

2014 - 2015 Strategic Investment Plan

Commonwealth of Pennsylvania
State Employees' Retirement System

TABLE OF CONTENTS

Introduction	1
Purpose	2
Key Principles	3
Current Status of SERS Plan	6
Key Objectives	7
Special Focus	
Improving Total Fund Liquidity	8
Asset Allocation	9
Benchmarks	10
Transitional Asset Allocation Policy	11
Alternative Investments	12
Global Public Equity	14
Real Assets	16
Diversifying Assets	18
Fixed Income/Liquidity Reserve	20
Appendix	
Long-Term Asset Allocation Analysis	22
Capital Market Assumptions	24

Established in 1923, the Pennsylvania State Employees' Retirement System (SERS) is one of the nation's oldest statewide retirement plans for public employees. It ranks among the largest pension plans in the United States, with net assets exceeding \$27 billion. SERS has more than 227,000 members, including more than 107,000 active employees and more than 120,000 retirees and beneficiaries.

SERS' mission is to provide retirement benefits and services to members through sound administration and prudent investments. Over the past 10 years, SERS has paid approximately \$23 billion in benefits and expenses.

Due largely to its long-term obligations and investment horizon, SERS takes a long-term, strategic approach to its investment decision-making. The *2014 - 2015 Strategic Investment Plan* has been developed jointly by SERS' investment staff and SERS' investment consultants after careful analysis of major quantitative and qualitative factors. This analysis incorporates the unique needs, preferences, objectives, and constraints of SERS as well as expected long-term market conditions. Ultimately, however, the plan is achieved with input from and is subject to final approval of SERS' 11-member board.

This detailed investment plan manifests itself in an asset allocation framework designed to achieve diversification and to provide guidance in the investment decision-making process, which includes advancing certain investment strategies; hiring and monitoring external investment managers; rebalancing the portfolio; and pursuing work initiatives over the plan period.

SERS' *2014 - 2015 Strategic Investment Plan* is specifically designed to meet the unique needs of a system that is currently underfunded, is steadily maturing (i.e. has more retirees than active members), and, in the near term, will continue to receive employer contributions below the actuarially required rate. Thus, the plan emphasizes liquidity, reduction of cash flow volatility, and pursuit of capital protection strategies to ensure that the fund's assets are best positioned to meet continuing obligations to beneficiaries.

The ultimate objective of this plan is to formulate an asset allocation policy that provides a high expected probability of achieving SERS' long-term actuarially assumed rate of return, consistent with the board's tolerance for risk, while continuing to meet obligations to beneficiaries.

PURPOSE

The State Employees' Retirement Board seeks to pursue four key objectives in this *2014 - 2015 Strategic Investment Plan*.

1. Define the primary strategic objectives that are central to a successful investment program for the total SERS fund at this point in time.
2. Define, in general terms, the strategies and methods to be pursued at both the total fund and individual asset class levels to achieve those objectives.
3. Provide a tool for integrating key aspects of the SERS pension plan with the investment strategy and, similarly, for integrating board decisions and staff execution with that strategy.
4. Embed the pursuit of fund returns in a comprehensive risk monitoring and mitigation program which emphasizes transparency in both the execution of investment policy and the outcomes in varying capital market environments encountered over time.

At the outset, the board notes that this plan is intended to be compliant with SERS' statement of investment policy.

Moreover, while the board intends this plan to be in force and to guide the investment program for two years or until a new plan is approved by the board, it reserves the right to amend or materially revise the plan at any time.

Underlying the board's strategic investment plan and its execution over time, the investment program will encounter widely varying conditions in the investment markets and similarly widely varying investment opportunities to seek the returns needed to fund the system's liabilities.

In the design and execution of the investment program, the board, SERS' staff, consultants, and other system fiduciaries shall rely on the following principles listed below. These principles do not represent a comprehensive reflection of the many aspects of the board's views on appropriate and prudent management of the system's assets but, because of their broad application, deserve formal mention in this plan.

Principle #1

The ultimate purpose of the fund is to ensure the payment of current and future benefits due to pension plan participants. Strategies that, in the board's best judgment, place the payment of either current or future benefits at exceptional risk are undesirable. Similarly, investments that pursue objectives not directly aligned with the sole interests of the SERS beneficiaries are undesirable.

Execution

Periodically—as was the case in 2012—the board will direct the SERS staff and the general consultant, currently R.V. Kuhns & Associates, to conduct an asset/liability study to examine the alignment of SERS' investment strategy with the plan's benefit obligations and make any revisions it deems necessary.

Principle #2

The board's investment strategy must embrace risk in order to achieve returns. A risk-free investment strategy does not exist and adopting extremely low levels of risk ensures that nearly the entire burden of paying for pension benefits will fall on contributions alone.

Execution

The board will maintain a suite of fund monitoring techniques to provide detailed information about the performance of the fund and the various risks the investment program encounters in the pursuit of the returns needed to fund current and future benefit payments. The monitoring program will be comprehensive and will be focused at the total fund, asset class, and individual investment mandate levels. Periodically, the board may direct SERS' staff and the investment consultants to perform special risk studies.

KEY PRINCIPLES

Principle #3

The board embraces the risk-controlled pursuit of investment returns through a highly diversified strategic asset allocation. As such, the board expects to routinely utilize investments across multiple asset classes in varying amounts depending on the board’s best assessment of the expected risk and return characteristics present.

Execution

Periodically, the board will direct SERS’ staff and the general consultant to conduct an asset allocation study to evaluate potential changes in the allocations made to varying asset classes in the pursuit of fund returns at levels of risk deemed prudent by the board. However, the board views directing frequent, short-term, tactical investments or engaging in short-term market timing as inconsistent with the prudent management of the assets.

Table 1
Asset Classes & Thematic Roles

Thematic Role	Thematic Asset Class	Sub-Asset Class
High Growth	Alternative Investments	Private Equity Special Situations Venture Capital
Growth	Global Public Equity	Global Mandates U.S. Public Equity Non-U.S. Developed Public Equity Emerging Markets Public Equity
Inflation Protection	Real Assets	Private Energy Non-Core Real Estate Core Real Estate REITs Commodities & Infrastructure
Diversification/Alpha	Diversifying Assets	Absolute Return Hedged Strategies Direct Investments
Capital Preservation	Fixed Income	Core Plus Fixed Income Core Fixed Income Nominal U.S. Treasuries Global TIPS
Liquidity	Cash (Liquidity) Reserve	Cash Short-Term Notes

Principle #4

The board believes that executing this strategic plan and corresponding asset allocation and overseeing a risk monitoring process relies upon the prudent construction of each asset class portfolio. The structure of each asset class, including types of mandates pursued, must individually and collectively fit the plan's objectives.

Execution

The board will periodically require that SERS' staff collaborate with consultants to establish and confirm investment structures that articulate the intended strategy and expected risks associated with each asset class composite. The board expects that asset class compositions may vary over time along with material changes in market regimes.

Principle #5

The board believes that the actual and anticipated net-of-fees performance is a critical measure of the fund's performance at all levels.

Execution

The board will routinely examine performance of the total fund and all investments on a net-of-fees basis and direct SERS' staff and consultants to pursue the best fee structures achievable in executing the investment program.

Principle #6

The board embraces rules-based rebalancing of the fund's asset allocation pursuant to the rebalancing policy in the statement of investment policy as a disciplined means of mitigating risk and adhering as closely as possible to the board's chosen asset allocation.

Execution

The board directs SERS' staff to execute fund rebalancing in a timely manner and consistent with the board approved rebalancing policy.

CURRENT STATUS OF THE SERS PLAN

The board recognizes that its investment program does not exist in a vacuum and that aspects of the current status and long-term trends in the pension plan have implications for investment decisions.

SERS' pension plan is steadily maturing, with more retirees and beneficiaries receiving benefits than active members making contributions. At the December 31, 2013 valuation, the plan had assets with an actuarial value of \$26.0 billion and accrued actuarial liabilities of \$43.9 billion, resulting in an unfunded liability of \$17.9 billion and a funded ratio of 59.2%. On a mark-to-market basis, the plan's funded ratio was 62.4%.

According to a 2013 actuarial valuation performed by Hay Group and a 2012 asset/liability study conducted by R.V. Kuhns, the fund is projected to realize steadily increasing positive asset growth. However, actual net cash flows can deviate substantially from projections given SERS' fixed benefit payment obligations and variable investment results. Furthermore, projections assume that participating employers contribute the full contribution prescribed by Pennsylvania law. It is important to note that variations to expected asset growth will influence the plan's funded status, which could affect the strategic asset allocation.

Implications

Though detailed more thoroughly in the asset/liability study noted above, two significant implications of SERS' current status and trends include:

- First, the need to pursue returns as aggressively as the board deems prudent, given the considerable risks entailed, in order to allow the investment program and actuarially sound employer contributions to bring the plan back toward full funding.
- Second, the need to align the fund's allocation to long-term investments in private equity, private real estate, and similar strategies that require a virtually irrevocable commitment of assets for as many as five years or longer to:
 1. The steadily rising level of benefit payments the fund must pay—that currently and prospectively exceed incoming contributions—by converting investments into cash
 2. The risk that, in sharp market declines, the need to pay current benefits will disproportionately fall on the fund's liquid investments, forcing sale of these assets at undesirably low valuations, and consequently raising the plan's allocation to illiquid investments, all of which harm the plan's ability to pay future benefits

Illiquid investments can offer attractive expected returns to the fund. But given the two issues noted above, the percentage of the fund's assets in illiquid investments must be aligned with the funds structural needs and potential risks.

After assessing the current status of the pension plan, the fund's existing structure, and the studies/recommendations of SERS' staff, general consultant, and specialist consultants, the board adopts four key objectives.

These four key objectives are overarching intentions that sit atop myriad specific goals associated with the effective design and execution of SERS' investment program—related to cost management and resource sufficiency, for example. Some additional detail is outlined later in this plan, within discussions related to strategies and implementation methods associated with each asset class.

Objective #1

Pursue the highest returns possible at the level of risk deemed prudent by the board.

The board takes note of its current long-term assumed fund rate of return of 7.5% in both setting its asset allocation—the largest determinant of both risk and return in the fund—as well as its execution of investments in each asset class. The board recognizes that at any point in time, however, depending on market conditions and the board's assessment of risk, the probability of achieving the assumed rate will vary.

Objective #2

Reduce gradually the percentage of fund assets committed to long-term illiquid investments.

After reviewing the system's increasing maturity, the results of the asset/liability study, and the risks associated with the forced sale of liquid assets at undesirably low valuations in market declines, the board has determined that a steady decline in illiquid investments to a level better aligned with the system's current and evolving structure is appropriate.

Objective #3

Continue to maintain vigorous and highly transparent performance monitoring and board education programs.

The challenges facing fiduciaries in responsibly managing the prudent investment of more than \$27 billion across multiple asset classes, scores of investment mandates, and thousands of individual securities, and other assets are immense. To this end, the board, working with SERS' staff and consultants, will work to maintain—and enhance, where possible—the ongoing monitoring program as well as the board's understanding of institutional investing via a series of educational sessions.

Objective #4

Continue to maintain a comprehensive risk monitoring and mitigation program.

It is crucial to focus on the risks that are likely to have the largest effect on the fund's assets and, in turn, the fund's ability to ensure payment of current and future benefits.

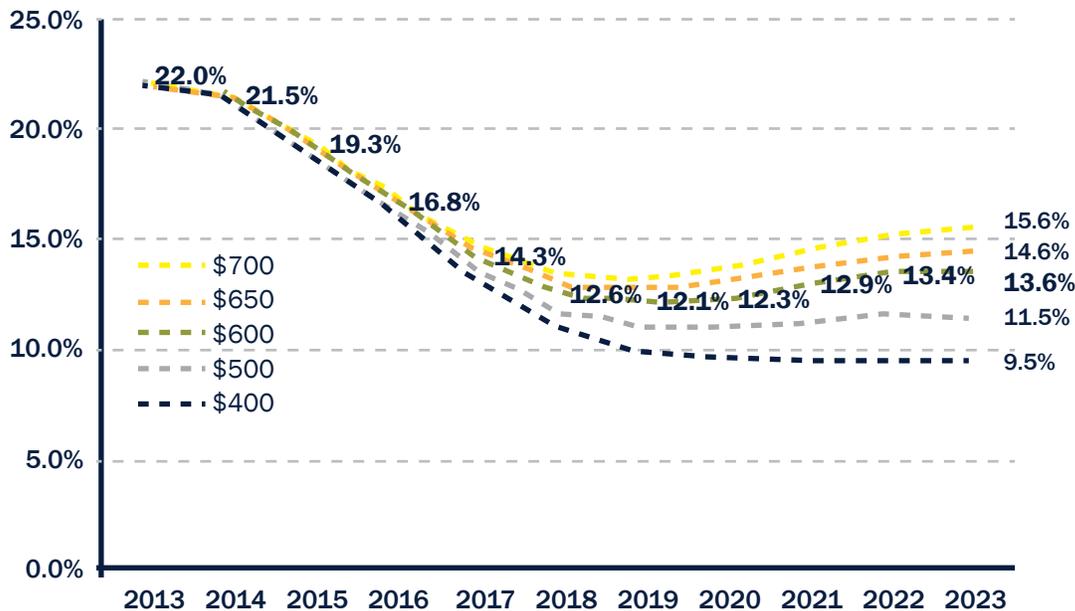
SPECIAL FOCUS | IMPROVING TOTAL FUND LIQUIDITY

Consideration is given later in this plan to some of the methods that will be employed on an asset class by asset class basis to better align exposure to illiquid investments with the plan’s need for greater liquidity. Improving total fund liquidity, however, requires coordination across multiple asset classes. Thus, this objective, the means by which the board intends to pursue it across the entire fund, and how the board intends to monitor progress deserve special mention.

SERS’ board has directed consultants to develop periodic, but not less than every 12 months, investment pacing models to inform and help regulate commitments to illiquid investments based on expected long-term liquidity needs of the fund.

This 2014 - 2015 Strategic Investment Plan sets illiquid investment annual pacing at \$600 million.

Table 2
Alternative Investments Annual Pacing Scenario Analysis
Alternative Investments Fair Market Value as % of Total Assets



Each line represents a different annual commitment level ranging from \$400 million to \$700 million. Provided by SERS private equity consultant, StepStone Group.

The commitment pacing assumes 100% employer contributions pursuant to Pennsylvania Act 2010-120 and a 7.5% actuarial rate of return. Any significant change in expected contributions will require review and possible revision of the pace of commitments to illiquid investments.

The board will monitor long-term changes in the fund’s liquidity through reports from SERS’ staff, consultants, and other sources as deemed necessary.

Asset allocation is widely accepted to be the primary determinant of any fund’s long-term return and risk. It is substantially more influential than the mandates arrayed in individual asset classes or the managers selected to implement them. As such, it deserves special focus in every investment plan.

Table 3
SERS 2014 – 2015 Strategic Asset Allocation Policy

Asset Class	Allocation as of January 31, 2014		2014 Strategic Asset Allocation Policy	
	Amount (\$ millions)	% of Fund	2014 Policy	Policy Range
Alternative Investments ¹	\$5,789	21.8%	15%	
Global Public Equity	9,356	35.2	40	
Total Equity	15,145	57.0	55	+/- 5%
Real Assets ^{2,3}	4,136	15.6	17	+/- 3
Diversifying Assets	1,733	6.5	10	+/- 3
Fixed Income	4,069	15.3	15	+/- 3
Liquidity Reserve	1,502	5.7	3	+/- 3
Total Fund	\$26,586	100%	100%	
Expected Return	7.58%		7.50%	
Expected Risk (Standard Deviation)	13.88%		13.46%	
Expected Equity Beta (Market Risk)	0.69		0.68	
RVK Liquidity Metric (T-Bills = 100)	61		64	

Policy ranges reflect the fund transitioning to its long-term targets and recognition of the desire to minimize transaction costs associated with frequent rebalancing.

¹ Includes private equity, special situations, and venture capital funds with long-term capital commitments.

² Includes core and non-core real estate funds as well as private energy investments with long-term capital commitments.

³ Includes commodities and infrastructure investments as well as REITs with near-term liquidity.

BENCHMARKS

The objective of the fund is to generate investment returns that meet, or preferably exceed, the actuarially assumed rate of return over complete market cycles. Performance is measured relative to the following benchmarks according to the 2014 - 2015 long-term target weights.

Table 4
SERS 2014 – 2015 Strategic Asset Allocation Policy Benchmarks

Asset Class	2014 Strategic Asset Allocation Policy	
	Long-Term Target	Benchmark(s)
Alternative Investments	15%	Russell 3000 Index + 3%; Custom Index
Global Public Equity	40	MSCI All Country World Investable Market Index
Real Assets	17	Consumer Price Index + 3%; Custom Index
Diversifying Assets	10	HFRI Fund-of-Funds Strategic Index
Fixed Income	15	Barclays U.S. Aggregate Bond Index
Liquidity Reserve	3	90-Day T-Bill
Total Fund	100%	Fund Composite

TRANSITIONAL ASSET ALLOCATION POLICY

The board recognizes that reducing the plan’s allocation to alternative investments may take time to accomplish, since it largely depends on the pacing schedule and capital available for distribution to other asset classes. Unless there are meaningful changes to actuarial or capital market assumptions, the long-term target is viewed as a 10-year, strategic allocation.

To properly measure progress toward the long-term target allocation, the board adopts a series of transitional targets that will allow it to:

- Establish milestone target allocations corresponding to reductions in alternative investments
- Minimize the impact asset allocation may have on measures of performance attribution relative to a target allocation
- Allow for a gradual transition that is tied to the pacing schedule

Beginning with the first transitional target allocation, the board will commence measuring the plan against the next target allocation once the actual alternative investment allocation meets or falls below the proceeding milestone.

Table 5
SERS Transitional Asset Allocation Policy

Asset Class	Allocation as of January 31, 2014		Transition			Long-Term Target
	Amount (\$ millions)	% of Fund				
Alternative Investments	\$5,789	22%	20%	18%	16%	15%
Global Public Equity	9,356	35	37	38	39	40
Real Assets	4,136	16	17	17	17	17
Diversifying Assets	1,733	7	8	9	10	10
Fixed Income	4,069	15	15	15	15	15
Liquidity Reserve	1,502	6	3	3	3	3
Total Fund	\$26,586	100%	100%	100%	100%	100%
Total Equity		57%	57%	56%	55%	55%
Total Fixed Income & Liquidity Reserve		21%	18%	18%	18%	8%

ALTERNATIVE INVESTMENTS

Asset Class Description, Role, Benchmarks, Structure & Initiatives

Description

The alternative investments program includes fund assets held in partnerships that pursue private market strategies in private equity, special situations, and venture capital that typically require commitments greater than five years and offer premium returns to compensate for illiquidity. These strategies are subject to the investment pacing established by this plan.

Role in the SERS Fund

The program seeks high, long-term capital appreciation to enhance total fund returns with an investment horizon that is typically seven or more years.

Benchmarks

The program's objective is to generate investment returns that exceed the total return of public equity markets by at least 3% and that exceed the mean return for the asset class over a seven- to 10-year period.

Performance is measured relative to the following benchmarks:

- Public Market Benchmark – Russell 3000 + 300 basis points (illiquidity premium)
- Private Market Benchmark – ThompsonONE Private Equity and Venture Capital benchmark

Program Structure

The program invests opportunistically across the targeted strategies. As of December 31, 2013, the program had investments in 337 partnerships managed by 140 general partners.

Strategic Initiatives

Strategic initiatives to improve the quality and efficiency of the alternative investments program and achieve its performance objectives include:

- Establishing a glide path toward the long-term target allocation
- Increasing geographic diversification to improve overall fund diversification and risk-adjusted return
- Maintaining uniform investment pacing within a reasonable range to ensure vintage year diversification
- Enhancing liquidity through shorter term strategies
- Making fewer, larger commitments to top-tier managers, thus reducing over-diversification and administrative burden
- Considering custom investment structures to access new markets, improve operational efficiency, and provide greater market intelligence

GLOBAL PUBLIC EQUITY

Asset Class Description, Role, Benchmark, Structure & Initiatives

Asset Class Description

Global public equity includes fund assets held in publicly traded securities of companies throughout the developed world and in emerging markets. These companies have a wide range of market capitalizations in many industries and sectors, and offer vastly different return opportunities.

The equity asset class is the most highly volatile in the fund and, thus, the largest contributor to total fund volatility. This asset class contributes a high expected long-term return to the fund but also brings the largest measure of near-term downside risk.

Role in the SERS Fund

The program seeks high total return which may be accompanied by higher volatility. This asset class offers a high degree of immediate liquidity in normal market conditions and can provide moderate inflation protection.

Asset Class Benchmark

The objective of the program is to generate annualized total net returns that exceed the benchmark by approximately 100 basis points over a three- to five-year period. Performance is measured and evaluated relative to the MSCI All-Country World Investable Market Index (ACW-IMI).

Program Structure

The global public equity program accomplishes its objective through active and passive ownership of large, mid and small capitalization stocks worldwide.

The program maintains a neutral profile compared to the composition of the program's benchmark. Regional and capitalization exposures emulate the benchmark. This neutral structure reduces uncompensated risk and makes security selection the primary determinant of excess return performance.

Within the context of benchmark neutrality, the portfolio is organized in a "core/satellite" structure. In developed markets, "core" investments include low-cost index funds, which provide equity market exposure in the most efficient regions of the global equity market. In emerging markets, "core" investments include diverse, actively managed strategies that provide moderate excess return expectations. The goal of the core portion in less-efficient emerging markets is to capture all available excess returns while controlling risk.

Regardless of region, “satellite” investments include aggressive investment strategies with moderate-to-high excess return targets. Such investments generally have concentrated exposures. When combined, these investments complement and diversify each other, providing opportunity for more-stable, high risk-adjusted returns.

While passive mandates are routinely employed, the program maintains a moderate bias toward active management, particularly in portions of the equity universe where historical returns have been commensurate with active risk taken. This bias is examined on a periodic basis.

Strategic Initiatives

Strategic initiatives to improve the quality and efficiency of the global public equity program and achieve its performance objectives include:

- Maintaining the program’s neutral weighting compared to the benchmark index, including neutral regional and capitalization exposures
- Examining the optimal mix between active and passive allocations, rebalancing the portfolio when appropriate

REAL ASSETS

Asset Class Description, Role, Benchmark, Structure & Initiatives

Asset Class Description

Real assets include the fund's investments that predominantly own or develop physical assets and are more correlated to inflation than most other asset classes. There are two categories of investments in this class:

- Private Real Assets

Private, closed-end, commingled funds and/or limited partnerships with long-term capital commitments and limited liquidity, including real estate, energy, infrastructure assets, agriculture, timber, mining, water, and other natural resources.

Investments through separate account relationships with reasonable levels of liquidity over a 12- to 18-month period.

Private, open-ended funds with investor redemption rights with reasonable levels of liquidity over a six- to 12-month period.

- Public Real Assets

REITs which are publicly traded real estate investment trusts.

Commodities, listed infrastructure, and master limited partnerships which provide exposure to oil and gas, natural resources, and infrastructure projects.

Role in the SERS Fund

The program is intended to generate competitive long-term returns through capital appreciation and current income. Real assets generally offer lower volatility than the equity markets and provide at least moderate protection against inflation. The asset class provides significant diversification benefits due to its relatively low correlation to stocks and bonds.

Asset Class Benchmark

Performance is measured and evaluated over a three- to five-year period relative to a custom stylized benchmark including market-based sub-asset class indices where available (such as real estate, timber, agriculture), plus CPI + 3% where not available, with the various components weighted according to long-term allocation targets within the class.

Program Structure

The real assets portfolio contains both public and private investments, direct and indirect investments, and investments across a variety of sub-asset classes; however, it is currently dominated by exposure to real estate and commodities. Focus during the plan period is to diversify into other real assets sectors.

Strategic Initiatives

Consolidating SERS' historic and intended investments into a real assets portfolio is new for SERS. Given the plan's emphasis on liquidity and the less-liquid and private market nature of most real asset investments, implementation requires careful planning and execution.

The size and scale of the SERS Fund offers a competitive advantage relative to many other institutional investors; SERS seeks to capitalize on this advantage by preserving flexibility and improving its ability to execute nimbly on investment opportunities.

Strategic initiatives to achieve the performance objectives of the program include:

- Creating a *real assets investment plan* that establishes an optimal portfolio mix across real asset sectors, improves total fund inflation hedging and diversification, and prudently manages risk and liquidity
- Focusing new investments in structures that preserve SERS' control and liquidity, while managing costs (such as separate accounts, open-end vehicles, and other hybrid structures that offer SERS greater control over investment funding and liquidations)
- Actively seeking new real assets investments, consistent with SERS' liquidity needs and return requirements, to increase and diversify exposure across real asset sectors, including infrastructure, energy, and other natural resources
- Managing the pace of new illiquid real asset investments, consistent with increasing overall liquidity of the real assets portfolio
- Developing management reporting for real assets that tracks the program's progress toward achieving strategic objectives, including but not limited to performance, market values, risk, inflation hedging, liquidity, cash flows, and funded status

DIVERSIFYING ASSETS

Asset Class Description, Role, Benchmark, Structure & Initiatives

Asset Class Description

The diversifying assets program includes investments designed to provide total returns comparable to the total fund return but with less volatility and lower correlation to other asset classes.

Role in the SERS Fund

The program seeks to provide competitive returns and protect capital in all market conditions by investing in a diverse set of strategies including long/short equity, global macro, relative value, credit, event driven, and other hedge fund strategies—all with attractive long-term, risk-adjusted returns. The program targets a liquidity profile less than that of public equities but significantly more than private equity.

Asset Class Benchmark

Performance is measured and evaluated over a three- to five-year period relative to the HFRI Fund-of-Funds Strategic Index.

Program Structure

The program contains both direct and fund-of-funds investments, which invest across a wide variety of strategies.

Strategic Initiatives

Strategic initiatives to achieve the objectives of the program include:

- Continuing to streamline SERS' DA program reporting process in collaboration with SERS' direct hedge fund and general consultants
- Negotiating lower fees with managers as allocated capital allows
- Conducting an asset class and benchmark review with SERS' direct hedge fund and general consultants
- Sourcing and evaluating direct hedge fund investments, subject to internal ability to underwrite and manage such investments
- Reallocating assets, gradually, from legacy funds to hedged investment strategies with higher expected returns

FIXED INCOME/LIQUIDITY RESERVE

Asset Class Description, Role, Benchmarks, Structure & Initiatives

Asset Class Description

Fixed income includes investments in publicly traded debt obligations of sovereign, quasi-sovereign, and corporate entities. The asset class generates current income and the repayment of principal at maturity. Fixed income has substantially lower volatility than equity and most fixed income investments are significantly uncorrelated with equity returns.

The liquidity reserve has a distinct mandate to support regular disbursement of fund obligations and is invested in liquid and short-term instruments either directly or through a fund structure.

Role in the SERS Fund

The program is structured to generate income to pay benefits; provide liquidity to minimize capital impairment risk; reduce volatility in the total fund; protect the fund against deflation (and inflation via TIPS); and, contribute to total fund return when market conditions permit.

Asset Class Benchmarks

Performance is evaluated over a five-year period relative to the following benchmarks:

- Fixed Income – Barclay’s U.S. Aggregate Bond Index
- Liquidity Reserves – 90 Day T-Bill

Program Structure

There are three key components to the fixed income program. The size of each is based on the fund’s liabilities and expected cash flows, general liquidity conditions in the capital markets, inflation and economic growth expectations, the risk level of the total fund, and current valuations of various fixed income strategies. Components of the program include:

- *Core and Core Plus Fixed Income* which provide excess return when performance conditions are favorable; offers varying potential return with a corresponding variance in expected risk; provides capital protection in difficult market conditions; and offers risk mitigation due to low correlation with equity depending on the mix of core and core plus exposures in the composite.

- *Treasury Inflation Protection Securities (TIPS)* which preserve purchasing power due to high positive correlation to inflation and include U.S. and foreign TIPS.
- *Liquidity Reserve* which includes cash equivalents and short-duration notes that mature within five years.

Strategic Initiatives

Zero interest rate policies and quantitative easing programs have artificially suppressed interest rates. Central banks will eventually withdraw monetary stimulus and interest rates will rise, negatively affecting fixed income value. Strategic initiatives to achieve the objectives of the program and to mitigate this risk include:

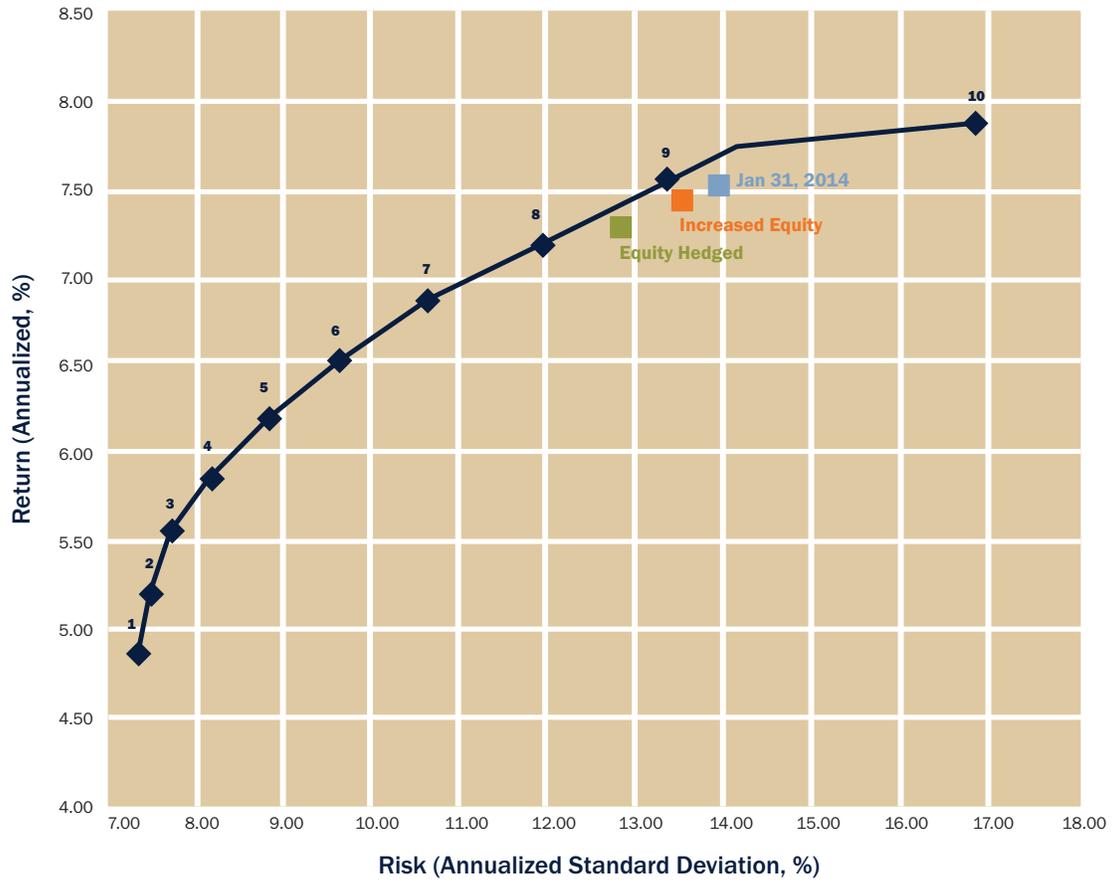
- **Optimizing the liquidity reserve:** The liquidity reserve is sized to meet the liquidity needs of the fund under all market conditions. Cash equivalents and short-duration notes have low returns and, thus, reduce fund performance. Working with the general consultant to maintain an optimal amount of reserves is necessary to balance liquidity needs and performance objectives.
- **Optimizing the fixed income segment:** SERS will work with the general consultant to evaluate allocations to the fixed income components to capture potential market opportunities and reduce exposure to potentially challenged segments, while ensuring allocations meet the liquidity needs of the fund.
- **Reducing the portfolio duration:** The primary risk in this asset class is interest risk (duration) in a rising rate environment. SERS may better protect asset values by providing managers with flexibility to protect the principal of their portfolios. Assets from passively managed and other long-duration mandates may be reallocated to other mandates that are more likely to perform better in a rising rate environment.
- **Diversifying the inflation hedge:** SERS and the general consultant will source, evaluate, and propose managers with dedicated floating-rate strategies to complement existing TIPS managers.
- **Reducing manager fees:** SERS will renegotiate fees whenever possible, particularly if more assets are added to an existing manager.

APPENDIX | LONG-TERM ASSET ALLOCATION ANALYSIS

Potential Thematic Portfolio Allocations

Asset Class	Current	Long-Term Alternative Targets	
	Jan 31 2014	Equity Hedged	Increased Equity
Alternative Investments	21.8	14	15
Global Public Equity	35.2	38	40
Real Assets	15.6	16	17
Diversifying Assets	6.5	10	10
Fixed Income	15.3	19	15
Liquidity Reserve	5.7	3	3
Total	100	100	100
Capital Appreciation	57	52	55
Capital Preservation	21	22	18
Alpha	7	10	10
Inflation	16	16	17
Expected Return	7.58	7.32	7.50
Risk (Standard Deviation)	13.88	12.77	13.46
Return (Compound)	6.70	6.57	6.67
Return/Risk Ratio	0.55	0.57	0.56
RVK Expected Equity Beta	0.69	0.65	0.68
RVK Liquidity Metric	61	65	64

Efficient Frontier



APPENDIX | CAPITAL MARKET ASSUMPTIONS

2014 Long-Term Capital Market Assumptions

Asset Class	Arithmetic Return Assumption	Standard Deviation Assumption	Index	Longest Historical Time Frame	Annualized Arithmetic Return	Annualized Standard Deviation
Alternative Investments	11.00	29.00	Venture Economics All PE	Jul 1981 - Jun 2013 (Q)	13.65	14.06
Global Public Equity	7.90	18.35	MSCI ACW IMI (Gross)	Jun 1994 - Dec 2013	8.42	15.93
Real Assets	7.45	12.73	SERS Custom Real Assets Index	Mar 1995 - Mar 2013 (Q)	8.24	9.30
Diversifying Assets	7.50	12.50	HFN Long/Short Eq (Net)	Jan 1983 - Dec 2013	14.33	10.51
Fixed Income	4.00	6.00	Barclays U.S. Agg Bond	Jan 1976 - Dec 2013	7.79	5.52
Liquidity Reserve	2.50	3.50	Barclays U.S. Gov't/Cred; 1-3 Yr	Jan 1976 - Dec 2013	6.63	2.76

2014 Long-Term Correlations Assumptions

	Alternative Investments	Global Public Equity	Real Assets	Diversifying Assets	Fixed Income	Liquidity Reserve
Alternative Investments	1.00	0.74	0.64	0.67	(0.18)	(0.18)
Global Public Equity	0.74	1.00	0.59	0.82	0.00	(0.06)
Real Assets	0.64	0.59	1.00	0.52	(0.15)	(0.13)
Diversifying Assets	0.67	0.82	0.52	1.00	0.09	0.09
Fixed Income	(0.18)	0.00	(0.15)	0.09	1.00	0.89
Liquidity Reserve	(0.18)	(0.06)	(0.13)	0.09	0.89	1.00

State Employees' Retirement System

30 N 3rd St, Suite 150

Harrisburg, PA 17101-1716

1.800.633.5461

www.SERS.state.pa.us