# State of Wisconsin

# Department of Employee Trust Funds Wisconsin Sick Leave Conversion Credit Programs

## December 31, 2023 Actuarial Valuation and 2018-2020 Experience Study Actuarial Audit

November 21, 2024

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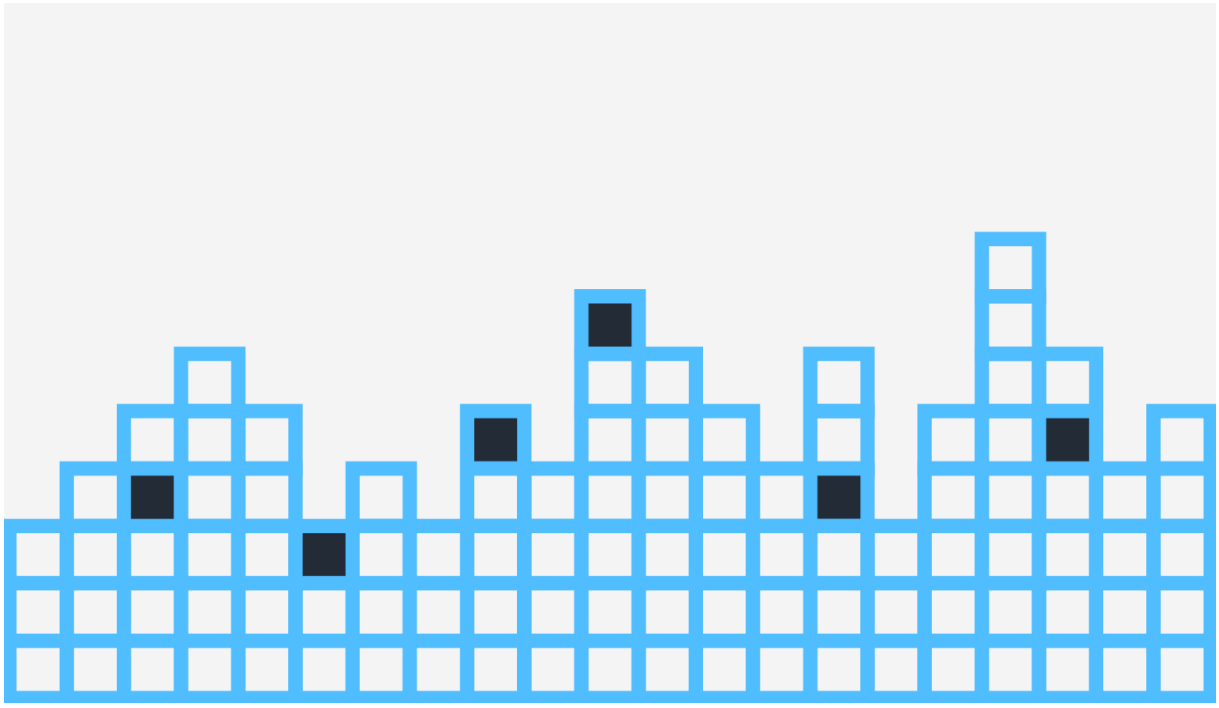

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# Certification

We have performed an actuarial audit review of the December 31, 2023 actuarial valuation report dated May 22, 2024 and the Three-Year Experience Study dated November 18, 2021 that was prepared by Gabriel, Roeder, Smith & Company (GRS) for the Wisconsin Sick Leave Conversion Credit Programs Accumulated Sick Leave Conversion Credit (ASLCC) Program and the Supplemental Health Insurance Conversion Credit (SHICC) Program. This report presents the results of our review. An overview of our findings is included in Section 1 of the report. More detailed commentary on our review process and findings is included in the latter sections.

All calculations are based on the ASLCC and SHICC Programs' plan provisions and the actuarial assumptions adopted by the Employee Trust Fund (ETF) Board. The plan provisions, assumptions and methods used are the same as those disclosed in GRS's December 31, 2023 valuation report. As discussed in our report, we believe the package of actuarial assumptions and methods is reasonable (taking into account the experience of ASLCC and SHICC and reasonable expectations). Nevertheless, the emerging costs will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as the following:

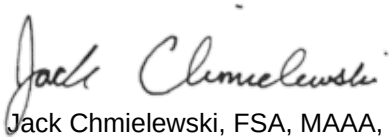
- Plan experience differing from the actuarial assumptions,
- Future changes in the actuarial assumptions,
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as potential additional contribution requirements due to changes in the Plan's funded status), and
- Changes in the plan provisions or accounting standards.

Due to the scope of this assignment, we did not perform an analysis of the potential range of such measurements.

In preparing this report, we relied, without audit, on information (both oral and in writing) furnished by ETF and GRS. We would like to express our appreciation to the ETF staff and the GRS staff for their assistance in supplying the requested information and for providing prompt responses to our questions.

The audit results have been developed using models employing standard actuarial techniques. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Actuarial Standards of Practice (ASOP) promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries. The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel. The signing actuaries are independent of ETF. We are not aware of any relationship that would impact the objectivity of our work. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



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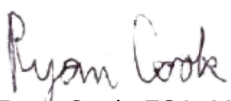

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# Section 1 Summary of Findings

## PURPOSE AND SCOPE OF THE ACTUARIAL AUDIT

In this actuarial audit, we independently calculate the key results from the December 31, 2023 actuarial valuation and review the January 1, 2018 – December 31, 2020 three-year experience study (2021 study), which was used to create the actuarial assumptions used in the valuation. The purpose of this audit is to provide an opinion regarding the reasonableness and accuracy of the actuarial assumptions, actuarial cost methods, valuation results and contribution rates. The following tasks were performed in this audit:

- Evaluation of the data used in the valuation,
- Full independent replication of the key valuation results,
- Confirmation that the actuarial assumptions are reasonable and appropriate, and
- Analysis of valuation results and reconciliation of material differences (if any).

We have also provided a brief discussion of the relevant ASOPs in **Section 8** of this audit report.

## AUDIT CONCLUSION

### Membership Data

We performed tests on the raw data supplied by GRS staff. Based on this review, we feel the individual member data used is appropriate and complete. A summary is shown in the following table:

**FIGURE 1: MEMBERSHIP DATA COMPARISON**

| | GRS | Milliman | Ratio Milliman/GRS |
|---|---|---|---|
| **ACTIVE MEMBERS** | | | |
| Count | 76,550 | 76,550 | 100.0% |
| **INACTIVE MEMBERS (NOT EMPLOYED)** | | | |
| Count | 25,621 | 25,621 | 100.0% |
| **INACTIVE MEMBER SICK LEAVE BALANCE ($ IN THOUSANDS)** | | | |
| ASLCC Sick Leave Balance | $995,769 | $995,769 | 100.0% |
| SHICC Sick Leave Balance | $1,318,689 | $1,318,689 | 100.0% |
| Total Sick Leave Balance | $2,314,458 | $2,314,458 | 100.0% |

### Actuarial Value of Assets

We reviewed the method used to determine the actuarial value of assets that was used in the December 31, 2023 valuation. We found the methodology to be appropriate and in compliance with actuarial standards of practice. It is noted that the Actuarial Value of Assets exceeds the Market Value of Assets by approximately 3.9%. However, the market value of assets is not separately identified in the report.

**Recommendation 1:** We recommend future reports include the market value of assets for informational purposes.

## Key Actuarial Components

We independently calculated the Present Value of Benefits (PVB) and Present Value of Future Earnings (PVFE) of the ASLCC and SHICC Programs; the results of which are summarized below.

**FIGURE 2: KEY ACTUARIAL COMPONENTS COMPARISON - SUMMARY**

| ($ in millions) | GRS | Milliman | Ratio Milliman/GRS |
|---|---|---|---|
| **Present Value of Benefits** | | | |
| ASLCC | $2,528.1 | $2,613.7 | 103.4% |
| SHICC | $1,474.9 | $1,560.2 | 105.8% |
| **Present Value of Future Earnings** | $58.639.8 | $57,451.2 | 98.0% |

Given the myriad of calculations in an actuarial valuation and differences in actuarial software between firms, actuarial audits are not expected to match the system's actuary's calculations exactly, and differences of up to three percent are expected. Our calculation of the PVFE was only two percent lower than GRS's, so within the desired range. Our calculation of PVB was 3.4% and 5.8% higher than GRS's for the ASLCC and SHICC plans, respectively. These differences are slightly larger than typically desired in an actuarial audit, so we had additional discussions with GRS and requested sample lives for review. In our review of the sample lives, we found that a significant portion of the difference in liabilities were attributable to the benefits from separation prior to retirement and becoming deceased while employed, which are relatively minor benefits in the plan. The most significant portion of the plan liabilities are attributed to benefits for members that retire directly from employment in the System, and we matched those liabilities relatively closely in the provided sample lives. Given our review of sample lives and the discussions with GRS, we concluded that all significant benefit provisions were accounted for in an accurate manner, the significant actuarial assumptions and methods were applied correctly, and that the differences in the results of our calculations and GRS's valuation are acceptable.

## Funding

We reviewed the application of the funding method and found it to be reasonable and in compliance with actuarial standards of practice. Based on the system's funding methods and assumptions, we believe the total recommended contribution rates were appropriately calculated. A comparison of the recommended contribution rate and the funded ratio using the Entry Age Normal actuarial cost method calculated by GRS and Milliman is shown in the table below. We're coming up with moderately higher contribution rates and funded ratios for both plans. The differences are attributable to the higher PVB amounts discussed above and are similarly acceptable.

**FIGURE 3: FUNDING COMPARISON**

| | GRS | Milliman |
|---|---|---|
| **Recommended Contribution Rate** | | |
| ASLCC | 0.9%* | 0.9%* |
| SHICC | 0.3% | 0.5% |
| Total | | |
| **Funded Ratio (Entry Age Normal)** | | |
| ASLCC | 105.5% | 101.9% |
| SHICC | 109.0% | 102.1% |

* Calculated amounts are 1.0% by GRS and 1.1% by Milliman, capped at 0.9% since can't be greater than prior year + 0.2%.

The Program's funding rates are based on the Frozen Initial Liability (FIL) cost method. The latest white paper[1] on pension plan actuarial funding policies from the Conference of Consulting Actuaries (CCA) lists the FIL cost

[1] https://www.ccactuaries.org/docs/default-source/papers/cca-actuarial-funding-policies-for-public-plans-2-final-8-2024.pdf

method as acceptable but recommends some additional disclosures based on the Entry Age cost method be included in the annual valuation reports. GRS's valuation report includes the Actuarially Accrued Liability under the Entry Age cost method but is missing some of the other recommended disclosures.

**Recommendation 2:** Add to the annual valuation report the normal cost and amortization period under the Entry Age cost method for informational purposes.

**Actuarial Assumptions (Economic)**
We reviewed the economic assumptions used in the valuation and found them to be reasonable. The economic assumptions used in the December 31, 2023 actuarial valuation were adopted based on GRS' Three Year Experience Study of the Wisconsin Retirement System completed in 2021.

**Actuarial Assumptions (Demographic)**
We reviewed the analysis and recommendations of the demographic assumptions from GRS' Three Year Experience Study completed November 18, 2021. Based on this review, we believe the demographic assumptions used in the valuation are reasonable but offer the following recommendations for improvement.

**Recommendation 3:** Provide reasoning and explain the "why" when changing methodology used to set an assumption. For example, we do not believe this was provided when updating the health care premium or sick leave balance accumulation corridor assumptions in the 2021 Experience Study.

**Recommendation 4:** When studying the participation rate, start with active member retirements and determine: (a) what fraction of them moved immediately to use sick leave credits, (b) what fraction of them initially deferred using their sick leave credits and then later started using them (for this group, also study how long, on average, members stayed in deferred use), and (c) what fraction never use their sick leave credits. This analysis would allow for the adoption of assumptions around active member retirements that more accurately reflect participant behavior.

**Recommendation 5:** The current assumption of 100% of active members commencing benefits immediately after retirement is conservative (i.e., overestimates liabilities), and an assumption more in line with participant behavior would decrease liabilities. For example, a decrease in the participation assumption by five to ten percent would decrease the liability by approximately $140-280 million. It is noted in the experience study report that the 100% immediate participation rate allows for a margin of adverse deviation. The margin should be documented, quantified, and clearly communicated.

**Recommendation 6:** Review period of time from termination to commencement for escrowed members. This group only accounts for approximately 4% of the liability, so the assumption would likely not have a material impact on the liabilities, but it would improve the accuracy of the valuation and provide a better understanding of member behavior.

**Recommendation 7:** Update the commencement age assumption for members who are active as of the valuation date but terminate in the future and defer usage of their sick leave balance to make this assumption consistent with what is used for current members that are no longer employed and deferring usage of their sick leave balance. The assumption for future terminated employees not eligible for immediate retirement is to begin usage at normal retirement age whereas the current assumption for those that are already terminated and deferring usage as of the valuation date is to begin usage at first eligibility. This would likely not have a material impact on the liabilities but would improve the internal consistency of the assumptions used in the valuation.

**Recommendation 8:** We believe it would be valuable to review if sick leave accrual rates change based on age or years of service, along with personal historical accrual patterns, which could improve the accuracy of this assumption. Without a study, it cannot be determined if this would or would not have a material impact on the calculation of liabilities.

**Recommendation 9:** Future premiums for members that are not currently using their sick leave balance as of the valuation date are based on the average premiums for 1-person contracts blended 50-50 with the average premiums for multiple-person contracts. This implies that 50% will elect multiple-person contracts which is consistent with the analysis in the experience study. However, the post-commencement mortality assumption used to value these members is single life mortality. We believe the mortality assumption should also account for the 50% probability of the member electing a multiple-person contract. This would have a moderate increase on the liabilities and would improve the internal consistency of the assumptions used in the valuation.

**Reports**

GRS's reports meet the actuarial standards of practice that apply to pension plans. We believe that, although the Wisconsin Sick Leave Conversion Credit Programs are not a pension plan, reviewing the ASLCC and SHICC reports using the pension actuarial standards of practice is a reasonable approach as sick leave plans are not specifically covered by the ASOPs. The report develops and presents the recommended contribution rates and adds commentary that is useful to both ETF and the Board.

An actuarial valuation report should satisfy the guidelines of ASOP 41, Actuarial Communications. Each actuarial valuation report should state the conclusions or findings and describe the data, assumptions, methods, and plan provisions used to arrive at the stated findings. The information contained in the actuarial valuation report should be stated with "sufficient clarity" that another qualified actuary with expertise in the same practice area could make an objective appraisal of the reasonableness of the work presented in the report (ASOP 41, Section 3.2). In addition, ASOPs 4, 6, 23, 27, 35, 44, 51, and 56 require the actuary to provide certain information in their reports. The complexity and uniqueness of the Program operations requires a significant amount of disclosure to allow another actuary to form such an opinion. We recommend the following addition to aid another actuary's review of the report be considered for future valuation reports.

**Recommendation 10:** Include the extent for which the census data was reviewed.

# Section 2 Membership Data

**AUDIT CONCLUSION**

We performed tests on the raw data supplied by ETF staff that GRS used in the valuation. Based on this review, we feel the individual member data used is appropriate and complete.

**COMMENTS**

Overall, the data process appears to be thorough and accurate. We have the following comments:

**Raw Data**: We were provided with the same data that was given by ETF staff to GRS for use in the actuarial valuation.

**Completeness:** The data contained all the necessary fields to perform the actuarial valuation. Additional knowledge of the "Curr Empt Cat" was needed to map for eligibility purposes.

**Quality:** Although we did not audit the data at the source, we performed some independent checks to confirm the overall reasonableness of the data. We compared the total retiree and beneficiary premium amounts from the ETF data with the actual premiums shown in the report, as reported in ETF's financial statements. We also compared the total active member compensation from the ETF data with the estimated active payroll for the prior year. The estimated payroll was based on the actual employer contribution amounts divided by the applicable employer contribution rates for the prior year. Based on this analysis, we found the data to be reasonable.

**Parallel Data Processing**: We performed independent edits on the raw data and then compared our results with the summary of valuation results provided in GRS' valuation report. We found our results to be very consistent. A summary of the data in aggregate is shown in Figure 4. The "Milliman" column reflects the ETF data after adjustments by Milliman. The "GRS" column reflects the census-related information contained in GRS's valuation report.

**FIGURE 4: MEMBERSHIP DATA COMPARISON**

| | GRS | Milliman | Ratio Milliman/GRS |
|---|---|---|---|
| **ACTIVE MEMBERS** | | | |
| Count | 76,550 | 76,550 | 100.0% |
| Average Age in years | 44.4 | 44.4 | 100.0% |
| Average Service in years | 10.4 | 10.3 | 99.0% |
| Average Sick Leave Days | 77.6 | 77.6 | 100.0% |
| **INACTIVE MEMBERS** | | | |
| Retiree – Single Coverage | 9,664 | 9,654 | 99.9% |
| Retiree – Multi Coverage | 9,414 | 9,426 | 100.1% |
| Escrowed/On-Hold | 6,019 | 6,019 | 100.0% |
| Terminated Vested | 524 | 524 | 100.0% |
| Total Inactive Count | 25,621 | 25,621 | 100.0% |
| **INACTIVE MEMBER SICK LEAVE BALANCE ($ IN THOUSANDS)** | | | |
| ASLCC Sick Leave Balance | 995,769 | 995,769 | 100.0% |
| SHICC Sick Leave Balance | 1,318,689 | 1,318,689 | 100.0% |
| Total Sick Leave Balance | 2,314,458 | 2,314,458 | 100.0% |
| **AVERAGE MONTHLY NET PREMIUM** | | | |
| Retiree – Single Coverage – Non-Medicare | $988.10 | $965.13 | 97.7% |
| Retiree – Single Coverage – Medicare | $428.96 | $432.29 | 100.8% |
| Retiree – Multi Coverage – Non-Medicare* | $2,382.55 | $2,295.98 | 96.4% |
| Retiree – Multi Coverage – Medicare* | $790.48 | $796.08 | 100.7% |
| Blended Net Premium – Non-Medicare | $1,685.33 | $1,630.56 | 96.7% |
| Blended Net Premium – Medicare | $609.72 | $614.19 | 100.7% |

* Excludes split contracts where one person covered is non-Medicare and the other is Medicare.

# Section 3 Actuarial Value of Assets

**AUDIT CONCLUSION**

We reviewed the methodology used to calculate the actuarial value of assets that was used in the December 31, 2023 valuation. We found the methodology to be appropriate and in compliance with actuarial standards of practice.

**COMMENTS**

The actuarial value of assets was used in determining the plan's unfunded liability as of December 31, 2023. The amounts shown in GRS' report are the Market Recognition Account (MRA) as provided by ETF. The MRA recognizes assumed returns fully each year. Differences between the actual return and expected return are phased in over a 5-year period. The objective is to give recognition to long-term changes in asset values while minimizing the effect of short-term fluctuations in the capital markets.

Using the MRA accounting of assets is a reasonable approach in determining the plan's unfunded actuarial liability.

In the Comments section of the report, GRS makes the observation that the actuarial value of assets exceeds the market value of assets by 3.9%. However, the market value of assets is not separately identified in the report.

**Recommendation 1:** We recommend future reports include the market value of assets for informational purposes.

# Section 4 Key Actuarial Components

**AUDIT CONCLUSION**

We independently calculated the key actuarial components for the ASLCC and SHICC programs as of December 31, 2023. Under the applicable actuarial cost method, the key actuarial components are the Present Value of Benefits and the Present Value of Future Earnings. We found that all significant benefit provisions were accounted for in an accurate manner, the actuarial assumptions and methods were applied correctly, and our total present values are moderately close to GRS's calculations.

**COMMENTS**

We independently calculated the present value of benefits for all members and the present value of future earnings for active members based on the following:

**Data:** We used the same data provided to GRS in its valuation. As discussed in Section 2, we confirmed that this data was consistent with the data provided by ETF staff. We also used GRS's blended net premium amounts.

**Assumptions:** We used the assumptions disclosed in the December 31, 2023 actuarial valuation report. This information was provided to us electronically by GRS. We confirmed the assumptions were consistent with those adopted based on the recent experience study report.

**Methods:** We used the actuarial methods disclosed in the December 31, 2023 actuarial valuation report. This was supplemented by discussions between GRS and Milliman on the technical application of these methods.

**Benefits:** We obtained this information from the ETF website.

We then performed a full replication of GRS's valuation as of December 31, 2023, and made a detailed comparison of the Actuarial Present Value of Benefits (PVB) and Present Value of Future Earnings (PVFE) computed in our independent replication and the amounts reported by GRS.

Figure 5 shows a summary of this analysis, separately for current inactive members (i.e., terminated vested members, escrowed retirees, and retirees using sick leave credits) and active employees. The results for each group were reasonable, and our calculated present values match moderately close with those reported in the valuation. The exhibit separately reports the ASLCC and SHICC plan liabilities, consistent with the GRS valuation report. To calculate the SHICC liabilities, GRS uses their valuation system to calculate (1) the present value of benefits for the base plan and (2) the present value of benefits for the combination of base plan and supplemental plan. Using the output from their valuation system, GRS then calculates the present value of benefits for the supplemental plan by subtracting (2) from (1). Mathematically, this is equivalent to calculating the present value of benefits for the supplemental plan directly from the valuation system. We followed the same approach to calculate the Milliman values in Figure 5.

**FIGURE 5: KEY ACTUARIAL COMPONENTS COMPARISON**

| ($ in millions) | GRS | Milliman | Ratio Milliman/GRS |
|---|---|---|---|
| **PRESENT VALUE OF BENEFITS** | | | |
| **(1) ASLCC** | | | |
| Current Inactive Members | $585.1 | $584.2 | 99.9% |
| Active Members | $1,943.0 | $2,029.5 | 104.4% |
| Total Base Plan PVB | $2,528.1 | $2,613.7 | 103.4% |
| **(2) ASLCC PLUS SHICC** | | | |
| Current Inactive Members | $1,201.3 | $1,198.1 | 99.7% |
| Active Members | $2,801.7 | $2,975.8 | 106.2% |
| Total Base plus Supplemental Plan PVB | $4,003.0 | $4,173.9 | 104.3% |
| **(3) SHICC [(2) - (1)]** | | | |
| Current Inactive Members | $616.2 | $613.9 | 99.6% |
| Active Members | $858.7 | $946.3 | 110.2% |
| Total Supplemental Plan PVB | $1,474.9 | $1,560.2 | 105.8% |
| **Present Value of Future Earnings** | $58,639.8 | $57,451.2 | 98.0% |

There will always be differences in the calculated liabilities when different software is used by different actuaries; however, the results should not deviate significantly. The ratios of the present value of benefits for ASLCC and the combination of ASLCC plus SHICC match closely for current inactive members, and moderately close for active members and in total. With the exception of the 110.2% ratio for active members, the ratios for the SHICC plan also match closely. We are comfortable with this result due to the leverage that exists in the way the SHICC plan works. When a member retires, the accumulated sick leave conversion balance for the ASLCC plan is used to pay for health insurance premiums. After the balance for the base plan is exhausted, then the balance for the SHICC plan is used. The liability of the SHICC plan is calculated as the difference between the total liability and the ASLCC plan liability. Therefore, a small difference in the value of the ASLCC plan liability or the total liability can lead to a larger difference in the SHICC plan liability.

Our audit provides assurance that the results of the valuation reasonably reflect the aggregate liabilities of Sick Leave Conversion Credit Program based on the assumptions and methods. The differences in the PVB are slightly larger than desired in an actuarial audit. Based on our review of sample lives and discussions with GRS, we believe a significant portion of the differences are attributable to the benefits from separation prior to retirement and becoming deceased while employed. We can explore further if requested by ETF or the Board.

In addition to reviewing the liabilities in total, we also received selected results from a number of individuals included in the valuation. In reviewing the active member individual liability samples provided by GRS, we were able to closely match the sick leave credits for an age 65 retirement. We were also able to closely match the liabilities under the retirement and disability decrements. We are calculating larger liabilities for the withdrawal and pre-retirement death decrement than those shared by GRS, so further investigation with GRS to identify the discrepancies in the valuation methods for these minor decrements could lead to improvements in our total liability match, additional recommendations, or both. However, these two decrements combined make up less than 5% of the active member liabilities, so our conclusion is still that the valuation results in aggregate are reasonable.

# Section 5 Funding

**AUDIT CONCLUSION**

We reviewed the application of the funding method and found it to be reasonable and in accordance with the actuarial standards of practice that apply to pension valuations. We believe the application of pension valuation standards to the valuation of the Sick Leave Conversion Credit Program is appropriate. Based on the system's funding methods and assumptions, we believe the recommended contribution rates were appropriately calculated.

**COMMENTS**

**Contribution Adequacy:** The Conference of Consulting Actuaries Public Plans Community (CCA PPC) published a paper on model actuarial funding policies which includes guidance for pension funding. Although the Sick Leave Conversion Credit Program is not a pension plan, we believe that applying pension funding principles to the program is a reasonable approach. The method of making contributions equal to the normal cost plus Unfunded Actuarial Accrued Liability (UAAL) payments and using 5-year asset smoothing fall into the "Acceptable Practices" category as defined by the CCA PPC white paper.

Wisconsin statute limits the contribution rate for the ASLCC program to be no more than the prior valuation's calculated rate plus 0.2%. As noted below, this limitation impacted the calculation of the ASLCC contribution rate as of December 31, 2023. This type of limit on the year-to-year change in contribution rates is known as a contribution collar and falls into the "Non-Recommended Practices" category as defined by the CCA PPC white paper. The white paper explains that "Contribution collars have the policy drawback that the collar parameters arbitrarily override the contribution results produced by the other funding policy parameters (including asset smoothing), each of which have a well-developed rationale." However, given this is a statutory provision, we have not included any recommendation for ETF or GRS in this report related to this practice.

**Actuarial Cost Method:** The purpose of any cost method is to allocate the cost of future benefits to specific time periods. Most public plans follow one of a group of generally accepted funding methods, which allocate the cost over the members' working years. In this way, benefits are financed during the time in which services are provided. The program uses the Frozen Initial Liability actuarial cost method. We agree that it is appropriate for valuing the costs and liabilities of the program.

The Frozen Initial Liability Actuarial Cost Method with separate normal cost rates calculated for the ASLCC and SHICC Plans falls in the "Acceptable Practice" category as defined by the CCA PPC white paper so long as the valuation report also discloses the Actuarial Accrued Liability, normal cost, and amortization period calculated under the Entry Age Normal actuarial cost method, and monitors contribution volatility. The GRS report discloses the Entry Age Normal actuarial accrued liability and funded ratio but not the normal cost or amortization period.

**FIGURE 6: FUNDING COMPARISON**

| | GRS | Milliman |
|---|---|---|
| **Recommended Contribution Rate** | | |
| ASLCC | 0.9%* | 0.9%* |
| SHICC | 0.3% | 0.5% |
| Total | | |
| **Funded Ratio (Entry Age Normal)** | | |
| ASLCC | 105.5% | 101.9% |
| SHICC | 109.0% | 102.1% |

* Calculated amounts are 1.0% by GRS and 1.1% by Milliman, capped at 0.9% since can't be greater than prior year + 0.2%.

**Recommendation 2:** Add to the annual valuation report the normal cost and amortization period under the Entry Age cost method for informational purposes.

# Section 6 Actuarial Assumptions (Economic)

An actuarial valuation uses various methods and two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its long-term impact on the Program, or to the operation of the Program itself. Demographic assumptions are based on the emergence of the specific experience of the Program's members. This section of the report will focus on the economic assumptions. The following section will address the demographic assumptions.

**AUDIT CONCLUSION**

We completed a high-level review of the economic assumptions used in the December 31, 2023. Based on this review, we believe the economic assumptions used in the valuation are reasonable.

**COMMENTS**

The economic assumptions used in the December 31, 2023 actuarial valuation were adopted based on GRS's Actuarial Experience Study of the Wisconsin Retirement System completed in 2021. The overall package of economic assumptions is reasonable.

**Actuarial Standard of Practice No. 27: Selection of Economic Assumptions**

Actuarial Standard of Practice (ASOP) No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans. While ASOP 27 does not directly apply to the ASLCC and SHICC Programs because they are not a pension plan, we believe ASOP 27 provides a reasonable framework for the evaluation of the assumptions used in the actuarial valuation of these Programs.

As the future is unknown, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. ASOP 27 explicitly advises the actuary not to give undue weight to recent experience.

Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period and should be expected to have no significant bias.

After completing the selection process, the actuary should review the set of economic assumptions for consistency. This may entail the actuary using the same inflation component in each of the economic assumptions selected.

An actuary's estimate with respect to a particular measurement of obligations may change from time to time due to changing conditions or emerging plan experiences. Even if assumptions are not changed, we believe that the actuary should be satisfied that each of the economic assumptions selected for a particular measurement complies with Actuarial Standard of Practice No. 27, unless that assumption has been prescribed by someone with the authority to do so.

**Economic Assumptions**

Based on the information and economic environment present as of the date of GRS's analysis, we believe the economic assumptions used by GRS in the December 31, 2023 actuarial valuation are reasonable and consistent with ASOP 27.

**FIGURE 7: ECONOMIC ASSUMPTIONS**

| | 12/31/2023 Valuation Rate |
|---|---|
| **Investment Return** | |
| Price Inflation | 2.4% |
| Real Investment Return | 4.4% |
| Total Investment Return | 6.8% |
| **Wage Inflation** | |
| Price Inflation | 2.4% |
| Real Wage Growth | 0.6% |
| Total Wage Inflation Rate | 3.0% |

The Board should be aware that the measured liabilities and normal cost rate are directly impacted by these important assumptions. The most critical assumption in determining the present value of benefits is the total investment return assumption.

### Inflation

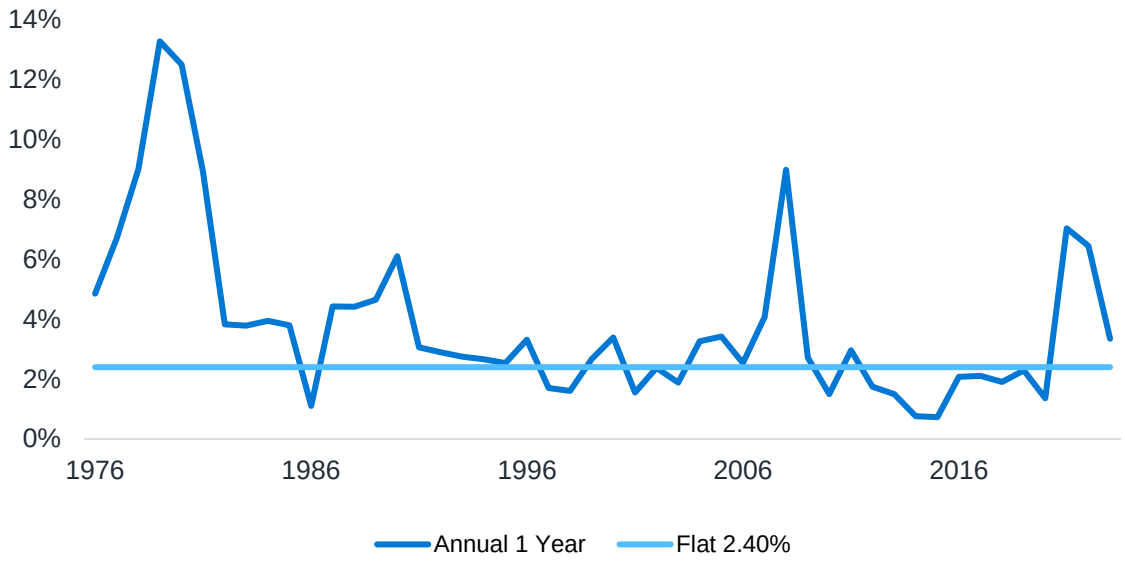
**Use in the Valuation:** Inflation, as referred to here, means price inflation. The inflation assumption has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, general wage increases, and the health care cost trend.

There is expected to be a long-term relationship between inflation and the investment return assumption. The basic principle is that the investors demand a “real return” – the excess of actual investment returns over inflation. If inflation rates are expected to be high, investors will demand expected investment returns that are also expected to be high enough to exceed inflation, while lower inflation rates will result in lower demanded expected investment returns, at least in the long run.

**Historical Perspective:** The data for inflation shown below is based on the national Consumer Price Index, US City Average, All Urban Consumers (CPI-U) as published by the Bureau of Labor Statistics.

National and local inflation have tracked fairly closely over the long-term period.

**FIGURE 8: HISTORICAL CPI-U**




**Milliman's Internal Capital Market Assumptions:** Milliman's investment consulting practice develops expected long-term capital market returns based on current yields and valuation levels, published surveys of expert forecasts of real GDP growth and inflation, and historical risk measures of asset class return volatility and covariance. As of December 31, 2023 these assumptions used 2.30% price inflation.

**Conclusion:** We believe that a 2.4% assumption is reasonable for an actuarial valuation of the Program. This assumption should continue to be monitored in the future.

**Investment Return**

**Use in the Valuation:** The investment return assumption is one of the primary determinants in the calculation of the expected cost of Program's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. This assumption has a direct impact on the calculations of present value of benefits, present value of future earnings, and recommended contribution rates.

The discount rate is the rate used to discount future benefit payments into an actuarial present value. The traditional actuarial approach used for public sector funding sets the discount rate equal to the expected investment return.

**Asset Allocation:** A key determinant of the investment return assumption is the asset allocation of the fund. For our analysis we gathered the 2024 Asset Allocation Targets from the SWIB website. We reviewed the 2024 Asset Allocation Targets to ensure that the expected rate of return used for the December 31, 2023 valuation, which was set based on the 2018-2020 experience study, is still a reasonable assumption The sum of these targets is 112%. The SWIB website includes the footnote "Totals exceed 100% due to SWIB's overall leverage of Core Fund assets." We added a -12% allocation to US Cash is a proxy for the borrowing cost of the leverage to get the following asset allocation for our analysis.

**FIGURE 8: ASSET ALLOCATION TARGETS**

| Asset Class | 2024 Asset Allocation Target | Index |
|---|---|---|
| **US Cash** | -12% | BAML 30Month T-Bill |
| **US Core Fixed Income** | 27% | Bloomberg Barclays Aggregate |
| **US Inflation-Indexed Bonds** | 19% | Bloomberg US Treasury US TIPS |
| **Global Equity** | 40% | MSCI ACWI NR |
| **Global REITs** | 8% | FTSE EPRA NAREIT Developed |
| **Private Equity/Debt** | 18% | Cambridge Associates US Private Equity |

**Milliman's Internal Capital Market Assumptions:** We independently reviewed the investment return using our standard model to develop expected investment return assumptions using Milliman's capital market assumptions. The table below shows Milliman's expected 25th, 50th and 75th percentile returns for 10, 20 and 30 year periods based on our capital market assumptions as of January 1, 2024. The percentile return refers to the likelihood that the actual return over the period will be less than the stated result. For example, we estimate that there is a 25% probability that over the next 30 years the return will be less than 5.60%. Underlying our expected investment return assumption is a 2.30% assumption for long-term average inflation.

Administrative and investing fees reduce the gross return available to the Plan for use in paying benefits. The returns used in our model are net of investment fees, and we applied a 5 basis point reduction to account for administrative fees in developing the table below.

**FIGURE 9: EXPECTED NET INVESTMENT RETURNS FOR VARIOUS TIME HORIZONS AFTER REFLECTING EXPECTED EXPENSES**

| | 10 Year Period | 20 Year Period | 30 Year Period |
|---|---|---|---|
| **75th Percentile Return** | 9.50% | 9.08% | 8.85% |
| **50th Percentile Return** | 6.65 | 7.07 | 7.22 |
| **25th percentile return** | 3.87 | 5.10 | 5.60 |

Our analysis included an inflation assumption of 2.3%, compared to the 2.4% inflation assumption used in the valuation. Factoring in this difference in underlying inflation assumptions, and based on Milliman's capital market assumptions, we believe the 6.8% investment return assumption used by GRS is reasonable.

**Conclusion:** We find the 6.8% expected return assumption is reasonable.

### Health Care Trend

The health care trend assumption used for the Sick Leave Program begins with near-term trend assumption and declines over time to an ultimate trend rate. The near-term rates reflect the increases in the current cost of health care goods and services. The process trending down to a lower ultimate trend relies on the theory that premium levels will moderate over the long-term, otherwise the health care sector would eventually consume the entire GDP. It is on this basis that projected premium rate increases continue to exceed wage inflation for the next eleven years, beginning with a first-year rate of 5.50% until the ultimate rate of 3.5%. The Society of Actuaries releases the Getzen trend model based on a similar premise, however the ultimate rate is generally further into the future. We believe this assumption to be reasonable.

# Section 7 Actuarial Assumptions (Demographic)

**AUDIT CONCLUSION**

We completed a high-level review of the valuation assumptions that were recommended in GRS's 2021 actuarial experience study. Based on this review, we believe the demographic assumptions used in the valuation are reasonable but offer the following recommendations for improvement.

**COMMENTS**

Studies of demographic experience involve a detailed comparison of actual and expected experience. If the actual experience differs significantly from the overall expected results, or if the actual pattern does not follow the expected pattern, new assumptions should be considered. Recommended revisions normally are not an exact representation of the experience during the observation period. Judgment is required to predict future experience from past trends and current evidence, including a determination of the amount of weight to assign to the most recent experience.

We did not independently perform the detailed calculations of the actual and expected rates that GRS did, but we reviewed the assumptions based the data provided in GRS's report on our experience with similar systems.

**Actuarial Standard of Practice No. 35: Selection of Demographic Assumptions**

Actuarial Standard of Practice No. 35 (ASOP 35) governs the selection of demographic and other noneconomic assumptions for measuring pension obligations. ASOP 35 states that the actuary should use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

**Actual-to-Expected Ratio**

In performing an experience study, an actuary will compare the actual results of the study with those the assumptions would have predicted. This comparison is called the Actual-to-Expected (A/E) ratio. If, for example, the A/E ratio for service retirement is 120%, this would indicate that the actual number of service retirements exceeded the number expected by the assumptions by 20%.

As noted, we did not independently calculate the A/E ratios, but we do comment on some of the ratios that were determined by GRS.

**Health Care Premiums**

For all non-active annuitants (i.e. current actives, preserved members and on-hold/escrowed retirees), a blended net premium of 50% 1-person and 50% multiple-person coverage is used. From 2018 – 2020 the actual election percentage was approximately 51% 1-person coverage and 49% multiple-person coverage. The use of the actual annual split was replaced with a 50/50 split. We believe the use of this assumption to be a reasonable simplification, although additional reasoning for the change in assumption should be provided.

**Recommendation 3:** In the experience study reports, provide reasoning and explain the "why" when changing methodology used to set an assumption. For example, we do not believe this was provided when updating the health care premium or sick leave balance accumulation corridor assumptions in the 2021 Experience Study.

**Salary Adjustment Factors**

The salary adjustment factor assumption used for the Sick Leave Program is the same as that used for the Wisconsin Retirement System. We believe this assumption to be reasonable.

**Rates of Service Retirement**
The rates of retirement assumption used for the Sick Leave Program is the same as that used for the Wisconsin Retirement System. We believe this assumption to be reasonable.

**Rates of Disability Retirement**
The rates of disability assumption used for the Sick Leave Program is the same as that used for the Wisconsin Retirement System. We believe this assumption to be reasonable.

**Rates of Termination (Withdrawal)**
The rates of termination assumption used for the Sick Leave Program is the same as that used for the Wisconsin Retirement System. We believe this assumption to be reasonable.

**Participation for Future Retirees**
**Experience Study Methodology:** The Three-Year Experience Study reviewed the participation rate. Our understanding of the methodology used is that all retired members using sick leave credits as of each valuation date during the study period were examined. For each of these members, GRS determined whether the member began using sick leave credits immediately after retirement or if they were in escrow status temporarily.

However, a participation rate assumption should determine what percentage of eligible members that retire ultimately end up using sick leave credits versus what percentage of them never use their balance. Based on our understanding of GRS's analysis, which uses the population currently using their balance for the study, it does not seem like it's capturing the eligible active members that retire and never use their balance.

**Recommendation 4:** When studying the participation rate, start with active member retirements and determine: (a) what fraction of them moved immediately to use sick leave credits, (b) what fraction of them initially deferred using their sick leave credits and then later started using them (for this group, also study how long, on average, members stayed in deferred use), and (c) what fraction never use their sick leave credits. This analysis would allow for the adoption of assumptions around active member retirements that more accurately reflect participant behavior.

**Valuation Assumption:** The valuation assumption is that 100% of eligible active members will begin using their sick leave credits immediately after retirement. In practice some go into escrow and then later start using benefits and others will never use any benefits.

**Recommendation 5:** The current assumption of 100% of active members commencing benefits immediately after retirement is conservative (i.e., overestimates liabilities), and an assumption more in line with participant behavior would decrease liabilities. For example, a decrease in the participation assumption by five to ten percent would decrease the liability by approximately $140-280 million. It is noted that the 100% immediate participation rate allows for a margin of adverse deviation. The margin should be documented, quantified, and clearly communicated.

**Commencement of Escrowed and Terminated Vested Members**
Half of escrowed members as of the valuation date are assumed to commence benefits immediately. The 50% assumption is consistent with member experience shown in the 2021 Experience Study. The immediate commencement assumption is a simplification. While this group only accounts for approximately 4% of the liability, it may be worth exploring reviewing the period of time from termination to commencement for escrowed members.

All terminated vested members as of the valuation date are assumed to commence benefits as soon as they reach eligibility to do so. This 100% participation assumption is consistent with that used for active members. If the active membership participation rate is re-considered, this one should be as well. Also, the post-withdrawal commencement age assumptions for members who are active as of the valuation date is normal retirement age, which is inconsistent with the terminated vested commencement assumption of first eligibility.

**Recommendation 6:** Review period of time from termination to commencement for escrowed members. This group only accounts for approximately 4% of the liability, so the assumption would likely not have a material impact on the liabilities, but it would improve the accuracy of the valuation and provide a better understanding of member behavior.

**Recommendation 7:** Update the commencement age assumption for members who are active as of the valuation date but terminate in the future and defer usage of their sick leave balance to make this assumption consistent with what is used for current members that are no longer employed and deferring usage of their sick leave balance. The assumption for future terminated employees not eligible for immediate retirement is to begin usage at normal retirement age whereas the current assumption for those that are already terminated and deferring usage as of the valuation date is to begin usage at first eligibility. This would likely not have a material impact on the liabilities but would improve the internal consistency of the assumptions used in the valuation.

**Accumulation and usage of Sick Leave Credits**

The sick leave accumulation assumption is calculated assuming each individual's historical sick leave usage will continue at the same rate as in the past, but not more than 100% and not less than 25% of their gross accrual rate. Previously, the corridor was limited to no more than 75% of their gross accrual. We believe it would be valuable to review if accrual rates change based on age or years of service, which could improve the accuracy of this assumption. We believe this assumption to be reasonable, although additional reasoning for the change in assumption should be provided. We believe it would be valuable to review if accrual rates change based on age or years of service, which could improve the accuracy of this assumption.

**Recommendation 8:** We believe it would be valuable to review if sick leave accrual rates change based on age or years of service, along with personal historical accrual patterns, which could improve the accuracy of this assumption. Without a study, it cannot be determined if this would or would not have a material impact on the calculation of liabilities.

**Post-Retirement Mortality**

The mortality assumption used for the Sick Leave Program is the same as that used for the Wisconsin Retirement System. We believe this assumption to be reasonable. The exception to this is for retirees with two-party coverage, GRS assumes no mortality assumption. We believe this is a reasonable approach based on sick leave balances and health premiums.

In the December 31, 2023 valuation, GRS used single-coverage mortality for all members not currently using sick leave credits. This is inconsistent with the premium amounts used for these members which assume that 50% will elect multi-party coverage as noted in Recommendation 9.

**Recommendation 9:** Future premiums for members that are not currently using their sick leave balance as of the valuation date are based on the average premiums for 1-person contracts blended 50-50 with the average premiums for multiple-person contracts. This implies that 50% will elect multiple-person contracts which is consistent with the analysis in the experience study. However, the post-commencement mortality assumption used to value these members is single life mortality. We believe the mortality assumption should also account for the 50% probability of the member electing a multiple-person contract. This would have a moderate decrease on the liabilities and would improve the internal consistency of the assumptions used in the valuation.

# Section 8 Reports

**AUDIT CONCLUSION**

GRS's reports meet the actuarial standards of practice that apply to pension plans. We believe that, although the Wisconsin Sick Leave Conversion Credit Programs are not a pension plan, reviewing the ASLCC and SHICC reports using the pension actuarial standards of practice is a reasonable approach as sick leave plans are not specifically covered by the ASOPs. The report develops and presents the recommended contribution rates and adds commentary that is useful to both ETF and the Board.

An actuarial valuation report should satisfy the guidelines of ASOP 41, Actuarial Communications. Each actuarial valuation report should state the conclusions or findings and describe the data, assumptions, methods, and procedures used to arrive at the stated findings. The information contained in the actuarial valuation report should be stated with "sufficient clarity" that another qualified actuary with expertise in the same practice area could make an objective appraisal of the reasonableness of the work presented in the report (ASOP 41, Section 3.2). In addition, ASOPs 4, 6, 23, 27, 35, 44, 51, and 56 require the actuary to provide certain information in their reports. The complexity and uniqueness of the Program operations requires a significant amount of disclosure to allow another actuary to form such an opinion. We recommend the following addition to aid another actuary's review of the report be considered for future valuation reports.

**Recommendation 10:** Include the extent for which the census data was reviewed.

**COMMENTS**

**Purpose of ASOPs**

A brief overview of the purpose that the ASOPs serve is as follows:

- The ASOPs provide actuaries: "guidance on the techniques, applications, procedures, and methods that reflect appropriate actuarial practices in the U.S."[2]
- Members of actuarial organizations in the U.S. are required "to satisfy applicable ASOPs when rendering actuarial services in the U.S."[3]
- "While these ASOPs are binding, they are not the only considerations that affect an actuary's work. Other considerations may include legal and regulatory requirements, professional requirements promulgated by employers or actuarial organizations, evolving actuarial practice, and the actuary's own professional judgment informed by the nature of the engagement. The ASOPs provide a basic framework that is intended to accommodate these additional considerations."[3]

**Description of Relevant ASOPs**

The December 31, 2023 Wisconsin Sick Leave Conversion Credit Programs Actuarial Valuation Report met many aspects of the ASOPs:

- The Actuary reviews the demographic assumptions to determine if they are still reasonable (ASOP 35, Section 3.9).
- Information regarding the member population was presented in some detail, permitting a reader to understand the number of covered members with different statuses, and the benefits being used by retired members (ASOP 6, Section 3.5).
- The source of the data is disclosed (ASOP 23, Section 4.1).
- The report is dated (ASOP 41, Section 4.1.2).
- The report includes the scope, purpose, and intended users of the report (ASOP 41, Section 4.1.3).

[2] https://www.actuary.org/content/actuarial-standards-practice-asops

[3] https://www.actuarialstandardsboard.org/wp-content/uploads/2013/10/asop001_170.pdf

- It is stated that the demographic assumptions were based on the Statewide Retirement System, including disclosing information such as the date of the last experience study of the Statewide Retirement System demographic assumptions (ASOPs 27 and 35, Section 4.1.2).
- The report discloses that the use, inputs, and design of any actuarial models that were used are consistent with the intended purpose (ASOP 56, Section 3.1.3).
- The description of the mortality assumptions indicates whether or not a margin for future longevity improvements has been included (ASOP 35, Section 4.1.1).

We did identify one minor aspect of the report that did not meet the ASOPs:

- The certification did not disclose that the census data was reviewed and to what extent (ASOP 23, Section 4.1).

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