INDEPENDENT FISCAL OFFICE

TO: Governor Josh Shapiro
All Members of the General Assembly

FROM: Matthew Knittel, Director
Independent Fiscal Office

DATE: October 12, 2023

RE: Actuarial Note for House Bill 1505, Printer's Number 1712 Amendment A01893

The Independent Fiscal Office (IFO) submits an actuarial note for **Amendment A01893 to House Bill 1505, Printer's Number 1712** in accordance with section 615-B of the Administrative Code of 1929. Due to the material impact of the legislation, the IFO submitted a formal request to its contracted actuary (Milliman) for an actuarial note. The actuary's note is attached along with comments submitted by the State Employees' Retirement System (SERS) in response to a data request made by the IFO on September 5, 2023.

Summary of Provisions

The legislation would amend Title 71 (State Government) to provide supplemental annuities to State Police officers who retired prior to July 1, 2010.

- The legislation would provide for the supplemental annuity to begin on July 1, 60 days after certification by SERS that it has a funded ratio of at least 95%.
- To be eligible, annuitants must be retired prior to July 1, 2010 and must be a former State Police officer who is a superannuation, withdrawal or disability annuitant prior to the commencement of the COLA.
- Beneficiaries and survivor annuitants of members who die prior to commencement of the COLA would not be eligible.
- The amount of the supplemental annual annuity is a prescribed dollar amount based on the retirement date of the annuitant. The amounts are as follows:

Retirement Effective Date	Annual Annuity Increase
7/1/2000-6/30/2010	$1,000
7/1/1990-6/30/2000	$2,000
On or Prior to 6/30/1990	$3,000

Review of Findings

The legislation would enact supplemental annuities for State Police officers who retired prior to July 1, 2010. The table below compares the projected impact from House Bill 1505, Printer's Number 1712 (base) to the legislation if amended by A01893.

Impacts of Amendment A01893 to House Bill 1505, P.N. 1712

	Base	A01893	Change
Required Funded Ratio	n.a.	95%	--
Commencement Date	7/1/2023	7/1/2042	19 years
Individuals	2,935	1,018	-1,917
Benefit Increases			
Avg. Annual First Year (actual $)[1]	$1,700	$1,285	-$415
Lifetime[2]	$69.9	$10.4	-$59.5
Initial Change			
Unfunded Actuarial Liability	+$41.8	+$7.3	-$34.5
Funded Ratio	-0.05%	-0.01%	+0.04%
Employer Contr. Rate	+0.08%	+0.01%	-0.07%
Annual Amortized Cost[3]	$5.9	$1.0	-$4.9

Note: Dollars in millions, unless otherwise noted.

1 The number of indentified individuals and the projected first year payments as provided by SERS. Does not take into account projected changes in annuitant demographics, including mortality. Eligible annuitants would only receive 50% of the value shown in the first year due to the July 1 start date.

2 Additional retirement benefits paid over the lifetime of the annuitants and qualified beneficiaries.

3 Analysis assumes a 10-year level dollar amortization period.

The SERS and Milliman analyses noted two issues related to the determination of eligible annuitants, listed only as "State Police officers" in the legislation.

1. SERS noted that it was necessary to make assumptions to determine the number of eligible benefit recipients. The legislation only specifies "State Police officers" and does not define any further qualifying requirements (e.g., must be vested as State Police officers, serve any number of years as State Police officers, or retire as State Police officers) to receive the supplemental annuity. For the analysis, the system could only identify individuals who retired as State Police officers. If individuals who worked as State Police officers, and possibly vested in the system, are also determined to be eligible, then those individuals would need to be identified and paid (the proposed annuity is automatic) and the projected cost of the legislation would increase.
2. Milliman noted that the current definition of State Police officer in statute (P.L. 237, No. 111, referred to as the "Policemen and Firemen Collective Bargaining Act") would apply only to those who had been subject to a collective bargaining agreement or binding interest arbitration award on or after July 1, 1989. If any annuitants included in this analysis retired prior to that date are determined to be ineligible for the supplemental annuity, then the projected cost of the legislation would decrease.

Additional notes from the Milliman analysis include:

- The employer contribution rate for unfunded accrued liabilities is projected to turn negative for certain years after the COLAs become effective; however, the total effective employer contribution rate cannot be less than the normal contribution rate. In the years this occurs, SERS would not make unfunded accrued liability contributions. System projections for this analysis result in unfunded liabilities being paid in only seven of the 10 amortization periods, which reduces the nominal cost to fund the COLAs ($7.0 million total). These costs would be absorbed by plan assets and could impact contributions in subsequent years.
- The legislation does not specify an amortization method. Therefore, the system used the ten-year equal dollar amortization method specified in the existing SERS code.
- As the legislation is written, incremental costs would be allocated to all SERS employers through increased employer contribution rates, and not allocated directly to the Pennsylvania State Police.

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October 5, 2023

Mr. Matthew Knittel
Director
Pennsylvania Independent Fiscal Office
Second Floor
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Harrisburg, PA 17105

Re: House Bill 1505, Printer's Number 1712, as amended by Amendment A01893

Dear Mr. Knittel:

As you requested, we have prepared an actuarial note on House Bill 1505, Printer's Number 1712, as amended by Amendment A01893. The Bill would amend the State Employees' Retirement Code to provide for an ad hoc cost-of-living-adjustment (COLA) (e.g. supplemental annuities) to State Police retirees with an effective date of retirement prior to July 1, 2010 commencing on the July 1 which is 60 days after the System is certified to be at least 95% funded.

Executive Summary

This amended Bill would provide an annual benefit increase at the effective date to State Police retirees in SERS ranging from $1,000 to $3,000 based on the member's date of retirement. The effective date would depend on when the System is certified to be at least 95% funded and would be 60 days after the certification is published. Based on the SERS' actuary's projections, approximately 1,000 State Police retirees would receive the increased benefits commencing July 1, 2042. Based on the SERS' actuary's projection, such increase would result in an approximately 0.01% decrease in the funded ratio as of the 2042 valuation and increase the FY 2043-2044 employer contribution rate by 0.01% based on the 10-year amortization period set forth in statute.

Because the unfunded accrued liability contribution rate is projected to become negative after the COLA benefits become effective, the number of the projected explicit additional payments is less than the 10-year amortization period. The SERS' actuary projects 7 years of the explicit additional payments. Plan assets will absorb the remaining cost of the COLA benefits. Based on the SERS' actuary's projections, the following chart compares the projected COLA benefit payments, the increase in the accrued liability of the COLA benefits, and the additional payments expected to be received.

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	SERS
Total COLA benefits projected to be paid	$10.4 million
Liability increase (present value of projected COLA benefit payments)	$7.3 million
10-year amortization payment	$1.0 million
Number of years projected to be paid	7 years
Total payments projected to be received	$7.0 million

If enacted as drafted, this Bill would have a negative cash flow impact on SERS until calendar year 2051. Prior to enactment, consideration should be given to revising the funding of the increased benefits to mitigate the negative cash flow impact. See the discussion starting on page 4 for more information.

This cost estimate is based on a preliminary identification of eligible retirees by Korn Ferry who retired from the Pennsylvania State Police, which may not coincide with the current statutory definition of "State Police officer". If retirees who had Pennsylvania State Police service earlier in their career would also be eligible for this supplemental annuity, the costs of the amended Bill would be higher than shown in this analysis. If this identification of retirees included retirees who are not considered State Police Officers as defined in the statute, the costs of the amended Bill would be lower than shown in this analysis. The amended Bill's sponsors may wish to review the eligibility requirements for this supplemental annuity. In reviewing a similar prior bill, the IFO had provided a revised definition of eligible benefit recipient from SERS that they would be able to administer more easily, as follows:

> "(f) Eligible benefit recipient. — As used in this section, the term "eligible benefit recipient" means a superannuation, withdrawal or disability annuitant on July 1, 2023, whose most recent date of retirement is prior to July 1, 2010, and whose most recent period of credited State service as an active member was as a sworn Pennsylvania State Police trooper."

In addition, the sponsors may wish to add a service requirement such that a State Police retiree would need at least a minimum number of years of service as a State Police Officer to be eligible for the supplemental annuity.

Employer contributions to SERS vary based on the employee's class of service. We understand that, as the amended Bill is written, the cost of this supplemental annuity for certain State Police retirees would be spread among all participating employers in SERS.

The cost of this amended Bill was determined independently of any other bill or amendment to a bill that may impact benefits paid to current retirees. To the extent that the increases proposed in this amended Bill apply to benefit increases provided in other bills or amendments to other bills, additional costs resulting from these changes may apply.

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Summary of the amended Bill

The amended Bill would provide for an ad hoc COLA commencing on the July 1 which is 60 days after the System is certified to be 95% funded for State Police retirees in the State Employees' Retirement System (SERS) with an effective date of retirement prior to July 1, 2010. Throughout this analysis, we refer to the July 1 date as the "applicable commencement date".

The SERS' Board would need to notify the Legislative Reference Bureau once it has certified that the System has an actuarial funded ratio of at least 95%. The funded ratio determination would include the balance, if any, of the advance payments made under §5507(h) as part of the System's assets. The effective date is 60 days after the Legislative Reference Bureau publishes the certification.

The current statute defines State Police officer as "any officer or member of the Pennsylvania State Police who, on or after July 1, 1989, shall have been subject to the terms of a collective bargaining agreement or binding interest arbitration award established pursuant to the act of June 24, 1968 (P.L.237, No.111), referred to as the Policemen and Firemen Collective Bargaining Act."

To be eligible for the COLA, the State Police officer must be a superannuation, withdrawal, or disability annuitant on the applicable commencement date and have an effective date of retirement prior to July 1, 2010.

Beneficiaries and survivor annuitants of State Police officers who die prior to the applicable commencement date would not be eligible for the COLA, but beneficiaries and survivor annuitants of eligible State Police officer recipients who die after the applicable commencement date would receive the survivor portion of the supplement based on the form of payment elected by the retiree.

The amount of the COLA is based on the annuitant's most recent effective date of retirement and would be paid in accordance with the schedule below as applied to the monthly annuity payment on the applicable commencement date. The COLA would be payable under the option in effect as of the applicable commencement date as selected by the member at retirement.

Most Recent Effective Date of Retirement	Annual Increase
On or prior to June 30, 1990	$3,000.00
July 1, 1990 through June 30, 2000	2,000.00
July 1, 2000 through June 30, 2010	1,000.00

While the amended Bill is silent on the funding of this provision, the existing §5508(e) of the SERS Code provides that the unfunded actuarial accrued liability resulting from the benefit increase would be amortized through level dollar payments over a period of 10 years beginning the July 1 after the valuation date coincident with or next following the effective date for SERS.

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Discussion of the amended Bill

This Bill would grant COLAs to State Police retirees who retired before July 1, 2010. Of these, retirees who retired before July 2, 2001 last received a supplemental annuity effective July 1, 2002 if retired prior to July 2, 1990 and July 1, 2003 if retired after July 1, 1990.

Applicable Commencement Date

Assuming no changes in plan provisions or actuarial assumptions since the latest valuation (December 31, 2022) and that experience matches the actuarial assumptions, including the assumed investment return of 6.875% on the market value of assets each and every year, SERS is projected to be at least 95% funded as of December 31, 2041. As a result, the estimated applicable commencement date would be July 1, 2042 with the funding beginning July 1, 2043 (assuming the effective date was prior to July 1, 2042).

The effective date of the COLA would occur 60 days after the publication of the notice in the Pennsylvania Bulletin that SERS is certified to be at least 95% funded. The timing of the valuation results and the Board's certification could result in the applicable commencement date being the July 1 that is six or eighteen months after the valuation date indicating that SERS is 95% funded. The SERS' actuary's projection assumes the applicable commencement date is six months after the valuation date.

Amortization period

In October 2014, the Conference of Consulting Actuaries Public Plans Community released a white paper titled *Actuarial Funding Policies and Practices for Public Pension Plans* ("CCA White Paper"), which is available at https://www.ccactuaries.org/docs/default-source/papers/cca-ppc_actuarial-funding-policies-and-practices-for-public-pension-plans.pdf?sfvrsn=6397cc76_6. This white paper provides "guidance to policymakers and other interested parties on the development of actuarially based funding policies for public pension plans", which could be helpful to the legislature.

This Bill would fund the increases due to these supplemental annuities in equal dollar installments over a 10-year period. The CCA White Paper recommends that plan amendments impacting inactive member benefits (such as increases due to supplemental annuities) be amortized over the lesser of the average payment period of the expected increased benefits and 10 years. The CCA White Paper also recommends that the amortization period should also control for negative cash flow where additional amortization payments are less than additional benefit payments, thus reducing plan assets in the short-term.

While the estimated life expectancy of the eligible retirees, including potential survivors, is approximately 9 years as of December 31, 2041 as reported by the System's actuary, this calculation does not take into account that older retirees would receive higher benefit increases, lost interest on the supplemental annuities, nor that the funding for this potential COLA would result in a projected negative cash flow. It also reflects the life expectancy of a spouse for

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retirees who have elected a joint and survivor form of payment. Using the estimated applicable commencement date of July 1, 2042 and assuming the additional amortization payments are paid for 10 years, this Bill is projected to result in lower asset values until December 31, 2051. Under the Bill, the increased benefits would begin immediately on the applicable commencement date but funding for the increased benefits would not begin until one year later. This funding delay is the primary reason for the negative cash flow impact.

To review the reasonableness of the 10-year amortization period, we estimated the duration of the supplemental annuities. Duration takes into account the weighting of additional projected benefits by the interest rate used in the actuarial values. While the estimated life expectancy is approximately 9 years as reported by the System's actuary, the duration of the increased benefits is approximately 5 years. We believe that it would be preferable to shorten the amortization period to at least 5 years for this amended Bill. This would also reduce the time until the projected asset values are higher than prior to adoption of the Bill by approximately 6 years.

Impact of Unfunded Accrued Liability Contribution Rate becoming Negative

Based on the SERS' actuary's projections, the unfunded accrued liability contribution rate is projected to become negative after the COLA benefits become effective. Because the employer contribution rate cannot be less than the normal contribution rate, there will be no unfunded accrued liability contribution in those years. This provision could eliminate the explicit additional payment for the COLA benefits resulting in the number of additional payments to pay for these COLA benefits being less than 10 years. The SERS' actuary projects only seven years of additional amortization payments for funding these COLA benefits. The remaining cost is absorbed by plan assets and could impact contributions in subsequent years.

Review of Estimated Actuarial Cost Prepared by System Actuaries

The IFO provided us with a copy of the September 19, 2023 estimate by Korn Ferry for SERS. In addition, Korn Ferry has provided us with additional details regarding their cost estimate. We appreciate their cooperation in providing this information on a timely basis.

The estimate contains the estimated increase in the actuarial accrued liability reflecting the estimated applicable commencement date of July 1, 2042 and the corresponding 10-year amortization beginning July 1, 2043. We have reviewed the estimate and found that it appears to be reasonable.

Korn Ferry indicated that the estimated number of eligible State Police retirees in SERS as of the estimated applicable commencement date is 1,018 based on data as of December 31, 2022. We have not been provided the underlying data files to review the accuracy of these calculations and have relied upon them in our analysis.

Korn Ferry indicated that these retirees were identified based on a code indicating that their last employment was with the Pennsylvania State Police (PSP). This group does not include

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retirees who may have had PSP service earlier in their career and then retired from a non-PSP position. If these additional retirees are determined to be eligible for the supplemental annuities provided under this Bill, the cost of the Bill would be higher than shown below. The code used to identify these retirees could also include retirees whose last employment was with PSP but who do not meet the statute's definition of State Police officer (e.g. retired before July 1, 1989). To the extent that these retirees are included in the cost estimate, but are not eligible for the supplemental annuity, the cost of the Bill would be lower than shown below.

Based on this estimate for SERS, the table below contains the estimated increase in the unfunded actuarial accrued liability and the first year of increased amortization payments due to this Bill reflecting the estimated applicable commencement date of July 1, 2042 with funding beginning the following July 1. Since the Bill would only affect retired members, there would be no change in normal cost. For illustrative purposes only, we have also shown the impact of using a 5-year amortization period instead of the Bill's 10-year period that could be used to help mitigate the negative cash flow impact of this Bill.

Estimated Actuarial Cost of
House Bill 1505, Printer's Number 1712
As amended by Amendment A01893
($ amounts in millions)

	10-year Amortization Period as specified in HB 1505	**Illustrative** 5-year Amortization Period
SERS – reflects estimated applicable commencement date of July 1, 2042		
Increase in Unfunded Actuarial Accrued Liability as of December 31, 2042	$7.3	$7.3
Increase in First Year Amortization Payment		
2043/2044 Contribution Amount	1.0	1.8
2043/2044 Contribution Rate	0.01%	0.02%

Based on the information provided for SERS, the Bill would result in a slight decrease in the funded ratio as of the projected valuation date after the COLA becomes effective. The projected SERS' funded ratio as of December 31, 2042 would decline by 0.01% from 97.22% to 97.21%.

The applicable commencement date, and thus the actual cost of this amended Bill, will depend on when the System is certified to be 95% funded. If the applicable commencement date is earlier than estimated, the costs would be higher; and if the applicable commencement date is later, the costs would be lower. If the applicable commencement date was 5 years earlier, the increase in the unfunded actuarial accrued liability would be roughly 80% higher. If the

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applicable commencement date was 5 years later, the increase in the unfunded actuarial accrued liability would be roughly 50% lower.

The Bill does not provide COLAs to beneficiaries and survivor annuitants of members who die prior to the applicable commencement date. Based on the estimation techniques used by the SERS' actuary, we believe they may have included future beneficiaries of retirees who are assumed to die between the valuation date and the date the COLAs are projected to begin. We believe this approximation used by the actuary is reasonable for purposes of this measurement.

Korn Ferry included information on the potential risks in their cost estimate. We encourage the legislature to consider these risks prior to enactment. In particular, Korn Ferry indicated that if the assumed mortality rates were lowered by 10% for a ten-year period, thereby increasing life expectancy, then the increase in the liability for the increased benefits provided in the original Bill would be 2.1% higher.

The above contribution rate was determined based on the projected total payroll of all active members and participants in SERS. The employer contribution rate is allocated by group based on the member's class of service as shown on Schedule C of the December 31, 2022 actuarial valuation. If this Bill is enacted, we understand that the cost of these supplemental annuities would be spread among all participating employers in SERS.

Basis for Analysis

In performing this analysis, we have relied on the information provided by the IFO, SERS, and Korn Ferry. We have not audited or verified this data and other information. If the data or information is inaccurate or incomplete, the results of this analysis may likewise be inaccurate or incomplete.

We performed a limited review of the cost estimates prepared by Korn Ferry as provided by the IFO and SERS for reasonableness and consistency and have not found material defects. If there are material defects, it is possible that they would be uncovered by a detailed, systematic review and comparison to search for values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Future actuarial measurements may differ significantly from the current measurements presented in this analysis due to actual plan experience deviating from the actuarial assumptions, the natural operation of the plan's actuarial cost method, and changes in plan provisions, actuarial assumptions, actuarial methods, and applicable law. An assessment of the potential range and cost effect of such differences is beyond the scope of this analysis.

As the reviewing actuary, Milliman is not required to provide a risk disclosure under Actuarial Standard of Practice No. 51 *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions* nor the additional disclosures required for funding valuations under Actuarial Standard of Practice No. 4 *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*.

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- The IFO may provide a copy of Milliman's work, in its entirety, to its professional service providers who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to provide services to the IFO.
- The IFO may provide a copy of Milliman's work, in its entirety, any applicable regulatory or governmental agency, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. We have not explored any legal issues with respect to the proposed changes. We are not attorneys and cannot give legal advice on such issues. We suggest that you review this proposal with counsel.

We are members of the American Academy of Actuaries and meet its Qualification Standards to render this actuarial opinion.

Please let us know if we can provide any additional information regarding this amended Bill.

Sincerely,

Timothy J. Nugent

Scott F. Porter

Katherine A. Warren

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Actuarial Cost Note Regarding H.B. 1505, P.N. 1712
Including Amendment A01893
To Estimate the Cost Impact of a Proposed Cost of Living Adjustment
to the Pennsylvania State Employees Retirement System

September 19, 2023

The following is an actuarial cost note which describes and presents the estimated cost impact of proposed legislation (under House Bill 1505, Printer's Number 1712) that would provide a Cost-of-Living Adjustment (COLA) to certain retired Pennsylvania State Police (PSP) officers who are members of the Pennsylvania State Employees' Retirement System (SERS), commencing with the first monthly annuity payment after July 1, 2023.

Design of the COLA

If this bill became law, retired members meeting both of these conditions would be eligible for the COLA:

- The PSP retiree must be either a retiree (early or superannuated) or a disabled retiree receiving an annuity on July 1, 2023, and
- The PSP retiree's most recent effective date of retirement would have to be prior to July 1, 2010.

Our December 31, 2022 data contains a special code that indicates whether a retiree's last employment before retirement was PSP service. We have used this code as the basis for estimating the liability impact of the proposed COLA. Therefore, if a member worked a period of time as a PSP officer and then worked the remainder of the career in a non-PSP position before retiring, that member will not be captured in this analysis since that member did not retire as a PSP officer. If the definition of who is eligible for this COLA needs to be expanded beyond the group that we identified, then additional data will need to be requested.

If enacted, the amount of the COLA increase, which would commence with the first monthly annuity payment after July 1, 2023, will be determined as an annual dollar amount, such dollar amount being specifically prescribed on the basis of the eligible member's most recent effective date of retirement. Table 1 on the following page provides the specific COLA increase amounts and effective dates of retirement proposed under this bill.

Other noteworthy provisions relating to the design of this proposed COLA include:

- Beneficiaries or survivors of members who die before July 1, 2023 are not eligible and
- The COLA will be payable under the same terms and conditions as provided under the option plan in effect as of July 1, 2023.

Funding of the COLA

The bill does not state an amortization period for the liability impact of the COLA, so 10 years is used for legislated benefit increases under the Retirement Code. Any liability for the increase in benefits is being funded in equal dollar installments over a period of 10 years beginning July 1, 2024.

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Proposed COLA Increases

The proposed COLA increase percentages are presented in Table 1 below.

Table 1
Proposed COLA Increases
Effective After July 1, 2023 &
Payable to Eligible Retired Members
Who Retired Prior to July 1, 2010

Most Recent Effective Date of Retirement	Proposed Annual COLA Increase
Prior to July 1, 1990	$3,000
July 1, 1990 - June 30, 2000	2,000
July 1, 2000 - June 30, 2010	1,000
July 1, 2010 and After	0

Estimated COLA Impact and Costs

Table 2 presents some approximate statistics related to the impact if this proposed COLA were to become law, as well as the estimated additional liability and annual cost to SERS, based upon funding in equal dollar annual installments over a 10-year period beginning July 1, 2024.

The estimated number of retirees to receive the proposed COLA is based on the number eligible to receive the COLA as of December 31, 2022. The average increase is the overall average increase the eligible members (as of December 31, 2022) would receive.

Table 2
Impact & Estimated Cost of
Proposed COLA Increase
(dollars in millions)

Effective date of first COLA payment	After July 1, 2023
Funding date	July 1, 2024
Estimated number of retirees to receive COLA	2,935
Average COLA increase	4.07%
Expected payroll in fiscal year 2024/2025	$7,103.6
Increase in liability	$41.8
Level annual 10-year funding payment	$5.9
As a percent of projected payroll	0.08%

Under Amendment A01893, the COLA payments and funding will be deferred until after the plan reaches a funded ratio of at least 95%. When a December 31 valuation achieves the funding

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threshold, then a notice is transmitted to the Legislative Reference Bureau for publication. The COLAs will be effective for retirees in the plan on July 1 after the publication occurs. The funding of the COLA will begin on the July 1 following the effective date of the COLA. Current projections have SERS reaching 95% funding on December 31, 2041, so the COLA is expected to be paid beginning July 2042 to all retirees in pay status. The funding of this COLA is expected to begin July 1, 2043.

Table 3 Impact & Estimated Cost of Proposed COLA Increase As Amended By A01893 (dollars in millions)	
Expected date of first COLA payment	After July 1, 2042
Expected Funding date	July 1, 2043
Estimated number of retirees to receive COLA	1,018
Estimated Average COLA increase	2.90%
Expected payroll in fiscal year 2043/2044	$11,101.1
Expected Increase in liability	$7.3
Level annual 10-year funding payment	$1.0
As a percent of projected payroll	0.01%

Methods and Assumptions Underlying Table 2 Results

The data used for this cost estimate is based on a special run provided by SERS that included all retirements through December 31, 2022. The data included age, gender, date of retirement, and both the initial and current monthly benefit for the retired population as of December 31, 2022. The estimated number of retirees to receive the COLA is based on the number of retirees in payment status as of December 31, 2022.

The liability was determined by using the actuarial assumptions and methods underlying the December 31, 2022 actuarial valuation, including the 6.875% interest rate (or assumed annual investment return), which was first effective with the December 31, 2022 actuarial valuation. The expected payroll figure shown above is as of the first fiscal year in which the COLA will be funded. It is the December 31, 2022 valuation funding payroll projected forward one year.

The valuation results were produced using a proprietary actuarial valuation system, Pension Valuation Language (PVL). PVL has been actively used for over 40 years to perform annual funding/accounting valuations, gain and loss analyses, and cost studies for a wide variety of retirement systems. PVL was created specifically to value pension plan liabilities and uses the applicable assumptions and methods along with the pension plan census data to produce appropriate results. Test lives are generated to review the accuracy of both the input and output, allowing the users to confirm with a high degree of accuracy how the programmed benefit is applied to an individual along with the proposed decrements and other assumptions. The actuarial team loads the participant data, programs the benefit provisions, enters the

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applicable assumptions into the model, and reviews sample life output and results under the supervision of a credentialed actuary or actuaries who are proficient users of the software. We are not aware of any material limitations in the model nor any material inconsistencies in the assumptions used within the model.

Potential Risks Related to the COLA

The liabilities and costs in this cost note are based upon actuarial assumptions utilized in the December 31, 2022 actuarial valuation of SERS. These measurements represent a single estimate of the future liabilities and costs of SERS. Since the actual liabilities and costs will be determined based upon (i) the future actuarial assumptions underlying such future measurements and (ii) the actual future experience of SERS, there is a risk that future measurements will differ from those presented in this cost note.

To provide readers of this cost note with a greater appreciation for the sensitivity of these results to potential future changes in both the underlying actuarial assumptions and future SERS experience, we have performed three additional liability calculations:

- One liability calculation, based upon a 5.875% underlying interest rate assumption (a full 1% lower than the 6.875% assumption currently applicable to SERS). This is for the purpose of showing the extent of increase that would occur in our liability result if a 1% lower interest rate assumption applied in the future. Our resulting liability (based on the 5.875% interest rate) was $44.5 million, or 6.4% greater than the Table 2 liability increase of $41.8 million.
- A second liability calculation, based upon the assumption that the actual future mortality rates experienced by the retirees eligible for the proposed COLA increases are 10% lower than those currently assumed for SERS annuitants for a 10-year period and then revert back to current mortality assumptions after. This is in order to show the extent of increase that would occur in our liability result if the COLA-eligible SERS retirees had favorable future longevity. Our resulting liability (based on the more favorable mortality rates) was $42.7 million, or 2.1% greater than the Table 2 liability increase of $41.8 million.
- A third liability calculation, based upon both of the two adjustments described above. Our resulting liability (based on the 5.875% interest rate and the 10% lower assumed mortality rates for 10 years) was $45.5 million, or 8.7% greater than the Table 2 liability increase of $41.8 million.
- The amendments that introduce funding thresholds reduce the impact by delaying the implementation of the COLA. If the plan does not achieve the funding target by our projection, then the impact of the COLA will be delayed and reduced further. Alternatively, if the funding target is reached early, then the impact of the COLA will be higher than presented. Since the impact of the delayed COLA is expected to be small, the timing of granting the COLA only poses a small risk.

Again, we are presenting the above supplemental results to be responsive to ASOP 51, hoping to enhance understanding and appreciation of SERS' risk exposure for readers of this cost note.

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September 19, 2023

Actuarial Certification

To the best of our knowledge, the information we are presenting herein is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles and on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience of SERS and reasonable expectations) and which represent our best estimate of anticipated experience under the plan.

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

Please let us know if you have any questions on any of this.

Respectfully submitted,

Korn Ferry

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September 19, 2023

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