

MINUTES

**SERS Board Meeting**

**Tuesday, October 7, 2025 ~ Scheduled Start: 9:30 a.m. ~ Actual Start: 9:33 a.m.**

**ATTENDANCE AT BOARD MEETING:**

**Board Members:**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Donald Enders, Jr.              | <input checked="" type="checkbox"/> Rep. Brett Miller           |
| <input checked="" type="checkbox"/> W. Russell Faber                | <input checked="" type="checkbox"/> Michael Heckmann, Designee  |
| <input type="checkbox"/> Rep. Dan Frankel                           | <input type="checkbox"/> Jill Vecchio, Designee                 |
| <input type="checkbox"/> Anne Baloga, Designee                      | <input type="checkbox"/> Sec. Uri Monson                        |
| <input type="checkbox"/> Jordan Laslett, Designee                   | <input type="checkbox"/> Sen. Devlin Robinson                   |
| <input checked="" type="checkbox"/> Matthew McCarry, Designee       | <input checked="" type="checkbox"/> Kevin Battle, Designee      |
| <input type="checkbox"/> Devin Mercado, Designee                    | <input type="checkbox"/> Stephanie Buchanan, Designee           |
| <input checked="" type="checkbox"/> John Galuska                    | <input type="checkbox"/> Allison Dutrey, Designee               |
| <input type="checkbox"/> Tr. Stacy Garrity                          | <input checked="" type="checkbox"/> Sec. Wendy Spicher          |
| <input type="checkbox"/> Christopher Craig, Designee                | <input type="checkbox"/> Seamus Dubbs, Designee                 |
| <input type="checkbox"/> Lloyd Ebright, Designee                    | <input type="checkbox"/> Eric Pistilli, Designee                |
| <input checked="" type="checkbox"/> Tom Waters, Designee            | <input type="checkbox"/> Jeffrey Soderstedt, Designee           |
| <input type="checkbox"/> Sen. Vincent Hughes                        | <input checked="" type="checkbox"/> Gregory Thall (Board Chair) |
| <input checked="" type="checkbox"/> Matthew Lindsay, Designee       |   |
| <input checked="" type="checkbox"/> Antoinette Marchowsky, Designee |   |

**SERS Leadership:**

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Chief Compliance Officer<br><i>Jo Ann Collins</i>    | <input checked="" type="checkbox"/> Chief Investment Officer<br><i>James Nolan</i>            |
| <input checked="" type="checkbox"/> Chief Counsel<br><i>N. Joseph Marcucci</i>           | <input checked="" type="checkbox"/> Comm. Director & Press Secretary<br><i>Pamela Hile</i>    |
| <input checked="" type="checkbox"/> Chief Financial Officer<br><i>Sara McSurdy</i>       | <input checked="" type="checkbox"/> Deputy Chief Counsel (Benefits)<br><i>Catherine Nolan</i> |
| <input checked="" type="checkbox"/> Chief Information Officer<br><i>Daniel Krautheim</i> | <input checked="" type="checkbox"/> Deputy Chief Counsel (Business)<br><i>Steven Skoff</i>    |

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Deputy Chief Financial Officer<br><i>Michael McGeoy</i>            | <input checked="" type="checkbox"/> Executive Director<br><i>Joseph Torta</i>                   |
| <input checked="" type="checkbox"/> Deputy Chief Investment Officer<br><i>William Truong</i>           | <input checked="" type="checkbox"/> HR Director<br><i>Michele Shaner</i>                        |
| <input type="checkbox"/> Deputy Executive Director for Admin.<br><i>Beth Christian</i>                 | <input checked="" type="checkbox"/> Internal Audit Director<br><i>Ryan McCoy</i>                |
| <input checked="" type="checkbox"/> Deputy Executive Director for OMPS<br><i>Brenda Cunard</i>         | <input checked="" type="checkbox"/> Legislative Affairs & Policy Director<br><i>Thomas Derr</i> |
| <input checked="" type="checkbox"/> Director of Gov. & Strategic Initiatives<br><i>Cynthia Collins</i> |   |

**SERS Board Committee Support:**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Administrative Assistant, OA<br><i>Kelly Bernhard</i>    | <input checked="" type="checkbox"/> IT Generalist<br><i>Jonathan Ryan</i>  |
| <input type="checkbox"/> Executive Assistant, OA<br><i>Shannon Zimmerman</i>                 | <input checked="" type="checkbox"/> IT Generalist<br><i>Brett Shaffer</i>  |
| <input checked="" type="checkbox"/> Executive Assistant, Board Ed.<br><i>Sheila Willrich</i> | <input checked="" type="checkbox"/> IT Generalist<br><i>Matthew Soule</i>  |
| <input checked="" type="checkbox"/> Executive Secretary<br><i>Courtney Yurovich</i>          | <input type="checkbox"/> Technical Support Director<br><i>Randy Gilson</i> |
| <input checked="" type="checkbox"/> IT Administrator<br><i>Mark Walter</i>                   |  |

**Other SERS Staff:**

Lindsay Bailor  
Richard Gaul

**MINUTES OF THE SERS BOARD MEETING TUESDAY, OCTOBER 7, 2025:****1. Call to Order**

The meeting was called to order at 9:33 a.m. by Gregory Thall, Board Chair.

**2. Welcome and Roll Call**

Executive Director Joseph Torta conducted a roll call of board members and designees. A quorum was met.

**3. Public Comments**

NONE

**4. Adoption of the Agenda**

**MOTION: 2025-35**

By motion that was moved, seconded, and approved unanimously by the board members present, it was RESOLVED that the board adopt the agenda for the October 7, 2025, board meeting.

**5. Approval of Consent Calendar****MOTION: 2025-36**

By motion that was moved, seconded, and approved unanimously by the board members present, it was RESOLVED that the board approves the Consent calendar items for the October 7, 2025, board meeting.

- A. Approving Board Meeting Minutes – July 29, 2025, Regular meeting
- B. Defined Benefit Plan Statements of Changes in Fiduciary Net Position for the Periods Ending: May 2025, June 2025
- C. Deferred Compensation Plan Statements of Changes in Fiduciary Net Position for the Periods Ending May 2025, June 2025
- D. Defined Contribution Plan Statements of Changes in Fiduciary Net Position for the Periods Ending: May 2025, June 2025

**6. Committee Reports/Action Items****A. Investment Committee**

Committee Assistant Chair Secretary Spicher presented a report of the Investment Committee meeting of September 30, 2025, to the board. The following actions were taken:

**REAL ESTATE OPPORTUNITY: BLUE OWL REAL ESTATE FUND VII****MOTION: 2025-37**

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

**RESOLVED:** That the State Employees' Retirement Board accept the recommendation of the Investment Committee to commit up to \$100 million to Blue Owl Real Estate Fund VII LP, plus investment expenses and pro rata share of partnership operating expenses, consistent with executed partnership documents, as a follow on investment within the Real Estate 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?

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes

Wendy Spicher	Yes
Gregory C. Thall	Yes

**Private Equity Opportunity: HarbourVest Dover Street XII and Secondary Overflow Fund VI-A**  
**MOTION: 2025-38**

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

**RESOLVED:** That the State Employees' Retirement Board accept the recommendation of the Investment Committee to:

commit (i) up to \$100 million to Dover Street XII L.P. and (ii) up to \$50 million to Secondary Overflow Fund VI-A L.P., a sidecar vehicle that will co-invest alongside Dover Street XII L.P., plus investment expenses and pro rata share of partnership operating expenses, consistent with executed partnership documents, as 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.

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

**Investment Manager Evaluation Quarterly Update**

**MOTION: 2025-39**

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

**RESOLVED:** That the State Employees' Retirement Board accept the recommendation of the Investment Committee to:

Approve the:

- (i) orderly liquidation of the Global Public Equity portfolio managed by Walter Scott & Partners Limited, and
- (ii) transition of the proceeds of such liquidation to SERS' cash account. Upon completion of this liquidation and transition, SERS' relationship with Walter Scott & Partners will terminate.

Donald Enders, Jr.	Yes
W. Russell Faber	Yes

Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

**B. Board Governance and Personnel Committee**

Committee Chair Gregory Thall presented a report of the Board Governance and Personnel Committee meeting of September 30, 2025, to the board. The following action was taken:

FY 2023 – FY 2027 REVISED SERS STRATEGIC PLAN MID-PLAN UPDATE

**MOTION: 2025-40**

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

**RESOLVED:** That the State Employees’ Retirement Board accept the recommendation of the Board Governance and Personnel Committee to approve the FY 2023-FY 2027 Revised SERS Strategic Plan Mid-Plan Update as set forth in the attached (Attachment A).

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

**C. Securities Litigation Committee**

Committee Chair Brett Miller presented a report of the Securities Litigation Committee meeting of September 30, 2025, to the board. No action was taken.

**D. Audit, Risk and Compliance Committee**

Thomas Waters, designee for Committee Chair Treasurer Garrity, presented a report of the Audit, Risk and Compliance Committee meeting of September 30, 2025, to the board. The following actions were taken:

INTERNAL AUDIT OFFICE UPDATE

**MOTION: 2025-41**

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

**RESOLVED:** That the State Employees' Retirement Board accept the recommendation of the Audit, Risk and Compliance Committee to approve, for Fiscal Year 2026-2027, the following proposed budgets for the Internal Audit Office

- (1) A portion of the SERS administrative Budget for the Internal Audit Office of up to \$1,086,000
- (2) A portion of the SERS Investment Budget for the Internal Audit Office of up to \$104,500
- (3) A portion of the State Employees' Defined Contribution Plan Budget for the Internal Audit Office of up to \$67,000
- (4) A portion of the Commonwealth's Deferred Compensation Plan Budget for the Internal Audit Office of up to \$69,000,

each substantially in the same form as presented and attached in the Internal Audit Budget Report, and each as amended and/or ultimately approved by the Office of the Budget.

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

GLOBAL INTERNAL AUDIT STANDARDS GAP ASSESSMENT PROCUREMENT

**MOTION: 2025-42**

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

**RESOLVED:** That the State Employees' Retirement Board accept the recommendation of the Audit, Risk and Compliance Committee to initiate the request for proposal procurement process for a gap assessment of the Internal Audit Office for its adherence to the Global Internal Audit Standards, as attached (Attachment B).

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes

John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

LEVEL ONE ACTUARY REPLICATION AUDIT RESULTS

**MOTION: 2025-43**

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

**RESOLVED:** That the State Employees' Retirement Board accept the auditor's opinion of the Level One Actuarial Replication audit performed by Gabriel, Roeder, Smith & Company on the results of Korn Ferry's 2023 actuarial valuation, as attached (Attachment C).

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

SOC 1 TYPE 2 AUDIT RESULTS

**MOTION: 2025-44**

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

**RESOLVED:** That the State Employees' Retirement Board accept the recommendation of the Audit, Risk, and Compliance Committee to accept the auditor's opinion of the SOC 1 Type 2 audit performed by Certified Public Accounting firm Clifton, Larson, Allen, LLP, as attached (Attachment D).

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes

Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

**Finance and Member and Participant Services Committee**

Matthew McCarry, designee for Committee Chair Dan Frankel, presented a report of the Finance and Member and Participant Services Committee meeting of September 30, 2025, to the board.

The following actions were taken:

STRESS TESTING AND RISK ASSESSMENT REPORT

**MOTION: 2025-45**

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

**RESOLVED:** That the State Employees’ Retirement Board accept the recommendation of the Finance and Member and Participant Services Committee to approve the 2025 Stress Testing and Risk Assessment Report prepared by SERS’ Actuary Gabriel, Roeder, Smith & Company (GRS) as set forth in the attached (Attachment E).

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

FISCAL YEAR 2026-2027 BUDGET

**MOTION: 2025-46**

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

**RESOLVED:** That the State Employees’ Retirement Board accept the recommendation of the Finance and Member and Participant Services Committee to approve, for Fiscal Year 2026-2027, the following proposed budgets:

- (1) SERS Administrative Budget of up to \$43,406,000 inclusive of amounts separately approved by the Audit, Risk, and Compliance (ARC) Committee specifically for the Internal Audit Office;
- (2) SERS Investment Budget of up to \$12,185,000 inclusive of amounts separately approved by the ARC Committee specifically for the Internal Audit Office;

- (3) State Employees’ Defined Contribution Plan Budget of \$4,939,000 inclusive of amounts separately approved by the ARC Committee specifically for the Internal Audit Office; and
- (4) Commonwealth’s Deferred Compensation Plan Budget of \$1,152,000 inclusive of amounts separately approved by the ARC Committee specifically for the Internal Audit Office,

each substantially in the same form as presented in the Chief Financial Officer’s SERS FY 2026-27 Budget presentation, and each as amended and/or ultimately approved by the Office of the Budget, as set forth in the attached (Attachment F).

Donald Enders, Jr.		Yes
W. Russell Faber		Yes
Dan B. Frankel	Designee Matt McCarry	Yes
John Galuska		Yes
Stacy Garrity	Designee Thomas Waters	Yes
Vincent J. Hughes	Designee Matt Lindsay	Yes
Brett R. Miller		Yes
Uri Monson		Absent
Devlin Robinson	Designee Kevin Battle	Yes
Wendy Spicher		Yes
Gregory C. Thall		Yes

**7. Old Business**

NONE

**8. New Business**

NONE

**9. Special Presentation**

NONE

**10. Reports of Executive Director and Agency Staff**

A. Executive Director Joseph Torta provided the following updates:

i. Executive Verbal Update:

Executive Director Torta introduced our new Project Manager, Lindsay Bailor. She will oversee the moving parts between each business area and our external stakeholders.

Executive Director Torta gave an update on BoardDocs. SERS has been made aware of a vendor mandated requirement to migrate its current BoardDocs automation site to the new Diligent community platform on or before the subscription renewal date, which is February 28, 2026. The migration process takes approximately 8-10 weeks and is almost entirely performed by Diligent. Once migrated, the old BoardDocs site will be converted to read

only mode and will include all SERS' historical BoardDocs data. One-on-one training will be provided by Diligent to all Board members, Board designees, and staff.

Executive Director Torta asked Board members to please review the draft 2026 Board Meeting Dates.

Executive Director Torta provided the Pension Administration System (PAS) update since Deputy Executive Director for Administration, Beth Christian, was absent. Nearly three months ago, Linea Solutions and a team of SERS employees held a kickoff meeting for the PAS modernization requirements gathering. As of the end of September, SERS has completed the business and technical requirements gathering, and we are now moving into a six-week review and validation phase. SERS is on schedule. The requirements gathering meetings have been conducted by more than 60 SERS employees across multiple business areas. The employees dedicated almost 240 hours to these sessions. Planning is underway to finalize the remaining parts of the RFP. SERS will continue to update the Board on this matter.

ii. Legislative Update:

Executive Director Torta noted that there are no legislative updates.

iii. Dismissals, Orders, and Adjudications:

Executive Director Torta noted that there are no Dismissals, Orders, or Adjudications in this board cycle.

- B. SERS Deputy Executive Director for Administration – PAS Update (provided by Executive Director Torta)
- C. Chief Investment Officer – NONE
- D. Chief Financial Officer – NONE

## 11. **Executive Session**

At 10:11 a.m. the board recessed and entered Executive Session to receive reports and legal advice on Executive Session agenda items.

- A. Board Self-Assessment
- B. Enterprise Risk Management Discussion
- C. Chief Compliance Officer's Report on Board Referrals
- D. Benefits Administration and Appellate Litigation Update
- E. Administrative Adjudications

Account of Joseph J. O'Neill

Docket No. 2022-05  
Claim of Joseph J. O'Neill

**12. Public Session Resumes**

The board exited Executive Session at 11:34 a.m. and resumed the public session of the meeting.

**Board Comments/Announcements/Dates to Remember**

December 2, 2025 – Next regularly scheduled committee meetings

December 9, 2025 – Next regularly scheduled board meeting

**13. MOTION TO ADJOURN**

**MOTION: 2025-47**

By motion of Chair Thall, the board unanimously agreed to adjourn the meeting at 11:36 a.m.

Respectfully Submitted,



Name: Joseph A. Torta

Job Title: Executive Director

# SERS Strategic Plan

July 1, 2023 - June 30, 2027  
Mid-Plan Update July 15, 2025

Transforming the SERS Experience  
by Expanding Digital Options



**pennsylvania**

STATE EMPLOYEES' RETIREMENT SYSTEM



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## ABOUT US

Simply put, the Pennsylvania State Employees' Retirement System is a small agency with a big purpose: administering the retirement benefits for nearly a quarter-million current and former Pennsylvania employees, their beneficiaries, and survivors.

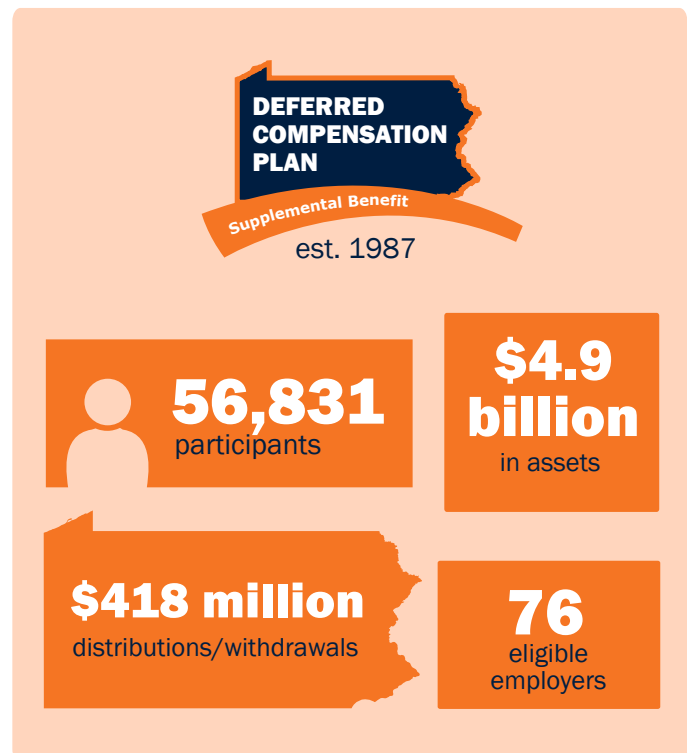
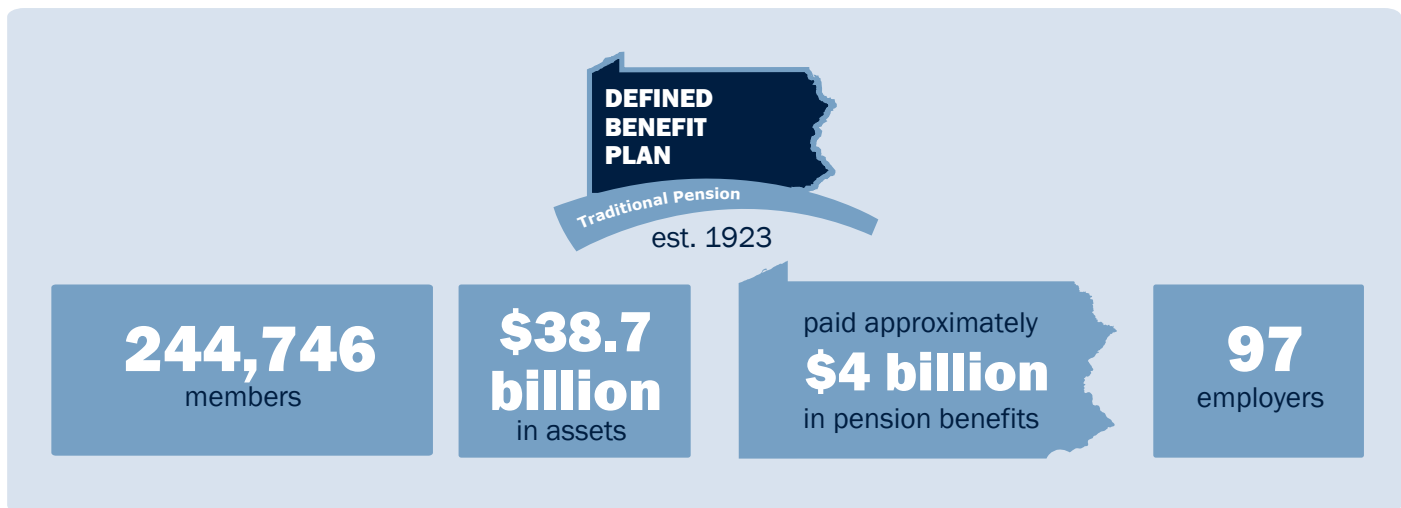
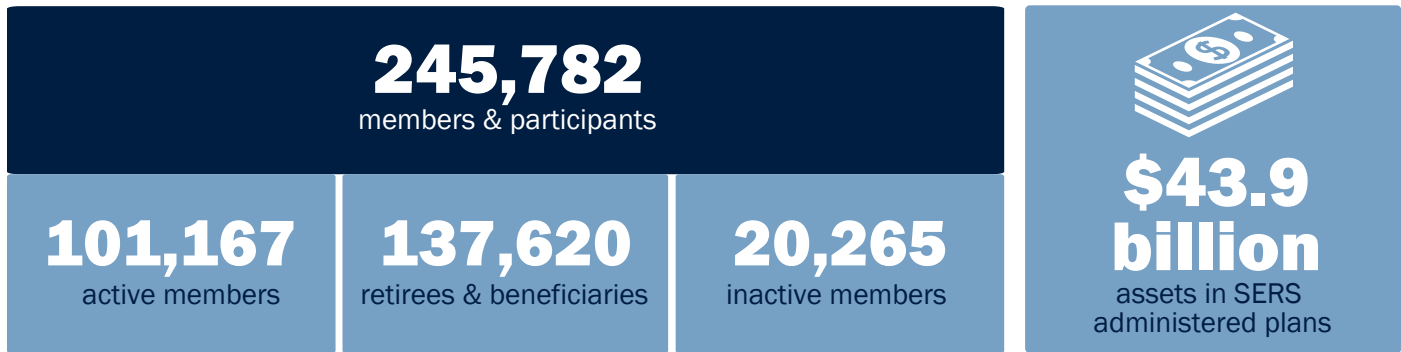
For most of our members and participants, these retirement benefits are their biggest assets, and are meant to support them for life after retirement. With that as our driving force, all of us at SERS share a singular focus: help prepare our members and participants to achieve financial security in retirement.

Guided by an 11-member board, our work involves administering nearly \$43.9 billion in assets, as of December 31, 2024. The assets are held in trust for our members and participants as part of the four retirement plans we administer:

- Defined Benefit Plan, known as the traditional pension plan, was established in 1923, making it one of the nation's oldest and largest statewide retirement plans for public employees.
- Defined Contribution Plan, is a personal investment plan, similar to a 401(k) plan, that opened to new employees in 2019.
- Hybrid Plan, is a combination plan in which employees contribute to both the traditional pension plan and the newer investment plan. It also opened to new employees in 2019.
- Deferred Compensation Plan, is a voluntary, supplemental investment plan that has been providing extra retirement savings to SERS members since 1987.



# WHO WE SERVE as of December 31, 2024



## MESSAGE FROM OUR EXECUTIVE DIRECTOR



We have crossed the mid-point of our four-year strategic plan, and we have accomplished a lot!

We've wrapped-up projects that were part of the initial plan and those that presented both opportunities and challenges outside of the plan. In both cases, staff rose to the challenges and met them head-on.

Our ability to remain flexible, yet focused, over the past two years has been our biggest asset to date.

Now, projects completed in the first half of our plan are driving the direction for the rest of the plan.

Of biggest impact to achieving our digital transformation, we procured a vendor to complete a major technology assessment of our current systems and tools. That review provided our board with an independent analysis and recommendations. As a result, we are now working to procure a pension administration system that we will personalize according to our specific plan provisions in the Retirement Code and plan documents. This work is profoundly impactful to our customer service delivery and will be for years to come.

Similarly, we reviewed and updated our policy and process documents and archived them in our digital library in preparation for our SOC audit. Early indications show that work has paid off with a positive audit report. We will continue to update processes as they change throughout our digital transformation.

We completed this vital work, while also administering the first ever shared-risk adjustment to member contributions. While not part of our original four-year plan, we faced the challenge, and staff handled it seamlessly.

In addition, we implemented one of the biggest benefits to our members and participants to date. Working with the state Treasury and our employers, we streamlined the flow of money through our Defined Contribution Plan and Deferred Compensation Plan. As a result, plan participants have quicker access to their money in the plans and enjoy savings of 35% over prior years. Well done!

Strategic plans are living things that evolve over time. We will remain flexible and focused as we continue through our digital transformation to better serve our members and participants.

Please feel free to reach out with any comments or suggestions you might like to share. You can email our Communications Office at: [RA-ERCOMMUNICATIONS@pa.gov](mailto:RA-ERCOMMUNICATIONS@pa.gov).

Sincerely,

A handwritten signature in black ink that reads "Joseph A. Tinter". The signature is written in a cursive, slightly slanted style.

# BOARD MEMBERS SERVING YOU

The SERS' Board establishes governance and board education policies and oversees the administration of the Defined Benefit Plan, the Deferred Compensation Plan, and the Defined Contribution Plan. The board also sets investment policy, asset allocation, and approves investments made by the fund. Other responsibilities include setting actuarial assumptions and adopting the annual employer contribution rates for the SERS plans. The board participates in the systematic development of the strategic plan, approves the final plan for adoption, and provides oversight and input on an ongoing basis.



Gregory C. Thall  
*Chair*



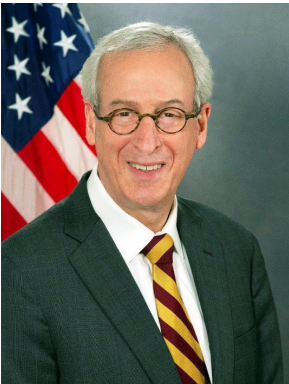
Uri Monson  
*Assistant Chair*



Donald Enders Jr.  
*Pres. & CEO, Enders Insurance Assoc.*



W. Russell Faber  
*Former Chief Clerk of the Pennsylvania Senate*



Dan B. Frankel  
*PA State Representative*



John Galuska, AFSCME  
*District Council 13*



Stacy Garrity  
*PA State Treasurer*



Vincent J. Hughes  
*PA State Senator*



Brett R. Miller  
*PA State Representative*



Devlin J. Robinson  
*SERS Member*



Wendy Spicher  
*Sec'y Banking & Securities*

# Mission

**Prepare our members and participants to achieve financial security in retirement.**

# Vision

**To be an employer of choice and an innovative leader among public pension organizations by providing best-in-class services and products to our members, participants, and stakeholders.**

**A Commitment to Service**

# OUR CORE VALUES

## CHAMPION THE MISSION

We champion the mission and SERS' commitment to serve our members, their families, and beneficiaries, throughout their careers and into retirement.

## ACT ETHICALLY & WITH INTEGRITY

We embrace the qualities of trustworthiness, honesty, integrity, fairness, accountability, and ethics as an organization. Remembering to do the right thing even when no one is looking.

## EMPOWER MEMBERS

We believe in providing our members and stakeholders with the services, tools, and information that they need, where and when they need them.

## EMBRACE INNOVATION

We strive to continuously improve by being open-minded and by encouraging, promoting, implementing, and valuing new ideas and solutions to better serve our members.

## FOSTER LIFE WORK BALANCE

We value, appreciate, and recognize our staff as individuals whose value extends beyond the workplace. We encourage and support the growth, development, and contributions of each employee outside of the workplace and seek to foster a positive balance with life and work.

## MODEL AN INCLUSIVE & RESPECTFUL WORKPLACE

We embrace different ideas, perspectives, experiences, knowledge, and opinions. We believe it's our differences that make us a better organization.

## VALUE & DEVELOP TEAM MEMBERS

We treat our members, coworkers, and others with empathy, politeness, courtesy, civility, and thoughtfulness. We provide encouragement, opportunities, and validation to our coworkers

## COLLABORATE

We encourage communication and collaboration among and between our employees, vendors, stakeholders, and members to provide responsive and excellent service to our coworkers, members, and stakeholders.

## FIND JOY

Find joy, laughter, and fun at work with your colleagues in serving our members and stakeholders. Always remember what you do is important and makes a difference, and you'll be great at your job.

# OUR STRATEGIC PLAN FRAMEWORK

Effective strategic planning and oversight of the plan has been and is critical to our success in fulfilling our responsibilities.

Our strategic plan framework:

- Ensures that strategic investment, operations, and business planning occurs in a rigorous, systematic, and coordinated manner across the agency
- Keeps the planning process roles of the board and staff clearly delineated and appropriate
- Develops a road map that provides direction for both long-term and short-term strategies to achieve common goals and strategic initiatives
- Facilitates the communication of SERS' strategic direction throughout the organization and to our stakeholders
- Provides ongoing oversight, accountability, and updates throughout the entire plan beginning on July 1, 2023 through June 30, 2027



# OUR STRATEGIC PRIORITIES

Transforming the “SERS experience” through the expansion of digital options, while reducing dependence on paper processes will be achieved through a framework that is focused on specific, measurable, action-oriented, realistic, and timely goals. The following strategic priorities will guide our digital transformation:

<p><b>Member Experience</b></p> <p>Enhance the member and participant experience through automated and self-service opportunities while maintaining personalized service</p>	<p><b>Operational Efficiencies</b></p> <p>Enhance efficiencies through streamlined processes and aligned content management practices</p>	<p><b>Centralized Data</b></p> <p>Enhance efficiencies and collaboration through a centralized repository(ies) of searchable, shareable resources</p>	<p><b>Workplace Experience</b></p> <p>Enhance the overall work experience for all employees while fulfilling the SERS mission</p>	<p><b>Pension Administration System</b></p> <p>Determine the roadmap in light of digital transformation and modernization efforts to provide digital access to member accounts</p>
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## OUR FOUNDATIONAL GOALS

These enterprise-wide foundational goals have and will continue to support the transformation of our operations and establish a road map for success.

### Year 1

Identify OMPS high-volume transactions for digitization.

Convert the member newsletter to digital for active employees.

Transition the phone system and initiate regular staff communications on the plan.

### Year 2

Complete agency-wide technology assessment.

Modernized the flow of money directly through the third-party administrator of the Defined Contribution Plan and Deferred Compensation Plan.

Conduct an audit of the methodology and processes used by SERS' current actuary.

Prepare for SOC audit - capturing the processes and procuring an auditor.

### Year 3

Enable email address storage to coincide with OA SAP upgrade.

Complete SOC audit.

Complete OMPS letters modifications, launch enterprise-wide risk management program.

Initiate employee resource groups.

### Year 4

Complete secure two-way transaction capabilities within our online member and employer services.

Select a pension administration system and initiate project to customize it for SERS plans.

Determine the architecture for storing, securing, and sharing network files.

# OUR STRATEGIC PLAN DELIVERABLES BY YEAR

Transform the SERS member experience by expanding digital options while reducing dependence on paper processes.

## YEAR 1

- Complete the phone system migration
- Begin digital newsletter distribution
- Draft initial SOC audit policies and processes
- Initiate quarterly staff updates on strategic plan progress
- Identify OMPS high-volume workflows for digital transition

## YEAR 2

- Develop an agency-wide project planning and governance process
- Modernize the flow of money directly through the third-party administrator for the Defined Contribution Plan and Deferred Compensation Plan
- Complete the gap analysis of SOC-related policies and processes
- Complete technology assessment to identify gaps and build out new technology solutions

## YEAR 3

- Prioritize and schedule (by year) the OMPS high-volume workflows to transition to digital
- Establish digital knowledge management plan
- Complete actuarial audit
- Implement third-party risk management framework
- Complete SOC audit
- Develop an agencywide project planning and governance process
- Establish employee resource group(s)
- Continue employee training to support digital transformation
- Initiate employee skills assessment
- Enable email address storage to coincide with OA's SAP upgrade
- Update member letters to correct information and reflect current branding
- Begin fact-finding for the agencywide digital repository of shared resources
- Begin Implementing third-party risk management framework

## YEAR 4

- Build member portal (MES) security enhancements for secure two-way transactions
- Develop Board metrics
- Implement an e-signature and notarization expansion plan
- Identify data management architecture
- Implement digital workflow solutions
- Complete digital knowledge transfer
- Initiate employee skills-based training
- Continue career development programs and opportunities for personal and professional growth
- Relax decimal calculation that creates excessive error codes in contribution reporting
- Request proposals for new pension administration system (RFP)
- Kick-off pension administration system development

Note: Conversion to digital new member packages is on hold to coordinate with new pension administration system.

# YEAR 1 GOALS

## #1 Member Experience

- Complete the SERS telephone system migration to Microsoft Teams.
- Convert current member newsletter to digital for commonwealth employees.
- Identify and prioritize OMPS priorities for secure member digital transactions.

## #2 Operational Efficiencies

- Procure the consultant and finalize the plan to review current and draft additional policies and processes in preparation for the 2025 SOC audit.
- Procure the consultant and finalize the plan to review current methodology and procedures of SERS' actuary, Korn Ferry.

## #4 Workplace Experience

- Develop and implement an agencywide Communication plan to support staff, members, and participants throughout the strategic plan process.
- Initiate quarterly updates to all staff to inform and engage them concerning our workplace transformation and its impact on our members, participants, and employees.



# YEAR 2 GOALS

## #1 Member Experience

- Develop and share information for members and employers to support their transition to our new digital resources.
- Allow retired members to print their own pension verification letters and access an online tax withholding calculator.
- Expand pension estimate tool capabilities to also calculate estimates for A-5 and A-6 members.\*
- Modernize the flow of money directly through the third-party administrator for the Defined Contribution Plan and Deferred Compensation Plan, to provide participants with quicker access to their money at reduced costs to participants and employers.\*

## #2 Operational Efficiencies

- Procure the consultant and finalize the plan to perform the agencywide SOC audit.
- Staff to publish policy and process documents on PolicyTech to aid in the agency SOC audit.
- Conduct an audit of the methodology and processes used by SERS' current actuary.
- Complete the gap analysis of SOC-related policies and processes.

## #4 Workplace Experience

- Initiate ongoing training to help managers and employees develop the skills to support their work experience at SERS.

## #5 Pension Administration Modernization

- Complete technology assessment of legacy system and SERIS 2.0.
- Variable member contribution rates built in current system to address future Shared Risk-Shared Gain rate changes.
- Evaluate market for best in class systems.
- Evaluate the pension administration system assessment recommendations and their potential integration into the new digital member experience.

\* Added after the original plan was approved.

Note: Conversion to digital new member packages is on hold to coordinate with new pension administration system.



# YEAR 3 GOALS

## #1 Member Experience

- OMPS to prioritize and schedule high-volume workflows to transition each year to a digital format to support members, participants, and employees and reduce dependency on paper.
- Enable email address storage.
- Develop and finalize the plan to identify the resources needed and initiate the necessary procurement to support the digital transition of high-volume workflow processes and expand the digital workflow solutions.

## #2 Operational Efficiencies

- Publish results from the audit of the methodology and processes used by SERS' current actuary.
- Complete the agencywide SOC audit.
- Complete OMPS letters update to correct phone numbers, revise formatting, and achieve consistent branding.

## #3 Centralized Data Resources

- In coordination with our selected pension administration system vendor, begin fact-finding for a digital knowledge-management plan that will best serve our staff and members.
- Review, evaluate, and clean all business unit shared network drives according to the established plan.

## #4 Workplace Experience

- Initiate employee resource group(s) to engage employees in enhancing the workplace experience while fulfilling the SERS mission.

## #5 Pension Administration Modernization

- Issue RFP for pension administration system.



# YEAR 4 GOALS

## #1 Member Experience

- Build support into the member portal (MES) for secure two-way transactions and delivery of member documents online.
- Deliver enhancements of member portal (MES) for secure two-way transactions and delivery of member documents.

## #2 Operational Efficiencies

- Identify and develop a plan for the use of e-signature to include external parties and notarization.
- Implement e-signature and notarization expansion plan.

## #3 Centralized Data Resources

- Coordinate the implementation of the approved online searchable data repository solution with agencywide access with SERS' other technology enhancements (i.e. pension administration system).

## #4 Workplace Experience

- Continue career development programs and opportunities for personal and professional growth.
- Initiate skills-based training for employees.

## #5 Pension Administration Modernization

- Select pension administration system and begin customizing for SERS plans and members.
- Continue integration of pension administration system recommendations into the new digital member experience.



# YOUR EXECUTIVE LEADERSHIP TEAM



**Joe Torta**  
*Executive Director*



**Brenda Cunard**  
*Deputy Director Member  
& Participant Services*



**Beth Christian**  
*Deputy Director Office of  
Administration*



**Cindy Collins**  
*Director Governance &  
Strategic Initiatives*



**Jo Ann Collins**  
*Chief Compliance Officer*



**Joe Marcucci**  
*Chief Counsel*



**Sara McSurdy**  
*Chief Financial Officer*



**Dan Krautheim**  
*Chief Information Officer*



# YOUR EXECUTIVE LEADERSHIP TEAM



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*Chief Investment Officer*



**Thomas Derr**  
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**Michele Shaner**  
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**Richard Gaul**  
*Director Operations Office*



**Ryan McCoy**  
*Internal Audit Director*



**Pam Hile**  
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# Agenda Item 6A-iii – IIA Global Internal Audit Standards Gap Assessment Procurement

# 6A-iii – Responsibility for Gap Assessment Oversight

- The Audit, Risk and Compliance (ARC) Committee charter charges the Committee with assisting the Board in fulfilling its oversight responsibilities for SERS' Internal Audit Office by mandating an external quality assessment review on compliance with the Global Internal Audit Standards.
- Internal Audit Office staff do not have the redundancy in their office to successfully perform this assessment themselves while executing the Board approved Internal Audit Plan.
- The ARC Committee will be responsible for selecting the external gap assessment vendor through the Commonwealth's RFP process.
- This procurement is critical because of the internal audit function's obligation to conform to these standards, which are mandated.

Audit, Risk and Compliance Committee

## 6A-iii – IIA Global Internal Audit Standards Gap Assessment RFP Process

- Staff will prepare, draft, and finalize all necessary RFP documents, obtain necessary approvals, and issue the RFP on the Commonwealth's Jaggaer system.
- ARC Committee Chair to seek volunteers to serve on the Technical Evaluation Committee and provide the Board Chair with names of volunteers.
- Board Chair will appoint Board members, designees, and staff to the Technical Evaluation Committee.
- RFP to be issued for engagement completion and report issuance by Q4 2026.

# 6A-iii – IIA Global Internal Audit Standards Gap Assessment RFP Reviews

## ■ Responsive Bid Technical Review

- Staff to receive proposals in compliance with the Commonwealth Procurement laws and requirements as set forth in the RFP. Staff to identify proposals containing exceptions to contract terms and conditions contained in the RFP, and/or to any exceptions taken to providing the service/technical related requirements of the RFP and provide a summary of all exceptions to the Technical Committee.
- Staff will forward all responsive proposals to the Technical Committee.
- The identity of the Technical Committee is confidential, and their identities will not be disclosed, even after the Contract Award is public.
- The Comptroller is provided the opportunity to elect to participate as a non-voting member of both the Technical Committee.
- The Technical Committee shall review the proposals as directed by the Commonwealth procurement code and score each proposal received. There will be both individual and group scoring.

# Thank you.

If you have questions, please contact me.

## **Ryan McCoy, CIA** Internal Audit Director

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Audit, Risk and Compliance Committee

# Pennsylvania State Employees' Retirement System

Actuarial Audit Report  
December 31, 2023





July 16, 2025

Pennsylvania State Employees' Retirement System  
SERS Audit, Risk and Compliance Committee and  
State Employees' Retirement Board

Dear Committee and Board Members:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an Audit of the December 31, 2023 Actuarial Valuation of the Pennsylvania State Employees' Retirement System (SERS). We are grateful to the SERS Staff for their cooperation throughout the Audit process. In addition, we wish to thank Craig Graby and Erika Mitchell of Korn Ferry (the retained actuary) for their assistance with this project.

The Actuarial Audit has several related objectives:

- Review assumptions and methods used in the valuation;
- Verify the demographic data through independent collection and processing;
- Express an actuarial opinion regarding the reasonableness and/or accuracy of valuation results based upon an independent full replication of the retained actuary's work product; and
- Replicate the shared risk calculation prepared for December 31, 2023 and December 31, 2022.

The Audit was performed under the supervision of Bonita Wurst and Jim Anderson. In our opinion, the retained actuary's work provides a reasonable assessment of the actuarial position of the SERS based upon the assumptions and methods employed. We are pleased to report that we have found no substantial errors or omissions in the retained actuary's work. Our main findings are summarized in Section VI of this report.

Throughout this report, the reader will note items where GRS sees things differently than the retained actuary. Indeed, our mission is to point out such items. In interpreting our recommendations and suggestions, SERS should be aware that while we are pointing out sources of difference, we agree with the retained actuary on the vast majority of items reviewed.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board.

The undersigned actuaries are independent of the plan sponsor. GRS' work on the audit was independent, unbiased, and in accordance with the Actuarial Code of Professional Conduct, including Precept 7 related to any conflicts of interest.

Bonita J. Wurst and James D. Anderson are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,  
Gabriel, Roeder, Smith & Company

*Bonita J. Wurst*

Bonita J. Wurst, ASA, EA, FCA, MAAA

*James D. Anderson*

James D. Anderson, FSA, EA, FCA, MAAA

BJW/JDA:sc



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VII	Formal Opinion and Concluding Remarks
VIII	Attestation of Independence

# SECTION I

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## INTRODUCTION

# Introduction

The Pennsylvania State Employees' Retirement System (SERS) issued a Request for Proposal (RFP) for an audit of the December 31, 2023 actuarial valuation of SERS performed by Korn Ferry (the retained actuary). Gabriel, Roeder, Smith & Company (GRS) responded to the RFP and was awarded the work. The work commenced on March 14, 2025.

An actuarial audit involves a review of the retained actuary's work by an independent actuarial firm. The purpose of this audit was to provide an evaluation sufficient to allow GRS to express an actuarial opinion regarding the reasonableness and/or accuracy of valuation results, actuarial assumptions, and actuarial methods in accordance with generally recognized and accepted actuarial principles and practices.

The scope of service for this audit was the following:

1. Mathematical modeling audit to replicate the calculation of the complete actuarial funding valuation including the funded ratio.
2. Review the methods of all economic assumptions, including the interest and inflation rates and salary growth assumptions, prior to commencing the replication work.
3. Assess the current practice utilized for phase-in periods for assumption changes that are made.
4. Assess compliance with ASOP 51 (assessment and disclosure of risk) and determine if any recommendations to make disclosures are necessary.
5. Assess the methodology utilized to develop the demographic assumptions, including but not limited to mortality rates, disability rates, salary increases, and termination rates.
6. Examine and calculate the valuation schedules including but not limited to the "Schedules of Active Member Valuation Data", "Solvency Test", "Analysis of Financial Experience", "Schedule of Funding Progress", and "History and Projection of Contribution Rates and Funded Ratios."\*
7. Replicate the shared risk calculation prepared for December 31, 2023, and December 31, 2022.
8. Validate that the December 31, 2023, actuarial valuation was in compliance with the parameters set by Actuarial Standards of Practice.
9. Validate that the procedures used by Korn Ferry are reasonable and consistent with all applicable laws, Board policies and generally accepted actuarial principles and practices. Validate that the December 31, 2023, actuarial valuation is in compliance with the ASOP 4 disclosure requirements effective for reports issued on or after February 15, 2023. Specifically, the Plan's investment portfolio risk assessments, disclosures of employer contributions and investment gain/loss analyses.
10. At the completion of the Project, draft a report as to the results of the audit to be reviewed by SERS' management and Korn Ferry. This review will allow SERS' management and/or Korn Ferry to respond to any recommendations that are made. The finalized report is then to be presented to the Audit, Risk and Compliance Committee.

*\* Note that review of the "History and Projection of Contribution Rates and Funded Ratios" exhibit was removed from the scope of services in an email from SERS dated June 3, 2025.*

In connection with the audit, we requested and received the following items from SERS:

1. Statutes for SERS.
2. Member handbooks.
3. Board policy and rule books (to the extent they interpret how benefits are to be determined).
4. Other documents that may control benefit determinations (such as legal opinions, attorney general rulings, employee contracts, lawsuit decisions, benefit calculation algorithms, or examples that may have been created for SERS' data system, etc.).
5. Descriptions of any special administrative procedures that affect the development of the shared-risk/shared-gain member contributions, in accordance with Act 2010-120 and Act 2017-5.
6. Most recent actuarial audit report.
7. Actuarial valuation presentation materials (if different from the actual valuation reports) presented to the Board (such as handouts or PowerPoint presentations).
8. Most recent projection or risk assessment reports, if any.
9. SERS target asset allocation for each plan and any long-term investment expectations that were developed by SERS asset consultants.
10. The participant data files that were provided to Korn Ferry for the actuarial valuation as of December 31, 2023.
11. A file layout containing the description and location of data items in the participant data files.
12. The financial information that was provided to Korn Ferry for the December 31, 2023 actuarial valuation purposes.

Additionally, we requested and received the following items from Korn Ferry:

1. The final "groomed" data files that were used for the actuarial valuation as of December 31, 2023.
2. Information about the data collection and editing process.
3. A file layout containing the description and location of data items in the "groomed" data files.
4. A description of how part-time employees are handled and valued.
5. An Excel workbook containing a complete listing of the actuarial assumptions used for the actuarial valuations.
6. Information regarding any minor actuarial assumptions not specifically mentioned in the valuation reports, including such items as timing of pay increases and decrements within the year, loads for difficult to value provisions, assumptions regarding missing or improbable data, etc.
7. Descriptions of methods that are not disclosed, approximation techniques and detail for payroll projections and roll-forward calculations.
8. A breakdown of actuarial valuation results by type of decrement corresponding to the December 31, 2023 data.
9. Any intermediate valuation calculations not shown in the report that could aid in the replication valuation.

We also downloaded information from the SERS Website, including actuarial valuation reports and actuarial experience studies.

In order to perform this audit, we used our proprietary actuarial valuation software that is 100% independent of the software that the retained actuary's firm uses.



Users of this report should bear in mind that an actuarial valuation involves a large number of intricate calculations and many individual judgments regarding rather arcane items along the way. Two independently written valuation programs will never agree. For actuarial audit purposes, we generally like to see principal valuation results within 1% to 2% for retired and deferred vested members, and within 5% for active members. For active members, larger differences may be seen for some valuation results. Different valuation systems may allocate costs between the past and the future, and among the various decrements (retirement, disability, turnover, etc.) in a somewhat different manner. In the audit, we concentrate on those differences that we believe are important and do not pursue differences that we believe are the result of minor judgment items.

Although we would perform certain aspects of the actuarial valuation differently than the retained actuary, and would probably arrive at slightly different assumptions and results, we have identified no significant exceptions to the work that we reviewed.

## **SECTION II**

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### **REVIEW OF DATA ELEMENTS**

## Review of Data Used for Actuarial Valuations

GRS evaluated the data which was used to perform the December 31, 2023 actuarial valuation. The data was independently collected from both SERS and the retained actuary. As is typical with the actuarial valuation process, the retained actuary may “groom” the data into necessary formats for mathematical calculations and make certain adjustments to account for missing or incomplete data. As part of this audit, GRS compared the SERS data with the “groomed” retained actuary data to confirm there were no unexpected or unusual changes in data elements.

From SERS, GRS received three data files: active/inactive member data (labeled “Active Valuation 2023.txt”), retiree member data (labeled “INACTIVE.TXT”) and benefit completion plan data (labeled “BCP Payment Data 2023.xlsx”). From the retained actuary, GRS received similar data split between active/inactive members and in-pay (retired) members.

After review of the data, we found that the data supplied by SERS was sufficient to perform the actuarial valuation. The data adjustments GRS observed within the retained actuary’s data files were minimal and not unusual for a data set as large as the SERS data. Actuaries commonly adjust data to account for missing or incomplete dates of birth, benefit amounts, etc.

GRS also reviewed the data for compliance with Actuarial Standards of Practice (ASOP) No. 23, which provides guidance to actuaries when selecting, reviewing and performing actuarial analyses based upon data. Please note that this standard does not require the actuary to perform an audit of the data. In our judgment, the retained actuary’s use of the data meets the requirements of ASOP 23.

The following pages discuss our observations on the data.

## Active and Inactive Member Data Observations

GRS analyzed the following data fields for reasonableness, in addition to comparing data received from SERS to the retained actuary's supplied data:

- Dates of birth
- Years of active service
- Gender
- Annual salary
- Member contributions (with interest)
- Membership status within SERS

There were no significant differences between the two files. However, we note:

- Inc50 (Non-covered compensation for SSI benefit (Age 50)) and Inc60 (Non-covered compensation for SSI benefit (Age 60)) fields were switched in the retained actuaries data. We have discussed this with the retained actuary and they confirmed that the fields did get switched in the data at some point, and noted that "Only judges and pre-March 1, 1974 hires can have this coverage. There are 376 active and inactive members with something in the non-covered earnings field and 235 are already age 60+. Of the remaining 141, over 2/3rds are within 7 years of age 60. We agree that these should be switched. There is currently a slight overstatement of the liability since only judges can still enter into this benefit and they overwhelmingly work past their normal retirement age and have very low turnover and very low early retirements." We agree with the retained actuary that this results in a slight overstatement in liabilities and is not a material audit finding. We recommend that the retained actuary correct this in their next valuation.

## Retiree Member Data Observations

GRS analyzed the following data fields for reasonableness, in addition to comparing to the retained actuary's supplied data:

- Member and Beneficiary Dates of Birth
- Member and Beneficiary Genders
- Pension Type Elected
- Pension Benefits

There were no significant differences between the data supplied by SERS and the data supplied by the retained actuary.

GRS believes the data provided was sufficient for the required calculations and has no recommendations for changes to the retiree data supplied.

## **SECTION III**

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### **REVIEW OF INVESTIGATION OF ACTUARIAL EXPERIENCE AND ACTUARIAL ASSUMPTIONS**

# Investigation of Actuarial Experience and Actuarial Assumptions

In this section of the report, we present our analysis of the 19th Investigation of Actuarial Experience prepared by the retained actuary. This study is the basis (i.e., rationale) for the actuarial assumptions that are used for annual actuarial valuation purposes. We present our assessment on the appropriateness of the actuarial assumptions and whether they comply with the following Actuarial Standards of Practice in effect for the reports under review:

- (1) Actuarial Standards of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*; and
- (2) ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*.

At the time the Investigation of Actuarial Experience was completed, ASOP No. 27 had an effective date of September 30, 2014. Since the completion of the investigation of actuarial experience, the Actuarial Standards Board has adopted two updates to ASOP No. 27: the first update has an effective date of August 1, 2021 and was applicable to the December 31, 2023 actuarial valuation; the second update, which combines ASOP No. 27 and ASOP No. 35, has an effective date of January 1, 2025. This audit primarily considers the standard in effect for the December 31, 2023 actuarial valuation.

The actuarial assumption setting process is a combination of art and science. An actuary's professional judgment is a key component in the assumption setting process. Different actuarial consulting firms, and different actuaries within the same firm, may have different thoughts on how some assumptions should be developed.

## Economic Assumptions

Generally, economic and demographic assumptions are reviewed together periodically (e.g., every five years for SERS) in an Investigation of Actuarial Experience. The most recently completed investigation of actuarial experience occurred after completion of the December 31, 2019 valuation in a report dated July 29, 2020. Additionally, the 2023 actuarial report states: "To ensure that the investment return assumption remains appropriate for every actuarial valuation, it is reviewed annually by the SERS actuaries and Board." The SERS Board last updated the investment return assumption with the 2022 valuation. Actuarial assumptions are required to be reasonable at each and every valuation date, and we commend the SERS' actuaries and Board in their annual review of the investment return assumption.

Economic assumptions that the retained actuary reviewed include the following:

- (1) Price inflation
- (2) Investment return (generally used as the discount rate for public plan valuations)
- (3) General salary increases (i.e., the across-the-board portion of salary increases)
- (4) Career salary increases

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by ASOP No. 27. The standard requires that the selected economic assumptions be consistent with each other. For example, the selection of the investment return assumption should be consistent with the selection of the price inflation assumption.

ASOP No. 27 (applicable to valuation dates on or after August 1, 2021) defines a reasonable economic assumption as an assumption that has the following characteristics:

- a. It is appropriate for the purpose of the measurement;
- b. It reflects the actuary's professional judgment;
- c. It takes into account current and historical data that is relevant to selecting the assumption for the measurement date, to the extent such relevant data is reasonably available;
- d. It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data (if any), or a combination thereof; and
- e. It is expected to have no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included (as discussed in Section 3.5.1) or when alternative assumptions are used for the assessment of risk, in accordance with ASOP No. 51, *assessment and disclosure of risk associated with measuring pension obligations and determining pension plan contributions*.

In selecting economic assumptions, the actuary may rely upon different experts (e.g., investment consultants) for data and analysis. However, as permitted by ASOP No. 27, "When the actuary is responsible for selecting or giving advice on selecting economic assumptions, the actuary may incorporate economic data and analyses from a variety of other sources, including representatives of the plan sponsor and administrator, investment advisors, economists, and other professionals. However, the selection or advice should reflect the actuary's professional judgment."

## Price Inflation

Price inflation underlies both the salary increases and investment return assumptions. ASOP No. 27 provides the following guidance when selecting an inflation assumption:

*The actuary should evaluate appropriate inflation data. These data may include consumer price indices, the implicit price deflator, forecasts of inflation, yields on government securities of various maturities, and yields on nominal and inflation-indexed debt.*

In making their recommendation for the price inflation assumption, the retained actuary considered the following sources:

- (1) Past experience
- (2) Forecasts of inflation from SERS' investment consultant (Callan)
- (3) Social Security projections

A strength of the retained actuary's analysis is that multiple sources of inflation data were considered, including historical data, as well as projections from the Social Security Administration (SSA), and the investment consultant (Callan). This is good practice and shows that the assumption isn't based solely on one source, but a range of reasonable inputs. The rationale could be improved by referencing additional forward-looking sources. Considering more than two sources of forward-looking data would result in a more comprehensive understanding of potential future outcomes.

GRS generally considers the following additional sources of data in the analysis of the price inflation assumption:

- (1) Inflation expectations of various Federal Reserve Banks (e.g., Cleveland, St. Louis)
- (2) Philadelphia Federal Reserve quarterly survey of Society of Professional Forecasters
- (3) Comparison of Treasury yields and Treasury Inflation Protected Securities (TIPS)
- (4) Future expectations of the plan's investment consultant and other investment firms that GRS monitors

Another strength of the retained actuary's analysis to note is that the rationale explicitly justifies the decision to lower the assumption from 2.60% to 2.50%, providing a clear reasoning based on both historical trends and recent forecasts. This transparency helps stakeholders understand the reasoning behind the adjustment.

We think the rationale and methodology could be strengthened using guideposts from our Price Inflation Analysis, as detailed below.

GRS Price Inflation Analysis:

Presented below are forward-looking price inflation forecasts that GRS monitors to assist in developing the price inflation assumption. This information is presented as of the end of the fourth quarter of 2023, which is consistent with the December 31, 2023 date of the valuation which we have been asked to audit. Although we recognize this information would not have been available to the retained actuary at the time of the Investigation of Actuarial Experience, we note that assumptions must be reasonable as of each valuation.

<b>Forward-Looking Price Inflation Forecasts<sup>a</sup></b>	
<b>Congressional Budget Office<sup>b</sup></b>	
5-Year Annual Average	2.83%
10-Year Annual Average	2.57%
<b>Federal Reserve Bank of Philadelphia<sup>c</sup></b>	
5-Year Annual Average	2.60%
10-Year Annual Average	2.40%
<b>Federal Reserve Bank of Cleveland<sup>d</sup></b>	
10-Year Expectation	2.28%
20-Year Expectation	2.33%
30-Year Expectation	2.39%
<b>Federal Reserve Bank of St. Louis<sup>e</sup></b>	
10-Year Breakeven Inflation	2.18%
20-Year Breakeven Inflation	2.42%
30-Year Breakeven Inflation	2.19%
<b>U.S. Department of the Treasury<sup>f</sup></b>	
10-Year Breakeven Inflation	2.09%
20-Year Breakeven Inflation	2.37%
30-Year Breakeven Inflation	2.19%
50-Year Breakeven Inflation	2.29%
100-Year Breakeven Inflation	2.36%
<b>Social Security Trustees<sup>g</sup></b>	
Ultimate Intermediate Assumption	2.40%

<sup>a</sup>**End of the Fourth Quarter, 2023.** Version 2024-01-25 by Gabriel, Roeder, Smith & Company.

<sup>b</sup>*The Budget and Economic Outlook: 2023 to 2033*, Release Date: February 2023, Consumer Price Index (CPI-U), Percentage Change from Year to Year, 5-Year Annual Average (2023 - 2027), 10-Year Annual Average (2023 - 2032).

<sup>c</sup>*Fourth Quarter 2023 Survey of Professional Forecasters*, Release Date: November 13, 2023, Headline CPI, Annualized Percentage Points, 5-Year Annual Average (2023 - 2027), 10-Year Annual Average (2023 - 2032).

<sup>d</sup>Inflation Expectations, Model output date: December 1, 2023.

<sup>e</sup>The breakeven inflation rate represents a measure of expected inflation derived from X-Year Treasury Constant Maturity Securities and X-Year Treasury Inflation-Indexed Constant Maturity Securities. Observation date: December, 2023.

<sup>f</sup>The Treasury Breakeven Inflation (TBI) Curve, Monthly Average Rates, December, 2023.

<sup>g</sup>*The 2023 Annual Report of The Board of Trustees of The Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, March 31, 2023, p. 10, Key Assumptions and Summary Measures for the Last 65 Years of the Long-Range (75-year) Projection Period, Intermediate, Consumer Price Index (CPI-W).



Because GRS is a benefits consulting firm and does not develop or maintain its own capital market expectations, we monitor forward-looking expectations developed by several major investment firms. For the investment firms that provided capital market assumptions over roughly a 10-year horizon (12 firms), the average forward-looking price inflation assumption is 2.39%. For the investment firms that provided capital market assumptions over a 20- to 30-year horizon (8 firms), the average forward-looking price inflation assumption is 2.53%.

GRS finds that the retained actuary's recommended price inflation assumption of 2.50% is reasonable although a lower assumption would also be reasonable, based upon information available at this time.

## **Investment Return**

The investment return assumption is the actuarial assumption that has one of the largest effects on actuarial valuation results. As more of the actuarial accrued liabilities are related to non-active members, the nominal (as opposed to real) investment return assumption becomes an increasingly prominent factor. Since one of most public plans' fundamental financial objectives is the receipt of level contributions over time, the discount rate assumption is set equal to the investment return assumption. In making their recommendation for the investment return assumption, the retained actuary considered the following sources:

- (1) Future expectations of the plan's investment consultant
- (2) Peer system comparison

We believe that the usefulness of a peer system comparison is somewhat limited because it does not adjust for differences in the asset allocations or liability structures of the various systems in the surveys.

Sources of data that GRS generally considers in the analysis of the investment return assumption include:

- (1) Future expectations of the plan's investment consultant
- (2) Future expectations of other investment firms that GRS monitors

We believe that the most appropriate analysis to consider in setting the investment return assumption is to model the expected returns using forward-looking capital market assumptions for the SERS target asset allocation. For the investment firms that GRS monitors, 12 firms provided capital market assumptions over roughly a 10-year horizon and 8 investment firms provided capital market assumptions over a 20- to 30-year horizon.

We recognize that there is no “right” answer in deciding which time horizon to use in establishing the investment return assumption. Some will argue that since public plans are long-term investors, 20- to 30-year horizons are more appropriate to use than 10-year horizons for setting the investment return assumption. The retained actuary makes this case in its review of the investment return assumption. While GRS does not believe that longer-term horizons should be ignored, we tend to lean towards using the 10-year horizon expectations for at least the following reasons:

- (1) While it is true that public plans are long-term investors, most public plans have significant liability commitments coming due in the next 10 to 15 years.
- (2) In many instances, we have seen rationale from investment consultants that indicate that their longer-term capital market assumptions assume a resumption of long-term equilibrium relationships between asset classes (i.e., reversion to the mean).
- (3) Many investment consulting firms consider 10-year assumptions to be “long-term.”
- (4) In many instances, it is difficult to rationalize the differences between the 10-year and 20-year capital market assumptions.
- (5) A public employee retirement system that fails to meet its return assumptions for a 10-year period is likely to come under severe pressure to reduce benefits, increase contributions, or both with the effective end result being that promises that were made are not kept.

Using GRS’ proprietary Capital Market Assumptions Modeler (CMAM), we determined the expected 10-year return resulting from SERS target asset allocation (results are based upon the price inflation assumption of 2.50% and no netting off for administrative expenses). This information is presented in our 2024 CMAM, which typically reflects the firms’ expectations at the beginning of the calendar year, consistent with the December 31, 2023 date of the valuation which we have been asked to audit. Although we recognize this information would not have been available to the retained actuary at the time of the Investigation of Actuarial Experience, we note that assumptions must be reasonable as of each valuation.

<b>GRS 2024 CMAM</b>				
<b>Capital Market Assumption Set (CMA)</b>	<b>Distribution of 10-Year Average Geometric Net Nominal Return</b>			<b>Probability of Exceeding 6.875%</b>
	<b>40th</b>	<b>50th</b>	<b>60th</b>	
(1)	(2)	(3)	(4)	(5)
1	4.75%	5.83%	6.92%	40.38%
2	5.47%	6.54%	7.62%	46.85%
3	5.54%	6.62%	7.72%	47.68%
4	5.95%	6.97%	8.01%	50.96%
5	6.10%	7.05%	8.01%	51.85%
6	6.07%	7.06%	8.06%	51.92%
7	6.22%	7.15%	8.09%	52.96%
8	6.22%	7.26%	8.31%	53.72%
9	6.25%	7.27%	8.30%	53.89%
10	6.40%	7.46%	8.53%	55.54%
11	6.66%	7.67%	8.69%	57.87%
12	6.83%	7.79%	8.76%	59.51%
<b>Average</b>	<b>6.04%</b>	<b>7.06%</b>	<b>8.09%</b>	<b>51.93%</b>



We note that the 50<sup>th</sup> percentile result of 7.06% in our 2024 CMAM (typically reflecting the firms' expectations at the beginning of the calendar year) compares very favorably to the current assumption of 6.875%. Based upon our analysis, GRS would consider the current investment return assumption of 6.875% to be reasonable for the 2023 valuation.

### **General Salary Increase Assumption**

The retained actuary recommended a general salary increase assumption of 2.80%. The rationale provided by the retained actuary was that the real salary growth in the prior valuation was 0.30%, and recommended a consistent real salary growth without further justification as to why 0.30% was appropriate. In the future, we suggest that the retained actuary justify the real salary growth without simply referring to the prior assumption.

We believe that the wage growth assumption of 2.80% is reasonable for the 2023 valuation.

### **Career Salary Increase Assumption**

We believe that the development of the career salary increase assumption complies with ASOP No. 27. However, the retained actuary should consider a separate analysis for General vs Non-General members in future studies. In our experience, police officers usually have a different pattern of career salary increases compared to general employees.

### **Demographic Assumptions**

In general, we believe the demographic assumptions developed in the Investigation of Actuarial Experience comply with ASOP No. 27 and ASOP No. 35, as referenced earlier in this report.

The retained actuary performed separate retirement and withdrawal analyses for different employment groups, which is good practice. However, we note that the retained actuary did not perform a separate analysis for the different employment groups when determining rates of death or disability. In our experience, police officers usually have different rates of death or disability compared to general employees. Given the relatively low incidence of total disabilities, it is possible that there is not enough credible experience to create separate rates for State Police. In future investigation of experience, we recommend that the retained actuary consider a separate analysis for State Police death and disability. In future investigations of experience, we also recommend that the retained actuary consider service-related vs non-service-related disabilities.

With the exception of post-retirement mortality experience, the demographic analysis was performed on a head count basis. In future investigations of experience, with the exception of mortality, we recommend the retained actuary perform the demographic analyses both on a head count and liability-weighted basis, with the liability-weighted experience generally given more credibility than the head count weighted results. We believe this is particularly important for the determination of retirement and termination rates. System costs are generally more responsive to liability movements than to head counts.

In its investigation of service purchases, the retained actuary did not provide numeric detail on the actual service purchase experience during the investigation period. Consequently, we were not able to opine on the reasonability of the assumption. In the future, we recommend that the retained actuary provide numeric detail on the actual service purchase experience.

We suggest that the retained actuary include additional disclosure of any credibility procedures used in the demographic assumption setting process as required by ASOP No. 25, Credibility Procedures.

## **Mortality**

For pre-retirement mortality, it appears that the retained actuary created their own set of rates. When publishing the Pub-2010 mortality rates (which were used for post-retirement mortality), the Society of Actuaries (SOA) also provided pre-retirement mortality rates. Since almost no individual system has data with sufficient credibility to create an independent assumption, it has become the industry norm, and our preference, to base pre-retirement mortality on the public sector rates published by the SOA, perhaps with a credibility adjustment. In future studies, we recommend the retained actuary consider the rates published by the SOA when recommending a pre-retirement mortality assumption.

We note that the retained actuaries used benefit-weighted experience when performing its analysis on post-retirement mortality. The use of benefit-weighted experience recognizes that those with higher income have different rates of mortality than those with lower income and is consistent with how the SOA developed the Pub-2010 mortality rates.

In developing the Pub-2010 tables, the SOA provided separate mortality rates based on Public Safety experience vs non-Public Safety experience. The retained actuary only recommended the use of the non-public safety tables in its investigation. Given the relatively large size of State Police in SERS and the separate contribution rates for State Police, we believe that it is appropriate to perform a separate mortality analysis for police officers. In future investigations, we recommend that the retained actuary consider the use of Public Safety mortality tables for public safety employees.

In its investigation, the retained actuary performs significant adjustments to the proposed Pub-2010 tables through the use of age set-forwards. However, the retained actuary has not disclosed any credibility analysis that would justify this level of adjustment to the tables and no specific rationale is given for using a set forward vs a table multiplier. Our preference is to use a mortality credibility procedure (as discussed in the 2017 SOA paper titled “Credibility Educational Resource for Pension Actuaries”). We suggest that in future investigations the retained actuary provide a credibility analysis for the adjustments made to the published mortality tables.

## **Actuarial Methods**

Although not discussed in the retained actuary’s investigation of experience, we have included our review of the actuarial methods in this section. In future investigations of actuarial experience, we recommend that the retained actuary discuss the items that follow.

We concur with the decision to use the Entry Age Actuarial Cost Method. This method produces a normal cost that is a level percent of pay and is the most common method used in public employee retirement systems.

When developing the Actuarial Value of Assets (AVA) the retained actuary includes a contribution receivable in the AVA, that is not included in the Market Value of Assets (MVA). Section 3.3(b)(2) of ASOP 44 states that for the AVA “Any differences between the actuarial value of assets and the market value are recognized within a reasonable period of time...”. We recognize that the AVA only includes a half year amortization receivable which would get recognized over half a year, but we are concerned that the AVA and MVA may never match even if all assumptions are met. Although we concur that a contribution



receivable should be considered when calculating the employer contribution, we do not believe it should be included in the AVA, which is used to determine the funded status of the System. Accordingly, we recommend that the retained actuary cease the practice of including the amortization receivable directly in the AVA and only incorporate such contributions in the development of the contribution rates.

Additionally, we recommend that the Board and retained actuary consider the use of a corridor when calculating the AVA to ensure that the actuarial value of assets (before applying a contribution receivable, if any) remains within a certain range from the market value of assets.

With respect to the amortization policy:

- The Board uses 10-year amortization period for benefit changes.
- The amortization period for changes in liability due to experience or assumption changes is 30 years. While we believe that the use of a 30-year level dollar amortization is currently reasonable and agree with the use of level dollar amortization, a period shorter than 30 years would also be reasonable, and in some circles would be preferred.
- When contributions are made based upon a percent of payroll (although calculated as a level dollar amount), it is possible that changes in payroll will result in contribution gains or losses. In order to avoid such losses, we recommend that the retained actuary also calculate a dollar contribution and that the Board consider the dollar contribution as a minimum.

### **Miscellaneous Assumptions Not In Investigation**

We recommend that the retained actuary include a discussion of the spouse age difference, and a description of the administrative expense assumption in the next investigation of actuarial experience.

### **Actuarial Equivalence Factors**

A review of the assumptions used for actuarial equivalence was outside the scope of this audit. We do agree with the retained actuary that a change in actuarial equivalence factors is not needed following every experience study. We note the retained actuary's statement in its investigation that "... this issue is one that Korn Ferry would like to explore further with SERS in the near future, rather than delay addressing it until the time of the next actuarial experience study." We agree that it would be good practice for the retained actuary and the Board to work together to determine the appropriate path forward.

### **Phase-in Periods for Assumption Changes**

We are not aware of any current use of phase-in periods by SERS for assumption changes.

## **SECTION IV**

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### **REVIEW OF ANNUAL VALUATION REPORT**

# Review of Annual Valuation Report

We believe that the 2023 valuation report is thorough, generally understandable, and the content is appropriate for the intended users. We include some observations based on our current views of the Actuarial Standards of Practice (ASOPs) and trends in the actuarial community. The ASOPs change from time to time. There is a new ASOP in force (ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions) since the last actuarial audit and several of the pension ASOPs are currently under revision. As much as possible, we have restricted our comments about compliance with the ASOPs to the versions in effect as of the valuation date.

## Retained Actuary's Cover Letter

The last paragraph on page 2 of the cover letter states (emphasis added):

*Based upon the valuation results, it is our opinion that, provided future employer contributions are made in accordance with current law, the Pennsylvania State Employees' Retirement System is, and **will continue to be, adequately funded**, in accordance with generally accepted actuarial principles and procedures. The current funding policy **guarantees** that there are sufficient assets to pay benefits when they come due based on current assumptions.*

We suggest the following changes to this paragraph:

- We believe it would be beneficial to state “... will continue to be, adequately funded **if all assumptions are met (including the employer making contributions in accordance with the funding policy).**”
- We believe the word “guarantee” in this context is too strong. Since the final sentence in this paragraph appears redundant, we suggest its removal.

The second to last paragraph of the cover letter refers to assumptions, “which represent our [retained actuaries] best estimate of anticipated experience under the plan.” The ASOPs require assumptions selected by the actuary to be reasonable, but not necessarily best estimates. Best estimate assumptions have specific significance for accounting purposes that may or may not be consistent with the retained actuaries' use of the term. The term “best estimate” also appears on page 68.

We also observe that in the investigation of actuarial experience, the retained actuaries state that, “...a moderately conservative approach – has been used by the SERS Board.”, which seems somewhat at odds with the assumptions being the best estimate. Additionally, Section 4.1 I. of ASOP 4 requires “a statement indicating whether, in the actuary's professional judgment, the combined effect of the assumptions ... is expected to have no significant bias (i.e., it is not significantly optimistic or pessimistic)...”. We suggest the retained actuary include a specific statement stating that the effect of the assumptions is expected to have no significant bias.

Additionally, we suggest that the cover letter define the intended users of the document, the extent to which other may have access to it, and the extent to which others may rely on it, if at all.



## Retained Actuary's Valuation Highlights

Page 1 includes the value of assets and funded status measure, but it does not include the corresponding actuarial accrued liability. We recommend that the retained actuary also disclose the actuarial accrued liability on this page.

Page 12 states that "The current funding policy will eventually restore the funded ratio to 100 percent provided that contributions are made as provided in current law." We recommend that the retained actuary add, "assuming all assumptions are met." to the end of this sentence.

With regard to the participant data, page 14 states that "we have made certain adjustments to the SERS data, including the use of a minimum annual salary assumption of \$20,000." ASOP 23 section 4.1 e., requires a disclosure of "...significant steps the actuary has taken to improve the data...". We recommend the retained actuary disclose other steps taken to improve the data. In particular, in our audit, we found that salary is annualized for active members listed with less than (or equal to for certain classes) 1,650 hours of service.

## Retained Actuary's Schedule A – Unfunded Liability and Normal Cost

Row I.A groups Active and Inactive participants. Our preference would be to show Inactive participants in their own category.

Rows I.A1 and VI.A1 of this schedule group the normal retirement and withdrawal liabilities. Our preference would be to see withdrawal separated from normal retirement, either as a line item or combined with refunds.

Row II is labeled as "Present Value of Member and **Employer Contributions.**" We suggest the label be clarified, because we believe that employer UAAL contributions are not included.

## Retained Actuary's Schedule D – Development of Shared-Risk/Gain Member Contributions

We have replicated the retained actuary's calculation in both the 2022 and 2023 valuation and we generally find that the retained actuary's disclosures in this section are appropriate. However, when replicating row 8 "Actual July 1, 2024 Impact of 3-Year Investment Period on Employer Contributions" of this schedule, we were unable to replicate the result without first reaching out to the retained actuary for the relevant details. Accordingly, we recommend that the retained actuary include documentation on the calculation of row 8 that would allow another actuary to replicate the calculation by relying only on the information provided in the report.

## **Retained Actuary’s Schedule E – Analysis of Change in Employer Contribution Rate and Amortization Liability**

We have replicated the majority of the retained actuary’s calculations in Schedule E, and we find that the information is accurate and the disclosures are appropriate. Note that we are unable to replicate the *Change in Liability Due to Pay increases different than assumptions* without additional member data.

## **Retained Actuary’s Schedule H – Schedule of Funding Progress**

We have reviewed the Schedule of Funding Progress exhibit and generally find the disclosures to be appropriate. The Funding Payroll shown in the exhibit and used to calculate the UAAL as a percentage of payroll is a projected amount. In our judgment, the better divisor would be the annualized covered compensation (i.e., as of the valuation date), which is the more common method in the public sector.

## **Retained Actuary’s Schedule I – Solvency Test**

We have reviewed the Solvency Test exhibit and generally find the disclosures to be appropriate. The Solvency Test indicates that less than 100% of the Annuitant and Beneficiary liability, and none of the Active Participant liability is currently covered by reported assets. This is a significant finding, and should be noted in the comments at the beginning of the report.

## **Retained Actuary’s Schedule J – Actuarial Value of Assets**

In Row IV.H) of this section, an adjustment to the calculated Actuarial Value of Assets (AVA) is made to include “Amortization Payment Receivable (January to June).” We understand the reasoning behind including the receivable in the AVA, but we think it would be greatly preferred to calculate the AVA without the receivable and revise the contribution allocation procedure to recognize the existence of the contributions and benefit payments that are expected to be received between the valuation date and the start of the fiscal year. One reason for this is that the inclusion of the receivable produces a biased comparison of assets to liabilities in schedules such as the solvency test in Schedule I. The assets and liabilities are essentially mismatched in time.

The cover letter of the report lists the valuation date as December 31, 2023. Schedule J is the first place in the report where it is made clear that the AVA considers information past the valuation date. Under the current method of calculating the AVA, if this practice is to continue, we recommend that the retained actuary clarify that the AVA includes the “Amortization Payment Receivable” earlier in the report.

Section 4.1.4 of ASOP 44 requires that the actuary must disclose if the AVA “...has significant systematic bias toward understatement or overstatement relative to market value...”. Since the current AVA method includes the “Amortization Payment Receivable”, the asset valuation method, over time, is more likely to produce an AVA that is greater than the market value of assets than one that is less than market value. Under the current method of calculating the AVA, we recommend that the retained actuary include such a disclosure. “Significant”, however, is a matter of opinion. In the 2023 valuation the receivable was less than 2.5% of assets. A commonly accepted corridor around the market value of assets is 20%.

It would also be good practice to calculate the ratio of actuarial value of assets to market value at some place in Schedule J.



## Retained Actuary's Schedule L – Risk Measurements

On page 35, the retained actuary includes a paragraph that states “In general, deviations in plan experience or expectations will have a larger effect on the contribution needs of a more mature plan than a less mature plan...”. We feel that this paragraph over generalizes the correlation between contribution risk and plan maturity. For example, a plan with more invested assets is more susceptible to investment risk, regardless of maturity. We believe that the intention of this paragraph could be better communicated by emphasizing the following points:

- a. As a plan accumulates more assets, investment risk will have a larger effect on the contribution needs.
- b. As a plan matures, and the retiree group grows in size compared to the active population, mortality risk will have a larger effect on the contribution needs.

On page 36, the retained actuary includes a statement that “The likelihood of large changes in the ADC increases as the number of retirees increases”, and “As a plan matures, the ADC becomes more sensitive to risks.” without further explanation. These statements do not seem intuitively true, and we recommend that the retained actuary provide further explanation.

ASOP 4 Section 3.2i requires the calculation of a Low-Default Risk Obligation Measure (LDROM). Section 3.11 outlines the parameters behind the measure. In particular, ASOP 4 requires the actuary to calculate the LDROM and to provide commentary to help the intended user understand the significance of the LDROM with respect to the funded status of the plan, plan contributions, and the security of participant benefits. The actuary should use professional judgment to determine the appropriate commentary for the intended user.

The final paragraph on page 36 appears to be intended to comply with Section 3.11 of ASOP 4. It reads as follows:

*If the plan were to reduce its investment risk and invest in low-default-risk investments, the effective interest rate earned would be 5.15% per year using the December 2023 monthly average of the Treasury High Quality Market Corporate Bond Yield Curve. This interest rate would result in an actuarial accrued liability of \$66.9 billion and a funded status of 58.0%. By assuming a reasonable amount of risk with its investments, SERS is able to reduce its liability by \$11.1 billion through earnings that exceed the corporate bond yields.*

To comply fully with ASOP 4, we recommend that the retained actuary provide the additional commentary described in ASOP 4 Section 3.11 related to plan contributions and the security of participant benefits.

On page 36, with regard to the use of investment risk vs low-default-risk measure, the retained actuary states that “... with its investments, SERS is able to reduce its liability by \$11.1 billion...”. The liability of the plan is its obligation to plan participants. This obligation is not diminished by investing assets in the general market nor by assuming a higher investment return. We believe that the retained actuary should change “liability” to “calculated actuarial accrued liability.”

The retained actuary also states the \$11.1 billion reduction occurs through "...earnings that exceed the corporate bond yields." In order to remind the audience of investment risk we recommend that:

- a. The retained actuary change "corporate bond yields" to "low-default-risk corporate bond yields."
- b. At the end of this statement, we recommend that the retained actuary also state "and assuming future earnings match expectations."

On page 38, it is not clear if the 1% change means an unexpected change or just if assets or liabilities were 1% different from what they are now. We would prefer an illustration with a greater difference, such as 5% or 10%.

Finally, we also suggest adding a measure of the effect of a 1 standard deviation move in the assets.

## Recommended Additional Report Disclosures

Section 4.1 q. of ASOP 4 requires "For funded status measurements ... the actuary should accompany this description with each of the following additional disclosures: 1. whether the funded status measure is appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; 2. whether the funded status measure is appropriate for assessing the need for or the amount of future contributions; and 3. if applicable, a statement that the funded status measure would be different if the measure reflected the market value of assets rather than the actuarial value of assets;". Although we recognize that Schedule J on page 30 of the report implicitly includes some of this information, we recommend the retained actuary include an explicit statement addressing this.

Section 4.1 y. of ASOP 4 requires "an estimate of the period over which the unfunded actuarial accrued liability, if any, is expected to be fully amortized...". Section 4.1.3 a. of ASOP 41 requires a disclosure of "the intended users of the actuarial report". We have found no such statements in the report and we recommend the retained actuary include such statements.

A reconciliation of the market value of assets from the beginning of year to the end of year does not appear in the report. We recommend that the report include such a statement.

We recommend that the report include a schedule which shows the current market value broken out by major investment classes.

Schedule O (Actuarial Assumptions) and Schedule P (Actuarial Methods) are missing several miscellaneous and technical assumptions. We recommend that the retained actuary also include the following disclosures in the report:

- a. The determination of administrative expense normal cost contributions.
- b. Decrement operation (when are the decrements operable), for example, "the disability decrement is not operable when eligible for superannuation."
- c. Assumed decrement timing, for example, "all decrements assumed to occur in the beginning of the year."
- d. Eligibility testing, for example, "eligibility is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur."
- e. Timing of contributions, for example, "employer contributions assumed to occur on a bi-weekly basis."



- f. Pay increase timing, for example, “Pay increases are assumed to occur at the beginning of the year.”
- g. Incidence of service vs non-service connected disabilities, for example, “All disabilities are assumed to be non-service connected.”
- h. Information on the type of pay reported (W-2, rate, mix).

On page 62 of the report, under “Form of Payment”, the report states “...some form of joint and survivor annuity 26 percent of the time...” without specifically stating which form of joint and survivor annuity is assumed. We recommend that the retained actuary expand on this statement to indicate the form of joint and survivor annuity assumed. For example, “...100% J&S (Option 2) annuity 26 percent of the time...”.

## SECTION V

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### REPLICATION VALUATION

# Replication of December 31, 2023 Valuation Results

## Introduction

The goal of a replication audit is to verify that the main valuation results can be independently duplicated to within reasonable tolerances. While valuation systems will tend to produce different results, the differences should generally be minor unless there is an actual error in either the retained actuary's or the auditing actuary's work. Replication of results within 2%-5% depending on the metric being compared are generally viewed as a successful replication.

The table below summarizes tolerances that were used in performing this actuarial audit.

Category	Active & Inactive Member Tolerance	Retired Member Tolerance	Aggregate Tolerance
Present Value of Future Benefits	5.0%	2.0%	2.5%
Actuarial Accrued Liability	N/A	N/A	2.5%
Normal Cost	5.0%	N/A	5.0%
Computed Contribution Rate	N/A	N/A	5.0%

The above tolerances were applied for the total population (i.e., without consideration to the membership class). When applicable (e.g., present value of future benefits), active and inactive in the table above is meant to represent the total for the non-retired population. The computed contribution rate tolerance was applied to the total required contribution rate. Tolerances are applied with professional judgement considering the complexity of the benefits being valued, the limitations of the data, the complexity of the assumptions being applied and the materiality of any observed difference.

It is not uncommon for the differences in actuarial accrued liabilities and normal costs to be in opposite directions (the auditing actuary's accrued liabilities are greater, but the normal costs are lower or vice-versa). This can happen due to minor differences in the way valuation systems allocate the present value of benefits between the past and the future.

The following pages provide an overview of the principal valuation results. Note that some numbers may not add due to rounding.

## Principal Valuation Results

<b>SYSTEM MEMBERSHIP - TOTAL</b>	<b>Retained</b>		<b>+/-</b>	<b>%</b>
	<b>Actuary</b>	<b>GRS</b>	<b>Diff</b>	<b>Diff</b>
<b>Active Membership</b>				
Number of Members	98,115	98,114	-1	-0.0%
Average Age	46.3	46.3	-0.0	-0.1%
Average Years of Service	10.9	11.0	+0.1	+0.8%
Average annualized covered compensation	\$ 69,870	\$ 69,874	+\$4	+0.0%
Total annualized covered compensation	\$6,855M	\$6,856M	+\$0M	+0.0%
Funding payroll <sup>1</sup>	\$7,169M	\$7,203M	+\$35M	+0.5%
<b>Inactive &amp; Retiree Membership</b>				
Number not In Pay Status	7,077	7,059	-18	-0.3%
Number of Retirees/Beneficiaries	136,972	136,972	-	-
Total Annual Pension	\$3,499M	\$3,499M	-\$0	-0.0%
<b>ASSETS AND LIABILITIES - TOTAL</b>				
	<b>Retained</b>		<b>+/-</b>	<b>%</b>
	<b>Actuary</b>	<b>GRS</b>	<b>Diff</b>	<b>Diff</b>
<b>Net Assets</b>				
Market Value of Assets (MVA)	\$36,415M	\$36,415M	-	-
Actuarial Value of Assets (AVA)	\$38,793M	\$37,961M	-\$832M	-2.1%
<b>Present Value of Future Benefits</b>				
Retired Members	\$34,725M	\$34,792M	+\$67M	+0.2%
Active and Inactive Members	<u>\$29,743M</u>	<u>\$28,294M</u>	<u>-\$1,449M</u>	<u>-4.9%</u>
Total PVFB	\$64,467M	\$63,086M	-\$1,382M	-2.1%
Actuarial Accrued Liability	\$55,778M	\$54,831M	-\$947M	-1.7%
Unfunded Actuarial Accrued Liability	\$16,984M	\$16,870M	-\$115M	
<b>Funded Ratio</b>				
AVA / AAL	69.6%	69.2%	-0.4%	
MVA / AAL	65.3%	66.4%	+1.1%	
<b>SYSTEM CONTRIBUTIONS</b>				
<b>FOR FISCAL YEAR 2025 (% OF PAY)</b>	<b>Retained</b>		<b>+/-</b>	
	<b>Actuary</b>	<b>GRS</b>	<b>Diff</b>	
Employer Contribution Rate	33.60%	32.94%	-0.66%	
Employee Contribution Rate	<u>5.98%</u>	<u>6.24%</u>	+0.26%	
Total Actuarial Contribution Rate	39.58%	39.18%	-0.40%	
<b>Shared-Risk/Gain</b>				
<b>Effective July 1, 2023 &amp; 2024</b>	<b>Retained</b>		<b>+/-</b>	
	<b>Actuary</b>	<b>GRS</b>	<b>Diff</b>	
A-3/A-4 Shared Risk Rate Effective July 1, 2023	0.00%	0.00%	-	
A-5/A-6 Shared Risk Rate Effective July 1, 2023	0.00%	0.00%	-	
A-3/A-4 Shared Risk Rate Effective July 1, 2024	0.00%	0.00%	-	
A-5/A-6 Shared Risk Rate Effective July 1, 2024	0.00%	0.00%	-	

<sup>1</sup> Funding payroll is the sum of the anticipated DB + DC payroll for the 2025 Fiscal Year. GRS calculated this amount by increasing the DB + DC payroll as of the valuation date by 2.8% for the 2024 calendar year pay and another 2.8% for the 2025 calendar year pay. GRS then took the average of those two values.



## Principal Valuation Results (Discussion)

In aggregate, GRS replicated the retained actuary's principal valuation results to within acceptable tolerances.

### Present Value of Future Benefits (PVFB)

GRS replicated the December 31, 2023 Actuarial Valuation total PVFB to within \$1.4 billion out of \$64.5 billion (or a 2.1% difference). As is typically expected, accuracy was higher for retired members (0.2% difference in PVFB) compared to active and inactive members (4.9% difference).

### Actuarial Accrued Liability (AAL) & Unfunded Actuarial Accrued Liability (UAAL)

The GRS Actuarial Accrued Liability in total was within 1.7% of the retained actuary's figure. Taking the Actuarial Accrued Liability and subtracting off System assets results in the Unfunded Actuarial Accrued Liability. Since this measure is the net difference between two large values, there is no tolerance test as a percentage. In dollars, GRS matched the UAAL calculation to within \$115 million out of \$17.0 billion.

### Projected Payroll

The retained actuary reports both the total annualized covered compensation and the projected funding payroll that is used as a divisor when converting dollar amounts into percentages of payroll. In 2022 and 2023, these figures were:

	2023	2022	% Change
Total Annualized Covered Compensation	\$6,855,295,000	\$6,547,630,000	4.70%
Funding Payroll	\$7,168,727,000	\$6,832,806,000	4.92%
Projection Ratio	4.57%	4.36%	

The December 2023 valuation determines the contribution rate for Fiscal 2025 (July 1 to June 30). Consequently, the Annual Covered Compensation for Calendar 2023 must be projected 1.5 years into the future. The assumed general salary increase is 2.80%, as shown in the actuarial report on page 63. Based upon the inflation assumption of 2.50%, we agree that it is reasonable to assume a long-term general salary increase rate of 2.80%. Additionally, we understand that the Funding Payroll includes DB and DC plan pay while the Total Annualized Covered Compensation only shows DB plan pay. On the prior page, GRS calculated the Funding Payroll by increasing the DB + DC payroll as of the valuation date by 2.8% for the 2024 calendar year pay and another 2.8% for the 2025 calendar year pay. GRS then took the average of those two values. The retained actuaries calculation yields a similar result. The retained actuary projects the funding payroll considering all assumptions, not just the general salary increase assumption, so some difference is to be expected. Therefore, the funding payroll calculation appears to be reasonable.

In the schedule of funding progress on page 25, and in the maturity measures on page 35, the retained actuary calculates ratios of asset and liabilities as of the valuation date to the funding payroll, which is projected 1.5 years into the future. This is a minor issue, but in our judgement the better divisor would be the annualized covered compensation (i.e., as of the valuation date), which is the more common method in the public sector.

## Computed Contribution Rates

The computed employee contribution rate was similar to the retained actuary calculation. The rate shown is a blended rate for all benefit groups, most of which have different employee contribution rates. The difference in the blended rate shown may be a result of differences in projected anticipated individual group sizes. This is common for Plans that have a mix of open groups and closed groups.

The computed total employer Actuarial Contribution Rate was similar to the retained actuary calculation, 33.60% versus 32.94%. A comparison of the contribution rate by group is shown below:

Adjusted Contribution Rate - Sched. C, Column 6 (% of pay)			
	Retained		+/- Diff
	Actuary	GRS	
Adjusted Contribution Rate			
Class A-5 Age 67	16.79%	16.81%	+0.02%
Class A-6 Age 67	17.04%	17.06%	+0.02%
DC Plan Only	15.54%	15.56%	+0.02%
Class A-3 and A-4 Age 65	27.03%	26.77%	-0.27%
Class AA Age 60	40.28%	40.27%	-0.01%
Class A Age 60	31.69%	31.29%	-0.39%
Class A-3 and A-4 Age 55	30.60%	29.91%	-0.69%
Class AA Age 50	45.06%	45.10%	+0.04%
Class A Age 50	35.61%	34.46%	-1.14%
Class A-3 and A-4 Park Range & Cap Pol	28.11%	29.14%	+1.03%
Class AA Park Range & Cap Pol	41.18%	43.62%	+2.44%
Class A Park Range & Cap Pol	33.84%	34.12%	+0.28%
Class A-3 and A-4 State Pol	51.92%	53.08%	+1.16%
State Pol Other	58.47%	58.34%	-0.13%
Class D4	48.53%	52.43%	+3.90%
Class E	<u>52.52%</u>	<u>55.02%</u>	<u>+2.50%</u>
Total	33.60%	32.94%	-0.66%

## Shared-Risk/Gain Calculation

An additional review was conducted to confirm the retained actuary's computation of the Shared-Risk/Gain rates was consistent with the relevant statutes. We believe the methodology applied for computation of the July 1, 2023 and 2024 Shared-Risk/Gain Rates were consistent with the appropriate statutes. We concur with the retained actuaries' calculations. Our only recommendation is for the retained actuary to provide more detail regarding the calculation of the "Impact of 3-Year Investment Period on Employer Contributions" in Schedule D of the valuation report.



## Present Value of Future Benefits

Grand Total				
(\$'s in Millions)	Retained		+/-	%
	Actuary	GRS	Diff	Diff
Active and Inactive Members				
Superannuation and Withdrawal	\$28,033	\$26,584	-\$1,449	-5.2%
Disability	803	912	109	+13.6%
Death	794	684	-110	-13.8%
Refunds	<u>113</u>	<u>114</u>	<u>0</u>	<u>+0.2%</u>
Total	\$29,743	\$28,294	-\$1,449	-4.9%
Annuitants and Beneficiaries	<u>34,725</u>	<u>34,792</u>	<u>67</u>	<u>+0.2%</u>
<b>Total Present Value of Future Benefits</b>	<b>\$64,467</b>	<b>\$63,086</b>	<b>-\$1,382</b>	<b>-2.1%</b>

## Present Value of Future Benefits (Discussion)

While the Present Value of Future Benefits in total matched the retained actuary's value to within 2.1%, the individual decrement by decrement breakdown resulted in more variance in ancillary death and disability benefits, which represent approximately 6% of the total Present Value of Future Benefits for active and inactive members. Accordingly, we believe the results to be within reasonable tolerances.

### Active Member Liabilities by Decrement

Results when broken down by individual decrement (i.e., by retirement, death, termination and disability benefits) experienced more variance than when observed in total.

We believe this occurred as a result of differing methods of decrement application from actuary to actuary. There is no one right answer for application of actuarial assumptions. For example, GRS classifies a non-vested active member death as a termination benefit, meanwhile the retained actuary could be classifying this as a death benefit. Another potential source of difference is that the methodology for applying decrements may differ. This difference in application can lead to liabilities being categorized differently. Since the differences by decrement type between the retained actuary and GRS offset one another and in aggregate are close, we do not believe this is a cause for concern and believe the computed Present Value of Future Benefits as of December 31, 2023 to be reasonable.

## Development of Unfunded Actuarial Accrued Liability

(\$'s in Millions)	Grand Total		+/- Diff	% Diff
	Retained Actuary	GRS		
1. Present Value of Future Benefits	\$64,467	\$63,086	-\$1,382	-2.1%
2. Present Value of Future Normal Costs	<u>8,690</u>	<u>8,255</u>	<u>-435</u>	-5.0%
3. Actuarial Accrued Liability (1) - (2)	\$55,778	\$54,831	-\$947	-1.7%
4. Actuarial Value of Assets	\$38,793	\$37,961	-\$832	-2.1%
5. Unfunded Actuarial Accrued Liability (3) - (4)	\$16,984	\$16,870	-\$115	
6. Funded Ratio (4) / (3)	69.6%	69.2%	-0.4%	

## **Development of Unfunded Actuarial Accrued Liability (Discussion)**

The next step after computing the Present Value of Future Benefits is to compute the split between the Actuarial Accrued Liabilities and the Present Value of Future Normal Costs (i.e., Normal Cost for short when referring to the cost of active members for one year).

### **Present Value of Future Normal Cost**

Although the GRS normal cost as a percent of pay was higher than the retained actuary's value, the GRS computation of the Present Value of Future Normal Costs was 5% lower than that of the retained actuary. This may be a result of differing methodologies in timing of Normal Cost computations.

### **Actuarial Accrued Liability**

Since the Actuarial Accrued Liability is the difference between Present Value of Future Benefits and the Present Value of Future Normal Cost, GRS estimates of the Actuarial Accrued Liabilities were slightly lower than the retained actuary calculation. The estimates are within the 5% tolerance range for Actuarial Accrued Liability.

### **Actuarial Value of Assets**

We note that the Actuarial Value of Assets utilized by the retained actuary includes the value of a contribution receivable. GRS's preference is to exclude contribution receivables from the Actuarial Value of Assets.

### **Funded Ratio**

GRS matched the retained actuary's computation of the System's funded ratio to within 1%.

## Analysis of Contribution Rates

Grand Total (% of pay)			
	Retained		+/- Diff
	Actuary	GRS	
1. Normal Cost Rate			
a. Superannuation and Withdrawal	12.19%	12.87%	+0.68%
b. Disability	0.56%	0.75%	+0.19%
c. Death	0.41%	0.40%	-0.01%
d. Refunds	0.41%	0.42%	+0.01%
e. Administrative	<u>0.35%</u>	<u>0.35%</u>	<u>+0.00%</u>
f. Total	13.92%	14.79%	+0.87%
2. Employee Contribution Rate	5.98%	6.24%	+0.26%
3. Employee Contribution Rate	25.66%	24.39%	-1.27%
4. Total Employer Contribution - Net BCP* (1. - 2. + 3.)	33.60%	32.94%	-0.66%

Amortization of the Unfunded Actuarial Accrued Liability (UAAL) (\$'s in Millions)	Retained		+/- Diff	%
	Actuary	GRS		
<b>December 31, 2023 UAAL Calculation</b>				
AAL	\$55,778	\$54,831	-\$947	-1.7%
AVA, net Receivable	\$37,961	\$37,961	\$0	+0.0%
Receivable	<u>\$832</u>	<u>n/a</u>		
<b>UAAL</b>	<b>\$16,984</b>	<b>\$16,870</b>	<b>-\$115</b>	<b>-0.7%</b>
<b>Calculation of Amortization Amount as of December 31, 2023</b>				
UAAL	\$16,984	\$16,870	-\$115	-0.7%
1/1/2024 to 6/30/2024 Amortization Payment PV <sup>1</sup>	<u>n/a</u>	<u>\$933</u>		
Amortization Amount	\$16,984	\$15,936	-\$1,048	-6.2%
December 31, 2023 Valuation Payroll	\$6,855	\$6,856	\$0	+0.0%
FY 2025 Funding Payroll	\$7,169	\$7,203	\$35	+0.5%
FYE 2025 Employer Contribution Rate (% of pay)	33.60%	32.94%		
FYE 2025 Employee Contribution Rate (% of pay)	<u>5.98%</u>	<u>6.24%</u>		
FYE 2025 Total Contribution Rate (% of pay)	39.58%	39.18%		
Projected FYE 2025 Employer Contributions	\$2,409	\$2,373	-\$36	-1.5%

<sup>1</sup> GRS calculated this amount by taking the difference of the total FY2024 employer contribution rate as calculated in the 2022 valuation and then subtracting off the employer normal cost rate as determined in the 2023 valuation in order to calculate the anticipated remaining FY2024 employer contribution rate that will go towards the UAAL. GRS then multiplied this rate by the remaining FY 2024 covered payroll from the 2023 valuation data and took the present value.

## Analysis of Contribution Rates (Discussion)

The replication of employee and employer contribution rates was based upon the Actuarial Accrued Liabilities and Normal Costs computed by GRS. Therefore, the results are expected to differ from those of the retained actuary.

### Contribution Rate

The GRS computation of normal cost was 87 basis points higher than the retained actuary's figure. Normal Cost is particularly sensitive to differences in the way valuation systems allocate the present value of benefits between the past and the future. This difference was offset by a lower UAL Contribution by 127 basis points. In aggregate, GRS replicated the retained actuary's Actuarial Contribution Rate for Fiscal Year 2025 to within 66 basis points (33.60% versus 32.94%).

**SECTION VI**

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**SUMMARY OF RECOMMENDATIONS**

# Summary of Recommendations

The principal results of this audit are:

- The actuarial assumptions are reasonable;
- The actuarial work is mathematically correct; and
- The actuarial report fairly presents the actuarial condition of the Retirement System.

However, two actuaries will never agree completely on all of the ingredients that go into an actuarial valuation. Also, different actuaries can draw different conclusions from the same set of facts, because they have been exposed to different experiences.

This section summarizes the recommendations we have made throughout the report. We have classified as *recommendations* those items which in our judgement have the potential of resulting in a meaningful improvement in the valuation process. Our *suggestions* in the body of the report are much more minor items that may result in minor improvements in clarity for the non-expert user or technical compliance with actuarial standards. It is unlikely that the many suggestions would affect end results in any material way.

## Recommendations Regarding Data

We recommend that the retained actuary correct the data fields Inc50 (Non-covered compensation for SSI benefit (Age 50)) and Inc60 (Non-covered compensation for SSI benefit (Age 60)), which were switched, in their next valuation.

## Recommendations Regarding the Investigation of Actuarial Experience and Actuarial Assumptions

In future investigations of experience, we recommend that the retained actuary consider a separate analysis for State Police death and disability.

With the exception of mortality, we recommend the retained actuary perform the demographic analyses both on a head count and liability-weighted basis, with the liability-weighted experience generally given more credibility than the head count weighted results. We believe this is particularly important for the determination of retirement and termination rates.

We recommend that the retained actuary provide numeric detail on the actual service purchase experience.

We recommend the retained actuary consider the rates published by the SOA when recommending a pre-retirement mortality assumption.

Given the relatively large size of State Police in SERS and the separate contribution rates for State Police, we believe that it is appropriate to perform a separate mortality analysis for police officers. In future investigations, we recommend that the retained actuary consider the use of Public Safety mortality tables for public safety employees.



We recommend that the retained actuary review the continued applicability of valuation methods, amortization periods, etc. in future experience studies.

We recommend that the retained actuary cease the practice of including the amortization receivable directly in the AVA and only incorporate such contributions in the development of the contribution rates.

## **Recommendations Regarding the Actuarial Valuation Reports**

Page 1 includes the value of assets and funded status measure, but it does not include the corresponding actuarial accrued liability. We recommend that the retained actuary also disclose the actuarial accrued liability on this page.

With regard to the participant data, we recommend the retained actuary disclose all significant steps taken to improve the data.

Section 4.1.4 of ASOP 44 requires that the Actuary disclose if the AVA "...has significant systematic bias toward understatement or overstatement relative to market value...". Since the current AVA method includes the "Amortization Payment Receivable", the asset valuation method, over time, is more likely to produce an AVA that is greater than the market value of assets than one that is less than market value. Under the current method of calculating the AVA, we recommend that the retained actuary include such a disclosure. "Significant", however, is a matter of opinion. In the 2023 valuation the receivable was less than 2.5% of assets. A commonly accepted corridor around the market value of assets is 20%.

In the Shared Risk/Gain calculation, we recommend that the retained actuary include documentation on the calculation of row 8 of Schedule D that would allow another actuary to replicate the calculation by relying only on the information provided in the report.

Section 4.1 q. of ASOP 4 requires "For funded status measurements ... the actuary should accompany this description with each of the following additional disclosures: 1. whether the funded status measure is appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; 2. whether the funded status measure is appropriate for assessing the need for or the amount of future contributions; and 3. if applicable, a statement that the funded status measure would be different if the measure reflected the market value of assets rather than the actuarial value of assets;". Although we recognize that Schedule J on page 30 of the report implicitly includes some of this information, we recommend the retained actuary include an explicit statement addressing this.

Section 4.1 y. of ASOP 4 requires "an estimate of the period over which the unfunded actuarial accrued liability, if any, is expected to be fully amortized...". Section 4.1.3 a. of ASOP 41 requires a disclosure of "the intended users of the actuarial report." We have found no such statements in the report and we recommend the retained actuary include such statements.

A reconciliation of the market value of assets from the beginning of year to the end of year does not appear in the report. We recommend that the report include such a statement.

We recommend that the report include a schedule which shows the current market value broken out by major investment classes.



## **SECTION VII**

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### **FORMAL OPINION AND CONCLUDING REMARKS**

## Formal Opinion and Concluding Remarks

The auditing actuarial firm, Gabriel, Roeder, Smith & Company, is independent of the retained actuarial firm, Korn Ferry. The auditing firm employed its proprietary actuarial software for this actuarial audit. The auditing firm's software is completely independent of the retained actuary's software. The auditing actuaries are not aware of any conflict of interest that would impair the objectivity of this work.

In the opinion of the auditing actuaries, the work of the retained actuaries reasonably represents the actuarial position of the Retirement System based upon the assumptions and methods employed. In particular:

- The actuarial assumptions and methods are reasonable and comply with generally accepted actuarial principles.
- With a minor exception, the retained actuary is processing the data correctly.
- In aggregate, GRS replicated the retained actuary's principal valuation results to within acceptable tolerances.

We have presented many suggestions for areas where we believe the actuarial work product can be improved. Of course, the retained actuary has access to information and a long history of experience with the SERS that we do not have. We understand that the retained actuary may agree with some of our recommendations, while rejecting others. We ask that the retained actuary and the Board consider our recommendations carefully. We hope that the SERS and the retained actuary find these suggestions useful.

We appreciate the opportunity to work on this assignment.



## **SECTION VIII**

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### **ATTESTATION OF INDEPENDENCE**



July 16, 2025

Mr. Ryan McCoy, CIA  
Internal Audit Director  
Pennsylvania State Employees' Retirement System  
30 North 3rd Street, Suite 150  
Harrisburg, PA 17101

**Re: GRS Audit of the Pennsylvania State Employees' Retirement System**

Dear Mr. McCoy:

This letter is in response to your request for Gabriel, Roeder, Smith & Company (GRS) to attest to our independence with regard to our recent actuarial audit of the Pennsylvania State Employees' Retirement System (SERS).

GRS was selected to audit the work of the actuaries employed by the Korn Ferry organization. An actuarial audit involves a review of the retained actuary's work by an independent actuarial firm. In accordance with the Request for Proposal for actuarial auditing services issued by SERS, the purpose of this audit was to provide an evaluation sufficient to allow GRS to express an actuarial opinion regarding the reasonableness and/or accuracy of valuation results, actuarial assumptions, and actuarial methods in accordance with generally recognized and accepted actuarial principles and practices. As you are now aware, GRS and the Korn Ferry organization (KF) have entered into an agreement to transition the pension actuarial work from KF to GRS. A timeline of events for the actuarial audit project and the agreement between GRS and KF follows:

**Timeline of Events – Audit Work**

2024-02-09	Proposals due to SERS
2024-06-04	SERS notifies GRS about bid protest
2024-10-24	SERS provides Notice of Selection of GRS/Contract Negotiations
2024-10-31	SERS provides initial draft contract
2024-12-11	SERS states that project will start in February 2025
2025-01-14	President of GRS (myself) signs contract provided by SERS
2025-02-25	Final executed contract received (effective March 1, 2025)
2025-03-17	Data requests sent
2025-04-07	Data file received from KF actuary
2025-04-07	GRS audit team members begin work on the replication
<b>2025-07-11</b>	<b>Draft audit report delivered to SERS and KF</b>
<b>2025-07-16</b>	<b>Final draft of audit report delivered</b>

**Timeline of Events – Korn Ferry Assignment to GRS**

2025-04-17	Mutual NDA signed between senior level management of KF /GRS
2025-05-20	NDA for other essential GRS/KF employees (only) signed
2025-06-11	Agreement finalized between KF and GRS
2025-06-25	GRS/KF contact SERS and legal counsel of GRS/SERS/KF agree on transfer terms.
<b>2025-07-17</b>	<b>Assignment date GRS/KF/SERS</b>

Based on these timelines and other known facts, GRS attests to the following:

- a) Only those GRS representatives that signed the mutual NDA between Korn Ferry and GRS were privy to the assignment discussions. None of the GRS employees who participated in the SERS audit, including the auditing actuaries (Wurst and Anderson) signed the NDA.
- b) The GRS auditing actuaries (Wurst and Anderson) had **no** knowledge of any negotiations or other transactions between GRS and KF until they were informed by default through an email from Mr. McCoy on July 14, 2025.
- c) Two former KF employees (Michael Spadaro and Kris Seets) were hired after the SERS audit was awarded to GRS but were not involved **in any way** with the SERS audit project.
- d) One additional KF employee (Craig Graby) will be joining GRS as part of the agreement on July 17, 2025.
- e) Once the June 11, 2025 agreement was finalized, GRS called SERS (Joe Torta) to ensure him that internal confidentiality will be maintained until the audit draft was delivered to SERS.
- f) The final transition of PA SERS work from KF to GRS is expected to occur immediately after the completion of the final audit on July 17, 2025;
- g) **The SERS audit was conducted in a completely independent and unbiased way with the same diligence and care as every other actuarial audit that GRS has conducted in its entire history since 1938.**

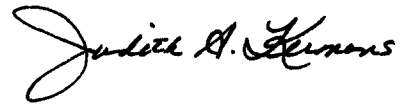
GRS has a long-standing history as the premier provider of independent actuarial consulting services to public sector pension plan and has likely performed more actuarial audits of public sector plans than any firm in the country. As such, audits can often occur over a period of many months and, it is not unusual to have changes in staff or clientele during this period. As similar situations have occurred over the years, GRS management was able to ensure that the auditing work for PA SERS was not compromised.

GRS is a firm comprised mostly of actuaries. We are not attorneys, accountants or auditors and cannot, therefore, attest to any legal issues or non-actuarial auditing or accounting functions. However, based on our reading of Government Accountability Office's Generally Accepted Auditing Standards (GAGAS) Section 3.30 threats to independence framework, including those related to self-interest and self-review, it is our professional judgement that we have not compromised the independence of the PA SERS audit in any way whatsoever. We further attest that there was no financial or other interest that would inappropriately influence the GRS actuarial auditor's judgment or behavior.



Mr. Ryan McCoy  
July 16, 2025  
Page 3

Sincerely,  
Gabriel, Roeder, Smith & Company

A handwritten signature in black ink that reads "Judith A. Kermans". The signature is written in a cursive style with a large, looping initial "J".

Judith A. Kermans  
President and CEO

JAK/vmb

cc: Mr. Joe Torta



Commonwealth of Pennsylvania  
State Employees' Retirement System  
2025 Stress Testing and Risk Assessment  
September 30, 2025



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## **SECTION 1**

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### **INTRODUCTION**

# Introduction

The Commonwealth of Pennsylvania State Employees' Retirement System (SERS) provides retirement benefits through a Defined Benefit (DB) plan and a Defined Contribution (DC) plan. The future DB plan benefits are based on contingent events such as members remaining employed until retirement eligibility and the future rates of retiree mortality. The value of the benefits, and the cost for employers to provide the benefits, is unknown and can only be estimated. Determinations of the value of benefits and the allocation of employer costs are conducted annually through an actuarial valuation. The allocation calculates an Actuarially Determined Contribution (ADC) to set the employer contribution rates applicable to the SERS employers.

The annual actuarial valuation and calculation of the ADC represent only a single measurement based on a single set of expectations of future experience. The purpose of this report is to identify and assess major factors that contribute to the risk that the actual future value of benefits will differ from the estimated value provided by the actuarial valuation and the ADC.

This risk assessment is provided through analysis of "What if?" scenarios to determine the effect on future employer contributions and the availability of assets to pay benefits when due to members. These "What if?" scenarios are referred to as Stress Tests or Scenario Tests. In each scenario, the effect on the Actuarially Determined Contribution (ADC) and funded ratio are projected over a period of 20 years and compared to the Baseline expectations.

**Actuarially Determined Contribution:** The employer contribution determined based on the SERS funding policy to ensure assets are accumulated and available to provide benefits when due to members.

**Funded Ratio:** The ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability at a specified date. The Actuarial Value of Assets is based on the market value of SERS assets but reflects an adjustment to dampen the effect of market volatility. Investment markets are volatile, and this "smoothing" is used to spread investment returns that are above or below expectations over a period of 5 years. This method is set in the SERS funding policy and is a generally accepted and recommended practice for retirement systems in the Public Sector. The Actuarial Accrued Liability is the expected value of member benefits that is allocated to past years of service. The value of benefits allocated to future years of service is funded through future contributions from members and employers.

**Baseline:** The baseline results are the current expectations based on the completed December 31, 2024 actuarial valuation, reflecting the Board's decision to maintain an investment return assumption of 6.875% and adopt new demographic assumptions, as a result of the most recent experience study, effective with the December 31, 2025 valuation.

The stress testing scenarios are organized into three distinct sections based on the major categories of risks: Investment Risks, Demographic Risks, and Contribution & Governance Risks.



## Investment Risks

SERS assets are accumulated and invested to create investment earnings that help offset the cost for employers to provide retirement benefits. The SERS funding policy is based on an assumed future investment return rate that is set as a long-term expectation of investment performance. However, it is important to understand that there is significant volatility in investment markets and that the actual investment return experienced during any given year may vary greatly from the long-term expected investment return rate.

The scenarios included in this section assess the sensitivity of the ADC and the funded ratio to:

- Differences in future investment performance;
- A large investment loss;
- The effect on investment liquidity;
- Simulated future investment performance and volatility (Stochastic Analysis); and
- Changes in the investment return assumption.

While there was relatively good investment performance during 2024, the results of these scenarios as well as the scenarios included in the following sections, are generally less favorable than the results provided in the previous Stress Testing and Risk Assessment Report that was completed in 2024. The improvement in assets was offset by the adoption of new demographic assumptions that will be effective December 31, 2025. It is important to understand that the sensitivity to investment performance will continue to increase as the funded ratio increases and additional assets are accumulated.

The SERS Board routinely monitors the effects of economic experience and changing capital market expectations. As a result of this monitoring, SERS has made periodic changes in the investment policy and the assumed investment return rate; therefore, SERS is well positioned to adjust to periods of unfavorable investment performance. Section 2.4 demonstrates the expected range of contribution needs based on simulations of future investment market volatility.

## Demographic Risks

The value of retirement benefits paid by SERS is affected by the future experience of members. The actuarial valuation and ADC are based on a single set of demographic assumptions related to future member experience. There is a risk that future member experience will differ from the assumptions used and will cause changes in the value of plan benefits.

The scenarios included in this section assess the sensitivity of the ADC and the funded ratio to:

- Changes in rates of member mortality; and
- Changes in rates of member salary growth.

Although the changes in rates of member mortality and salary growth have a relatively low impact on the future contribution needs and the funded ratio, the SERS Board monitors these rates, as well as other demographic experience of the plan, by having the plan actuary perform a comprehensive actuarial experience investigation every five years. The most recent such investigation was the 2025 experience study, which covered the period from January 1, 2020 through December 31, 2024. This periodic review reduces the likelihood of sustained periods of losses related to demographic experience affecting the funded status of SERS. Section 3.1 highlights the effect of changes in member mortality rates.



## Contribution & Governance Risks

The SERS funding policy sets employer contribution rates based on an Actuarially Determined Contribution (ADC). The ADC is designed to provide a relatively predictable and stable pattern of contributions that will ensure assets are accumulated to pay all benefits when due to members.

The scenarios included in this section assess the effect on future contribution needs and the funded ratio of employers making contributions that differ from the ADC. These scenarios do not assess the ability or willingness of the SERS employers to make future contributions. Any future contribution amounts shown are for illustrative purposes only. Contributing less than the ADC is neither recommended nor expected. The scenarios include the effect of:

- Reduced funding of the Actuarially Determined Contribution;
- Limited employer contributions due to sustained unfavorable investment performance;
- Limited employer contributions due to a large investment loss;
- Funding in excess of the Actuarially Determined Contribution;
- Granting a Cost-of-Living Adjustment (COLA); and
- Providing an Early Retirement Incentive (ERI).

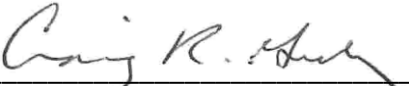
SERS is well positioned to adjust to the risks analyzed in Section 2 and Section 3 if the SERS employers consistently contribute the full ADC. The current policies and practices utilized by SERS contain mechanisms to help control the volatility of the employer contribution rates and can help ensure assets will be available to pay all benefits when due to members. Section 4.1 provides the potential impact if employers were unable to contribute the full ADC due to unexpected circumstances, such as those that may be caused by the global pandemic.

## Actuarial Certification

To the best of our knowledge, this report is complete and accurate, and all costs and liabilities have been determined in accordance with the applicable actuarial standards of practice and on the basis of actuarial assumptions and methods which are reasonable for the purpose of this analysis. The analysis is based on the data, assumptions, and methods as described in the December 31, 2024 actuarial valuation report except with changes as described within each scenario. The December 31, 2024 actuarial valuation report contains additional information necessary to understand the results contained herein. The projection years have been updated to reflect the most recent experience study.

The actuaries certifying this analysis are members of the Society of Actuaries, or other professional actuarial organizations, and meet the Qualification Standards of the American Academy of Actuaries for purposes of issuing Statements of Actuarial Opinion.

Respectfully submitted,  
Gabriel, Roeder, Smith & Company

By   
Craig R. Graby, EA, FCA, MAAA

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## **SECTION 2**

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### **INVESTMENT RISKS**

## 2.1 Effect of Future Investment Performance

SERS assets are accumulated and invested to create investment earnings that help offset the cost for employers to provide retirement benefits. The SERS funding policy is based on an assumed future investment return rate that is set as a long-term expectation of investment performance. However, it is important to understand that there is significant volatility in investment markets and that the actual investment return experienced during any given year may vary greatly from the long-term expected investment return rate.

The SERS funding policy utilizes an asset smoothing method to help dampen the effect of market volatility on the Actuarially Determined Contribution (ADC) and the funded ratio. This smoothing method recognizes investment returns that are above or below the expected rate over a period of 5 years. This allows employers to plan and adjust future budgets for changes in contribution needs.

Investment returns below the expected investment return rate will dampen the growth of SERS assets and therefore increase the contributions needed to fund the benefits. The following scenarios provide the projected effects of various investment return rates over a 20-year period:

**Baseline** – Investment returns are equal to the assumed investment return throughout the 20-year period.

**2% Above Assumption** – Investment returns are equal to the assumed investment return rate plus 2% (200 basis points) for each of the first 10 years, then equal to the assumed investment return rate for the remainder of the period.

**2% Below Assumption** – Investment returns are equal to the assumed investment return rate minus 2% (200 basis points) for each of the first 10 years, then equal to the assumed investment return rate for the remainder of the period.

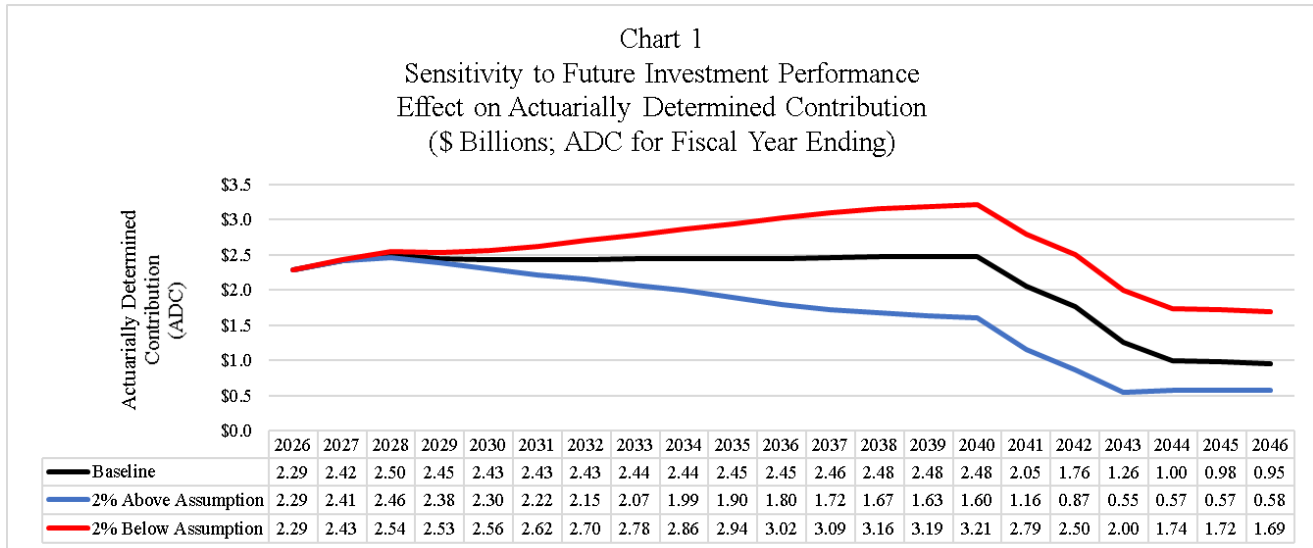
The investment return rates used by calendar year are provided in the following schedule:

Calendar Year	Baseline	2% Above Assumption	2% Below Assumption
2025-2034	6.875%	8.875%	4.875%
2035-2044	6.875%	6.875%	6.875%

The scenarios are based on the assumed investment return rate for Calendar Year 2025 of 6.875% and do not reflect any actual 2025 investment performance. Pursuant to action taken by the SERS Board at its July 2025 meeting, the assumed investment return rate was maintained at 6.875% for the December 31, 2025 actuarial valuation.

## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to future investment performance. Investment returns above the actuarial assumption reduce the ADC relative to the baseline. Investment returns below the actuarial assumption increase the ADC relative to the baseline.



The favorable investment returns in the “2% Above Assumption” scenario gradually reduce the ADC compared to the baseline projection. The cumulative effect over the 10-year period results in an expected Fiscal Year 2035/2036 ADC of \$1.80 billion, about \$650 million lower than the baseline ADC. Since investment returns that are above the assumed rates are smoothed over a period of 5 years, the investment gains that occurred through Calendar Year 2034 continue to reduce the ADC through Fiscal Year 2039/2040. After the initial 10-year period, the investment performance is set equal to the assumed investment return rate of 6.875%. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rates) as a percentage of payroll.

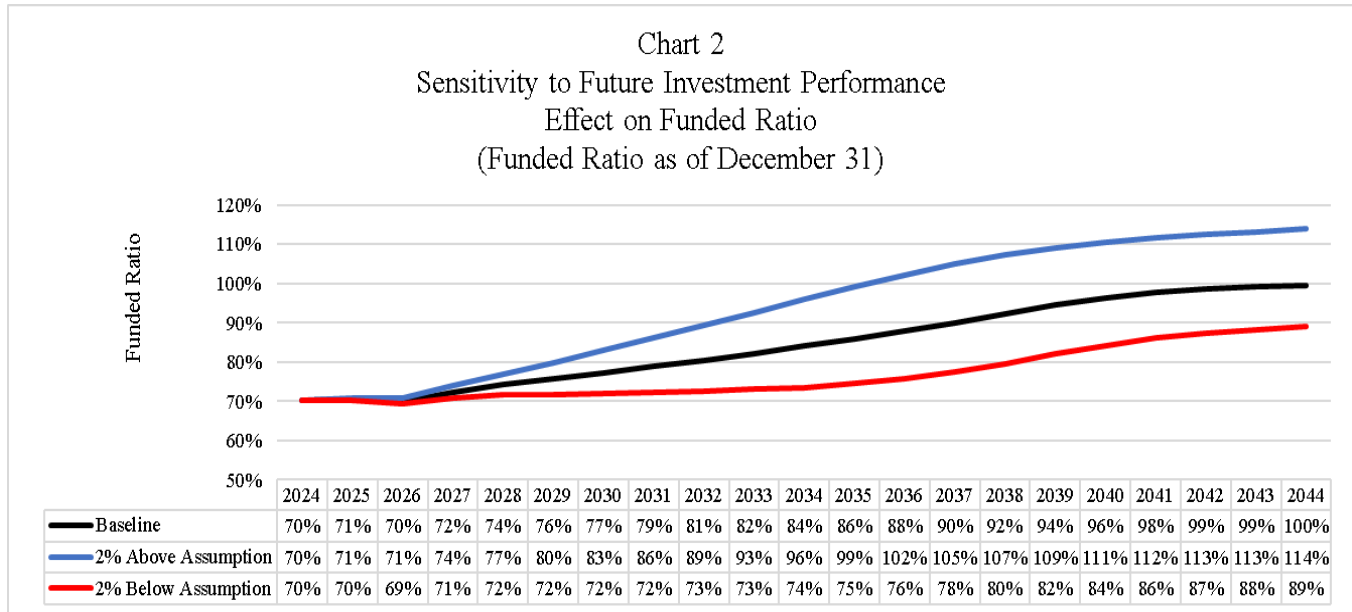
The unfavorable investment returns in the “2% Below Assumption” scenario gradually increase the ADC compared to the baseline projection. The cumulative effect over the 10-year period results in an expected Fiscal Year 2035/2036 ADC of \$3.02 billion, about \$570 million higher than the baseline ADC. Since investment returns that are below the assumed rates are smoothed over a period of 5 years, the investment losses that occurred through Calendar Year 2034 continue to increase the ADC through Fiscal Year 2039/2040. After the initial 10-year period, the investment performance is set equal to the assumed investment return rate of 6.875%. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rates) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			2% Above Assumption			2% Below Assumption		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)	ADC (8)	Payroll (9)	ADC Rate (10)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.41	\$8.05	29.9%	\$2.43	\$8.05	30.2%
2028	\$2.50	\$8.28	30.2%	\$2.46	\$8.28	29.7%	\$2.54	\$8.28	30.7%
2029	\$2.45	\$8.51	28.8%	\$2.38	\$8.51	28.0%	\$2.53	\$8.51	29.7%
2030	\$2.43	\$8.74	27.8%	\$2.30	\$8.74	26.3%	\$2.56	\$8.74	29.3%
2031	\$2.43	\$8.98	27.1%	\$2.22	\$8.98	24.7%	\$2.62	\$8.98	29.2%
2032	\$2.43	\$9.22	26.4%	\$2.15	\$9.22	23.3%	\$2.70	\$9.22	29.3%
2033	\$2.44	\$9.47	25.8%	\$2.07	\$9.47	21.9%	\$2.78	\$9.47	29.4%
2034	\$2.44	\$9.73	25.1%	\$1.99	\$9.73	20.5%	\$2.86	\$9.73	29.4%
2035	\$2.45	\$9.98	24.5%	\$1.90	\$9.98	19.0%	\$2.94	\$9.98	29.5%
2036	\$2.45	\$10.25	23.9%	\$1.80	\$10.25	17.6%	\$3.02	\$10.25	29.5%
2037	\$2.46	\$10.51	23.4%	\$1.72	\$10.51	16.4%	\$3.09	\$10.51	29.4%
2038	\$2.48	\$10.78	23.0%	\$1.67	\$10.78	15.5%	\$3.16	\$10.78	29.3%
2039	\$2.48	\$11.06	22.4%	\$1.63	\$11.06	14.7%	\$3.19	\$11.06	28.8%
2040	\$2.48	\$11.34	21.9%	\$1.60	\$11.34	14.1%	\$3.21	\$11.34	28.3%
2041	\$2.05	\$11.63	17.6%	\$1.16	\$11.63	10.0%	\$2.79	\$11.63	24.0%
2042	\$1.76	\$11.93	14.8%	\$0.87	\$11.93	7.3%	\$2.50	\$11.93	21.0%
2043	\$1.26	\$12.24	10.3%	\$0.55	\$12.24	4.5%	\$2.00	\$12.24	16.3%
2044	\$1.00	\$12.56	8.0%	\$0.57	\$12.56	4.5%	\$1.74	\$12.56	13.9%
2045	\$0.98	\$12.90	7.6%	\$0.57	\$12.90	4.4%	\$1.72	\$12.90	13.3%
2046	\$0.95	\$13.26	7.2%	\$0.58	\$13.26	4.4%	\$1.69	\$13.26	12.7%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of the funded ratio to investment performance under the three scenarios. Investment returns above the actuarial assumption increase the funded ratio relative to the baseline. Investment returns below the actuarial assumption decrease the funded ratio relative to the baseline.



The effect of investment performance on the funded ratio is delayed by the asset smoothing method, which is designed to dampen the effect of market volatility. In the long-term, the unfavorable investment performance of the “2% Below Assumption” scenario does result in a lower funded ratio compared to the baseline but does not prevent the growth of the funded ratio from 70% in 2024 to 74% in 2034 and then 89% in 2044. The favorable investment performance of the “2% Above Assumption” scenario accelerates the growth of the funded ratio from 70% in 2024 to 96% in 2034 and 114% in 2044.

## Conclusions

The future investment performance of the SERS assets is unknown and will have a substantial impact on the contributions needed to fund benefits. These scenarios have shown the sensitivity of the ADC and funded ratio to sustained periods of favorable or unfavorable investment performance, including:

1. Investment market volatility will produce investment returns that, during any given year, may be either above or below the expected investment returns. The asset smoothing method is utilized to dampen the effect of market volatility on the ADC and funded ratio to provide a more stable and predictable contribution pattern. The effect of market underperformance is recognized over multiple years, allowing employers to plan for the contribution increases and set future budget expectations.

2. The ADC will increase over time if the actual investment returns are below the assumed investment return rate. The unfavorable investment performance in the “2% Below Assumption” scenario steadily increased the ADC relative to the baseline, causing the contribution rate (ADC Rate) to be as much as 6.4% of payroll higher than the baseline (28.8% in Fiscal Year 2038/2039 compared to the baseline ADC Rate of 22.4% of payroll). As the funded ratio increases and additional assets are accumulated, the sensitivity to investment performance will continue to increase.
3. Although unfavorable investment performance can cause the funded ratio to decrease temporarily, the funded ratio is still expected to increase in the long-term. Even during the 10 years of unfavorable performance in the “2% Below Assumption” scenario, in most years, the funded ratio is gradually increasing as the ADC is contributed.

## 2.2 Effect of a Large Investment Loss

SERS assets are accumulated and invested to create investment earnings that help offset the cost for employers to provide retirement benefits. The SERS funding policy is based on an assumed future investment return rate that is set as a long-term expectation of investment performance. However, it is important to understand that there is significant volatility in investment markets and that the actual investment return experienced during any given year may vary greatly from the long-term expected investment return rate.

The SERS funding policy utilizes an asset smoothing method to help dampen the effect of market volatility on the Actuarially Determined Contribution (ADC) and the funded ratio. This smoothing method recognizes investment returns that are above or below the expected rate over a period of 5 years. This allows employers to plan and adjust future budgets for changes in contribution needs.

Investment returns below the expected investment return rate will dampen the growth of SERS assets and therefore increase the contributions needed to fund the benefits. The following scenario provides the projected effects of a large investment loss:

**Baseline** – Investment returns are equal to the assumed investment return throughout the 20-year period.

**Scenario** – The investment return for Calendar Year 2025 is -20%. For the remainder of the 20-year period, the investment returns are equal to the assumed investment return rate.

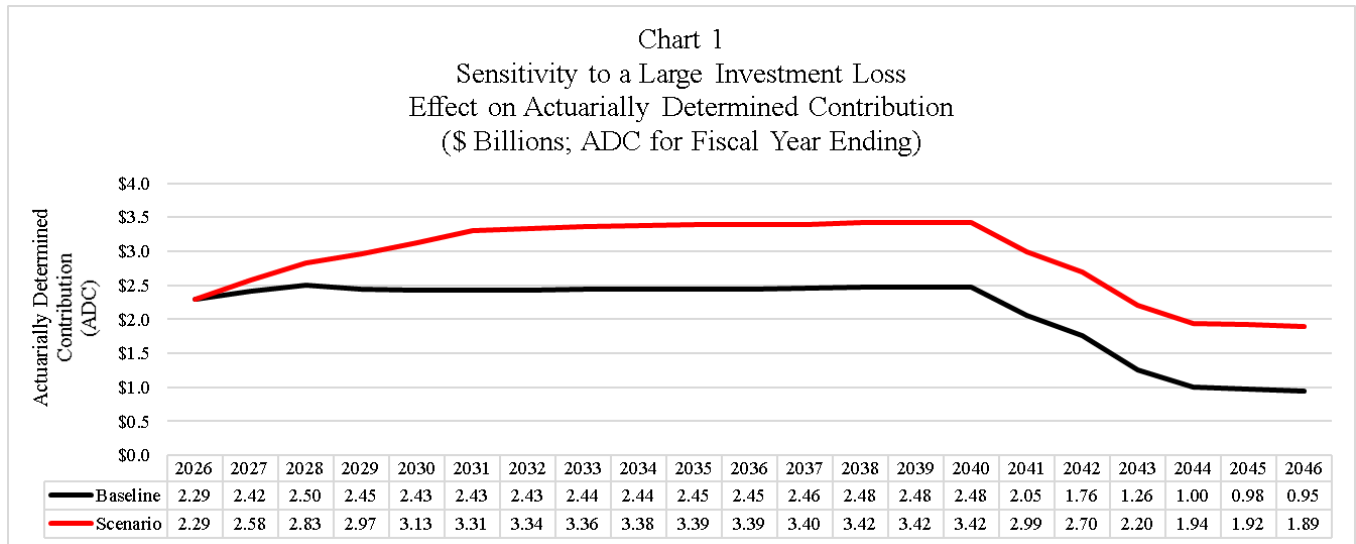
The investment return rates used by calendar year are provided in the following schedule:

Calendar Year	Baseline	Scenario
2025	6.875%	-20.000%
2026-2044	6.875%	6.875%

The scenarios are based on the assumed investment return rate for Calendar Year 2025 of 6.875% and do not reflect any actual 2025 investment performance. Pursuant to action taken by the SERS Board at its July 2025 meeting, the assumed investment return rate was maintained at 6.875% for the December 31, 2025 actuarial valuation.

## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to a large investment loss. The loss is assumed to occur during Calendar Year 2025, would first be recognized in the December 31, 2025 actuarial valuation and would first be reflected as an increase to the ADC in Fiscal Year 2026/2027.



The asset smoothing method causes the hypothetical -20% return experienced during Calendar Year 2025 to be recognized over a 5-year period. One-fifth (1/5) of the 2025 loss is recognized each year, with the first amount recognized in the Fiscal Year 2026/2027 ADC and the final amount recognized in the Fiscal Year 2030/2031 ADC.

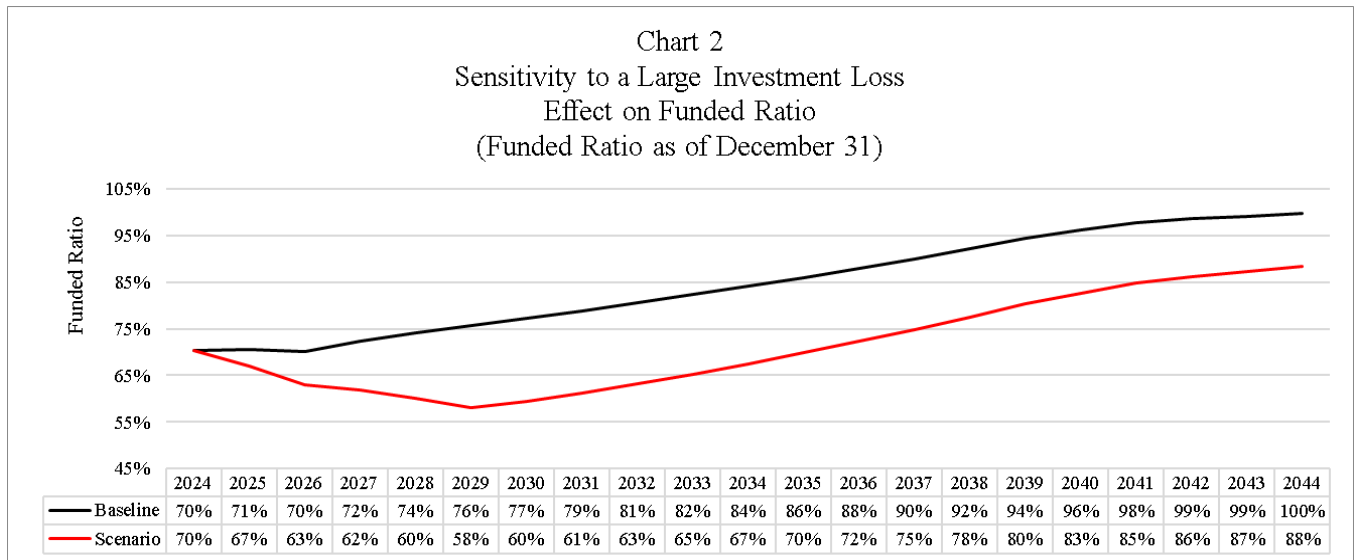
The hypothetical -20% return in Calendar Year 2025 causes the December 31, 2025 market value of assets to be \$10.2 billion less in the Scenario as compared to the baseline. This shortfall will need to be funded through additional employer contributions and is reflected in Scenario ADC's that are significantly higher than the baseline ADC's. When the Calendar Year 2025 loss is fully recognized in Fiscal Year 2030/2031, the Scenario ADC is about \$880 million higher than the baseline ADC. This \$880 million increase represents about 9.8% of member payroll and would be a substantial additional burden on employers. Table 1 provides the effect of the hypothetical Calendar Year 2025 investment loss on the future contribution rates (ADC Rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			Scenario		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.58	\$8.05	32.0%
2028	\$2.50	\$8.28	30.2%	\$2.83	\$8.28	34.2%
2029	\$2.45	\$8.51	28.8%	\$2.97	\$8.51	34.9%
2030	\$2.43	\$8.74	27.8%	\$3.13	\$8.74	35.8%
2031	\$2.43	\$8.98	27.1%	\$3.31	\$8.98	36.9%
2032	\$2.43	\$9.22	26.4%	\$3.34	\$9.22	36.2%
2033	\$2.44	\$9.47	25.8%	\$3.36	\$9.47	35.5%
2034	\$2.44	\$9.73	25.1%	\$3.38	\$9.73	34.7%
2035	\$2.45	\$9.98	24.5%	\$3.39	\$9.98	34.0%
2036	\$2.45	\$10.25	23.9%	\$3.39	\$10.25	33.1%
2037	\$2.46	\$10.51	23.4%	\$3.40	\$10.51	32.4%
2038	\$2.48	\$10.78	23.0%	\$3.42	\$10.78	31.7%
2039	\$2.48	\$11.06	22.4%	\$3.42	\$11.06	30.9%
2040	\$2.48	\$11.34	21.9%	\$3.42	\$11.34	30.2%
2041	\$2.05	\$11.63	17.6%	\$2.99	\$11.63	25.7%
2042	\$1.76	\$11.93	14.8%	\$2.70	\$11.93	22.6%
2043	\$1.26	\$12.24	10.3%	\$2.20	\$12.24	18.0%
2044	\$1.00	\$12.56	8.0%	\$1.94	\$12.56	15.4%
2045	\$0.98	\$12.90	7.6%	\$1.92	\$12.90	14.9%
2046	\$0.95	\$13.26	7.2%	\$1.89	\$13.26	14.3%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of the funded ratio to a large investment loss. The loss is assumed to occur during Calendar Year 2025 and would first be recognized as a reduction to the funded ratio in the December 31, 2025 actuarial valuation.



The asset smoothing method causes the hypothetical -20% return experienced during Calendar Year 2025 to be recognized over a 5-year period. One-fifth (1/5) of the 2025 loss is recognized each year, with the first amount recognized in the December 31, 2025 funded ratio and the final amount recognized in the December 31, 2029 funded ratio.

The hypothetical large investment loss during Calendar Year 2025 in this stress test causes the December 31, 2029 funded ratio to decrease to 58%, substantially lower than the baseline December 31, 2029 funded ratio of 76% and lower than the December 31, 2024 funded ratio of 70% before the investment loss occurred.

The effect on the funded ratio continues until the shortfall is fully funded through increased contributions. The December 31, 2044 funded ratio reflecting the large investment loss is only 88%, still substantially lower than the baseline December 31, 2044 funded ratio of 100%. The Scenario Funded Ratio would not return to the baseline value until December 31, 2060, when the large investment loss is fully amortized.

## Conclusions

The future investment performance of the SERS assets is unknown and will have a substantial impact on the contributions needed to fund benefits. This scenario has shown the sensitivity of the ADC and funded ratio to a large investment loss, including:

1. The effect of a large investment loss is delayed by the asset smoothing method. The asset smoothing method recognizes the loss over a period of 5 years, causing the ADC to increase gradually over a 5-year period rather than one large increase in a single year. In this scenario, the ADC increased by about \$176 million per year compared to the baseline for Fiscal Year 2026/2027 through Fiscal Year 2030/2031. Spreading the loss over the 5-year period allows employers to plan for the contribution increases and adjust future budgets.
2. This scenario assumes a large investment loss in a single year of -20% return on assets without considering the investment results in years preceding or following the year of the large loss. It is possible that the effect of a large investment loss in a given year could be partially offset by periods of favorable investment market performance. This was recently experienced when the unfavorable return of -4.6% during 2018 was followed by very favorable returns of 18.8% in 2019, 11.1% in 2020, and 17.24% in 2021. Another example is provided by the periods of favorable investment performance experienced by the SERS fund in the years preceding or following the large losses experienced in 2001-2002 and 2008:

Calendar Year	Investment Return
2001	-7.9%
2002	-10.9%
2003	24.3%
2004	15.1%
2005	14.5%
2006	16.4%
2007	17.2%
2008	-28.7%
2009	9.1%
2010	11.9%

3. A large investment loss could substantially reduce the funded ratio. In this scenario, the hypothetical -20% return in Calendar Year 2025 would cause the funded ratio to be as low as 58% in 2029. The calculation of the ADC reflects investment performance and would increase substantially to fund the investment shortfall. If the ADC is contributed each year, the funded ratio would be expected to return to 70%, the December 31, 2024 funded ratio just prior to the large investment loss, by December 31, 2035.

## 2.3 Effect on Investment Liquidity

Section 2.3 provides the effect of unfavorable investment performance on the Actuarially Determined Contribution (ADC) and the funded ratio. Although the ADC is designed to ensure assets are available to pay all benefits when due to members, there is a potential that SERS investments would need to be liquidated (sold) at unfavorable values in order to meet the cash flow needs of the plan.

To mitigate the risk of selling assets at unfavorable values, the SERS investment policy includes an allocation to Capital Preservation investments that have a low correlation to U.S. equity values. These Capital Preservation investments include Cash, Treasury Inflation-Protected Securities (TIPS), and U.S. public market fixed income investments based on the following target allocations:

<b>Asset Class</b>	<b>Target Allocation</b>
Cash	2%
TIPS	3%
U.S. Fixed Income*	<u>17%</u>
Capital Preservation Total	22%

*\* The U.S. Fixed Income allocation shown excludes the allocation to opportunistic fixed income.*

These Capital Preservation investments can be expected to maintain value during periods of unfavorable equity performance. If Capital Preservation investments were insufficient to pay member benefit payments net of contributions, there is a risk that other investments would need to be liquidated at unfavorable values.

The target allocation of 22% to Capital Preservation investments is expected to be sufficient to cover 76 months of member benefit payments net of contributions, thus providing a substantial period for equity investments to recover value or for other adjustments to be made to avoid liquidation at unfavorable values.

Future unfavorable investment performance could reduce the total fund values and therefore the Capital Preservation assets. Maintaining an allocation of 22% to Capital Preservation investments would provide sufficient assets to cover at least 36 months of expected member benefit payments net of contributions as long as the total fund value exceeded \$19.3 billion, which is substantially lower than the December 31, 2024 fund value of \$38.6 billion.

Future investment performance in a single year is not reasonably expected to cause the total fund value to decline from \$38.6 billion to below \$19.3 billion. Investment returns would need to be less than -16% per year for a 3-year period in order for the projected fund value to be approximately \$20.0 billion and to include Capital Preservation investments sufficient to cover 36 months<sup>1</sup> of member benefit payments net of contributions. This investment performance was set to cause an adverse investment liquidity scenario that is not reasonably expected to occur.

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<sup>1</sup> The Capital Preservation investments would be sufficient to cover the 36 months beginning at the end of the 3-year period. That is, the Capital Preservation investments would be available both during the 3-year period of -16% annual investment returns and still be sufficient to cover 36 months of expected member benefit payments net of contributions.

The following scenario provides the effect of severe investment losses over a 3-year period that would potentially cause the Capital Preservation assets to be sufficient to cover only 36 months of expected member benefits net of contributions:

**Baseline** – Investment returns are equal to the assumed investment return throughout the 20-year period.

**Scenario** – The investment return for Calendar Year 2025 through Calendar Year 2027 is -16% per year. For the remainder of the 20-year period, the investment returns are equal to the assumed investment return rate. These returns are expected to result in Capital Preservation investments as of December 31, 2027 that would be sufficient to cover approximately 36 months of expected member benefit payments net of contributions.

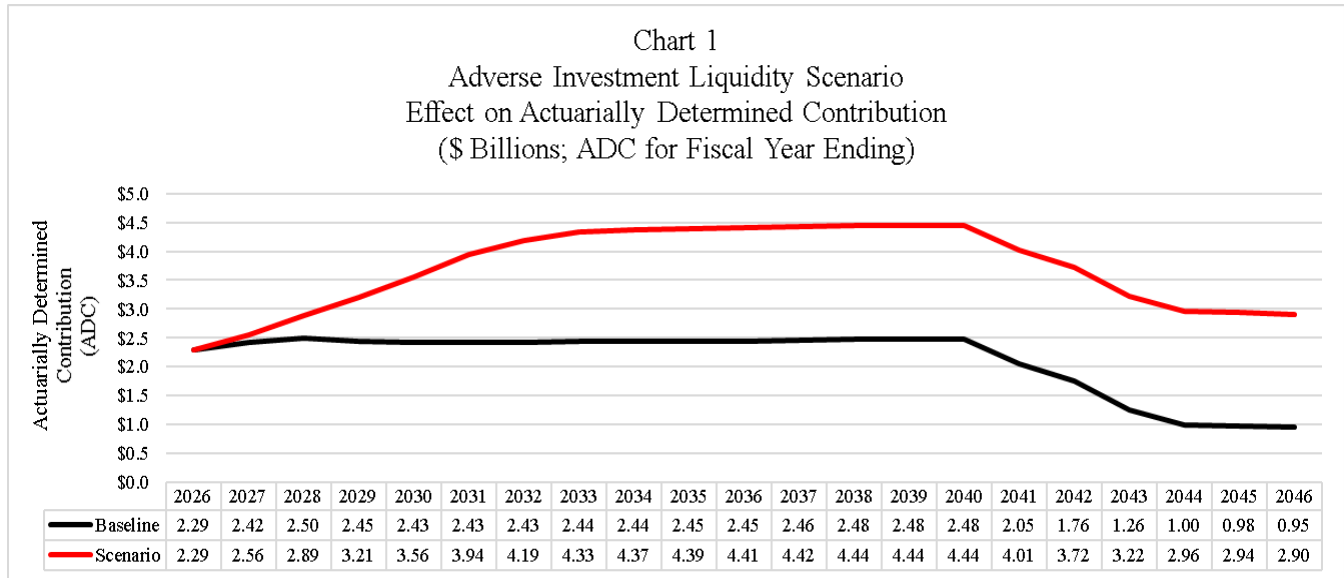
The investment return rates used by calendar year are provided in the following schedule:

Calendar Year	Baseline	Scenario
2025-2027	6.875%	-16.000%
2028-2044	6.875%	6.875%

The scenarios are based on the assumed investment return rate for Calendar Year 2025 of 6.875% and do not reflect any actual 2025 investment performance.

## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the effect of the adverse investment liquidity scenario on the Actuarially Determined Contribution (ADC). The investment losses under the adverse investment liquidity scenario are severe and would cause substantial increases in the ADC.



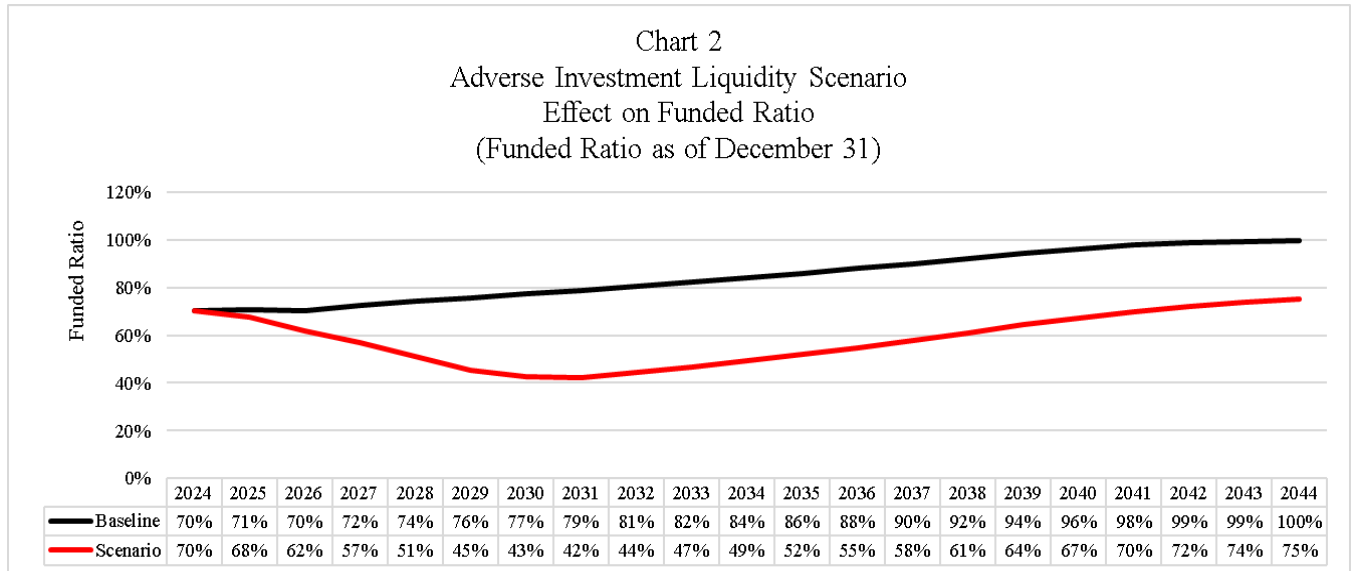
The hypothetical large investment losses in Calendar Year 2025 through Calendar Year 2027 cause the December 31, 2027 market value of assets to be \$22.6 billion less in the Scenario as compared to the baseline. These investment losses represent a severely adverse scenario that may not be reasonably expected to occur. Table 1 provides the effect of the hypothetical investment losses in Calendar Year 2025 through Calendar Year 2027 on the future contribution rates (ADC Rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			Scenario		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.56	\$8.05	31.8%
2028	\$2.50	\$8.28	30.2%	\$2.89	\$8.28	34.9%
2029	\$2.45	\$8.51	28.8%	\$3.21	\$8.51	37.7%
2030	\$2.43	\$8.74	27.8%	\$3.56	\$8.74	40.7%
2031	\$2.43	\$8.98	27.1%	\$3.94	\$8.98	43.9%
2032	\$2.43	\$9.22	26.4%	\$4.19	\$9.22	45.4%
2033	\$2.44	\$9.47	25.8%	\$4.33	\$9.47	45.7%
2034	\$2.44	\$9.73	25.1%	\$4.37	\$9.73	44.9%
2035	\$2.45	\$9.98	24.5%	\$4.39	\$9.98	44.0%
2036	\$2.45	\$10.25	23.9%	\$4.41	\$10.25	43.0%
2037	\$2.46	\$10.51	23.4%	\$4.42	\$10.51	42.1%
2038	\$2.48	\$10.78	23.0%	\$4.44	\$10.78	41.2%
2039	\$2.48	\$11.06	22.4%	\$4.44	\$11.06	40.1%
2040	\$2.48	\$11.34	21.9%	\$4.44	\$11.34	39.2%
2041	\$2.05	\$11.63	17.6%	\$4.01	\$11.63	34.5%
2042	\$1.76	\$11.93	14.8%	\$3.72	\$11.93	31.2%
2043	\$1.26	\$12.24	10.3%	\$3.22	\$12.24	26.3%
2044	\$1.00	\$12.56	8.0%	\$2.96	\$12.56	23.6%
2045	\$0.98	\$12.90	7.6%	\$2.94	\$12.90	22.8%
2046	\$0.95	\$13.26	7.2%	\$2.90	\$13.26	21.9%

## Effect on Funded Ratio

Chart 2 provides the effect of the adverse investment liquidity scenario on the funded ratio. The investment losses under the adverse investment liquidity scenario are severe and would cause substantial reductions in the funded ratio.



The hypothetical large investment losses during Calendar Year 2025 through Calendar Year 2027 in this stress test cause the December 31, 2031 funded ratio to decrease to 42%, substantially lower than the baseline December 31, 2031 funded ratio of 79% and the December 31, 2024 funded ratio of 70% before the investment losses occurred. These investment losses represent a severely adverse scenario that may not be reasonably expected to occur.

## Conclusions

The SERS investment policy includes Capital Preservation investments that are expected to be highly liquid and have a low correlation to changes in the U.S. equity markets. These investments provide a stable source for meeting the cash flow needs of the plan and protect against the risk that equity investments would need to be liquidated at unfavorable values in order to pay member benefits. Analysis of the projected availability of Capital Preservation assets in this scenario has shown:

1. The Capital Preservation target allocation of 22% of total fund assets is expected to be sufficient to cover 76 months of projected member benefits net of contributions. The total fund would need to experience investment returns below -16% per year over a period of 3 years to cause the Capital Preservation investments to be insufficient to cover 36 months of the projected member benefits net of contributions. The Capital Preservation investments appear to be achieving the goal of providing security in both the ability to pay benefits when due and the ability to avoid liquidating equity investments at unfavorable values.
2. This scenario assumes significant investment losses over a period of 3 years. Although this is possible, the magnitude of the losses appears unlikely when compared to past performance and the expected range of future performance. Section 2.4 provides an analysis of simulated future investment performance to determine the likelihood of potential future outcomes. The unfavorable investment returns required for this adverse liquidity scenario are not reasonably expected to occur.
3. This analysis is based on the SERS investment policy, including a target allocation of 22% to Capital Preservation assets. Changes in the investment policy could significantly affect the results of this analysis. The projected availability of assets to pay member benefits when due should continue to be monitored.

## 2.4 Simulation of Future Investment Performance (Stochastic Analysis)

SERS assets are accumulated and invested to create investment earnings that help offset the cost for employers to provide retirement benefits. The SERS funding policy is based on an assumed future investment return rate that is set as a long-term expectation of investment performance. However, it is important to understand that there is significant volatility in investment markets and that the actual investment return experienced during any given year may vary greatly from the long-term expected investment return rate.

Simulations of future investment performance can be aggregated and analyzed to measure the expected likelihood of certain events. For this analysis, the SERS investment advisor, RVK, provided 5,000 sets of simulated investment returns over a 20-year period based on the SERS investment policy and asset allocations. GRS has reviewed the simulated investment returns prepared by RVK and found them to be reasonable to provide an estimated range of potential future investment performance. It is important to understand that this is only one set of simulations based on a single set of assumptions. Other simulations could be produced using other methods or assumptions that would provide different results.

The simulated returns were used to develop sets of future Actuarially Determined Contribution (ADC) amounts and funded ratios over a 20-year period. These results were aggregated and ranked by percentile. The following scenarios provide the projected effects of various investment return rates over a 20-year period:

**Baseline** – Investment returns are equal to the assumed investment return throughout the 20-year period.

**95<sup>th</sup> Percentile** – Results generated from the 95<sup>th</sup> percentile of simulated returns. This represents an **unlikely** scenario that would be **very unfavorable**. Only 5% of the simulated returns were less favorable than this scenario.

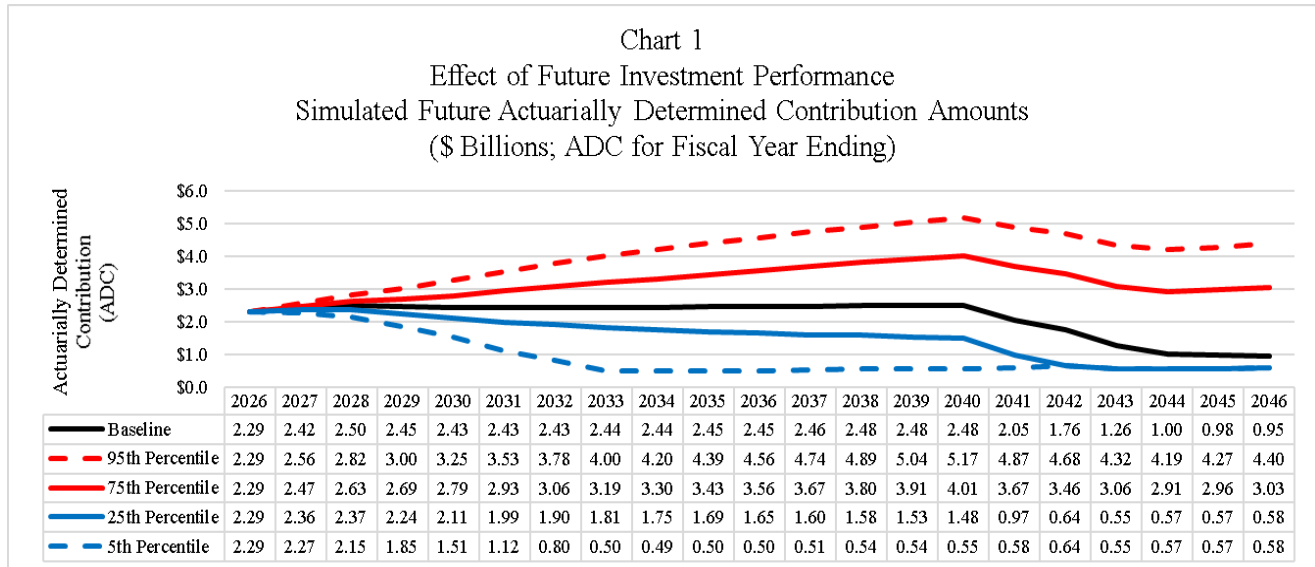
**75<sup>th</sup> Percentile** – Results generated from the 75<sup>th</sup> percentile of simulated returns. This represents a **reasonably likely unfavorable scenario**. 25% of the simulated returns were less favorable than this scenario.

**25<sup>th</sup> Percentile** – Results generated from the 25<sup>th</sup> percentile of simulated returns. This represents a **reasonably likely favorable scenario**. 75% of the simulated returns were less favorable than this scenario.

**5<sup>th</sup> Percentile** – Results generated from the 5<sup>th</sup> percentile of simulated returns. This represents an **unlikely** scenario that would be **very favorable**. 95% of the simulated returns were less favorable than this scenario.

## Simulated Future Actuarially Determined Contribution (ADC) Amounts

Chart 1 provides the simulated future Actuarially Determined Contribution (ADC) amounts. Unfavorable investment returns cause larger increases in the ADC relative to the baseline. Favorable investment returns cause larger reductions in the ADC relative to the baseline.



In general, favorable future investment performance results in future ADC amounts that are less than the baseline ADC. Unfavorable future investment performance results in future ADC amounts that exceed the baseline ADC. Comparing the “25<sup>th</sup> Percentile” scenario to the “75<sup>th</sup> Percentile” scenario provides a likely range of future ADC amounts. For example, the simulations predict that there is a 50% chance that the Fiscal Year 2035/2036 ADC will be in the range of \$1.65 billion to \$3.56 billion. It is important to understand that this also means there is a 50% chance that the Fiscal Year 2035/2036 ADC will be outside of that range.

Comparing the “5<sup>th</sup> Percentile” scenario to the “95<sup>th</sup> Percentile” scenario provides a highly likely range of future ADC amounts. For example, the simulations predict that there is a 90% chance that the Fiscal Year 2035/2036 ADC will be in the range of \$0.50 billion to \$4.56 billion. This is a very wide range that may not be reasonable for budgeting purposes but does provide a reasonable range for the “best case” (“5<sup>th</sup> Percentile”) and “worst case” (“95<sup>th</sup> Percentile”). However, this is not a guarantee that future results will be within this range.

The simulations predict a relatively narrow range of likely ADC amounts during the initial years, but the volatility of investment returns causes the range of potential outcomes to widen over the projection period. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rates) as a percentage of payroll.

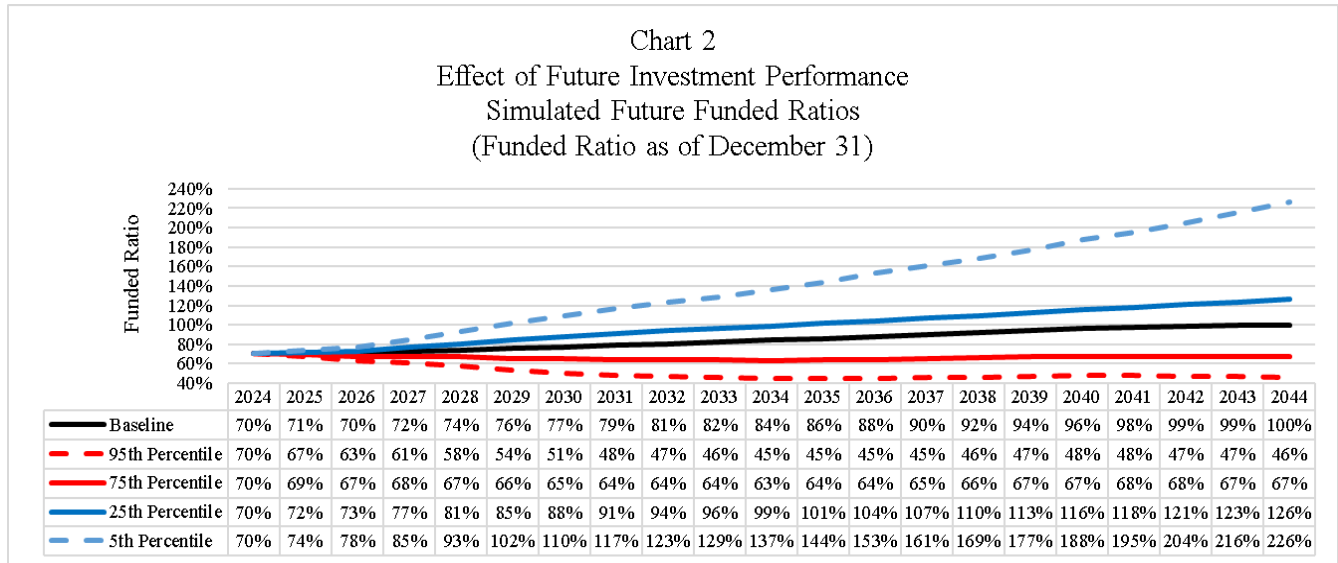
**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			95 <sup>th</sup> Percentile		75 <sup>th</sup> Percentile		25 <sup>th</sup> Percentile		5 <sup>th</sup> Percentile	
	ADC (2)	Payroll (3)	ADC Rate* (4)	ADC (5)	ADC Rate* (6)	ADC (7)	ADC Rate* (8)	ADC (9)	ADC Rate* (10)	ADC (11)	ADC Rate* (12)
2026	\$2.29	\$7.62	30.1%	\$2.29	30.1%	\$2.29	30.1%	\$2.29	30.1%	\$2.29	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.56	31.8%	\$2.47	30.7%	\$2.36	29.3%	\$2.27	28.2%
2028	\$2.50	\$8.28	30.2%	\$2.82	34.1%	\$2.63	31.8%	\$2.37	28.6%	\$2.15	26.0%
2029	\$2.45	\$8.51	28.8%	\$3.00	35.3%	\$2.69	31.6%	\$2.24	26.3%	\$1.85	21.7%
2030	\$2.43	\$8.74	27.8%	\$3.25	37.2%	\$2.79	31.9%	\$2.11	24.1%	\$1.51	17.3%
2031	\$2.43	\$8.98	27.1%	\$3.53	39.3%	\$2.93	32.6%	\$1.99	22.2%	\$1.12	12.5%
2032	\$2.43	\$9.22	26.4%	\$3.78	41.0%	\$3.06	33.2%	\$1.90	20.6%	\$0.80	8.7%
2033	\$2.44	\$9.47	25.8%	\$4.00	42.2%	\$3.19	33.7%	\$1.81	19.1%	\$0.50	5.3%
2034	\$2.44	\$9.73	25.1%	\$4.20	43.2%	\$3.30	33.9%	\$1.75	18.0%	\$0.49	5.0%
2035	\$2.45	\$9.98	24.5%	\$4.39	44.0%	\$3.43	34.4%	\$1.69	16.9%	\$0.50	5.0%
2036	\$2.45	\$10.25	23.9%	\$4.56	44.5%	\$3.56	34.7%	\$1.65	16.1%	\$0.50	4.9%
2037	\$2.46	\$10.51	23.4%	\$4.74	45.1%	\$3.67	34.9%	\$1.60	15.2%	\$0.51	4.9%
2038	\$2.48	\$10.78	23.0%	\$4.89	45.4%	\$3.80	35.3%	\$1.58	14.7%	\$0.54	5.0%
2039	\$2.48	\$11.06	22.4%	\$5.04	45.6%	\$3.91	35.4%	\$1.53	13.8%	\$0.54	4.9%
2040	\$2.48	\$11.34	21.9%	\$5.17	45.6%	\$4.01	35.4%	\$1.48	13.1%	\$0.55	4.9%
2041	\$2.05	\$11.63	17.6%	\$4.87	41.9%	\$3.67	31.6%	\$0.97	8.3%	\$0.58	5.0%
2042	\$1.76	\$11.93	14.8%	\$4.68	39.2%	\$3.46	29.0%	\$0.64	5.4%	\$0.64	5.4%
2043	\$1.26	\$12.24	10.3%	\$4.32	35.3%	\$3.06	25.0%	\$0.55	4.5%	\$0.55	4.5%
2044	\$1.00	\$12.56	8.0%	\$4.19	33.4%	\$2.91	23.2%	\$0.57	4.5%	\$0.57	4.5%
2045	\$0.98	\$12.90	7.6%	\$4.27	33.1%	\$2.96	23.0%	\$0.57	4.4%	\$0.57	4.4%
2046	\$0.95	\$13.26	7.2%	\$4.40	33.2%	\$3.03	22.9%	\$0.58	4.4%	\$0.58	4.4%

*\*All simulations and ADC Rates are based on the same projection of member payroll shown in the "Baseline" results.*

## Simulated Future Funded Ratios

Chart 2 provides the simulated future funded ratios. Unfavorable investment returns cause reductions in the funded ratio relative to the baseline. Favorable investment returns cause increases in the funded ratio relative to the baseline.



In general, favorable future investment performance results in future funded ratios that are greater than the baseline results. Unfavorable future investment performance results in future funded ratios that are less than the baseline results. Comparing the “25<sup>th</sup> Percentile” scenario to the “75<sup>th</sup> Percentile” scenario provides a likely range of future funded ratios. For example, the simulations predict that there is a 50% chance that the December 31, 2034 funded ratio will be in the range of 63% to 99%.

Comparing the “5<sup>th</sup> Percentile” scenario to the “95<sup>th</sup> Percentile” scenario provides a highly likely range of future funded ratios. For example, the simulations predict that there is a 90% chance that the December 31, 2034 funded ratio will be in the range of 45% to 137%. This is a very wide range that may not be reasonable for understanding funding expectations but does provide a reasonable range for the “best case” (“5<sup>th</sup> Percentile”) and “worst case” (“95<sup>th</sup> Percentile”). However, this is not a guarantee that future results will be within this range.

## Conclusions

The future investment performance of the SERS assets is unknown and will have a substantial impact on the contributions needed to fund benefits. These scenarios have shown the sensitivity of the ADC and funded ratio to future volatility of investment performance, including:

1. It is likely that investment market volatility will cause future ADC amounts to be significantly different from the expected long-term amounts shown in the “Baseline” projections. Based on the simulated investment returns, there is a 50% chance that the expected (“Baseline”) Fiscal Year 2035/2036 ADC of \$2.45 billion could instead be either above \$3.56 billion or below \$1.65 billion

2. Assets are expected to be available to pay benefits when due to members. In the reasonably likely unfavorable outcome represented by the “75th Percentile” scenario, the funded ratio is expected to remain relatively stable compared to the December 31, 2024 funded ratio of 70%. Even in the unlikely very unfavorable outcome represented by the “95th Percentile” scenario, the funded ratio is not expected to fall below 45% as long as the SERS employers continue to contribute the full ADC.

This analysis only recognizes the effect of future investment performance based on a single expectation of future investment returns. The effect of changes in future expectations, reflected through changes in the investment return assumption, are included in the “Sensitivity to Changes in the Investment Return Assumption” section of this report. Many other factors affect the contribution needs of the plan and can cause the ADC to vary widely in the future. Analysis of the effects of other major risks are included within the “Demographic Risks” and “Contribution Risks” sections of this report.

## 2.5 Sensitivity to Changes in the Investment Return Assumption

The SERS funding policy is based on an assumed future investment return rate that is set as a long-term expectation of investment performance. Changes in the expected future investment performance and the assumed future investment return rate can have significant effects on the results of future actuarial valuations. As of the December 31, 2024 actuarial valuation date, this assumption was 6.875% compounded annually. Pursuant to the review taken by the SERS Board at its July 2025 meeting, this assumption was maintained at 6.875% for the December 31, 2025 actuarial valuation.

This section provides the projected sensitivity of the key actuarial cost and liability components and the funded ratio as of December 31, 2025 under alternative investment return assumptions. The cost and liability components include the Total Normal Cost (i.e., the total allocated cost of benefits), the Employer Normal Cost (i.e., the allocated costs to employers calculated as the Total Normal Cost offset by the contributions from employees), the Actuarial Accrued Liability and the Unfunded Actuarial Accrued Liability.

Table 1 provides the hypothetical projected valuation results as of December 31, 2025 based on adjusting the investment return assumption (i) upward by 1% (to 7.875%), (ii) downward by 1% (to 5.875%) and (iii) downward by 2% (to 4.875%) compared to the Baseline assumption of 6.875%.

**Table 1**  
**Hypothetical Valuation Results as of December 31, 2025**  
**Under Various Investment Return Assumptions**

<b>Annual Investment Return Assumption</b>	<b>Baseline 6.875%</b>	<b>(i) 7.875%</b>	<b>(ii) 5.875%</b>	<b>(iii) 4.875%</b>
Total Normal Cost Rate (As % of Payroll)	14.03%	11.52%	17.27%	21.45%
Employer Normal Cost Rate (As % of Payroll)	8.13%	5.62%	11.37%	15.55%
Total Employer Contribution (\$ Billions)	\$2.42	\$1.88	\$2.99	\$3.63
Unfunded Actuarial Accrued Liability (\$ Billions)	\$17.17	\$11.94	\$23.32	\$30.60
Funded Ratio	70.50%	77.46%	63.77%	57.29%

Note: The results shown above are based on the projected December 31, 2025 valuation results.

## Conclusions

This analysis has shown the sensitivity of valuation results to changes in the investment return assumption, including:

1. Reducing the investment return assumption would result in higher actuarial costs and liabilities, since a smaller share of the funding of SERS would be expected to be covered by annual net investment returns. Increases in the investment return assumption would reduce the actuarial costs and liabilities.
2. Reducing the investment return assumption would increase the Actuarial Accrued Liability and reduce the funded ratio. Increasing the investment return assumption would reduce the Actuarial Accrued Liability and increase the funded ratio.
3. The SERS Board, with input and assistance from both the actuary and the investment advisor, reviews the investment return assumption annually to determine the appropriate assumption to be used for each actuarial valuation. The SERS Board makes this determination based upon a review of the SERS asset allocation and Investment Policy Statement as well as recent economic experience, future capital market expectations, and the projected effect on future contribution requirements.

## **SECTION 3**

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### **DEMOGRAPHIC RISKS**

## 3.1 Effect of Changes in Rates of Member Mortality

The value of retirement benefits paid by SERS is affected by the future experience of members. Because most SERS retirement benefits are paid in the form of a lifetime annuity, the valuation of such benefits requires that mortality assumptions be used to estimate the future lifetimes of SERS annuitants, both those currently receiving benefits and those projected to receive annuity benefits in the future.

The mortality assumptions used for SERS annual actuarial valuation purposes, when applied to any individual member, will not likely accurately predict that individual's remaining lifetime; however, when these assumptions are applied to the entire SERS covered population of 240,000+ members, they generally will result in fairly accurate predictions of the remaining lifetimes of the population on average.

Every 5 years, the SERS actuary performs an actuarial experience study, which includes a review of the actual SERS member mortality experience of the recent past compared to the then current mortality assumptions. The most recent experience study was completed in 2025 covering the period January 1, 2020 through December 31, 2024. This analysis reflects revised mortality assumptions that better reflect recent SERS member mortality while utilizing the most up to date mortality tables provided by the Society of Actuaries. Specifically, the PubG-2016 mortality table is used with females set forward one year and generational mortality improvement. The actual SERS member mortality experience will continue to be monitored particularly in the wake of COVID as new mortality studies are completed. At this time, additional mortality due to COVID can be viewed as a short-term shock and mortality rates are likely to return closer to what the projected improvement tables predict.

The actuarial valuation and Actuarially Determined Contribution (ADC) are based on a single set of demographic assumptions related to future member experience. Included in this set of assumptions are the mortality assumptions. There is a risk that future member mortality experience will differ from the mortality assumptions currently used in the SERS valuations and that this difference will cause changes in the value of plan benefits. Increased future annuitant longevity compared to the current SERS mortality assumptions will increase the value of benefits and therefore increase the contributions needed to fund the benefits. The following scenarios provide the projected effects of actual rates of member mortality deviating from the current mortality assumptions over a 20-year period:

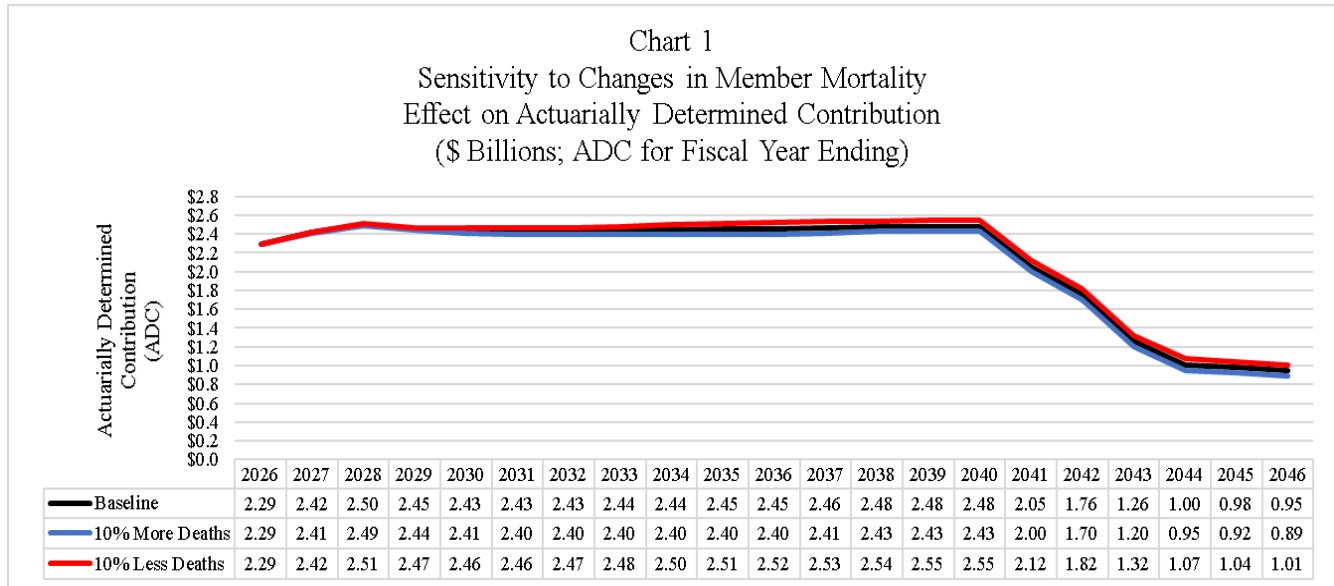
**Baseline** – Members (specifically, healthy annuitants) will experience deaths consistent with the mortality expectations adopted from the most recent experience study and effective with the December 31, 2025 valuation throughout the 20-year period.

**10% More Deaths** – Members (specifically, healthy annuitants) will experience 10% more deaths than would result from the assumed mortality rates effective with the December 31, 2025 valuation during the first 10 years of the projection, then will experience deaths consistent with the mortality assumptions for the remainder of the 20-year projection.

**10% Less Deaths** – Members (specifically, healthy annuitants) will experience 10% less deaths than would result from the assumed mortality rates effective with the December 31, 2025 valuation during the first 10 years of the projection, then will experience deaths consistent with the mortality assumptions for the remainder of the 20-year projection.

## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to changes in healthy annuitant mortality rates under the three scenarios. Member mortality rates that are higher than the actuarial assumptions decrease annuitant lifetimes, increase the number of deaths and thus decrease the value of plan benefits and the ADC relative to the baseline. Member mortality rates that are lower than the actuarial assumptions increase annuitant lifetimes, decrease the number of deaths and thus increase the value of plan benefits and the ADC relative to the baseline.



The higher mortality rates in the “10% More Deaths” scenario gradually decrease the ADC compared to the baseline projection. The cumulative effect over the 10-year period results in an expected Fiscal Year 2035/2036 ADC of \$2.40 billion, about \$50 million lower than the baseline ADC. After the initial 10-year period, the mortality rates return to the actuarial assumption, but the ADC remains lower than the baseline to reflect the lower than expected number of living healthy annuitants. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

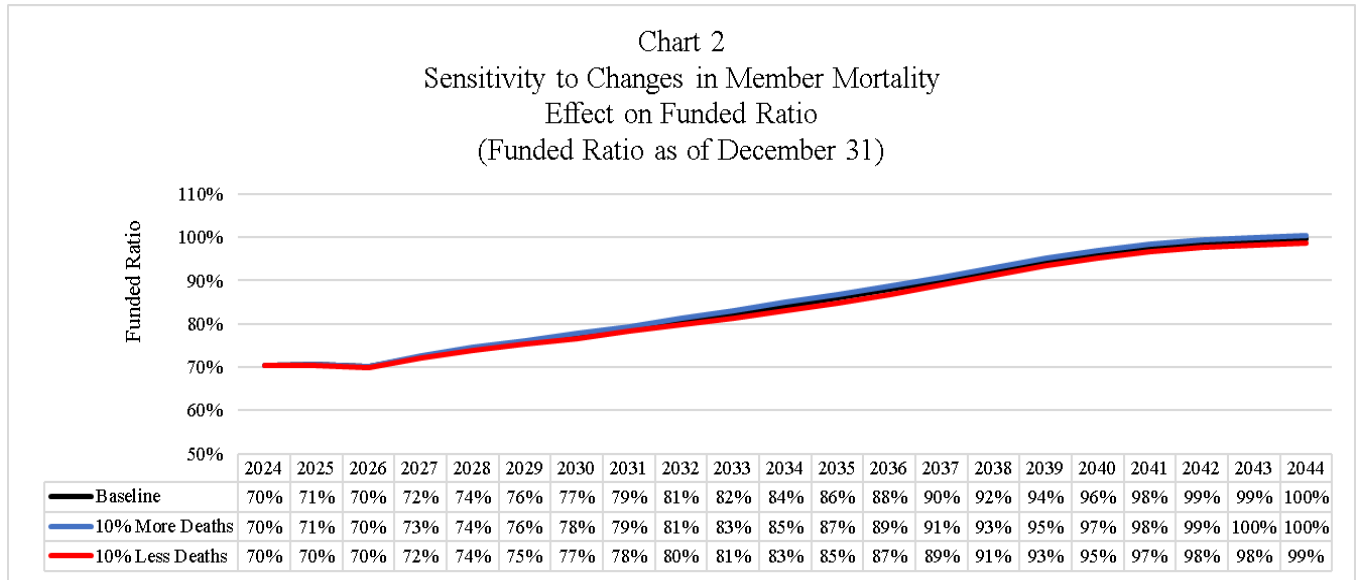
The lower mortality rates in the “10% Less Deaths” scenario gradually increase the ADC compared to the baseline projection. The cumulative effect over the 10-year period results in an expected Fiscal Year 2035/2036 ADC of \$2.52 billion, about \$70 million higher than the baseline ADC. After the initial 10-year period, the mortality rates return to the actuarial assumption, but the ADC remains higher than the baseline to reflect the higher than expected number of living healthy annuitants. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			10% More Deaths			10% Less Deaths		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)	ADC (8)	Payroll (9)	ADC Rate (10)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.41	\$8.05	29.9%	\$2.42	\$8.05	30.1%
2028	\$2.50	\$8.28	30.2%	\$2.49	\$8.27	30.1%	\$2.51	\$8.28	30.3%
2029	\$2.45	\$8.51	28.8%	\$2.44	\$8.50	28.7%	\$2.47	\$8.51	29.0%
2030	\$2.43	\$8.74	27.8%	\$2.41	\$8.74	27.6%	\$2.46	\$8.74	28.1%
2031	\$2.43	\$8.98	27.1%	\$2.40	\$8.98	26.7%	\$2.46	\$8.98	27.4%
2032	\$2.43	\$9.22	26.4%	\$2.40	\$9.22	26.0%	\$2.47	\$9.23	26.8%
2033	\$2.44	\$9.47	25.8%	\$2.40	\$9.47	25.3%	\$2.48	\$9.48	26.2%
2034	\$2.44	\$9.73	25.1%	\$2.40	\$9.72	24.7%	\$2.50	\$9.73	25.7%
2035	\$2.45	\$9.98	24.5%	\$2.40	\$9.98	24.0%	\$2.51	\$9.99	25.1%
2036	\$2.45	\$10.25	23.9%	\$2.40	\$10.24	23.4%	\$2.52	\$10.25	24.6%
2037	\$2.46	\$10.51	23.4%	\$2.41	\$10.51	22.9%	\$2.53	\$10.51	24.1%
2038	\$2.48	\$10.78	23.0%	\$2.43	\$10.78	22.5%	\$2.54	\$10.79	23.5%
2039	\$2.48	\$11.06	22.4%	\$2.43	\$11.06	22.0%	\$2.55	\$11.06	23.1%
2040	\$2.48	\$11.34	21.9%	\$2.43	\$11.34	21.4%	\$2.55	\$11.34	22.5%
2041	\$2.05	\$11.63	17.6%	\$2.00	\$11.63	17.2%	\$2.12	\$11.63	18.2%
2042	\$1.76	\$11.93	14.8%	\$1.70	\$11.93	14.2%	\$1.82	\$11.94	15.2%
2043	\$1.26	\$12.24	10.3%	\$1.20	\$12.24	9.8%	\$1.32	\$12.25	10.8%
2044	\$1.00	\$12.56	8.0%	\$0.95	\$12.56	7.6%	\$1.07	\$12.57	8.5%
2045	\$0.98	\$12.90	7.6%	\$0.92	\$12.90	7.1%	\$1.04	\$12.91	8.1%
2046	\$0.95	\$13.26	7.2%	\$0.89	\$13.26	6.7%	\$1.01	\$13.26	7.6%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of the funded ratio to changes in healthy annuitant mortality under the three scenarios. Member mortality rates that are higher than the actuarial assumptions decrease annuitant lifetimes, increase the number of deaths and thus decrease the liability for plan benefits, thereby increasing the funded ratio relative to the baseline. Member mortality rates that are lower than the actuarial assumptions increase annuitant lifetimes, decrease the number of deaths and thus increase the liability for plan benefits, thereby decreasing the funded ratio relative to the baseline.



Although the sustained period of higher mortality rates in the “10% More Deaths” scenario does increase the funded ratio, and the sustained period of lower mortality rates in the “10% Less Deaths” scenario does decrease the funded ratio, the funded ratio effect in both scenarios is not significant. Throughout the 20-year period, the funded ratios under the three scenarios were always within 2% of each other.

## Conclusions

Although sustained lower mortality rates will increase the ADC, it is unlikely to be a significant risk since:

1. During the 20-year period, the “10% Less Deaths” ADC never exceeded the baseline ADC by more than about \$70 million, or about 0.7% of covered payroll.
2. As shown in Chart 2, sustained periods of lower mortality rates are not expected to significantly affect the funded ratio or the availability of assets to pay benefits when due to members. There was no significant difference (never greater than 2%) in the funded ratio under the “10% Less Deaths” scenario compared to the baseline funded ratio.

## 3.2 Effect of Changes in Rates of Member Salary Growth

The retirement benefits paid by SERS are based on each member's salary (compensation) at the time of their retirement. SERS funding is based on each member's current salary projected to retirement, using a salary scale to reflect increases for general inflation, real wage growth, and career (merit) growth. This salary increase scale is used as a budgeting tool to reflect expected overall salary growth in funding the future benefits. It is not a guarantee of future salary increases nor a reflection of the expected career progression of any single individual.

It is common for actual member salary increases to be significantly higher or lower than expected during any individual year or over a period of multiple years as the economy moves through cycles. For example, many retirement systems experienced dampened salary growth following the economic recession of 2007-2009.

Member salary increases above the expected growth rate will increase the value of benefits and therefore increase the contributions needed to fund the benefits. The following scenarios provide the projected effects of salaries increasing by various rates over a 20-year period:

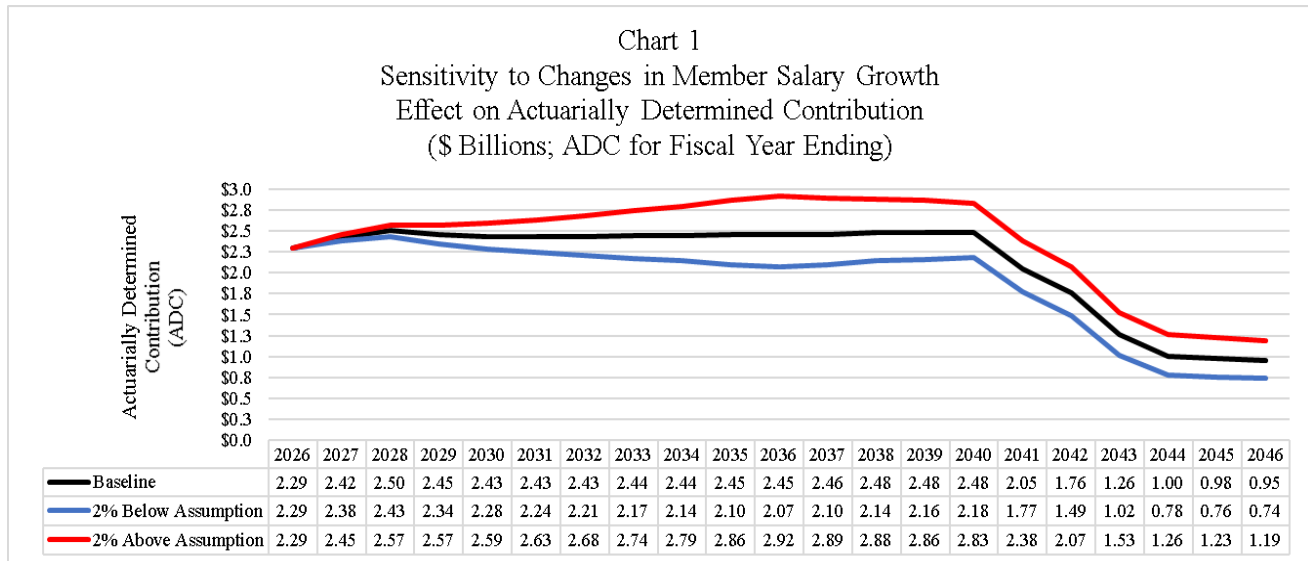
**Baseline** – Member salaries increase based on the salary scale adopted in the most recent experience study and effective with the December 31, 2025 valuation throughout the 20-year period.

**2% Above Assumption** – Member salaries increase by the salary scale effective with the December 31, 2025 valuation plus 2% (200 basis points) for each of the first 10 years, then increase by the assumed salary scale for the remainder of the period.

**2% Below Assumption** – Member salaries increase by the salary scale effective with the December 31, 2025 valuation minus 2% (200 basis points) for each of the first 10 years, then increase by the assumed salary scale for the remainder of the period.

## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to changes in salary growth rates under the three scenarios. Salary growth rates above the actuarial assumption increase the ADC relative to the baseline. Salary growth rates below the actuarial assumption decrease the ADC relative to the baseline.



The larger salary growth rate in the “2% Above Assumption” scenario gradually increases the ADC compared to the baseline projection. The cumulative effect over the 10-year period results in an expected Fiscal Year 2035/2036 ADC of \$2.92 billion, about \$470 million higher than the baseline ADC. After the initial 10-year period, the salary growth rates return to the actuarial assumption, but the ADC remains larger than the baseline to reflect the larger payroll. The larger projected payroll in the “2% Above Assumption” scenario also results in a decrease in the contribution rate as a percentage of payroll compared to the baseline projection. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

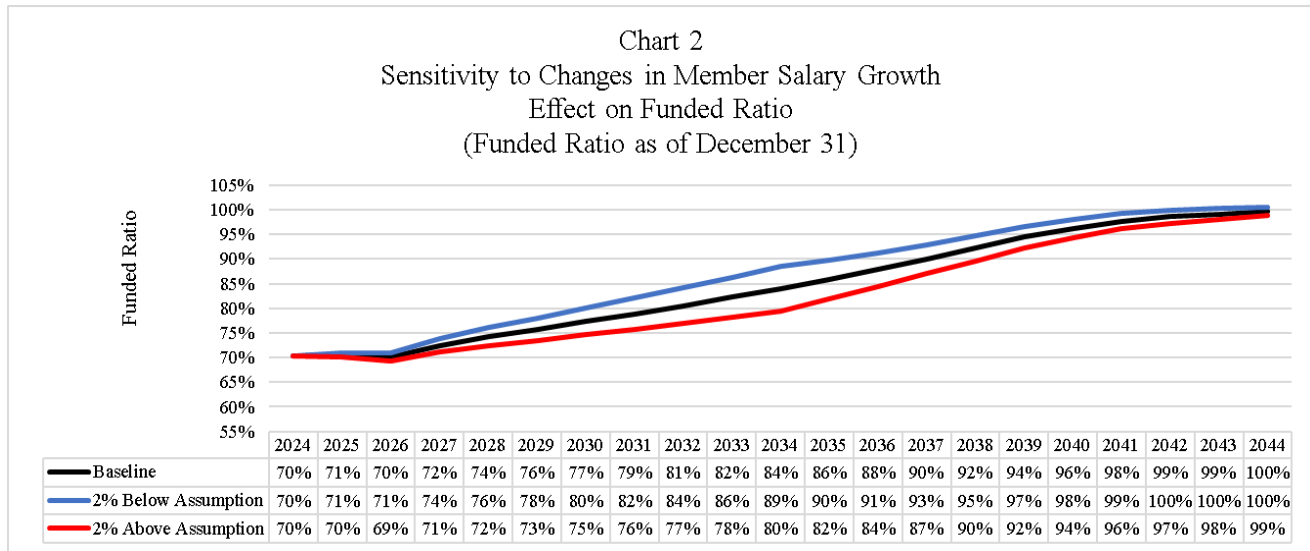
The reduced salary growth rate in the “2% Below Assumption” scenario gradually reduces the ADC compared to the baseline projection. The cumulative effect over the 10-year period results in an expected Fiscal Year 2035/2036 ADC of \$2.07 billion, about \$380 million lower than the baseline ADC. After the initial 10-year period, the salary growth rates return to the actuarial assumption, but the ADC remains lower than the baseline to reflect the reduced payroll. The reduced projected payroll in the “2% Below Assumption” scenario also results in an increase in the contribution rate as a percentage of payroll compared to the baseline projection. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			2% Below Assumption			2% Above Assumption		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)	ADC (8)	Payroll (9)	ADC Rate (10)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.38	\$7.81	30.5%	\$2.45	\$8.29	29.6%
2028	\$2.50	\$8.28	30.2%	\$2.43	\$7.87	30.9%	\$2.57	\$8.69	29.6%
2029	\$2.45	\$8.51	28.8%	\$2.34	\$7.93	29.5%	\$2.57	\$9.11	28.2%
2030	\$2.43	\$8.74	27.8%	\$2.28	\$7.99	28.5%	\$2.59	\$9.54	27.1%
2031	\$2.43	\$8.98	27.1%	\$2.24	\$8.05	27.8%	\$2.63	\$10.00	26.3%
2032	\$2.43	\$9.22	26.4%	\$2.21	\$8.11	27.3%	\$2.68	\$10.47	25.6%
2033	\$2.44	\$9.47	25.8%	\$2.17	\$8.16	26.6%	\$2.74	\$10.96	25.0%
2034	\$2.44	\$9.73	25.1%	\$2.14	\$8.22	26.0%	\$2.79	\$11.48	24.3%
2035	\$2.45	\$9.98	24.5%	\$2.10	\$8.27	25.4%	\$2.86	\$12.01	23.8%
2036	\$2.45	\$10.25	23.9%	\$2.07	\$8.40	24.6%	\$2.92	\$12.44	23.5%
2037	\$2.46	\$10.51	23.4%	\$2.10	\$8.62	24.4%	\$2.89	\$12.76	22.6%
2038	\$2.48	\$10.78	23.0%	\$2.14	\$8.85	24.2%	\$2.88	\$13.09	22.0%
2039	\$2.48	\$11.06	22.4%	\$2.16	\$9.07	23.8%	\$2.86	\$13.42	21.3%
2040	\$2.48	\$11.34	21.9%	\$2.18	\$9.31	23.4%	\$2.83	\$13.76	20.6%
2041	\$2.05	\$11.63	17.6%	\$1.77	\$9.55	18.5%	\$2.38	\$14.12	16.9%
2042	\$1.76	\$11.93	14.8%	\$1.49	\$9.80	15.2%	\$2.07	\$14.48	14.3%
2043	\$1.26	\$12.24	10.3%	\$1.02	\$10.05	10.1%	\$1.53	\$14.86	10.3%
2044	\$1.00	\$12.56	8.0%	\$0.78	\$10.31	7.6%	\$1.26	\$15.24	8.3%
2045	\$0.98	\$12.90	7.6%	\$0.76	\$10.59	7.2%	\$1.23	\$15.66	7.9%
2046	\$0.95	\$13.26	7.2%	\$0.74	\$10.89	6.8%	\$1.19	\$16.09	7.4%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of the funded ratio to changes in salary growth rates under the three scenarios. Salary growth rates above the actuarial assumption slightly reduce the funded ratio relative to the baseline. Salary growth rates below the actuarial assumption slightly increase the funded ratio relative to the baseline.



Although the sustained period of larger salary growth rates does reduce the funded ratio, the effect is not significant compared to the total SERS benefits. The larger salary growth rates increase the future benefits for current active members but do not affect the value of benefits for current retirees, which accounts for a large portion of the total SERS benefits. Also, the increased ADC increases SERS assets as the additional contributions are received and invested to pay future benefits, which somewhat offsets the reduction to the funded ratio.

## Conclusions

Although sustained salary growth that exceeds the expected growth rates will increase the ADC, it is unlikely to be a significant risk since:

1. Sustained periods of high salary growth rates are likely to coincide with strong economic growth periods that could also provide favorable investment returns and revenue growth.
2. High salary growth rates would reduce the ADC rate as a percentage of payroll. A reduced ADC rate may be viewed as a reduced burden on employers to provide the benefits since the contributions would represent a smaller portion of the total compensation costs.
3. Sustained periods of high salary growth rates are not expected to significantly affect the funded ratio or the availability of assets to pay benefits when due to members. There was no significant difference in the funded ratio under the “2% Above Assumption” scenario compared to the baseline.

## SECTION 4

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### CONTRIBUTION & GOVERNANCE RISKS

## 4.1 Effect of Reduced Funding of Actuarially Determined Contribution

It is the SERS funding policy to fully fund the Actuarially Determined Contribution (ADC), the annual employer contribution calculated by the actuary based on a defined actuarial cost method, asset valuation method and amortization method. Developing an ADC each year serves two primary purposes:

1. Ensures assets are accumulated to pay all benefits when due to members
2. Provides a relatively predictable and stable pattern of contributions to assist with budgeting

Substantial underfunding can result in an insufficient accumulation of assets to pay benefits when due to members. However, even temporary periods of underfunding can create a significant burden on future budgets.

When contributions are not appropriately budgeted and paid, many governments have struggled to restore the appropriation in subsequent years. Therefore, it is important to recognize both the effect of underfunding and the difficulty to return to full funding. Although we neither recommend nor expect future underfunding, the following scenarios provide the projected effects of temporarily reducing SERS funding:

**Baseline** – Employers contribute 100% of the ADC in all years.

**Scenario Contribution** – Employers provide reduced funding to the Defined Benefit Plan based on the following schedule:

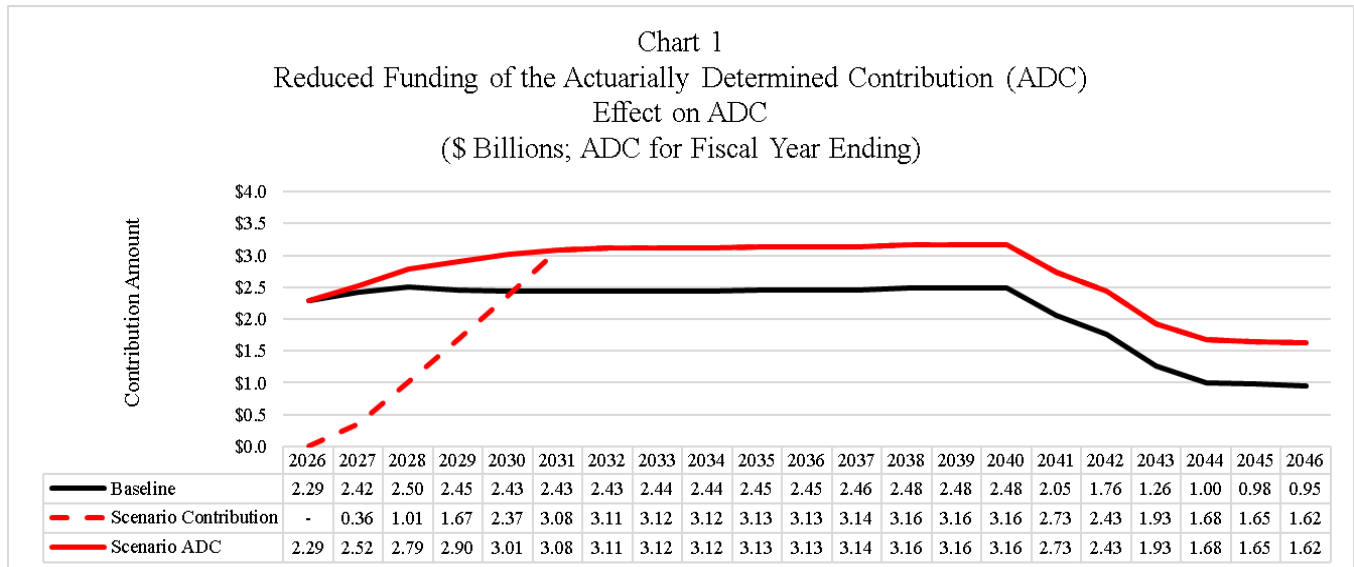
Fiscal Year	Percentage of ADC Contributed to Defined Benefit Plan
2025/2026	0%
2026/2027	20%
2027/2028	40%
2028/2029	60%
2029/2030	80%
2030/2031 through 2045/2046	100%

This scenario reflects a missed contribution during Fiscal Year 2025/2026 followed by a four-year period of partial funding during Fiscal Year 2026/2027 through Fiscal Year 2029/2030, as the annual budget gradually ramps up before recovering to full funding in Fiscal Year 2030/2031 and thereafter.

**Scenario ADC** – The Actuarially Determined Contribution (ADC) reflecting the reduced funding provided in the Scenario Contribution.

## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to reduced funding of the ADC. The reduced funding for Fiscal Year 2025/2026 through Fiscal Year 2029/2030 in this stress test increases the unfunded actuarial liabilities relative to the baseline. These additional unfunded liabilities cause the Scenario ADC to increase relative to the baseline.



The accumulated effect of the reduced funding for Fiscal Year 2025/2026 through Fiscal Year 2029/2030 results in an expected Fiscal Year 2030/2031 ADC of \$3.08 billion, about \$650 million higher than the baseline ADC. The increased ADC continues throughout the projection period until the System's 30-year amortization of the underfunded liabilities is complete.

In this scenario, there is about \$8.10 billion of underfunding during Fiscal Year 2025/2026 through Fiscal Year 2029/2030 relative to the baseline. This \$8.10 billion of underfunding causes future contributions (through Fiscal Year 2059/2060) to increase by \$21.61 billion.

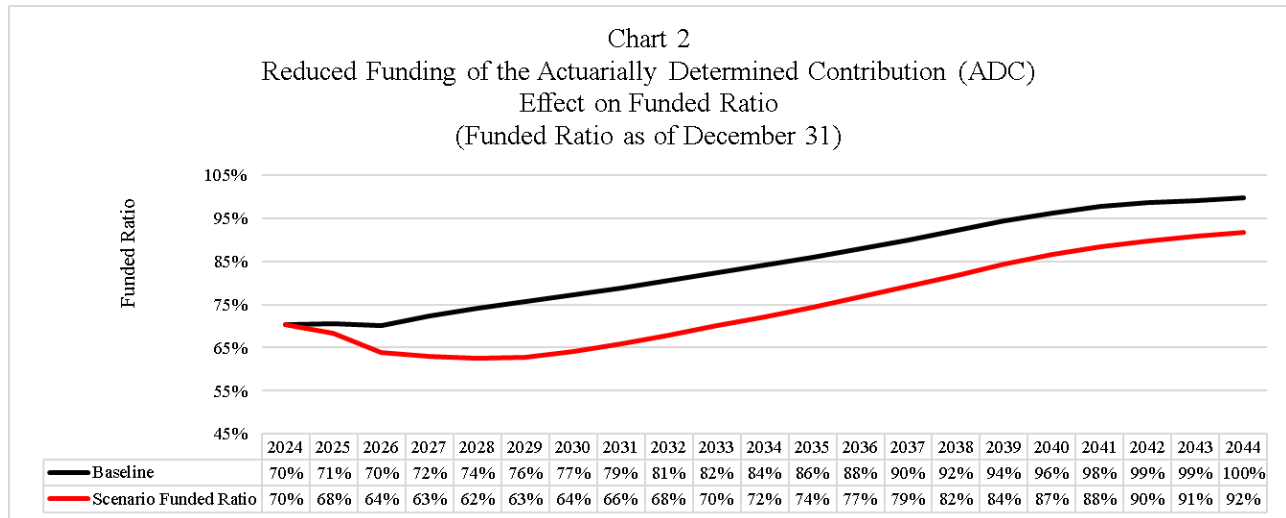
The underfunding also creates a larger burden for future employers since the Scenario ADC represents a larger percentage of member funding payroll. Table 1 provides the effect of the underfunding on the future contribution rates (ADC Rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			Scenario ADC		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.52	\$8.05	31.3%
2028	\$2.50	\$8.28	30.2%	\$2.79	\$8.28	33.7%
2029	\$2.45	\$8.51	28.8%	\$2.90	\$8.51	34.1%
2030	\$2.43	\$8.74	27.8%	\$3.01	\$8.74	34.4%
2031	\$2.43	\$8.98	27.1%	\$3.08	\$8.98	34.3%
2032	\$2.43	\$9.22	26.4%	\$3.11	\$9.22	33.7%
2033	\$2.44	\$9.47	25.8%	\$3.12	\$9.47	32.9%
2034	\$2.44	\$9.73	25.1%	\$3.12	\$9.73	32.1%
2035	\$2.45	\$9.98	24.5%	\$3.13	\$9.98	31.4%
2036	\$2.45	\$10.25	23.9%	\$3.13	\$10.25	30.5%
2037	\$2.46	\$10.51	23.4%	\$3.14	\$10.51	29.9%
2038	\$2.48	\$10.78	23.0%	\$3.16	\$10.78	29.3%
2039	\$2.48	\$11.06	22.4%	\$3.16	\$11.06	28.6%
2040	\$2.48	\$11.34	21.9%	\$3.16	\$11.34	27.9%
2041	\$2.05	\$11.63	17.6%	\$2.73	\$11.63	23.5%
2042	\$1.76	\$11.93	14.8%	\$2.43	\$11.93	20.4%
2043	\$1.26	\$12.24	10.3%	\$1.93	\$12.24	15.8%
2044	\$1.00	\$12.56	8.0%	\$1.68	\$12.56	13.4%
2045	\$0.98	\$12.90	7.6%	\$1.65	\$12.90	12.8%
2046	\$0.95	\$13.26	7.2%	\$1.62	\$13.26	12.2%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of the Funded Ratio to reduced funding of the ADC. The reduced funding for Fiscal Year 2025/2026 through Fiscal Year 2029/2030 in this stress test substantially reduces the SERS assets relative to the baseline. These reduced asset values cause the Scenario Funded Ratio to decrease relative to the baseline funded ratio.



The reduced funding for Fiscal Year 2025/2026 through Fiscal Year 2029/2030 in this stress test causes the December 31, 2030 funded ratio to decrease to 64%, substantially lower than the baseline December 31, 2030 funded ratio of 77%.

The effect on the funded ratio continues until the underfunding is fully amortized over the 30-year period. The December 31, 2044 funded ratio reflecting the reduced funding is only 92%, still substantially lower than the baseline December 31, 2044 funded ratio of 100%. The Scenario Funded Ratio would not return to the baseline value until December 31, 2061, when the additional contributions for the underfunding are fully amortized.

## Conclusions

Even temporary reductions in funding can have significant effects on both the future contribution burden and the funded ratio. This hypothetical scenario of missed contributions has shown:

1. The \$8.10 billion of missed contributions increased future contributions by a total of \$21.61 billion and increased the future employer contribution rate by as much as 7.3% of payroll.
2. Each dollar of shortfall between the amount contributed and the baseline ADC immediately increases the unfunded liability and reduces the funded ratio. The funded ratio is expected to steadily increase in the baseline scenario from 70% in 2024 to 100% in 2044. The reduced funding scenario would reduce the funded ratio below the baseline (to as low as 62% in 2028 compared to the baseline of 74%) before recovering to only 92% by 2044.
3. The ADC is designed to provide relatively predictable and stable contribution patterns. When ADC-level contributions are not appropriately budgeted and paid, it may be very difficult to budget for the large contribution increases needed to return to fully funding the ADC.

## 4.2 Effect of Limited Employer Contributions Due to Sustained Unfavorable Investment Performance

The Investment Risks Section includes a stress test to assess the effect of future investment performance assuming SERS employers continue to contribute the full Actuarially Determined Contribution (ADC). However, if there is sustained unfavorable investment performance, there is an additional risk that SERS employers would be unable to adjust their budgets to meet the increases in the ADC without adversely impacting their ability to meet the critical needs of the Commonwealth.

The following scenarios provide the projected effects of sustained unfavorable investment performance assuming various employer contribution patterns:

**Baseline** – Investment returns are equal to the assumed investment return throughout the 20-year period. All employers contribute the ADC in each year of the 20-year period.

**Full Funding Scenario** – Investment returns are equal to the assumed investment return rate minus 2% (200 basis points) for each year of the 20-year period. All employers contribute the ADC in each year of the 20-year period.

**Limited Funding Scenario** – Investment returns are equal to the assumed investment return rate minus 2% (200 basis points) for each year of the 20-year period. After Fiscal Year 2024/2025, the annual rate of growth of employer contributions to the Defined Benefit Plan is limited to the 3.6% per year long-term projected rate of State revenue growth.

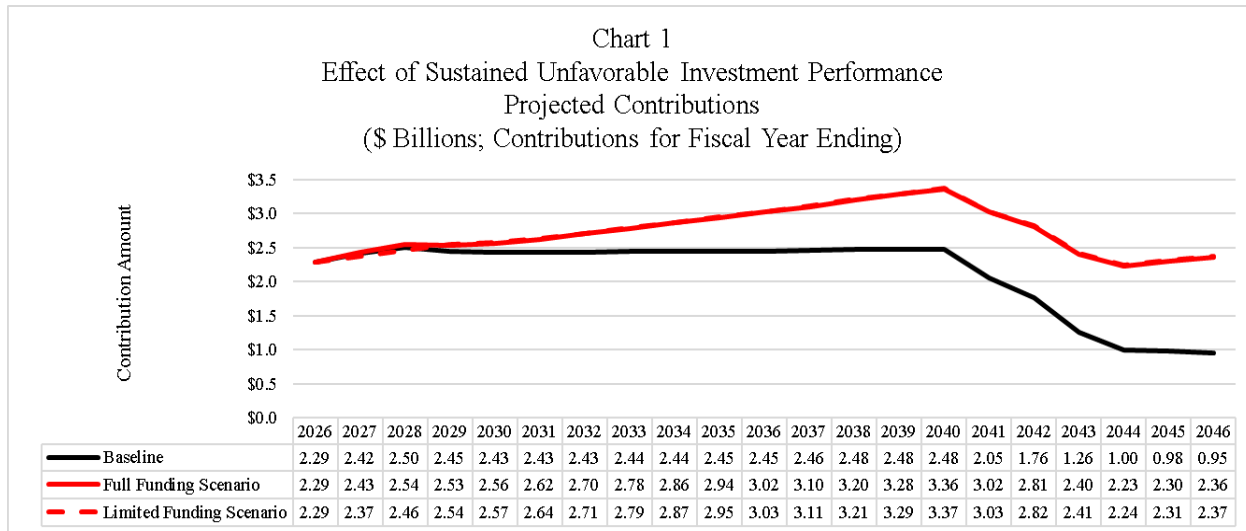
The investment return rates used by calendar year are provided in the following schedule:

Calendar Year	Baseline	Full Funding Scenario	Limited Funding Scenario
2025-2044	6.875%	4.875%	4.875%

The scenarios are based on the assumed investment return rate for Calendar Year 2025 of 6.875% and do not reflect any actual 2025 investment performance.

## Effect on the Actuarially Determined Contribution (ADC)

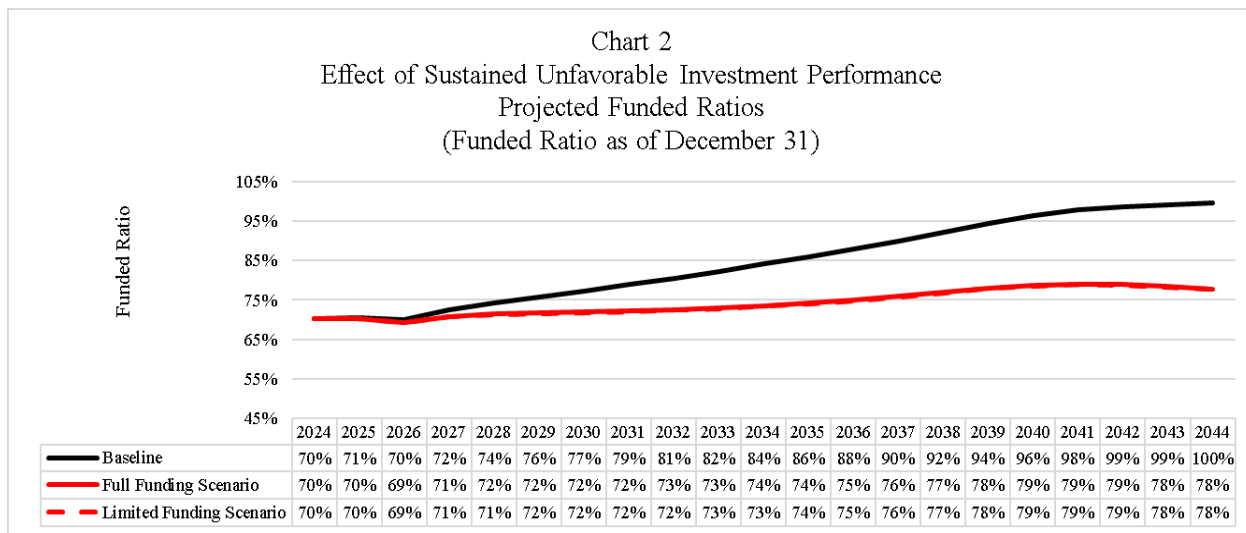
Chart 1 provides the projected contribution amounts by Fiscal Year for each scenario.



The sustained unfavorable investment performance gradually increases the ADC compared to the baseline projection. The “Limited Funding Scenario” would not generate sufficient increases in employer contributions to fund the ADC, only impacting Fiscal Years 2026/2027 and 2027/2028. Although contributions under the “Limited Funding Scenario” would gradually recover to the level under the “Full Funding Scenario” by Fiscal Year 2028/2029 and only be slightly higher through the projection period, the lower contributions in the earlier years create a funding deficiency. The funding deficiency is shown by analyzing the effect on the funded ratio. Analysis of the effect on the funded ratio is provided in the following section. Detailed projections of the results are provided in Table 1 (Baseline), Table 2 (Full Funding Scenario), and Table 3 (Limited Funding Scenario), which follow the “Conclusions” section.

## Effect on Funded Ratio

Chart 2 provides the projected funded ratios by Calendar Year for each scenario.



The sustained unfavorable investment performance gradually reduces the funded ratio compared to the baseline. The Actuarially Determined Contribution (ADC) is adjusted to reflect the unfavorable investment performance and is contributed in the “Full Funding Scenario”. The 3.6% annual increases in employer contributions in the “Limited Funding Scenario” cause the funded ratio to increase almost identically to the “Full Funding Scenario”. That is, moderate increases of 3.6% per year in the employer contributions would gradually increase the funded ratio even if there was sustained unfavorable investment performance. Although these increases are sufficient for this scenario, other potential limited funding scenarios could substantially increase the future contributions needed to fund member benefits. Detailed projections of the results are provided in Table 1 (Baseline), Table 2 (Full Funding Scenario), and Table 3 (Limited Funding Scenario), which follow the “Conclusions” section.

## Conclusions

Sustained periods of unfavorable investment performance can increase the future contributions needed to fund member benefits. Analysis of the “Limited Funding Scenario” has shown:

1. The 3.6% annual growth in employer contributions is not projected to provide sufficient funding even in the event of sustained periods of unfavorable investment performance. Although SERS is still well positioned to adjust to periods of unfavorable investment performance, limited funding is not recommended. Other scenarios, including the scenario analyzed in Section 4.3, show that these limited contributions would not always provide sufficient funding.
2. Although the Actuarially Determined Contribution (ADC) is designed to provide relatively predictable and stable contribution patterns, adjustments are required to reflect actual investment performance and to ensure member benefits are fully funded. When the ADC is not fully contributed, even though contribution levels are stable, as they are under the “Limited Funding Scenario”, there is a funding deficiency that can substantially increase the future employer contributions needed to fund member benefits. Each dollar of shortfall between the amount contributed and the ADC immediately increases the unfunded liability and reduces the funded ratio.
3. The sustained unfavorable performance reflected in these scenarios would likely result in changes to plan funding. If SERS’ annual investment performance repeatedly fell short of the actuarial expectations, it is important to note that the SERS Board, with assistance from both the plan’s actuary and investment consultant, would re-examine and potentially adjust the plan’s investment return assumption and other actuarial assumptions. Analysis of the effect of changes in the investment return assumption is included in the Investment Risks section of this report.

**Table 1**  
**Baseline Projection of Results**  
**(Dollars in Billions)**

Calendar Year	Fiscal Year	Employer Contrib.	Payroll	Employer Contrib. Rate	Actuarial Accrued Liability	Assets	Unfunded Actuarial Accrued Liability	Change in Unfunded Liability from Prior Year	Funded Ratio	Service Cost	Benefit Payments	Ratio of Net Cash Flow to Assets
2024	2025/2026	\$2.29	\$7.62	30.1%	\$57.08	\$40.11	\$16.97	-	70.3%	\$0.58	\$4.04	3.3%
2025	2026/2027	\$2.42	\$8.05	30.1%	\$58.22	\$41.05	\$17.17	\$0.20	70.5%	\$0.65	\$4.12	3.4%
2026	2027/2028	\$2.50	\$8.28	30.2%	\$59.03	\$41.38	\$17.65	\$0.48	70.1%	\$0.65	\$4.23	3.3%
2027	2028/2029	\$2.45	\$8.51	28.8%	\$59.82	\$43.33	\$16.49	(\$1.16)	72.4%	\$0.65	\$4.31	3.1%
2028	2029/2030	\$2.43	\$8.74	27.8%	\$60.59	\$44.97	\$15.62	(\$0.87)	74.2%	\$0.64	\$4.38	3.1%
2029	2030/2031	\$2.43	\$8.98	27.1%	\$61.34	\$46.44	\$14.90	(\$0.72)	75.7%	\$0.64	\$4.46	3.2%
2030	2031/2032	\$2.43	\$9.22	26.4%	\$62.08	\$47.96	\$14.12	(\$0.78)	77.3%	\$0.64	\$4.53	3.3%
2031	2032/2033	\$2.44	\$9.47	25.8%	\$62.79	\$49.53	\$13.27	(\$0.85)	78.9%	\$0.63	\$4.61	3.3%
2032	2033/2034	\$2.44	\$9.73	25.1%	\$63.50	\$51.14	\$12.36	(\$0.91)	80.5%	\$0.63	\$4.67	3.3%
2033	2034/2035	\$2.45	\$9.98	24.5%	\$64.20	\$52.81	\$11.39	(\$0.97)	82.3%	\$0.63	\$4.73	3.2%
2034	2035/2036	\$2.45	\$10.25	23.9%	\$64.90	\$54.55	\$10.35	(\$1.04)	84.1%	\$0.63	\$4.80	3.2%
2035	2036/2037	\$2.46	\$10.51	23.4%	\$65.58	\$56.36	\$9.23	(\$1.12)	85.9%	\$0.62	\$4.86	3.2%
2036	2037/2038	\$2.48	\$10.78	23.0%	\$66.26	\$58.24	\$8.02	(\$1.21)	87.9%	\$0.62	\$4.93	3.2%
2037	2038/2039	\$2.48	\$11.06	22.4%	\$66.92	\$60.22	\$6.70	(\$1.32)	90.0%	\$0.62	\$4.99	3.1%
2038	2039/2040	\$2.48	\$11.34	21.9%	\$67.57	\$62.28	\$5.29	(\$1.41)	92.2%	\$0.61	\$5.06	3.1%
2039	2040/2041	\$2.05	\$11.63	17.6%	\$68.21	\$64.43	\$3.78	(\$1.51)	94.5%	\$0.61	\$5.13	3.1%
2040	2041/2042	\$1.76	\$11.93	14.8%	\$68.83	\$66.24	\$2.59	(\$1.19)	96.2%	\$0.61	\$5.19	3.4%
2041	2042/2043	\$1.26	\$12.24	10.3%	\$69.43	\$67.84	\$1.59	(\$1.01)	97.7%	\$0.61	\$5.25	3.9%
2042	2043/2044	\$1.00	\$12.56	8.0%	\$70.02	\$69.07	\$0.95	(\$0.64)	98.6%	\$0.61	\$5.30	4.5%
2043	2044/2045	\$0.98	\$12.90	7.6%	\$70.64	\$70.04	\$0.60	(\$0.35)	99.1%	\$0.61	\$5.35	5.0%
2044	2045/2046	\$0.95	\$13.26	7.2%	\$71.30	\$71.03	\$0.27	(\$0.33)	99.6%	\$0.62	\$5.38	5.1%

**Table 2**  
**Full Funding Scenario Projection of Results**  
**(Dollars in Billions)**

Calendar Year	Fiscal Year	Employer Contrib.	Payroll	Employer Contrib. Rate	Actuarial Accrued Liability	Assets	Unfunded Actuarial Liability	Change in Unfunded Liability from Prior Year	Funded Ratio	Service Cost	Benefit Payments	Ratio of Net Cash Flow to Assets
2024	2025/2026	\$2.29	\$7.62	30.1%	\$57.08	\$40.11	\$16.97	-	70.3%	\$0.58	\$4.04	3.3%
2025	2026/2027	\$2.43	\$8.05	30.2%	\$58.22	\$40.90	\$17.33	\$0.35	70.2%	\$0.65	\$4.12	3.4%
2026	2027/2028	\$2.54	\$8.28	30.7%	\$59.03	\$40.92	\$18.12	\$0.79	69.3%	\$0.65	\$4.23	3.4%
2027	2028/2029	\$2.53	\$8.51	29.7%	\$59.82	\$42.39	\$17.44	(\$0.68)	70.9%	\$0.65	\$4.31	3.1%
2028	2029/2030	\$2.56	\$8.74	29.3%	\$60.59	\$43.37	\$17.22	(\$0.22)	71.6%	\$0.64	\$4.38	3.1%
2029	2030/2031	\$2.62	\$8.98	29.2%	\$61.34	\$44.02	\$17.32	\$0.10	71.8%	\$0.64	\$4.46	3.1%
2030	2031/2032	\$2.70	\$9.22	29.3%	\$62.08	\$44.69	\$17.40	\$0.07	72.0%	\$0.64	\$4.53	3.1%
2031	2032/2033	\$2.78	\$9.47	29.4%	\$62.79	\$45.38	\$17.41	\$0.01	72.3%	\$0.63	\$4.61	3.1%
2032	2033/2034	\$2.86	\$9.73	29.4%	\$63.50	\$46.11	\$17.38	(\$0.03)	72.6%	\$0.63	\$4.67	3.0%
2033	2034/2035	\$2.94	\$9.98	29.5%	\$64.20	\$46.90	\$17.30	(\$0.09)	73.1%	\$0.63	\$4.73	2.8%
2034	2035/2036	\$3.02	\$10.25	29.5%	\$64.90	\$47.76	\$17.14	(\$0.16)	73.6%	\$0.63	\$4.80	2.7%
2035	2036/2037	\$3.10	\$10.51	29.5%	\$65.58	\$48.69	\$16.90	(\$0.24)	74.2%	\$0.62	\$4.86	2.6%
2036	2037/2038	\$3.20	\$10.78	29.7%	\$66.26	\$49.69	\$16.57	(\$0.32)	75.0%	\$0.62	\$4.93	2.5%
2037	2038/2039	\$3.28	\$11.06	29.7%	\$66.92	\$50.78	\$16.14	(\$0.44)	75.9%	\$0.62	\$4.99	2.4%
2038	2039/2040	\$3.36	\$11.34	29.6%	\$67.57	\$51.96	\$15.61	(\$0.53)	76.9%	\$0.61	\$5.06	2.3%
2039	2040/2041	\$3.02	\$11.63	26.0%	\$68.21	\$53.23	\$14.98	(\$0.62)	78.0%	\$0.61	\$5.13	2.2%
2040	2041/2042	\$2.81	\$11.93	23.6%	\$68.83	\$54.16	\$14.67	(\$0.31)	78.7%	\$0.61	\$5.19	2.5%
2041	2042/2043	\$2.40	\$12.24	19.6%	\$69.43	\$54.88	\$14.55	(\$0.13)	79.1%	\$0.61	\$5.25	3.0%
2042	2043/2044	\$2.23	\$12.56	17.8%	\$70.02	\$55.24	\$14.78	\$0.24	78.9%	\$0.61	\$5.30	3.6%
2043	2044/2045	\$2.30	\$12.90	17.8%	\$70.64	\$55.34	\$15.30	\$0.51	78.3%	\$0.61	\$5.35	4.2%
2044	2045/2046	\$2.36	\$13.26	17.8%	\$71.30	\$55.49	\$15.81	\$0.51	77.8%	\$0.62	\$5.38	4.3%

**Table 3**  
**Limited Funding Scenario Projection of Results**  
**(Dollars in Billions)**

Calendar Year	Fiscal Year	Employer Contrib.	Payroll	Employer Contrib. Rate	Actuarial Accrued Liability	Assets	Unfunded Actuarial Accrued Liability	Change in Unfunded Liability from Prior Year	Funded Ratio	Service Cost	Benefit Payments	Ratio of Net Cash Flow to Assets
2024	2025/2026	\$2.29	\$7.62	30.1%	\$57.08	\$40.11	\$16.97	-	70.3%	\$0.58	\$4.04	3.3%
2025	2026/2027	\$2.37	\$8.05	29.5%	\$58.22	\$40.90	\$17.33	\$0.35	70.2%	\$0.65	\$4.12	3.4%
2026	2027/2028	\$2.46	\$8.28	29.7%	\$59.03	\$40.89	\$18.15	\$0.82	69.3%	\$0.65	\$4.23	3.4%
2027	2028/2029	\$2.54	\$8.51	29.8%	\$59.82	\$42.28	\$17.54	(\$0.61)	70.7%	\$0.65	\$4.31	3.3%
2028	2029/2030	\$2.57	\$8.74	29.4%	\$60.59	\$43.23	\$17.37	(\$0.17)	71.3%	\$0.64	\$4.38	3.2%
2029	2030/2031	\$2.64	\$8.98	29.4%	\$61.34	\$43.88	\$17.47	\$0.10	71.5%	\$0.64	\$4.46	3.1%
2030	2031/2032	\$2.71	\$9.22	29.4%	\$62.08	\$44.55	\$17.53	\$0.07	71.8%	\$0.64	\$4.53	3.1%
2031	2032/2033	\$2.79	\$9.47	29.5%	\$62.79	\$45.25	\$17.54	\$0.01	72.1%	\$0.63	\$4.61	3.1%
2032	2033/2034	\$2.87	\$9.73	29.5%	\$63.50	\$45.98	\$17.51	(\$0.03)	72.4%	\$0.63	\$4.67	2.9%
2033	2034/2035	\$2.95	\$9.98	29.6%	\$64.20	\$46.78	\$17.42	(\$0.09)	72.9%	\$0.63	\$4.73	2.8%
2034	2035/2036	\$3.03	\$10.25	29.6%	\$64.90	\$47.64	\$17.25	(\$0.16)	73.4%	\$0.63	\$4.80	2.7%
2035	2036/2037	\$3.11	\$10.51	29.6%	\$65.58	\$48.57	\$17.01	(\$0.24)	74.1%	\$0.62	\$4.86	2.6%
2036	2037/2038	\$3.21	\$10.78	29.8%	\$66.26	\$49.58	\$16.68	(\$0.33)	74.8%	\$0.62	\$4.93	2.5%
2037	2038/2039	\$3.29	\$11.06	29.7%	\$66.92	\$50.68	\$16.24	(\$0.44)	75.7%	\$0.62	\$4.99	2.4%
2038	2039/2040	\$3.37	\$11.34	29.7%	\$67.57	\$51.86	\$15.70	(\$0.54)	76.8%	\$0.61	\$5.06	2.3%
2039	2040/2041	\$3.03	\$11.63	26.1%	\$68.21	\$53.14	\$15.07	(\$0.63)	77.9%	\$0.61	\$5.13	2.2%
2040	2041/2042	\$2.82	\$11.93	23.6%	\$68.83	\$54.07	\$14.76	(\$0.32)	78.6%	\$0.61	\$5.19	2.4%
2041	2042/2043	\$2.41	\$12.24	19.7%	\$69.43	\$54.80	\$14.63	(\$0.13)	78.9%	\$0.61	\$5.25	3.0%
2042	2043/2044	\$2.24	\$12.56	17.8%	\$70.02	\$55.16	\$14.86	\$0.23	78.8%	\$0.61	\$5.30	3.6%
2043	2044/2045	\$2.31	\$12.90	17.9%	\$70.64	\$55.27	\$15.37	\$0.51	78.2%	\$0.61	\$5.35	4.2%
2044	2045/2046	\$2.37	\$13.26	17.9%	\$71.30	\$55.43	\$15.87	\$0.51	77.7%	\$0.62	\$5.38	4.3%

## 4.3 Effect of Limited Employer Contributions Due to a Large Investment Loss

The Investment Risks Section includes a stress test to assess the effect of future investment performance assuming SERS employers continue to contribute the full Actuarially Determined Contribution (ADC). However, if there is a large investment loss during a single calendar year, there is an additional risk that SERS employers would be unable to adjust their budgets to meet the increases in the ADC without adversely impacting their ability to meet the critical needs of the Commonwealth.

The following scenarios provide the projected effects of a large investment loss assuming various employer contribution patterns:

**Baseline** – Investment returns are equal to the assumed investment return throughout the 20-year period. All employers contribute the ADC in each year of the 20-year period.

**Full Funding Scenario** – The investment return for Calendar Year 2025 is -20%. For the remainder of the 20-year period, the investment returns are equal to the assumed investment return rate. All employers contribute the ADC in each year of the 20-year period.

**Limited Funding Scenario** – The investment return for Calendar Year 2025 is -20%. For the remainder of the 20-year period, the investment returns are equal to the assumed investment return rate. After Fiscal Year 2025/2026, the annual rate of growth of employer contributions to the Defined Benefit Plan is limited to the 3.6% per year long-term projected rate of State revenue growth.

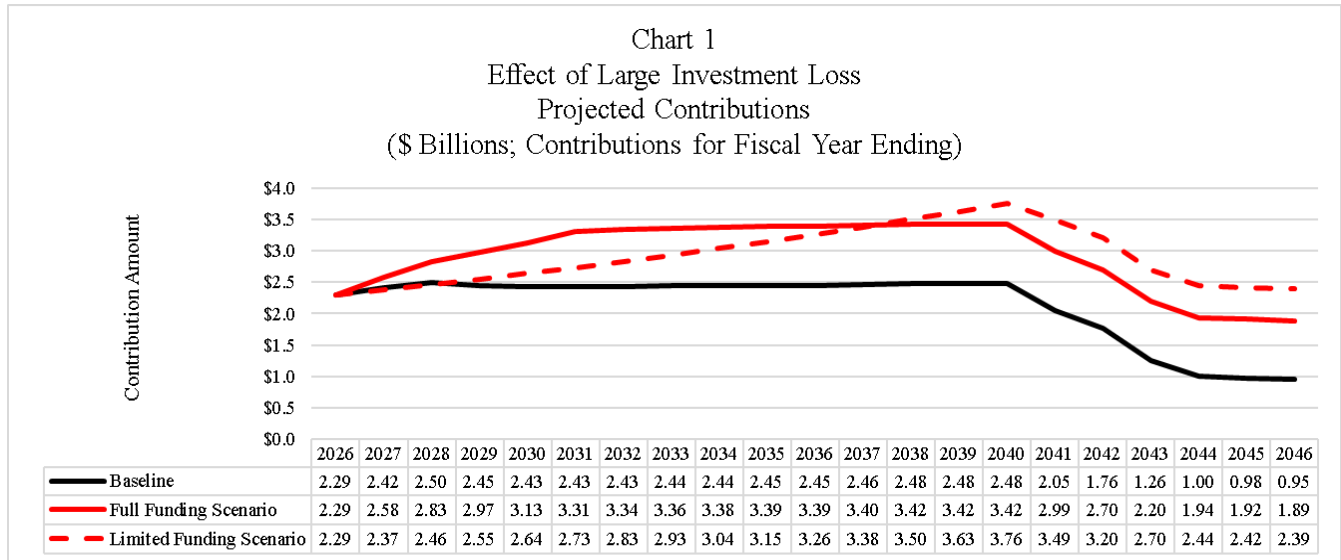
The investment return rates used by calendar year are provided in the following schedule:

Calendar Year	Baseline	Full Funding Scenario	Limited Funding Scenario
2025	6.875%	-20.00%	-20.00%
2026-2044	6.875%	6.875%	6.875%

The scenarios are based on the assumed investment return rate for Calendar Year 2025 of 6.875% and do not reflect any actual 2025 investment performance.

## Effect on the Actuarially Determined Contribution (ADC)

Chart 1 provides the projected contribution amounts by Fiscal Year for each scenario. The large loss is assumed to occur during Calendar Year 2025, would first be recognized in the December 31, 2025 actuarial valuation and would first be reflected as an increase to the ADC in Fiscal Year 2026/2027.

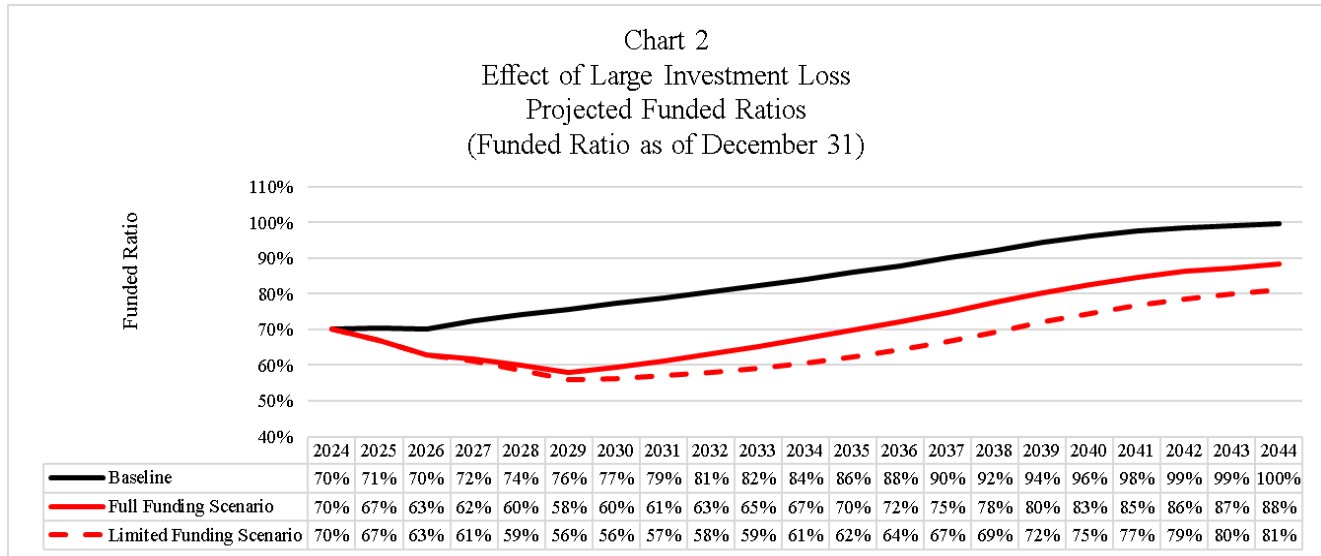


While SERS’ 5-year asset smoothing method, which causes the hypothetical -20% return experienced in Calendar Year 2025 to be recognized over a 5-year period, dampens the effect on the ADC, the large investment loss causes the December 31, 2025 market value of assets to be \$10.2 billion less as compared to the baseline. This shortfall will need to be funded through additional employer contributions. The ADC is adjusted for the shortfall and results in significantly higher contributions in the “Full Funding Scenario” compared to the baseline.

The “Limited Funding Scenario” would not generate sufficient increases in employer contributions to fund the ADC. Although contributions under the “Limited Funding Scenario” would gradually recover to the level under the “Full Funding Scenario” by Fiscal Year 2035/2036 and be higher through the remaining projection period, the lower contributions in the earlier years create a funding deficiency. The funding deficiency is shown by analyzing the effect on the funded ratio. Analysis of the effect on the funded ratio is provided in the following section. Detailed projections of the results are provided in Table 1 (Baseline), Table 2 (Full Funding Scenario), and Table 3 (Limited Funding Scenario), which follow the “Conclusions” section.

## Effect on Funded Ratio

Chart 2 provides the projected funded ratios by Calendar Year for each scenario. The loss is assumed to occur during Calendar Year 2025 and would first be recognized as a reduction to the funded ratio in the December 31, 2025 actuarial valuation.



Again, SERS' 5-year asset smoothing method, which causes the hypothetical -20% return experienced in Calendar Year 2025 to be recognized over a 5-year period, dampens the effect on the funded ratio. The hypothetical large investment loss causes the December 31, 2029 funded ratio to decrease to 56%, substantially lower than the baseline December 31, 2029 funded ratio of 76% and the December 31, 2024 funded ratio of 70% before the investment loss occurred.

The Actuarially Determined Contribution (ADC) is adjusted to reflect the large investment loss and is contributed in the "Full Funding Scenario". These increased contributions cause the funded ratio to increase much more rapidly compared to the "Limited Funding Scenario" funded ratio. Although the December 31, 2044 funded ratio of 88% under the "Full Funding Scenario" is below the baseline funded ratio of 100%, it is higher than the "Limited Funding Scenario" funded ratio of 81%. The funding deficiency under the "Limited Funding Scenario" causes the projected unfunded liability as of December 31, 2044 to be \$5.11 billion higher than the unfunded liability under the "Full Funding Scenario". The ADC is designed to reflect investment performance and fully fund member benefits. Limited funding can substantially increase the future contributions needed to fund member benefits. Detailed projections of the results are provided in Table 1 (Baseline), Table 2 (Full Funding Scenario), and Table 3 (Limited Funding Scenario), which follow the "Conclusions" section.

## Conclusions

A large investment loss in a given year will have a substantial impact on the employer contributions needed to fund benefits, the unfunded liability and the funded ratio. Our analyses of these scenarios have shown:

1. Although the Actuarially Determined Contribution (ADC) is designed to provide relatively predictable and stable contribution patterns, adjustments are required to reflect actual investment performance and to ensure member benefits are fully funded. When the ADC is not fully contributed, even though contribution levels are stable, as they are under the “Limited Funding Scenario”, there is a funding deficiency that can substantially increase the future contributions needed to fund member benefits.
2. Each dollar of shortfall between the amount contributed and the ADC immediately increases the unfunded liability and reduces the funded ratio. By December 31, 2044, reduced contributions under the “Limited Funding Scenario” would increase the total unfunded liability by \$5.11 billion compared to the “Full Funding Scenario”.
3. A large investment loss could substantially reduce the funded ratio. In this scenario, the hypothetical -20% return in Calendar Year 2025 would cause the funded ratio to be as low as 56% in 2029. The calculation of the ADC reflects investment performance and would increase substantially to fund the investment shortfall. If the ADC is contributed each year, the funded ratio would be expected to exceed 70%, the December 31, 2024 funded ratio just prior to the large investment loss, by December 31, 2039.

**Table 1**  
**Baseline Projection of Results**  
**(Dollars in Billions)**

Calendar Year	Fiscal Year	Employer Contrib.	Payroll	Employer Contrib. Rate	Actuarial Accrued Liability	Assets	Unfunded Actuarial Accrued Liability	Change in Unfunded Liability from Prior Year	Funded Ratio	Service Cost	Benefit Payments	Ratio of Net Cash Flow to Assets
2024	2025/2026	\$2.29	\$7.62	30.1%	\$57.08	\$40.11	\$16.97	-	70.3%	\$0.58	\$4.04	3.3%
2025	2026/2027	\$2.42	\$8.05	30.1%	\$58.22	\$41.05	\$17.17	\$0.20	70.5%	\$0.65	\$4.12	3.4%
2026	2027/2028	\$2.50	\$8.28	30.2%	\$59.03	\$41.38	\$17.65	\$0.48	70.1%	\$0.65	\$4.23	3.3%
2027	2028/2029	\$2.45	\$8.51	28.8%	\$59.82	\$43.33	\$16.49	(\$1.16)	72.4%	\$0.65	\$4.31	3.1%
2028	2029/2030	\$2.43	\$8.74	27.8%	\$60.59	\$44.97	\$15.62	(\$0.87)	74.2%	\$0.64	\$4.38	3.1%
2029	2030/2031	\$2.43	\$8.98	27.1%	\$61.34	\$46.44	\$14.90	(\$0.72)	75.7%	\$0.64	\$4.46	3.2%
2030	2031/2032	\$2.43	\$9.22	26.4%	\$62.08	\$47.96	\$14.12	(\$0.78)	77.3%	\$0.64	\$4.53	3.3%
2031	2032/2033	\$2.44	\$9.47	25.8%	\$62.79	\$49.53	\$13.27	(\$0.85)	78.9%	\$0.63	\$4.61	3.3%
2032	2033/2034	\$2.44	\$9.73	25.1%	\$63.50	\$51.14	\$12.36	(\$0.91)	80.5%	\$0.63	\$4.67	3.3%
2033	2034/2035	\$2.45	\$9.98	24.5%	\$64.20	\$52.81	\$11.39	(\$0.97)	82.3%	\$0.63	\$4.73	3.2%
2034	2035/2036	\$2.45	\$10.25	23.9%	\$64.90	\$54.55	\$10.35	(\$1.04)	84.1%	\$0.63	\$4.80	3.2%
2035	2036/2037	\$2.46	\$10.51	23.4%	\$65.58	\$56.36	\$9.23	(\$1.12)	85.9%	\$0.62	\$4.86	3.2%
2036	2037/2038	\$2.48	\$10.78	23.0%	\$66.26	\$58.24	\$8.02	(\$1.21)	87.9%	\$0.62	\$4.93	3.2%
2037	2038/2039	\$2.48	\$11.06	22.4%	\$66.92	\$60.22	\$6.70	(\$1.32)	90.0%	\$0.62	\$4.99	3.1%
2038	2039/2040	\$2.48	\$11.34	21.9%	\$67.57	\$62.28	\$5.29	(\$1.41)	92.2%	\$0.61	\$5.06	3.1%
2039	2040/2041	\$2.05	\$11.63	17.6%	\$68.21	\$64.43	\$3.78	(\$1.51)	94.5%	\$0.61	\$5.13	3.1%
2040	2041/2042	\$1.76	\$11.93	14.8%	\$68.83	\$66.24	\$2.59	(\$1.19)	96.2%	\$0.61	\$5.19	3.4%
2041	2042/2043	\$1.26	\$12.24	10.3%	\$69.43	\$67.84	\$1.59	(\$1.01)	97.7%	\$0.61	\$5.25	3.9%
2042	2043/2044	\$1.00	\$12.56	8.0%	\$70.02	\$69.07	\$0.95	(\$0.64)	98.6%	\$0.61	\$5.30	4.5%
2043	2044/2045	\$0.98	\$12.90	7.6%	\$70.64	\$70.04	\$0.60	(\$0.35)	99.1%	\$0.61	\$5.35	5.0%
2044	2045/2046	\$0.95	\$13.26	7.2%	\$71.30	\$71.03	\$0.27	(\$0.33)	99.6%	\$0.62	\$5.38	5.1%

**Table 2**  
**Full Funding Scenario Projection of Results**  
**(Dollars in Billions)**

Calendar Year	Fiscal Year	Employer Contrib.	Payroll	Employer Contrib. Rate	Actuarial Accrued Liability	Assets	Unfunded Actuarial Accrued Liability	Change in Unfunded Liability from Prior Year	Funded Ratio	Service Cost	Benefit Payments	Ratio of Net Cash Flow to Assets
2024	2025/2026	\$2.29	\$7.62	30.1%	\$57.08	\$40.11	\$16.97	-	70.3%	\$0.58	\$4.04	3.3%
2025	2026/2027	\$2.58	\$8.05	32.0%	\$58.22	\$39.01	\$19.21	\$2.24	67.0%	\$0.65	\$4.12	3.5%
2026	2027/2028	\$2.83	\$8.28	34.2%	\$59.03	\$37.21	\$21.82	\$2.61	63.0%	\$0.65	\$4.23	3.5%
2027	2028/2029	\$2.97	\$8.51	34.9%	\$59.82	\$36.96	\$22.86	\$1.03	61.8%	\$0.65	\$4.31	3.0%
2028	2029/2030	\$3.13	\$8.74	35.8%	\$60.59	\$36.37	\$24.22	\$1.37	60.0%	\$0.64	\$4.38	2.6%
2029	2030/2031	\$3.31	\$8.98	36.9%	\$61.34	\$35.60	\$25.74	\$1.52	58.0%	\$0.64	\$4.46	2.5%
2030	2031/2032	\$3.34	\$9.22	36.2%	\$62.08	\$36.94	\$25.14	(\$0.60)	59.5%	\$0.64	\$4.53	2.1%
2031	2032/2033	\$3.36	\$9.47	35.5%	\$62.79	\$38.45	\$24.34	(\$0.80)	61.2%	\$0.63	\$4.61	1.9%
2032	2033/2034	\$3.38	\$9.73	34.7%	\$63.50	\$40.10	\$23.39	(\$0.95)	63.2%	\$0.63	\$4.67	1.9%
2033	2034/2035	\$3.39	\$9.98	34.0%	\$64.20	\$41.90	\$22.31	(\$1.09)	65.3%	\$0.63	\$4.73	1.9%
2034	2035/2036	\$3.39	\$10.25	33.1%	\$64.90	\$43.81	\$21.09	(\$1.21)	67.5%	\$0.63	\$4.80	1.9%
2035	2036/2037	\$3.40	\$10.51	32.4%	\$65.58	\$45.81	\$19.78	(\$1.31)	69.8%	\$0.62	\$4.86	1.9%
2036	2037/2038	\$3.42	\$10.78	31.7%	\$66.26	\$47.90	\$18.36	(\$1.42)	72.3%	\$0.62	\$4.93	1.9%
2037	2038/2039	\$3.42	\$11.06	30.9%	\$66.92	\$50.10	\$16.81	(\$1.55)	74.9%	\$0.62	\$4.99	1.9%
2038	2039/2040	\$3.42	\$11.34	30.2%	\$67.57	\$52.41	\$15.16	(\$1.66)	77.6%	\$0.61	\$5.06	1.9%
2039	2040/2041	\$2.99	\$11.63	25.7%	\$68.21	\$54.82	\$13.39	(\$1.77)	80.4%	\$0.61	\$5.13	1.9%
2040	2041/2042	\$2.70	\$11.93	22.6%	\$68.83	\$56.92	\$11.92	(\$1.47)	82.7%	\$0.61	\$5.19	2.3%
2041	2042/2043	\$2.20	\$12.24	18.0%	\$69.43	\$58.82	\$10.61	(\$1.31)	84.7%	\$0.61	\$5.25	2.9%
2042	2043/2044	\$1.94	\$12.56	15.4%	\$70.02	\$60.37	\$9.65	(\$0.96)	86.2%	\$0.61	\$5.30	3.6%
2043	2044/2045	\$1.92	\$12.90	14.9%	\$70.64	\$61.67	\$8.96	(\$0.69)	87.3%	\$0.61	\$5.35	4.2%
2044	2045/2046	\$1.89	\$13.26	14.3%	\$71.30	\$63.03	\$8.26	(\$0.70)	88.4%	\$0.62	\$5.38	4.3%

**Table 3**  
**Limited Funding Scenario Projection of Results**  
**(Dollars in Billions)**

Calendar Year	Fiscal Year	Employer Contrib.	Payroll	Employer Contrib. Rate	Actuarial Accrued Liability	Assets	Unfunded Actuarial Accrued Liability	Change in Unfunded Liability from Prior Year	Funded Ratio	Service Cost	Benefit Payments	Ratio of Net Cash Flow to Assets
2024	2025/2026	\$2.29	\$7.62	30.1%	\$57.08	\$40.11	\$16.97	-	70.3%	\$0.58	\$4.04	3.3%
2025	2026/2027	\$2.37	\$8.05	29.5%	\$58.22	\$39.01	\$19.21	\$2.24	67.0%	\$0.65	\$4.12	3.5%
2026	2027/2028	\$2.46	\$8.28	29.7%	\$59.03	\$37.10	\$21.93	\$2.72	62.9%	\$0.65	\$4.23	3.8%
2027	2028/2029	\$2.55	\$8.51	29.9%	\$59.82	\$36.55	\$23.27	\$1.34	61.1%	\$0.65	\$4.31	3.8%
2028	2029/2030	\$2.64	\$8.74	30.2%	\$60.59	\$35.53	\$25.07	\$1.80	58.6%	\$0.64	\$4.38	3.8%
2029	2030/2031	\$2.73	\$8.98	30.4%	\$61.34	\$34.25	\$27.10	\$2.03	55.8%	\$0.64	\$4.46	3.9%
2030	2031/2032	\$2.83	\$9.22	30.7%	\$62.08	\$34.96	\$27.12	\$0.03	56.3%	\$0.64	\$4.53	3.7%
2031	2032/2033	\$2.93	\$9.47	31.0%	\$62.79	\$35.78	\$27.01	(\$0.12)	57.0%	\$0.63	\$4.61	3.6%
2032	2033/2034	\$3.04	\$9.73	31.2%	\$63.50	\$36.79	\$26.70	(\$0.30)	57.9%	\$0.63	\$4.67	3.3%
2033	2034/2035	\$3.15	\$9.98	31.5%	\$64.20	\$37.99	\$26.21	(\$0.49)	59.2%	\$0.63	\$4.73	3.1%
2034	2035/2036	\$3.26	\$10.25	31.8%	\$64.90	\$39.37	\$25.53	(\$0.69)	60.7%	\$0.63	\$4.80	2.8%
2035	2036/2037	\$3.38	\$10.51	32.2%	\$65.58	\$40.92	\$24.66	(\$0.86)	62.4%	\$0.62	\$4.86	2.6%
2036	2037/2038	\$3.50	\$10.78	32.5%	\$66.26	\$42.66	\$23.60	(\$1.06)	64.4%	\$0.62	\$4.93	2.3%
2037	2038/2039	\$3.63	\$11.06	32.8%	\$66.92	\$44.60	\$22.32	(\$1.28)	66.6%	\$0.62	\$4.99	2.1%
2038	2039/2040	\$3.76	\$11.34	33.1%	\$67.57	\$46.75	\$20.82	(\$1.50)	69.2%	\$0.61	\$5.06	1.8%
2039	2040/2041	\$3.49	\$11.63	30.0%	\$68.21	\$49.12	\$19.09	(\$1.74)	72.0%	\$0.61	\$5.13	1.6%
2040	2041/2042	\$3.20	\$11.93	26.8%	\$68.83	\$51.29	\$17.54	(\$1.55)	74.5%	\$0.61	\$5.19	1.7%
2041	2042/2043	\$2.70	\$12.24	22.1%	\$69.43	\$53.31	\$16.12	(\$1.42)	76.8%	\$0.61	\$5.25	2.3%
2042	2043/2044	\$2.44	\$12.56	19.4%	\$70.02	\$54.99	\$15.03	(\$1.08)	78.5%	\$0.61	\$5.30	3.0%
2043	2044/2045	\$2.42	\$12.90	18.8%	\$70.64	\$56.43	\$14.21	(\$0.82)	79.9%	\$0.61	\$5.35	3.7%
2044	2045/2046	\$2.39	\$13.26	18.0%	\$71.30	\$57.93	\$13.37	(\$0.84)	81.3%	\$0.62	\$5.38	3.8%

## 4.4 Effect of Funding in Excess of the Actuarially Determined Contribution

It is the SERS funding policy to fully fund the Actuarially Determined Contribution (ADC), the annual employer contribution calculated by the actuary based on a defined actuarial cost method, asset valuation method and amortization method. Developing an ADC each year serves two primary purposes:

1. Ensures assets are accumulated to pay all benefits when due to members
2. Provides a relatively predictable and stable pattern of contributions to assist with budgeting

If, in any year, SERS employers fund amounts in excess of the ADC, the excess contribution amount is treated as an actuarial experience gain. Although the excess contribution amount is immediately recognized in the SERS assets, the gain is combined with all other sources of actuarial gains and losses that occurred in that same period, and the net amount is amortized over 30 years.

Contributing amounts in excess of the ADC results in numerous advantages, including:

- Immediate dollar-for-dollar increase in the SERS market assets, and therefore a reduction in the unfunded actuarial accrued liability;
- Decrease in future ADC amounts, thus providing some degree of relief for future budgets; and
- Immediate increase in future funded ratios.

Although funding in excess of the ADC is not generally expected, the following scenarios provide the projected effects of temporarily funding in excess of the ADC:

**Baseline** – All employers contribute the ADC in each year of the 20-year period.

**Scenario +\$500m** – Employers collectively contribute \$500 million in excess of the ADC in the first year of the projection, then contribute the ADC for the remainder of the period. The contributions made are summarized in the following schedule:

Fiscal Year	Amount Contributed
2025/2026	ADC + \$500 million
2026/2027 through 2045/2046	ADC

**Scenario +\$1b** – Employers collectively contribute \$1 billion in excess of the ADC in the first year of the projection, then contribute the ADC for the remainder of the period. The contributions made are summarized in the following schedule:

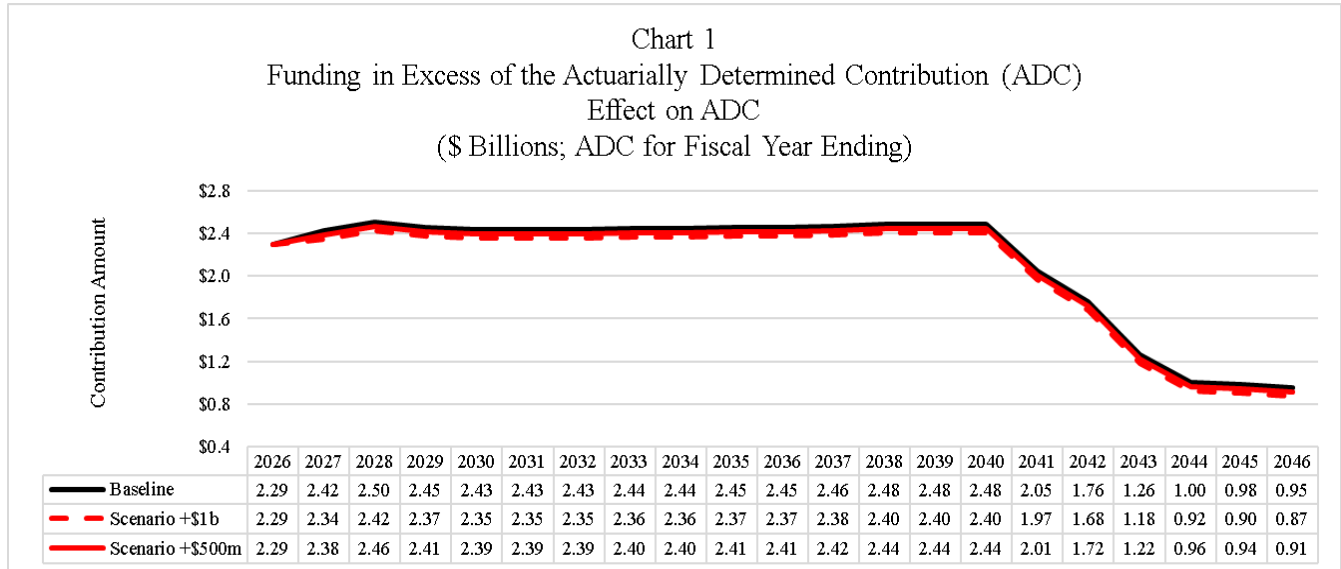
Fiscal Year	Amount Contributed
2025/2026	ADC + \$1 billion
2026/2027 through 2045/2046	ADC

Both scenarios reflect one year of contributions in excess of the ADC followed by 19 years of contributions equal to the ADC.



## Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to contributing amounts in excess of the ADC. The additional funding during Fiscal Year 2025/2026 in this scenario increases SERS assets and decreases the SERS unfunded actuarial liabilities relative to the baseline. These lower unfunded liabilities cause the scenarios to decrease relative to the baseline.



The accumulated effect of the extra funding for Fiscal Year 2025/2026 of \$500 million results in an increase of about 1.3% in SERS assets and results in a decrease in the Fiscal Year 2026/2027 ADC by about \$40 million (or about 0.5%), from \$2.42 billion under the baseline to \$2.38 billion under the Scenario +\$500 million. The decreased ADC continues throughout the projection period.

The accumulated effect of the extra funding for Fiscal Year 2025/2026 of \$1 billion results in an increase of about 2.5% in SERS assets and results in a decrease in the Fiscal Year 2026/2027 ADC by about \$80 million (or about 1.0%), from \$2.42 billion under the baseline to \$2.34 billion under the Scenario +\$1 billion. The decreased ADC continues throughout the projection period.

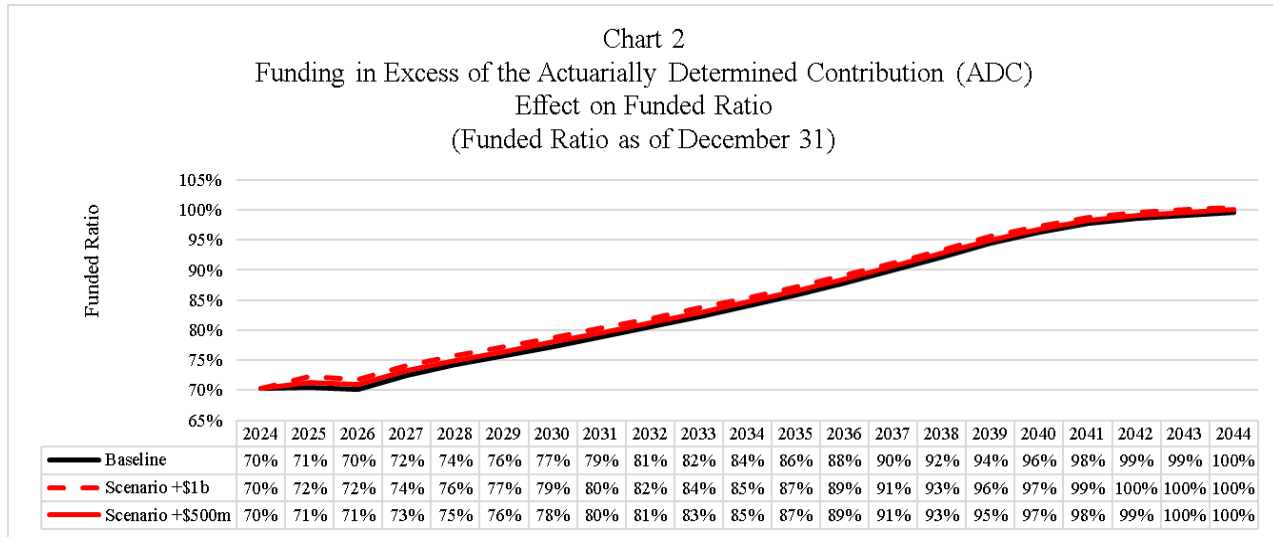
The extra funding also reduces the future burden for employers since the scenarios represent a smaller percentage of member funding payroll in future periods. Table 1 provides the effect of the extra funding on the future contribution rates (ADC Rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			Scenario +\$500 million			Scenario +\$1 billion		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)	ADC (8)	Payroll (9)	ADC Rate (10)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.38	\$8.05	29.6%	\$2.34	\$8.05	29.1%
2028	\$2.50	\$8.28	30.2%	\$2.46	\$8.28	29.7%	\$2.42	\$8.28	29.2%
2029	\$2.45	\$8.51	28.8%	\$2.41	\$8.51	28.3%	\$2.37	\$8.51	27.8%
2030	\$2.43	\$8.74	27.8%	\$2.39	\$8.74	27.3%	\$2.35	\$8.74	26.9%
2031	\$2.43	\$8.98	27.1%	\$2.39	\$8.98	26.6%	\$2.35	\$8.98	26.2%
2032	\$2.43	\$9.22	26.4%	\$2.39	\$9.22	25.9%	\$2.35	\$9.22	25.5%
2033	\$2.44	\$9.47	25.8%	\$2.40	\$9.47	25.3%	\$2.36	\$9.47	24.9%
2034	\$2.44	\$9.73	25.1%	\$2.40	\$9.73	24.7%	\$2.36	\$9.73	24.3%
2035	\$2.45	\$9.98	24.5%	\$2.41	\$9.98	24.1%	\$2.37	\$9.98	23.7%
2036	\$2.45	\$10.25	23.9%	\$2.41	\$10.25	23.5%	\$2.37	\$10.25	23.1%
2037	\$2.46	\$10.51	23.4%	\$2.42	\$10.51	23.0%	\$2.38	\$10.51	22.6%
2038	\$2.48	\$10.78	23.0%	\$2.44	\$10.78	22.6%	\$2.40	\$10.78	22.3%
2039	\$2.48	\$11.06	22.4%	\$2.44	\$11.06	22.1%	\$2.40	\$11.06	21.7%
2040	\$2.48	\$11.34	21.9%	\$2.44	\$11.34	21.5%	\$2.40	\$11.34	21.2%
2041	\$2.05	\$11.63	17.6%	\$2.01	\$11.63	17.3%	\$1.97	\$11.63	16.9%
2042	\$1.76	\$11.93	14.8%	\$1.72	\$11.93	14.4%	\$1.68	\$11.93	14.1%
2043	\$1.26	\$12.24	10.3%	\$1.22	\$12.24	10.0%	\$1.18	\$12.24	9.6%
2044	\$1.00	\$12.56	8.0%	\$0.96	\$12.56	7.6%	\$0.92	\$12.56	7.3%
2045	\$0.98	\$12.90	7.6%	\$0.94	\$12.90	7.3%	\$0.90	\$12.90	7.0%
2046	\$0.95	\$13.26	7.2%	\$0.91	\$13.26	6.9%	\$0.87	\$13.26	6.6%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of the funded ratio to funding in excess of the ADC. The extra funding for Fiscal Year 2025/2026 in the scenario increases the SERS assets relative to the baseline. These larger asset values cause the scenarios Funded Ratio to increase relative to the baseline funded ratio.



The extra funding for Fiscal Year 2025/2026 in the scenarios causes the December 31, 2025 funded ratio to maintain at 71% in the Scenario +\$500 million and increase to 72% in the Scenario +\$1 billion, compared to the baseline December 31, 2025 funded ratio of 71%. Both scenarios increased the funded ratio above the December 31, 2024 funded ratio of 70% before the extra funding began.

The effect on the funded ratio continues until the extra funding is fully amortized over the 30-year period. The December 31, 2044 funded ratio reflecting the Scenario +\$500 million is 100% and the Scenario +\$1 billion is 100%, both matching the baseline December 31, 2044 funded ratio of 100%. The Scenarios Funded Ratios will not return to the baseline value until December 31, 2057, when the amortization credit for the extra funding is fully amortized.

## Conclusions

Even temporary periods of contributing amounts in excess of the ADC can have favorable effects on both the future contribution burden and the funded ratio. This hypothetical scenario of extra contributions has shown:

1. The \$500 million of extra contributions decreased future annual employer contributions by as much as \$40 million (or 0.5% of payroll) in a single year and decreased the total future contributions by about \$1.2 billion.
2. The \$1 billion of extra contributions decreased future annual employer contributions by as much as \$80 million (or 1.0% of payroll) in a single year and decreased the total future contributions by about \$2.4 billion.

3. Each dollar of excess between the amount contributed and the baseline ADC immediately decreases the unfunded liability and increases the funded ratio. The funded ratio is expected to steadily increase in the baseline scenario from 77% in 2030 to 100% in 2044. In the extra funding scenarios, the funded ratio is generally expected to exceed the baseline funded ratio by 1-2% throughout the period from December 31, 2025 through December 31, 2044.
4. The ADC is designed to provide relatively predictable and stable contribution patterns. When actual contributions exceed the ADC, the resulting decrease in future ADC amounts provides a degree of relief to employers in meeting future budgets.

A noteworthy example of SERS employers contributing in excess of the ADC comes from one of the provisions of Act 2017-5, the recent Pennsylvania pension reform legislation. Act 2017-5 (Act 5) included a “plow-back” financing feature whereby, in order to accelerate the funding of SERS, in any future year in which there was projected to be savings as a result of this legislation, additional employer contributions equal to the amount of that annual savings would be assessed as a percentage of all covered compensation. By “plowing back” into the SERS fund many years of projected savings, rather than using that savings to meet non-pension obligations, the funding of SERS is enhanced, in the form of an accelerated decline in the SERS unfunded actuarial accrued liability and an accelerated increase in the SERS funded ratio. Therefore, out of a period of 23 fiscal years following the enactment of Act 5 (through Fiscal Year 2041/2042), additional employer contribution amounts (ranging from as low as 0.10% to as high as 0.93% of covered payroll) are now mandated under law for 13 of those fiscal years.

## 4.5 Effect of Granting a Cost-of-Living Adjustment (COLA)

Periodically, legislation is introduced to grant a COLA to current retirees which would cause an increase in the ADC and a decrease to the funded ratio if granted. The uncertainty of when a COLA will be granted, how large it may be, and how many members may be impacted could cause various levels of budgetary strain.

The following scenarios provide the projected effects under various COLA structures:

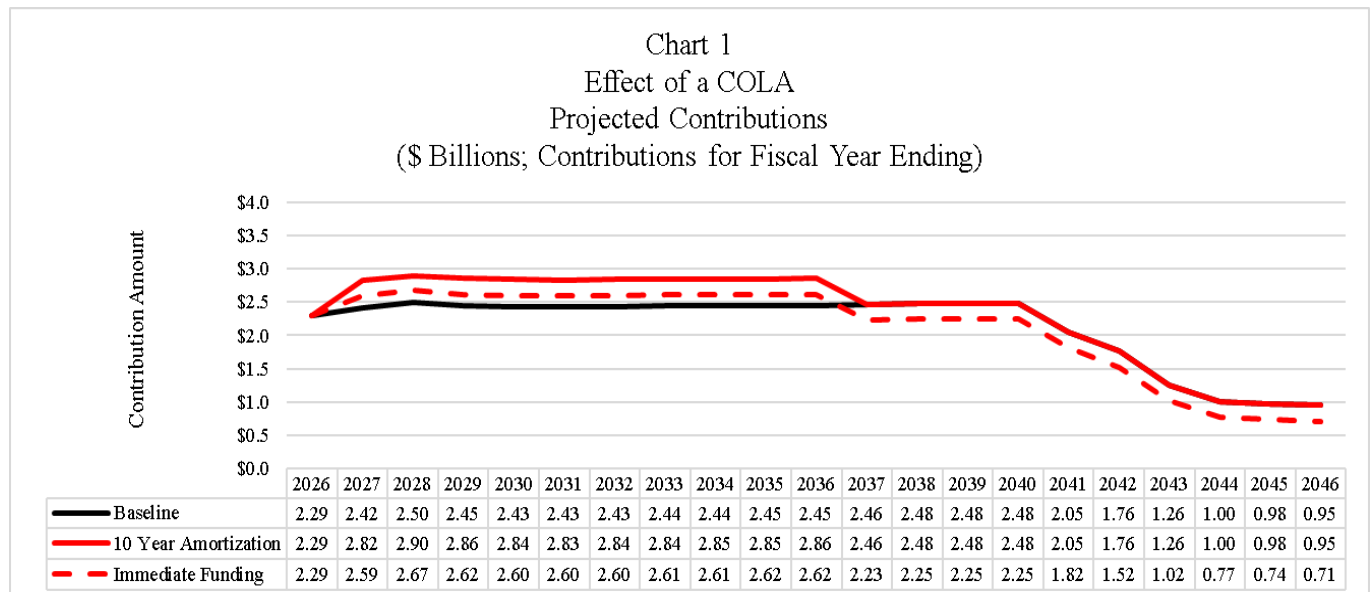
**Baseline** – No COLA granted during the 20-year period.

**Scenario 10-Year Amortization** – An 8.33% increase in benefits (equivalent of a 13<sup>th</sup> check each year) is granted to all current retirees and disabled members. The increase in liability is amortized over a 10-year period.

**Scenario Immediate Funding** – An 8.33% increase in benefits (equivalent of a 13<sup>th</sup> check each year) is granted to all current retirees and disabled members. The increase in liability is amortized over a 10-year period. The assets used to immediately fund the increase in liability are amortized over 30 years.

### Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to the COLA under the two funding scenarios. The funding of the COLA during Fiscal Year 2025/2026 through Fiscal Year 2035/2036 in this scenario increases the SERS unfunded liability relative to the baseline. This higher unfunded liability causes the ADC to increase relative to the baseline. If the full COLA is funded immediately, there is no immediate impact to the SERS unfunded liability relative to the baseline but, since the COLA liability is amortized over 10 years and the additional assets over 30 years, the ADC increases slightly and then later decreases below the baseline after the initial 10-year period.



The 10-Year Amortization scenario increases the ADC for 10 years compared to the baseline projection. The result is an expected Fiscal Year 2035/2036 ADC of \$2.86 billion, about \$410 million (or 4.0% of payroll) higher than the baseline ADC. Accumulated over 10 years, the additional ADC is approximately \$4.05 billion to fund the COLA. After the initial 10-year period, the COLA is paid off and the ADC reverts toward the baseline scenario. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

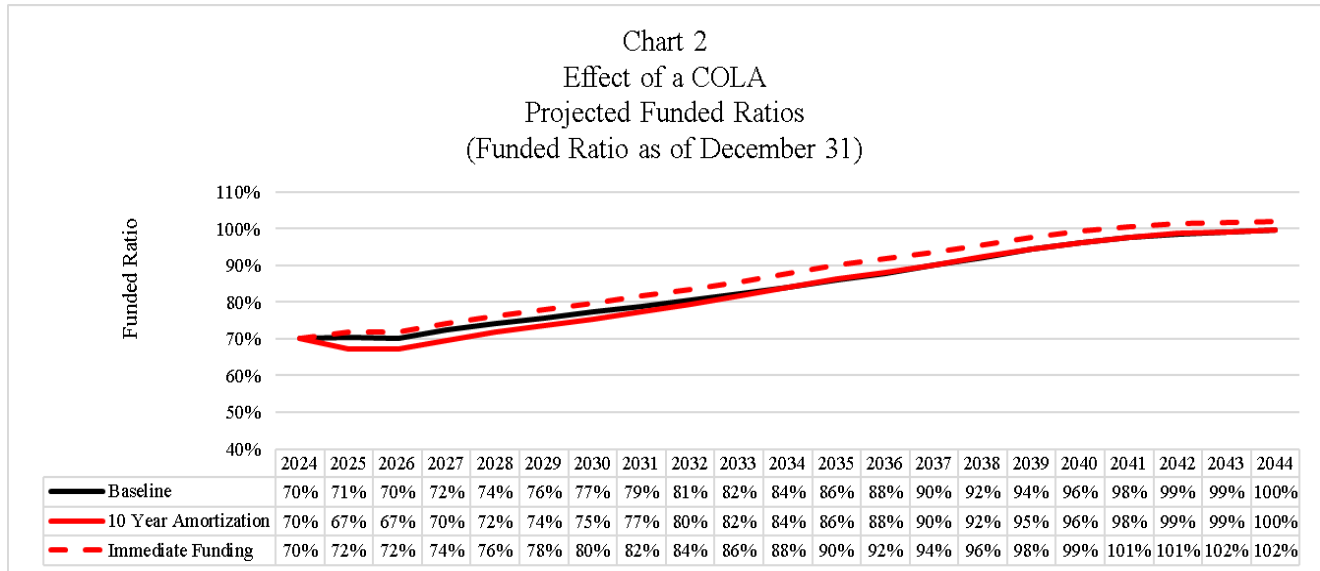
The Immediate Funding scenario creates a small increase in the ADC for the first 10 years as the liability from the COLA is amortized over 10 years, but the additional assets are amortized over 30 years. The additional assets continue to reduce the ADC below the baseline for the next 20 years. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			8.33% COLA – 10-Year Amortization			8.33% COLA – Immediate Funding		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (5)	Payroll (6)	ADC Rate (7)	ADC (8)	Payroll (9)	ADC Rate (10)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.82	\$8.05	35.0%	\$2.59	\$8.05	32.2%
2028	\$2.50	\$8.28	30.2%	\$2.90	\$8.28	35.0%	\$2.67	\$8.28	32.2%
2029	\$2.45	\$8.51	28.8%	\$2.86	\$8.51	33.6%	\$2.62	\$8.51	30.8%
2030	\$2.43	\$8.74	27.8%	\$2.84	\$8.74	32.5%	\$2.60	\$8.74	29.7%
2031	\$2.43	\$8.98	27.1%	\$2.83	\$8.98	31.5%	\$2.60	\$8.98	29.0%
2032	\$2.43	\$9.22	26.4%	\$2.84	\$9.22	30.8%	\$2.60	\$9.22	28.2%
2033	\$2.44	\$9.47	25.8%	\$2.84	\$9.47	30.0%	\$2.61	\$9.47	27.6%
2034	\$2.44	\$9.73	25.1%	\$2.85	\$9.73	29.3%	\$2.61	\$9.73	26.8%
2035	\$2.45	\$9.98	24.5%	\$2.85	\$9.98	28.6%	\$2.62	\$9.98	26.3%
2036	\$2.45	\$10.25	23.9%	\$2.86	\$10.25	27.9%	\$2.62	\$10.25	25.6%
2037	\$2.46	\$10.51	23.4%	\$2.46	\$10.51	23.4%	\$2.23	\$10.51	21.2%
2038	\$2.48	\$10.78	23.0%	\$2.48	\$10.78	23.0%	\$2.25	\$10.78	20.9%
2039	\$2.48	\$11.06	22.4%	\$2.48	\$11.06	22.4%	\$2.25	\$11.06	20.3%
2040	\$2.48	\$11.34	21.9%	\$2.48	\$11.34	21.9%	\$2.25	\$11.34	19.8%
2041	\$2.05	\$11.63	17.6%	\$2.05	\$11.63	17.6%	\$1.82	\$11.63	15.6%
2042	\$1.76	\$11.93	14.8%	\$1.76	\$11.93	14.8%	\$1.52	\$11.93	12.7%
2043	\$1.26	\$12.24	10.3%	\$1.26	\$12.24	10.3%	\$1.02	\$12.24	8.3%
2044	\$1.00	\$12.56	8.0%	\$1.00	\$12.56	8.0%	\$0.77	\$12.56	6.1%
2045	\$0.98	\$12.90	7.6%	\$0.98	\$12.90	7.6%	\$0.74	\$12.90	5.7%
2046	\$0.95	\$13.26	7.2%	\$0.95	\$13.26	7.2%	\$0.71	\$13.26	5.4%

## Effect on Funded Ratio

Chart 2 provides the sensitivity on the funded ratio of granting a COLA under the two funding scenarios. The 10-Year Amortization scenario reduces the funded ratio relative to the baseline. The Immediate Funding scenario slightly increases the funded ratio relative to the baseline.



Although the 10-Year Amortization scenario reduces the funded ratio, the effect is not significant and reverts to the baseline scenario. The Immediate Funding scenario slightly increases the funded ratio and remains higher than the baseline scenario until the 30-year amortization of the assets is completed.

## Conclusions

Granting a COLA is a benefit enhancement that would require increased funding and create additional risk. Depending on the funding period:

1. A \$2.8 billion liability increase due to a COLA would increase future contributions by a total of \$4.05 billion and increase the future employer contribution rate by as much as 4.9% of payroll if funded over 10 years.
2. If the same \$2.8 billion COLA liability increase is funded immediately, future ADCs avoid \$1.86 billion of the increases due to deferring contributions toward the COLA over a 20-year period.
3. After the COLA is fully paid for under the 10-Year Amortization scenario, the funded ratio and ADC reverts to the baseline scenario. This reversion takes 30 years under the Immediate Funding scenario.

## 4.6 Effect of Providing an Early Retirement Incentive (ERI)

Periodically, legislation is introduced to provide an ERI to current employees. This additional risk would cause a minimal increase in the ADC and a negligible decrease to the funded ratio if provided for a very short window with limited employees taking advantage of the incentive. The uncertainty of when an ERI will be provided, how long the ERI window will be open, how large the incentive will be, and how many employees take advantage of the incentive could cause various levels of budgetary strain.

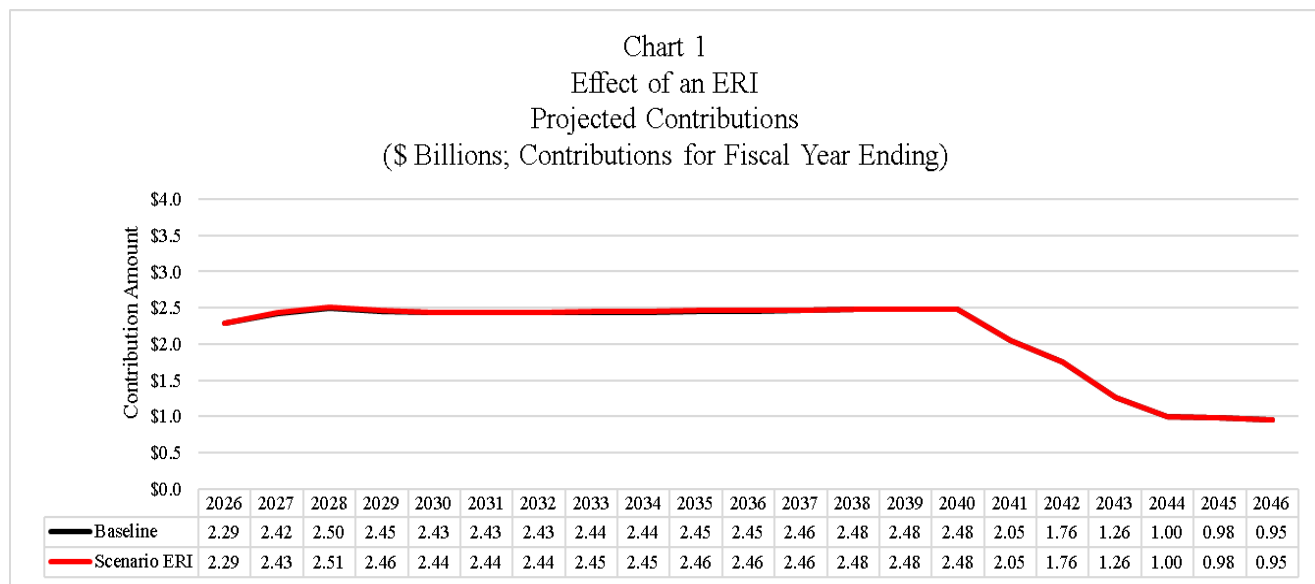
The following scenario provides the projected effect if an ERI is provided:

**Baseline** – No ERI Provided during the 20-year period.

**Scenario ERI** – A “30 and out” ERI is provided during calendar year 2026 which eliminates the early retirement factor reduction applied to benefits for any employee with 30 or more years of service. The impact is amortized over a 10-year period.

### Effect on Actuarially Determined Contribution (ADC)

Chart 1 provides the sensitivity of the Actuarially Determined Contribution (ADC) to the ERI. The funding of the ERI during Fiscal Year 2026/2027 through Fiscal Year 2035/2036 in this scenario increases the SERS unfunded liability relative to the baseline. This higher unfunded liability causes the ADC to increase relative to the baseline.



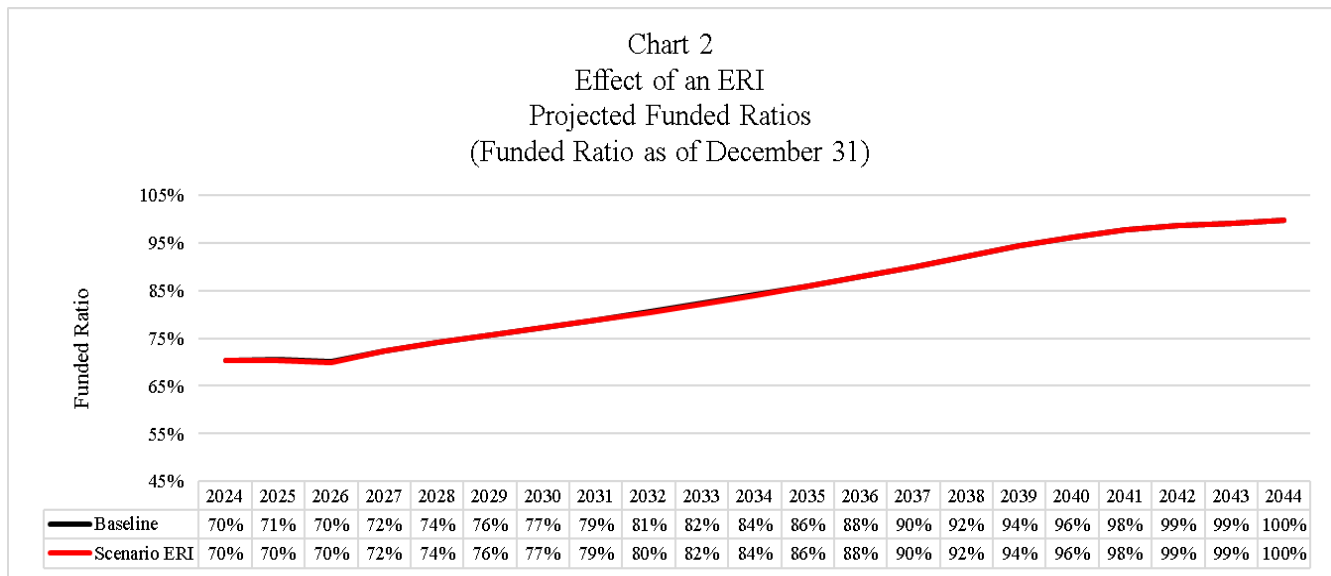
The scenario marginally increases the ADC for 10 years compared to the baseline projection. The result is an expected Fiscal Year 2036/2037 ADC of \$2.46 billion, which is the same as the baseline ADC. Accumulated over 10 years, the additional ADC is approximately \$100 million to fund the ERI. After the initial 10-year period, the ERI is paid off and the ADC reverts toward the baseline scenario. Table 1 provides the projected ADC, payroll, and contribution rates (ADC rate) as a percentage of payroll.

**Table 1**  
**Projected ADC, Funding Payroll and Contribution Rates (ADC Rate)**  
**(Dollars in Billions)**

Fiscal Year Ending (1)	Baseline			Scenario ERI		
	ADC (2)	Payroll (3)	ADC Rate (4)	ADC (8)	Payroll (9)	ADC Rate (10)
2026	\$2.29	\$7.62	30.1%	\$2.29	\$7.62	30.1%
2027	\$2.42	\$8.05	30.1%	\$2.43	\$8.04	30.2%
2028	\$2.50	\$8.28	30.2%	\$2.51	\$8.26	30.4%
2029	\$2.45	\$8.51	28.8%	\$2.46	\$8.49	29.0%
2030	\$2.43	\$8.74	27.8%	\$2.44	\$8.73	27.9%
2031	\$2.43	\$8.98	27.1%	\$2.44	\$8.97	27.2%
2032	\$2.43	\$9.22	26.4%	\$2.44	\$9.22	26.5%
2033	\$2.44	\$9.47	25.8%	\$2.45	\$9.47	25.9%
2034	\$2.44	\$9.73	25.1%	\$2.45	\$9.72	25.2%
2035	\$2.45	\$9.98	24.5%	\$2.46	\$9.98	24.6%
2036	\$2.45	\$10.25	23.9%	\$2.46	\$10.24	24.0%
2037	\$2.46	\$10.51	23.4%	\$2.46	\$10.51	23.4%
2038	\$2.48	\$10.78	23.0%	\$2.48	\$10.78	23.0%
2039	\$2.48	\$11.06	22.4%	\$2.48	\$11.06	22.4%
2040	\$2.48	\$11.34	21.9%	\$2.48	\$11.34	21.9%
2041	\$2.05	\$11.63	17.6%	\$2.05	\$11.63	17.6%
2042	\$1.76	\$11.93	14.8%	\$1.76	\$11.94	14.7%
2043	\$1.26	\$12.24	10.3%	\$1.26	\$12.25	10.3%
2044	\$1.00	\$12.56	8.0%	\$1.00	\$12.57	8.0%
2045	\$0.98	\$12.90	7.6%	\$0.98	\$12.91	7.6%
2046	\$0.95	\$13.26	7.2%	\$0.95	\$13.26	7.2%

## Effect on Funded Ratio

Chart 2 provides the sensitivity of providing an ERI. The ERI reduces the funded ratio relative to the baseline. Although the scenario reduces the funded ratio, the effect is not significant and reverts to the baseline scenario.



## Conclusions

Providing an ERI is a benefit enhancement that would require increased funding and create additional risk. The scenario provided is a very limited window. If this window is extended or more valuable benefits are provided as an incentive, the ERI could become a significant risk due to a much larger increase in the ADC. This hypothetical scenario of an ERI has shown:

1. A limited ERI could increase future contributions by a total of \$100 million and increase the future employer contribution rate by as much as 0.2% of payroll if funded over 10 years.
2. After the ERI is fully paid for, the funded ratio and ADC revert to the baseline scenario.