2021
Annual Investment Plan
For the Year Ended June 30, 2021
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Executive Summary
The Board’s Statement of Investment Policy (SIP) requires the Chief Investment Officer prepare and present to the Board for its approval an Annual Investment Plan (Plan). The following document outlines the recommended Plan for Fiscal Year (FY) 2021.

As in prior years, the Plan reviews the economic environment based upon consensus reports from leading sources, SERS’ asset allocation target and long-term performance objective for each portfolio, last year’s objectives and accomplishments, a review of the market conditions over the last year and objectives for FY2021. Implementation Guidelines for each asset class portfolio are included to provide further details on how each portfolio will be managed in the coming year relative to portfolio construction parameters and risk limits. This Plan is meant to be a living document subject to adjustment during the year. If circumstances change or opportunities arise during the year, items will be discussed with the Board which may lead to intra-year changes to the Plan or Strategy Statements.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION

The general objectives of the Investment Department for FY2020 were as follows:

- **Our major strategic goals remain unchanged. The focus will continue to be on value added performance, risk management, cost effectiveness and maintenance of an investment program that meets or exceeds investment objectives over the long-term.**

  Staff added an opportunistic High Yield portfolio within the Global Fixed Income structure. The intent was to start with a nominal allocation and increase the funding as high yield spreads widened, as they normally do in times of market stress, to predetermined levels. During the March/April period spreads widened to hit those targets and the portfolio was funded accordingly.

  Staff also approved commitments to new stressed/distressed credit opportunities to take advantage of market dislocations due to the COVID-19 pandemic.

- **Conduct Asset/Liability study with the Board, facilitate approval of a new asset allocation framework and targets in collaboration with the Investment Consultant and Actuaries.**

  The Asset/Liability study process began in September 2019 with a presentation to the Board on expected returns for the various asset classes and other inputs for modeling. In subsequent months, Staff and Wilshire presented various asset allocation scenarios including the consideration of Global Private Credit as a new asset class and eliminating the allocation to the MAS (Hedge Funds) portfolio. The Board approved Staff’s recommended Asset Allocation in February, 2020. The new allocation is effective July 1, 2020.

- **Continue to develop and engage the Investment team.**

  The Investment team is well aligned in terms of goals, focus, processes and collaboration. The Investment Committee process is working well and decisions are contributing to positive performance. Two new Staff members were hired in February, 2020 to fill vacancies.

FY2021 OBJECTIVES

- **Our major strategic goals remain unchanged. The focus will continue to be on value added performance, risk management, cost effectiveness and maintenance of an investment program that meets or exceeds investment objectives over the long-term.**

- **Implement the new asset allocation framework and targets approved by the Board in FY2020.**

- **Conduct a search for a General Investment Consultant as the current agreement will expire June 30, 2021.**

- **Continue to research and invest in opportunities arising from the economic impact of the COVID-19 pandemic.**

- **Explore and implement leverage strategy of the Total Fund not exceeding 5% consistent with the Statement of Investment Policy and Leverage Policy.**

- **Continue to develop and engage the Investment team.**
EXECUTIVE SUMMARY

CONCLUSION
Staff has been shifting the fund allocations to a more defensive position beginning in early 2019. Equity allocation was reduced and Fixed Income allocation were increased. After a steep decline in March equity markets rebounded somewhat in April, but the path to economic recovery appears uncertain. The bias is to be defensive in the short term until there is clarity about the pickup in economic activity following the gradual opening announced in May. However, staff has already been making new commitments to investments arising from the dislocations in the credit markets.

Staff appreciates the support and guidance received from the Board in FY2020 and looks forward to working with the Board in FY2021 for another successful year.

ACKNOWLEDGEMENTS
SERS is very fortunate to have an experienced and deep Investment Staff. The following individuals contributed to this report.

- Economic Outlook – Farouki Majeed and Hai Yen Le
- Global Equities – Judi Masri and Dustin Matthiessen
- Global Private Equity – Steve Price and Phil Sisson
- Multi Asset Strategies – Judi Masri and Jason Naber
- Global Fixed Income – Jason Naber
- Global Private Credit – Adam Messerschmitt
- Global Real Assets – Nancy Turner and Michael Browning
- Cash Equivalents – Jason Naber
- Opportunistic and Tactical – Farouki Majeed, Phil Sisson, Nancy Turner and Michael Browning
- Overlay Program – Farouki Majeed, Hai Yen Le and Nancy Turner
- Investment Risk Management and Analytics – Hai Yen Le and Michael Browning
- Investment Operations – Terri Martin and Katie Swank

We would appreciate the opportunity to review the Annual Investment Plan with you at the June 2020 Board meeting. If you have any questions or comments before then, please let me know.

Respectfully submitted,

Farouki A. Majeed
Chief Investment Officer
Global Economic Outlook
The global economy performed below par in 2019 at a growth rate of 2.9% while US GDP grew modestly at 2.3%. Economic growth accelerated in the second half of 2019 as trade tensions eased, global trade improved and the Federal Reserve (Fed) as well as other central banks shifted to more accommodative monetary policy. Entering 2020, the global economic outlook was positive with all indicators (PMI) showing upward trends. However, this picture was unexpectedly disrupted by the COVID-19 global pandemic in February as countries around the world including the US adopted containment measures which effectively shuttered economic activity. US unemployment claims reached 30 million by the end of April indicating an unemployment rate of around 18% which is unprecedented since the Great Depression of the 1930s. The US Fed has taken various measures to inject liquidity into the financial system including the purchase of treasuries and mortgage securities, vastly expanding the Fed’s balance sheet. The US Government has also stepped in with fiscal packages totaling $3.0 trillion to protect payrolls, expand unemployment benefits and provide funds to small businesses. These extensive measures may cushion the impact of the economic decline by filling some part of the income shortfall but the path of economic recovery remains uncertain and will cause markets to be volatile well into 2021. Equity markets fell sharply from the mid-February highs resulting in a 20% drawdown for 1Q and have since trended up in April. The US 10 year yield has compressed to 0.6% from 2.0% at the end of 2019 and 3.0% in 2018. Credit markets show a high level of stress with spreads widening to a scale not seen since the financial crisis of 2008. US consumer sentiment has fallen from 101.0 in February to 71.8 in April.

The emergency fiscal spending undertaken by the US government will lead to a spike in deficits and add to the already high level of debt. While current conditions are deflationary, the increase in deficits and debt may cause inflation in the future and debase the value of the US dollar.

Economic forecasts from the Blue Chip Consensus (US) and the International Monetary Fund (IMF) are presented below:

**US Economy:**
The Blue Chip consensus economic forecast (April 2020) expects the US to be in a deep recession in the first half of 2020 with a projected GDP annualized growth rate of -3.8% in Q1 and -24.5% in Q2. Then, GDP is expected to recover to 7.4% in Q3 and 7.9% in Q4. Overall the US economy is expected to shrink 4.1% in 2020. The actual GDP for Q1 was -4.8%, higher than expected. The consensus expectation is for positive GDP growth of 3.8% in 2021. The US economic crisis has been strongly supported by highly accommodative monetary policy from the Fed, and a large, broad-based fiscal stimulus package from the government. The Fed aggressively cut the federal funds short-term interest rate to 0.25% from 1.75% in a single stroke and has also engaged in quantitative easing measures.

According to the Blue Chip Economic forecasts, labor markets are expected to deteriorate steeply as the unemployment rate is expected to jump up to 8.8% in 2020 then slightly ease to 7.2% in 2021 (Table 1). Inflation is expected to decline to 0.9% in 2020 and rebound in 2021 to 1.7% closer to the Fed’s target of 2.0%. The yield on 10-year US Treasuries is expected to fall an average of 1.0% in 2020 and marginally increase to 1.2% in 2021. Corporate profit growth rate is expected to plunge to -14.6% in 2020 and bounce back to 14.0 in 2021.

Table 1

<table>
<thead>
<tr>
<th>Period</th>
<th>Unemployment Rate</th>
<th>Inflation Rate CPI</th>
<th>T-Bill 3-Mo.</th>
<th>T-Note 10-Yr.</th>
<th>Corporate Profits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>4.9</td>
<td>1.3</td>
<td>0.3</td>
<td>1.8</td>
<td>(0.4)</td>
</tr>
<tr>
<td>2017</td>
<td>4.3</td>
<td>2.1</td>
<td>0.9</td>
<td>2.3</td>
<td>(3.0)</td>
</tr>
<tr>
<td>2018</td>
<td>3.9</td>
<td>2.4</td>
<td>2.0</td>
<td>2.9</td>
<td>3.4</td>
</tr>
<tr>
<td>2019</td>
<td>3.7</td>
<td>1.8</td>
<td>2.1</td>
<td>2.1</td>
<td>0.0</td>
</tr>
<tr>
<td>2020 Consensus Forecast</td>
<td>8.8</td>
<td>0.9</td>
<td>0.3</td>
<td>1.0</td>
<td>-14.6</td>
</tr>
<tr>
<td>2021 Consensus Forecast</td>
<td>7.2</td>
<td>1.7</td>
<td>0.3</td>
<td>1.2</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Source: Blue Chip Economic Indicators, April 2020
GLOBAL ECONOMIC OUTLOOK

World Economy:
Global GDP is projected by the IMF to sharply contract by 3.0% in 2020 (Table 2). The US economy is projected to shrink by 5.9%. The emerging and developing economies are projected to steer the pandemic better than the advanced economies as the former are expected to contract by 1% while the latter by 6.1%. China and India, which are included in the emerging and developing group, are projected to grow at 1.2% and 1.9%, respectively, in 2020. Nevertheless, the global economy is expected to recover strongly in 2021 by 5.8%, which is twice as fast as the 2019 growth rate. The US growth rate in 2021 is projected at 4.7%, the same rate as the Euro area. The emerging and developing economies are expected to recover at a rate of 6.6% in 2021.

Table 2

<table>
<thead>
<tr>
<th>Annual GDP Growth</th>
<th>2019 (estimated)</th>
<th>2020 (projected)</th>
<th>2021 (projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>2.9</td>
<td>(3.0)</td>
<td>5.8</td>
</tr>
<tr>
<td>US</td>
<td>2.3</td>
<td>(5.9)</td>
<td>4.7</td>
</tr>
<tr>
<td>Advanced Economies (including US)</td>
<td>1.7</td>
<td>(6.1)</td>
<td>4.5</td>
</tr>
<tr>
<td>Emerging and Developing Economies</td>
<td>3.7</td>
<td>(1.0)</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Source: International Monetary Fund World Economic Outlook, April 2020
Portfolio Strategy
PORTFOLIO STRATEGY - Global Equities

INVESTMENT STRATEGY
SERS invests in equity securities to earn a premium over government treasury bonds, which is compensation for assuming the relatively higher risk inherent in public equity securities. Global equities add diversification, liquidity and inflation protection to the SERS portfolio.

SERS’ Statement of Investment Policy sets the Global Equities target allocation as follows:

<table>
<thead>
<tr>
<th></th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Equities</td>
<td>45%</td>
<td>35% - 55%</td>
</tr>
</tbody>
</table>

The allocation within Global Equities is as follows (as percentage of Total Fund):

<table>
<thead>
<tr>
<th></th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Equity Portfolio</td>
<td>22.5%</td>
<td>15% - 30%</td>
</tr>
<tr>
<td>Non-US Equity Portfolio</td>
<td>22.5%</td>
<td>15% - 30%</td>
</tr>
</tbody>
</table>

The performance objectives of the Global Equities portfolio are as follows:

- **US Equities**: Exceed the return on the Russell 3000 Index, net of manager fees. The target excess return is 20 basis points over three-year rolling periods.

- **Non-US Equities**: Exceed the return on the MSCI All Country World Free, excluding the United States Index (net of dividends reinvested), net of manager fees. The target excess return is 50 basis points over three-year rolling periods.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
FY2020 Annual Investment Plan objectives and related activities are as follows:

- **Address underperformance in US Equity by increasing the Portfolio’s passive allocation and investigating alternative sources of alpha.**

  Five active large cap mandates were terminated in calendar year 2019, moving these allocations to low cost passive management. This increased our US Equity portfolio’s passive allocation to 68%, split between two accounts: a Russell 1000 account and a Russell 1000 Growth account. The Russell 1000 Growth account is new, allowing SERS to obtain crucial large cap growth exposure that our active managers were not successfully obtaining. FY2020 US Equity net excess returns through March are now a positive 102 basis points over the benchmark with an average management fee of 14 basis points FYTD.

- **Evaluate proper allocation between active and passive in Non-US portfolio and ensure Portfolio is positioned to generate alpha in line with expectations.**

  The Non-US Equity passive allocation was reduced from 30% to 28% during the Fall of 2019 after funding two new active managers. The Non-US Equity passive allocation is appropriately lower than our US Equity passive allocation as SERS Non-US Equity managers have historically produced excess returns over the benchmark. However, the passive allocation helps reduce management fees, provides extra liquidity and reduces risk. Thus, the passive Non-US Equity allocation may be slowly reduced to 25%, but will continue to fulfill an important role in Non-US Equity portfolio management due to lower management fees, liquidity and risk reduction versus active managers.

- **Regularly evaluate and rebalance the Global Equity Portfolio to ensure that country exposure, management mix, capitalization weight, and style orientation is appropriate and make recommendations as necessary.**

  Both the US and Non-US Equity portfolios remained nearly neutral in all primary characteristics over the last year. After the switch to more passive, the US portfolio slightly tilted to a large cap growth bias, overweighing technology. This bias was very helpful to returns in the second half of 2019 as large growth companies returned 36.39% in 2019, the highest equity market return for the calendar year. Even though the US portfolio has a beta of 1.0, many of our remaining active managers provide downside protection, which has provided good excess return during the 1st quarter of 2020.
PORTFOLIO STRATEGY - Global Equities

The Non-US Equity’s portfolio’s main tilt is to small cap, which has helped longer-term net excess returns, despite a shorter term headwind to performance. The portfolio has a slight value bias, although SERS is overweighted technology, which helped 2019 calendar year returns. Finally, our slight underweight to emerging markets has been helpful as developed market returns continue to outpace emerging market returns.

- Review Investment Manager Agreements (IMAs) and Investment Guidelines on the review schedule and make necessary adjustments as needed.

The passive IMA was fully renegotiated, adding our new Russell 1000 Growth account. An addition, amendments were added to a US small cap manager and a Non-US emerging market manager.

CURRENT MARKET CONDITIONS AND OUTLOOK

<table>
<thead>
<tr>
<th>Cumulative Periods through March 31, 2020</th>
<th>1 Year</th>
<th>3 Year</th>
<th>5 Year</th>
<th>10 Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>FyTD</td>
<td>FYTD</td>
<td>4.00</td>
<td>5.77</td>
<td>10.15</td>
</tr>
<tr>
<td>Russell - 3000 Index</td>
<td>12.70</td>
<td>9.13</td>
<td>4.00</td>
<td>5.77</td>
</tr>
<tr>
<td>Russell - 3000 Growth Index</td>
<td>4.73</td>
<td>0.44</td>
<td>10.54</td>
<td>9.74</td>
</tr>
<tr>
<td>Russell - 3000 Value Index</td>
<td>20.93</td>
<td>18.02</td>
<td>2.67</td>
<td>1.62</td>
</tr>
<tr>
<td>Russell - 1000 Index</td>
<td>11.77</td>
<td>8.03</td>
<td>4.64</td>
<td>6.22</td>
</tr>
<tr>
<td>Russell - 2000 Index</td>
<td>25.55</td>
<td>23.99</td>
<td>4.64</td>
<td>0.25</td>
</tr>
<tr>
<td>MSCI - AC World Index ($Net)</td>
<td>14.35</td>
<td>11.26</td>
<td>1.50</td>
<td>2.85</td>
</tr>
<tr>
<td>MSCI - AC World Ex-USA Index ($Net)</td>
<td>18.02</td>
<td>15.57</td>
<td>1.96</td>
<td>0.64</td>
</tr>
<tr>
<td>MSCI - World Ex USA Index ($Net)</td>
<td>18.00</td>
<td>14.89</td>
<td>2.07</td>
<td>0.76</td>
</tr>
<tr>
<td>MSCI - Emerging Markets Index ($Net)</td>
<td>18.18</td>
<td>17.69</td>
<td>1.62</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Source: Wilshire Compass


The broad US equity market outperformed international developed and emerging markets in 2019. Strong US market returns were helped by a 2018 market valuation rebound, good profit margins and the Federal Reserve lowering interest rates three times in 2019. The Russell 3000 Index which captures both large and small capitalization stocks, returned 31.02% in 2019, the best return since 2013. Large cap stocks finished the year up 31.43% (Russell 1000 Index), while small cap stocks (Russell 2000 Index) posted a 25.53% return. Continuing a theme from previous years, growth stocks outperformed value stocks in 2019 by 9.59% with the Russell 3000 Growth Index posting a 35.85% return. The best two returning sectors were technology (up 46.73%) and financials (up 32.93%) while energy (up 9.63%) posted the lowest return in US markets.

Although lower than US equity markets, Non-US markets also posted strong returns in 2019 with developed markets returning 22.49% while emerging markets returned 18.42%. Just like in the US, Non-US equity markets were led by large cap growth stocks with growth posting a 27.34% return versus 15.71% for value. Again, the technology sector (up 41.38%) led the way with communications (up 12.81%) and energy (up 15.74%) posting the lowest returns in Non-US equity.

Non-US markets began their decline in January 2020 with the coronavirus outbreak in China whereas US markets posted new highs in February. That changed with the news of the virus spreading throughout Asia, then to Europe, and finally to the United States in late February. The global equity market sell-off worsened in March due to COVID-19 spreading along with a technical sell-off from levered funds being force to sell liquid assets to meet increasing margin calls. The broad US market declined (20.90%), Non-US developed markets...
PORTFOLIO STRATEGY - Global Equities

fell (23.26%) and emerging equities dropped (23.60%) during the first quarter of 2020. Large growth stocks still outperformed value so far in this market decline with the S&P 500 technology sector only declining (11.9%) while energy dropped (50.5%).

Faced with a global pandemic, the global equity market outlook remains uncertain. The world is undoubtedly in a global recession. Analysts are predicting second quarter 2020 GDP to decline anywhere from (9%) to (40%). This uncertainty is compounded as this is the first recession ever caused by a government decree from many world governments, shutting all non-essential business and much consumer activity. On the positive side, the world looks to China whose PMI began a slight rebound in March as business very slowly returned. The world economy was growing and the US consumer was strong pre-virus, so this pent up demand may rebound if COVID-19 can be controlled soon. Many world governments have also implemented rapid and large scope fiscal and monetary policy measures. On the negative side, globalization may never be the same. Companies may add redundancy processes and determine that global supply chains and just-in-time inventory is too risky, adding extra costs for onshore production. Governments may continue travel restrictions and leisure and business travel may never be the same. Oil’s 67% decline this year along with a strong US dollar may hurt emerging markets for some time, just as they were rebounding. SERS’ equity portfolio may face a difficult calendar year 2020, even as our active managers implement capital preservation strategies.

PORTFOLIO STRUCTURE
At the beginning of SERS’ fiscal year, the US portfolio was approximately 2.0% over the policy target, which was kept throughout the fiscal year due to strong US equity returns versus Non-US equity and other asset classes. The Non-US portfolio was kept slightly below its 22.5% policy target for the fiscal year due to better US equity absolute returns. Both portfolios remained nearly neutral versus their benchmarks in regards to size, style, and in the Non-US, geography. A structural overweight to small cap remains in Non-US, though this is less pronounced than in years past. Staff expects to keep the passive allocation near 70% in the US portfolio as active US large cap management net excess performance is difficult to find, particularly in US large cap growth. Non-US passive management will be 25-30% as active management has historically been successful in this portfolio. Both portfolios will continue to be monitored for performance, especially for capital preservation if market drawdowns continue.

FY2021 OBJECTIVES
Staff will focus on the following objectives during FY2021:

• Monitor the portfolio for possible performance enhancement given FY2020 portfolio changes of US active large cap terminations and Non-US equity active manager additions. Compare SERS active managers to peers and conduct any manager searches, if appropriate.

• Ensure the global equity portfolio has appropriate risk and return characteristics given the current equity market decline and volatility pickup.

• Regularly evaluate and rebalance the Global Equity Portfolio to ensure that country exposure, management mix, capitalization weight, and style orientation is appropriate and make recommendations as necessary.

• Review IMAs and Investment Guidelines on the review schedule and make necessary adjustments as needed.
INVESTMENT STRATEGY
SERS invests in private equity to provide risk adjusted returns in excess of those provided by publicly traded equities.

SERS’ Statement of Investment Policy sets the Private Equity target allocation as follows:

<table>
<thead>
<tr>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Private Equity</td>
<td>11%</td>
</tr>
</tbody>
</table>

The performance objective for private equity is to provide returns in excess of the Burgiss All Private Equity Benchmark.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- **Manage the private equity portfolio and fiscal year commitments to reflect the investment bias of actively overweighting private equity relative to its target of 10% of the Total Fund, subject to identifying opportunities that meet SERS’ investment criteria.**

  Staff has been actively working toward this goal and to date nearly $350 million has been committed to eight private equity investment opportunities. This exceeds the typical investment pacing of $150 million to $250 million in private equity commitments per fiscal year that has been the target since the allocation was increased to 10% of the total fund.

- **Review the private equity portfolio strategy and structure and develop a plan to improve risk and return characteristics of the portfolio, achieve fee reductions and optimize manager counts as appropriate.**

  To date seven commitments have been made to private equity funds with an average management fee of 1.6%. Additionally, one commitment has been made to a co-investment that has no management fees or carried interest. Together the average management fees for all fiscal year 2020 commitments is 1.4%. These private equity commitments are diversified by investment strategy, sector focus and geography.

- **Actively seek co-investment opportunities where appropriate with current SERS’ private equity general partners who meet co-investment criteria, as outlined in the private equity co-investment guidelines.**

  Staff reviewed several co-investment opportunities throughout the fiscal year. One opportunity met SERS’ criteria and was funded in October 2019. The private equity portfolio has a total of four co-investments totaling approximately $35 million. The co-investments are in various stages of their lifecycle and are currently generating an IRR of 17% and a 1.6x multiple of invested capital.

- **Research and identify new managers who offer compelling opportunities and return expectations that may replace current managers who no longer meet SERS’ investment criteria.**

  Staff reviewed over 100 investment offerings during fiscal year 2020. One opportunity met the investment criteria and SERS committed $50 million to this new manager in September 2019.

PORTFOLIO COMPOSITION

<table>
<thead>
<tr>
<th>Commitments as of March 31, 2020</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyout</td>
<td>79%</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>2%</td>
</tr>
<tr>
<td>Special Situations</td>
<td>19%</td>
</tr>
<tr>
<td>Domestic</td>
<td>74%</td>
</tr>
<tr>
<td>International</td>
<td>26%</td>
</tr>
</tbody>
</table>
CURRENT MARKET CONDITIONS AND OUTLOOK
Despite growing macroeconomic and political uncertainty across all markets globally, the private equity industry marched on during 2019. Private equity firms continued to invest, exit companies, raise capital and generate solid returns while at the same time navigating the challenges of a high valuation environment that raised the bar for investors looking to create value. Many PE firms took advantage of the higher prices and moved toward the exits before any impending recession. Fund-raising continued to be strong but was skewed by larger firms raising capital. Although returns are still attractive, they continue to come under pressure as the industry matures and competition intensifies. Taking a closer look, the total number of platform companies purchased in 2019 came in at around 3,500 transactions globally totaling approximately $551 billion. Both the value and number of these purchases remained relatively flat from the previous year. The large amount of deal flow is a direct result of the abundance of low-cost debt financing and the estimated $2.5 trillion of dry powder available across all fund types and all geographies at the end of 2019. The intense competition for assets has led to increased purchase price multiples and made it difficult for private equity firms to find and purchase companies. Purchase price multiples have risen from 8.5 times earnings in 2008 to an average of 11.5 times earnings in 2019. Nevertheless, the same factors that complicated deal making paved the way for an excellent exit market for private equity funds in 2019. Exits slowed a bit in 2019 to 1,078 exit transactions valued at $405 billion but was still a solid contributor to the strong six-year stretch of exits that have produced significant levels of distributions for investors. The continued positive momentum for private equity produced an abundant fundraising market and private equity backed funds raised a record $894 billion in 2019. Buyout funds led the way closing on over $361 billion of new commitments, however, this total was aided by the number of large and mega buyout funds raised during the year. The level of investment activity at increased purchase valuations and steady uplift in dry powder once again underscores the importance of identifying and backing high quality private equity managers that remain disciplined in their process, due diligence and selection criteria throughout investment cycles.

Nonetheless, as illustrated in the below table private equity continues to generate solid performance over all periods.

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Performance for Periods Ended March 31, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-Year</td>
</tr>
<tr>
<td>SERS Private Equity</td>
<td>15.56</td>
</tr>
<tr>
<td>Burgiss Benchmark</td>
<td>8.95</td>
</tr>
</tbody>
</table>

Source: Burgiss All Private Equity Index

Although 2019 was a solid year for private equity, moving into 2020 the picture is less clear. In the near term, the industry could be influenced by a wide range of factors that may include the economic effects of a global pandemic, increased valuations, political uncertainty and global trade implications. Although it is too early to tell what impact these issues may have on the private equity market, in general it is expected that fundraising and exit activity will continue to cool in 2020. Additionally, as was mentioned earlier, the recent strength of the private equity market has resulted in increased price expectations for sellers. As a result, private equity firms on average are currently paying more to acquire new portfolio companies. However, private equity firms with finely tuned strategies and repeatable value-creation models will prosper. Top quartile private equity managers find ways to overcome problems, generate returns for their limited partners and earn the capability to raise additional funds.

With this in mind, the outlook for the SERS private equity portfolio is favorable. Current market conditions reflect positively on the style of investing employed by the general partners that make up the core of the SERS private equity portfolio. Quality investments can be identified in the current market; however, finding these companies requires patience, discipline and the ability to fully understand the operations of the target company. The pandemic's impact on private equity remains to be seen. As prices are clearly depressed for target companies, legislation is threatened to limit “vulture” acquisitions. Cash flow pressure from the global shut-down and uncertainty about resumption of pre-pandemic norms will force the re-evaluation of previously sound business plans. Additionally, value can be created in target companies through hands-on, proactive and experienced management teams. SERS’ private equity portfolio is comprised primarily of general partners who have demonstrated their ability to identify, create value and exit companies in all market environments. In an effort to ensure the portfolio is properly positioned for future uncertainty, our goals for the fiscal year include;
PORTFOLIO STRATEGY – Global Private Equity

continuing to identify and invest with operationally focused managers who primarily target the middle market and avoid the competition in the large and mega space, increasing exposure to attractive investments that meet our criteria and offer lower costs through co-investments, and ensuring that we stay on top of market trends and opportunities by continuing to research and seek out managers offering investment strategies that deliver private equity like returns with differentiated and unique strategies. Additionally, as the Total Fund moves into what many believe will be a low return environment we will seek to increase the allocation level of private equity to its new target of 12% in an effort to obtain the benefit of this higher returning assets class to the Total Fund level. This will however take time as private equity is a long-term asset class where manager selection is critical and additional capital takes more time to deploy.

FY2021 OBJECTIVES

Staff will focus on the following objectives during FY2021:

• Manage the private equity portfolio and fiscal year commitments to reflect the increased investment allocation of 12% of the total fund. Seeking to achieve a target of 11% of the Total Fund by the end of fiscal year 2021 and 12% by the end of fiscal year 2022, subject to identifying opportunities that meet SERS’ investment criteria.

• Review the private equity portfolio strategy and structure and develop a plan to improve risk and return characteristics of the portfolio, achieve fee reductions and optimize manager counts as appropriate.

• Actively seek co-investment opportunities where appropriate with current SERS’ private equity general partners who meet co-investment criteria, as outlined in the private equity co-investment guidelines.

• Research and identify new managers who offer compelling opportunities and return expectations that may replace current managers who no longer meet SERS’ investment criteria.
INVESTMENT STRATEGY
The role of the Multi-Asset Strategies portfolio (MAS) is to generate consistent returns with managed volatility and beta to global equities, resulting in risk diversification and downside protection to the Total Fund.

SERS’ Statement of Investment Policy sets the Multi-Asset Strategies target allocation as follows:

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Asset Strategies</td>
<td>Interim target of 4% to be reduced to 0% by June 30, 2021</td>
<td>0% – 4%</td>
</tr>
</tbody>
</table>

The performance benchmark for the MAS portfolio is the HFRI Fund of Funds Composite Index plus 1% annually, calculated on a time-weighted basis.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- Actively manage the strategy and portfolio allocations, ensuring appropriate risk and return characteristics. Actively seek to improve risk-adjusted returns and fee efficiency by making allocation adjustments, including new strategies and terminations, between managers and sectors.

During FY2020, four manager terminations were completed along with two new hires. Several manager and sector rebalancings also occurred. Even with Staff attempts to restructure the portfolio, MAS underperformed its benchmark FYTD through February 2020 by (1.35%) with negative excess return through five years.

- Continue to evaluate the passive hedge fund replication strategy for appropriate performance and risk tracking.

The passive hedge fund replication strategy had a net excess return of 36 basis points versus its benchmark since its February 2019 inception through February 2020. Staff has contributed a net $10 million to the strategy during FY2020 due to its successful outperformance and low fee structure.

- Complete FY2019 manager searches for relative value and tactical trading managers, improving performance and balancing sector underweights.

The new relative value mandate was funded in December 2019 with an initial $20 million subscription. The performance through February 2020 was an excess net return of 21 bps over the benchmark. The fund’s 75 bps management fee and 20% over 3-month LIBOR hurdle performance fee is much lower than the MAS portfolio average. The new tactical trading mandate was funded in November 2019 with an initial $20 million subscription. The inception date through February 2020 performance was an excess net return of 21 bps over the benchmark and this mandate has a 90bps management fee with no performance fee, which is also lower than the portfolio average. Both of these mandates are being considered for transfer into the Global Fixed Income portfolio in FY2021 as complements to the existing strategies in that portfolio.

- Evaluate different fund structures with longer lock ups that offer reduced fees and/or appropriate hurdle rates that can capitalize on developing market opportunities and enhance returns.

Although our last few hires have had reduced fees and/or performance hurdles rates, no additional different fee structures were negotiated with current managers as the MAS portfolio is being liquidated according to the new asset allocation approved in February 2020.

CURRENT MARKET CONDITIONS, OUTLOOK AND PORTFOLIO STRUCTURE
The MAS asset allocation was eliminated at the February 2020 Board meeting with an effective date of July 1, 2020. Since most of the current 10% MAS allocation is being redirected to private asset classes that take time to implement, an interim asset allocation of 4% will remain for MAS through FY2021. Given that MAS is in liquidation and hedge funds are strategies, not a stand-alone asset class, current market conditions and outlook
are covered in the relevant asset class write-up. The MAS portfolio structure going forward will be comprised of two fund types. First, MAS will contain highly liquid strategies that will be redeemed as cash needs occur in other asset classes. Second, MAS will contain funds with quarterly or longer redemption terms that will be redeemed throughout FY2021 as MAS liquidity becomes available. Staff plans to transfer several high conviction managers in the portfolio to the Global Fixed Income, Private Credit and Opportunistic portfolios on July 1, 2020.

**FY2021 OBJECTIVES**

- Submit the MAS portfolio manager redemptions and transfers to other portfolios reducing the portfolio from its FY2020 10% allocation down to 4% on July 1, 2020. Redemptions will continue in FY2021 as short-term cash needs dictate, with the MAS allocation being completely liquidated by June 30, 2021.

- Monitor the portfolio to ensure appropriate risk and return during the redemption phase.
PORTFOLIO STRATEGY - Global Fixed Income

INVESTMENT STRATEGY
SERS invests in fixed income assets for the primary purpose of risk diversification and decreasing the overall risk of the investment plan. Fixed income assets may include sovereign debt securities, global corporates, securitized securities, private placements, convertibles, derivatives and currency.

SERS’ Statement of Investment Policy sets the Fixed Income target allocation as follows:

<table>
<thead>
<tr>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Fixed Income</td>
<td>19%</td>
</tr>
</tbody>
</table>

The performance objective for the fixed income portfolio is to exceed the Bloomberg Barclays Capital US Aggregate Bond Index, net of manager fees, by 50 basis points over rolling three-year periods.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- **Ensure the fixed income portfolio has appropriate risk and return characteristics given that spreads are near ten-year historical tights and volatility is expected to rise.**

Due to the impacts of the coronavirus in Q1 2020, the portfolio underperformed the Bloomberg Barclays US Aggregate by (2.79%) through March 2020 of the current fiscal year. This significant underperformance also led to negative excess returns for three and five years of (0.67%) and (0.09%), respectively. The allocations to emerging market debt and high yield were the most significant detractors due to their higher sensitivity to slowing economic growth. The annualized three-year tracking error in March 2020 rose to 1.7% from 0.8% one year ago. The increase in tracking error was due to portfolio over-weights to investment grade, high yield, structured credit and emerging market debt that all diverged significantly in performance relative to the higher US Treasury exposure of the benchmark.

- **Tactically manage core and core plus allocations to enhance risk and return. Staff has already added to core assets and may continue to add to core due to expected late cycle environment volatility.**

The following allocation changes were implemented:

- In October 2019, $100 million was contributed from short-term cash. The contributions were split $65 million to core and $35 million to core plus.

- In February 2020, $10 million was contributed to the new high yield dislocation strategy from cash.

- In March 2020, $155 million in withdrawals were transferred to short-term cash with $60 million from core and $95 million from core plus. In addition, $53 million was added from cash to the high yield dislocation strategy in three separate tranches during the month at attractive high yield spread levels.

- In April 2020, $10 million was contributed to a core strategy that focuses on structured credit opportunities.

During the fall of 2019, Staff continued to increase the core sector from 51% to 52% and decrease the portfolio underweight relative to the target allocation of 19%. The net withdrawals in March 2020 were transferred to short-term cash to fund other opportunities.

- **Review IMAs and Investment Guidelines making necessary adjustments as needed.**

An IMA for the new high yield dislocation strategy was successfully negotiated in Q1 2020. In Q2, 2020, SERS will be updating the portfolio investment guidelines to create a new sub-sector called Tactical and Diversifying to include return seeking and diversifying strategies including emerging market debt, high yield and fixed income arbitrage strategies.
PORTFOLIO STRATEGY - Global Fixed Income

CURRENT MARKET CONDITIONS AND OUTLOOK
The Bloomberg Barclays Capital US Aggregate Bond Index returned 5.68% for FY2020 through March. US Treasuries were the best performing sector posting a 9.92% return as short-term interest rates declined to the lower bound of 0 – 0.25%. The benchmark 10-year US Treasury yield declined from 2.00% in July 2019 to 0.70% as of March 31, 2020. Residential mortgages returned 4.97% during the same period. Investment grade corporate debt returned 0.48%, as spreads widened drastically in February and March 2020 from coronavirus fears. After posting healthy returns during 2019, the coronavirus also hurt riskier fixed income sectors of emerging market debt local currency with a decline of (4.40%) and high yield, which dropped the most (9.21%) for FY2020 through March.

The Fed lowered rates five times during FY2020. Starting in the second half of 2019, the Fed lowered rates by 25 basis points in July 2019, September 2019 and October 2019 to the range of 1.50% - 1.75% to keep economic growth from stalling. The Fed then held rates steady with two meetings late in the year with no interest rate action. Coronavirus changed everything with the Fed holding two March 2020 emergency meetings, cutting rates to the 0% - 0.25% range. The Fed and the US Congress implemented several monetary and fiscal programs to support the economy after the mandated government shut down of non-essential businesses caused unemployment to skyrocket.

Fixed income spreads widened dramatically in March 2020. Investment grade corporates widened from 100 basis points over US Treasuries to 325 basis points while high yield widened from 370 basis points to over 1,000 basis points. Spreads recovered some in April after the Fed announced additional programs for purchasing corporate and agency mortgage securities.

Now that fixed income markets have repriced, managers are deploying cash and government reserves to buy securitized and corporate securities. For the most part, managers began their purchases buying higher quality credit, as opportunities were so plentiful that there was no reason to take on excess credit risk. The portfolio has a slightly short duration stance as rates are at historic low levels. The current yield on the portfolio is 3.07%, which will generate more gains going forward. Although fixed income markets have quickly rebounded from the March lows, managers are cautious about future opportunities as the impacts from the coronavirus may not be clear until the economy restarts and people go back to work. Corporate defaults remain low, but are expected to go higher as the impact to businesses from the extended shutdown becomes clear. The next year in fixed income is expected to more volatile than the last few years, but this should provide opportunities for managers to buy securities at cheaper valuations.

PORTFOLIO STRUCTURE
The fixed income portfolio is currently weighted 53% core, 43% core plus, 2% high yield and 2% EMD with a bias towards income producing assets. The portfolio continues to be underweight government assets and overweight credit sectors to earn more yield than the benchmark. Fixed income strategies that produce more income historically produce more return over the long-term, but short-term performance usually suffers as risk elevates and US Treasuries are favored as safe haven assets.

Over the last two years, Staff has been slowly rotating capital from core plus into core fixed income assets as fixed income markets became expensive and markets often take a downturn at the end of an interest rate hiking cycle. By March 2020, the core allocation had increased from 45% in December 2017 to 53% and the underweight to fixed income had decreased from 5% to 2%, better positioning the portfolio for capital preservation. Going forward, the opportunity set for fixed income assets is rich. Investment grade and high yield spreads continue to offer attractive entry points, the Federal Reserve and US Treasury have implemented programs designed to support fixed income markets and the economy, and interest rates are expected to remain low for an extended period of time. Staff intends to cautiously add capital to core plus strategies in FY2021 while being mindful that the full impacts of the coronavirus may not be known for some time. Several high conviction strategies from the MAS portfolio will be moved into a new sector of the portfolio called Tactical and Diversifying on July 1. This sector is intended to increase portfolio performance and diversify the sources of return by investing in alternative fixed income strategies with higher expected outperformance and tracking error relative to the Bloomberg Barclays US Aggregate Index.
**FY2021 Objectives**

Staff will focus on the following objectives in FY2021:

- Implement the new fixed income guidelines pertaining to the new Tactical and Diversifying sector ensuring the selected strategies are optimally weighted relative to the expected risk and return objectives.

- Ensure the fixed income portfolio has appropriate risk and return characteristics given the new tactical and diversifying sector manager changes and expected negative economic impacts from coronavirus.

- Review IMAs and Investment Guidelines to make any necessary adjustments.
PORTFOLIO STRATEGY – Global Private Credit

INVESTMENT STRATEGY
SERS invests in private credit to provide risk adjusted returns in excess of those provided by publicly traded fixed income securities and to generate a consistent stream of income.

SERS’ Statement of Investment Policy sets the Global Private Credit target allocation as follows:

<table>
<thead>
<tr>
<th></th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Private Credit</td>
<td>3%</td>
<td>3% - 7%</td>
</tr>
</tbody>
</table>

The target for Global Private Credit during the ramp-up period is set at 3% for fiscal year 2021 and will increase to the policy target allocation of 5% for fiscal year 2022. The performance objective for global private credit is to produce net of fee returns in excess of the 3-month LIBOR + 4.5%.

CURRENT MARKET CONDITIONS AND OUTLOOK

The private credit market continued to grow in 2019 and reached $812 billion in assets under management, its highest point since the asset class began to take off post the Global Financial Crisis. Investors continued to seek out higher risk adjusted returns relative to traditional fixed income asset classes in what continued to be a relatively low interest rate environment. The continued momentum of private equity deals helped fuel the need for borrowers to access capital in the private markets. However, the number of private credit fund launches decreased marginally in 2019 as investor sentiment about the potential for an economic slowdown dampened capital commitments. The asset class saw dry powder marginally shrink for the first time since 2014 as fund managers struggled to raise capital faster than they could deploy it. Direct lending continued to be the largest sub asset class within the private credit market, accounting for over half of all private credit funds. The ability to structure deals with an acceptable level of covenants continued to be an attractive aspect of private credit in comparison to the growing number of covenant-lite public fixed income issuances, particularly within the syndicated loan market. The continued growth of the private credit asset class and the amount of capital available to invest will require managers to be more diligent in seeking out quality investments.

The rise of the COVID-19 pandemic in the first quarter of 2020 caused global economies to shut down and increased volatility in markets around the world. Investors became sharply concerned about the ability of companies to service their debt and high yield spreads widened to over 1,000 basis points, the highest since the Global Financial Crisis. The primary origination of debt began to slow, while the secondary market remained active as many existing deals began to trade at lower prices. The economic impact of the pandemic is still uncertain and the number of credit downgrades continues to increase. Nonetheless, opportunities still exist within the private credit market, particularly within stressed and distressed sub asset classes, as well as direct lending. During this time of market dislocation, many companies need liquidity and are looking to private lenders for assistance. Private credit managers are seeing a plethora of borrowing needs in the U.S. and Europe from high quality companies across all sectors, but particularly within those sectors directly impacted by the pandemic.

FY2021 OBJECTIVES

Staff will focus on the following objectives in FY2021:

- Increase the private credit allocation towards 5% of the Total Fund by making new investments that fit the SERS’ investment policy. Target an allocation to private credit of 3% of the Total Fund by the end of fiscal year 2021 and 5% of the Total Fund by the end of fiscal year 2022, subject to identifying opportunities that fit SERS’ investment criteria.

- Build the private credit allocation in line with the implementation guidelines and ensure appropriate risk and return characteristics are present within the new target allocation.

- Make new investments that serve a primary purpose of the private credit allocation to generate consistent income for the Total Fund.
PORTFOLIO STRATEGY - Global Real Assets

INVESTMENT STRATEGY
The role of SERS’ global real assets portfolio is to provide a stable income return from tangible assets, to be a partial inflation hedge over the long term and to provide low correlation to equities.

SERS’ Statement of Investment Policy sets the Global Real Assets target allocation as follows:

<table>
<thead>
<tr>
<th>Global Real Assets</th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16%</td>
<td>14% - 20%</td>
</tr>
</tbody>
</table>

The performance objective for global real assets is to produce net of fee returns in excess of the NCREIF Property Index (“NPI”), one quarter in arrears, over a market cycle, with the income component of the return comprising a significant portion of the total return.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- **Achieve 15% target allocation to Real Assets with the addition of approximately $100 million to new managers.**

  The allocation to Real Assets ranged between 14.5% and 15.0% during FY2020 with $126.5 million in commitments made to two managers during the fiscal year. These commitments were made to strategies including infrastructure debt, which is expected to distribute a yield of approximately 7-8% after the end of the investment period, and traditional infrastructure sectors including transportation, energy, and telecommunications. In February 2020, the target allocation to Real Assets increased to 17%, effective July 1, 2020. A two-year plan will be formulated and implemented to reach and maintain the new allocation.

- **Tactically manage real estate and infrastructure allocations to improve returns without increasing risk. During FY2020, infrastructure will slightly exceed its 20% target allocation while private and public real estate will be slightly below its 80% target allocation.**

  As of December 31, 2019, real estate was 81% of real assets and infrastructure was 19%. Infrastructure has been beneficial to Real Assets in terms of performance, exceeding the benchmark return by 493 basis points and 708 basis points over the one and three year periods respectively.

- **Actively manage real estate property type exposures to ensure proper weights during late stage property market cycle. The current property type exposures will continue into the next fiscal year, with overweights to industrial and specialty property types such as student and senior housing and corresponding underweights to office and retail.**

  Due to changing consumer behaviors around e-commerce, the industrial sector continues to lead all other property sectors while the retail sector continues to suffer. As of December 31 2019, the industrial sector outperformed the benchmark return by 694 basis points and 687 basis points over the one and three year periods. Within Real Assets, the industrial exposure is 11.5% overweight to the benchmark while the retail exposure is 8.5% underweight to the benchmark. Specialty property types remained overweight to the benchmark and included assets such as self-storage and senior housing.

- **Maintain income yield as it will be a significant part of total return going forward.**

  The income return from the Real Assets portfolio is 4.06%, representing nearly half of the total return from Real Assets. Maintaining this yield level is uncertain for the near term and will be harder to maintain given the struggles of many tenants needing rent relief and the possibility of lower income distributions.

CURRENT MARKET CONDITIONS AND OUTLOOK
Returns for real estate properties continued to moderate in 2019 as the current real estate cycle entered its tenth year. SERS’ Real Assets portfolio returned 8.76% net of fees in 2019 versus an NPI return of 6.24% gross of fees, producing an excess return of 2.52%. The income return gross of fees during 2019 was 4.06%.
In general, 2019 was a strong year for real estate. Real estate returns are driven by demographics, economic growth, interest rates, and property type fundamentals. Strong job growth helped office properties achieve a 2019 vacancy rate that is lower than peak before the global financial crisis in 2008. Rent growth in 2019 of 5.2% for office space was at its fastest pace since 2016 because demand for office space was higher than supply in 2019. Industrial finished 2019 as the best performing property type because of record high asking rent, a vacancy rate of 4.4%, and strong demand for last-mile warehouses. Multifamily properties vacancy level of 4.1% is the lowest rate since 2000. The amount of supply and demand in the near term will be impacted by the severity and duration of the COVID-19 pandemic. Retail continues to struggle because of the growth of e-commerce and changing consumer behaviors. The vacancy rate for retail remains low because of the limited new supply being built.

Valuations for properties remain high and cap rates were low at the end of 2019. SERS’ is currently overweight industrial, neutral to multifamily, and underweight office and retail. For diversification, SERS’ portfolio also has properties that are not in the benchmark, such as self-storage and senior housing. The coronavirus has significantly impacted the outlook for 2020 real estate returns. Properties will likely see some dislocation and provide a strong buying or recapitalization opportunity for the SERS’ real estate managers. Hotels and retail will have an immediate impact from coronavirus while logistics, office, and multifamily will be impacted if the duration of the pandemic is long and the economy enters a period of contraction or slow growth. Returns for Real Assets will mostly be driven by income in 2020 and total returns for the benchmark are expected to be approximately -3%, per an industry consensus forecast.

Infrastructure ended 2019 with an allocation of 19.4% of the Real Assets portfolio with the expectation for a higher allocation in 2020 as capital commitments are called by managers. SERS’ exposure to telecommunications, social, and healthcare are more defensive assets with contracted cash flows. The transportation and energy assets in the portfolio are more exposed to economic cycles. The coronavirus will impact the more cyclical assets in 2020.

**FY2021 OBJECTIVES**

Staff will focus on the following objectives in FY2021:

- Formulate and implement a two-year plan to achieve and maintain a 17% allocation to Real Assets.

- Target demographic-driven real estate investments such as data centers, life science, and medical office versus GDP-driven sectors such as office. These sectors are anticipated to have higher rent growth and more durable income. This would maintain the overweight to the specialty property types within Real Assets.

- Evaluate specific opportunities arising from the impacts of coronavirus and economic slowdown, including opportunistic strategies involving real estate recapitalizations.

- As the infrastructure portfolio has been built out and is at its target allocation, switch focus to actively soliciting co-investment opportunities with existing infrastructure managers.
PORTFOLIO STRATEGY - Cash Equivalents

INVESTMENT STRATEGY
SERS invests in cash equivalents for the purpose of earning market returns on cash held for benefits and expenses and to provide short-term cash needed to fund other asset classes. Cash equivalents are fixed income assets with maturities of less than 270 days and may include US government, asset-backed, corporate and high quality money market-type securities.

SERS’ Statement of Investment Policy sets the cash equivalent target allocation as follows:

<table>
<thead>
<tr>
<th>Cash Equivalents</th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2%</td>
<td>0% – 5%</td>
</tr>
</tbody>
</table>

The performance objective for cash equivalents is to exceed the return on 30-day US Treasury Bills.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- *Research and monitor commercial paper credits and money market funds.*
  
  Bloomberg is utilized to check the daily commercial paper issuance and short-term market. Staff continues to utilize the Fidelity Investments (Fidelity) money market complex for investing the daily short-term cash. Fidelity offers competitive yields relative to both money market competitors and higher liquidity to the commercial paper market.

- *Evaluate opportunities to improve the cash management system and maintain liquidity requirements.*
  
  The Fidelity institutional money market fund provides the best overall yield for SERS short-term cash investments in FY2020. Staff invests in both Fidelity’s US government fund with same day liquidity and the prime fund with a higher yield and next day liquidity. Staff keeps only enough cash in the US government fund to manage the daily cash needs of the portfolio and invests the remainder in the higher yielding prime fund, which earns on average 20 basis points more.

CURRENT MARKET CONDITIONS AND OUTLOOK
The Federal Reserve (Fed) cut interest rates by 25 basis points in July, August and September for a total of 75 basis points, bringing the range to 1.5 – 1.75% on concerns about falling inflation and global economic growth. In March 2020, the Fed held two emergency meetings that reduced interest rates to the range of 0 – 0.25% and also introduced several other stimulus measures totaling over $4.5 trillion over the next month in an effort to stabilize the economy from the impact of COVID-19. Based on the Fed's current guidance, interest rates are expected to remain low for an extended period of time and therefore, the yield on short-term cash will also remain low.

FY2021 OBJECTIVES
Staff will focus on the following objectives in FY2021:

- Research and monitor commercial paper issuers and money market funds.

- Evaluate opportunities to improve the cash management process and maintain liquidity needs for the portfolio.
INVESTMENT STRATEGY
SERS invests in opportunistic investments for the purpose of earning returns greater than the Bloomberg Barclays US Aggregate Bond Index + 2% for investments that do not fit within the existing asset classes. The investments are defined as tactical or non-traditional investment opportunities. Such investments may involve capitalizing on short-term market dislocations or other unique situations or innovative strategies including tactical allocation.

SERS’ Statement of Investment Policy sets the Opportunistic investments target allocation as follows:

<table>
<thead>
<tr>
<th>Opportunistic Investments</th>
<th>Target</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
<td>0% – 5%</td>
</tr>
</tbody>
</table>

The performance objective for opportunistic investments is to exceed the return of Bloomberg Barclays US Aggregate Bond Index + 2%.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- **Search for possible opportunistic investments for the Fund that are expected to exceed the Total Fund return objective, with an emphasis on high-yielding investments. This will be accomplished through the evaluation of markets, strategies and specific funds that offer compelling risk-adjusted returns. Investments that pass initial screening will undergo detailed due diligence prior to staff recommendation.**

As of mid-March, three new investments have been made, totaling $225 million of commitments. The first commitment is a re-up with a direct lending manager that provides loans to middle market businesses located in the US. The second commitment is a re-up with a direct lending manager that provides loans to large companies primarily located in the US and to European and Asian companies on a selective basis. These investments are attractive because of their high levels of current income and total expected returns of 8% to 10%.

The third commitment is to a fund that will invest in the debt of privately-owned technology companies. The fund is sponsored by a long-tenured private equity manager that has a dedicated team to deploy an opportunistic strategy that can invest in different debt structures, depending on where they identify good risk adjusted returns. This fund will pay a quarterly income distribution and is expected to generate a net return in the mid-teens.

- **Actively manage the liquid portion of the portfolio to improve the risk and return profile of the portfolio.**

Historically, the portfolio has been designed to generate a return greater than the Total Fund Policy Benchmark. Starting in FY 2021 the performance objective will be the Bloomberg Barclays US Aggregate Bond Index + 2%. The liquid portion of the portfolio has not performed in line with expectations. These investments have underperformed relative to their benchmark and have been highly volatile. As a result of the combination of underperformance and high volatility, staff has actively reduced the exposure to these investments this fiscal year.

CURRENT MARKET CONDITIONS AND OUTLOOK
The opportunistic portfolio has made investments in funds that seek to take advantage of market dislocations or which do not fit within the risk and return objectives of other asset classes. The return objective of the portfolio is to outperform the Total Fund Policy Benchmark. In addition, there is a priority on investments that generate current income. Several themes have arisen in the portfolio including financial deleveraging, distressed assets, structured credit, financial restructuring, private credit, energy and peripheral European market opportunities.

The opportunity set is rapidly changing as a result of COVID-19, which has created an emerging set of investment themes across the financial landscape. The first area of focus is the credit markets, which have experienced an increase in spreads across the spectrum. For example, in March high yield spreads peaked in excess of 1,000 basis points. Historically when spreads have reached this threshold, the subsequent one-year returns of high yield have been greater than 10%. Investment managers are also reporting a lack of liquidity in credit markets, which is creating attractive opportunities in the investment grade space. For example, many
borrowers with refinancings in the next 18 months are looking to refinance existing debt now, even if the cost is substantially higher than it would have been earlier this year. In this environment, borrowers are willing to pay a premium for the certainty of capital.

The energy markets continue to be volatile in 2020 with energy trading at $20/barrel at the end of March compared to more than $60 at the beginning of the year. The lower prices have been a result of excess supply after negotiations between Saudi Arabia and Russia broke down earlier in March. Both countries have increased their output in an effort to gain market share. These low prices are hurting producers in the US, who need oil to be in the $50 to $60 range to remain profitable. In an effort to cut costs, these producers have reduced their capital expenditures budgets and cut back on their 2020 drilling programs. These reductions have had a significant impact on an already fragile MLP industry, which is down approximately 50% year to date. Staff will continue to closely monitor these markets to manage the existing energy exposure and determine if there are actionable investment opportunities.

**FY2021 OBJECTIVES**
Staff will focus on the following objectives in FY2021:

- Search for possible opportunistic investments for the Fund that are expected to exceed the Bloomberg Barclays US Aggregate Bond Index + 2%, with an emphasis on high yielding investments. This will be accomplished through the evaluation of markets, strategies and specific funds that offer compelling risk adjusted returns. Investments that pass initial screening will undergo detailed due diligence prior to staff recommendation.

- Actively manage the liquid portion of the portfolio to improve the risk and return profile of the portfolio.
INVESTMENT STRATEGY
SERS invests in overlay strategies that trade derivatives of the Total Fund’s underlying assets and currency exchange rates to enhance the Total Fund portfolio’s efficiency. The overlay program includes tactical asset allocation and active currency strategies.

The tactical asset allocation strategy aims to add value to the Total Fund performance through active allocations (long/short) across stocks and bonds thereby exploiting short-term macro market dislocations. The active currency strategies aim to add value and risk diversification to the Total Fund, as well as help manage currency risk by utilizing short-term inefficiency in the foreign exchange markets and low correlation of the strategies to the major asset classes such as US equity and fixed income.

The program is fully tactical; exposures to any overlay strategies in this program are not required by the Statement of Investment Policy.

The overlay program is targeted to add 10 to 20 bps excess return to the Total Fund’s performance on a three to five year horizon. Tracking errors of the tactical rebalancing strategy and the currency program are expected in the ranges of 5 to 15 bps and 5 to 8%, respectively.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION
The FY2020 Annual Investment Plan objectives and related activities are as follows:

• **Actively monitor the Tactical Asset Allocation Strategy to enhance the impacts of the strategy to the Total Fund’s performance.**

  In September 2019, the Staff adjusted the strategy guideline to allow its exposure per asset class including US Equity, Non-US equity and US Fixed Income, up to 7% from 5% based on its strong track record and conviction in the strategy. Since the inception in December 2014 to June 2019, the program added 0.05% to the Total Fund’s annualized return; its risk contribution was 0.01%, which offered an attractive risk adjusted return contribution to the Total Fund’s performance over the period. In 2020, the program put on positions in January and closed shortly afterward. In late February and early March when the markets started tumbling, responding to the Coronavirus spread, the program phased in positions. The positions were kept on throughout March and stayed open through the time this report was written. As markets declined sharply in late March, the strategy incurred a substantial loss. As of the end of March, the strategy contributed (0.76%) to the Total Fund’s FYTD 2020 return. The risk contribution was 0.25%. The positions are expected to remain open as the markets are expected to recover from the lows.

• **Actively monitor the Active Currency Strategies to improve the program’s risk and return characteristics.**

  During FY2020, Staff rebalanced the currency portfolio based on managers’ performance and Staff’s conviction in their strategies. Staff increased the notional allocation to one manager by $100 million and terminated two other managers. The program added 0.19% to the Total Fund’s FYTD 2020 return, lowered the Total Fund’s risk by 0.08% through currency risk reduction. As of April 2020, the currency portfolio’s notional exposure is $ 450 million, which is 16.4% of the Non-US Equity portfolio’s value vs. 50% maximum limit by the currency program’s guideline.

**Overall Overlay Program:**
The overlay program in aggregate detracted 0.58% from the Total Fund’s FYTD 2020, return and added 0.17% to the Total Fund’s risk.

**FY2021 OBJECTIVES**
Staff will focus on the following objectives in FY2021:

• Actively monitor the Tactical Asset Allocation Strategy to enhance the impacts of the strategy to the Total Fund’s performance.

• Actively monitor the Active Currency Strategies to improve the program’s risk and return characteristics.
PORTFOLIO STRATEGY - Investment Risk Management & Analytics

Investment Risk Management and Analytics is responsible for provision and communication of diligent, thorough, timely and forward-looking investment risk analytics and other investment analytics to the Board and Investment Staff.

Equity market volatility was mild in 2019 with an average daily S&P 500 Implied Volatility (VIX) level of 15.5%. As the Coronavirus spread and became an unprecedented global pandemic, crippling major portions of the global economy, the markets experienced a rapid sell-off. The VIX daily average in March, the most volatile month, was 57.74%, almost four times higher than the 2019 average. The VIX fell materially in April, and is expected to normalize in the second half of 2020, but it will likely stay above the historical average. The Total Fund's total risk is expected to increase materially, as will active risk, closer to the 3% limit stated in the Statement of Investment Policy.

REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION:
The FY2020 Annual Investment Plan objectives and related activities are as follows:

- Provide risk forecast and analyses of the Total Fund and asset class portfolios.
  
  Staff utilized the risk system to generate risk analyses of the Total Fund and asset classes. The risk analyses based on SERS’ investment holdings provide forecasted volatility of returns of portfolios. The analyses also provide portfolio risk decomposition by strategies, as well as by factors.

- Continue to report risk of the Total Fund to the Board on a quarterly basis.
  
  Staff reported volatility of the Total Fund’s returns, providing both total risk and active risk decomposition analysis by asset classes and by major risk factor groups. The total risk decomposition by asset classes focused on their role in the Total Fund. The total risk decomposition by factors focused on cross factor exposures, especially equity factors among the asset class portfolios as the equity factors are the largest risk driver of the Total Fund. The active risk decomposition showed risk contribution from the investment implementation, which is comprised of active allocation among the asset classes and active selection of strategy and securities.

- Communicate asset class portfolio’s risk with asset class investment officer(s) and discuss any potential changes of the portfolio structure on a quarterly basis.
  
  Staff discussed the risk profile of asset class portfolios with each asset class team. The discussion was focused on i) trend and level of forecast risks, ii) the portfolio’s risk structure in terms of manager line-up and factor tilts and iii) the portfolio’s sensitivity to market movements. The discussions assisted each asset class team in balancing their portfolio risks and minimizing unintended risk tilts.

- Provide return attribution analysis of Total Fund and asset classes of the Fund to the Investment Strategy Team.
  
  Staff reported monthly return attribution analysis of the Total Fund, analyzing effects of active weights on alpha generation of each asset class. The analyses were presented to the Investment Strategy Team.

  Staff also delivered to the Investment Strategy Team attribution reports of each asset class portfolio analyzing the contribution of each account within an asset class.

- Evaluate the existing risk analytics provider's capacity and service quality then consider to extend the current agreement or search for a better provider.
  
  Staff issued a public Request for Quotation (RFQ) for investment risk analytics tool and service in April and will select the one that offers the highest quality and cost-effective holdings-based investment risk analytics for SERS.

- Perform other portfolio and market analyses and research as needed.
PORTFOLIO STRATEGY - Investment Risk Management & Analytics

Staff conducted analyses of the Total Fund liquidity and leverage. Staff also conducted portfolio and market analyses as needed or upon request.

FY2021 OBJECTIVES:
Staff will focus on the following objectives in FY2021:

• Provide risk forecast and analyses of the Total Fund and asset class portfolios.

• Report risk of the Total Fund to the Board on a quarterly basis.

• Communicate asset class portfolio’s risk with asset class investment officer(s) and discuss any potential changes of the portfolio structure on a quarterly basis.

• Provide return attribution analysis of the Total Fund and asset classes of the Fund to the Investment Strategy Team.

• Implement a new risk system should SERS select a new provider, ensure a smooth and efficient transition, and develop report packages tailored to fit the investment management needs.

• Perform other portfolio and market analyses and research as needed.
The Investment Operations area is responsible for managing administrative activities for the Investment department, assisting the CIO and investment officers, and providing reports and information to Staff and the Board. The objectives for FY2021 remain consistent with those of FY2020 as these three broad categories reflect the primary duties of Investment Operations.

**REVIEW OF FY2020 OBJECTIVES AND IMPLEMENTATION**

The FY2020 Annual Investment Plan objectives and related activities are as follows:

- *Coordinate, assist and participate in organizational initiatives including Policies, Procedures and Practices; fiscal budget; Subject Matter Experts (SMEs); and Corporate Emergency Preparedness Project (CEPP).*

  Investment Operations assisted with the annual review and revisions to the Investment Department Policies, Procedures and Practices and participated in the system-wide Records Management Project. Staff prepared and analyzed the fiscal budget for executive approval as well as participated in and provided feedback in relation to SME and CEPP activities.

- *Perform administrative duties and attend meetings for the Investment Committee, Strategy Team and Board meetings including establishing meeting dates and agendas, organizing and distributing documents to team members, producing reports and taking minutes.*

  Operations attended all Investment Committee, Strategy Team and Board meetings. Agendas and documents were prepared and distributed and minutes were taken and distributed in a timely manner. Staff assisted with processing documents associated with hiring, terminating and redeeming of managers.

- *Assist with projects for the CIO and Investment officers including revising the Annual Investment Plan, updating the Statement of Investment Policy as needed, new manager searches as needed and aiding with special projects for Staff.*

  Operations coordinated revisions to and produced the FY2020 Annual Investment Plan and the amended Statement of Investment Policy, assisted the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis project, the realignment of Investment Officer duties, and new manager searches throughout the fiscal year.

**FY2021 OBJECTIVES:**

Staff will focus on the following objectives in FY2021:

- *Coordinate, assist and participate in organizational initiatives including Policies, Procedures and Practices; fiscal budget; Subject Matter Experts (SMEs); and Corporate Emergency Preparedness Project (CEPP).*

- *Perform administrative duties and attend meetings for the Investment Committee, Strategy Team and Board meetings including establishing meeting dates and agendas, organizing and distributing documents to team members, producing reports and taking minutes.*

- *Assist with projects for the CIO and Investment officers including revising the Annual Investment Plan, updating the Statement of Investment Policy as needed, searches for a new General Investment Consultant and new Investment managers as needed, and aiding with special projects for Staff.*
Implementation Guidelines
IMPLEMENTATION GUIDELINES - Global Equities

I. ROLE

The role of Global Equities is to earn the equity risk premium over US Treasury bonds by investing in common stock of publicly-listed companies.

II. ASSET ALLOCATION

<table>
<thead>
<tr>
<th></th>
<th>Target</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Minimum</td>
</tr>
<tr>
<td>Global Equity</td>
<td>45%</td>
<td>35%</td>
</tr>
<tr>
<td>US Equity (USE)</td>
<td>22.5%</td>
<td>15.0%</td>
</tr>
<tr>
<td>Non-US Equity (NUSE)</td>
<td>22.5%</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

III. BENCHMARK:

The Global Equity benchmark is a composite benchmark comprised of:

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Percentage</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Equity Portfolio</td>
<td>50%</td>
<td>Russell 3000 Index</td>
</tr>
<tr>
<td>Non-US Equity Portfolio</td>
<td>50%</td>
<td>MSCI All Country World ex-US Index ($net)</td>
</tr>
</tbody>
</table>

IV. PERFORMANCE OBJECTIVE

The annualized return objective, net of management fees, is as follows:

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Excess Return Target (over 3-year rolling periods)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Equity Portfolio</td>
<td>20 basis points over USE benchmark</td>
</tr>
<tr>
<td>Non-US Equity Portfolio</td>
<td>50 basis points over Non-USE benchmark</td>
</tr>
</tbody>
</table>

V. PORTFOLIO DESIGN AND CONSTRUCTION:

The USE and NUSE portfolios are constructed using a multi-manager line-up and a combination of active and passive strategies to deliver risk-adjusted performance relative to their respective benchmarks. Portfolio design will consider risk/return characteristics, manager count and investment management fees.

VI. PERMISSIBLE INVESTMENTS

<table>
<thead>
<tr>
<th>Security Type</th>
<th>US Equity Portfolio</th>
<th>Non-US Equity Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Stock</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Stock Treated as Common Stock</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Cash / Treasuries</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Preferred Stock</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Convertible Rights</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Warrants</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Depository Receipts</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>REITS</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Rule 144a Issues</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Private Placement</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>IPOs</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Commingled Funds</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Exchange Traded Funds</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Futures</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Options</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Currency Forwards</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Currency Futures</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Currency Options</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Country Funds</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>
VII. RISK MANAGEMENT

<table>
<thead>
<tr>
<th>Active Risk Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Equity Portfolio</td>
</tr>
<tr>
<td>Non-US Equity Portfolio</td>
</tr>
</tbody>
</table>

US Equity Implementation Guidelines

<table>
<thead>
<tr>
<th>Investment Benchmark</th>
<th>Target Allocation</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Equity Allocation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russell 3000 Index</td>
<td>22.50%</td>
<td>15.0% - 30.0%</td>
</tr>
</tbody>
</table>

Portfolio Structure

<table>
<thead>
<tr>
<th>Capitalization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Cap Equity</td>
<td>Russell 1000 Index</td>
</tr>
<tr>
<td>Large Cap Active</td>
<td>Manager Specific</td>
</tr>
<tr>
<td>Large Cap Passive</td>
<td>Russell 1000 Index</td>
</tr>
<tr>
<td>Small Cap Equity</td>
<td>Russell 2000 Index</td>
</tr>
<tr>
<td>Small Cap Active</td>
<td>Manager Specific</td>
</tr>
</tbody>
</table>

Style

<table>
<thead>
<tr>
<th>Growth</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager Specific</td>
<td>Neutral to BM</td>
</tr>
<tr>
<td>Manager Specific</td>
<td>Neutral to BM</td>
</tr>
</tbody>
</table>

Portfolio Risk/Return Characteristics

<table>
<thead>
<tr>
<th>Total Expected Excess Return</th>
<th>Russell 3000 Index</th>
<th>0.20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Expected Tracking Error</td>
<td>Russell 3000 Index</td>
<td>1.00%</td>
</tr>
</tbody>
</table>

Factors such as currency, sector and country limits are manager specific and outlined in each manager’s Investment Guidelines. Aggregate portfolio characteristics such as P/E, B/P, yield, size, etc., shall be within a reasonable range of the US equity benchmark.

Non-US Equity Implementation Guidelines

<table>
<thead>
<tr>
<th>Investment Benchmark</th>
<th>Target Allocation</th>
<th>Permissible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-US Equity Allocation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSCI All Country World ex-US Index ($net)</td>
<td>22.50%</td>
<td>15.0% - 30.0%</td>
</tr>
</tbody>
</table>

Broad Market Exposure

<table>
<thead>
<tr>
<th>ACW ex-US + Developed Markets Active</th>
<th>Manager Specific</th>
<th>70%</th>
<th>60% - 80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed Markets Passive</td>
<td>MSCI World ex US Index ($net)</td>
<td>30%</td>
<td>20% - 40%</td>
</tr>
<tr>
<td>Emerging Markets Active</td>
<td>MSCI Emerging Markets Index ($net)</td>
<td>100%</td>
<td>+/- 10%</td>
</tr>
</tbody>
</table>

Portfolio Structure

<table>
<thead>
<tr>
<th>Capitalization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Cap Equity</td>
<td>Manager Specific</td>
</tr>
<tr>
<td>Small to Mid-Cap Equity</td>
<td>Manager Specific</td>
</tr>
<tr>
<td>Small Cap Equity</td>
<td>Manager Specific</td>
</tr>
<tr>
<td>Micro Cap Equity</td>
<td>Manager Specific</td>
</tr>
</tbody>
</table>

Style

<table>
<thead>
<tr>
<th>Growth</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager Specific</td>
<td>Neutral to BM</td>
</tr>
<tr>
<td>Manager Specific</td>
<td>Neutral to BM</td>
</tr>
</tbody>
</table>

Portfolio Risk/Return Characteristics

<table>
<thead>
<tr>
<th>Total Expected Excess Return</th>
<th>MSCI All Country World ex-US Index ($net)</th>
<th>0.50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Expected Tracking Error</td>
<td>MSCI All Country World ex-US Index ($net)</td>
<td>2.50%</td>
</tr>
</tbody>
</table>

Factors such as currency, sector and country limits are manager specific and outlined in each manager’s Investment Guidelines. Aggregate portfolio characteristics such as P/E, B/P, yield, size, etc., shall be within a reasonable range of the Non-US equity benchmark.
I. ROLE

SERS invests in private equity to provide returns in excess of those provided by publicly-traded equities to compensate for private equity’s liquidity and concentration risk.

II. ASSET ALLOCATION

The private equity target asset allocation is established with periodic asset allocation studies. The most recent asset allocation study authorized an 11% allocation target to private equity with a range of 8% - 16%.

III. BENCHMARK

Private equity performance is benchmarked to the Burgiss All Private Equity benchmark.

IV. PERFORMANCE OBJECTIVE

The performance objective for private equity is to provide net returns in excess of the SERS Global Equity portfolio over time periods five years and longer.

V. PORTFOLIO DESIGN AND CONSTRUCTION

Capital allocation among the various market segments is a critical driver for the long-term success of the private equity portfolio. Capital allocation risk is controlled in a portfolio structure incorporating long-term sub assets target allocations.

Long-term sub-asset target exposure is detailed below:

<table>
<thead>
<tr>
<th></th>
<th>Range Target</th>
<th>Range Minimum</th>
<th>Range Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small/Middle</td>
<td>60%</td>
<td>50%</td>
<td>70%</td>
</tr>
<tr>
<td>Large/Mega</td>
<td>15%</td>
<td>5%</td>
<td>25%</td>
</tr>
<tr>
<td>Total Buyout</td>
<td>75%</td>
<td>55%</td>
<td>95%</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Special Situations</td>
<td>25%</td>
<td>5%</td>
<td>35%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td>75%</td>
<td>55%</td>
<td>85%</td>
</tr>
<tr>
<td>International</td>
<td>25%</td>
<td>15%</td>
<td>45%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Commitments</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>Fund of Funds</td>
<td>0%</td>
<td>0%</td>
<td>15%</td>
</tr>
<tr>
<td>Co-Investments</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The portfolio is tilted toward buyout investments and does not have a target allocation to venture capital due to higher risk and manager selection issues. Within buyouts, the preference is for small and middle market managers with a significant value creation approach and away from larger firms with a financial engineering approach.
VI. PERMISSIBLE INVESTMENTS

<table>
<thead>
<tr>
<th>Investment Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited partnership interests</td>
</tr>
<tr>
<td>Discretionary Managers investing in Private Equity Partnerships</td>
</tr>
<tr>
<td>Co-Investments</td>
</tr>
<tr>
<td>Separate Accounts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investment Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyouts</td>
</tr>
<tr>
<td>Venture Capital</td>
</tr>
<tr>
<td>Special Situations (secondary interests, distressed debt or equity, mezzanine, co-investments, energy, etc.)</td>
</tr>
</tbody>
</table>

Buyout  
**Net Expected Return 10-15%, Moderate Risk**  
Capital is typically invested in more established companies, those further along the business life cycle having relatively predictable cash flows and the ability to raise capital along the entire capital structure, including secured and unsecured debt. Buyouts are targeted to represent 75% of the private equity portfolio.

Venture Capital  
**Net Expected Return: 15-25%, High Risk**  
Venture capital equity is targeted at companies in the earliest phases of a business life cycle. Companies may be classified as seed, early, middle and late stage and are characterized by their inability to access public equity and other forms of capital such as secured and unsecured debt. These companies have uncertain revenues and a need for cash to build their businesses and are subject to high failure rates. Venture capital is targeted to represent 0% of the portfolio.

Special Situations  
**Net Expected Return: 10-20%, Moderate Risk**  
Many private equity opportunities have characteristics of buyout or venture capital but have enough differences as to require separate classification. These investments include energy, distressed debt, mezzanine, opportunity and secondary funds. Special situations is targeted to represent 25% of the portfolio.

Co-Investments  
**Net Expected Return: 15-20%, Moderate Risk**  
Co-Investments are direct investment in a single asset of a multi-asset fund, made alongside the Fund’s investment in the asset. Typically, co-investments are offered on more attractive economic terms and shorter time frames than those of the Fund. Co-Investments are targeted to represent up to 10% of the portfolio.

VII. RISK MANAGEMENT

The primary risk management tool in private equity is industry diversification as well as extensive due diligence of prospective investments. Monitoring is managed through a combination of quantitative and qualitative constraints. The following sections identify the most significant risks with private equity investments and the method of control.

Liquidity  
Private equity investments are illiquid and typically have expected holding periods of 10-12 years. Investments are typically held until maturity and selling prior to maturity typically results in a discount to fair market value. Liquidity risk is managed by minimizing the possibility of forced sales that may arise from exceeding maximum exposure limits or lowering asset allocation exposure limits.
IMPLEMENTATION GUIDELINES – Global Private Equity

Geography
Geographic risk is controlled through a long-term international target exposure of 25% by market value.

Vintage Risk
Vintage reflects the year of first capital draw and vintage risk refers to the variability of private equity commitments over time. The investment-pacing model controls the short and long-term private equity commitment amounts and attempts to minimize vintage risk while achieving targeted exposure. Commitments will be dependent on the availability of investments that meet SERS’ investment criteria and will not be driven by the target investment pace in any given year.

Manager Risk
Manager risk consists of two elements, managing the exposure within a partnership and controlling the number of general partners in our private equity portfolio. Partnership exposure is controlled by limiting the commitment size within a partnership and the maximum commitment to a partnership will be 25% of a fund’s size. The 25% limit does not apply to funds committed to a discretionary manager or a separate account. The maximum market value exposure to a single manager is targeted to be less than 20% of the portfolio. The optimum number of general partners in the portfolio varies with time.

Firm Risk
Firm risk is the exposure to a private equity general partner and is controlled by limiting the maximum commitment to funds operated by a general partner and its affiliates.

Currency
The private equity program accepts the currency risks consistent with the geographic constraints. Private equity partnerships generally do not hedge currency risk and the private equity program will not implement currency hedges.

Industry
Typically, private equity partnerships are permitted to invest in a wide variety of industries. Industry risk is controlled primarily through appropriate diversification across classes and subclasses.

Leverage
General partners invest capital from private equity partnerships throughout the capital structure of firms. The capital markets control the maximum leverage available to the general partners and limited partners control leverage exposure through partnership selection and portfolio construction.
IMPLEMENTATION GUIDELINES – Multi-Asset Strategies

I. ROLE

The role of the Multi-Asset Strategies portfolio (MAS) is to generate consistent returns with constrained volatility and beta to global equities, resulting in risk diversification and downside protection to the Total Fund.

II. ASSET ALLOCATION

The MAS allocation is established with periodic asset allocation studies. The most recent asset allocation approved by the Board in February 2020 eliminated the MAS allocation effective July 1, 2020. However, Staff has requested an interim asset allocation to be approved by the Board setting an interim 4% MAS allocation for FY2021. This interim allocation is needed as private asset classes require implementation time.

III. BENCHMARK

MAS performance is benchmarked to the HFRI Fund of Funds Composite Index plus 1.0% annually and will be calculated on a time-weighted basis.

IV. LIQUIDATION GUIDELINES AND PLAN

The MAS allocation was eliminated at the February 2020 Board meeting with an effective date of July 1, 2020. Since most of the MAS allocation is being moved to private assets that take implementation time, Staff has asked the Board for an interim MAS allocation of 4% through FY2021. The portfolio will be composed of either highly liquid strategies that will be liquidated to fund the cash needs of other asset classes or funds with quarterly or longer redemption terms that will be redeemed throughout FY2021 as liquidity becomes available. The MAS allocation will be completely liquidated by June 30, 2021. The following guidelines no longer pertain to MAS:

- Volatility Objective
- Portfolio Design and Construction
- Investment Styles
- Permissible Investments
- Risk Management

Staff will liquidate the portfolio in an orderly manner, while continuing to monitor the funds for performance, team and firm changes. Liquidations will occur simultaneously with other asset class short-term cash needs so SERS can remain as fully invested as possible.
I. ROLE

The primary role of diversified fixed income is to reduce the overall risk of the investment plan. Fixed income securities should provide stable income returns through yield oriented assets. Fixed income provides risk reduction through lower correlations to the investment program.

II. ASSET ALLOCATION

The global fixed income allocation is established with periodic asset allocation studies. The most recent asset allocation study authorized a 19% market value exposure to global fixed income with a range of 12% - 26%.

III. BENCHMARK

Global fixed income performance is benchmarked to the Bloomberg Barclays US Aggregate Bond Index for the asset class.

IV. PERFORMANCE OBJECTIVE

The annualized return objective for the global fixed income portfolio is 50 basis points net of fees above the benchmark over rolling three year periods broken into the following strategies:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Expected Excess Return</th>
<th>Tracking Error</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>20 basis points</td>
<td>N/A</td>
<td>Bloomberg Barclays US Aggregate Bond Index</td>
</tr>
<tr>
<td>Core Plus</td>
<td>60 basis points</td>
<td>N/A</td>
<td>Bloomberg Barclays US Aggregate Bond Index</td>
</tr>
<tr>
<td>Tactical/Diversifying</td>
<td>200 basis points</td>
<td>N/A</td>
<td>Bloomberg Barclays US Aggregate Bond Index</td>
</tr>
<tr>
<td>Total Portfolio</td>
<td>50 basis points</td>
<td>0 – 4%</td>
<td>Bloomberg Barclays US Aggregate Bond Index</td>
</tr>
</tbody>
</table>

V. PORTFOLIO DESIGN AND CONSTRUCTION

SERS seeks to obtain broad fixed income market exposure to gain diversification while receiving income. The portfolio is 100% externally managed in active strategies, in broad mandates of core, core plus, tactical and diversifying strategies. Core mandates invest primarily in benchmark type securities. Core sector weightings can deviate from the benchmark, depending on external manager’s market views and strategies. Core plus mandates allow investments in all sectors of the Bloomberg Barclays US Aggregate Bond Index along with additional allocations to the extended sectors of high yield, Non-US debt and emerging market debt. The tactical and diversifying sector invests in return seeking or diversification enhancing strategies and can provide high excess returns. The sector invests in emerging market debt, high yield, long/short credit and fixed income relative value arbitrage strategies.

Below are the current sector exposure limits:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
</tr>
<tr>
<td>Core</td>
<td>30%</td>
</tr>
<tr>
<td>Core Plus</td>
<td>25%</td>
</tr>
<tr>
<td>Tactical &amp; Diversifying</td>
<td>5%</td>
</tr>
</tbody>
</table>
VI. PERMISSIBLE INVESTMENTS

<table>
<thead>
<tr>
<th>Security Type</th>
<th>Core</th>
<th>Core Plus</th>
<th>Tactical &amp; Diversifying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governments:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Treasuries and Agencies</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Sovereigns/Quasi-Sov. in US $</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Sovereigns/Quasi-Sov. in local currency</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Corporates:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Corporates</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Non-US Corporates in US $</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Non-US Corporates in local currency</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>High Yield</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Bank Loans</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Mortgages</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Municipals</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>144 (A)s</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Commingled Funds</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Currency</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Derivatives</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Money Markets</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Repurchase Agreements</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

VII. RISK MANAGEMENT

For strategies held in separate accounts, the following risk factors are controlled through limits specified in each manager’s Investment Manager Agreement (IMA) and Investment Guidelines. Duration, sector and credit risk are reviewed on a total portfolio basis quarterly by SERS:

Interest Rate
Controlled by duration band limits around the benchmark duration.

Yield Curve Risk
Controlled by duration band limits around the benchmark duration.

Sector Risk
Riskier sectors like high yield, non-US, non-agency mortgages and CMBS are controlled around set limits with each individual manager. Portfolios are allowed 25% maximum exposure to any one industry.

Credit Risk
Portfolios must maintain a minimum exposure to investment grade securities. In addition, each manager portfolio has an established average weighted credit quality that must be maintained at all times.

Currency Risk
Currency is not hedged from the overall portfolio level. Managers who demonstrate skill are allowed to purchase non-US securities on a hedged or unhedged basis or take direct currency positions without owning securities.

Issuer Risk
Issuer limits are specified in each IMA investment guidelines.
**Liquidity Risk**
Accounts have a maximum 144(A) limit without registration rights.

**Active Risk**
Normal tracking error is expected to be 2-4% over any rolling three-year time horizon. During periods of increased volatility, tracking error should not exceed 5% over any rolling three-year time horizon.
I. ROLE

The role of SERS' private credit portfolio is to provide risk adjusted returns in excess of those provided by publicly traded fixed income securities and to generate a consistent stream of income.

II. ASSET ALLOCATION

SERS' Statement of Investment Policy sets the private credit target allocation at 5%, with a range of 3% to 7%. The target for Global Private Credit during the ramp-up period is set at 3% for fiscal year 2021 and will increase to the policy target allocation of 5% for fiscal year 2022.

III. BENCHMARK

The private credit benchmark is 3-month LIBOR + 4.5%.

IV. PERFORMANCE OBJECTIVE

The performance objective of the private credit portfolio is to provide net returns in excess of the SERS Global Fixed Income portfolio over time periods five years and longer, with the income component of the return comprising a significant portion of the total return.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The private credit portfolio is designed to gain exposure to various aspects of the private credit market with a focus on consistent income generation. It is expected that a greater portion of the private credit portfolio will be allocated to direct lending investments with higher expected yields.

Long-term sub asset target exposure is detailed below:

<table>
<thead>
<tr>
<th>Range</th>
<th>Target</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Lending</td>
<td>80%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>Mezzanine</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Stressed/Distressed</td>
<td>10%</td>
<td>0%</td>
<td>15%</td>
</tr>
<tr>
<td>Structured Credit/Other</td>
<td>10%</td>
<td>0%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td>50%</td>
<td>40%</td>
<td>85%</td>
</tr>
<tr>
<td>International</td>
<td>50%</td>
<td>15%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Commitments</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>Secondaries</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Co-Investments</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The portfolio is tilted toward direct lending investments and does not have a target allocation to mezzanine due to the structure of investments typically containing a larger portion of equity and a less guaranteed income component than direct lending.
VI. PERMISSIBLE INVESTMENTS

<table>
<thead>
<tr>
<th>Investment Structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited partnership Interests</td>
<td>Y</td>
</tr>
<tr>
<td>Co-Investments</td>
<td>Y</td>
</tr>
<tr>
<td>Separate Accounts</td>
<td>Y</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investment Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Lending</td>
<td>Y</td>
</tr>
<tr>
<td>Mezzanine</td>
<td>Y</td>
</tr>
<tr>
<td>Stressed/Distressed</td>
<td>Y</td>
</tr>
<tr>
<td>Structured Credit and Other (specialty finance, etc.)</td>
<td>Y</td>
</tr>
</tbody>
</table>

Direct Lending
Net Expected Return: 6-8%, Moderate Risk
Direct Lending represents loans made directly to small to medium size companies; secured by assets/cash flows/contracts, etc. depending on the type of loan. Direct Lending is targeted to represent 80% of the private credit portfolio.

Mezzanine
Net Expected Return: 8-12%, High Risk
Mezzanine debt is subordinated to senior loans and typically is structured as a floating rate loan with an equity component. Mezzanine is targeted to represent 0% of the private credit portfolio.

Stressed/Distressed
Net Expected Return: 12-25%, High Risk
Stressed/Distressed debt represents loans made to companies that are financially stressed and/or are likely to go through restructuring/bankruptcy. These investments typically have longer holding periods where the lender sometimes is seeking to take control of the company. Distressed is targeted to represent 10% of the private credit portfolio.

Structured Credit & Other
Net Expected Return: 5-20%, Moderate to High Risk
Structured credit includes investments in collateralized loan obligation tranches and other asset backed securities. Other private credit investments include specialty financing, non-performing loans, and other investment types that do not fit within the other categories. Structured Credit & Other is targeted to represent 10% of the private credit portfolio.

VII. RISK MANAGEMENT

The primary risk management tool in private credit is extensive due diligence of prospective investments and diversification. The following sections identify the most significant risks with private credit investments and the method of control.

Credit Risk
Credit risk is the primary risk associated with the asset class. Thorough due diligence of investments will be completed to ensure the general partners have sufficient measures in place to monitor and assess the risks involved with underlying investments.

Interest Rate Risk
Interest rate risk is inherent within the private credit portfolio since investments are typically structured as floating rate credit instruments and interest rates will fluctuate over time. The risk is managed by the general partners through the structuring process to ensure appropriate interest rate floors and other measures are in place to manage an acceptable level of interest income.
**Liquidity Risk**
Private credit investments are illiquid but have short holding periods than other private security types, with 3 – 5 years being a typical holding period. Investments are typically held until maturity and selling prior to maturity typically results in a discount to fair market value. Liquidity risk is managed through portfolio design by limiting the amount of exposure to more illiquid areas of private credit, such as distressed debt.

**Geography Risk**
International exposure refers to non-U.S. investments and is limited to 60% of the portfolio.

**Vintage Risk**
Vintage reflects the year of first capital draw and vintage risk refers to the variability of private credit commitments over time. The investment-pacing model controls the short and long-term private credit commitment amounts and attempts to minimize vintage risk while achieving targeted exposure. Commitments will be dependent on the availability of investments that meet SERS’ investment criteria and will not be driven by the target investment pace in any given year.

**Manager Risk**
Manager risk consists of two elements, managing the exposure within a partnership and controlling the number of general partners in the private credit portfolio. Partnership exposure is controlled by limiting the commitment size within a partnership and the maximum commitment to a partnership will be 25% of a fund’s size. The 25% limit does not apply to funds committed to a discretionary manager or a separate account. The maximum market value exposure to a single manager is targeted to be less than 35% of the portfolio. The optimum number of general partners in the portfolio varies with time.

**Firm Risk**
Firm risk is the exposure to a private credit general partner and is controlled by limiting the maximum commitment to funds operated by a general partner and its affiliates.

**Currency Risk**
The private credit program does not hedge currency risk and relies upon its external managers to determine if such hedges are appropriate. Currency risk will be managed through geographic exposure limits, as shown above under geographic risks.

**Industry/Sector Risk**
Typically, private credit partnerships are permitted to invest in a wide variety of industries and sectors. Industry/Sector risk is controlled primarily through appropriate diversification across classes and subclasses.

**Leverage Risk**
The capital markets control the maximum leverage available to the general partners and limited partners control leverage exposure through partnership selection and portfolio construction. Leverage at an individual fund level is managed through the portfolio construction process.

**Valuation Risk**
The valuation frequency for private credit is dependent upon the external managers’ internal and external valuation policies, which are reviewed during the operational due diligence process.
I. ROLE

The role of SERS’ global real assets portfolio is to provide a stable income return from tangible assets, to be a partial inflation hedge over the long term and to provide low correlation to equities.

II. ASSET ALLOCATION

SERS’ Statement of Investment Policy sets the global real asset target allocation at 16%, with a permissible range of 14% to 20%.

III. BENCHMARK

The global real assets benchmark is the NCREIF Property Index (NPI), one quarter in arrears.

IV. PERFORMANCE OBJECTIVE

The performance objective for global real assets is to produce net of fee returns in excess of the benchmark over a market cycle, with the income component of the return comprising a significant portion of the total return.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The global real assets portfolio is designed to achieve the performance objective, to manage risks and to focus on the overall role of global real assets within the Total Fund. SERS’ Global Real Assets Implementation Guidelines set the private market, public market and asset type exposures for global real assets, as shown in the table below.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Target</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Minimum</td>
</tr>
<tr>
<td>Private Core Real Estate</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>Private Non-Core Real Estate</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Private Infrastructure</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Public Market Real Assets</td>
<td>5%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Core real estate investments include substantially leased or fully operational institutional quality properties or projects located in developed markets. The revenue streams from core real estate are generally long duration and comprise a majority of the asset’s total return. Core real estate strategies are typically implemented through open-end commingled funds.

Non-core real estate investments include value-added and opportunistic strategies in which properties or projects are re-leased, re-developed, or newly constructed, particularly in developing or transitional markets. This strategy has a higher return expectation, but also comes with greater risk due to the uncertainty of cash flows. Non-core real estate strategies are typically implemented through closed-end commingled funds.

Private infrastructure typically involves the movement of goods, people, water and energy (definition provided by JPMorgan Asset Management). The sectors include but are not limited to transportation, communication, social and regulated assets. Infrastructure revenue streams are typically long-dated, contractual and inflation linked. Private infrastructure is implemented through both open and closed end commingled funds.
Public market real assets are securities of companies whose primary source of revenue comes from the operation of tangible assets, including, but not limited to, real estate (REITs), listed infrastructure, natural resources and master limited partnerships. While more liquid in nature, public market real assets exhibit greater volatility than privately-held real assets. Master limited partnerships, or MLPs, are publicly-traded limited partnerships that derive most of the partnership’s cash flows from infrastructure and natural resource assets. The advantage of an MLP is that it combines the tax benefits of a limited partnership with the liquidity of a publicly-traded company.

VI. PERMISSIBLE INVESTMENTS

The underlying investments included in the global real asset portfolio generally are tangible assets, have long term investment horizons or holding periods, produce attractive income returns and cash yields and provide a partial inflation hedge over the long term. Permissible investment structures and types are as follows.

<table>
<thead>
<tr>
<th>Investment Structure and Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Partnership Interests</td>
<td>Y</td>
</tr>
<tr>
<td>Co-Investments</td>
<td>Y</td>
</tr>
<tr>
<td>Separate Accounts</td>
<td>Y</td>
</tr>
<tr>
<td>Commingled Funds</td>
<td>Y</td>
</tr>
<tr>
<td>Joint Ventures</td>
<td>Y</td>
</tr>
<tr>
<td>Private Real Estate Equity and Debt</td>
<td>Y</td>
</tr>
<tr>
<td>Real Estate Investment Trusts (REITs)</td>
<td>Y</td>
</tr>
<tr>
<td>Private Infrastructure Equity and Debt</td>
<td>Y</td>
</tr>
<tr>
<td>Public Infrastructure Securities and MLPs</td>
<td>Y</td>
</tr>
<tr>
<td>Natural Resources and Commodities</td>
<td>Y</td>
</tr>
</tbody>
</table>

VII. RISK MANAGEMENT

Qualitative constraints and quantitative measures are used to manage risk in the global real assets portfolio. The following sections identify the most significant risks with real asset investments and the method of control.

Real Estate Life Cycle Risk
Life cycle risk refers to the stage of an investment’s life and generally falls into two categories, operating and non-operating. Operating investments are those that are leased or functioning to a level in which the contractual cash payments are supporting operations. Non-operating investments are those in pre-development, construction, conversion, or in a stage of major releasing. A significant portion of the private market real asset portfolio will be in operating investments in order to achieve global real asset’s role.

<table>
<thead>
<tr>
<th></th>
<th>Operating</th>
<th>Non-Operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Exposure</td>
<td>≥85%</td>
<td>≤15%</td>
</tr>
<tr>
<td>Current Exposure</td>
<td>94%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Real Estate Property Type Risk
Property type risk refers to the level of exposure of the five property type categories in the private market real estate portfolio relative to the NCREIF Property Index. Property type risk will be managed through portfolio design and the use of diversified commingled funds. At least 80% of the private market real estate portfolio will be invested in the four primary property type categories including apartment, industrial, office and retail.
Real Estate Geographic Risk
Geographic risk can be broken down into two segments: US regional exposure and non-US exposure. US regional exposure refers to the level of exposure of the four US regions in the private market real estate portfolio relative to the NCREIF Property Index.

<table>
<thead>
<tr>
<th>(as of December 31, 2019)</th>
<th>NCREIF Property Index</th>
<th>Private Market Portfolio</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>26%</td>
<td>24%</td>
<td>15% - 40%</td>
</tr>
<tr>
<td>Industrial</td>
<td>18%</td>
<td>29%</td>
<td>15% - 40%</td>
</tr>
<tr>
<td>Office</td>
<td>35%</td>
<td>26%</td>
<td>20% - 40%</td>
</tr>
<tr>
<td>Retail</td>
<td>20%</td>
<td>13%</td>
<td>10% - 30%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>99%</td>
<td>92%</td>
<td>80% - 100%</td>
</tr>
<tr>
<td>Hotel/Other</td>
<td>1%</td>
<td>8%</td>
<td>5% - 20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

Global Real Assets Geographic Risk
Non-US exposure refers to the level of exposure of non-US investments in the total global real assets portfolio. Non-US exposure will be limited to 20% of the private market portfolio.

Liquidity Risk
Private market real asset investments are illiquid, with both holding periods and commingled fund terms ranging from 7-10 years or more. Liquidity risk will be managed through target allocations to private and public market real assets as well as through portfolio design.

Leverage Risk
Private market real assets investments typically are acquired with a combination of equity capital and mortgage financing. The amount of leverage per asset or pool of assets depends on debt availability, property type and asset life cycle. The amount of leverage and financing terms ultimately are the responsibility of SERS’ external real asset managers and are governed and constrained by partnership agreements. The leverage maximum for the total private market real assets portfolio is 50% of the gross asset value of the private market real assets portfolio. Leverage risk will be managed through target allocations and portfolio design.

Currency Risk
The global real assets program does not hedge currency risk and relies upon its external managers to determine if such hedges are appropriate. Currency risk will be managed through geographic exposure limits, as shown above under geographic risks.

Valuation Risk
The valuation frequency for private market real assets is dependent upon the external managers’ internal and external valuation policies, which are reviewed during the operational due diligence process.

Manager Concentration Risk
A single manager utilizing core strategies shall not constitute more than 25% of the net assets of the global real assets program. For non-core strategies, a single fund commitment shall not constitute more than 7% of the net assets of the global real assets program and a single manager with multiple fund commitments, including co-investments, shall not constitute more than 20% of the net assets of the global real assets program.
IMPLEMENTATION GUIDELINES – Cash Equivalents

I. ROLE

Short-term cash should provide liquidity for funding investment capital calls and operational expenses. Cash should be invested in conservative, low risk securities/funds to preserve capital for future expenditures and investments.

II. ASSET ALLOCATION

The cash allocation is established with periodic asset allocation studies. The most recent asset allocation study authorized a 2% exposure to cash with a range of 0% - 5%.

III. BENCHMARK

The short-term cash benchmark is the Citigroup 30-day Treasury Bill Index.

IV. PERFORMANCE OBJECTIVE

The annualized return objective for the short-term portfolio is five basis points net of fees over the benchmark.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The cash portfolio is designed with preservation of capital in mind. The officer compares daily treasury, commercial paper and money market offerings for new purchases. The cash balance is kept as small as possible to allow for one to three months of expenditures. The average weighted maturity of the portfolio will not exceed 20 days.

Risk is constantly assessed before investment purchases are made in the portfolio. Only top tier commercial paper is purchased. Money market holdings are also reviewed on a regular basis along with choosing a top tier money market provider with a deep credit analyst team and whose short-term investments are important to the organization.

VI. PERMISSIBLE INVESTMENTS

<table>
<thead>
<tr>
<th>Security Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>US Treasury Bills</td>
<td>Y</td>
</tr>
<tr>
<td>Commercial Paper rated A-1/P-1 or higher</td>
<td>Y</td>
</tr>
<tr>
<td>Money Market Funds rated at least A-1/P-1</td>
<td>Y</td>
</tr>
<tr>
<td>Unrated Market Funds comparable to a A-1/P-1 sister fund</td>
<td>Y</td>
</tr>
</tbody>
</table>

VII. RISK MANAGEMENT

Liquidity Risk
The weighted average maturity shall not exceed 20 days. All money market funds must provide daily liquidity.

Credit Risk
A commercial paper issuer must be on the approved credit list or approved by the Chief Investment Officer before purchasing. Market and issuer news are reviewed daily by the Senior Investment Officer – Global Fixed Income. Money market funds must regularly send a holdings report to SERS, where it is reviewed on a regular basis.

Issuer Risk
Single issuer commercial paper investments are limited to $20 million. Related entity commercial paper investments are limited to the lower of 30% of the short-term account or $40 million. Overnight commercial paper issuer maturities are limited to $50 million.
IMPLEMENTATION GUIDELINES – Opportunistic and Tactical

I. ROLE

The role of SERS’ opportunistic portfolio is to earn a return above the Bloomberg Barclays US Aggregate Bond Index + 2% by investing in assets and strategies that do not fit within the existing asset classes. The investments are defined as tactical or non-traditional investment opportunities.

II. ASSET ALLOCATION

SERS’ Statement of Investment Policy sets the opportunistic target allocation at 0%, with a range of 0% to 5%.

III. BENCHMARK

The opportunistic benchmark is the Bloomberg Barclays US Aggregate Bond Index + 2%.

IV. PERFORMANCE OBJECTIVE

The performance objective of the opportunistic portfolio is to earn a net of fee return in excess of the Bloomberg Barclays US Aggregate Bond Index + 2%, with a meaningful component of the total return coming from current income.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The opportunistic portfolio may consist of a wide variety of investment types, structures and strategies targeting cash yield as well as price appreciation. Investment strategies include separate accounts, commingled funds, ETFs, co-investments and derivatives.

VI. PERMISSIBLE INVESTMENTS

Permissible investments include, but are not limited to, common stock, preferred stock, debt securities, currencies, commodities, etc.

VII. RISK MANAGEMENT

Leverage
Leverage will be prudent for the given strategy and consistent with the fund’s offering memorandum.

Liquidity
Liquidity will be monitored regularly to ensure the portfolio can be traded or rebalanced within a reasonable timeframe. Liquidity risk will be managed through target allocations to private and public market assets as well as through portfolio design.

Currency
The opportunistic portfolio does not directly hedge foreign currency risk and relies upon its external managers to determine if such hedges are appropriate.
I. ROLE

SERS invests in overlay strategies that trade derivatives of the Total Fund’s underlying asset exposures and currency exchange rates to enhance Total Fund portfolio’s efficiency. The overlay program includes i) tactical asset allocation rebalance, and ii) active currency strategies.

The tactical asset allocation strategy aims to add value to the Total Fund performance through long and short positions based on short-term relative attractiveness of assets.

The active currency strategies aim to add value to the Total Fund on a risk-adjusted basis by employing long and short positions in various currency pairs based on relative attractiveness of the currencies. The strategies are expected to have low correlation to the major asset classes such as US equity and fixed income.

II. ASSET ALLOCATION

The target allocation of the tactical asset allocation and currency program is 0% since long and short positions net out.

The tactical asset allocation program’s notional exposure limit is +/- 7% of the Total Fund to each of the following assets: US fixed income, US equity and Non-US equity. Since the tactical asset allocation positions are employed for short periods, the notional exposures are not subject to the policy asset allocation ranges set forth in the Statement of Investment Policy; however, the active risk contribution by the overlay program as a whole is subjected to the overall guideline on active risk for the management of the Total Fund specified in the Risk Management Policy.

The notional value of the active currency program is capped at 50% of the Non-US equity portfolio’s value.

III. BENCHMARK

The benchmark for the tactical asset allocation and currency overlay program is 0% since net exposure is 0%.

IV. PERFORMANCE OBJECTIVE

The overlay program is expected to add 5 to 10 bps of excess return to the Total Fund’s performance on a three to five year horizon.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The mandates are unfunded. The overlay strategies buy (long) or sell (short) futures or forwards contacts to get exposures to desired markets in order to exploit shifts in relative valuation of assets and currencies.

The tactical Rebalancing strategy’s net exposures, sum of long and short positions, are valued at zero on the initiating position time. Active currency strategies can go either net long or net short US dollar. Both tactical rebalancing and active currency aggregate portfolios are constructed to have no dependency on any single risk factor.

VI. PERMISSIBLE INVESTMENTS

Tactical asset allocation: equity futures and fixed income futures.

Currency overlay: currency forwards, currency futures, gold forwards, gold futures, limited currency options.
VII. RISK MANAGEMENT

Counter-party risk management:

• Futures and exchange traded options are traded at exchanges thus having default risk only to the clearinghouse while having no credit risk to trade counterparties.

• Forward contacts and over-the-counter options entail default risk of the counterparties. Counterparty risk of these contracts is managed through ISDA (International Swaps and Derivatives Association) and EMIR (European Market Infrastructure Regulation) umbrella agreements with managers.

Volatility management:

• The tactical asset allocation program’s tracking error range is 5 to 15 bps.

• All active currency strategies have targeted tracking error equal to or less than 8%; the aggregate active currency program’s tracking error is expected to be in the range of 5 to 8%.
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SOURCES

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**Cash Equivalents:**
Glossary
**Active Risk** - also known as Tracking Error, describes how a portfolio’s performance is different from its benchmark; and is measured by the standard deviation of the differences in returns of the actual portfolio and the benchmark portfolio.

**Alpha** – the premium an investment portfolio earns above a certain benchmark (such as the Standard & Poor’s 500 Index). A positive alpha indicates the investor earned a return in excess of the index return.

**Asset Allocation** – the practice of allocating a certain percentage of a portfolio between different types of investment assets, such as stocks, bonds, real estate, cash, etc. By diversifying among asset classes it is expected to create a favorable risk/reward ratio for the portfolio.

**Bloomberg Barclays US Aggregate Bond Index** – a market capitalization weighted US bond index published by Bloomberg LLC. Most US traded investment grade bonds are represented in the index. The Bloomberg Barclays US Aggregate Bond Index is SERS’ global fixed income policy benchmark.

**Basis Point** – one hundredth of one percent. For example, an addition of 40 basis points to a yield of 7.50 percent would increase the yield to 7.90 percent. Basis points are normally used when quoting yields or returns, alpha, or fees paid to investment managers.

**Benchmark** – a measurement or standard that serves as a point of reference by which portfolio performance is measured. Benchmarks must meet standard criteria.

**Burgiss All Private Equity (BAPE)** – BAPE is comprised of data from more than 5,000 private equity funds contributed by limited partners that are Burgiss clients and use Burgiss’ web-based institutional portfolio management platform Private i. The benchmark data is sourced from Burgiss’ limited partner clients and includes complete transactional and valuation history between the limited partner and their fund investments. Burgiss publishes a detailed breakdown of the dataset every quarter allowing for increased transparency.

**Citigroup 30-day T-Bill Index** – an index that measures the rate of return for 30-day US Treasury Bills, which are considered representative of the performance of short-term money market instruments. The Citigroup 30-day T-Bill index is SERS’ policy benchmark for Cash Equivalents.

**Co-investment** – a direct investment in a single asset of a multi-asset Fund, made alongside the Fund's investment in the asset; typically involves terms that are more attractive terms and shorter time frames than those of the Fund.

**Derivatives (Derivative Instruments)** – financial instruments (securities or contracts) whose values are derived from underlying financial assets, indices or other instruments. Derivative performance is based on the performance of assets, interest rates, currency exchange rates and various domestic and foreign indices underlying the instruments. The common forms of derivatives are forward, futures, swap and options contracts.

**Diversification** – the method of reducing risk by distributing investment assets among a variety of investment securities which have different risk/ reward ratios.

**Due Diligence** – an investigation or audit of a potential or existing investment.

**Equity Investment** – claims held by the residual owners of a firm. May also be referred to as common stock. Investments in Real Estate and certain Private Markets classifications may also be considered equity.

**Fixed Income Investment** – a security issued by a borrower that obligates the issuer to make specified payments to the holder over a specific period. May also be referred to as “debt” or “bonds.”

**Fund** – fund means a limited partnership, trust or commingled investment vehicle in which SERS invests or may invest (e.g., hedge fund, private equity fund, or real estate fund).

**Global Equities** – reflects the consolidation of what had been treated by SERS as US Equity and Non-US Equity asset classes; includes equities of US and non-US origin, equities of various capitalizations (e.g., large cap, small cap, mid cap, etc.), equities from developed, emerging and frontier markets, growth and value
equities and passive and active strategies. Investments in Global Equities strategies are made in accordance with established investment guidelines, and amended as necessary, by mutual agreement between the Chief Investment Officer and the Investment Consultant.

**Guidelines** – refers to an Investment Manager's "Investment Guidelines," established between the Investment Manager and Staff as part of an investment management agreement. Guidelines may be general or specific.

**Hedge Fund** – a private investment partnership or an offshore investment corporation in which the general partner has made a substantial personal investment and whose offering memorandum allows for the Fund to take both long and short positions, using leverage and derivatives and invest in many markets. Hedge funds often use strategies involving program trading, selling short, swaps and arbitrage.

**HFRI Fund of Funds Composite Index** – published by Hedge Fund Research, Inc., the HFRI Fund of Funds Composite Index is an equally weighted index of funds of hedge funds, offshore and onshore. Funds in the index must have at least $50 million under management or must have been trading actively for at least 12 months.

**Investment Committee** – a committee comprised of the Chief investment Officer and Investment Officers from SERS' Investment Department who possess the Ohio State Retirement System Investment Officer (SRSIO) license, with clearly defined structure, rules and procedures for reviewing and approving investments in a timely and prudent fashion.

**Investment Consultant** – any consultant hired by the Board or by Staff to advise or assist with the Investment Program in accordance with the Statement of Investment Policy. Board investment consultants must be approved by the Board. Staff investment consultants shall be approved by the Executive Director.

**Investment Manager** – a manager or potential manager of SERS assets, both public market and private market. Includes, but is not limited to managers of equity, fixed income, private equity, real estate, hedge funds, commodities and cash.

**Investment Staff** – members of the investment department of SERS, including the Chief Investment Officer, Investment Officers and other department personnel.

**Leverage** – in investments, this is the control of a large amount of money by a smaller amount of money, such as buying on margin. In finance, this is the relationship of debt to equity on a company’s balance sheet in the form of the debt/equity ratio.

**LIBOR** – London Interbank Offered Rate, the interest rate that is commonly used as the benchmark reference rate for lenders. The 3-month LIBOR is the reference rate utilized by Staff.

**Long a futures contract or a forward contract** – buying exposure to the underlying assets of the contract without actually owing those assets. When the underlying assets deliver a positive return, the long position gains; when the underlying assets deliver a negative return, the reverse is true.

**Morgan Stanley Capital International – All Country World Free ex-USA Index ($Net)** – an equity index representing 44 developed and emerging countries. “Free” indicates the index reflects actual investable opportunities for global investors by taking into account local market restrictions on share ownership by foreigners. “Net” indicates that dividends are reinvested after the deduction of withholding taxes applicable to non-resident institutional investors. The MSCI-ACWI ex-USA Index, net of dividends reinvested is SERS’ policy benchmark for Non-US Equities.

**Multi-Asset Strategies** – active investment strategies that aim to generate absolute returns with managed volatility, using all types of investable securities (equities, bonds, commodities, currencies, derivatives, etc.). These strategies typically apply non-traditional portfolio management techniques including, but not restricted to shorting securities, leverage, arbitrage and creating synthetic exposures using financial instruments. In addition, funds in this portfolio may tactically allocate across asset classes and/or geographical regions depending upon the relative attractiveness of the respective asset classes. Generally, multi-asset strategies have low to medium correlation with global equities and much lower volatility.
NCREIF Property Index (NPI) – a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only. The NCREIF Property Index is a component of SERS’ Global Real Estate Policy Benchmark.

Opportunistic and Tactical Investments – global opportunistic investments are tactical or non-traditional investment opportunities that may be short-term or may not fit within the generally accepted risk/return parameters of specific asset classes or strategy groupings. Such opportunities may involve capitalizing on short-term market dislocations or other such unique situations. Tactical investments may include strategies with dynamic allocations to single assets or across multiple asset types or other innovative approaches.

Options contract - a form of financial derivatives. In an options contract, two parties (buyer and seller) agree that the buyer, who pays an option premium to the seller, has the right to exercise an option whether or not to buy or sell a particular asset at a specified price at a specified future date.

Portfolio – a collection of investments owned, managed, or overseen by an individual or investment manager, a board or an organization. Portfolio can mean a manager account or subset thereof (e.g., Goldman Sachs Core Plus account), an asset class (e.g., US Equity), or the entire fund (e.g., SERS’ Total Fund).

Rebalancing – adjusting asset class or portfolio allocations relative to their targets or ranges to adjust for actual or anticipated market movements.

Russell 3000 Index – a market-value weighted equity index published by the Frank Russell Company. The index measures the performance of the 3,000 largest US companies in terms of market capitalization. The Russell 3000 Index is SERS’ Domestic Equity Policy Benchmark.

Secondaries – pre-existing investor capital commitments to private funds that are purchased in the secondary market.

Short a futures contract or forward contract – selling exposure to the underlying assets of the contract without transferring the ownership of those assets to the buyers. When the underlying assets deliver a positive return, the short position losses; when the underlying assets deliver a negative return, the reverse is true.

Style – style refers to an investment product, strategy or style offered by an Investment Management Firm and reflects how the assets are invested. For example, value versus growth; core versus value added; quantitative versus fundamental; etc.

Total Fund – refers to SERS’ total investment assets.

Tracking Error – otherwise known as active risk (see Active Risk).