | S&P GSCI Total Return Daily |
| | **REITs** | FTSE EPRA/NAREIT Developed Liquid (Net) |
| **Legislators' Retirement System Fund** | **Global Equity** | MSCI ACWI IMI (Net) |
| | **U.S. Fixed Income** | Bloomberg Barclays Long Liability Index |
| | **TIPS** | Bloomberg Barclays U.S. TIPs Index, Series L |
| | **Commodities** | S&P GSCI Total Return Daily |
| | **REITs** | FTSE EPRA/NAREIT Developed Liquid (Net) |
| **Public Employees' Health Care Fund** | **U.S. Fixed Income** | Bloomberg Barclays U.S. Aggregate Bond Index |
| **Long-Term Care Fund** | **Global Equity** | MSCI ACWI IMI (Net) |
| | **U.S. Fixed Income** | Bloomberg Barclays Long Liability Index |
| | **TIPS** | Bloomberg Barclays U.S. Treasury Inflation Protected Securities (TIPS) Index |
| | **Commodities** | S&P GSCI Total Return Daily |
| | **REITs** | FTSE EPRA/NAREIT Developed Liquid (Net) |
| **California Employers' Retiree Benefit Trust (CERBT) Funds 1, 2 & 3** | **Global Equity** | MSCI ACWI IMI (Net) |
| | **U.S. Fixed Income** | Bloomberg Barclays Long Liability Index |
| | **TIPS** | Bloomberg Barclays U.S. TIPS Index, Series L |
| | **Commodities** | S&P GSCI Total Return Daily |
| | **REITs** | FTSE EPRA/NAREIT Developed Liquid (Net) |

# CalPERS Trust Level

## Trust Level Benchmarks
**As of June 30, 2019**

**Supplemental Income Plan Policy Benchmarks**

| Policy Weights | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Global Equity | US Equity | In'l Equity | US Income | | Real Assets | Cash & Cash Equivalents |
| Supplemental Income Plan | Russell 3000 / MSCI ACWI ex US | Russell 3000 | MSCI ACWI ex US | Bloomberg Barclays US Ag Bond Index | Bloomberg Barclays US 1-3 Year Govt/Credit Bond Index | SSGA Real Asset | BofA ML 3 mo T-bill |
| Target Income Fund | 30.0% | 16.0% | 14.0% | 60.0% | - | 5.0% | 5.0% |
| Target 2015 Fund | 37.0% | 20.0% | 17.0% | 54.0% | - | 5.0% | 4.0% |
| Target 2020 Fund | 50.0% | 27.0% | 23.0% | 43.0% | - | 4.0% | 3.0% |
| Target 2025 Fund | 62.0% | 33.0% | 29.0% | 32.0% | - | 4.0% | 2.0% |
| Target 2030 Fund | 75.0% | 40.0% | 35.0% | 20.0% | - | 4.0% | 1.0% |
| Target 2035 Fund | 87.0% | 46.0% | 41.0% | 10.0% | - | 3.0% | - |
| Target 2040 Fund | 92.0% | 49.0% | 43.0% | 5.0% | - | 3.0% | - |
| Target 2045 Fund | 92.0% | 49.0% | 43.0% | 5.0% | - | 3.0% | - |
| Target 2050 Fund | 92.0% | 49.0% | 43.0% | 5.0% | - | 3.0% | - |
| Target 2055 Fund | 92.0% | 49.0% | 43.0% | 5.0% | - | 3.0% | - |
| Target 2060 Fund | 92.0% | 49.0% | 43.0% | 5.0% | - | 3.0% | - |
| SSgA STIF | - | - | - | - | - | - | 100.0% |
| SIP US ST Bond Core | - | - | - | - | 100.0% | - | - |
| SIP US Bond Core | - | - | - | 100.0% | - | - | - |
| SIP Real Asset Core | - | - | - | - | - | 100.0% | - |
| SIP Russell All Cap Core | 100.0% | 100.0% | - | - | - | - | - |
| SIP Global All Cap ex US | 100.0% | - | 100.0% | - | - | - | - |