

MINUTES of SERS Board Regular Meeting – Wednesday, April 25, 2018

CALLED TO ORDER: 9:30 a.m. by Chairman David R. Fillman

ATTENDEES:

Members and Designees

David R. Fillman – Chairman

Glenn E. Becker

Dan B. Frankel

Robert W. Godshall

Charles T. McIlhinney, Jr.

T. Terrance Reese

Mary A. Soderberg

Joseph M. Torsella

Robin L. Wiessmann

Thomas Clancy – Designee for Treasurer Joseph M. Torsella

Bernie Gallagher – Designee for Representative Dan B. Frankel

Toni Marchowsky – Designee for Senator Vincent J. Hughes

Dan Ocko – Designee for Representative Dan B. Frankel

Monica Riddle – Designee for Senator Charles T. McIlhinney, Jr.

Ned Smith – Designee for Representative Robert W. Godshall

Consultants

Craig Graby, Korn Ferry Hay Group, Inc.

Anthony Johnson, RVK, Inc.

Olga Kusters, StepStone Group LP

Kyuman Lee, Korn Ferry Hay Group, Inc.

Brent Mowery, Korn Ferry Hay Group, Inc.

Matt Roche, StepStone Group LP

Jim Voytko, RVK, Inc.

Michael Yang, NEPC, LLC

Executive Staff

Anthony Faiola

Bryan Lewis

N. Joseph Marcucci

Staff

Rose Agnew

Grace Bachman

Lena Bickle

Dino DeGennaro

James Ditty

Myisha Ebersole

Linda Engle

Brittany Erney-Muniz
David Felix
Randy Gilson
Jason Giurintano
Phillip Greenberg
Whitney Harlow
Pamela Hile
Khalfani King
Barbara Kiral
Dan Krautheim
Cheryl Krchnar
Karen Lynn
Katie Mathews
Jeffrey McCormick
Karen McCurdy
Sara McSurdy
Jeffrey Meyer
Ryan Morse
James Nolan
M. Catherine Nolan
Dorothy Packer
Kathleen Ryan
Sharon Smith
Thomas Swope
David Tarsi
Joseph Torta
Tonya Troutman
William Truong
Denise Williams

Visitors

Chris Ade, Lord, Abbett & Co. LLC
Tony Agentowicz, Voya Financial
Mark Babiec, CBRE Clarion Securities LLC
Skip Corkran, Macquarie Investment Management
Lloyd Ebright, PA Treasury
Alan Flannigan, PA Department of Banking and Securities
Christopher Houston, Special General Counsel
Jim Kane, Unite Here
Michele Kreisler, PA Treasury
Carrie Pickett, Blueprint Capital Advisors LLC
Mark Ryan, PA Independent Fiscal Office
Rita Sallis, Blueprint Capital Advisors LLC
Terrill Sanchez, PA Public School Employees' Retirement System
Rosanna Weaver, As You Sow

Presenters

Chris Austin, ICG Europe Fund VII SCSp and ICG North American Private Debt Fund II L.P.

Karen Brennan, LaSalle Investment Management, Inc.

Hadj Djemai, ICG Europe Fund VII SCSp

Sal Gentile, ICG North American Private Debt Fund II L.P.

Scott Hahn, Hahn & Company III L.P. & Hahn & Company III-S L.P.

Steve Inglis, LaSalle Investment Management, Inc.

Jason Kern, LaSalle Investment Management, Inc.

Keith Kyung-Koo Kim, Hahn & Company III L.P. & Hahn & Company III-S L.P.

Pratish Patel, Hahn & Company III L.P. & Hahn & Company III-S L.P.

Michelle Russo, Hotel Asset Value Enhancement, Inc.

MINUTES of the SERS Board Regular Meeting Wednesday, April 25, 2018

A. STANDARD MOTIONS

Action: 1. Minutes of Board Meeting – April 6, 2018

Chairman Fillman presented the minutes provided to the board (4/25/2018 Board Package, Administrative Report, Tab 2).

MOTION: 2018-17

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board approves the minutes of the April 6, 2018, board meeting.

Action: 2. Statement of Changes in Fiduciary Net Position for Periods Ending – January 31 and February 28, 2018

Chairman Fillman presented the report provided to the board (4/25/2018 Board Package, Administrative Report, Tab 3).

MOTION: 2018-18

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board accepts the State Employees' Retirement System's Statement of Changes in Fiduciary Net Position for the periods ending January 31 and February 28, 2018.

B. RECOGNITION FOR SERS RETIREES – DOROTHY PACKER, CHIEF OF INFORMATION TECHNOLOGY AND CHERYL KRCHNAR, HUMAN RESOURCES DIRECTOR

MOTION: 2018-19

By motion of Chairman Fillman, the board unanimously agreed to recognize Dorothy Packer with a board resolution, read by Tony Faiola, a copy of which shall be filed with the minutes of the meeting (ATTACHMENT A).

MOTION: 2018-20

By motion of Chairman Fillman, the board unanimously agreed to recognize Cheryl Krchnar with a board resolution, read by Tony Faiola, a copy of which shall be filed with the minutes of the meeting (ATTACHMENT B).

C. INTRODUCTION OF SERS EXECUTIVE DIRECTOR TERRILL SANCHEZ

Chairman Fillman noted that newly hired Executive Director, Terrill Sanchez, is attending the board meeting today to observe before she starts with SERS in mid-May.

D. Investment Presentations and Reviews: SERS INVESTMENT OFFICE AND RVK, INC.

Presentation: 1. Asset Allocation Education Session

Messrs. Lewis, Nolan, Truong, Johnson and Voytko presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 7).

Action: 1. 2018-2019 Investment Plan

Messrs. Lewis, Nolan, Truong, Johnson and Voytko presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 2).

MOTION: 2018-21

By motion that was moved, seconded, and approved by board members, except for members Secretary Wiessmann, Mr. Becker, Representative Frankel and Treasurer Torsella who voted No, it was

RESOLVED: That the board accepts the State Employees' Retirement System 2018-2019 Investment Plan (ATTACHMENT C).

E. SERS' ACTUARY, THE KORN FERRY HAY GROUP, INC.

Action: 1. Asset Allocation Education Session

Messrs. Mowery, Graby and Lee presented the report provided to the board (4/25/2018 Board Package, Administrative Report, Tab 14).

MOTION: 2018-22

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board approves the results of the 2017 actuarial valuation; and for the fiscal year 2018/2019 certifies the following:

1. Shared risk contribution rate of 0.0%;
2. Employer normal contribution rate of 4.88%;
3. Composite employer contribution rate necessary for the funding of the system of 32.90%; and
4. Employer contribution rates by group and class of service of employees as set forth in the actuarial valuation

as calculated by the Korn Ferry Hay Group, Inc. ("SERS' Consulting Actuary") pursuant to Section 5508 of the State Employees' Retirement Code; and authorizes SERS' staff and SERS' Consulting Actuary to use these rates to develop all the employer rates for the period July 1, 2018, to June 30, 2019, pursuant to Section 5902(k) of the State Employees' Retirement Code and authorizes the Acting Executive Director to certify such rates to all employers with employees who are active members of SERS and to the Secretary of the Budget.

AND FURTHER RESOLVED: That in addition to the foregoing employer contribution rates, the board hereby adopts and establishes an employer contribution rate of 0.03% for the fiscal year 2018/2019 to fund the Benefits Completion Plan established pursuant to Section 5941 of the State Employees' Retirement Code and authorizes the Acting Executive Director to certify such rate to all employers with employees who are active members of SERS and to the Secretary of the Budget.

F. Investment Presentations and Reviews: SERS INVESTMENT OFFICE AND STEPSTONE GROUP LP

Action: 1. Private Equity Interview – Hahn & Company III L.P. & Hahn & Company III-S L.P.
Messrs. Felix, Roche, Hahn, Patel and Kim presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 9).

MOTION: 2018-23

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to commit up to (i) \$50 million to Hahn & Company III L.P., and up to (ii) \$25 million to Hahn & Company III-S L.P., plus investment expenses and pro rata share of partnership operating expenses, consistent with executed partnership documents, as follow-on investments within the Private Equity asset class, subject to successful completion of contract

negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 12 months.

Presentation: 1. Private Equity Recommendation for Future Interview – Thoma Bravo Fund XIII, L.P.

Messrs. Felix, Morse and Roche presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 6).

It was the consensus of the board to interview representatives of this manager at the June 13, 2018, board meeting.

G. EXECUTIVE SESSION

Presentation: 1. Agenda

At 12:33 p.m., the board recessed and entered executive session to receive legal advice and confidential performance information on executive session agenda items, as provided in ATTACHMENT D.

H. LUNCH BREAK

I. PUBLIC MEETING RESUMES

The public meeting resumed at 2:05 p.m.

J. AUDIT COMMITTEE RECOMMENDATION

Action 1: The following motion was presented as a result of discussion in executive session.

MOTION: 2018-24

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board accepts the recommendation of the SERS Audit Committee to adopt the amendments to the Board Education Policy (2017 POL-BD-06), as set forth in ATTACHMENT E: Board Education Policy (2017 POL-BD-06), as amended.

K. Investment Presentations and Reviews: SERS INVESTMENT OFFICE AND STEPSTONE GROUP LP

Action: 1. Multi-Strategy Interview – ICG Europe Fund VII SCSp

Ms. Kusters and Messrs. Felix, Morse, Austin and Djemai presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 10 and board handout).

MOTION: 2018-25

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to commit up to €80 million (approximately \$100 million), plus investment expenses and pro rata share of partnership operating expenses, consistent with executed partnership documents, to ICG Europe Fund VII SCSp, as an investment within the Multi-Strategy asset class, subject to successful completion of contract negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 12 months.

Action: 2. Multi-Strategy Interview – ICG North American Private Debt Fund II L.P.

Ms. Kosters and Messrs. Felix, Morse, Austin and Gentile presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 11 and board handout).

MOTION: 2018-26

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to commit up to \$75 million, plus investment expenses and pro rata share of partnership operating expenses, consistent with executed partnership documents, to ICG North American Private Debt Fund II L.P., as an investment within the Multi-Strategy asset class, subject to successful completion of contract negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 12 months.

Presentation: 1. Multi-Strategy Recommendation for Future Interview – TSSP Opportunities Partners IV, L.P.

Ms. Kosters and Messrs. Felix and Morse presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 5).

It was the consensus of the board to interview representatives of this manager at the June 13, 2018, board meeting.

L. Investment Presentations and Reviews: SERS INVESTMENT OFFICE AND NEPC, LLC

Action: 1. Real Estate Interview – LaSalle Investment Management, Inc.

Ms. Brennan and Messrs. Greenberg, Yang, Kern and Inglis presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 12).

MOTION: 2018-27

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to authorize the orderly transfer of the non-hotel/hospitality portion of the real estate asset portfolio currently managed by Lowe Enterprises Investment Management, LLC to LaSalle Investment Management, Inc., subject to successful completion of contract negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 12 months.

Action: 2. Real Estate Interview – Hotel Asset Value Enhancement, Inc.

Ms. Russo and Messrs. Greenberg and Yang presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 13).

MOTION: 2018-28

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to authorize the orderly transfer of the hotel/hospitality portion of the real estate asset portfolio currently managed by Lowe Enterprises Investment Management, LLC to Hotel Asset Value Enhancement, Inc., subject to successful completion of contract negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 12 months.

M. Investment Presentations and Reviews: SERS INVESTMENT OFFICE AND RVK, INC.

Action: 1. Global Public Equity Discussion

Messrs. Nolan, Truong, Johnson and Voytko presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 3).

MOTION: 2018-29

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to approve redeeming \$400 million from the MCM Russell 1000 Index Fund and contributing that \$400 million to the existing BlackRock Emerging Markets Index Fund. A board approved transition manager may be used to assist in facilitating these transactions.

MOTION: 2018-30

By motion that was moved, seconded, and approved by board members, except Mr. Clancy, designee for Treasurer Torsella, who voted No, it was

RESOLVED: That the board orders to approve the conversion of two current emerging markets portfolios (Macquarie Group and Martin Currie) from separate accounts to commingled structures. A board approved transition manager may be used to assist in facilitating these transactions.

N. Investment Presentations and Reviews: SERS INVESTMENT OFFICE AND RVK, INC.

Action: 1. Cost Reduction Tactics

Messrs. Nolan, Truong, Felix, Greenberg, Johnson and Voytko presented the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 8).

O. Investment Consultant Contracts: SERS INVESTMENT OFFICE

Action: 1. RVK Contract Extension

Chairman Fillman noted the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 4).

MOTION: 2018-31

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to authorize an extension of the (i) Agreement between SERS and RVK, Inc. for consulting services for the State Employees' Retirement System Defined Benefit Plan and Commonwealth's IRC §457(b) Deferred Compensation Plan, and (ii) Agreement between the State Employees' Retirement Board and RVK, Inc. for consulting services for the IRC §401(a) State Employees' Defined Contribution Plan, both until April 9, 2019, under the existing terms, services, and fee schedules, subject to successful completion of contract negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 6 months.

Action: 2. StepStone Contract Extension

Chairman Fillman noted the report provided to the board (4/25/2018 Board Package, Investment Report, Tab 4).

MOTION: 2018-32

By motion that was moved, seconded, and approved by board members, it was

RESOLVED: That the board orders to authorize an extension of the Agreement between SERS and StepStone Group LP for private equity consulting services until October 5, 2019, under the existing terms, services, and fee schedules, subject to successful completion of contract negotiations and execution and delivery of closing documents by all parties, including required Commonwealth legal approvals, within 6 months.

P. REPORT FROM ACTING EXECUTIVE DIRECTOR**Presentation: 1. Board Dismissals**

Mr. Faiola presented the report regarding uncontested matters that an Order was issued dismissing the following administrative appeals, as provided to the board (4/25/2018 Board Package, Administrative Report, Tab 8).

Account of Maria T. DeAugustino

Docket No. 2015-07

Claim of Maria T. DeAugustino

Account of Brenda A. Gavin

Docket No. 2017-06

Claim of Brenda A. Gavin

Presentation: 2. Legislative Update

Mr. Faiola noted that the report was provided to the board (4/25/2018 Board Package, Administrative Report, Tab 9).

Presentation: 3. Personnel Committee Meeting Minutes – March 1, 2018

Mr. Faiola noted that the Personnel Committee meeting minutes were provided to the board (4/25/2018 Board Package, Administrative Report, Tab 10).

Presentation: 4. 457 DCP Committee Meeting Minutes – March 6, 2018

Mr. Faiola noted that the 457 DCP Committee meeting minutes were provided to the board (4/25/2018 Board Package, Administrative Report, Tab 11).

Presentation: 5. Audit Committee Meeting Minutes – April 6, 2018

Mr. Faiola noted that the Audit Committee meeting minutes were provided to the board (4/25/2018 Board Package, Administrative Report, Tab 12).

Q. NEXT BOARD MEETING – JUNE 13, 2018

Chairman Fillman noted that the next regular meeting of the SERS board is scheduled for June 13, 2018.

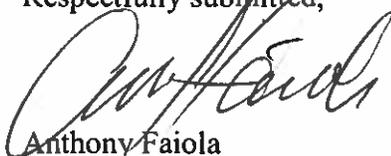
R. MOTION TO ADJOURN

Action: 1. Adjournment

MOTION: 2018-33

By motion of Chairman Fillman, the board unanimously agreed to adjourn the meeting at 4:40 p.m.

Respectfully submitted,



Anthony Faiola

Acting Executive Director

Commonwealth of Pennsylvania
State Employees' Retirement System



RESOLUTION

WHEREAS, Dorothy Packer is retiring after more than 36 years with the Commonwealth of Pennsylvania, having dedicated more than 26 years of that service to the Pennsylvania State Employees' Retirement System; and

WHEREAS, Dorothy has been entrusted with additional and increasingly significant responsibilities and authority over the years, rising up through the ranks of the agency from a Computer Systems Analyst 1 to the Chief Information Officer, and

WHEREAS, Dorothy has overseen several large business-critical projects including establishing and later updating the SERS Disaster Recovery Datacenter; and

WHEREAS, Dorothy has envisioned and initiated the ongoing multi-year project to modernize the agency's proprietary system that maintains member records; now therefore be it

RESOLVED, that the Pennsylvania State Employees' Retirement System Board commends Dorothy Packer for her dedication to this System and the more than 239,000 members we serve, and wishes her good health, happiness and success in retirement; and be it further

RESOLVED, That the original resolution be transmitted to Dorothy Packer, and a copy included in the minutes.

April 25, 2018

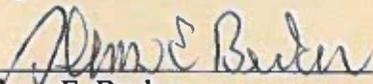
Harrisburg, Pennsylvania



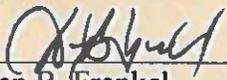
David R. Fillman, Chairman



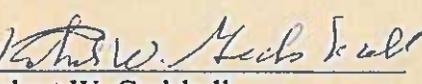
Stephen S. Aichele



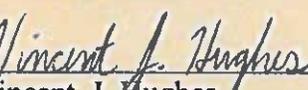
Glenn E. Becker



Dan B. Frankel



Robert W. Godshall

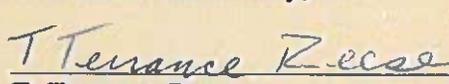


Vincent J. Hughes

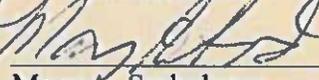




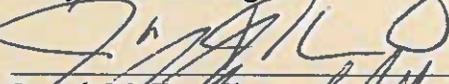
Charles T. McIlhinney, Jr.



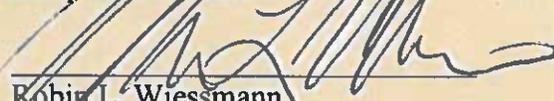
T. Terrance Reese



Mary A. Soderberg



Joseph M. Torsella



Robin L. Wiessmann

**Commonwealth of Pennsylvania
State Employees' Retirement System**



RESOLUTION

WHEREAS, Cheryl Krchnar is retiring after nearly 34 years with the Commonwealth of Pennsylvania, having dedicated nearly 14 years of that service to the Pennsylvania State Employees' Retirement System; and

WHEREAS, Cheryl has worked in human resources in four different agencies before coming to SERS and becoming a confidante and resource for the SERS Board, Executive Director, and management staff, and

WHEREAS, Cheryl has worked to bring the highest quality candidates as a result of the rigorous recruitment process implemented at SERS; and

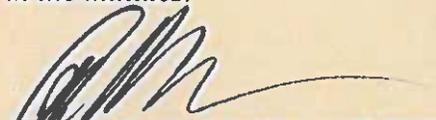
WHEREAS, Cheryl has provided strategic support to the agency throughout her tenure and to the members of the Personnel Committee regarding staff compensation and personnel reviews; now therefore be it

RESOLVED, that the Pennsylvania State Employees' Retirement Board expresses its sincere appreciation to Cheryl Krchnar for her dedication to this System and the more than 239,000 members we serve, and wishes her good health, happiness and success in retirement; and be it further

RESOLVED, That the original resolution be transmitted to Cheryl Krchnar, and a copy included in the minutes.

April 25, 2018

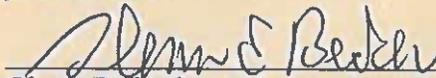
Harrisburg, Pennsylvania



David R. Fillman, Chairman



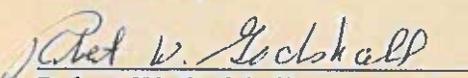
Stephen S. Aichele



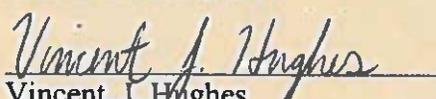
Glenn E. Becker



Dan B. Frankel

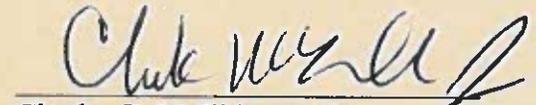


Robert W. Godshall

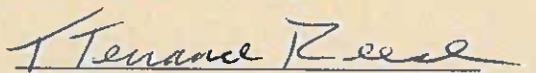


Vincent J. Hughes

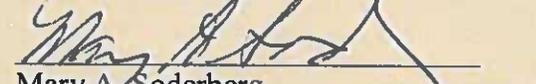




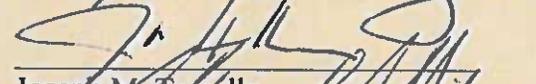
Charles T. McIlhinney, Jr.



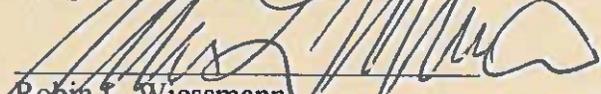
T. Terrance Reese



Mary A. Soderberg



Joseph M. Torsella



Robin L. Wiessmann

2018 – 2019 Investment Plan

Commonwealth of Pennsylvania
State Employees' Retirement System

Prepared by SERS' Investment Office – in consultation with the State Employees' Retirement Board and its investment consultants. Adopted by SERS' Board on April 25, 2018.

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Investment Plan Purpose

SERS' Statement of Investment Policy established two objectives for SERS' investment program:¹

- Achieve a net total return equivalent to the actuarial interest rate assumption, or preferably, in excess of this rate in order to improve the funded ratio of the fund through investment earnings and favorably impact future employer and employee contribution rates.
- Achieve a net, total long-term return that meets or exceeds an appropriate composite plan benchmark index on a five to 10-year rolling time horizon. The composite benchmark index is based on the asset allocation set forth in this investment plan, as approved by the SERS Board.

This plan provides a clear strategic direction for SERS' investment program. The State Employees' Retirement Board ("Board") seeks to pursue five key objectives in this investment plan.

1. Formulate an asset allocation policy that provides a high expected probability of achieving SERS' actuarially assumed long-term rate of return, consistent with the Board's tolerance for risk, while continuing to meet obligations to beneficiaries.
2. Define the primary strategic objectives that are central to a successful investment program for the total SERS fund at this point in time.
3. Define, in general terms, the strategies and methods to be pursued at both the total fund and the individual asset class levels to achieve those objectives.
4. Provide a tool for integrating key aspects of SERS' pension plan attributes with the investment strategy and, similarly, for integrating Board decisions and staff execution of that strategy.
5. 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.

SERS' investment office staff, in consultation with the Board and investment consultants, updates the investment plan every other year. If economic, fiscal, or capital market conditions change significantly, SERS' investment office staff and consultants may recommend changes to

¹ SERS Statement of Investment Policy (amended 03/08/2017) (p.8).

this investment plan for the Board's approval on an interim basis. Approval of this investment plan by SERS' Board authorizes SERS' investment office staff to:

- Execute the asset class changes
- Strive towards asset allocation policy targets
- Begin researching and implementing initiatives

SERS' investment office staff will report its recommendations to SERS' Board for consideration.

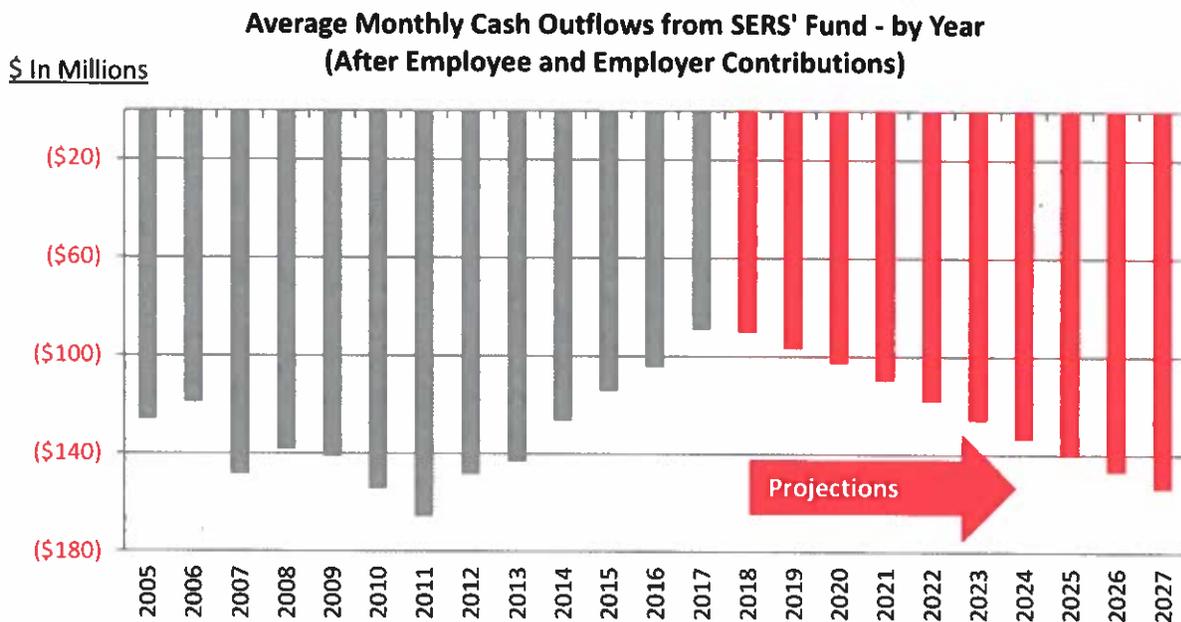
Liquidity Requirements

SERS is a mature pension plan with negative cash flows – retirement benefit payments are greater than contributions from employees and employers. Over the past decade, SERS paid over \$26 billion in retirement benefits to over 105,000 members. During the same period, SERS received contributions of \$3.5 billion from employees and \$6.8 billion from employers.²

Over the next 10 years, SERS’ projected monthly retirement benefit payments will increase from just under \$100 million to over \$140 million (net of contributions from employees and employers under Act 2010-120 assumptions).³

A critical risk factor to consider is the potential for prolonged suppressed cash payments from employers during difficult state government budget cycles. Over the next 10 years, the average annual employer contribution is expected to be approximately 31% of payroll. Figure 1 shows the average monthly cash outflows from SERS after employee and employer contributions.

Figure 1



² 10-years ending December 31, 2016.

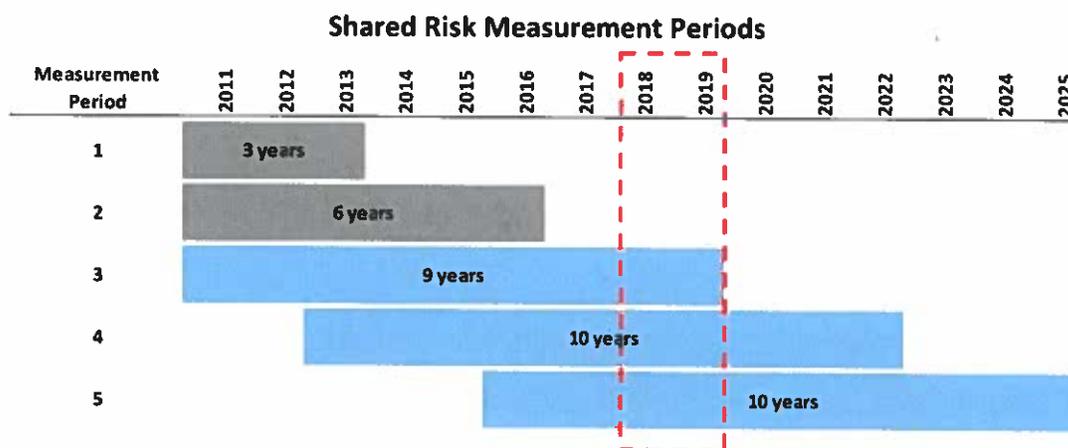
³ SERS’ 2016 Actuarial Report (p.32), Projection of Expected Contributions and Benefits.

Shared Risk – Potential Impact on Employee Contributions

Under the shared risk provision of Act 2010-120, employee contributions will increase if SERS underperforms its actuarial assumed rate of return by greater than 100 basis points (>1.0%) over a measurement period. The shared risk provision highlights the importance of SERS’ investment decision-making process, including:

- The appropriateness of the actuarial assumed rate of return established by the Board
- The probability that a Board-approved asset allocation can achieve the actuarial assumed rate of return within an appropriate level of expected risk
- The process of how investment managers and funds are selected and hired by the Board

Figure 2



There were no increases to employee contributions for measurement periods 1 and 2. As shown in Figure 2, the third measurement period will be from January 1, 2011, to December 31, 2019 (9 years). All measurement periods thereafter are calculated every three years using the prior 10-year rolling annualized return. It is important to note that employee contributions may increase by a maximum of 50 basis points (0.5%) as a result of any one measurement period outcome and is subject to a maximum cumulative cap of 200 basis points (2.0%).⁴

In addition to the existing shared risk provision, Act 2017-5 provides that Class A-3 and Class A-4 members will share in the gains (50 basis points reduction in contribution rates with a cumulative maximum reduction of 200 basis points) if SERS outperforms its actuarial assumed rate of return by greater than 100 basis points (>1.0%) over the measurement periods.

⁴ SERS’ 2016 Actuarial Valuation Report – Schedule D (pgs.19-20).

A Well-Defined Investment Philosophy and Process

SERS' investment program has a critical requirement to pay retirement benefits in perpetuity and the Board, investment office staff, and external consultants spend a considerable amount of time evaluating liquidity, shared risk, capital markets, expected returns, and expected risks. To avoid a permanent loss of capital during potentially prolonged periods of market decline, SERS' investment program has a continuing commitment to ensure that:

- **The fund is diversified, which serves as a foundation of risk management.**
- **Investment strategies embrace risk in order to achieve returns since a risk-free investment strategy does not exist.**
- **A disciplined rebalancing process is executed to adhere as closely as possible to the Board's chosen target asset allocation.**
- **Every dollar invested must align to an initiative or an asset class structure of the Board-approved investment plan.**
- **Every dollar invested must have the potential to add exceptional value relative to its competing investment opportunities with similar risk/return, fee, and liquidity profiles.**

SERS' investment program has a continuing commitment to conduct thorough due diligence and intensive manager monitoring, and to continuously enhance its disciplined investment decision-making process. Although it requires extensive time and resources, the goals of SERS' disciplined investment process are to:

- **Improve the probability of achieving long-term expected return objectives;**
- **Ensure confidence that all investment opportunities recommended by investment staff and consultants are the best available opportunities; and**
- **Enhance accountability of investment recommendations from investment office staff.**

SERS' investment program is structured with a long-term focus and is based on a combination of academic theory, market and economic assumptions, and state budgetary assumptions. The theoretical framework relies on a mean-variance optimization analysis which combines expected returns, volatility, and covariance of investment combinations. A long-term asset allocation target policy is constructed to provide a high probability of achieving SERS' long-term actuarially assumed rate of return, consistent with the Board's tolerance for risk, while continuing to meet retirement benefit payment obligations in perpetuity.

SERS' investment program endeavors to maintain an appropriate level of cash to pay benefits through prolonged periods of market and economic decline.

Key Objectives

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 adopted four key objectives.

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 rate of return of 7.25% (lowered from 7.5% in 2017) in both setting its asset allocation—the largest determinant of both risk and return in the fund—as well as in executing individual 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

Align the percentage of fund assets committed to long-term illiquid investments with expected net cash outflows.

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 successfully executed its plan to decrease the allocation to illiquid investments to an appropriate level better aligned with the system's expected net cash outflows and assumed rate of return. As such, the Board will continue to incorporate future liquidity requirements into its investment decisions in pursuit of achieving or exceeding the assumed rate of return.

Objective #3

Continue to maintain vigorous performance monitoring and a comprehensive risk monitoring and mitigation program.

The challenges facing fiduciaries to manage responsibly and prudently the investment of more than \$29 billion across multiple asset classes, scores of investment mandates, and other assets are immense. To this end, the Board will work with SERS' staff and consultants to maintain and enhance, where possible, the ongoing monitoring program. Moreover, the Board will continue 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.

Objective #4

Continue managing and negotiating investment costs across the fund.

It is crucial to focus on the investment management costs of a fund invested in various strategies that collectively targets a risk-adjusted performance that meets or exceeds the assumed rate of return.

Forward Vision

Although significant accomplishments to enhance returns and reduce fees have been achieved, SERS' investment program strives for continuous improvement to utilize best practices to achieve or exceed its expected return while controlling costs.

As a long-term investor, SERS remains committed to utilizing best practices in governance, asset allocation, and risk management. Accordingly, SERS will continue to enhance its efficiency, while simultaneously allocating resources to low-cost passive strategies or best-in-class actively managed opportunities where the Board, investment office, and external consultants have the highest conviction that the opportunities can generate excess return.

All of the 2018 – 2019 Investment Plan initiatives listed below focus on achieving SERS' long-term expected return of 7.25%.

Strategic Initiatives

Private Equity and Real Estate

1. Target the annual pacing of up to \$650 million in new Private Equity commitments (currently \$750 million) to meet its long-term target allocation of 16% of the total fund.
2. Target Private Equity fund commitments of \$75 million or more, in best-in-class funds to build long-term strategic partnerships, improve operational efficiency by reducing the number of funds, and improve SERS' leverage to negotiate lower management fees. Certain commitments under \$75 million to high conviction relationships such as venture capital and emerging markets may be considered on a case-by-case basis.
3. Target the annual pacing of up to \$600 million in new Real Estate commitments to meet its long-term target allocation of 12% of the total fund.
4. Target Real Estate fund commitments of \$50 million or more with best-in-class managers/funds to build long-term strategic partnerships and improve SERS' leverage to negotiate lower fees. Certain commitments of under \$50 million may be considered to tactical sectors on a case-by-case basis.
5. Research Private Equity co-investment options to lower SERS' management fees.
6. Improve Real Estate's risk/return profile by establishing clear long-term target allocation ranges designed to increase the expected return, liquidity, diversification, and inflation hedging characteristics of the Real Estate portfolio, while decreasing expected risk.

Multi-Strategy

7. Target up to \$350 million in the Private Credit Funds sub-strategy to meet its long-term target allocation.
8. Target Private Credit fund commitments of \$75 million or more in best-in-class funds to build long-term strategic partnerships, and improve SERS' leverage to negotiate lower management fees.

Global Public Equity and Fixed Income

9. Research and implement optimal active and passive allocations within SERS' Global Public Equity and Fixed Income programs.
10. Implement optimal structures to enhance global mandate and emerging market equity investment opportunities.
11. Implement an emerging investment manager program for public equities.

Legacy Hedge Funds (in liquidation)

12. Continue with the liquidation of SERS' legacy hedge fund portfolios.

Total Fund Level

13. Enhance investment-related governance policies (e.g., Statement of Investment Policies, Investment Advisor Monitoring Policy, Rebalancing Policy, Proxy Voting Policies, Derivatives Policy, etc.).
14. Provide SERS' Board with educational opportunities to discuss global market and economic conditions, and their impact on SERS' investment program.
15. Implement investment-related governance policies approved by the Board.
16. Take into account the Pennsylvania Department of the Auditor General's 2017 audit recommendations while implementing this plan.
17. Conduct an in-depth benchmark review.

Asset Liability Study

SERS performs a comprehensive asset liability study every three to five years to examine the probable future consequences, over extended periods of time, of applying alternative asset allocation strategies to SERS' investment assets in order to fund the liabilities created by the benefit provisions of the pension plan. Asset liability studies are unique in their ability to combine, in a single analysis, the three critical factors that drive the financial health of the pension plan: 1) benefit policy (liabilities), 2) contribution policy, and 3) investment strategy (asset allocation).

The results of the 2015 Asset Liability Study indicate that SERS currently is underfunded but improvements in financial health are possible. SERS can best meet its objectives through the continued use of a well-diversified investment portfolio. **However, positive outcomes are extremely dependent on the employer contribution policy.**⁵

Asset Allocation Policy

Asset allocation is widely accepted as the primary determinant of any pension plan's long-term return and risk. It is substantially more influential than the mandates deployed in individual asset classes, the managers selected to implement the mandates, or the tactical asset allocation decisions. A significant and often-cited study on this topic demonstrates that asset allocation explained 93.6% of the variation in quarterly returns for a typical large pension fund.⁶

SERS' historical adherence to its asset allocation process generated investment returns that contributed 51% of the assets added to its portfolio over the past decade. Of the remaining 49%, employer contributions added 32% and employee contributions added 17%.⁷

In developing long-term asset allocation policy targets, SERS' investment team must consider:

- Maintaining an appropriate level of cash to pay retirement benefits and covenants during prolonged periods of market decline and potential state budgetary constraints.
- Maintaining an appropriate liquidity profile of the total fund to align with the projected increase in retirement benefit payments.
- Pursuing the highest returns possible at the level of risk deemed prudent by SERS' Board.

⁵ RVK Asset Liability Study Executive Summary dated September 16, 2015.

⁶ Brinson, Hood, and Beebower, "Determinants of Portfolio Performance," *Financial Analysts Journal*, July/August 1986

⁷ SERS' 2016 CAFR (p.5).

SERS' asset allocation structure was developed and weighted by considering each asset class' expected return, volatility, and correlation with other asset classes. SERS' investment office staff, in consultation with the Board and external investment consultants, combines asset classes in such a way to provide the highest expected return for a given level of risk, subject to the fundamental liquidity and diversification constraints.

SERS' updated asset allocation is positioned to maintain the current liquidity profile of the total fund, improve staff, consultant, and investment manager accountability, leverage staff and consultant skill sets, and improve transparency. The Board selected the 10-year target asset allocation policy as shown below (Figure 3).

Figure 3

SERS 2018 – 2019 Asset Allocation Policy⁸

	Current Exposure 12/31/2017	2018 – 2019 Asset Allocation Policy	Policy Ranges
Private Equity	14%	16%	
Global Equity	53%	48%	
<i>Total Equity</i>	67%	64%	+/-5%
Real Estate	8%	12%	+/-3%
Multi-Strategy	8%	10%	+/-3%
Fixed Income	14%	11%	+/-3%
Cash	3%	3%	+/-3%
Total	100%	100%	
Expected Return	7.17%	7.35%	
Risk (Standard Deviation)	14.27%	14.45%	
RVK Liquidity Metric	67	61	

⁸ Source: SERS' Investment Office and RVK

As a result of the Board’s selected target asset allocation policy, SERS’ investment program is positioned to achieve the actuarial assumed rate of return over the long-term. These returns are inclusive of expected total excess performance over benchmarks while ensuring there is sufficient liquidity to pay retirement benefits.

To explain the primary risk and return contributors, the chart below (Figure 4) shows the major asset class components of SERS’ asset allocation, with expected return on the vertical axis, and expected risk along the horizontal axis.

Figure 4

SERS’ 10-Year Target Asset Allocation

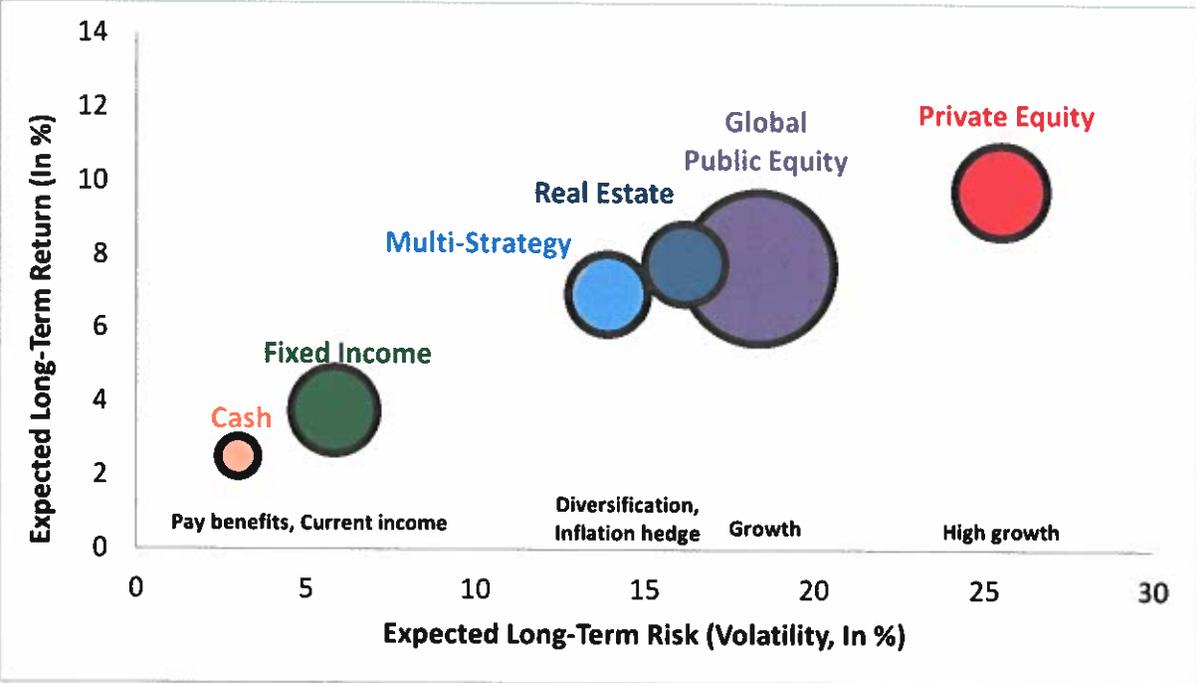
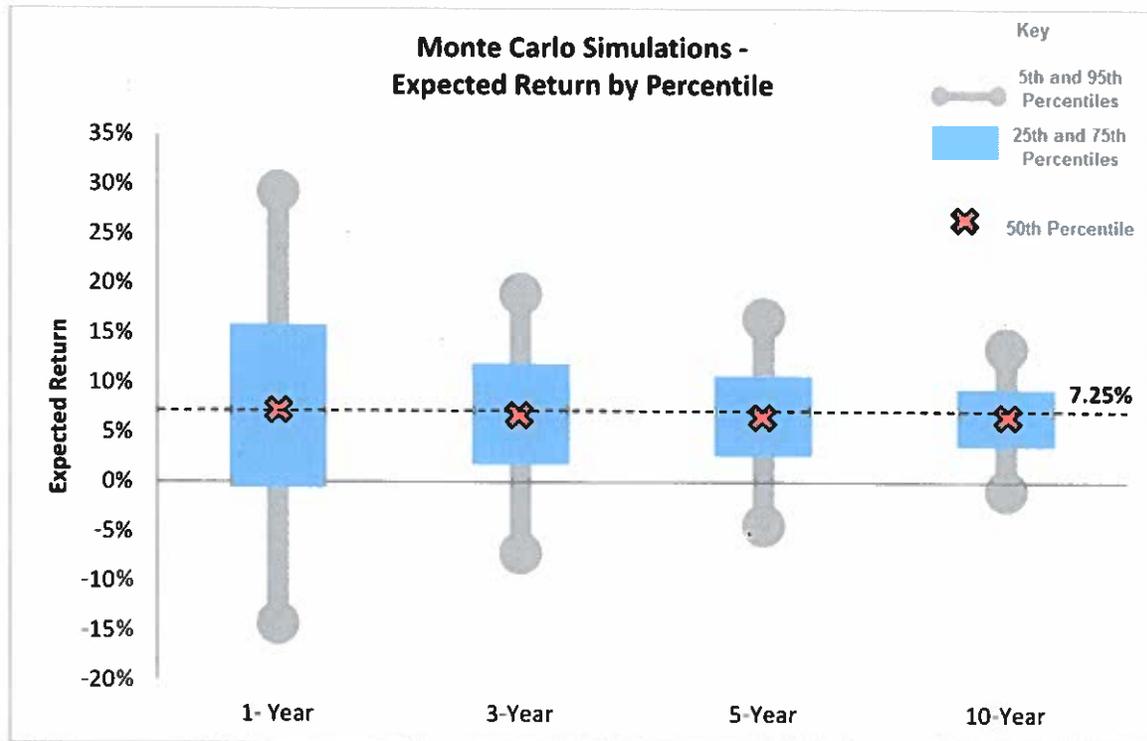


Figure 5 below depicts a range of possible distribution of returns over one, three, five, and 10-year horizons. Note that the dispersion of possible returns narrows significantly as the length of time covered by the analysis increases; extreme returns in any given year may tend to offset each other over a longer timeframe.

Figure 5

Potential Dispersion of Returns by Percentile for Target Allocation Policy⁹



⁹ Source: SERS' Investment Office and RVK

Asset Classes

Private Equity

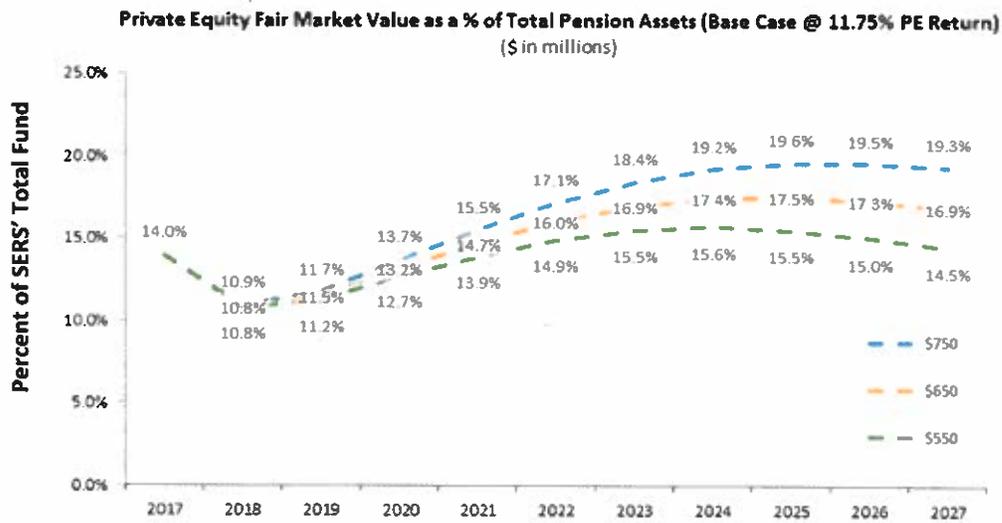
Role: SERS' Private Equity program is structured to generate the highest return and growth opportunities that capture market inefficiencies through active management in the private markets.

Objective: The objective of the Private Equity program is to generate annualized net-of-fee returns that exceed the total return of public equity markets by at least 3% (illiquidity premium) and exceed the mean return for the asset class over a seven- to 10-year period (see Benchmarks section).

Structure: Private Equity investments are in the form of closed-end limited partnership interests. As an investor, SERS is a limited partner and does not have control of distributions. The investment horizon is typically seven or more years. SERS' Private Equity program endeavors to continue to build long-term strategic partnerships by investing in world class top-quartile funds. Private equity investments typically require commitments of greater than seven years and, therefore, must target premium returns to compensate for illiquidity and risks.

This plan establishes an annual pacing target for Private Equity of up to \$650 million. Figure 6 shows the 10-year (Year 2027) expected allocation to Private Equity as a percent of the total fund from 14.5% to 19.3% at multiple annual commitment pacing levels.

Figure 6



NOTE: Any significant change in expected employer contributions and returns will require review and possible revision of the pacing target.

SERS' Private Equity program is categorized into three strategies.

Strategy	Description
Buyouts	A specialized form of private equity, characterized chiefly by investments in established private or publicly listed firms that are undergoing a fundamental change in operations or strategy.
Special Situations	Investments in funds which acquire distressed companies or companies in need of restructuring, funds from the secondary market, and funds providing mezzanine financing.
Venture Capital	Investments in specialized forms of private equity, characterized chiefly by high-risk investments in new or young companies following a growth path (early, late, balanced stage funds) in technology and other value-added sectors.

Global Public Equity

Role: SERS' Global Public Equity program is structured to generate high returns through capital appreciation and income from dividend payments while also improving the total fund's liquidity. SERS' Global Public Equity program contributes a high expected long-term return to the fund but also may be the greatest contributor to near-term volatility.

Objective: The objective of the Global Public Equity program is to generate annualized net-of-fee returns that meet or exceed its benchmark over a three- to five-year period (see Benchmarks section).

Structure: Investments in public equity are achieved through buying and holding publicly-traded securities of companies throughout the developed world and in emerging markets. These companies exhibit a wide range of market capitalizations in many industries and sectors.

SERS' Global Public Equity program is categorized into four strategies.

Strategy	Description
Global Mandate	U.S., non-U.S. developed markets, and emerging markets, large/mid/small cap
U.S.	U.S. broad market, large/mid/small cap
Non-U.S. Developed Markets	Non-U.S. developed markets, large/mid/small cap
Emerging Markets	Emerging markets, large/mid/small cap

Real Estate

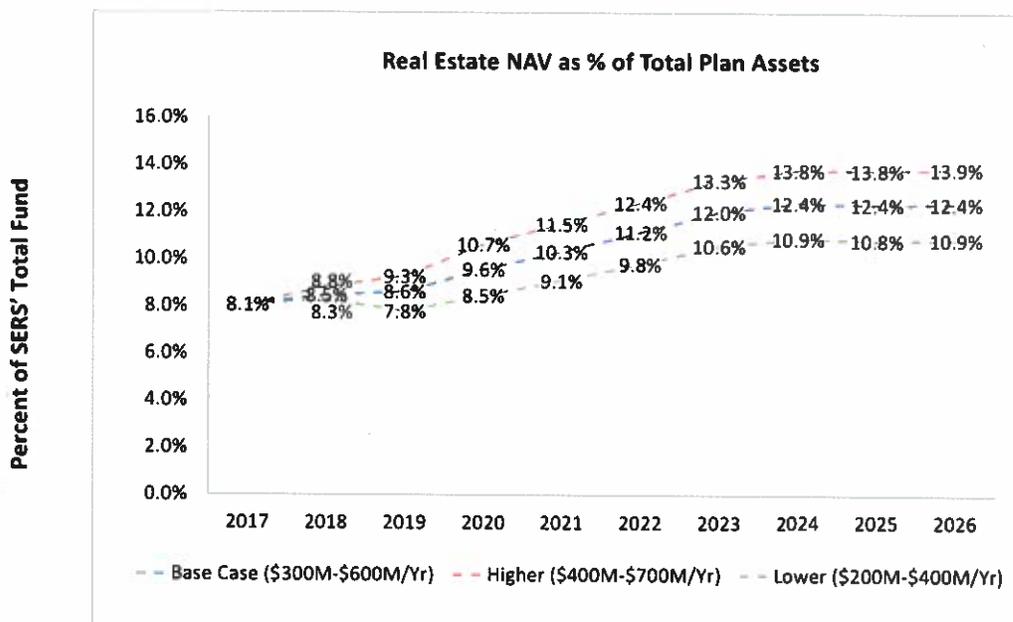
Role: Real Estate has several roles within SERS' overall investment portfolio, including enhancing returns and providing diversification, income, and an inflation hedge. As in the past, SERS has emphasized a balance between value-add/opportunistic real estate strategies which can provide competitive total returns through capital appreciation, with core/core plus strategies, which have a larger emphasis on income, and in many cases, increased liquidity. SERS will seek to achieve this balanced risk profile by focusing on top-tier managers in each aspect of real estate, which is expected to result in attractive, long-term risk-adjusted returns.

Objective: The objective of the Real Estate program is to generate annualized net-of-fee returns that exceeds its benchmark over a seven- to 10-year period, with the various components weighted according to long-term allocation targets within the asset class (see Benchmarks section).

Structure: SERS will build its Real Estate allocation towards its long-term target by steadily increasing investments in both relatively stable, core/core plus investments as well as value-add and opportunistic strategies. New target allocations within the Real Estate program are designed to balance expected return, liquidity, diversification, and inflation hedging, while decreasing expected risk. SERS' Real Estate program is subject to the investment pacing established by this investment plan to help manage the liquidity profile of the total fund to align with the projected increase in retirement benefit payments.

This plan sets the annual pacing target of up to \$600 million for the Real Estate program.

Figure 7



Commitment ranges pertain to initial three years of pacing model.

NOTE: Any significant change in expected employer contributions and/or returns will require review and possible revision of the pace of commitments.

SERS' Real Estate program is categorized into four specific strategies.

Strategy	Description
Core/Core Plus	Core and Core Plus investments are long-term investments in high-quality real estate that generate returns primarily from stable income producing properties.
Value-Add and Opportunistic	Value-Add and Opportunistic investments have higher risk/return expectations than Core/Core Plus investments. Value-Add and Opportunistic strategies utilize greater leverage and active real estate strategies including leasing, repositioning, renovation and/or rehabilitation in addition to development, thereby taking higher risks but demanding higher returns. Returns are primarily generated from capital appreciation from opportunistic investments.
Real Estate Securities	Investments in publicly-traded securities of companies whose primary business is to own real estate. Real Estate Securities provide SERS with direct exposure to U.S. and non-U.S. real estate markets and offer high dividend yield and liquidity.
Natural Resources/Infrastructure	In general, Natural Resources and Infrastructure investments differ from real estate in that they focus on other real assets other than real estate, but maintain the characteristics of collateralization by hard assets and income-producing potential.

Multi-Strategy

Role: SERS' Multi-Strategy program is structured to provide attractive long-term returns which capture market inefficiencies through active management in multiple markets. Multi-Strategy increases investment flexibility to invest in strategies with high return generating potential which may not fit the characteristics of other asset classes.

Objective: The objective of the Multi-Strategy program is to generate annualized net-of-fee returns that exceed the public equity market over a long-term period but with lower volatility and beta to traditional markets (measured by recession to recession) (see Benchmarks section).

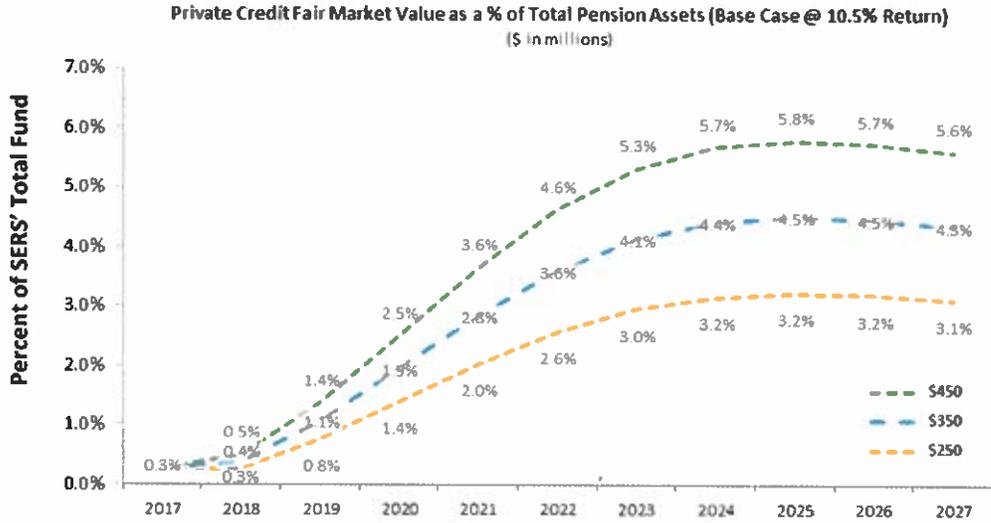
Structure: SERS' Multi-Strategy program invests in a diverse set of strategies including distressed debt, direct lending, structured credit, niche credit, and opportunistic equity. The program will be less liquid than traditional strategies.

SERS' Multi-Strategy program is categorized into three strategies.

Strategy	Description
Private Credit Funds	Private credit funds are generally closed-end (drawdown) limited partnership structures with liquidity events in five years or more, which may include investment strategies such as direct lending, specialty lending, mezzanine, and distressed investing.
Credit-Focused Strategies	Credit-Focused Strategies include directional and relative value investments through various structures, excluding closed-end funds, that may include debt securities, credit derivatives and related instruments, and/or multi-sector fixed income funds.
Opportunistic Equity & Fixed Income	Opportunistic equity and fixed income investments include non-traditional public market strategies.

This plan establishes an annual pacing target of up to \$350 million for commitments to Private Credit Funds. Figure 8 shows the 10-year (Year 2027) expected allocation to Private Credit Funds as a percent of the total fund from 3.1% to 5.6% at multiple annual commitment pacing levels.

Figure 8



NOTE: Any significant change in expected employer contributions and/or returns will require review and possible revision of the pace of commitments.

Fixed Income

Role: SERS' Fixed Income program is structured to provide additional liquidity to minimize capital impairment risk, reduce volatility of the total fund, and contribute total return to the fund.

Objective: The objective of the Fixed Income program is to generate annualized net-of-fee returns that meet or exceed its benchmark over a three- to five-year period (see Benchmarks section).

Structure: 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. SERS' Fixed Income program is categorized into four strategies.

Strategy	Description
Core Plus Fixed Income	Investments in sovereign debt, commercial mortgage-backed securities, credit strategies, high yield debt, and asset backed securities which seek to provide excess return when performance conditions are favorable, and offer varying potential return with a corresponding variance in expected risk.
Core Fixed Income	Investments in intermediate duration bonds, which provide capital loss protection in difficult market conditions, and offer risk mitigation due to low correlation with equity.
Global Treasury Inflation-Protected Securities (TIPS)	Investments in U.S. and non-U.S. inflation-linked bonds designed to preserve purchasing power due to high positive correlation to inflation.
Nominal U.S. Treasuries	Investments in securities matching the risk and return profile of 10-year U.S. Treasury Notes.

Cash

Role: SERS' investment program is structured to maintain an appropriate level of cash to pay retirement benefits and covenants during prolonged periods of market decline and state budgetary constraints.

Objective: The objective of Cash is to generate annualized net-of-fee returns that meet or exceed its benchmark over a three-year period (see Benchmarks section).

Structure: Cash investments emphasize the use of higher credit quality debt instruments that are liquid and have short maturities and durations, or have floating rates and have historically been invested in the Pennsylvania Treasury Group Investment Fund, a short-term investment fund.

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 net-of-fees relative to the following benchmarks according to the long-term target asset allocation weights.

Private Equity	Private Equity Peer Group Comparison and Russell 3000 + a 3% premium
Global Equity	MSCI All Country World Investable Market Index
Real Estate	Custom Index (NCREIF Fund Index - Open End Diversified Core Equity, FTSE NAREIT U.S. Real Estate Index for REITs, & CPI plus a 3% premium for Natural Resources/Infrastructure)
Multi-Strategy	S&P/LSTA Leveraged Loan Index and Russell 3000 Index
Fixed Income	Barclays U.S. Aggregate Bond Index
Cash	90-Day T-Bill Index
Total Fund	Total Fund Custom Index and Public Market Equivalent Index

Private Equity Peer Group Custom Indices – The current Private Equity Peer Custom Indices currently utilize the Burgiss private equity database. They are calculated using the time-weighted returns for a composite of funds based on their specified strategies and with the same vintage dates as SERS' funds. For all Burgiss benchmarks, geographic focus, industry focus, fund size, and currency are all inclusive across countries, industries, funds, and currencies, respectively.

Russell 3000 Index – The Russell 3000 Index measures the performance of the 3,000 largest U.S. companies based on total market capitalization, which represents approximately 98% of the investable U.S. equity market.

MSCI All Country World Investable Market Index – The index captures large, mid and small-cap public equity representation across developed and emerging market countries. With approximately 8,600 constituents, the index covers approximately 99% of the global public equity investment opportunity set.

NCREIF Fund Index – Open-End Diversified Core Equity – The first of the NCREIF Fund Database products and is an index of investment returns reporting on both a historical and

current basis the results of 33 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NFI-ODCE Index is capitalization-weighted and is reported gross of fees. Measurement is time-weighted. NCREIF will calculate the overall aggregated Index return.

FTSE NAREIT U.S. Real Estate Index – The FTSE NAREIT U.S. Real Estate Index defines and measures the investable universe of publicly traded property companies domiciled in the United States. The companies in the index are engaged in real estate related activities, such as property ownership, management, development, rental and investment.

The Consumer Price Indexes (CPI) – The CPI program produces monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services. Prices for the goods and services used to calculate the CPI are collected in 87 urban areas throughout the country and from about 23,000 retail and service establishments.

S&P/LSTA Leveraged Loan Index – This index is a capitalization-weighted syndicated loan index based upon market weights, spreads, and interest payments of senior secured institutional loans with a term of one year. The index covers the U.S. market dating back to 1997. S&P and the Loan Syndications & Trading Association, the loan market's trade group, jointly run the index, which utilize real-time market weightings and spreads for the facilities constituting the index.

Barclays U.S. Aggregate Bond Index – The Barclays U.S. Aggregate Bond Index is a comprehensive measure of the entire U.S. taxable bond market. The aggregate includes all publicly issued, non-convertible domestic debt of the U.S. Government and agencies, the three major corporate bond classifications (industrial, utility, and financial), mortgage-backed securities (GNMA, FNMA, FHLMC) and Yankee bonds (U.S. dollar denominated, SEC registered fixed-rate debt issued or guaranteed by sovereign foreign governments). Bonds included are investment grade (Baa rating or higher), have a minimum outstanding principal of \$1 million, and a minimum one-year maturity. The index is a capitalization weighted and includes income calculated on an accrual basis at the end of each month. The universe is screened on the last business day of each month for inclusion in the next month's index. Bonds that decline below the minimum quality or one-year maturity will drop out of the index during the monthly screening.

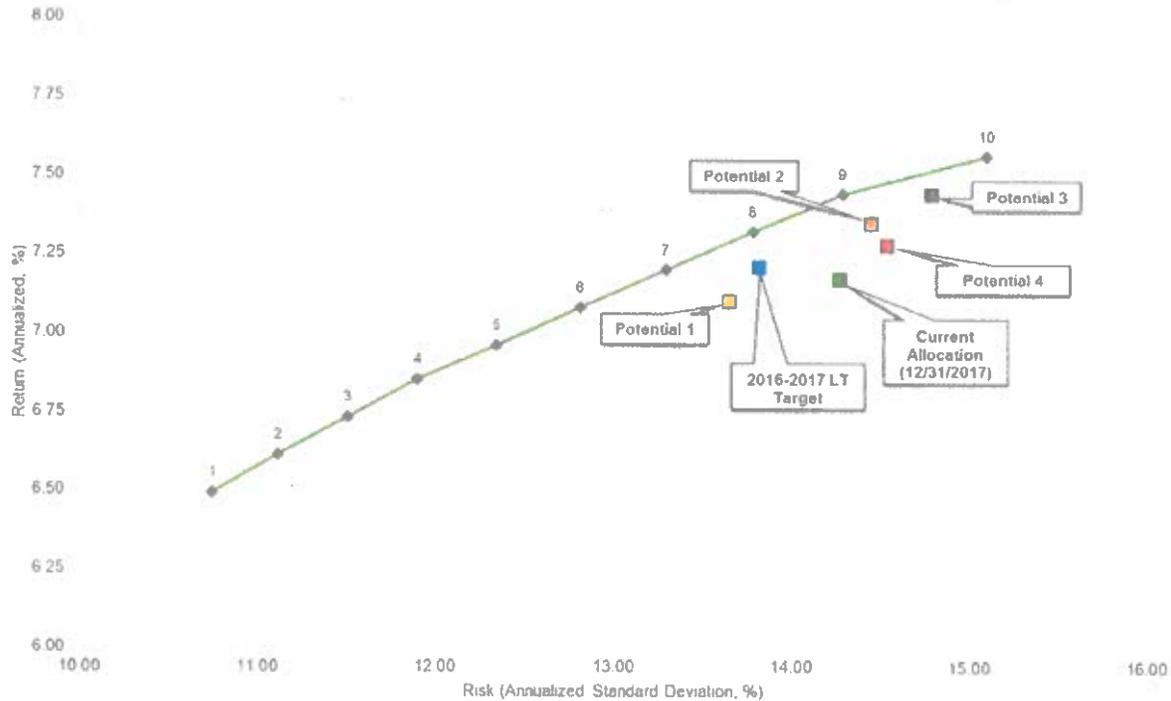
90-Day U.S. T-Bill Index – The index is made up of U.S. Treasury securities maturing in 90 days that assumes reinvestment of all income.

Total Fund Custom Benchmarks – The Total Fund Custom Benchmarks are calculated monthly using target weights for each asset class, applied to corresponding primary and secondary benchmarks.

Appendix 1

RVK Efficient Frontier from Mean Variance Optimization Modeling

All four potential portfolios lie close to the efficient frontier—differences between those and the theoretically efficient portfolios reflect both SERS’ liquidity risk management and reflection of general risk preferences of SERS’ Board.



RVK 2018 Capital Market Assumptions

RVK Return & Risk Assumptions			Longest Historical Time Frame			
Asset Class	Arithmetic Return Assumption	Standard Deviation Assumption	Index	Longest Historical Time Frame	Annualized Arithmetic Return	Annualized Standard Deviation
Global Equity	7.65	18.35	MSCI ACW IMI (Gross)	Jun 1994 - Dec 2017	7.72	18.89
Custom Fixed Income	3.76	5.84	SERS Custom Fixed Income	Jan 2003 - Dec 2017	4.64	3.88
Custom Real Estate	7.76	16.19	SERS Custom Real Estate	March 1997 - Sept 2017	11.21	8.83
Custom Multi-Strategy	6.94	13.92	SERS Custom Multi-Strategy	Jan 1992 - Dec 2017	5.92	5.97
Private Equity	9.75	25.50	Cambridge US Private Equity Index	Jun 1986 - Jun 2017	13.64	13.20
Cash Equivalents	2.50	3.00	BofA ML 3 Mo US T-Bill	Jan 1978 - Dec 2017	4.98	4.10

RVK Correlation Assumptions

	Global Equity	Custom Fixed Income	Custom Real Estate	Custom Multi-Strategy	Private Equity	Cash Equivalents
Global Equity	1.00	0.15	0.35	0.75	0.79	-0.03
Custom Fixed Income	0.15	1.00	-0.01	0.12	0.01	0.09
Custom Real Estate	0.35	-0.01	1.00	0.27	0.60	0.16
Custom Multi-Strategy	0.75	0.12	0.27	1.00	0.74	0.07
Private Equity	0.79	0.01	0.60	0.74	1.00	-0.22
Cash Equivalents	-0.03	0.09	0.16	0.07	-0.22	1.00

Appendix 2

The Board selected Target Allocation 2 as the 10-year target asset allocation policy.

Efficient Asset Allocation Targets¹⁰

	Current Exposure 12/31/2017	Current LT Target	Target Allocation 1	Target Allocation 2	Target Allocation 3	Target Allocation 4	Policy Ranges
Private Equity	14%	16%	14%	16%	16%	15%	
Global Equity	53%	43%	48%	48%	50%	53%	
Total Equity	67%	59%	62%	64%	66%	68%	+/- 5%
Real Estate	8%	12%	10%	12%	12%	9%	+/- 3%
Multi-Strategy	8%	12%	8%	10%	10%	7%	+/- 3%
Fixed Income	14%	14%	18%	11%	10%	14%	+/- 3%
Cash	3%	3%	2%	3%	2%	2%	+/- 3%
Total	100%	100%	100%	100%	100%	100%	
Expected Return	7.17%	7.21%	7.10%	7.35%	7.44%	7.28%	
Risk (Standard Deviation)	14.27%	13.82%	13.66%	14.45%	14.79%	14.54%	
RVK Liquidity Metric	67	60	65	61	61	66	

¹⁰ Source: SERS' Investment Office and RVK

ATTACHMENT D

EXECUTIVE SESSION MINUTES Meeting: April 25, 2018

Executive Session

1. Notational Ballot

Account of Barbara C. Allerton
Docket No. 2016-12
Claim of Barbara C. Allerton

2. Litigation Update

3. Securities Litigation

4. Governance Project – Education Policy & By-law Amendments

5. Proxy Voting – ISS Contract

6. Fund Update

Policy Name: Board Education Policy
Policy Number: 2017 POL-BD-06
Effective Date: July 26, 2017, as amended April 25, 2018
Reviewed Date: July 26, 2017, April 25, 2018
Applies To: SERS Board Members
Contact Person: Board Education and Training Manager

Purpose

Board members, as the trustees of the Pennsylvania State Employees' Retirement Fund (the "Fund"), are governing fiduciaries of the Fund and are subject to the exercise of that degree of judgment, skill and care that a prudent investor would observe under similar circumstances. Board members, with the exception of designees, are required to successfully complete at least eight hours of training as specified in Act 2017-5 and identified below. Board members should also individually and collectively aspire to develop an understanding of peer practices and the issues involved in managing large pools of assets. This policy sets forth the process for Board members to receive such training, education and professional development. Except as otherwise provided herein, for purposes of this policy, "Board" and "Board member(s)" include designee(s) and "Chairperson" includes the Chairperson's designee.

Core Competencies

Board members should aspire to develop a collective understanding of the following areas ("Core Competencies"). This policy does not contemplate that every member become fully competent in each of these areas or that all Core Competencies must be represented on the Board. Rather, the Board should engage in a biennial evaluation and planning process focused on (a) identifying member skill sets and interests, (b) aspiring to foster development of individual and combined member Core Competencies that are as complete as practical, and (c) prioritizing development of any Core Competencies which are expected to be most needed over the next two to four years. The following nonexclusive list is merely for demonstration purposes and is not intended to reflect minimum competencies.

- (1) Fiduciary Responsibilities and Laws Relevant to the Board
- (2) Governance Structure, Practices and Policies
- (3) Regulatory and Legal Issues (*e.g.*, public records and open meetings law compliance, budget, state government oversight, tax law and plan qualification features, non-tax legal requirements etc.)

- (4) Investment Strategies and Retirement Portfolio Management (*e.g.*, asset allocation, benchmarks, performance measurement, investment risk, reporting standards, economic principles and related concepts)*
- (5) Standards of Conduct, Confidentiality, Conflicts of Interest, Ethics Code Provisions, Personal Investments and Related Disclosure Requirements
- (6) Financial and Accounting Standards and Practice (*e.g.*, financial controls, audits, and compliance functions)
- (7) Benefits Design and Administration (*e.g.*, benefit plan features, risks inherent in benefits administration, basic administrative operations and processes)
- (8) Actuarial, Funding and Asset-Liability concepts*
- (9) Communications and Stakeholder relations
- (10) Best Practices for Governing Board and the Conduct of Meetings
- (11) Selection, Contracting, Monitoring and Evaluation of Advisors, Managers, Consultants and Other Service Providers
- (12) Materiality of Sustainability, Environmental, Societal and Corporate Governance Factors
- (13) Enterprise Risk Management and Oversight
- (14) Strategic Planning Processes
- (15) Pension Plan and Investment Industry Issues and Trends
- (16) Other Topics Related to Particular Issues that Arise

Skills Inventory and Education Plan

Section 5901(f) of the Retirement Code requires that each Board member, with the exception of designees, is required to obtain eight hours of mandatory training in investment strategies, actuarial cost analysis and retirement portfolio management on an annual basis (“Mandatory Training”). The Board should undertake, in conjunction with receipt of any Board self-assessment results and in consideration of the Mandatory Training requirement, a biennial

* These Core Competencies are required for Board members, with the exception of designees, pursuant to 71 Pa. C.S. § 5901(f), which provides: “Board Training.—Each Member of the Board will be required to obtain eight hours of mandatory training in investment strategies, actuarial cost analysis and retirement portfolio management on an annual basis.”

planning process to identify and prioritize those Core Competencies on which training is desired and required and those which are expected to be particularly important over the following two to four years. The Chairperson may request individual member preferences for participation in future training. A proposed education plan that contains Board and individual member educational goals and Mandatory Training requirements shall be developed for Board approval. The plan shall include an education budget to cover costs associated with authorized attendance at outside conferences, classes or training sessions. In addition to the required Mandatory Training, each Board member should attempt to receive or attend at least four hours of training on an annual basis ("Non-Mandatory Training"). Other than for designees, Non-mandatory Training shall be in addition to any Mandatory Training requirements. Training hours earned for any Mandatory and Non-Mandatory Training shall be determined annually on December 31, effective for the calendar year commencing January 1, 2018. Up to four qualifying hours of Mandatory Training earned in a calendar year in excess of the required eight hours may be applied to the next calendar year. For any new members, the annual training requirements shall commence on January 1 of the calendar year following their being seated on the Board. Relevant training received through attendance at presentations approved by the Pennsylvania Public School Employees' Retirement System, as part of the mandatory training requirements of Act 5 of 2017, may be counted toward the annual Mandatory Training requirements. Relevant training received for or through other entities may be counted toward the annual requirement, upon approval of the Chairperson.

New Member Orientation and Regular Training

1. A formal orientation program, covering the Core Competencies outlined above as well as any other pertinent topics, shall be developed by the Executive Director for the benefit of new members. The orientation may consist of a single session or multiple sessions. It should be scheduled and completed as soon as reasonably practical. The orientation may be conducted by SERS staff or outside experts, or both, and may include attendance at conference sessions, classes or seminars.
2. Prior to attending their first meeting of the Board as a trustee and to the extent practicable, new members shall be invited by the Chairperson or Executive Director to attend a meeting of the Board or a standing committee as an observer.
3. New members shall, as soon as possible, and under the direction of the Executive Director, be:
 - a. Briefed on the history, background and structure of the Pennsylvania State Employees' Retirement System ("SERS").
 - b. Briefed on current issues before the Board;
 - c. Introduced to senior management;

- d. Briefed on their fiduciary duties, conflict of interest guidelines, financial disclosure requirements, public records and open meetings laws, and other pertinent laws, policies and regulations; and
 - e. Provided with all relevant information and documentation deemed appropriate by the Chairperson or the Executive Director.
4. The Executive Director shall biennially review and, if necessary, update all orientation material and supply each member with those updates.
 5. Participation in orientation sessions shall be open to all Board members.
 6. The Executive Director shall provide regular opportunities for Board members to receive industry periodicals, books and other materials that are relevant to development and maintenance of Core Competencies.
 7. The Executive Director shall ensure that refresher training sessions are offered on a regular basis, in Board meetings or otherwise, with attention to specific Core Competencies in the education plan. Board members may request scheduling of training on specific relevant topics. The Chairperson may also arrange for special educational presentations in coordination with the Executive Director.

Mentorship

A new member may request assignment of a mentor to assist in becoming familiar with Board responsibilities. If requested, the Chairperson shall assign an experienced Board member to provide mentorship for up to a year.

Educational Opportunities and Budget

1. Training on many Core Competencies may be effectively taught by staff or experts from the Office of State Treasurer, Office of Attorney General, Office of General Counsel, Pennsylvania State Ethics Commission or other local sources. To assist Board members in identifying quality educational opportunities that provide relevant training, the Executive Director shall compile and maintain a list of recommended educational events, based on the feedback of SERS members and SERS staff who have attended such events. The list shall be distributed to the Board at each regular meeting. Board members may also suggest educational events for the Executive Director to consider in developing the list. Such training and educational events for Core Competencies may include those which satisfy other professional development requirements (*e.g.*, continuing legal education credits for attorneys).
2. Attendance at outside educational events shall be done in compliance with all applicable travel, business expense, budget, ethics code and standards of conduct limitations. Members attend events as fiduciary representatives of the Board and should avoid even the appearance of impropriety.

3. The Board with input from the Executive Director shall establish a budget to allow attendance at approved outside educational opportunities on a fair and impartial basis, pursuant to its education plan.

Approval and Reports on Outside Training

1. Pre-approval to attend an educational event with all or part of the costs paid being paid for by the Board must be obtained from the Chairperson. Approval requests should include a reference to how the training fits the current Board education plan and specify whether the event is on the list of recommended educational events developed by the Executive Director.
2. After attending an outside educational event with all or part of the costs being paid for by the Board, a Board member shall report on the event and provide copies of instructional materials received to the Executive Director within 30 calendar days of attendance. Completed reports shall be distributed to all Board members at the next regular Board meeting as an informational item. The Executive Director shall consider member reports and recommendations in evaluating events for inclusion on the list of recommended educational events.

Attachment

Document Properties

- a. **Document Owner:** Executive Office
- b. **Document Author:** SERS Legal Office
- c. **Summary of Changes:**

Date	Version	Author	Summary
July 26, 2017	2017 POL- BD-06	SERS Legal Office	The policy the Board established setting forth the process for Board members to receive training, education and professional development.
April 25, 2018		SERS Legal OFFICE	Revised policy to allow for carryover of Mandatory Training credit hours and for utilization of Pennsylvania Public School Employees' Retirement System board training to satisfy Mandatory Training requirements.