2022 ANNUAL INVESTMENT PLAN

For the Year Ended June 30, 2022

School Employees Retirement System of Ohio
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SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO
ANNUAL INVESTMENT PLAN

For the year ended June 30, 2022

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Serving the People Who Serve Our Schools®

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Executive Summary

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) 2022.

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 FY2022. 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 FY2021 OBJECTIVES AND IMPLEMENTATION

The general objectives of the Investment Department for FY2021 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.*

  Changes made to the structure of the Fixed Income portfolio and increased allocations to credit and high yield, post-pandemic, in 2020 helped improve performance relative to the benchmark, and reverse underperformance in FY2020. For FYTD, March 2021 Fixed Income returns were positive compared to a negative return for the benchmark and exceeded the benchmark by 3.48%. Underweighting the Fixed Income allocation relative to policy target as interest rates rose from the March 2020 lows also contributed to excess returns at the Total Fund level. Overweighting Global Equities also contributed to excess returns relative to the Total Fund benchmark. For FYTD March 2021, the Total Fund net return was 20.17% which exceeded the benchmark by 2.33%.

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

  Staff has approved new commitments of $650 million to Private Credit managers to ramp up the allocation to the interim target of 3% for this new asset class approved in FY2020. Currently, the Private Credit allocation has increased to 1.84% and is expected to move closer to the target as capital commitments are called and invested. MAS allocation has been reduced to 1.6% and will be further reduced to 0% by end of fiscal 2021 as approved in the new Asset Allocation plan. MAS managers with strong performance have been retained in the Fixed Income and Opportunistic asset classes and have contributed to performance in these portfolios. The US Equity and Non-US equity allocations, which was 50%/50%, was consolidated into a Global Exposure with allocation targets and ranges for US Equity, Non-US Developed markets, and Emerging Markets. This will provide a better alignment with current market weights of these segments in the Global Index and flexibility for staff to manage tactical allocations.

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

  The Board approved extending the existing General Investment Consultant's agreement for a five-year term through June 30, 2026.

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

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

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

  Staff did not believe it prudent to implement this strategy during the heightened market volatility in 2020 due to the COVID induced shut down. Since the upward trend in interest rates is expected to continue as the economy picks up, this strategy may be on hold until favorable conditions emerge.

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

EXECUTIVE SUMMARY

Staff was able to function at a high level remotely since March 2020, with daily calls, strategy meetings and holding Investment Committee meetings to approve new transactions. Team function and cohesion appear to have been sustained through this period. Following the retirement of the Senior Investment Officer of Real Assets, a recruitment was conducted and a candidate selected to fill this role as of June 2021. Steve Price was promoted to Assistant Director since that role fell vacant with the aforesaid retirement.

FY2022 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.
- Continue to implement the asset allocation framework and targets approved by the Board in FY2020, specifically, increase allocations to Private Credit, Private Equity and Real Assets on a selective basis.
- Research new strategies in renewable energy, infrastructure, and commodities and implement on a selective basis.
- Re-engage the investment team as they return to the office to maintain strong investment culture and team work.

CONCLUSION

Capital markets have rebounded from the lows of March 2020 and reached new heights helped by the massive federal stimulus, low rates, and economic activity picking up after successful roll out of vaccinations. When markets are richly valued prospective returns are diminished. As of March 31, 2021, SERS' Total Fund has net returns of 10.6% over five years and 8.6% over ten years exceeding the actuarial rate of 7.5%. Future returns will most likely be lower than these figures. Staff will remain focused on adding value relative to policy benchmarks and managing risks and costs.

Staff appreciates the support and guidance received from the Board in FY2021 and looks forward to working with the Board in FY2022 for another successful year.

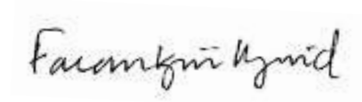
ACKNOWLEDGEMENTS

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
- Global Fixed Income – Jason Naber
- Global Private Credit – Adam Messerschmitt
- Global Real Assets – Michael Browning
- Cash Equivalents & Securities Lending – Jason Naber
- Opportunistic and Tactical – Farouki Majeed, Phil Sisson, Michael Browning, Dustin Matthiessen and Adam Messerschmitt
- Overlay Program – Farouki Majeed, Jason Naber and Judi Masri
- 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 2021 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

GLOBAL ECONOMIC OUTLOOK

The global economy continues to recover from the severe recession caused by the COVID-19 pandemic in 2020. Although the world GDP shrank 3.3% and the US economy declined 3.5% in 2020, the economic recovery is gaining momentum in the US since Q3 2020. The global economic recovery has been aided by accommodative monetary policy of the Federal Reserve (Fed) and other central banks, as well as by massive fiscal stimulus in the US and other major economies.

In response to the pandemic induced recession, the Fed reduced rates to zero and injected liquidity by purchasing Treasury bonds and other securities. The Fed has continued its easy monetary policy to support the recovery. The US Government also stepped in with several fiscal stimulus packages totaling $5 trillion as of March 2021 in order to protect payrolls, expand unemployment benefits and provide funds to small businesses, education, and public health entities impacted by COVID-19 measures. The US government has also effectively conducted the COVID-19 vaccination rollout. As of May 2, 2021, according to the CDC, 31.6% of the US population was fully vaccinated and 44.3% of the US population received at least one vaccine dose. The US economy recovered 33.4% in Q3 and 4.3% in Q4, 2020. The recovery accelerated again in 2021 with a growth rate of 6.4% in Q1, and an expected rate of 8.7% for Q2, according to the Blue Chip consensus. The US labor market has improved significantly since March 2020; the unemployment rate decreased from 14.7% in April 2020 to 6.0% in March 2021.

Equity markets bounced back from the lows and finished 2020 with gains. For 2020, US equity markets gained 20.89% and non-US equity markets returned 10.65%. The credit market has also significantly improved. Credit spreads have narrowed to a level lower than their historical averages. The yield curve has steepened significantly as the US 10-year yield increased from 0.6% in June 2020 to 1.74% in March 2021 while the short-term rate has remained close to 0%. US consumer sentiment improved from the lows to 84.9 in March 2021 but remained below its historical average. While fiscal spending undertaken by the US government fuels the short-run growth, it will lead to a spike in deficits and add to the already high level of US Federal debt, likely causing inflation acceleration and devaluation 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 expects the US economic recovery to accelerate further in the second half of 2021, and slow in 2022. Growth rates are expected to be 6.3% for 2021 and 4.3% for 2022.

According to the Blue Chip Economic forecasts, labor markets are expected to improve significantly in 2021 and 2022 as the unemployment rate is expected to decline to 5.4% in 2021 and continue to fall in 2022 to 4.2%, a level close to the natural unemployment rate (Table 1). Inflation is expected to increase to 2.5% in 2021 then decline to 2.2% in 2022. The yield on 10-year US Treasuries is expected to rise to 1.7% in 2021 and increase further to 2.0% in 2022. US corporations are expected to earn profits of $14.2 trillion in 2021 and $5.4 trillion in 2022.

Table 1

Period	Unemployment Rate	Inflation Rate CPI	T-Bill 3-Mo.	T-Note 10-Yr.	Corporate Profits (Cur. $)
2017	4.3	2.1	0.9	2.3	4.5
2018	3.9	2.4	2.0	2.9	6.1
2019	3.7	1.8	2.1	2.1	0.3
2020	8.1	1.2	0.4	0.9	-6.6
2021 Consensus Forecast	5.4	2.5	0.1	1.7	14.2
2022 Consensus Forecast	4.2	2.2	0.2	2.0	5.4

Source: Blue Chip Economic Indicators, April 2021

GLOBAL ECONOMIC OUTLOOK

Global Economy:

The global GDP is projected by the IMF to recover strongly in 2021 with a growth rate of 6.0% (Table 2). For 2021, emerging and developing economies are expected to grow faster than advanced economies as the former's growth rate is expected at 6.7% while the latter's is expected at 5.1%. The US growth rate is projected to be 6.4%, significantly more favorable than 4.4% in the Euro-area. For 2022, global growth is expected to slow down yet remain at a healthy level of 4.4%. The US and Euro-area are expected to grow 3.5% and 3.6%, respectively. The emerging and developing economies are expected to maintain their growth advantage with a 5.1% growth rate.

Table 2

Annual GDP Growth	2020 (estimated)	2021 (projected)	2022 (projected)
World	-3.3	6.0	4.4
US	-3.5	6.4	3.5
Advanced Economies (including US)	-4.7	5.1	3.6
Emerging and Developing Economies	-2.2	6.7	5.0

Source: International Monetary Fund World Economic Outlook, April 2021

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:

	Total Fund Target	Permissible Range
Global Equities	45%	35% - 55%

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

- Global Equities: Exceed the return on the combined US Equity and Non-US Equity composite benchmark composed of 55% Russell 3000 Index, 30% MSCI World ex-USA Net Total Return Index (USD) and 15% MSCI Emerging Markets Net Total Return Index (USD), net of manager fees. The target excess return is 28 basis points over three-year rolling periods.
- US Equities: Exceed the return on the Russell 3000 Index, net of manager fees. The target excess return is 10 basis points over three-year rolling periods.
- Non-US Developed Market Equities: Exceed the return of the MSCI World ex-USA Net Total Return Index (USD), net of manager fees. The target excess return is 50 basis points over three-year rolling periods.
- Non-US Emerging Market Equities: Exceed the return of the MSCI Emerging Market Net Total Return Index (USD), net of manager fees. The target excess return is 50 basis points over three-year rolling periods.

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION

FY2021 Annual Investment Plan objectives and related activities are as follows:

- *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.*

  After performing well last FY and into fall 2020, the US Equity portfolio began underperforming as small cap and value stocks soared in November 2020. US Equities underperformed by 1.86% FYTD through March 2021. This underperformance was caused by active managers in the large cap and small cap sectors. This was a difficult period for active management as the markets rallied strongly powered by the technology and growth sectors, which then shifted sharply to favor value stocks. Staff continues to review the portfolio structure and manager exposures particularly in large cap to improve performance. The index exposure in the large cap sector has continued to increase with corresponding reduction in active management. While the current year was negative for small cap performance, longer term the small cap composite has outperformed its benchmark.

  The Non-US Equity Developed Market portfolio has outperformed by 5.29% FYTD through March 2021. Staff added a new 130/30 long/short strategy in November to enhance active performance. The two managers added in late 2019 have contributed to the excess performance. Finally, Non-US small cap growth managers are being reviewed for a possible addition to the portfolio.

  The Non-US Equity Emerging Market portfolio has outperformed by 6.64% FYTD through March 2021. Due diligence is currently being conducted on a China A-Share strategy, which would be the first dedicated country specific strategy within the public market portfolio.

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

  Global Equity risk has declined so far this FY with a 0.98 active risk as of February 2021. The Emerging Market portfolio has the most risk, followed by Non-US Developed markets. This is due to a combination of riskier Non-US markets, currency fluctuations and utilizing more active management in Non-US markets. US equity risk is kept in check by employing mostly passive management. The US portfolio is 66.5% passive whereas Developed Equities are 31.2% passive and Emerging Markets are 100% active.

The US Equity portfolio's overall beta of 0.97 shows its defensive nature. SERS' US large cap active managers only have a beta of 0.81. This low active beta has been a big headwind in the market rally this year as for every $1.00 in US Equity benchmark increase, our active managers only increase $0.81. Staff has not redeemed from these defensive active managers as their valuations are cheap.

The Non-US Equity Developed portfolio has a beta of 1.0 and the Non-US Equity Emerging Market portfolio has a beta of 1.03. Both of these portfolios have performed well in the current up-trending market.

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

In US Equities, large-cap growth equities worked well until November when small-cap value equities became favored. Staff redeemed $95 million from growth equities while contributing $85 million to value equities during the first quarter of 2021 to move the portfolio away from its growth bias. The US equity portfolio growth tilt lowered from 6.57% in December 2020 down to 1.22% overweight in March 2021 on a mandate level due to these portfolio changes.

In Non-US Equity Developed Markets, $25 million was added to growth equities in July. Similar to US Equities, the growth factor performed well until November. Staff redeemed $60 million in growth equities in 2021 so far while adding $55 million to value equities. Hence, value equities increased by 2.5% in our Developed Market large cap portfolio due to contributions directed by Staff.

In Non-US Equity Emerging Markets, $100 million was added during the first seven months of the FY while emerging market returns rose. Emerging returns fell 1.5% in March, so Staff redeemed $75 million in early April.

- *Review IMAs and Investment Guidelines on the review schedule and make necessary adjustments as needed.*

One US equity and one Non-US emerging market manager IMA were fully renegotiated during the current fiscal year.

CURRENT MARKET CONDITIONS AND OUTLOOK

Cumulative Periods through March 31, 2021		Annualized Returns (in percent)			
	FYTD	1 Year	3 Year	5 Year	10 Year
Russell - 3000 Index	33.19	62.53	17.12	16.64	13.79
Russell - 3000 Growth Index	28.38	64.31	22.39	20.88	16.35
Russell - 3000 Value Index	38.26	58.38	10.99	11.87	10.91
Russell - 1000 Index	31.82	60.59	17.31	16.66	13.97
Russell - 2000 Index	55.36	94.85	14.76	16.35	11.68
MSCI - AC World Index ($Net)	29.68	54.60	12.05	13.21	9.14
MSCI - AC World Ex-USA Index ($Net)	28.67	49.41	6.51	9.76	4.93
MSCI - World Ex USA Index ($Net)	26.46	45.86	6.34	8.92	5.21
MSCI - Emerging Markets Index ($Net)	34.13	58.39	6.48	12.07	3.65

Source: Wilshire Compass　　Fiscal years begin July 1 and end on June 30

Global equity markets experienced strong returns since the March 2020 market decline prompted by the coronavirus-related economic shutdown. Developed market governments, led by the US, implemented quick fiscal stimulus that sent markets rallying. Global markets continued to rise through March 31, 2021. The US market is the top performer amongst world equities again for the last year, keeping its lead over all time periods. However, the US market leadership gap has closed significantly. In fact, Non-US Developed and Emerging markets posted higher returns during the last quarter of 2020 than the US. With US Democrats in full power and the US suffering from COVID-19 resurgence over winter, a new government stimulus bill was passed, which sent US markets to all-time highs. A more detailed summary of the FYTD follows for US and Non-US markets.

Strong US market returns were helped by broad government stimulus passed to offset COVID-19 pandemic effects. Large-cap growth equities, led by technology, topped the market through early Fall 2020 just like most of the last decade. With COVID-19 vaccine announcements in November 2020, US small-cap value equities posted the strongest returns. As markets saw the end of COVID nearing, interest rates also began climbing. Rising interest rates hurt technology stocks and helped bank and value cyclical stocks. This led to value beating growth FYTD by almost 10% and US small cap, represented by the Russell 2000 Index, beating large capitalization stocks by 23.5%. Consumer discretionary and energy were the top two performing sectors in the US over the last year with a 96.88% and 82.89% return, respectively.

Non-US Equity Developed Markets posted a 26.46% return FYTD, but longer-term returns are only in the mid-single digits. Helped by currency effects and a resurgence of value equities, Developed Markets posted a 15.85% return for the 4th quarter of 2020 outperforming the US by 1.17%. Consumer discretionary and materials were the top two performing sectors in Developed Markets ex US over the last year with a 69.42% and 68.84% return, respectively.

Non-US Equity Emerging Markets posted a 34.13% return FYTD, topping both US and Developed Market equity returns. Emerging markets still significantly trail US equity over three-, five- and ten-year periods. Asian emerging markets, which controlled COVID-19 well, performed the best FYTD. Top performers were Taiwan with a 90.70% gross return and South Korea with a 90.56% gross return. China A-Shares returned 49.92% FYTD.

The global equity market outlook is positive as vaccine measures are initiated around the globe, allowing recoveries from lock-down. The IMF expects Global GDP to grow 6% this year while US GDP is expected to grow 6.4% in 2021. US companies are expected to post near 20% earnings increases from a very low base last year due to COVID-19. Spurred by low rates from global monetary and fiscal stimulus, investors have turned to equities for return. First quarter 2021 had a record global equity inflow of $334 billion, easily beating the previous high of $142 billion in the first quarter of 2013. Markets could decline as global valuations are stretched or if vaccines do not curb COVID-19, but positives outweigh the negatives in 2021 for equities.

PORTFOLIO STRUCTURE

At the end of March, Global Equity was overweight the 45% target allocation by 4.84% as follows:

- The US portfolio was 3.02% underweight relative to its 55% Global Equity target allocation,
- The Non-US Developed Market portfolio was overweight by 1.83% relative to its 30% Global Equity target allocation and
- The Non-US Emerging portfolio was overweight by 1.19% relative to its 15% Global Equity target allocation.

Global Equities will likely remain overweight for the next FY as equities are expected to outperform fixed income and cash. Redemptions will occur for pension benefits and for alternative capital calls as these asset classes ramp up allocations. FYTD, $295 million in Global Equity redemptions have occurred.

Even though $140 million was contributed to value equity mandates during the first quarter of 2021, Global Equities still has a growth style bias. Staff plans to add to value equity exposures gradually if value continues outperforming. We also remain overweight to small capitalization stocks, which is expected to continue as small caps are outperforming. The US portfolio is currently 66.5% passively allocated, which is expected to gradually increase through the next FY if active management continues to underperform passive. In Non-US, we are 31.23% passive in Developed markets and 100% active in Emerging markets as active management is more successful in Non-US Equities.

FY2022 OBJECTIVES

Staff will focus on the following objectives during FY2022:

PORTFOLIO STRATEGY - Global Equities

- Monitor the portfolio for possible performance enhancement. Compare SERS active managers to peers and conduct any manager searches, if appropriate.
- Complete the Non-US Equity Developed Market Small Cap and Emerging Market Dedicated China A-Share searches. Research and identify other new and innovative investment opportunities with managers who offer compelling return expectations.
- Ensure the global equity portfolio has appropriate risk and return characteristics given the continued Global Equity rally.
- Regularly evaluate and rebalance the Global Equity Portfolio to ensure that country exposure, management mix, capitalization weight, and style orientation are appropriate and make recommendations as necessary.
- Review IMAs and Investment Guidelines on the review schedule and make necessary adjustments as needed.

PORTFOLIO STRATEGY – Global Private Equity

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:

	Target	Permissible Range
Global Private Equity	12%	8% - 16%

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

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 Annual Investment Plan objectives and related activities are as follows:

- *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.*

  Staff has been actively working toward this goal and to date nearly $200 million has been committed to four private equity opportunities. Staff is continuing due diligence on a fifth opportunity and anticipates bringing a recommendation before the Investment Committee in May 2021. Should this fifth investment opportunity be approved, total private equity commitments will increase to $250 million for the fiscal year. $250 million is on the upper limit of the typical private equity annual pacing of $150 million to $250 million per fiscal year.

- *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 three commitments have been made to private equity funds with an average management fee of 2%. Additionally, one commitment has been made to a co-investment that has no management fees or carried interest. Together the average management fees on all approved commitments is 1.5%. 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 January 2021. The private equity portfolio has a total of five co-investments totaling approximately $54 million. The co-investments are in various stages of their life cycle and are generating an IRR of 21% and a 1.7x 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 the fiscal year 2021. One opportunity met the investment criteria and SERS committed $50 million to this new manager in December 2020.

PORTFOLIO COMPOSITION

	Commitments as of March 31, 2021	Target Range
Buyout	83%	75%
Venture Capital	2%	0%
Special Situations	15%	25%
Domestic	75%	75%
International	25%	25%

PORTFOLIO STRATEGY – Global Private Equity

CURRENT MARKET CONDITIONS AND OUTLOOK

Despite an economic slowdown triggered by a global pandemic, private equity emerged from 2020 relatively unscathed. Private equity investment activity fell sharply in April and May, however, the environment changed dramatically in the second half of the year as market conditions improved and private equity investors put large amounts of capital to work. The resulting annual totals for private equity demonstrate that 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 has raised the bar for investors looking to create value. Fund-raising totals may be the only indicator that point to the underlying volatility present in the industry throughout the year. Although returns are still attractive, they continue to come under pressure as the industry matures and competition intensifies. Taking a closer look at the data we see that after falling off in the first half of the year, the private equity industry raced to the finish line completing over $590 billion in transactions in 2020. Overall, the year observed an 8% increase in transactions from the prior year. Highlighting the level of the second half of the year activity, $410 billion of the $590 billion total was completed in the third and fourth quarters. Nevertheless, the total volume of deals completed fell to approximately 3,100 in 2020 representing a 24% decrease from the 4,100 transactions completed in 2019. The rise in dollar volume combined with the decrease in transactions highlights the ever increasing transactions sizes in the marketplace with the average deal size coming in at approximately $776 million. This is also reflective of another growing trend in the marketplace that has larger firms seeking out bigger transactions so that they can move the needle in their large and mega sized funds. The increase in deal flow is a direct result of the abundance of low-cost debt financing and the estimated $2.9 trillion of dry powder available across all fund types and all geographies at the end of 2020. The intense competition for assets has led to growth in purchase price multiples and made it very difficult for private equity firms to find and purchase companies. Purchase price multiples have risen from 8.5 times earnings in 2010 to an average of 11.5 times earnings in 2020. Nevertheless, the same factors that complicated deal making paved the way for an excellent exit market for private equity funds in 2020. Exit activity in 2020 followed a similar pattern as many sellers sat on the sidelines in the first half of the year and then picked up their activity levels in the second half. The result was that just over 1,000 exits were completed in 2020 for a total value of $427 billion. This was on balance with 2019 and in line with the five-year average. The first half of the year slowdown in activity also affected the fundraising market as private equity funds raised a total of $989 billion in 2020, down from a record high $1.1 trillion in 2019. Buyout funds once again led the way closing on over $300 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.

Annualized Returns (in percent)) for Periods Ended March 31, 2021				
Fund Type	**1-Year**	**3-Years**	**5-Years**	**10-Years**
SERS Private Equity	24.53	17.62	17.57	16.55
Burgiss Benchmark	23.79	15.89	15.00	14.60

Source: Burgiss All Private Equity Index

After successfully navigating the events of 2020, the outlook for private equity in 2021 is positive. In the near term, the industry could be influenced by a wide range of factors that may include the economic effects of exiting a global pandemic, increased valuations, 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 accelerate in 2021 as sellers seek to take advantage of increased valuations and investor appetite for private equity continues to rise. As mentioned earlier, the increased price expectations for sellers has resulted in the average private equity firm paying a higher price 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 full impact of the pandemic on private equity still remains to be seen. However, navigating through the pandemic required firms to pay close attention to portfolio operations and in some cases reassess their approach to value creation. Top private equity firms understand and displayed their ability to create and maintain value in portfolio companies under difficult conditions in 2020, generating an opportunity for investors to more easily separate the top private equity firms from the rest of the pack. 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: 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 asset 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.

FY2022 OBJECTIVES

Staff will focus on the following objectives during FY2022:

- Manage the private equity portfolio and fiscal year commitments to reflect the increased investment allocation of 12% of the Total Fund 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 and innovative investment opportunities with managers who offer compelling return expectations. These new opportunities may be used for a combination of purposes to replace current managers who no longer meet SERS' investment criteria or to target strategies that are not currently a directly invested component of the private equity portfolio. Current areas of interest under consideration include China and Asia focused private equity, niche venture capital, GP led secondaries and investments managed by emerging and minority managers.

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:

	Target	Permissible Range
Global Fixed Income	19%	12% – 26%

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 FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 Annual Investment Plan objectives and related activities are as follows:

- *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.*

  The Tactical and Diversifying sector was funded in July 2020 and currently holds three fixed income-oriented alternative strategies, two COVID-related opportunistic strategies as well as the emerging market debt and opportunistic high yield mandates. The sector's weight was 15% of the Fixed Income portfolio at the end of March. The sector has been a strong contributor to portfolio FYTD performance while also bringing down absolute portfolio risk through diversification.

- *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.*

  Since implementation at the beginning of the fiscal year, the Tactical and Diversifying sector has significantly improved the return/risk and the information ratios of the Fixed Income portfolio. The quick recovery in asset prices post the 2020 lockdown has been a strong tailwind for these out-of-benchmark exposures. Overall, Staff continues to closely monitor the portfolio risk and return and expects to reduce exposure to the Tactical and Diversifying sectors as markets continue to recover in 2021.

- *Review IMAs and Investment Guidelines to make necessary adjustments.*

  One amendment was made to a side letter agreement for a Tactical and Diversifying strategy. Additionally, in 2020 JPM began including China in the GBI-EM benchmark and Staff opened a new China account allowing the portfolio to trade Chinese bonds in the emerging market debt strategy.

CURRENT MARKET CONDITIONS AND OUTLOOK

The Bloomberg Barclays Capital US Aggregate Bond Index returned -2.12% for FY2021 through March 2021. The negative performance has been primarily driven by US Treasuries (UST), which was the poorest performing sector with a return of -4.88%. Negative performance in UST has been driven by rising interest rates and inflation expectations as the US economy continues to reopen in 2021. The benchmark 10-year US Treasury yield has risen from 0.65% in July 2020 to 1.74% at the end of March and is expected to be around 2.0% by the end of 2021. While high yield and emerging market debt were hit hardest in FY2020, they have seen the strongest FY2021 returns at 12.29% and 3.25%, respectively. High yield spreads have recovered to pre-pandemic lows and emerging markets stand to benefit from a weaker dollar and continued vaccine rollout in the second half of 2021. Investment grade corporates recovered quickly after March 2020 and returned 9.89% by December 31, 2021, but have since given back some of those gains with a fiscal year-to-date return of -0.23%. Residential mortgages returned -0.75% during the same period.

We have entered a period of positive macro data momentum as encouraging vaccine rollout allows for a meaningful pickup in growth in the second half of 2021. However, there are still large output and labor market gaps and limited prospects of seeing interest rate hikes in the coming year. With the exception of COVID-related sectors like airlines, hotels, and leisure, credit spreads have normalized and returned to pre-pandemic levels and default rates are expected to continue falling while recovery rates rise throughout 2021. Returns in fixed income are expected to be low to negative over the next several years due to a rising rate environment and slow long-term growth.

PORTFOLIO STRUCTURE

The fixed income portfolio is currently weighted 43% core, 42% core plus and 15% to Tactical and Diversifying strategies. 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. Given market expectations of rising interest rates, the portfolio has a short duration position.

Several new strategies were introduced to the portfolio at the beginning of the fiscal year when long/short credit, emerging market macro and fixed income arbitrage strategies were transferred from the MAS portfolio. Additionally, the portfolio made allocations to two opportunistic drawdown strategies, one focused on structured credit and the other corporate and emerging market debt. Along with the existing emerging market debt and opportunistic high yield strategies, these exposures constitute the Tactical and Diversifying sector that was created at the beginning of the fiscal year. This sector has had the desired effect of increasing performance and diversifying the sources of portfolio return relative to the Bloomberg Barclays US Aggregate Index. Staff will continue to monitor both markets and valuations and expects to be selectively overweight to certain fixed income sectors in fiscal year 2022.

FY2022 OBJECTIVES

Staff will focus on the following objectives in FY2022:

- Ensure the fixed income portfolio has appropriate risk and return characteristics given credit spreads have already recovered to pre-pandemic levels and interest rates are expected to continue rising.

- Tactically manage the allocations to core, core plus and Tactical and Diversifying sectors to enhance risk and return. Continue to research other potential new and innovative investment opportunities.

- 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 offered 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:

	Target	Permissible Range
Global Private Credit	3%	1% - 7%

The target allocation for Global Private Credit during the ramp-up period is set at 3% with a range of 1% - 7% for fiscal year 2022 and will increase to the policy target allocation of 5% with a range of 3% - 7% for fiscal year 2023.. The performance objective for global private credit is to produce net of fee returns in excess of the 3-month LIBOR + 4.5%.

In 2017, the Alternative Reference Rates Committee selected the Secured Overnight Financing Rate (SOFR) as the rate to replace USD LIBOR. It is expected that after December 31, 2021, market participants will no longer utilize the USD LIBOR as the reference rate in loan documentation. In addition, it is expected that the USD LIBOR tenors will no longer be published after June 30, 2023. Staff is monitoring the transition and may need to change the Global Private Credit benchmark from the 3-month LIBOR to the replacement benchmark, which is expected to be a form of the SOFR, at some point during the fiscal year. Once it is determined that a benchmark replacement is required due to the discontinuation of LIBOR, Staff will notify the Board that a change is needed.

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 Annual Investment Plan objectives and related activities are as follows:

- *Increase the private credit allocation toward 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.*

  Staff has made progress toward the fiscal year 2021 interim target allocation of 3%. To date, Staff has executed $683 million in new capital commitments and total unfunded capital commitments has increased to $870 million. An additional $400 million in new capital commitments has been approved by the Investment Committee but are pending the execution of legal documents. If the full amount of capital commitments is executed, the total amount of unfunded capital commitments will increase to nearly $1.3 billion. While Staff has made substantial progress toward ramping the portfolio, it will take time for the capital commitments to be called by the funds since most private credit managers draw investor capital evenly over a three or four-year period. Staff expects the ramp-up period to be longer than anticipated due to the time it takes for investor capital to be called in comparison to the original two-year ramp-up period for the portfolio. Therefore, Staff will extend the interim target allocation of 3% to the end of fiscal year 2022 and will increase the target allocation to 5% in fiscal year 2023. Staff continues to review investment opportunities that can be implemented within the private credit portfolio to reach the 5% target allocation.

- *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.*

  Staff has executed $583 million in capital commitments to investments that fall within the Direct Lending subasset class in order to bring that portion of the private credit portfolio closer to its target of 80%. The pending deals in the pipeline also fit within the Direct Lending subasset class. As the portfolio is ramped toward the target allocation and capital is called in the coming years, the subasset classes will fall within the ranges stated in the implementation guidelines. In addition, Staff has executed investments that are diversified across industries, geographies, and contain various types of private credit instruments. Most of the new investments have been made within the Direct Lending subasset class, which is primarily comprised of investments that are senior in the capital structure of a company, contain a contractual income component, are structured with robust covenants to protect investors, and have priority over a company's cash flows or other assets in the event of a default. In addition, Staff has primarily invested in fund vehicles that do not have fund level leverage to further control risk within the private credit portfolio.

- *Make new investments that serve a primary purpose of the private credit allocation to generate consistent income for the Total Fund.*

  All of the investments that have been executed or considered for the private credit portfolio include an income component, which is expected to comprise the largest part of the investment return. Most of the underlying investments within private credit funds include a contractual cash payment that is distributed to investors in the form of income on a quarterly basis. Staff also executed the first private credit co-investment, which includes a contractual cash income payment that SERS will receive.

CURRENT MARKET CONDITIONS AND OUTLOOK

The private credit market continued to grow in 2020 and reached $887 billion in assets under management as of June 2020. A total of $110 billion was raised within private credit funds during 2020, which was a decrease from $152 billion in 2019 and the first year-over-year decrease in capital raised since 2016. Similarly, the number of funds raising capital also decreased from 189 to 111 during 2020. Direct lending fundraising decreased the most out of the private credit strategies primarily due to the slowdown in private equity activity, while distressed and special situations strategies increased in size given the opportunity set brought about by the global pandemic. Private credit funds experienced markdowns early in 2020 in reaction to the volatility displayed in the public markets in anticipation of potential distress. However, as governments deployed stimulus into the economy and the economic outlook improved, valuations of private credit assets began to increase back toward par value. The tumultuous environment of 2020 tested the ability of private credit managers to navigate through a period of great uncertainty, but also provided a robust pipeline of lending opportunities. Despite the challenges that direct lending managers and their portfolio companies faced, the strategy continued to provide investors with an attractive yield close to 9%, which reflects a strong premium over the US High Yield market of 4.2% and the US 10-year Treasury of 0.9%. During the height of the market disruption brought about by the global pandemic, global leveraged loan yields quickly increased to 13.1% and lending within the syndicated bank loan market slowed, providing an opportunity for private credit managers to fill a lending void. Consequently, there was an increase in competition amongst private credit managers for larger deals valued at above $1 billion, leading to larger fund raises that could deploy capital in that part of the market. Given the influx of debt financing needs, many private credit managers experienced an increase in spreads, tighter loan covenants, and equity cushions, creating a more lender-friendly environment.

The outlook for the private credit market is positive with considerable growth expected through 2025. The low interest rate environment is expected to persist in the coming years and investors are hunting for higher yielding investments that private credit funds can offer. Historically, the US private credit market has been the focal point for fundraising activity, but other markets like Europe and Asia continue to increase in size. The impacts from the global pandemic are expected to be felt by middle market companies for some time, which will continue to provide lending opportunities for private credit managers.

FY2022 OBJECTIVES

Staff will focus on the following objectives in FY2022:

- Increase the private credit allocation toward 3% of the Total Fund by making new investments that fit the SERS' investment policy, 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, while considering different strategies that add further diversification to the portfolio, such as venture debt, specialty finance, emerging markets, or other niche categories.

- Monitor the USD LIBOR transition to SOFR and implement the replacement benchmark at the appropriate time.

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:

	Target	Permissible Range
Global Real Assets	17%	14% - 20%

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 FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 Annual Investment Plan objectives and related activities are as follows:

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

  The Real Assets portfolio ended 2020 with a Total Fund allocation of 14.7%. As of March 2021, the Real Assets portfolio has $674 million of outstanding capital commitments. Staff made new commitments totaling $475 million during 2020 to help increase the portfolio allocation and achieve the FY 2021 16% interim target. The majority of the new commitments will be called during FY2022. Staff continues to make new commitments during 2021 to help achieve a 17% allocation by FY2022.

- *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.*

  The Real Assets portfolio had a 10.1% allocation to the specialty property types at the end of 2020. Staff made a new commitment of $100 million during 2020 to an existing manager to increase our exposure to the demographic-driven real estate investments. Staff expects the new $100 million commitment to be called during FY 2022. Staff will continue to evaluate specialty property type managers in FY 2022.

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

  Staff committed $100 million to a fund that is focused on capitalizing on opportunities arising from the pandemic in 2020. The commitment was made to an existing manager who will focus opportunistically providing rescue capital on stressed assets. As of March 2021, the manager has called 10% of SERS commitment.

- *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.*

  Staff reviewed several co-investment opportunities during 2020 but did not make a new commitment. Staff will continue to review opportunities to expand our co-investment program in 2021.

CURRENT MARKET CONDITIONS AND OUTLOOK

Returns for real estate properties were impacted by the pandemic in 2020. SERS' Real Assets portfolio returned 2.76% net of fees in 2020 versus a benchmark NPI return of 2.00% gross of fees, producing an excess return of 0.76%. The income return gross of fees during 2020 was 3.01%.

In general, 2020 was a challenging year for real estate. Real estate returns are typically driven by demographics, economic growth, interest rates, and property type fundamentals. However, COVID drastically changed the real estate markets. Large job losses and local restrictions impacted each property type differently during 2020. COVID's impact on apartments in 2020 mostly depends on where the assets were located. Urban apartments struggled during the year as renters moved away from city centers and into suburban apartments with more space and amenities. The 4.5% vacancy level of multifamily properties was slightly higher than the previous year, but rent growth declined by about 4.8%.

Additionally, the shift to work from home has changed the way businesses and employees use offices. Office vacancy rates increased to about 15% and the future remains uncertain as more companies can provide employees the ability to work from home. Rental collections for office remained strong during the pandemic because of the long-term leases in place before the pandemic began.

Retail was severely impacted by the lockdowns during the pandemic. The best performing areas of retail were grocery anchored centers while restaurants and department stores lost foot traffic and were forced to temporality shut down.

Industrial was the biggest winner during the pandemic as more consumers chose to place orders online and have items delivered. As e-commerce sales continue to grow, the demand for industrial warehouses will continue to support the future returns. Vacancy for industrial properties increased only slightly to 4.6%.

Valuations for properties declined in 2020 even though comparable transaction volumes were lower. SERS is currently overweight in the industrial and multifamily sectors and underweight in office and retail. For diversification, SERS' portfolio also has properties that are not in the benchmark, such as self-storage, single-family rentals, and senior housing.

The coronavirus has significantly impacted the outlook for 2021 real estate returns. Returns for Real Assets will mostly be driven by income in 2021 and total returns for the benchmark are expected to be approximately 4% per an industry consensus forecast. Infrastructure ended 2020 with an allocation of 26.3% of the Real Assets portfolio with the expectation for a higher allocation in FY2022 as capital commitments are called by managers. SERS' exposure to telecommunications, renewables, social, and healthcare are more defensive assets with contracted cash flows. In contrast, the transportation and energy assets in the portfolio are more exposed to economic cycles. Although coronavirus has impacted the transportation assets during 2020, those assets should see a strong recovery as the vaccine becomes broadly available and people begin to travel again.

FY2022 OBJECTIVES

Staff will focus on the following objectives in FY2022:

- Formulate and implement a one-year plan to achieve and maintain a 17% allocation to Real Assets.
- Tactically manage real estate and infrastructure allocations to improve portfolio structure and returns without increasing risk.
- Evaluate new investment strategies for the Real Assets portfolio such as energy transition, secondaries, co-investment funds, and ESG focused funds.
- As the Real Assets portfolio has been built out, switch focus to actively soliciting co-investment opportunities with existing managers.

PORTFOLIO STRATEGY - Cash Equivalents & Securities Lending

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:

	Target	Permissible Range
Cash Equivalents	2%	0% – 5%

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

The securities lending program is designed to be a low risk, intrinsic value focused strategy that generates additional income for the plan by temporarily lending equity and fixed income securities. All loans are collateralized with cash at 102-105% of security market value and reinvested in government money markets and repurchase agreements. Loans to approved borrowers are limited to 25% of the average monthly market value of the loan from the prior year. Fixed income security loans require a ten basis point minimum spread at loan initiation. The program is implemented through a third-party lending agent and collateral reinvestment manager.

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 Annual Investment Plan objectives and related activities are as follows:

- *Research and monitor commercial paper credits and money market funds.*

  Staff utilized the Fidelity and Federated Hermes money market complexes for investing the daily short-term cash. Fidelity and Federated offer competitive yields relative to money market competitors and has higher liquidity than the commercial paper market. The commercial paper market has never quite recovered from '08 financial crisis and Staff has not purchased a commercial paper credit in several years. Going forward, Staff does not anticipate making commercial paper purchases given the limited number of issuers and tenors available.

- *Evaluate opportunities to improve the cash management system and maintain liquidity requirements.*

  After only investing in Fidelity's government money market fund since March 2020, a portion of the short-term cash was invested in Federated's institutional prime money market fund in December 2020. Federated's prime money market fund offers same day liquidity with a higher yield. Staff continues to keep the majority of cash in the Fidelity government money market fund due to the floating net asset value declining and low incremental yield earned in the prime money market fund.

CURRENT MARKET CONDITIONS AND OUTLOOK

Yields on money market funds tend to follow short-term rates set by the Federal Reserve on a lagged basis. With the Fed expected to keep rates on hold until at least 2023, money market yields will continue to be low in fiscal year 2022. These low yields will continue to suppress the income earned on both the cash equivalents and securities lending reinvestment portfolios.

FY2022 OBJECTIVES

Staff will focus on the following objectives in FY2022:

- Research and monitor money market funds.
- Evaluate opportunities to improve the cash management process and maintain liquidity needs for the portfolio.
- Monitor the securities lending program for opportunities to generate incremental income and ensure that it is operating within the program implementation guidelines.

PORTFOLIO STRATEGY – Opportunistic & Tactical

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:

	Target	Permissible Range
Opportunistic Investments	0%	0% – 5%

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

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 Annual Investment Plan objectives and related activities are as follows:

- *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.*

  Two new commitments have been made as of March 2021, totaling $125 million. The first commitment is to a fund focused on investing in structured products. The next commitment is to a distressed debt fund that will invest in both stressed trading and debt for control situations, with an emphasis on companies based in the United States and Europe.

  In addition to the new commitments, there are new opportunities in the deal pipeline, including several that could lead to investment recommendations to the SERS investment committee in the coming months.

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

  Staff continues to closely monitor and manage the liquid portion of the portfolio. Two legacy funds from the SERS multi asset strategy portfolio have moved to the opportunistic portfolio this year with the opportunistic team now responsible for the oversight of these investments. Staff is evaluating several additional multi-asset strategy funds that could move to the opportunistic portfolio prior to fiscal year end.

CURRENT MARKET CONDITIONS AND OUTLOOK

The opportunistic portfolio consists of 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 Bloomberg Barclays US Aggregate Bond Index + 2%. Several themes have arisen in the portfolio including financial deleveraging, distressed assets, structured credit, financial restructuring, and long/short multi strategy funds.

In addition to the opportunities discussed above, staff continues to evaluate new strategies that can take advantage of rapidly changing market conditions. For example, the outlook for inflation has changed in the last year due to government stimulus. As a result, staff is researching strategies that could act as a hedge in an inflationary environment.

FY2022 OBJECTIVES

Staff will focus on the following objectives in FY2022:

- 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. Specific investments under consideration include strategies that focus on climate sustainability as well as commodity-focused strategies that can serve as an inflation hedge. 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.

PORTFOLIO STRATEGY – Overlay Program

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 FY2021 OBJECTIVES AND IMPLEMENTATION

The FY2021 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.*

  SERS Tactical Asset Allocation manager, Russell, initiated long equity trades in late February 2020 and added to this position in early March 2020, shorting fixed income. This trade suffered a loss as equity markets continued to trade down through much of March 2020. The trade then began to rebound throughout the second and third quarters of 2020 and was reversed in August 2020 at a gain. FYTD since inception, the program has netted a $46.76 million gain. The program has added 5bps to Total Fund return over the last five years.

  AlphaEngine (AE) was approved by the March 2021 Investment Committee as an additional Tactical Asset Allocation manager. AE is complementary to Russell as:

  1. AE has positions on constantly versus just several times annually.
  2. AE will place both long and short equity trades versus long only.
  3. AE will have additional exposures of commodities and precious metals along with equity and fixed income.

  AE is expected to be implemented with a $500 million notional exposure at a 1% risk target later this Spring.

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

  During the Spring of 2020, Staff increased currency manager PE Global's target volatility from 3% to 6%, while simultaneously cutting their notional exposure from $900 million to $450 million. Gold was also added to PE's currency investment selections. After these changes were approved, PE began experiencing losses as their safe-haven currency overweights declined in value during 2020's risk-on market. The Staff guideline changes exacerbated the losses due to increasing the risk allowed in the mandate. FYTD since inception, the program has netted a $39 million loss from PE's underperformance FYTD and from prior terminated manager losses. The program has subtracted 8bps from Total Fund return over the last five years.

FY2022 OBJECTIVES

Staff will focus on the following objectives in FY2022:

- 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 the provision and communication of diligent, thorough, timely and forward-looking investment risk analytics and other investment analytics to the Board and Investment Staff.

The equity market was extremely volatile in 2020. In March, the average daily S&P 500 Implied Volatility (VIX) reached 82.6%, its all-time high level, concurrent with the market though related to the COVID-19 pandemic. The volatility index fell significantly in April 2020 and further declined to 30.4% by the end of June 2020 as the equity market recovered from the lows. Market volatility spiked again for a brief period in late October and early November 2020, then oscillated in the range of 20% to 26% for the rest of 2020 and the first quarter of 2021 while markets recovered, recouping all losses and generating new gains.

The total risk of the Total Fund is expected to be 15.64% based on December 2020 holdings. The active risk is projected to be 1.31%, below the 3% limit stated in the Statement of Investment Policy.

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION:

The FY2021 Annual Investment Plan objectives and related activities are as follows:

- *Provide risk forecasts 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.

- *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 strategies 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 the 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.

- *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 Strategy Team's needs for return attribution analysis of the Total Fund and asset classes of the Fund.*

  As the service contract with the existing service provider was extended for a year until June 2021, Staff continued to work with the finalists of the 2020 search in order to evaluate their capacity in data management; risk modelling especially for private credit and private real estate; and report customization. Over the course of the year, one provider showed significant improvements in all areas listed above, thus proved to be a better fit to SERS. The subscription negotiation is in process at the time this report was written.

- *Perform other portfolio and market analyses and research as needed.*

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

FY2022 OBJECTIVES:
Staff will focus on the following objectives in FY2022:

- Provide risk forecast and analyses of the Total Fund and asset class portfolios.
- Report risk of the Total Fund to the Board and Investment Committee 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.
- Perform other portfolio and market analyses and research as needed.

Investment Operations

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 FY2022 remain consistent with those of FY2021 as these three broad categories reflect the primary duties of Investment Operations.

REVIEW OF FY2021 OBJECTIVES AND IMPLEMENTATION
The FY2021 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 Information Governance 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 FY2021 Annual Investment Plan and the amended Statement of Investment Policy, onboarding of new Investment staff, and new manager searches throughout the fiscal year.

FY2022 OBJECTIVES:
Staff will focus on the following objectives in FY2022:

- Coordinate, assist and participate in organizational initiatives including Policies, Procedures and Practices; Information Governance Project, 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 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

		Range	
	Total Fund Target	Minimum	Maximum
Global Equity	45%	35%	55%

The US Equity, Non-US Equity Developed Market and Non-US Equity Emerging Market sub-asset classes have the following targets and ranges within Global Equities above:

		Range	
	Global Equity Target	Minimum	Maximum
US Equity (USE)	55%	50%	60%
Non-US Equity Developed Market	30%	25%	35%
Non-US Equity Emerging Market	15%	10%	20%

III. BENCHMARK:

The Global Equity benchmark is a composite benchmark comprised of:

US Equity Portfolio	55%	Russell 3000 Index
Non-US Equity Developed Market	30%	MSCI World ex-USA Net Total Return Index (USD)
Non-US Equity Emerging Market	15%	MSCI Emerging Markets Net Total Return Index (USD)

IV. PERFORMANCE OBJECTIVE

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

	Excess Return Target (over 3-year rolling periods)
US Equity Portfolio	10 basis points over USE benchmark
Non-US Developed Market Equity Portfolio	50 basis points over the Non-USE developed market benchmark
Non-US Emerging Market Equity Portfolio	50 basis points over the Non-USE emerging market benchmark
Global Equity Portfolio	28 basis points over Global Equity composite benchmark in Section III. Benchmark above

V. PORTFOLIO DESIGN AND CONSTRUCTION:

The USE and Non-USE developed and emerging market 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

Security Type	US Equity Portfolio	Non-US Equity Portfolio
Common Stock	Y	Y
Stock Treated as Common Stock	Y	Y
Cash / Treasuries	Y	Y
Preferred Stock	Y	Y

Convertible Rights	Y	Y
Warrants	Y	Y
Depository Receipts	Y	Y
REITS	Y	Y
Rule 144a Issues	Y	Y
Private Placement	Y	Y
IPOs	Y	Y
Commingled Funds	Y	Y
Exchange Traded Funds	Y	Y
Futures	Y	Y
Options	Y	Y
Currency Forwards	N	Y
Currency Futures	N	Y
Currency Options	N	Y
Country Funds	N	Y

VII. RISK MANAGEMENT

	Active Risk Target
US Equity Portfolio	Tracking Error of 1.0% with a range of 0.0% to 1.5%
Non-US Equity Developed Market Portfolio	Tracking Error of 1.5% within a range of 0.0% to 3.0%
Non-US Equity Emerging Market Portfolio	Tracking Error of 2.5% within a range of 0.0% to 4.0%

US Equity Implementation Guidelines			
	Investment Benchmark	**Global Equity Target Allocation**	**Permissible Range**
US Equity Allocation	Russell 3000 Index	55%	50% - 60%
Portfolio Structure			
Capitalization			
Large Cap Equity	Russell 1000 Index	Neutral to BM	+/- 5%
Large Cap Active	Manager Specific	-	0% - 25%
Large Cap Passive	Russell 1000 Index	-	75% - 100%
Small Cap Equity	Russell 2000 Index	Neutral to BM	+/- 10%
Small Cap Active	Manager Specific	100%	n/a
Style			
Growth	Manager Specific	Neutral to BM	+/- 5%
Value	Manager Specific	Neutral to BM	+/- 5%

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.

IMPLEMENTATION GUIDELINES - Global Equities

Non-US Equity Implementation Guidelines			
	Investment Benchmark	**Global Equity Target Allocation**	**Permissible Range**
Non-US Equity Developed Markets	MSCI World ex-USA Net Total Return Index (USD)	30%	25 - 35%
Non-US Equity Emerging Markets	MSCI Emerging Markets Net Total Return Index (USD)	15%	10 – 20%
Broad Market Exposure			
ACW ex-US + Developed Markets Active	Manager Specific	70%	60% - 80%
Developed Markets Passive	MSCI World ex US Index ($net)	30%	20% - 40%
Emerging Markets Active	MSCI Emerging Markets Index ($net)	100%	+/- 10%
Portfolio Structure			
Capitalization			
Large Cap Equity	Manager Specific	BM Weight	+/- 10%
Small to Mid-Cap Equity	Manager Specific	BM Weight	+/- 10%
Small Cap Equity	Manager Specific	BM Weight	+/- 10%
Micro Cap Equity	Manager Specific	BM Weight	+/- 5%
Style			
Growth	Manager Specific	Neutral to BM	+/- 10%
Value	Manager Specific	Neutral to BM	+/- 10%

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 developed and emerging market equity benchmarks.

IMPLEMENTATION GUIDELINES – Global Private Equity

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 a 12% 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 Burgiss All Private Equity Benchmark. Over time periods of five years and longer Private Equity net returns are expected to exceed SERS Global Equity portfolio by 2%.

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 asset target allocations.

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

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

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 de-emphasizes larger firms with a financial engineering approach.

VI. PERMISSIBLE INVESTMENTS

Investment Structure	
Limited Partnership Interests	Y
Discretionary Managers investing in Private Equity Partnerships	Y
Co-Investments	Y
Separate Accounts	Y

Investment Type	
Buyouts	Y
Venture Capital	Y
Special Situations (secondary interests, distressed debt or equity, mezzanine, co-investments, energy, etc.)	Y

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 investments 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 Risk

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

Geographic Risk
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 Risk
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 Risk
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 Risk
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 – Global Fixed Income

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.

IV. PERFORMANCE OBJECTIVE

The annualized return objective for the global fixed income portfolio is 60 basis points net of fees above the benchmark over rolling three year periods and is comprised of the following strategies:

Strategy	Expected Excess Return	Tracking Error	Benchmark
Core	20 basis points	N/A	Bloomberg Barclays US Aggregate
Core Plus	60 basis points	N/A	Bloomberg Barclays US Aggregate
Tactical & Diversifying	200 basis points	N/A	Bloomberg Barclays US Aggregate
Total Portfolio	60 basis points	0 – 5%	Bloomberg Barclays US Aggregate

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, and Tactical & Diversifying strategies. Core mandates invest primarily in benchmark type securities. Core sector weightings can deviate from the benchmark, depending on the external manager's market views and strategies. Core plus mandates allow investments in all sectors of the Bloomberg Barclays US Aggregate Bond Index with additional allocations to the extended sectors of high yield, Non-US debt and emerging market debt. The Tactical & 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:

	Range	
Strategy	Minimum	Maximum
Core	30%	70%
Core Plus	25%	50%
Tactical & Diversifying	5%	20%

VI. PERMISSIBLE INVESTMENTS

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

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 of individual portfolios has an established average weighted credit quality that must be maintained at all times.

Currency Risk
Currency is not hedged at 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.

IMPLEMENTATION GUIDELINES – Global Fixed Income

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.

IMPLEMENTATION GUIDELINES – Global Private Credit

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 allocation for Global Private Credit during the ramp-up period is set at 3% with an interim range of 1% to 7% for fiscal year 2022 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 cash yields.

Long-term sub asset target exposure is detailed below:

		Range	
	Target	**Minimum**	**Maximum**
Direct Lending	80%	60%	100%
Mezzanine	0%	0%	10%
Stressed/Distressed	10%	0%	15%
Structured Credit/Other	10%	0%	15%
Total	100%		
Domestic	50%	40%	85%
International	50%	15%	60%
Total	100%		
Primary Commitments	100%	80%	100%
Secondaries	0%	0%	10%
Co-Investments	0%	0%	10%
Total	100%		

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 predictable cash income component than direct lending.

VI. PERMISSIBLE INVESTMENTS

Investment Structure	
Limited Partnership Interests	Y
Co-Investments	Y
Separate Accounts	Y

Investment Type	
Direct Lending	Y
Mezzanine	Y
Stressed/Distressed	Y
Structured Credit and Other	Y

Direct Lending
<u>Net Expected Return 6-8%, Moderate Risk</u>
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 global private credit portfolio.

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

Stressed/Distressed
<u>Net Expected Return: 12-25%, High Risk</u>
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. Stressed/Distressed is targeted to represent 10% of the global private credit portfolio.

Structured Credit & Other
<u>Net Expected Return: 5-20%, Moderate to High Risk</u>
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 global 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 of 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, as well as the capabilities to structure loans with adequate covenants to protect the lender.

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 shorter 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 the portfolio construction process by limiting the amount of exposure to more illiquid areas of private credit, such as distressed debt.

Geographic Risk
International exposure refers to non-US 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.

IMPLEMENTATION GUIDELINES – Global Real Assets

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 assets target allocation at 17%, 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.

		Range	
Strategy	**Target**	**Minimum**	**Maximum**
Private Core Real Estate	60%	40%	80%
Private Non-Core Real Estate	10%	5%	20%
Private Infrastructure	25%	15%	40%
Public Market Real Assets	5%	0%	10%

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 assets 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.

Investment Structure and Type	
Limited Partnership Interests	Y
Co-Investments	Y
Separate Accounts	Y
Commingled Funds	Y
Joint Ventures	Y
Private Real Estate Equity and Debt	Y
Real Estate Investment Trusts (REITs)	Y
Private Infrastructure Equity and Debt	Y
Public Infrastructure Securities and MLPs	Y
Natural Resources and Commodities	Y

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 assets portfolio will be in operating investments in order to achieve global real assets' role.

	Operating	Non-Operating
Target Exposure	≥85%	≤15%
Current Exposure	95%	5%

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.

IMPLEMENTATION GUIDELINES – Global Real Assets

(as of December 31, 2020)	NCREIF Property Index	Private Market Portfolio	Range
Apartment	25%	31%	15% - 40%
Industrial	21%	21%	15% - 40%
Office	35%	25%	15% - 40%
Retail	18%	11%	5% - 25% -
Subtotal	*99%*	*88%*	80% - 100%
Hotel/Other	1%	12%	5% - 20%
Total	100%	100%	

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 in the four US regions in the private market real estate portfolio relative to the NCREIF Property Index.

(as of December 31, 2020)	NCREIF Property Index	Private Market Portfolio	Range
West	40%	36%	20% - 50%
East	31%	36%	20% - 50%
Midwest	8%	7%	5% - 20%
South	21%%	21%	10% - 30%
Total	100%	100%	

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 30% 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 asset 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 & Securities Lending

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. A cash balance of one to three months of expenditures is usually maintained. A higher allocation to cash may also be used to preserve capital in volatile markets. 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.

The securities lending program is designed to be a low risk, intrinsic value focused strategy that can generate additional income for the system. The program is implemented through a third-party lending agent and collateral reinvestment manager. Separately, additional securities lending income is earned by the commingled passive global equity accounts.

VI. PERMISSIBLE INVESTMENTS

Security Type	
US Treasury Bills	Y
Commercial Paper rated A-1/P-1 or higher	Y
Money Market Funds rated at least A-1/P-1	Y
Unrated Market Funds comparable to an A-1/P-1 equivalent fund	Y

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 – Cash Equivalents & Securities Lending

Securities Lending Risk
All loans will be collateralized with cash at 102% for US securities and 105% for non-US securities and marked-to-market daily. Collateral will be reinvested in government money market funds and/or repurchase agreements. Loans on fixed income securities will be subject to a ten-basis point minimum spread requirement at loan initiation. Loans to approved borrowers will be limited to 25% of the average monthly market value on loan for the prior calendar year.

IMPLEMENTATION GUIDELINES – Opportunistic & 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 Risk
Leverage will be prudent for the given strategy and consistent with the fund's offering memorandum.

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

IMPLEMENTATION GUIDELINES – Overlay Program

I. ROLE

SERS invests in overlay strategies that trade derivatives of the Total Fund's underlying asset exposures and currency exchange rates to enhance the 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, fixed income, commodity and precious metals futures and options on futures.

Currency overlay: currency forwards, currency futures, gold forwards, gold futures, and 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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Glossary

GLOSSARY

Active Risk – see Tracking Error.

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.

Alternative Reference Rates Committee (ARCC) – The ARCC was established by the Federal Reserve to identify risk-free alternative reference rates for USD LIBOR, identify best practices for contract robustness, and create an implementation plan with metrics of success and a timeline to support an orderly adoption of the replacement rate.

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 and with 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).

GLOSSARY

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 in 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 (MAS) – 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.

Secured Overnight Financing Rate (SOFR) – SOFR is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. There is a considerable volume of transactions executed that utilize SOFR and the rate is published on each business day.

Securities Lending – the temporary loan of a security from an institutional investor's portfolio to a broker/dealer to support the firm's trading activities. Loaned securities are collateralized with cash at 102-105% of the loan exposure. The lender retains the entitlement to all the benefits of the loaned security, including dividends and interest, except the right to vote proxies. The lender has a right to recall the loan at any time.

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 experiences 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 – standard deviation of the excess return of the portfolio relative to the Benchmark measured over rolling three year periods.

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