REAL ESTATE STRATEGY
SEMI-ANNUAL REPORT
(OPEN SESSION)
AS OF Q1 2018

California State Teachers’ Retirement System
August 14, 2018
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## REPORT PREPARED BY:

- Gadi Kaufmann, Managing Director/CEO
- Taylor Mammen, Managing Director
- Ben Maslan, Principal
- Jonathan Kaufman, Associate
The objective of this semi-annual report is to provide the Committee with an evaluation of the real estate portfolio’s alignment with CalSTRS’ established goals and policies and the investment opportunities presented by property and capital markets.

To accomplish the above objective, we reviewed the CalSTRS portfolio, policies and limitations, previous recommendations and activities, as well as current and forecasted economic, capital market, and property market conditions.

Based upon an evaluation of these factors, the report provides recommended strategic considerations based upon projected opportunities driven by market and investor dynamics, the real estate cycle, and CalSTRS’ real estate goals and objectives.

Current long-term goals and objectives that the semi-annual report evaluates include:

► A short-term real estate allocation target of 12% and long-term allocation target of 13%;

► Target a net return benchmarked to the NCREIF NFI-ODCE Index for the core portfolio, 50 basis points over the ODCE for the value add portfolio, and 300 basis points over the ODCE for the opportunistic portfolio;

► Allocation based on property stage – stable and value creation (lease-up/reposition and construction) – to maintain an appropriate risk profile; and

► An appropriate level of leverage.

We continue to recommend that this long-term view continues to be evaluated and revised at least annually to reflect near-term trends that may impact long-term decisions.
FUNDING STATUS AND COMPLIANCE
AS OF MARCH 31, 2018

The CalSTRS Real Estate portfolio NAV was $28.3 billion as of Q1 2018, representing 12.7% of the total CalSTRS fund (~$223.4 billion), slightly below the long-term target allocation to real estate of 13%, but within the policy range of 10%-16%.

The Real Estate portfolio has generally outperformed its target return benchmarks, with the exception of riskier value add and opportunistic investments over longer time horizons. The legacy assets within the portfolio have a decreasing impact on total returns over 1-, 3-, 5-, and 10-year investment horizons, although these assets within the portfolio have been steadily liquidating.

The portfolio is compliant with the targeted allocation by investment strategy and is within the permitted leverage limits as outlined by the CalSTRS Investment Policy Statement ("IPS").

Portfolio Performance¹

<table>
<thead>
<tr>
<th>TIME WEIGHTED NET RETURNS</th>
<th>Including Legacy</th>
<th>Excluding Legacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Yr</td>
<td>3 Yr</td>
</tr>
<tr>
<td>Core</td>
<td>9.3%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Value Add</td>
<td>14.0%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>11.6%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Total</td>
<td>10.5%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Target Return (ODCE)</td>
<td>7.1%</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

¹Green cells denote outperformance of the target return metric. The Core portfolio has a net target return benchmarked to the ODCE, while the Value Add and Opportunistic portfolios have net target returns of 50 basis points and 300 basis points over the ODCE, respectively.

SOURCE: CalSTRS; State Street; NCREIF
CORE PORTFOLIO
PROPERTY TYPE AND GEOGRAPHIC DIVERSIFICATION

► The CalSTRS core portfolio has property type and geographic diversification targets of ± 5% of the benchmark ODCE Index, while the value add and opportunistic portfolios do not have location and property type targets.

► Property type diversification for the core portfolio is closely in line with ODCE, with office, apartment, retail, and industrial allocations being slightly underweighted to the ODCE Index, but within the specified 5% deviation.

► Regionally, the core portfolio is underexposed in the East by 5.7% and overexposed in the West by 5.5%, both slightly beyond the specified 5% variance per the IPS. Although the ODCE only includes assets within the United States, the core portfolio’s international allocation of 3.5% is within the specified deviation.

► Although portfolio allocations in the East and West regions are slightly beyond the specified 5% deviation, RCLCO suggests that allocation variances should be permitted based on an evaluation of the long-term trends, opportunities, and risks facing different property types and geographies, rather than mechanically investing to benchmark the ODCE.

SOURCE: State Street INV360

The information contained in this report is confidential, may be legally privileged, and is intended only for the use of the CalSTRS.
HISTORICAL RETURNS
AS OF MARCH 31, 2018

► While the active portfolio (excluding legacy assets) underperformed the ODCE by 40 basis points over the 10-year period due to the effects of the Recession, it has exhibited much stronger recent performance, outperforming the ODCE over the 1-, 3-, and 5-year periods by at least 200 basis points.

► The legacy portfolio has had a negative impact on long-term total returns; the active portfolio has outperformed the overall portfolio by as little as 10 basis points over the 1-year period and as many as 230 basis points over the 10-year period. Despite this negative impact on returns, the legacy portfolio has been steadily liquidating and is expected to represent less than 1% of the overall portfolio in 2020, down from roughly 8% at the end of 2017.

Historical Net Time-Weighted Returns

![Bar chart showing historical net time-weighted returns for 1 Year, 3 Year, 5 Year, and 10 Year periods.](chart_image)

- Total Active
- Legacy
- Total Portfolio
- ODCE

SOURCE: State Street
MARKET OUTLOOK

MACROECONOMIC CONDITIONS

► Economic Cycle: RCLCO’s point of view is that we continue to be in the “late stable” stage of the market cycle for most property types and geographies, which should endure throughout 2018 and potentially through 2019/2020. Pricing is well above peak values among all product types, especially for multifamily and central business district (CBD) office assets. Meanwhile, construction activity has declined for all product types with the exception of industrial assets.

► Capital Markets: Despite rising interest rates, an unprecedented amount of capital continues to pursue real estate investments, and dry powder available for investment continues to expand. While transaction volume remains below the 2015 peak, the pace is well above the historical average, and transaction volume through Q2 2018 has outpaced volume through Q2 2017 by more than 5%. Although lending standards continue to tighten, debt flows remain well above historical averages, and CMBS issuances have increased significantly in Q1 2018 YoY.

► Cap Rates: Interest rates have risen and will likely continue to rise; however, real estate cap rates have remained flat. Although the spread between the 10-Year Treasury Yield and average going-in cap rate declined below the historical average in Q2 2018 for the first time in the current cycle, history suggests that the spread can continue to narrow in the late cycle. Despite being less elastic, cap rates are projected to eventually move higher in response to a rising interest rate environment.
MARKET OUTLOOK

PROPERTY TYPE OUTLOOK

► Multifamily: RCLCO’s view is that multifamily remains the furthest along in the economic cycle of all property types. Although absorption and transaction flow remain high, vacancies are slightly above long-term averages in most markets resulting from an oversupply of new deliveries. Class B multifamily units currently have a lower vacancy rate nationwide than class A units, suggesting a need for more affordable rental product. Though multifamily rents continue to exhibit strong growth, expanding by 3.0% YoY in Q2 2018, this growth has moderated and stabilized over the past two years.

► Office: New office deliveries have exceeded absorption for the sixth straight quarter in Q2 2018, signaling peak conditions. Markets with strong tech sectors are experiencing the most rental growth and absorption, although they will also experience significant introductions of supply in the near-term.

► Retail: Retail continues to exhibit disciplined construction activity benefiting neighborhood and community retail operating performance, but certain retail types (primarily power centers and suburban malls) and locations are suffering from “structural obsolescence,” largely thanks to e-commerce. Transaction volume recently declined to its lowest level since 2013, with the majority of capital being invested in higher quality transactions.

► Industrial: Industrial remains the healthiest major property sector; however, construction has finally caught up with demand. This is unlikely to be problematic given historically high occupancies nationwide and a relatively modest construction pipeline. Transaction volume has increased by 26.1% YoY through Q2 2018, driving cap rates to all-time lows.

► Expected Returns: Market participants are expecting declining levels of return, as evidenced by the latest investor survey results compiled by the Pension Real Estate Association (PREA). While income returns are expected to stay relatively flat, returns from appreciation are anticipated to decline from 1.5% in 2018 to -0.5% in 2020 as cap rates expand.

Property Markets Short-Term Outlook

Projected Real-Estate Returns – Q2 2018 PREA Consensus Forecast Survey

1Q2 2018 survey conducted in May 2018. Data labels in the chart reflect total returns.

SOURCE: PREA; RCLCO
APPENDIX: REAL ESTATE MARKET
The economy continues to be in the late stable stage of the economic cycle for most product types.

Pricing has surpassed previous peaks for all product types and construction activity has declined for all with the exception of industrial.

Interest rates are expected to rise and the yield curve has begun to flatten, suggesting a slowdown in economic conditions in the near future.

Despite rising rates at late stable conditions, an unprecedented amount of capital is pursuing real estate.

The current cycle may have been extended by recent tax cuts and fiscal stimulus in the United States. RCLCO projects late stable conditions to persist through 2018 and potentially through 2019/2020.

As mentioned in the previous Q3 2017 Semi-Annual Report, strategic activities should therefore include:

► Selectively investing in extraordinary opportunities;
► Pruning the portfolio of non-strategic assets;
► Preparing/arranging “dry powder” for acquisitions during the bottom.
# MARKET CYCLE BY PROPERTY TYPE

<table>
<thead>
<tr>
<th>CYCLE STAGE</th>
<th>DECLINING</th>
<th>RECOVERING</th>
<th>STABLE</th>
<th>MATURING</th>
<th>PEAK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions/Trends</td>
<td></td>
<td>Rapid rental rate and occupancy improvements</td>
<td></td>
<td>Stabilizing operating performance</td>
<td>Flattening operating performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pent-up demand significantly exceeds supply; limited new construction</td>
<td></td>
<td>Steady demand leads to construction</td>
<td>Existing supply begins to exceed demand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asset valuations rely on conservative assumptions</td>
<td></td>
<td>Asset valuation metrics tightening</td>
<td>Asset valuations rely on aggressive assumptions</td>
</tr>
<tr>
<td>Property Types</td>
<td></td>
<td>For-Sale Residential</td>
<td></td>
<td>Medical Office</td>
<td>Apartments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neighborhood and Community Retail</td>
<td></td>
<td>Self-Storage</td>
<td>CBD Office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Seniors Housing</td>
<td>Suburban Office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Single-Family Rental</td>
<td>Grocery-Anchored Shopping Centers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Student Housing</td>
<td>Prime Malls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Warehouse/Distribution</td>
<td>Hotel – Full Service</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Small/Mid Scale Industrial</td>
<td>High-Street Retail</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hotel – Limited Service</td>
</tr>
</tbody>
</table>

SOURCE: RCLCO
LONGER-TERM TRENDS & THEMES

TRENDS AND THEMES

► Enduring lifecycle stage shifts and changes
► Growing single-family demand form aging Millennials
► Housing inventory at 30-year low suggesting pent up demand
► Ownership increasingly unaffordable compared to renting
► Stagnant wage growth and increasing income inequality

► Companies locate to where talent wants to be and talent demands work spaces offering:
  » Proximity to housing, transportation, and amenities
  » Interesting and collaborative workspace
► Large percentage of existing office stock may be structurally obsolete
► Growing need/demand for health care

► Industrial is the “new retail” through e-commerce
► Consumers want “less stuff, more fun”
► Convenience is paramount:
  » Location, location, location
  » Click and Shop
► Increasing obsolescence of many retail centers

REAL ESTATE STRATEGIES

► Lower Density Rental Products
► For-Sale Housing Development
► Active Adult and Seniors Housing
► Manufactured Housing

► Best Markets & Evolving Submarkets
► Build New and Renovate “Best Properties”:
  » Walkability to Transport & Amenities
  » Flexible Floor Plans
  » 21st Century Infrastructure
► Medical Office, Evolving Health Care Real Estate

► Logistics-Based Industrial, from “Super Bulk” to “Last Mile”
► Best Groceries in the Best Locations
► Experiential Retail
► Redevelop/Repurpose Obsolete Retail

SOURCE: RCLCO
APPENDIX: CURRENT PORTFOLIO
CURRENT PORTFOLIO SUMMARY

► Real estate NAV totaled $28.3 billion as of March 31, 2018, representing 12.7% of the total CalSTRS fund (~$223.4 billion), which is slightly below the long-term target allocation to real estate of 13%, but within the policy range of 10%-16%.

► Since the Q3 2017 Semi-Annual Report, the Real Estate portfolio has grown by $1.8 billion (7.0% increase in portfolio size) resulting from a $1.9 billion increase in controlled assets, a $400 million increase in non-controlled assets, and a $500 million decrease in non-controlling legacy assets.\(^1\)

► The CalSTRS real estate portfolio has achieved a net time-weighted return (“TWR”) of 10.5% over the past year, outperforming the ODC E Index return of 7.1%. Over the past ten years, the portfolio has achieved a net TWR of 1.5%, trailing the ODCE return of 4.2% over the same time period. As noted in the previous Semi-Annual Report, CalSTRS has reduced its exposure to commingled closed-end opportunistic funds coming out of the Great Recession, and placed a greater emphasis on retaining discretion within its portfolio by investing primarily through separate accounts and joint ventures, resulting in significantly improved performance. Excluding Legacy assets, the portfolio has outperformed the ODCE by 350 basis points and achieved a 10.6% net TWR over the year. Over the past ten years it has achieved a 3.8% net TWR excluding Legacy assets, trailing the ODCE by 40 basis points.

► Assets of older vintage (prior to 2009) comprise a sizeable share of the portfolio—$4.6 billion of $28.3 billion in real estate—while resulting in a drag on overall returns; these assets have an average since inception time weighted return of 5.5%, compared to an average since inception TWR of 10.5% for assets of newer vintage.\(^2\) Assets acquired during the early parts of the current decade (2010-2013) have resulted in the highest returns due to their relatively low cost basis coming out of the last recession.

► The allocation of assets by risk-factor has remained mostly unchanged since the previous Semi-Annual report, with a current distribution of 63% to core, 17% to value-add, and 12% to opportunistic risk-factor assets, with Legacy assets continuing to comprise 8% of the portfolio. By 2020 these allocations are forecasted to increase to 65%, 18%, and 16%, for core, value add, and opportunistic risk-factor assets, respectively, primarily due to the liquidation of the Legacy portfolio, which is projected to comprise less than 1% of the portfolio.

► The portfolio remains relatively concentrated; the top 15 separate account managers (by size) comprise approximately 80% of the total NAV of the portfolio, with the top two managers—Principal and CBRE—together comprising nearly 30% of the total portfolio. The average IRR of the portfolio’s largest separate account managers exceeds the portfolio as a whole, which is biased downward by the Legacy portfolio.

► Approximately 13% of the portfolio, or $3.8 billion, is allocated to international investments. European and Asian investments comprise 38% and 29% of the international allocation, respectively, while other global regions and emerging markets represent the remaining 33% of the international portfolio. The European portfolio has a make-up of moderate risk investments, with a current allocation of 0%, 82%, and 12% for core, value add, and opportunistic assets, respectively. Meanwhile, the Asian portfolio has a more balanced allocation of 32%, 57%, and 11% for core, value add, and opportunistic assets, respectively. Looking forward, total unfunded commitments for the international portfolio amount to $4.9 billion, 63% of which will be allocated to non-controlling investments.

\(^1\)The “controlled” portfolio is comprised of joint ventures, separate accounts, and open-end funds, while the “direct” portfolio is comprised of joint ventures and separate accounts.\(^2\)Since inception time weighted returns aggregated by vintage calculated by the geometric mean of the annualized returns.
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STATUS OF CALSTRS REAL ESTATE PORTFOLIO
PORTFOLIO ALLOCATIONS

- Real estate NAV totaled $28.3 billion as of Q1 2018, representing 12.7% of the total CalSTRS fund, which is slightly above the short-term target allocation of 12.0%, and slightly below the long-term target of 13.0%.

- The direct portfolio, which includes separate accounts and joint ventures, comprises 62% of the total fund, while the remaining 38% is allocated to funds and other investment vehicles.

- Approximately 64% of the portfolio is allocated to core assets, with 36% of the portfolio being in value creation through value add and opportunistic assets. Though the allocation of core investments would be expected to increase over the next few years as construction projects and value creation investments convert to core investments through lease-up and stabilization, these transitioning assets will likely be offset by future value add and opportunistic investments given that 59% of current unfunded commitments, or $6.4 billion in capital, are dedicated to these higher risk-profiles.

![Allocation by Vehicle](image1)

![Allocation by Risk](image2)

![Allocation by Property Category](image3)

1 Allocations by risk and investment vehicle as of Q4 2017.

SOURCE: State Street
REAL ESTATE FUND
HISTORICAL PERFORMANCE

The CalSTRS Real Estate portfolio has achieved attractive returns over the past five years, experiencing net time weighted returns of 12.7% and 10.8% with and without Legacy assets, respectively. The portfolio continues to perform strongly, having achieved net time weighted returns of 10.6% over the past year for the active portfolio and 10.5% for the overall portfolio.

The impacts of the Great Recession are visible over the 10-year investment horizon, reducing annualized returns to only 3.8% for the active portfolio and 1.5% for the overall portfolio.

Since inception, the overall portfolio has achieved a net IRR of 5.6%.

<table>
<thead>
<tr>
<th>CURRENT COMPOSITION</th>
<th>NET TIME WEIGHTED RETURNS¹</th>
<th>SINCE INCEPTION NET IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAV ($ millions)</td>
<td>% OF TOTAL</td>
<td>CURRENT QUARTER</td>
</tr>
<tr>
<td>Core</td>
<td>18,044.3</td>
<td>63.7%</td>
</tr>
<tr>
<td>Value Add</td>
<td>4,677.1</td>
<td>16.5%</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>5,602.7</td>
<td>19.8%</td>
</tr>
<tr>
<td>Public</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total (Including Legacy)</td>
<td>28,324.1</td>
<td>2.8%</td>
</tr>
<tr>
<td>Legacy</td>
<td>2,016.4</td>
<td>3.8%</td>
</tr>
<tr>
<td>Total (Excluding Legacy)</td>
<td>26,307.7</td>
<td>2.7%</td>
</tr>
<tr>
<td>Target Return (ODCE)</td>
<td>181,815.6</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

¹Green cells denote outperformance of the target return metric. The Core portfolio has a net target return benchmarked to the ODCE, while the Value Add and Opportunistic portfolios have net target returns of 50 basis points and 300 basis points over the ODCE, respectively.

SOURCE: State Street

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REAL ESTATE FUND
ASSET VINTAGE

- Assets of older vintage (prior to 2009) comprise a sizeable share of the portfolio—$4.6 billion of $28.3 billion in real estate—while resulting in a drag on overall returns; these assets have a since inception net TWR of 5.5%, compared to an average since inception net TWR of 10.5% for assets of newer vintage.¹

- Assets acquired during the early parts of the current decade (2010-2013) have resulted in the highest returns, due in large part to their relatively low cost basis coming out of the last recession.

### Performance by Vintage

<table>
<thead>
<tr>
<th>VINTAGE</th>
<th>NAV (millions)</th>
<th>NET TIME WEIGHTED RETURNS</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Current Quarter</td>
<td>1 - Year</td>
</tr>
<tr>
<td>Q1 2018</td>
<td>$368.8</td>
<td>4.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>2017</td>
<td>$3,425.0</td>
<td>2.5%</td>
<td>7.5%</td>
</tr>
<tr>
<td>2016</td>
<td>$2,839.6</td>
<td>4.1%</td>
<td>22.1%</td>
</tr>
<tr>
<td>2015</td>
<td>$2,115.5</td>
<td>2.9%</td>
<td>10.1%</td>
</tr>
<tr>
<td>2014</td>
<td>$4,718.0</td>
<td>2.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>2013</td>
<td>$1,758.1</td>
<td>2.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>2012</td>
<td>$2,467.8</td>
<td>3.3%</td>
<td>11.2%</td>
</tr>
<tr>
<td>2011</td>
<td>$985.3</td>
<td>2.1%</td>
<td>9.6%</td>
</tr>
<tr>
<td>2010</td>
<td>$4,793.2</td>
<td>1.4%</td>
<td>8.0%</td>
</tr>
<tr>
<td>2009</td>
<td>$175.1</td>
<td>2.7%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Newer Vintage (2009 or later)¹</td>
<td>$23,646.3</td>
<td>2.7%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Older Vintage (prior to 2009)¹</td>
<td>$4,601.7</td>
<td>2.0%</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

¹ Since inception time weighted returns aggregated by vintage calculated by the geometric mean of the annualized returns. SOURCE: State Street

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The CalSTRS real estate portfolio has grown from $15.8 billion in 2010 to $27.6 billion as of Q1 2018.\(^1\)

Since the Q3 2017 Semi-Annual Report, the Real Estate portfolio grew by $1.8 billion (7.0% increase in portfolio size) resulting from a $1.9 billion increase in controlled assets, a $400 million increase in non-controlled assets, and a $500 million decrease in non-controlled Legacy assets.

Portfolio composition continues to shift in favor of controlled investments, which, as of Q1 2018, represent 78% of the portfolio (including co-investments), up from only 46% in 2010.

\(^1\)Portfolio NAV provided from CalSTRS, which differs from State Street’s estimate of $28.3 billion.

SOURCE: CalSTRS
REAL ESTATE FUND

PORTFOLIO ALLOCATION BY RISK PROFILE

From 2017 to 2020, core assets are expected to grow from 63% to roughly two-thirds of the portfolio, while opportunistic assets will have a considerable increase from 12% to 16% of the portfolio. Meanwhile, legacy assets are expected to decrease from an 8% share to only 1% of the portfolio.

NOTE: (f) denotes forecasted estimate.

SOURCE: CalSTRS
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The top 15 managers (by size) comprise 80% of the total NAV of the portfolio.

The top two managers—Principal and CBRE—together comprise nearly 30% of the total portfolio; however, with divergent responsibilities. While Principal largely acts as an independent fiduciary, CBRE directly invests in real estate on behalf of CalSTRS.

The portfolio of the largest managers achieved an average weighted since inception IRR of 7.8%, which is 220 basis points higher than the total portfolio since inception IRR of 5.6%.

### TOP 15 MANAGERS BY NAV

<table>
<thead>
<tr>
<th>MANAGER</th>
<th>STYLE</th>
<th>NAV (millions)</th>
<th>% TOTAL</th>
<th>SINCE INCEPTION NET IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal</td>
<td>Industrial / Retail / Student Housing</td>
<td>$5,110.3</td>
<td>18%</td>
<td>7.3%</td>
</tr>
<tr>
<td>CB Richard Ellis</td>
<td>Office / Industrial</td>
<td>$2,992.0</td>
<td>11%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Blackstone</td>
<td>Multiple</td>
<td>$1,838.1</td>
<td>6%</td>
<td>12.6%</td>
</tr>
<tr>
<td>BlackRock</td>
<td>Residential</td>
<td>$1,822.0</td>
<td>6%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Lionstone</td>
<td>Office</td>
<td>$1,537.9</td>
<td>5%</td>
<td>8.3%</td>
</tr>
<tr>
<td>GL Partners</td>
<td>Residential</td>
<td>$1,499.0</td>
<td>5%</td>
<td>11.4%</td>
</tr>
<tr>
<td>ING Clarion</td>
<td>Office</td>
<td>$1,347.7</td>
<td>5%</td>
<td>8.8%</td>
</tr>
<tr>
<td>Fairfield</td>
<td>Residential</td>
<td>$1,163.9</td>
<td>4%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Pacific Coast Capital</td>
<td>Residential / Office / Retail</td>
<td>$1,071.8</td>
<td>4%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Fortress</td>
<td>Debt</td>
<td>$1,048.7</td>
<td>4%</td>
<td>2.6%</td>
</tr>
<tr>
<td>LaSalle</td>
<td>Office</td>
<td>$837.9</td>
<td>3%</td>
<td>4.2%</td>
</tr>
<tr>
<td>JP Morgan</td>
<td>Office</td>
<td>$708.3</td>
<td>3%</td>
<td>11.3%</td>
</tr>
<tr>
<td>Invesco</td>
<td>Land</td>
<td>$638.8</td>
<td>2%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Beacon Capital</td>
<td>Office</td>
<td>$619.6</td>
<td>2%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Lone Star</td>
<td>Debt</td>
<td>$379.5</td>
<td>1%</td>
<td>11.8%</td>
</tr>
</tbody>
</table>

Subtotal/Weighted Average: $22,615.4 80% 7.8%

Fund Total (including Legacy assets): $28,324.1 N/A 5.6%

Fund Total (excluding Legacy assets): $26,307.7 N/A N/A

**SOURCE:** State Street
The information contained in this report is confidential, may be legally privileged, and is intended only for the use of the CalSTRS.
APPENDIX: KEY REAL-ESTATE MARKET TRENDS
REAL-ESTATE MARKET TRENDS SUMMARY

► RCLCO continues to assume that we are in the “late stable” stage of the market cycle for most property types and geographies, which should endure throughout 2018 and potentially 2019/2020.

► Pricing is well above peak values, especially for multifamily and CBD office, while construction activity has been declining for all product types with the exception of industrial.

► Though rising interest rates are an imminent threat that should likely dampen pricing, we believe the impacts may be modest over the immediate future. We expect cap rates to remain flat or grow modestly over the near term for the following two primary reasons:

  » Although the spread between average cap rates and the 10-Year U.S. Treasury recently dipped below the long-term historical average as of Q2 2018 for the first time in the current economic cycle, history suggests that this spread can become narrower in the late cycle.

  » Despite rising interest rates, we continue to see unprecedented amounts of capital searching for real estate investments. Dry powder for real estate investment has reached historic highs while fundraising both nationally and internationally continues at levels well above historical averages. Additionally, transaction volume remains strong, having increased by 5.3% YoY through Q2 2018. Lastly, although lending standards continue to tighten, debt flows remain high. Such high capital flows, likely a result of expectations of an extended cycle due to the recent tax cuts and fiscal stimulus, should presumably keep real estate valuations afloat.

► Cap rate spreads among markets and product types have been expanding well beyond historical averages. Historically, spreads for geographies and product types have ranged from 50-100 basis points, and are now three times wider today. This suggests that effective market and product type selection, in combination with efficient operations, will have a greater impact on returns compared to past periods when cap rates were much more homogenous.

► Global capital flows totaled $873 billion in 2017, down slightly from a peak of nearly $980 billion in 2015, but on par with transaction volume in 2016. Meanwhile, pricing for commercial real estate worldwide continues to expand as RCA’s Global CPPI (price index) has increased by 8.4% from Q1 2017 to Q1 2018. This pace of annual growth is down slightly from the last few quarters, however, as several markets worldwide have posted flat or modest declines in Q1 2018. As appreciation has begun to slow after several years of double-digit expansion in many markets globally, international investment should focus on opportunities in markets with strong economic fundamentals driven by job growth.
PRICING LARGELY EXCEEDS PREVIOUS “PEAK”

‘MAJOR MARKETS,’ APARTMENTS, AND CBD OFFICE LEAD THE WAY

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SOURCE: Moody’s; RCA

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CONSTRUCTION CYCLE HAS LARGELY PEAKED
INDUSTRIAL ACTIVITY GROWS AS OTHER CLASSES SLOW DOWN

New Completions (% of Stock)

- **Apartment**
  - Deliveries as % of Stock

- **Retail**
  - Deliveries as % of Stock

- **Office**
  - Deliveries as % of Stock

- **Industrial**
  - Deliveries as % of Stock

**SOURCE:** CoStar, RCLCO
RATE INCREASES LIKELY TO CONTINUE

FLATTENING YIELD CURVE SUGGESTS POTENTIAL RECESSION

Implied 10-Year Treasury Forward

SOURCE: Chatham Financial; U.S. Department of the Treasury; U.S. Federal Reserve

Implied 10-Year Treasury Forward as of 7/16/18.
CAP RATE SPREAD FALLS BELOW HISTORICAL AVERAGE FOR THE FIRST TIME IN THE CURRENT CYCLE

10-Year Treasury Yield and Going-In Cap Rate; Q1 1989 – Q2 2018

Spread Between 10-Year Treasury Yield and Going-In Cap Rate; Q1 1989 – Q2 2018

SOURCE: U.S. Federal Reserve; RERC; RCA
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1 Cumulative private equity cash reserves held to fund future obligations

Source: Preqin
TRANSACTION VOLUME REMAINS STRONG
TRANSACTION VOLUME UP BY 5.3% YOY THROUGH Q2 2018

NOTE: YTD values are through Q2. Only includes transactions valued at $2.5 million or greater.
SOURCE: RCA
OFFSHORE CAPITAL FLOW FLOWS MODERATELY YOY TRANSACTION VOLUME DECREASED BY 6.0% IN Q1 2018

Offshore Capital in United States ($ in Billions)

Source: RCA
BANKS’ REMAIN MODERATELY DISCIPLINED
LENDING STANDARDS REMAIN UNCHANGED FROM Q4’17 TO Q1’18

NOTE: As of Q4 2014, the U.S. Federal Reserve separated this data into three categories (construction / development, nonfarm nonresidential, and multifamily residential), depending on the type of structure for which the loan is intended. For these time periods, the data shown on the graph represents the average of these three categories.

SOURCE: U.S. Federal Reserve

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DESPITE HIGHER STANDARDS, FLOWS REMAIN HIGH
DEBT FLOWS LED BY COMMERCIAL BANKS AND GSEs


- CMBS
- Unsecured REIT Debt
- Commercial Banks/Savings
- Life Insurance Companies
- Pension Funds
- Other
- GSEs

SOURCE: U.S. Federal Reserve
INCREASE IN CMBS ISSUANCES IN Q1 2018
CMBS ISSUANCES GROW 55% BETWEEN Q1‘17 AND Q1‘18

US Annual CMBS Issuances; Q1 2000 – Q1 2018

SOURCE: Commercial Real Estate Finance Council
CAP RATE SPREADS AMONG MARKETS WIDEN
INVESTORS HAVE CHANGED THEIR VALUATION ASSUMPTIONS

Source: PwC Real Estate Investor Survey; RCA

Cap Rates by Metro; Q1 2002 – Q1 2018

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SPREADS AMONG PROPERTY TYPES WIDEN
ONLY WAREHOUSE CAP RATES CONTINUE TO COMPRESS

Cap Rates by Property Type; Q1 1990 – Q1 2018

Source: RERC; RCA

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INTERNATIONAL
GLOBAL MARKETS TRENDS

- Global capital flows totaled $873 billion in 2017, down slightly from a peak of nearly $980 billion in 2015, but on par with transaction volume in 2016. Increases in investment activity in Asia and Europe were offset by a decline in volume in the United States.

- Pricing for commercial real estate worldwide continues to expand as RCA’s Global CPPI (price index) has increased by 8.4% from Q1 2017 to Q1 2018. This pace of annual growth is down slightly from the last few quarters, however, as several markets worldwide have posted flat or modest declines in Q1 2018.

- As appreciation has begun to slow after several years of double-digit expansion in many markets globally, international investment should focus on opportunities in markets with strong economic fundamentals driven by job growth.

- Historical and forecasted GDP growth and population growth are provided below for the 10 largest countries by GDP in Asia-Pacific and the European Union. Within Asia-Pacific, India, China, and Indonesia are expected to witness the strongest economic and population growth over the next five years. Most markets in the European Union are expected to exhibit strong economic growth moving forward; however, Germany and Poland stand out for experiencing strong GDP over the past five years while Sweden has experienced impressive population growth.

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</thead>
<tbody>
<tr>
<td>China</td>
<td>$12,014.6</td>
<td>7.0%</td>
<td>8.9%</td>
<td>1,390.1</td>
<td>0.5%</td>
<td>0.3%</td>
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<tr>
<td>Japan</td>
<td>$4,872.1</td>
<td>-4.7%</td>
<td>2.9%</td>
<td>126.7</td>
<td>-0.1%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>India</td>
<td>$2,611.0</td>
<td>7.4%</td>
<td>10.4%</td>
<td>1,316.9</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>South Korea</td>
<td>$1,538.0</td>
<td>4.7%</td>
<td>4.9%</td>
<td>51.5</td>
<td>0.5%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Australia</td>
<td>$1,379.5</td>
<td>-2.5%</td>
<td>5.5%</td>
<td>25.1</td>
<td>1.5%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>$1,015.4</td>
<td>2.0%</td>
<td>7.6%</td>
<td>262.0</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>$579.3</td>
<td>3.2%</td>
<td>1.5%</td>
<td>23.6</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Thailand</td>
<td>$455.4</td>
<td>2.8%</td>
<td>6.1%</td>
<td>69.1</td>
<td>0.3%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Iran</td>
<td>$431.9</td>
<td>2.1%</td>
<td>2.4%</td>
<td>81.4</td>
<td>1.4%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>$341.7</td>
<td>5.4%</td>
<td>6.1%</td>
<td>7.4</td>
<td>0.7%</td>
<td>0.7%</td>
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</tbody>
</table>

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</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>$3,684.8</td>
<td>0.8%</td>
<td>4.6%</td>
<td>82.7</td>
<td>0.6%</td>
<td>0.0%</td>
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<tr>
<td>United Kingdom</td>
<td>$2,624.5</td>
<td>-0.3%</td>
<td>3.4%</td>
<td>66.1</td>
<td>0.7%</td>
<td>0.5%</td>
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<tr>
<td>France</td>
<td>$2,583.6</td>
<td>-0.8%</td>
<td>4.2%</td>
<td>64.8</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Italy</td>
<td>$1,937.9</td>
<td>-1.3%</td>
<td>3.2%</td>
<td>60.6</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Spain</td>
<td>$1,314.0</td>
<td>-0.3%</td>
<td>4.5%</td>
<td>46.3</td>
<td>-0.2%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>$825.7</td>
<td>-0.1%</td>
<td>4.3%</td>
<td>17.1</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Sweden</td>
<td>$538.6</td>
<td>-0.2%</td>
<td>4.4%</td>
<td>10.1</td>
<td>1.2%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Poland</td>
<td>$524.9</td>
<td>0.9%</td>
<td>5.2%</td>
<td>38.0</td>
<td>0.0%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Belgium</td>
<td>$494.7</td>
<td>-0.1%</td>
<td>4.1%</td>
<td>11.4</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Austria</td>
<td>$416.8</td>
<td>0.3%</td>
<td>4.5%</td>
<td>8.8</td>
<td>0.9%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

SOURCE: PwC; RCA; IMF
DISCLAIMERS

CRITICAL ASSUMPTIONS

Our analysis depends on the correctness and completeness of data available as of the date of this memo. The future performance of the global, national, and local economy and real estate market, and other factors similarly outside our control may vary. Given the fluid and dynamic nature of the economy and real estate markets, as well as the uncertainty surrounding particularly the near-term future, it is critical to monitor the economy and markets continuously. Stable and moderate growth patterns are historically not sustainable over extended periods of time; the economy is cyclical; and real estate markets are typically highly sensitive to business cycles. Further, it is very difficult to predict when an economic and real estate upturn will end.

Our analysis cannot predict unusual economic shocks on the national and/or local economy, potential benefits from major "booms" that may occur, or the residual impact on the real estate market and the competitive environment of such a shock or boom. Also, it is important to note that it is difficult to predict changing consumer and market psychology.

As such, we recommend the close monitoring of the economy and the marketplace, and updating this analysis as appropriate.

GENERAL LIMITING CONDITIONS

Reasonable efforts have been made to ensure that the data contained in this study reflect accurate and timely information and are believed to be reliable and comprehensive. This study is based on estimates, assumptions, and other information developed by RCLCO Fund Advisors from its independent research effort and general knowledge of the industry. No responsibility is assumed for inaccuracies in reporting by any data source used in preparing or presenting this study. This memo is based on information that to our knowledge was current as of the date of this memo, and RCLCO Fund Advisors has not undertaken any update of its research effort since such date.