



INDEPENDENT FISCAL OFFICE

TO: Governor Tom Wolf
All Members of the General Assembly

FROM: Matthew Knittel, Director
Independent Fiscal Office

DATE: June 23, 2022

RE: Actuarial Note for House Bill 1578, Printer's Number 1730 Amendment A04586

The Independent Fiscal Office (IFO) submits an actuarial note for **Amendment A04586 to House Bill 1578, Printer's Number 1730** in accordance with section 615-B of the Administrative Code of 1929. Due to the potential material impact of the amendment, the IFO submitted a formal request to its contracted actuary (Milliman) for an actuarial note. A copy of the actuary's note is attached, along with responses prepared by the State Employees' Retirement System (SERS) and the Public School Employees' Retirement System (PSERS) in response to a data request made by the IFO on June 10, 2022.

This actuarial note only addresses the language in Amendment A04586, not the legislation as introduced. The introduced legislation would codify the prohibition on the use of collared employer contribution rates for SERS and PSERS. The IFO issued a letter for House Bill 1578, Printer's Number 1730 on September 13, 2021 which found de minimis actuarial costs associated with that legislation.

Amendment Summary

The amendment would amend Title 24 (Education) and Title 71 (State Government) to provide supplemental annuities to individuals who retired prior to July 2, 2001 for SERS and PSERS.

- The amendment would provide for the supplemental annuity to begin on July 1, 2022 for eligible PSERS annuitants, and on January 1, 2023 for eligible SERS annuitants.
- To be eligible, annuitants must (1) receive an annuity by July 1, 2022 (PSERS) or January 1, 2023 (SERS); (2) be retired prior to July 2, 2001; and (3) have no credited service that qualifies as Class T-D, Class D-4, or Class AA.
- Beneficiaries and survivor annuitants of members who die prior to July 1, 2022 (PSERS) or January 1, 2023 (SERS) would not be eligible.
- The unfunded actuarial liability resulting from the benefit increase would be amortized through level dollar payments over a period of 10 years beginning July 1, 2023.
- The amount of the supplemental annuity is based on the most recent date of retirement for the individual. The full schedule is below.

Retirement Effective Date	Annuity Increase (%)	Retirement Effective Date	Annuity Increase (%)
7/2/2000 - 7/1/2001	4.5	7/2/1990 - 7/1/1991	7.2
7/2/1999 - 7/1/2000	4.6	7/2/1989 - 7/1/1990	7.8
7/2/1998 - 7/1/1999	4.7	7/2/1988 - 7/1/1989	8.4
7/2/1997 - 7/1/1998	4.8	7/2/1987 - 7/1/1988	9.2
7/2/1996 - 7/1/1997	5.0	7/2/1986 - 7/1/1987	10.0
7/2/1995 - 7/1/1996	5.2	7/2/1985 - 7/1/1986	10.8
7/2/1994 - 7/1/1995	5.4	7/2/1984 - 7/1/1985	11.8
7/2/1993 - 7/1/1994	5.8	7/2/1983 - 7/1/1984	12.8
7/2/1992 - 7/1/1993	6.2	7/2/1982 - 7/1/1983	13.8
7/2/1991 - 7/1/1992	6.6	Prior to 7/2/1982	15.0

Review of Findings

The bill would enact supplemental annuities for individuals who retired prior to July 2, 2001 for SERS and PSERS. Based on the letters attached to this note, the impacts are as follows:

Impact on SERS:

- Individuals impacted: 27,334
- Average age of eligible retiree: 79.2
- Change in unfunded actuarial liability (UAL): \$134.9 million
- Change in funded ratio: -0.2% (71.5% to 71.3%)
- Change in employer contribution rate: 0.28% (33.16% to 33.43%)
- Annual amortized cost: \$19.1 million (nominal)
- Total amortized cost: \$191.0 million (nominal)
- Total projected benefit increases paid over lifetime: \$207.7 million (nominal)

Impact on PSERS:

- Individuals impacted: 46,919
- Average age of eligible retiree: 82.2
- Change in unfunded actuarial liability (UAL): \$289.3 million
- Change in funded ratio: -0.2% (61.3% to 61.1%)
- Change in employer contribution rate: 0.30% (35.69% to 35.99%)
- Annual amortized cost: \$44.1 million (nominal)
- Total amortized cost: \$440.6 million (nominal)
- Total projected benefit increases paid over lifetime: \$432.8 million (nominal)

In their analysis, Milliman notes the following issues:

- There are different commencement dates for SERS and PSERS retirees, while past supplemental annuities have commenced at the same dates.
- The cost of the amendment was determined independently of any other bill or amendment that may impact benefits paid to current retirees. To the extent that the increases proposed in this amendment apply to benefits provided in other bills, additional costs for these changes may apply.

- The amendment provides that the cost of the supplemental annuities would be funded in equal dollar installments over a period of 10 years in §8348.8(f). However, §8328(d)(2) in the PSERS code indicates that increases in benefits due to supplemental annuities shall be funded as a level percentage of compensation over a period of ten years from the July 1 second succeeding the date such legislation is enacted.



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June 22, 2022

Mr. Matthew Knittel
Director
Pennsylvania Independent Fiscal Office
Second Floor
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17105

Re: Amendment A04586 to House Bill 1578, Printer's Number 1730

Dear Mr. Knittel:

As you requested, we have prepared an actuarial note on Amendment A04586 to House Bill 1578, Printer's Number 1730. The Amendment would amend both the Public School Employees' Retirement Code and the State Employees' Retirement Code to provide for an ad hoc cost-of-living-adjustment (COLA) (e.g. supplemental annuities) commencing July 1, 2022 and January 1, 2023, respectively, to retirees of both systems with an effective date of retirement prior to July 2, 2001.

Executive Summary

This Amendment would provide a benefit increase to approximately 74,000 retirees in PSERS and SERS ranging from 4.5% to 15% of the member's benefit at the effective date based on the member's date of retirement. The effective date is July 1, 2022 for PSERS and January 1, 2023 for SERS. Based on the Systems' actuaries projections, such increase would result in an approximately 0.2% decrease in the funded ratio of both Systems as of the 2022 valuations and increase the FY 2023-2024 employer contribution rate by 0.3% for each system based on the 10-year amortization period set forth in the Amendment.

Although Milliman does not take a position in favor of or opposition to the proposed legislation, we concur with the statement made by the PSERS actuary Buck in their cost analysis. They noted that increasing benefits when the funded ratio of the plan is only at 59.6% based on the actuarial value of assets at June 30, 2021 and employer contribution levels are at a rate of 34.31% of payroll should be carefully considered. The significant decrease in asset values during 2022 should also be considered prior to enactment.

This analysis was prepared solely for the Pennsylvania Independent Fiscal Office and may not be appropriate for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Mr. Matthew Knittel

June 22, 2022

Page 2

SERS is in a similar funding situation. Furthermore, Act 5 of 2017 reduced benefits for future hires for both systems.

If enacted as drafted, this Amendment would have a negative cash flow impact on both Systems until FY 2029-2030 for PSERS and calendar year 2027 for SERS. 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 3 for more information.

We note that there are different commencement dates for PSERS and SERS retirees while past supplemental annuities have commenced at the same dates for PSERS and SERS retirees.

The cost of this Amendment was determined independently of any other bill or amendment that may impact benefits paid to current retirees. To the extent that the increases proposed in this Amendment apply to benefits provided in other bills, additional costs for these changes may apply.

Summary of the Amendment

The Amendment would provide for an ad hoc COLA commencing July 1, 2022 for retirees in the Public School Employees' Retirement System (PSERS) and January 1, 2023 for retirees in the State Employees' Retirement System (SERS) with an effective date of retirement prior to July 2, 2001. Throughout this analysis, we refer to July 1, 2022 for PSERS and January 1, 2023 for SERS as the "applicable commencement date".

To be eligible for the COLA, superannuation, withdrawal, and disability annuitants must be receiving an annuity on the applicable commencement date, have an effective date of retirement prior to July 2, 2001, and whose credited service does not include any service credited as either Class T-D, Class D-4, or Class AA service. Withdrawal annuitants would not be eligible to receive the COLA until the July 1 coincident with or following attainment of superannuation age.

Beneficiaries and survivor annuitants of members who die prior to the applicable commencement date would not be eligible for the COLA.

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.

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Most Recent Effective Date of Retirement	Percentage Increase
July 2, 2000 through July 1, 2001	4.5%
July 2, 1999 through July 1, 2000	4.6
July 2, 1998 through July 1, 1999	4.7
July 2, 1997 through July 1, 1998	4.8
July 2, 1996 through July 1, 1997	5.0
July 2, 1995 through July 1, 1996	5.2
July 2, 1994 through July 1, 1995	5.4
July 2, 1993 through July 1, 1994	5.8
July 2, 1992 through July 1, 1993	6.2
July 2, 1991 through July 1, 1992	6.6
July 2, 1990 through July 1, 1991	7.2
July 2, 1989 through July 1, 1990	7.8
July 2, 1988 through July 1, 1989	8.4
July 2, 1987 through July 1, 1988	9.2
July 2, 1986 through July 1, 1987	10.0
July 2, 1985 through July 1, 1986	10.8
July 2, 1984 through July 1, 1985	11.8
July 2, 1983 through July 1, 1984	12.8
July 2, 1982 through July 1, 1983	13.8
Prior to July 2, 1982	15.0

The unfunded actuarial accrued liability resulting from the benefit increase would be amortized through level dollar payments over a period of 10 years beginning July 1, 2023.

Discussion of the Amendment

This Amendment would grant COLAs to retirees who retired prior to the 25% benefit increase under Act 9 of 2001. Such retirees 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.

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.

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This Amendment would fund the increases due to these supplemental annuities in equal dollar installments over a 10-year period starting July 1, 2023. 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 is approximately 10 years as reported by the Systems' actuaries, 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. This Amendment is projected to result in lower asset values until June 30, 2030 for PSERS and December 31, 2028 for SERS. Under the Amendment, the increased benefits would begin immediately on the applicable commencement date but funding for the increased benefits would not begin until July 1, 2023 – one year later for PSERS and six months later for SERS. 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 10 years, the duration of the increased benefits is approximately 5 - 6 years. We believe that it would be preferable to shorten the amortization period to 5 years for this Amendment. This would also reduce the time until the projected asset values are higher than prior to adoption of the Amendment by approximately 5 years for both PSERS and SERS. In addition, funding for the supplemental annuities could begin July 1, 2022 to coincide with the payment of the supplemental annuities to effectively eliminate any negative cash flow period. Alternatively, the applicable commencement date could be delayed to coincide with the date that funding begins for these supplemental annuities.

Different commencement date

The Amendment would provide for COLAs starting July 1, 2022 for eligible PSERS retirees and January 1, 2023 for eligible SERS retirees. Past COLAs have generally commenced at the same date for both PSERS and SERS retirees.

In addition, the new §8348.8 for PSERS and §5708.9 for SERS indicate “Supplemental annuity commencing 2022”.

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Potential Conflict in type of amortization in PSERS

As the PSERS' actuary indicates in their cost estimate, the Amendment provides that the cost of these supplemental annuities would be funded in equal dollar installments over a period of 10 years in §8348.8(f). However, §8328(d)(2) in the PSERS code indicates that increases in benefits due to supplemental annuities shall be funded as a level percentage of compensation over a period of ten years from the July 1 second succeeding the date such legislation is enacted.

The cost estimate prepared by the System actuary reflects a 10-year level dollar amortization. We believe that the level dollar approach is more appropriate in this situation.

Review of Estimated Actuarial Cost Prepared by System Actuaries

The IFO provided us with a copy of the June 14, 2022 estimate by Buck Global, LLC (Buck) for PSERS and the June 14, 2022 estimate by Korn Ferry for SERS. In addition, Buck and Korn Ferry have provided us with additional details regarding their cost estimates. We appreciate their cooperation in providing this information on a timely basis.

The estimates contain the estimated increase in the actuarial accrued liability and the corresponding 10-year amortization beginning July 1, 2023. We have reviewed the estimates for both PSERS and SERS and found that they appear to be reasonable.

Buck and Korn Ferry indicated that the number of eligible retirees is 46,919 in PSERS based on data as of June 30, 2021 and 27,334 in SERS based on data as of December 31, 2021, respectively. We have not been provided the underlying data files to review the accuracy of these calculations and have relied upon them in our analysis.

Based on these estimates for PSERS and SERS, the table below contains the estimated increase by year in the unfunded actuarial accrued liability and the first year of increased amortization payments due to this Amendment. Since the Amendment 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 Amendment's 10-year period that could be used to help mitigate the negative cash flow impact of this Amendment.

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**Estimated Actuarial Cost of Amendment A04586
 to House Bill 1578, Printer's Number 1730
 (\$ amounts in millions)**

	10-year Amortization Period as specified in A04586	Illustrative 5-year Amortization Period
PSERS		
Increase in Unfunded Actuarial Accrued Liability as of June 30, 2022	\$289.3	\$289.3
Increase in First Year Amortization Payment		
2023/2024 Contribution Amount	44.1	75.5
2023/2024 Contribution Rate	0.30%	0.51%
SERS		
Increase in Unfunded Actuarial Accrued Liability as of December 31, 2022	\$134.9	\$134.9
Increase in First Year Amortization Payment		
2023/2024 Contribution Amount	19.1	32.8
2023/2024 Contribution Rate	0.28%	0.48%

Based on the information provided for PSERS and SERS, the Amendment would result in a 0.2% decrease in the funded ratio. The projected PSERS' funded ratio as of June 30, 2022 would decline from 61.3% to 61.1%. The projected SERS' funded ratio as of December 31, 2022 would decline from 71.5% to 71.3%.

The PSERS actuary Buck notes that granting benefit improvements may increase the impact of longevity risk due to larger benefits being paid for longer than expected. The SERS actuary 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 would be 3.6% higher.

Basis for Analysis

In performing this analysis, we have relied on the information provided by the IFO, PSERS, SERS, Buck, 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.

This analysis was prepared solely for the Pennsylvania Independent Fiscal Office and may not be appropriate for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

We performed a limited review of the cost estimates prepared by Buck and Korn Ferry as provided by the IFO, PSERS, 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*.

Milliman's work is prepared solely for the internal business use of the Pennsylvania Independent Fiscal Office. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

- 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 retirement 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.

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Mr. Matthew Knittel

June 22, 2022

Page 8

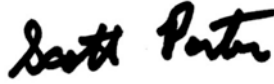
We are members of the American Academy of Actuaries and meet its Qualification Standards to render this actuarial opinion.

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

Sincerely,



Timothy J. Nugent



Scott F. Porter



Katherine A. Warren

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Actuarial Cost Note Regarding H.B. 1578, P.N. 1730, As Amended by A04586
To Estimate the Cost Impact of a Proposed Cost of Living Adjustment
to the Pennsylvania State Employees Retirement System

June 14, 2022

The following is an actuarial cost note which describes, and presents the estimated cost impact of proposed legislation (under House Bill 1578, Printer's Number 1730, as amended by Amendment A04586) that would provide a Cost of Living Adjustment (COLA) to certain retired members of the Pennsylvania State Employees' Retirement System (SERS), commencing with the first monthly annuity payment after January 1, 2023.

Design of the COLA

If this bill became law, retired members meeting all three (3) of these conditions would be eligible for the COLA:

- The retired member must be either a retiree who has reached superannuation age or a disabled retiree or an early retiree (who would become eligible for the COLA upon reaching superannuation age) receiving an annuity on January 1, 2023;
- The retired member's most recent effective date of retirement would have to be prior to July 2, 2001, and
- The retired member's credited service may not include any service credited as Class AA or Class D-4 (or Class T-D).

If enacted, the amount of the COLA increase, which would commence with the first monthly annuity payment after January 1, 2023, will be determined as a percentage of the amount of the monthly annuity payment on January 1, 2023, such percentage 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 percentages 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 January 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 January 1, 2023.

Funding of the COLA

The bill states that "... the additional liability for the increase in benefits provided under this section shall be funded in equal dollar installments over a period of 10 years beginning July 1, 2023."



Actuarial Cost Note Regarding H.B. 1578, P.N. 1730, As Amended by A04586
To Estimate the Cost Impact of a Proposed Cost of Living Adjustment
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June 14, 2022

Proposed COLA Increases

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

Table 1 Proposed COLA Increases Effective After January 1, 2023 & Payable to Eligible Retired Members Who Retired Prior to July 2, 2001	
Most Recent Effective Date of Retirement	Proposed COLA Increase
Prior to July 2, 1982	15.0%
July 2, 1982 - July 1, 1983	13.8%
July 2, 1983 - July 1, 1984	12.8%
July 2, 1984 - July 1, 1985	11.8%
July 2, 1985 - July 1, 1986	10.8%
July 2, 1986 - July 1, 1987	10.0%
July 2, 1987 - July 1, 1988	9.2%
July 2, 1988 - July 1, 1989	8.4%
July 2, 1989 - July 1, 1990	7.8%
July 2, 1990 - July 1, 1991	7.2%
July 2, 1991 - July 1, 1992	6.6%
July 2, 1992 - July 1, 1993	6.2%
July 2, 1993 - July 1, 1994	5.8%
July 2, 1994 - July 1, 1995	5.4%
July 2, 1995 - July 1, 1996	5.2%
July 2, 1996 - July 1, 1997	5.0%
July 2, 1997 - July 1, 1998	4.8%
July 2, 1998 - July 1, 1999	4.7%
July 2, 1999 - July 1, 2000	4.6%
July 2, 2000 - July 1, 2001	4.5%
July 2, 2001 and After	0.0%

Estimated COLA Impact and Costs

Table 2 on the following page 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, 2023.

The estimated number of retirees to receive the proposed COLA is based on the number eligible to receive the COLA as of December 31, 2021. The average increase is the overall average increase the eligible members (as of December 31, 2021) would receive.



Actuarial Cost Note Regarding H.B. 1578, P.N. 1730, As Amended by A04586
To Estimate the Cost Impact of a Proposed Cost of Living Adjustment
to the Pennsylvania State Employees Retirement System

June 14, 2022

Table 2 Impact & Estimated Cost of Proposed COLA Increase (dollars in millions)	
Effective date of first COLA payment	After January 1, 2023
Funding date	July 1, 2023
Estimated number of retirees to receive COLA	27,334
Average COLA increase	5.96%
Expected payroll in fiscal year 2023/2024	\$6,835.5
Increase in liability	\$134.9
Level annual 10-year funding payment	\$19.1
As a percent of projected payroll	0.28%

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, 2021. The data included age, gender, date of retirement, and both the initial and current monthly benefit for the retired population as of December 31, 2021. The estimated number of retirees to receive the COLA is based on the number of retirees in payment status as of December 31, 2021.

The liability was determined by using the actuarial assumptions and methods underlying the December 31, 2021 actuarial valuation, with the exception of the interest rate (or assumed annual investment return), which was updated to reflect that the SERS Board has approved a change to that assumption, from 7.00% to 6.875%, 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, 2021 valuation funding payroll projected forward one year based upon the current annual increase assumption of 2.8 percent per year for salary schedule increases.

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 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.



Actuarial Cost Note Regarding H.B. 1578, P.N. 1730, As Amended by A04586
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June 14, 2022

Potential Risks Related to the COLA

The liabilities and costs in this cost note are based upon actuarial assumptions adopted by the State Employees' Retirement Board (the Board) and funding procedures specified in the SERC that will be 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 \$142.3 million, or 5.5% greater than the Table 2 liability increase of \$134.9 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 \$139.8 million, or 3.6% greater than the Table 2 liability increase of \$134.9 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 \$147.6 million, or 9.4% greater than the Table 2 liability increase of \$134.9 million.

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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June 14, 2022

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

By: 

Kristopher E. Seets, F.S.A.
Member American Academy of Actuaries
Enrolled Actuary No. 20-8055

By: 

Craig R. Graby
Member American Academy of Actuaries
Enrolled Actuary No. 20-7319

June 14, 2022



COMMONWEALTH OF PENNSYLVANIA
PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM

PSERS
5 N 5th Street
Harrisburg PA 17101-1905

Toll-free: 1.888.773.7748 (1.888.PSERS4U)

Local: 717.787.8540

www.psers.pa.gov

June 15, 2022

Matthew Knittel, Director
Independent Fiscal Office
Rachel Carson State Office Building
400 Market Street Harrisburg, PA 17105

Dear Mr. Knittel,

This letter responds to your June 10, 2022, correspondence requesting “an actuarial note for Amendment A04586 to House Bill 1578, Printer’s Number 1730 from Senator Patrick Browne, Chairman of the Senate Appropriations Committee” per section 615-B of the Administrative Code of 1929.

Consistent with past practice, PSERS has not taken a position on A04586 or the underlying bill, HB 1578. As always, we are happy to serve as a resource and timely provide the information IFO requested.

The amendment would provide monthly cost-of-living adjustments (COLAs) to annuitants who retired before July 2, 2001. According to the amendment, the COLAs would be based on a sliding percentage scale that ranges from 4.5% to 15.0% depending on an annuitant’s retirement date. Members retired the longest would receive the highest rate of increase. Conversely, members retired the shortest would receive the lowest rate increase. COLAs “shall be funded in equal dollar annual installments over a period of 10 years beginning July 1, 2023,” the amendment states.

In complying with our duties under the Administrative Code, I present PSERS actuarial note written and computed by Buck, the Fund’s contracted actuarial firm. Buck’s note complies with all of IFO’s information requests and includes Microsoft Excel files for ease of your review. Please note that Buck has taken a neutral position on the amendment while also acknowledging the actuarial impact the proposed benefit increase would place on PSERS, which currently has an actuarial-funded status below 60% and an employer pension contribution rate above 34%.

Buck’s analysis found:

- 46,919 PSERS retirees would be eligible for the supplemental annuity that would go into effect in the 2022-23 fiscal year, which begins July 1, 2022.
- 82 is the average age of the eligible retirees.
- \$440 million is the collective actuarial cost on a cashflow basis of the total supplemental annuity through FY 2055 as detailed in Exhibit 1.

If you have any questions or need additional information, please contact PSERS Communications Director Evelyn Williams at ewilliams@pa.gov, 717-720-4734.

Sincerely,

A handwritten signature in black ink, appearing to read "Terrill J. Sanchez". The signature is fluid and cursive, with a long, sweeping tail that loops back under the name.

Terrill J. Sanchez
Interim Executive Director
PSERS



200 Plaza Drive
 1st Floor
 Secaucus, New Jersey 07094

June 14, 2022

Ms. Terrill J. Sanchez
 Interim Executive Director
 Pennsylvania Public School Employees' Retirement System
 5 North 5th Street
 Harrisburg, PA 17101

Re: Amendment A04586 to House Bill 1578, Printer's No. 1730

Dear Ms. Sanchez:

As requested, we have examined proposed Amendment A04586 to House Bill 1578, Printer's No.1730 (Amendment). A copy of the Independent Fiscal Office's (IFO) request together with the Amendment can be found in the Appendix. Our understanding of the Amendment is as follows:

- The amendment would provide monthly supplemental annuities for Public School Employees' Retirement System (PSERS or System) retirees who meet the following conditions:
 - (a) Retirees who are in receipt of a superannuation, withdrawal, or disability annuity from the System on July 1, 2022,
 - (b) Retirees whose most recent effective date of retirement is prior to July 2, 2001, and
 - (c) Retirees whose credited service does not include any service credited as either Class T-D, Class D-4, or Class AA.
- The amount of each eligible retiree's monthly supplemental annuity would be a percentage of the retiree's monthly annuity payment in effect on July 1, 2022. The applicable percentage is based on the retiree's most recent effective date of retirement, as follows:

<u>Most recent effective date of retirement:</u>	<u>Percentage Factor:</u>
July 2, 2000 through July 1, 2001	4.5%
July 2, 1999 through July 1, 2000	4.6%
July 2, 1998 through July 1, 1999	4.7%
July 2, 1997 through July 1, 1998	4.8%
July 2, 1996 through July 1, 1997	5.0%
July 2, 1995 through July 1, 1996	5.2%
July 2, 1994 through July 1, 1995	5.4%
July 2, 1993 through July 1, 1994	5.8%
July 2, 1992 through July 1, 1993	6.2%
July 2, 1991 through July 1, 1992	6.6%
July 2, 1990 through July 1, 1991	7.2%
July 2, 1989 through July 1, 1990	7.8%
July 2, 1988 through July 1, 1989	8.4%
July 2, 1987 through July 1, 1988	9.2%
July 2, 1986 through July 1, 1987	10.0%
July 2, 1985 through July 1, 1986	10.8%
July 2, 1984 through July 1, 1985	11.8%
July 2, 1983 through July 1, 1984	12.8%
July 2, 1982 through July 1, 1983	13.8%
Prior to July 2, 1982	15.0%

- No monthly supplemental annuity would be payable to any beneficiary or survivor of a retiree who dies prior to July 1, 2022.
- The monthly supplemental annuity for eligible retirees would commence with the first monthly annuity payment after July 1, 2022. However, no monthly supplemental annuity would be payable to an annuitant receiving a withdrawal annuity prior to the first day of July coincident with or next following the annuitant's attainment of superannuation age.
- The monthly supplemental annuity would be paid automatically unless the annuitant files a written notice with the Board requesting that the additional monthly supplemental annuity not be paid.
- The monthly supplemental annuity would be payable under the same optional form of payment as the July 1, 2022 annuity payment. It would also be subject to any subsequent modification of the July 1, 2022 annuity form of payment.
- The additional liability attributable to the increase in benefits provided under this legislation would be funded in equal installments over a 10-year period beginning July 1, 2023.

Estimates of the potential financial impact of the Amendment are presented in the attached Exhibit 1; the Amendment's additional cost to the System through 2055 is estimated to be \$440,618,000 on a cash flow basis.

It should be noted that increasing benefits at a time when the funded status of the System is only at 59.6% based on the actuarial value of assets at June 30, 2021, and employer pension contribution levels are at a rate of 34.31% of payroll should be carefully considered; particularly, the impact on the System's projected funded status and employer contribution rates. However, Buck does not take a position in favor of nor in opposition to the proposed legislation.

Exhibit 2 provides a distribution of the eligible benefit recipients based on the Amendment's "most recent effective date of retirement" supplemental annuity subgroups.

Exhibit 3 provides the projected annual annuity cash flows for the eligible recipients with and without the Amendment's supplemental annuity.

In addition, the IFO has requested the following supplemental information:

- i) The total number of eligible recipients as of June 30, 2021, the most recent date as of which data is available, is 46,919. However, we note that this includes 1,488 retirees who retired prior to July 2, 2001 and are listed in the June 30, 2021 actuarial valuation data as Class T-D. The additional liability for these 1,488 retirees is estimated to be \$11,767,000. The eligibility of these retirees for the supplemental annuity will need to be individually determined.
- ii) The average age of the eligible retirees as of June 30, 2021 was 82.23 years.
- iii) The total annual annuities paid to the eligible recipients as of June 30, 2021 was \$891,618,122.
- iv) The total of annual annuities for the eligible recipients with the proposed supplemental annuity increases is estimated to be \$942,881,801. This includes \$22,912 in prospective annual supplemental annuities for retirees receiving a withdrawal annuity who have not attained superannuation age; the supplemental annuity for these retirees are deferred to the first day of July coincident with or next following the annuitant's attainment of

superannuation age. These amounts are based on the June 30, 2021 valuation data and assume survival of all eligible retirees to the first effective payment of the supplemental annuity. The estimates of the Amendment's potential financial impact will be reduced by the cost of any eligible member who dies prior to July 1, 2022.

- v) The expected annual increases in benefit payments due to the proposed supplemental annuity are reported in Exhibit 3.
- vi) The average life expectancy for the eligible retirees as of June 30, 2021 was 10.23 years.

The calculations presented here are based on the data, methods and assumptions used in the June 30, 2021, actuarial valuation of PSERS, including an assumed annual rate of return on System assets of 7.00%, as well as the following assumptions for the projected actuarial valuations:

- (a) The workforce size is assumed to remain constant over the projection period, and
- (b) Among new school employees hired on or after July 1, 2021, 98% will become Class T-G members, 1% will elect Class T-H membership, and 1% will elect Class DC participation.
- (c) Future new employees are assumed to have similar demographic characteristics (age/gender/salary) to those of new members who entered PSERS in the period July 1, 2018, through June 30, 2021.

In addition:

- All eligible recipients were assumed to accept the Amendment's supplemental annuity.
- The System's annual actuarial valuation does not anticipate subsequent modifications to current retirees' annuity form of payment. Therefore, this analysis does not consider future modifications to the Amendment's supplemental annuity form of payment.
- The Amendment requires funding of the additional liability in equal payments over a 10-year period. However, this contradicts § 8328(d) of current statutes, which stipulates that the additional liability for increases in supplemental benefits due to legislation enacted after June 30, 2010, is to be funded as a level percentage of compensation over a 10-year period. We are not qualified to comment on possible conflicts in Pennsylvania law. This analysis is based on the Amendment's provisions. The estimates of the Amendment's potential financial impact, as presented in the attached Exhibit 1, will change if it is determined that § 8328(d) of current statutes takes precedence over the funding provisions of the Amendment.

The information contained herein was developed at your request by Buck Global, LLC, using generally accepted actuarial principles and techniques in accordance with all applicable Actuarial Standards of Practice (ASOPs). The purpose of this analysis is to provide an estimate of the Amendment's projected additional cost to the System. Use of this presentation for any other purpose, or by anyone other than the Board of Trustees or the staff of PSERS, may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the presentation for that purpose. Buck should be asked to review any statement to be made on the basis of the results contained herein. Buck will accept no liability for any such statement made without prior review by Buck. No third party recipient of Buck's work product should rely upon Buck's work product absent involvement of Buck or without our approval.

Unless stated otherwise, references to "funded ratio" and "unfunded accrued liability" are measured using the actuarial value of assets. It should be noted that if the same measurements were made using the market value of assets, different funded ratios and unfunded accrued liabilities would result. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the System if the System were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

Ms. Terrill J. Sanchez

June 14, 2022

Page 4

These results may be used as estimates of the likely pattern of emerging costs and liabilities resulting from the Amendment's proposed changes but should not be viewed as a guarantee of actual costs. Actual future funding obligations will be determined by actuarial valuations made on future valuation dates and will likely differ from the estimates provided in this analysis.

ASOP Nos. 27 and 35 ask the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the Board do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. The Board adopted a new set of economic and demographic assumptions for the June 30, 2021, actuarial valuation based on the recommendations outlined by Buck in their 5-year experience study for the period July 1, 2015, to June 30, 2020. In the case of the Board's selection of an expected return on assets ("EROA"), we reviewed the analysis provided by the System's investment advisor as well as Buck's Financial Risk Management practice and determined the EROA assumption together with the System's other economic and demographic assumptions do not significantly conflict with what is reasonable for the purpose of the measurement.

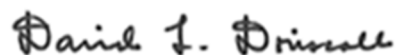
Please see the appendix for a discussion of risks of actual future measurements deviating from expected future measurements and models used in calculating the results shown in this analysis.

This cost note only provides information with regard to future funding contributions of the System. It does not provide any information regarding the impact any changes may have on financial disclosures under applicable GASB standards.

This cost note was prepared under my supervision. I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Academy's qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice and I am available to answer questions about it.

Please contact me if you have any questions concerning this report.

Sincerely,



David L. Driscoll, FSA, MAAA, EA, FCA
Principal, Consulting Actuary

Enc.

Pc: Brian Carl

Exhibit 2
Eligible Benefit Recipients
Distributed on Most Recent Effective Date of Retirement

Most recent effective date of retirement	Percentage Factor	Number of Eligible Benefit Recipients
July 2, 2000 through July 1, 2001	4.50%	1,397
July 2, 1999 through July 1, 2000	4.60%	3,417
July 2, 1998 through July 1, 1999	4.70%	6,948
July 2, 1997 through July 1, 1998	4.80%	3,942
July 2, 1996 through July 1, 1997	5.00%	5,417
July 2, 1995 through July 1, 1996	5.20%	3,347
July 2, 1994 through July 1, 1995	5.40%	1,990
July 2, 1993 through July 1, 1994	5.80%	1,869
July 2, 1992 through July 1, 1993	6.20%	4,687
July 2, 1991 through July 1, 1992	6.60%	1,732
July 2, 1990 through July 1, 1991	7.20%	1,635
July 2, 1989 through July 1, 1990	7.80%	1,429
July 2, 1988 through July 1, 1989	8.40%	1,299
July 2, 1987 through July 1, 1988	9.20%	999
July 2, 1986 through July 1, 1987	10.00%	994
July 2, 1985 through July 1, 1986	10.80%	1,171
July 2, 1984 through July 1, 1985	11.80%	909
July 2, 1983 through July 1, 1984	12.80%	788
July 2, 1982 through July 1, 1983	13.80%	624
Prior to July 2, 1982	15.00%	2,325
Total		46,919

This is an attachment to Buck's June 14, 2022 cost note on Amendment A04586 to House Bill 1578, Printer's No. 1730. Please refer to that cost note for more information.

Exhibit 3

Projected Annual Benefit Cash Flows for the Eligible Benefit Recipients

Fiscal Year Ending June 30	Current	Reflecting the Amendment Supplemental Annuity	Increase in Benefit Payments due to the Proposed Supplemental Annuity
2022	866,799,329	866,799,329	0
2023	816,615,803	862,918,990	46,303,187
2024	765,626,501	808,658,389	43,031,888
2025	714,187,939	753,982,831	39,794,892
2026	662,661,615	699,278,278	36,616,663
2027	611,408,758	644,922,014	33,513,256
2028	560,783,596	591,285,580	30,501,984
2029	511,136,074	538,735,236	27,599,162
2030	462,807,994	487,626,776	24,818,782
2031	416,126,332	438,299,614	22,173,282
2032	371,395,761	391,069,551	19,673,790
2033	328,893,362	346,222,764	17,329,402
2034	288,863,590	304,010,926	15,147,336
2035	251,513,105	264,646,014	13,132,909
2036	217,005,848	228,295,303	11,289,455
2037	185,457,752	195,075,930	9,618,178
2038	156,930,341	165,048,274	8,117,933
2039	131,428,741	138,213,935	6,785,194
2040	108,904,145	114,518,376	5,614,231
2041	89,257,630	93,854,932	4,597,302
2042	72,344,586	76,069,450	3,724,864
2043	57,979,869	60,965,662	2,985,793
2044	45,947,002	48,314,802	2,367,800
2045	36,010,326	37,868,301	1,857,975
2046	27,924,524	29,367,731	1,443,207
2047	21,441,793	22,552,291	1,110,498
2048	16,320,420	17,167,751	847,331
2049	12,332,435	12,974,448	642,013
2050	9,269,504	9,753,428	483,924
2051	6,946,968	7,310,650	363,682
2052	5,205,626	5,478,841	273,215
2053	3,912,085	4,117,848	205,763
2054	2,957,673	3,113,480	155,807
2055	2,256,119	2,375,076	118,957
2056	1,740,573	1,832,367	91,794
2057	1,360,435	1,432,156	71,721
2058	1,078,236	1,135,037	56,801
2059	866,725	912,341	45,616
2060	706,323	743,462	37,139

Exhibit 3

Projected Annual Benefit Cash Flows for the Eligible Benefit Recipients

Fiscal Year Ending June 30	Current	Reflecting the Amendment Supplemental Annuity	Increase in Benefit Payments due to the Proposed Supplemental Annuity
2061	583,079	613,714	30,635
2062	487,126	512,706	25,580
2063	411,492	433,093	21,601
2064	351,218	369,649	18,431
2065	302,714	318,594	15,880
2066	263,317	277,121	13,804
2067	231,017	243,115	12,098
2068	204,286	214,966	10,680
2069	181,948	191,438	9,490
2070	163,059	171,539	8,480
2071	146,862	154,472	7,610
2072	132,773	139,624	6,851
2073	120,338	126,519	6,181
2074	109,210	114,791	5,581
2075	99,124	104,162	5,038
2076	89,881	94,423	4,542
2077	81,339	85,425	4,086
2078	73,403	77,068	3,665
2079	66,010	69,287	3,277
2080	59,118	62,035	2,917
2081	52,697	55,282	2,585
2082	46,731	49,009	2,278
2083	41,209	43,206	1,997
2084	36,123	37,864	1,741
2085	31,470	32,978	1,508
2086	27,245	28,544	1,299
2087	23,436	24,549	1,113
2088	20,028	20,974	946
2089	17,000	17,800	800
2090	14,333	15,005	672
2091	12,002	12,563	561
2092	9,979	10,444	465
2093	8,232	8,614	382
2094	6,731	7,043	312
2095	5,451	5,703	252
2096	4,368	4,570	202
2097	3,458	3,618	160
2098	2,700	2,825	125
2099	2,076	2,171	95

Exhibit 3**Projected Annual Benefit Cash Flows for the Eligible Benefit Recipients**

Fiscal Year Ending June 30	Current	Reflecting the Amendment Supplemental Annuity	Increase in Benefit Payments due to the Proposed Supplemental Annuity
2100	1,568	1,640	72
2101	1,162	1,215	53
2102	842	881	39
2103	596	623	27
2104	411	430	19
2105	275	288	13
2106	178	187	9
2107	112	117	5
2108	68	71	3
2109	39	41	2
2110	22	23	1
2111	12	12	0
2112	6	6	0
2113	3	3	0
2114	1	1	0
2115	1	1	0
2116	0	0	0

This is an attachment to Buck's June 14, 2022 cost note on Amendment A04586 to House Bill 1578, Printer's No. 1730. Please refer to that cost note for more information.

Appendix

Actuarial Standard of Practice No. 56

ASOP No. 56 provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- third-party software in the performance of annual actuarial valuations and projections to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report

Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software or model. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within the company who are familiar with the details of the required changes.

Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important. ASOP 51 requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the Retirement System.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the Retirement System's future financial condition:

- Investment risk – potential that the investment return will be different than the 7.00% expected in the actuarial valuation
- Salary increases – potential that salary increases will be different from that assumed for the actuarial valuation

- Longevity risk – potential that participants live longer than expected from the valuation mortality assumptions
- Declining workforce – potential that future employer contribution rates will be different from expected
- Contribution risk – potential that the contribution will be different than the recommended contribution in the actuarial valuation

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the Retirement System employers to make contributions to the Retirement System when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk. Buck welcomes the opportunity to assist in such matters as part of a separate project or projects utilizing the appropriate staff and resources for those objectives.

Investment Risk: Retirement System costs are very sensitive to the market return. Returns on assets below those assumed will increase costs.

- Investment returns at less than expected levels will cause the assets to be lower than expected. This decrease in assets will increase the Retirement System cost.
- The Retirement System uses an actuarial value of assets that smooths gains and losses on market returns over a ten-year period to help control some of the volatility in costs due to investment risk.

Salary increases: Retirement System costs are sensitive to salary increases since benefits at retirement are pay related.

- Salary increases above those expected would lead to higher liabilities, larger unfunded liabilities, and larger employer contributions.
- Salaries below those expected would lead to lower liabilities but may increase employer contribution rates due to lower employer payroll.

Longevity Risk: Retirement System costs will increase as participants are expected to live longer. This is because:

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which increases the life expectancy of participants. As health care improves, Retirement System costs will increase.
- The mortality assumption used in the actuarial valuation of the Retirement System incorporates assumed future improvement in longevity. Future longevity improvements exceeding those reflected in the current mortality assumption would lead to increased Retirement System costs.
- Granting benefit improvements may increase the impact of this risk due to payment of larger benefits over a being paid for a longer time than is presently expected. Because the benefit increases are an ad hoc, one-time improvement, the increase in longevity risk may be mitigated.

Declining workforce: Employer contributions are based on a percentage of participants' salaries. If the required dollar amount of contributions remains level or increases, a declining active workforce will result in higher contribution rates in order to meet required contribution levels.

Contribution Risk: The Retirement System contribution is a budgeted amount. There is a risk associated with the employer's contribution when the budgeted amount and recommended amount differ. This is because:

- When the budgeted contribution is lower than the recommended contribution the Retirement System may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with any lower than recommended contribution amounts.