



STATE OF WISCONSIN POSTRETIREMENT LIFE INSURANCE PLAN (STATE)

GASB 74 and 75 DISCLOSURE Fiscal Year Ending: December 31, 2019

Prepared by

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Certification

Actuarial computations presented in this report under Statements No. 74 and 75 of the Governmental Accounting Standards Board are for purposes of assisting the Department of Employee Trust Funds (ETF) in fulfilling its financial accounting requirements. No attempt is being made to offer any accounting opinion or advice. This report is for the fiscal year ending December 31, 2019. The reporting date for determining plan assets and obligations is December 31, 2019. The calculations enclosed in this report have been made on a basis consistent with our understanding of the plan provisions. Determinations for purposes other than meeting financial reporting requirements may be significantly different than the results contained in this report. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security or meeting employer funding requirements.

In preparing this report, we relied, without audit, on information as of January 1, 2019 and December 31, 2019 furnished by the ETF and Securian. This information includes, but is not limited to, statutory provisions, member census data, and financial information. The membership as of January 1, 2019 includes 49,813 active participants and 34,176 retirees.

We performed a limited review of the census and financial information used directly in our analysis and have found them to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

We hereby certify that, to the best of our knowledge, this report, including all costs and liabilities based on actuarial assumptions and methods, is complete and accurate and determined in conformance with generally recognized and accepted actuarial principles and practices, which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Code of Professional Conduct, amplifying Opinions and supporting Recommendations of the American Academy of Actuaries.

This valuation report is only an estimate of the plan's financial condition as of a single date. It can neither predict the plan's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of plan benefits, only the timing of plan contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuarial assignment, we did not perform an analysis of the potential range of such future measurements.

Certification

Milliman's work is prepared solely for the internal use and benefit of the Wisconsin Department of Employee Trust Funds. 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: (a) the Plan Sponsor may provide a copy of Milliman's work, in its entirety, to the Plan Sponsor's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the Fund; and (b) the Plan Sponsor may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

This report and its use are subject to the terms of our Consulting Services Agreement with the Wisconsin Department of Employee Trust Funds dated October 1, 2014.

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 specific needs.

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 the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and has been prepared in accordance with generally recognized accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.



John M. Chmielewski, FSA, EA, MAAA
Principal and Consulting Actuary



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Executive Summary

Overview of GASB 74 and GASB 75

The Governmental Accounting Standards Board (GASB) released new accounting standards for public postemployment benefit plans other than pension (OPEB) and participating employers in 2015. These standards, GASB Statements No. 74 and 75, have substantially revised the accounting requirements previously mandated under GASB Statements No. 43 and 45. The most notable change is that the Annual Required Contribution (ARC) has been eliminated and the Net OPEB Liability will be an item on the employer's financial statement rather than a footnote entry.

GASB 74 applies to financial reporting for public OPEB plans and is required to be implemented for plan fiscal years beginning after June 15, 2016. Note that a plan's fiscal year might not be the same as the employer's fiscal year. Even if the plan does not issue standalone financial statements, but rather is considered a trust fund of a government, it is subject to GASB 74. Under GASB 74, enhancements to the financial statement disclosures are required, along with certain required supplementary information.

GASB 75 governs the specifics of accounting for public OPEB plan obligations for participating employers and is required to be implemented for employer fiscal years beginning after June 15, 2017. GASB 75 requires a liability for OPEB obligations, known as the Net OPEB Liability (Total OPEB Liability for unfunded plans), to be recognized on the balance sheets of participating employers. Changes in the Net OPEB Liability (Total OPEB Liability for unfunded plans) will be immediately recognized as OPEB Expense on the income statement or reported as deferred inflows/outflows of resources depending on the nature of the change.

Notes to Financial Statements

Statement No. 74 - Notes to Stand-Alone Plan Financial Statements

OPEB Plan description	<ul style="list-style-type: none"> ▪ Plan name, administrator, and classification ▪ Identification of board of trustees ▪ Participating employers and nonemployer contributing entities as applicable ▪ Plan eligibility and coverage, key benefit terms, and membership counts ▪ Contribution requirements, bases, amounts, sources, and authority
Significant assumptions and inputs	<ul style="list-style-type: none"> ▪ Items such as (but not limited to) discount rate basis and derivation, mortality assumptions, benefit levels, cost sharing, cash flows, and healthcare cost trend rates, including discount rate and trend rate sensitivity
OPEB plan investments	<ul style="list-style-type: none"> ▪ Investment policies, authority, and changes during period ▪ Asset allocations of five percent or more in non-U.S. government investments ▪ Money-weighted rates of return
OPEB liabilities	<ul style="list-style-type: none"> ▪ Total OPEB Liability, FNP, Net OPEB Liability, FNP as a percentage of Total OPEB Liability
Dates and roll forward details	<ul style="list-style-type: none"> ▪ Valuation and measurement dates, and any update procedures used

Statement No. 75 - Notes to Financial Statements for Employers and Nonemployer Contributing Entities

Description of associated OPEB plans	<ul style="list-style-type: none"> ▪ Plan name, administrator, and classification ▪ Plan eligibility and coverage, key benefit terms, and membership counts ▪ Contribution requirements, bases, amounts, sources, and authority ▪ Availability of stand-alone plan financial statements
Significant assumptions and inputs for associated OPEB plans	<ul style="list-style-type: none"> ▪ Items such as (but not limited to) discount rate basis and derivation, mortality assumptions, benefit levels, cost sharing, cash flows, and healthcare cost trend rates, including discount rate and health trend rate sensitivity ▪ Proportionate share of collective NOL or TOL as applicable, including sensitivity to discount rate and health trend rate
Asset information and FNP for associated OPEB plans	<p>Either:</p> <ul style="list-style-type: none"> ▪ included, or ▪ if part of a plan's standalone statements or included in the financial report of another government, provide information as to how to obtain the report, or ▪ disclosure that there are no assets in trust
OPEB liabilities and changes in NOL/TOL for associated OPEB plans (as applicable)	<ul style="list-style-type: none"> ▪ Beginning and ending balances of TOL, FNP, and NOL ▪ OPEB expense and expenditures ▪ Disclosure of special funding situations
Dates and roll forward details	<ul style="list-style-type: none"> ▪ Valuation and measurement dates, and any update procedures used
Other items	<ul style="list-style-type: none"> ▪ Changes in assumptions and benefit terms ▪ Determination basis of proportionate share and changes in the employer's or nonemployer contributing entities' portion ▪ Significant events affecting NOL or TOL ▪ OPEB expense recognized for the period ▪ Balances of deferred outflows and inflows of resources related to OPEB, including a five-year schedule of net amounts to be recognized ▪ Insurance purchases and support by nonemployer contributing entities, if any ▪ Experience studies

Required Supplementary Information (RSI)

The financial statements of employers also include RSI showing a 10-year fiscal history of the following. The first two tables may be built prospectively as the information becomes available. The reader should note that an actuarially determined contribution is not calculated for this plan.

- sources of changes in the net OPEB liability/(asset)
- information about the components of the net OPEB liability/(asset) and related ratios
- comparison of actual employer contributions to the actuarially determined contributions, if an actuarially determined contribution is calculated
- collective amounts, proportions, and proportionate share information as applicable for the above schedules
- the annual money-weighted rate of return on OPEB plan investments

Overview of Postretirement Life Insurance program

After an employee satisfies the Enrollment Eligibility, both the employee and the employer pay premiums for life insurance coverage. These premiums support life insurance coverage for death while an active employee and in retirement after the employee satisfies the Retirement Eligibility.

Both the employee and employer pay the applicable premiums until the employee retires. If an employee retires before age 65, the retired employee must continue to pay the employee premiums until reaching age 65 in order to maintain the life insurance coverage after age 65. This report continues prior practice of identifying retired employees before age 65 as "Pre-65 Annuitants", and retired employees on or after age 65 as "Post-64 Retirees".

This GASB 74 report presents the results of the actuarial valuation in accordance with GASB 74 as of December 31, 2019 for the State of Wisconsin Retiree Life Insurance Programs for State employees. Under GASB 74, an actuarial valuation is required for post-employment benefits. Consequently, the death benefits provided prior to retirement are excluded from the actuarial valuation. There are several differences in actuarial assumptions and methods specified by GASB 74 compared to those used to determine the financial reporting prepared by Securian. These differences include treatment of assets, actuarial methods, and the discount rate. Reconciliation of these differences is outside the scope of our assignment with the ETF.

The actuarial liability for the Postretirement Life Insurance program for state employees discussed in this report consists of the following components:

- Actives: The liability for actives represents the expected present value of future death benefits payable to active members based upon expected future retirements. There were 49,813 active members as of 1/1/2019.
- Disabled Participants: The liability for disabled participants represents the expected present value of future death benefits payable to disabled participants. There were 1,268 disabled members as of 1/1/2019.
- Pre-65 Annuitants: The liability for pre-65 annuitants represents the expected present value of future death benefits payable less the present value of expected future employee premiums payable before age 65 to pre-65 annuitants who retired on or before 1/1/2019. There were 6,859 pre-65 annuitants reported as of 1/1/2019.
- Post-64 Retirees: The liability for post-64 retirees represents the expected present value of future death benefits payable to post-64 retirees as of 1/1/2019. There were 26,049 post-64 retirees reported as of 1/1/2019.

Summary of Results

This report presents the results of the actuarial valuation in accordance with GASB 74 as of December 31, 2019 for the State of Wisconsin Retiree Life Insurance Programs for State employees. Under GASB 74, an actuarial valuation is required for post-employment benefits. Consequently, the death benefits provided prior to retirement are excluded from the actuarial valuation. Both the employee and employer pay the applicable premiums until the employee retires. If an employee retires before age 65, the retired employee must continue to pay the employee premiums until reaching age 65 in order to maintain the life insurance coverage after age 65. The table below compares the 12/31/2018 to 12/31/2019 GASB 74 results.

(\$ in millions)		
Valuation Date	01/01/2018	01/01/2019
Measurement Date	12/31/2018	12/31/2019
Funded Status		
Total OPEB Liability (TOL)	\$775	\$1,031
Fiduciary Net Position (FNP)	(344)	(348)
Net OPEB Liability (NOL) ⁽¹⁾	\$431	\$683
FNP as a % of TOL	44%	34%
OPEB Expense	\$38	\$68
Discount Rate	4.20%	2.84%

⁽¹⁾ May not add due to rounding.

Net OPEB Liability

Under GASB 74, the Net OPEB Liability is equal to the Total OPEB Liability less the fiduciary net position. The Net OPEB Liability increased from \$431 million as of December 31, 2018 to \$683 million as of December 31, 2019 for the state plan. There are four significant factors impacting the change in the Net OPEB Liability:

- (1) Municipal bond rate
- (2) Expected return on plan assets assumption
- (3) Revised premium rates
- (4) Level of employer contributions

Each of these factors is discussed in further detail below.

1. Municipal Bond Rate

At implementation of GASB 74, the State of Wisconsin chose the Bond Buyer GO 20-Bond Municipal Bond Index. The bond index decreased from 4.10% at December 31, 2018 to 2.74% at December 31, 2019. The impact due to the change in the municipal bond index was an increase in the net OPEB liability of approximately \$216.8 million for the state plan.

2. Expected Return on Plan Assets Assumption

The expected return on plan assets was updated from 5.00% to 4.25% based on the plan's investment policy, including target asset allocations, and capital market expectations. This change caused the expected depletion date to change from the year 2035 to 2034. The impact due to the change in the expected return on plan asset assumption was an increase in the net OPEB liability of approximately \$13.6 million for the state plan.

3. Revised Premium Rates

The State of Wisconsin Group Insurance Board approved a premium rate increase of 5% during each of the next nine years, effective April 1, 2020 for the Wisconsin State Plan at their August 21, 2019 meeting.

As instructed by the Wisconsin Department of Employee Trust Funds, we have reflected the new premium rates in the December 31, 2019 GASB 74 valuation. The impact of the revised premium rates is a decrease in the net OPEB liability of approximately \$7.4 million for the state plan.

4. Level of Employer Contributions

Employer contributions to the postretirement life insurance program are a specified percentage of the employer premiums to the life insurance plan. GASB 74 requires depletion date projections using projections of future contributions according to the “funding policy”. The depletion date projections indicate the current level of employer contributions are not large enough to cover the cost of benefits earned by active employees and reduce the Net OPEB Liability. Absent additional monies from other sources, contributions under the current funding policy will not be sufficient to accumulate sufficient money to pay benefits when due under the current actuarial assumptions. As of December 31, 2019, the fiduciary net position is projected to be insufficient by December 31, 2034 for the state plan.

Assets for the postretirement life insurance program are held in the Retiree Premium Deposit Fund and the Contingent Liability Reserve. These assets are held in an irrevocable trust for the exclusive purpose of providing postretirement life insurance benefits to plan participants. The 2019 asset activity is reported on pages 8 and 9. The Active Premium Deposit Fund and Active Stabilization Reserve are two accounts maintained separately by Securian, the plan’s insurance carrier, but are not included in the plan assets in the GASB 74 valuation. It is our understanding that these funds are discretionary funds that the Group Insurance Board may use to (1) hold as a reserve to mitigate current premium fluctuations pertaining to coverage for active employees, retirees or both, (2) use to mitigate future premium fluctuations pertaining to coverage for active employees, retirees or both, or (3) transfer to the postretirement life insurance program assets. In 2019, a transfer of \$13.1 million was made from these funds to the trust for postretirement life insurance benefits. As of 12/31/2019, the total value in the Active Premium Deposit Fund plus the Active Stabilization Reserve was \$52 million.

Overall Net OPEB Liability Impact

The discount rate is determined as the single equivalent rate that results in the same actuarial present value as the long-term expected rate of return applied to benefit payments, to the extent that the plan’s fiduciary net position is projected to be sufficient to make projected benefit payments, and the municipal bond rate applied to benefit payments, to the extent that the plan’s fiduciary net position is projected to be insufficient. The factors above play a key role in the calculation of the single equivalent rate.

Because the projections result in a date of depletion, the GASB 74 discount rate is lower than the investment return assumption of 4.25% as of December 31, 2019. After assets are expected to be depleted, projected benefit payments are discounted using the municipal bond index. The net result of the decrease in the municipal bond rate, the decrease in the expected return assumption and the transfer of assets from the Active fund to the Retiree fund is a decrease in the single equivalent rate from 4.20% as of December 31, 2018 to 2.84% as of December 31, 2019, which caused an increase in the Net OPEB Liability of \$223.0 million.

The Net OPEB Liability is \$683 million resulting in a funded ratio of 33.8% for the state plan as of December 31, 2019.

Statement of Fiduciary Net Position

December 31, 2019

Assets

Receivables:

Due From Other Benefit Programs	\$0
Miscellaneous Receivables	93,731
Total Receivables	93,731

Investments:

Investment Contract	349,353,218
Total Investments	349,353,218

Total Assets	349,446,949
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Liabilities

Benefits Payable	1,052,065
Unearned Revenue	281,767
Due to Other Benefit Programs	34,003
Interfund Payables	0
Miscellaneous Payables	59,464
Total Liabilities	1,427,299

**Net Position Restricted For Postemployment Benefits
Other Than Pensions**

\$348,019,650

Statement of Changes in Fiduciary Net Position

	<u>December 31, 2019</u>
Additions	
Employer Contributions	\$1,149,359
Total Contributions	1,149,359
Investment Income (loss):	
Other Investment Income	10,317,401
Net Investment Income	10,317,401
Service Reimbursement Income	93,731
Total Additions	11,560,491
Deductions	
Other Benefit Expenses	19,856,814
Carrier Administrative Expenses	714,450
Administrative Expenses	93,466
Total Deductions	20,664,730
Transfer from Active Life Insurance Program	13,140,320
Net Increase/(Decrease) in Net Position	4,036,081
Net Position Restricted For Postemployment Benefits Other Than Pensions	
Beginning of Year (January 1, 2019)	343,983,569
End of Year (December 31, 2019)	\$348,019,650

Money-Weighted Rate of Return

The money-weighted rate of return shown in the table below is calculated by Securian, the plan's insurance carrier.

Fiscal Year Ending December 31	Net Money-Weighted Rate of Return
2010	N/A
2011	N/A
2012	N/A
2013	N/A
2014	N/A
2015	N/A
2016	N/A
2017	3.19%
2018	3.16%
2019	3.09%

Long-Term Expected Rate of Return

Milliman's capital market assumptions underlie the "building block" method used in our estimate of expected return. The building block method in our model considers asset allocation, expected return and variance of each class, and correlation between asset classes. We then analyze the output ranges in order to arrive at our recommended investment return assumption.

Generally speaking, we recommend the expected return be set using a geometric return reasonably close to the 50th percentile over an appropriate time horizon. Due to the long-term nature of the retiree life insurance obligation, we looked at results compounded over 30, 40, and 50 year time periods. Based on Milliman's capital market assumptions as of December 31, 2019 and the target asset allocation for the retiree life insurance program, the 50th percentile returns over these time periods are 4.12%, 4.25%, and 4.33%, respectively. The rates shown below are from the 30-year time period.

Investments for the Retiree Life Insurance Funds are held with the insurance carrier. Interest is calculated and credited to the Retiree Life Insurance Funds based on the rate of return for a segment of the insurance carrier's general fund, specifically 10 Year A- Bonds (as a proxy, and not tied to any specific investments). The funds invested during the year earn interest based on that year's rate of return for 10 Year A- Bonds. The overall aggregate interest rate is calculated using a tiered approach based on the year the funds were invested and the rate of return for that year. Investment interest is credited based on the aggregate rate of return and assets are not adjusted to fair market value.

Asset Class	Index	Target Allocation	Long-Term Expected Geometric Real Rate of Return
US Credit Bonds	Barclays Credit	45.00%	2.12%
US Long Credit Bonds	Barclays Long Credit	5.00%	2.90%
US Mortgages	Barclays MBS	50.00%	1.53%
Inflation			2.20%
Long-Term Expected Rate of Return			4.25%

Depletion Date Projection

In order to determine if the plan's fiduciary net position is projected to be sufficient to make projected benefit payments, we have prepared a depletion date projection using the following techniques and assumptions:

- The employer and pre-65 annuitants contribute according to the premium schedule on page 30 of this report.
- Benefit payments are projected based on the actuarial assumptions and the current plan provisions.
- Members are assumed to terminate, retire, become disabled, die, and so forth according to the actuarial assumptions as listed in the Actuarial Assumptions section beginning on page 22 of this report.
- Terminating and retiring members will not be replaced with new employees, as mandated by the GASB 74/75 standards.
- All cash flows are assumed to occur on average halfway through the year.
- The long-term expected rate of return on plan investments is 4.25%.
- The 20 year tax-exempt municipal bond index rate is 2.74% as of December 31, 2019, based on the Bond Buyer GO 20-Bond Municipal Bond Index.
- The actuarial assumptions do not change.
- The plan provisions do not change except if any material future changes have been agreed upon as of the measurement date.

Actual results at each point in time will yield different values, reflecting the actual experience of the plan membership and assets.

The projection results to determine the December 31, 2019 discount rate are shown on pages 13 through 15.

Projection of Fiduciary Net Position

Year	Projected Beginning Fiduciary Net Position	Projected Employer Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings	Projected Ending Fiduciary Net Position
2020	\$348,019,649	\$1,519,935	\$22,627,117	\$700,000	\$14,327,433	\$340,539,900
2021	340,539,900	1,496,012	23,831,807	715,400	13,983,108	331,471,813
2022	331,471,813	1,468,857	25,116,595	731,139	13,569,501	320,662,437
2023	320,662,437	1,438,036	26,472,758	747,224	13,080,287	307,960,778
2024	307,960,778	1,403,029	27,912,712	763,663	12,508,775	293,196,208
2025	293,196,208	1,361,413	29,453,719	780,463	11,847,293	276,170,731
2026	276,170,731	1,314,058	31,045,519	797,634	11,088,513	256,730,150
2027	256,730,150	1,265,890	32,697,486	815,181	10,225,787	234,709,159
2028	234,709,159	1,216,693	34,410,145	833,115	9,252,075	209,934,667
2029	209,934,667	1,111,326	36,323,844	851,444	8,155,864	182,026,569
2030	182,026,569	1,011,928	38,278,532	870,176	6,925,723	150,815,512
2031	150,815,512	920,241	40,282,519	889,320	5,554,313	116,118,227
2032	116,118,227	834,558	42,331,962	908,885	4,033,891	77,745,830
2033	77,745,830	755,292	44,436,482	928,880	2,356,234	35,491,993
2034	35,491,993	680,930	46,563,714	949,316	513,228	(10,826,878)

Actuarial Present Value of Projected Benefit Payments

Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit Payments	"Unfunded" Portion of Benefit Payments	Present Value of "Funded" Benefit Payments*	Present Value of "Unfunded" Benefit Payments**	Present Value of Total Benefit Payments***
2020	\$348,019,649	\$22,627,117	\$22,627,117	\$0	\$22,161,094	\$0	\$22,312,248
2021	340,539,900	23,831,807	23,831,807	0	22,389,422	0	22,850,689
2022	331,471,813	25,116,595	25,116,595	0	22,634,484	0	23,417,004
2023	320,662,437	26,472,758	26,472,758	0	22,884,054	0	23,999,267
2024	307,960,778	27,912,712	27,912,712	0	23,145,137	0	24,605,321
2025	293,196,208	29,453,719	29,453,719	0	23,427,276	0	25,246,162
2026	276,170,731	31,045,519	31,045,519	0	23,686,697	0	25,875,120
2027	256,730,150	32,697,486	32,697,486	0	23,930,065	0	26,498,790
2028	234,709,159	34,410,145	34,410,145	0	24,156,831	0	27,116,048
2029	209,934,667	36,323,844	36,323,844	0	24,460,718	0	27,832,994
2030	182,026,569	38,278,532	38,278,532	0	24,726,156	0	28,520,138
2031	150,815,512	40,282,519	40,282,519	0	24,959,845	0	29,183,756
2032	116,118,227	42,331,962	42,331,962	0	25,160,404	0	29,820,930
2033	77,745,830	44,436,482	44,436,482	0	25,334,528	0	30,438,320
2034	35,491,993	46,563,714	0	46,563,714	0	31,464,727	31,013,933
2035	0	48,699,491	0	48,699,491	0	32,030,316	31,540,014
2036	0	50,799,774	0	50,799,774	0	32,520,635	31,990,974
2037	0	52,765,489	0	52,765,489	0	32,878,170	32,310,515
2038	0	54,649,102	0	54,649,102	0	33,143,712	32,539,072
2039	0	56,437,886	0	56,437,886	0	33,315,727	32,675,414
2040	0	58,108,401	0	58,108,401	0	33,387,040	32,712,784
2041	0	59,648,213	0	59,648,213	0	33,357,759	32,651,583
2042	0	61,078,968	0	61,078,968	0	33,246,931	32,510,730
2043	0	62,350,740	0	62,350,740	0	33,034,057	32,270,438
2044	0	63,474,689	0	63,474,689	0	32,732,662	31,944,203
2045	0	64,415,472	0	64,415,472	0	32,331,911	31,521,719
2046	0	65,169,478	0	65,169,478	0	31,838,006	31,009,314
2047	0	65,757,203	0	65,757,203	0	31,268,381	30,424,221
2048	0	66,171,754	0	66,171,754	0	30,626,343	29,769,875
2049	0	66,431,073	0	66,431,073	0	29,926,381	29,060,552
2050	0	66,566,588	0	66,566,588	0	29,187,687	28,315,035
2051	0	66,602,409	0	66,602,409	0	28,424,560	27,547,296
2052	0	66,516,782	0	66,516,782	0	27,630,929	26,751,521
2053	0	66,339,026	0	66,339,026	0	26,822,162	25,942,664
2054	0	66,066,618	0	66,066,618	0	25,999,632	25,122,091
2055	0	65,715,657	0	65,715,657	0	25,171,809	24,298,014
2056	0	65,267,950	0	65,267,950	0	24,333,579	23,465,517
2057	0	64,707,543	0	64,707,543	0	23,481,258	22,621,077
2058	0	64,007,249	0	64,007,249	0	22,607,683	21,757,839
2059	0	63,174,207	0	63,174,207	0	21,718,365	20,881,160
2060	0	62,248,593	0	62,248,593	0	20,829,426	20,006,567
2061	0	61,222,870	0	61,222,870	0	19,939,850	19,133,083
2062	0	60,122,964	0	60,122,964	0	19,059,391	18,270,056
2063	0	58,972,056	0	58,972,056	0	18,195,976	17,425,048
2064	0	57,783,631	0	57,783,631	0	17,353,790	16,602,014
2065	0	56,534,637	0	56,534,637	0	16,525,879	15,794,241
2066	0	55,224,193	0	55,224,193	0	15,712,300	15,001,744
2067	0	53,840,781	0	53,840,781	0	14,910,156	14,221,715
2068	0	52,373,854	0	52,373,854	0	14,117,110	13,451,892
2069	0	50,832,819	0	50,832,819	0	13,336,317	12,695,250
2070	0	49,234,918	0	49,234,918	0	12,572,608	11,956,347
2071	0	47,580,386	0	47,580,386	0	11,826,073	11,235,217
2072	0	45,867,632	0	45,867,632	0	11,096,330	10,531,447

This work product was prepared solely for the ETF for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

Actuarial Present Value of Projected Benefit Payments (Continued)

Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit Payments	"Unfunded" Portion of Benefit Payments	Present Value of "Funded" Benefit Payments*	Present Value of "Unfunded" Benefit Payments**	Present Value of Total Benefit Payments***
2073	\$0	\$44,087,529	\$0	\$44,087,529	\$0	\$10,381,240	\$9,842,960
2074	0	42,222,924	0	42,222,924	0	9,677,033	9,166,140
2075	0	40,269,275	0	40,269,275	0	8,983,140	8,500,416
2076	0	38,225,344	0	38,225,344	0	8,299,772	7,845,959
2077	0	36,100,427	0	36,100,427	0	7,629,350	7,205,020
2078	0	33,905,845	0	33,905,845	0	6,974,454	6,579,996
2079	0	31,649,960	0	31,649,960	0	6,336,789	5,972,449
2080	0	29,345,297	0	29,345,297	0	5,718,670	5,384,508
2081	0	27,018,634	0	27,018,634	0	5,124,841	4,820,578
2082	0	24,692,119	0	24,692,119	0	4,558,645	4,283,732
2083	0	22,385,104	0	22,385,104	0	4,022,508	3,776,168
2084	0	20,122,258	0	20,122,258	0	3,519,452	3,300,632
2085	0	17,929,279	0	17,929,279	0	3,052,260	2,859,641
2086	0	15,825,408	0	15,825,408	0	2,622,250	2,454,323
2087	0	13,825,081	0	13,825,081	0	2,229,704	2,084,840
2088	0	11,939,429	0	11,939,429	0	1,874,233	1,750,721
2089	0	10,176,320	0	10,176,320	0	1,554,860	1,450,949
2090	0	8,551,707	0	8,551,707	0	1,271,785	1,185,612
2091	0	7,080,441	0	7,080,441	0	1,024,900	954,505
2092	0	5,773,069	0	5,773,069	0	813,371	756,751
2093	0	4,636,134	0	4,636,134	0	635,767	590,922
2094	0	3,671,283	0	3,671,283	0	490,028	455,010
2095	0	2,869,512	0	2,869,512	0	372,796	345,811
2096	0	2,215,297	0	2,215,297	0	280,127	259,592
2097	0	1,690,724	0	1,690,724	0	208,093	192,646
2098	0	1,276,281	0	1,276,281	0	152,894	141,404
2099	0	953,027	0	953,027	0	111,125	102,671
2100	0	703,956	0	703,956	0	79,893	73,742
2101	0	514,359	0	514,359	0	56,819	52,392
2102	0	371,618	0	371,618	0	39,956	36,807
2103	0	265,197	0	265,197	0	27,753	25,540
2104	0	186,764	0	186,764	0	19,024	17,490
2105	0	129,747	0	129,747	0	12,864	11,814
2106	0	88,716	0	88,716	0	8,561	7,855
2107	0	59,572	0	59,572	0	5,595	5,129
2108	0	39,325	0	39,325	0	3,595	3,292
2109	0	25,495	0	25,495	0	2,269	2,075
2110	0	16,282	0	16,282	0	1,410	1,289
2111	0	10,250	0	10,250	0	864	789
2112	0	6,326	0	6,326	0	519	473
2113	0	3,743	0	3,743	0	299	272
2114	0	2,168	0	2,168	0	169	153
2115	0	1,203	0	1,203	0	91	83
2116	0	577	0	577	0	42	39
2117	0	241	0	241	0	17	16
2118	0	112	0	112	0	8	7
Total					333,056,711	+ 1,076,135,463	= 1,409,192,174

* Discounted at the long-term expected rate of return, 4.25%

** Discounted at the municipal bond rate, 2.74%

*** Discounted at the single interest rate that produces a total actuarial present value equal to the sum of the actuarial present values of "funded" and "unfunded" benefit payments, 2.84%

Net OPEB Liability

Net OPEB Liability	December 31, 2018	December 31, 2019
Total OPEB liability	\$775,464,369	\$1,031,143,927
Fiduciary net position	343,983,569	348,019,650
Net OPEB liability	431,480,800	683,124,277
Fiduciary net position as a % of total OPEB liability	44.36%	33.75%
Covered payroll	3,182,513,000	3,299,478,000
Net OPEB liability as a % of covered payroll	13.56%	20.70%

The total OPEB liability was determined by an actuarial valuation as of the valuation date, calculated based on the discount rate and actuarial assumptions below, and was then projected forward to the measurement date. Any significant changes during this period have been reflected as prescribed by GASB 74 and 75.

Discount Rate

Discount rate	4.20%	2.84%
Long-term expected rate of return, net of investment expense	5.00%	4.25%
20 Year Tax-Exempt Municipal Bond Yield	4.10%	2.74%

The plan's fiduciary net position was projected to be insufficient to make all projected future benefit payments of current active and inactive employees. Therefore, the discount rate for calculating the total OPEB liability is equal to the single equivalent rate that results in the same actuarial present value as the long-term expected rate of return applied to benefit payments, to the extent that the plan's fiduciary net position is projected to be sufficient to make projected benefit payments, and the municipal bond rate applied to benefit payments, to the extent that the plan's fiduciary net position is projected to be insufficient.

Other Key Actuarial Assumptions

Valuation date	January 1, 2018	January 1, 2019
Measurement date	December 31, 2018	December 31, 2019
Salary increases including inflation	WRS; see "Actuarial Assumptions" for details	WRS; see "Actuarial Assumptions" for details
Mortality	WRS; see "Actuarial Assumptions" for details	WRS; see "Actuarial Assumptions" for details
Actuarial cost method	Entry Age Normal	Entry Age Normal

Changes in Net OPEB Liability

Changes in Net OPEB Liability	Increase (Decrease)		
	Total OPEB Liability (a)	Plan Fiduciary Net Position (b)	Net OPEB Liability (a) - (b)
Balances as of December 31, 2018	\$775,464,369	\$343,983,569	\$431,480,800
Changes for the year:			
Service cost	25,430,413		25,430,413
Interest on total OPEB liability	33,224,876		33,224,876
Effect of plan changes	0		0
Effect of economic/demographic gains or losses	(6,128,118)		(6,128,118)
Effect of assumptions changes or inputs	223,009,201		223,009,201
Benefit payments	(19,856,814)	(19,856,814)	0
Employer contributions		1,149,359	(1,149,359)
Transfer from active life insurance program		13,140,320	(13,140,320)
Net investment income		10,411,132	(10,411,132)
Administrative expenses		(807,916)	807,916
Balances as of December 31, 2019	1,031,143,927	348,019,650	683,124,277

Sensitivity Analysis

The following presents the net OPEB liability, calculated using the discount rate of 2.84%, as well as what the net OPEB liability would be if it were calculated using a discount rate that is 1 percentage point lower (1.84%) or 1 percentage point higher (3.84%) than the current rate.

	Current		
	1% Decrease 1.84%	Discount Rate 2.84%	1% Increase 3.84%
Total OPEB liability	\$1,260,087,025	\$1,031,143,927	\$854,821,359
Fiduciary net position	348,019,650	348,019,650	348,019,650
Net OPEB liability	912,067,375	683,124,277	506,801,709

Healthcare trend rates do not affect the retiree life insurance liabilities. Thus, sensitivity analysis of healthcare trend rates is not included.

Schedule of Changes in Net OPEB Liability and Related Ratios
(in 1,000s)

	Fiscal Year Ending December 31									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service cost	\$25,430	\$30,668	\$26,146	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interest on total OPEB liability	33,225	31,194	30,731	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Changes of benefit terms	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Effect of economic/demographic (gains) or losses	(6,128)	(17,528)	(5,266)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Effect of assumption changes or inputs	223,009	(94,851)	49,008	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benefit payments	(19,857)	(19,538)	(17,670)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net change in total OPEB liability	255,680	(70,054)	82,949	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total OPEB liability, beginning	775,464	845,519	762,570	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total OPEB liability, ending (a)	1,031,144	775,464	845,519	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary Net Position										
Employer contributions	\$1,149	\$1,387	\$1,376	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Transfer from active life insurance program	13,140	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Investment income	10,411	10,897	11,530	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benefit payments	(19,857)	(19,538)	(17,670)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Administrative expenses	(808)	(735)	(699)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net change in plan fiduciary net position	4,036	(7,989)	(5,462)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, beginning	343,984	351,972	357,435	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, ending (b)	348,020	343,984	351,972	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net OPEB liability, ending = (a) - (b)	\$683,124	\$431,481	\$493,547	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position as a % of total OPEB liability	33.75%	44.36%	41.63%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Covered payroll	\$3,299,478	\$3,182,513	\$3,183,994	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net OPEB liability as a % of covered payroll	20.70%	13.56%	15.50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A

This schedule is presented to illustrate the requirement to show information for 10 years. However, recalculations of prior years are not required, and if prior years are not reported in accordance with the current GASB standards, they should not be reported.

Notes to Schedule:

* May not add due to rounding

OPEB Expense and Deferred Inflows/Outflows of Resources

OPEB Expense	January 1, 2018 to December 31, 2018	January 1, 2019 to December 31, 2019
Service cost	\$30,668,472	\$25,430,413
Interest on total OPEB liability	31,194,168	33,224,876
Effect of plan changes	0	0
Administrative expenses	734,502	807,916
Expected investment return net of investment expenses	(17,132,242)	(16,717,245)
Recognition of Deferred Inflows/Outflows of Resources		
Recognition of economic/demographic gains or losses	(3,327,766)	(4,235,635)
Recognition of assumption changes or inputs	(6,967,444)	26,070,956
Recognition of investment gains or losses	2,431,649	3,692,872
OPEB Expense	<u>37,601,339</u>	<u>68,274,153</u>

As of December 31, 2019, the deferred inflows and outflows of resources to be recognized in future OPEB expense are as follows:

Deferred Inflows / Outflows of Resources	Deferred Inflows of Resources	Deferred Outflows of Resources
Differences between expected and actual experience	(\$20,608,439)	\$0
Changes of assumptions	(66,953,694)	218,035,395
Net difference between projected and actual earnings	<u>0</u>	<u>11,155,329</u>
Total	(87,562,133)	229,190,724
Total net deferrals		141,628,591

Amounts currently reported as deferred outflows of resources and deferred inflows of resources related to other postemployment benefits will be recognized in OPEB expense as follows:

Year ended December 31:	
2020	\$25,528,193
2021	25,528,192
2022	24,343,686
2023	23,096,542
2024	19,034,081
Thereafter*	24,097,897
Total net deferrals	\$141,628,591

* Note that additional future deferred inflows and outflows of resources may impact these numbers.

Schedule of Deferred Inflows and Outflows of Resources

	Original Amount	Date Established	Original Recognition Period*	Remaining Recognition Period	Amount Recognized in 12/31/2019 Expense	Balance of Deferred Inflows 12/31/2019	Balance of Deferred Outflows 12/31/2019
Investment (gains) or losses	\$6,306,113	12/31/2019	5.00	5.00	\$1,261,223	\$0	\$5,044,890
	6,235,702	12/31/2018	5.00	4.00	1,247,140	0	3,741,422
	5,922,544	12/31/2017	5.00	3.00	<u>1,184,509</u>	<u>0</u>	<u>2,369,017</u>
		Total			3,692,872	0	11,155,329
Differences between expected and actual experience	(6,128,118)	12/31/2019	6.75	6.75	(907,869)	(5,220,249)	0
	(17,528,066)	12/31/2018	6.80	5.80	(2,577,657)	(12,372,752)	0
	(5,265,765)	12/31/2017	7.02	5.02	<u>(750,109)</u>	<u>(3,015,438)</u>	<u>0</u>
		Total			(4,235,635)	(20,608,439)	0
Assumption changes or inputs	223,009,201	12/31/2019	6.75	6.75	33,038,400	0	189,970,801
	(94,851,066)	12/31/2018	6.80	5.80	(13,948,686)	(66,953,694)	0
	49,008,320	12/31/2017	7.02	5.02	<u>6,981,242</u>	<u>0</u>	<u>28,064,594</u>
		Total			26,070,956	(66,953,694)	218,035,395
Subtotal of Deferred Inflows/Outflows						(87,562,133)	229,190,724
Total net deferrals							141,628,591

* Investment (gains)/losses are recognized in OPEB expense over a period of five years; differences between expected and actual experience and assumption changes or inputs are recognized over the average remaining service life for all active and inactive members.

OPEB Liability and Expense Summary

	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability	Deferred Inflows	Deferred Outflows	Net Deferrals	Net OPEB Liability plus Net Deferrals	Annual Expense
Balances as of December 31, 2018	(\$775,464,369)	\$343,983,569	(\$431,480,800)	(\$99,618,336)	\$43,587,924	(\$56,030,412)	(\$487,511,212)	
Service cost	(25,430,413)		(25,430,413)					25,430,413
Interest on total OPEB liability	(33,224,876)		(33,224,876)					33,224,876
Effect of plan changes	0		0					0
Effect of liability gains or losses	6,128,118		6,128,118	(6,128,118)		(6,128,118)		
Effect of assumption changes or inputs	(223,009,201)		(223,009,201)		223,009,201	223,009,201		
Benefit payments	19,856,814	(19,856,814)	0					
Transfer from active life insurance program		13,140,320	13,140,320				13,140,320	
Administrative expenses		(807,916)	(807,916)					807,916
Expected investment income (net of inv expenses)		16,717,245	16,717,245					(16,717,245)
Investment gains or losses		(6,306,113)	(6,306,113)		6,306,113	6,306,113		
Employer contributions		1,149,359	1,149,359				1,149,359	
Recognition of liability gains or losses				4,235,635		4,235,635		(4,235,635)
Recognition of assumption changes or inputs				13,948,686	(40,019,642)	(26,070,956)		26,070,956
Recognition of investment gains or losses					(3,692,872)	(3,692,872)		3,692,872
Annual expense							(68,274,153)	68,274,153
Balances as of December 31, 2019	(1,031,143,927)	348,019,650	(683,124,277)	(87,562,133)	229,190,724	141,628,591	(541,495,686)	

Actuarial Assumptions

The following assumptions were used in the actuarial valuation of the State of Wisconsin Postretirement Life Insurance Plan. Where consistent with the terms of the plan, we have utilized the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. All assumptions are based on estimates of future experience.

Valuation Date:	January 1, 2019
Census Date:	January 1, 2019
Discount Rate:	2.84% (net of expenses)
Expected Return on Plan Assets:	4.25%
Inflation Rate:	2.20%
Salary Increases:	Salary increase assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Assumed rates for individual active members are shown below. Part of the assumption for each age is for merit and longevity increase, and another 3.00% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces.

% of Merit & Longevity Increase Next Year

Service	Protective with Social Security	Protective w/o Social Security	Executive & Elected	General	Public Schools	University
1	4.80%	5.50%	2.5%	3.5%	5.6%	3.0%
2	4.80	5.50	2.5	3.5	5.6	3.0
3	4.10	4.70	2.0	3.1	5.2	2.9
4	3.50	3.80	1.6	2.8	4.7	2.8
5	2.80	3.00	1.1	2.5	4.3	2.7
10	1.10	0.90	0.2	1.5	2.6	2.2
15	0.80	0.50	0.2	1.1	1.4	1.7
20	0.70	0.40	0.2	0.9	0.6	1.2
25	0.60	0.30	0.2	0.6	0.3	0.9
30	0.50	0.20	0.2	0.4	0.2	0.7

Expected Premium Rate Change:	5.00% annual increases to life insurance premiums effective April 1, 2020 for nine years. Current rates shown on page 30.
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Pre-Retirement Mortality:

This assumption applies to death while in service. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Rates are based on the 2015-2017 experience study as the base table and project future improvements with MP-2018 generational improvement scale (multiplied by 60%). This assumption includes a margin for improvements in longevity beyond the valuation date. Sample rates of the mortality with attained ages in 2017 are as follows:

Age	Males	Females
20	0.0134%	0.0080%
25	0.0163	0.0089
30	0.0208	0.0121
35	0.0364	0.0216
40	0.0482	0.0301
45	0.0615	0.0459
50	0.0814	0.0673
55	0.1895	0.1207
60	0.2718	0.1747
65	0.4150	0.2631
70	0.6771	0.4408
75	1.1435	0.7994
80	2.1013	1.5010

Post-Retirement Mortality:

This assumption applies to death while retired. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Rates are based on the 2015-2017 experience study as the base table and project future improvements with MP-2018 generational improvement scale (multiplied by 60%). This assumption includes a margin for improvements in longevity beyond the valuation date. Sample rates of the mortality with attained ages in 2017 are as follows:

Age	Males	Females
40	0.0964%	0.0603%
45	0.1230	0.0918
50	0.1627	0.1346
55	0.3790	0.2413
60	0.5436	0.3493
65	0.8300	0.5261
70	1.3542	0.8817
75	2.2869	1.5987
80	4.2026	3.0020
85	7.8539	6.0225

Post-Disability Mortality:

This assumption applies to death after disablement. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Rates are based on the 2015-2017 experience study as the base table and project future improvements with MP-2018 generational improvement scale (multiplied by 60%). This assumption includes a margin for improvements in longevity beyond the valuation date. Sample rates of the mortality with attained ages in 2017 are as follows:

Age	Males	Females
45	0.2370%	0.1536%
55	0.6227	0.3968
65	1.8095	1.0670
75	5.8651	3.6058
85	17.4261	12.7575

Disability:

Percent of employees expected to become disabled each year. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Sample rates are as follows:

Age	Protective with Social Security	Protective w/o Social Security	Executive & Elected	General		Public Schools		University	
				Male	Female	Male	Female	Male	Female
20	0.01%	0.03%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
25	0.01	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00
30	0.01	0.03	0.00	0.00	0.02	0.00	0.01	0.00	0.00
35	0.01	0.03	0.01	0.01	0.02	0.00	0.01	0.00	0.02
40	0.02	0.04	0.01	0.02	0.03	0.01	0.01	0.00	0.02
45	0.02	0.08	0.01	0.04	0.04	0.02	0.04	0.01	0.02
50	0.04	0.46	0.02	0.09	0.06	0.06	0.07	0.01	0.04
55	0.61	0.34	0.09	0.17	0.12	0.12	0.10	0.04	0.06
60	1.02	0.10	0.11	0.30	0.16	0.19	0.15	0.06	0.09

Withdrawal:

Percent of employees expected to terminate each year within the first 10 years of employment. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Sample rates are as follows:

Service	Protective with Social Security	Protective w/o Social Security	Executive & Elected	General		Public Schools		University	
				Male	Female	Male	Female	Male	Female
0	16.0%	4.0%	14.0%	17.0%	20.0%	18.5%	15.0%	16.0%	14.5%
1	9.5	3.5	13.0	12.3	15.0	11.0	11.0	15.0	14.0
2	6.0	1.5	12.0	9.3	11.5	8.0	8.0	13.0	13.0
3	5.0	1.3	10.0	7.6	10.0	6.5	6.0	11.0	10.0
4	4.5	1.2	10.0	7.5	9.5	5.5	5.5	9.0	9.5
5	4.0	1.1	5.0	5.8	7.8	4.0	5.0	8.0	9.0
6	3.8	1.0	5.0	4.8	7.0	3.5	4.0	7.5	7.0
7	3.5	0.9	5.0	4.7	6.0	3.2	3.7	6.0	6.0
8	3.0	0.8	5.0	4.1	5.7	3.0	3.3	5.5	5.0
9	2.5	0.7	5.0	4.0	5.3	2.8	3.0	5.0	4.0

Percent of employees expected to terminate each year after the first 10 years of employment. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Sample rates are as follows:

Age	Protective with Social Security	Protective w/o Social Security	Executive & Elected	General		Public Schools		University	
				Male	Female	Male	Female	Male	Female
25	2.3%	0.7%	5.0%	3.7%	4.7%	2.2%	2.4%	4.7%	4.0%
30	2.3	0.7	5.0	3.7	4.7	2.2	2.4	4.7	4.0
35	2.0	0.7	5.0	3.0	3.9	1.8	1.9	4.2	4.0
40	1.6	0.6	5.0	2.4	3.2	1.5	1.5	3.4	3.7
45	1.4	0.6	4.7	2.0	2.7	1.4	1.3	2.7	3.2
50	1.2	0.5	4.2	1.7	2.2	1.3	1.2	2.2	2.7
54+	1.2	0.5	4.0	1.6	2.0	1.3	1.2	2.0	2.5

Normal Retirement:

Percent of employees expected to retire each year. These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System. Sample rates are as follows:

Age	Protective with Social Security	Protective w/o Social Security	Executive & Elected	General		Public Schools		University	
				Male	Female	Male	Female	Male	Female
50	6.0%	2.0%							
51	8.0	4.0							
52	10.0	4.0							
53	25.0	17.0							
54	20.0	23.0							
55	20.0	25.0							
56	20.0	25.0							
57	20.0	25.0	8.0%	19.0%	17.0%	33.0%	27.0%	12.0%	15.0%
58	20.0	33.0	8.0	19.0	17.0	29.0	27.0	12.0	15.0
59	20.0	33.0	8.0	19.0	17.0	24.0	27.0	12.0	10.0
60	20.0	20.0	20.0	19.0	17.0	25.0	27.0	12.0	12.0
61	20.0	20.0	12.0	19.0	17.0	25.0	27.0	12.0	16.0
62	30.0	40.0	12.0	26.0	27.0	35.0	37.0	12.0	15.0
63	30.0	40.0	12.0	29.0	27.0	32.0	30.0	12.0	20.0
64	30.0	40.0	15.0	28.0	27.0	29.0	28.0	12.0	20.0
65	40.0	40.0	15.0	30.0	30.0	29.0	37.0	15.0	20.0
66	40.0	100.0	15.0	35.0	35.0	35.0	39.0	20.0	24.0
67	40.0	100.0	15.0	30.0	30.0	33.0	33.0	20.0	20.0
68	40.0	100.0	15.0	19.0	25.0	27.0	30.0	18.0	17.0
69	40.0	100.0	20.0	19.0	25.0	23.0	28.0	16.0	17.0
70	100.0	100.0	20.0	19.0	25.0	25.0	38.0	20.0	18.0
71	100.0	100.0	20.0	19.0	20.0	20.0	20.0	18.0	18.0
72	100.0	100.0	20.0	19.0	20.0	15.0	20.0	16.0	18.0
73	100.0	100.0	20.0	19.0	20.0	15.0	20.0	16.0	15.0
74	100.0	100.0	20.0	19.0	20.0	15.0	20.0	16.0	15.0
75	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Reduced Retirement:

These rates are the assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System.

Age	Executive & Elected*	General		Public Schools		University	
		Male	Female	Male	Female	Male	Female
55	3.0%	8.0%	7.0%	13.0%	12.0%	3.0%	5.0%
56	3.0	8.0	7.0	13.0	12.0	3.0	5.0
57	3.0	5.0	6.0	12.0	12.0	3.0	5.0
58	3.0	6.0	7.0	13.0	12.0	3.0	5.0
59	3.0	7.0	7.0	14.0	13.0	4.0	5.0
60	5.0	9.0	10.0	14.0	17.0	6.0	9.0
61	5.0	9.0	10.0	15.0	17.0	6.0	9.0
62	2.0	17.0	16.0	21.0	23.0	7.0	12.0
63	2.0	18.0	18.0	21.0	23.0	7.0	12.0
64	2.0	17.0	18.0	21.0	23.0	10.0	15.0

* For participants hired on or before December 31, 2016, the normal retirement eligibility is age 62 and any years of service or age 57 with 30 years of service. For participants hired after December 31, 2016, the normal retirement eligibility is age 65 and any years of service or age 57 with 30 years of service.

Expenses:

Benefit payment expense: 2.1% of benefits paid after age 65

Administrative expense: \$700,000. This is equal to the average of the actual administrative expenses paid in the prior two years. For depletion date projection purposes, we assume that this figure will increase with price inflation.

Missing Data Assumptions:

The following assumptions were used for any missing data.

1. Gender – 50% male; 50% female
2. Employment code – 100% General

Changes Since Prior Valuation:

The discount rate has changed from 4.20% to 2.84%. A decrease in the discount rate increases the liabilities.

The administrative expense assumption was updated from \$650,000 to \$700,000 as part of the annual review of administrative expenses. This change had no impact on the determination of the discount rate because assets were projected to deplete in the same future date under either assumption.

The expected return on plan assets was updated from 5.00% to 4.25% based on the plan's investment policy, including target asset allocations, expected inflation, and capital market expectations.

The expected premium rate change was updated from 0% future increases to a 5% annual increase effective April 1, 2020 for nine years based on the approval of the motion by the Group Insurance Board during the August 21, 2019 meeting.

The inflation rate was updated from 2.30% to 2.20% based on current and future expected market expectations.

Rationale for Significant Assumptions:

With any valuation of future benefits, assumptions of anticipated future events are required. If actual events differ from the assumptions made, the actual cost of the plan will vary as well. The following assumptions should be reviewed for appropriateness.

Discount Rate:

We have discounted future benefit payments back to the present using an interest rate of 2.84%. This rate is the single equivalent rate that results in the same actuarial present value as the long-term expected rate of return while funded and the municipal bond rate while unfunded.

Expected Premium Rate Change:

At their August 21, 2019 meeting, the State of Wisconsin Group Insurance Board approved a premium rate increase of 5% during each of the next nine years effective April 1, 2020 for the Wisconsin State Plan. The new premium rates were first reflected in the December 31, 2019 GASB 74 valuation.

Expected Return on Plan Assets:

The expected return on plan assets, 4.25%, has been selected by the plan sponsor to reflect the plan's investment policy, including target asset allocations, and capital market expectations.

Demographic Assumptions:

All demographic assumptions are based upon assumptions adopted by the Employee Trust Funds Board in connection with a study of experience during 2015-2017 for the Wisconsin Retirement System.

Expenses:

Based on recent history of the plan.

For the post-65 portion of the plan, employer contributions to premium deposit fund are not treated as premiums; therefore, no state premium tax is applied. However, when benefits are paid from the premium deposit fund, they are cleared as premiums, and the state premium tax is applied. Furthermore, other administrative expenses including state premium taxes are also cleared as premiums and subject to state premium tax.

The Department of Employee Trust Funds classifies the state premium tax for the post-65 portion of the plan as a benefit payment expense and all other expenses as administrative expenses. The expense assumptions used in this report follow this classification.

Summary of Plan Provisions

This summary of plan provisions is intended only to describe the essential features of the plan used in the actuarial valuation. All eligibility requirements and benefit amounts shall be determined in strict accordance with the plan document itself.

Enrollment Eligibility:

Generally, members may enroll during a 30-day enrollment period. They may enroll after the initial 30-day enrollment period with evidence of insurability. Members under evidence of insurability enrollment must enroll in group life insurance coverage before age 55 to be eligible for Basic or Supplemental coverage.

Retirement Eligibility:

At retirement, the member must satisfy one of the following –

- WRS coverage prior to January 1, 1990, or
- at least one month of group life insurance coverage in each of 5 calendar years after 1989

and one of the following –

- eligible for an immediate WRS benefit, or
- at least 20 years from their WRS creditable service as of 1/1/1990 plus their years of group life insurance coverage after 1989, or
- at least 20 years on the payroll of their last employer.

In addition, terminating members and retirees must continue to pay Employee Premiums until age 65 (age 70 if active).

Basic Coverage Benefits:

After retirement, Basic coverage is continued for life in these amounts of the insurance in force before retirement (one times WRS earnings):

<u>Age</u>	<u>Percent of Basic Coverage Continuing</u>
Before age 65	100%
While age 65	75
While age 66 and later	50

Supplemental Coverage Benefits:

After retirement, Supplemental coverage may be continued until age 65 at 100% of the amount of the insurance in force before retirement at the employee's expense (this benefit is not included in the valuation as it is entirely employee paid).

Additional Coverage:

After retirement, Additional coverage may be continued until age 65 at 100% of the amount of the insurance in force before retirement at the employee's expense (this benefit is not included in the valuation as it is entirely employee paid).

Spouse & Dependent Coverage:

After retirement, the coverage is terminated and not included in the Postretirement Life Insurance Plan.

Employee Premiums:

The employee must pay these monthly premiums per \$1,000 of insurance until age 65 (age 70 if active):

Attained Age	Before April 1, 2019		April 1, 2019 - March 31, 2020*	
	Basic	Supplemental	Basic	Supplemental
Under 30	\$0.04	\$0.04	\$0.04	\$0.04
30-34	0.04	0.04	0.04	0.04
35-39	0.04	0.04	0.04	0.04
40-44	0.06	0.06	0.06	0.06
45-49	0.10	0.10	0.11	0.11
50-54	0.16	0.16	0.17	0.17
55-59	0.22	0.22	0.23	0.23
60-64	0.30	0.30	0.32	0.32
65-69	0.39	0.39	0.41	0.41

Disabled members under age 70 receive a waiver-of-premium benefit.

*Additional premium increase of 5% during each of the next nine years, effective April 1, 2020.

Employer Premiums:

The employer must pay these premiums while actively employed:

- 63% of the Employee Premiums for Basic coverage
 - 35% is paid to fund pre-retirement coverage
 - 28% is paid to fund retiree coverage
- 35% of the Employee Premiums for Supplemental coverage

Summary of Participant Data

The participant data used in the valuation was provided by Securian and the State of Wisconsin. While the participant data was checked for reasonableness, the data was not audited, and the valuation results presented in this report are dependent upon the accuracy of the participant data provided. The table below presents a summary of the basic participant information for the active and inactive participants covered under the terms of the Plan.

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
A. Active Participants										
Count	49,813	50,060	49,125	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	45.4	45.4	45.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Service	10.2	10.1	10.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Projected Salary	\$66,774	\$65,711	\$64,814	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Disabled Participants										
Count	1,268	1,328	1,337	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	57.3	57.3	57.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Current Insurance	\$45,705	\$45,325	\$44,847	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C. Pre-65 Annuitants										
Count	6,859	7,032	7,127	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	61.3	61.2	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Current Insurance	\$67,136	\$65,986	\$65,518	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Post-64 Annuitants										
Count	26,049	24,972	23,760	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	74.4	74.3	74.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Current Insurance	\$28,982	\$28,445	\$28,843	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Summary of Demographic Information

Active Members as of January 1, 2019											
Years of Service											
Age	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30-34</u>	<u>35-39</u>	<u>40+</u>	<u>ALL</u>
<25	475	597	3	-	-	-	-	-	-	-	1,075
25-29	913	2,933	301	7	-	-	-	-	-	-	4,154
30-34	743	3,102	1,478	431	3	-	-	-	-	-	5,757
35-39	644	2,590	1,490	1,293	423	4	-	-	-	-	6,444
40-44	425	1,871	1,289	1,261	1,269	314	3	-	-	-	6,432
45-49	366	1,570	1,079	1,137	1,441	1,098	173	2	-	-	6,866
50-54	329	1,360	954	1,017	1,305	1,206	695	115	1	-	6,982
55-59	238	1,176	883	896	1,174	1,032	729	395	118	7	6,648
60-64	116	600	569	573	678	618	518	307	194	49	4,222
65-69	22	112	182	165	180	173	150	107	85	57	1,233
70+	-	-	-	-	-	-	-	-	-	-	-
ALL	4,271	15,911	8,228	6,780	6,473	4,445	2,268	926	398	113	49,813

Projected Salary											
Years of Service											
Age	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30-34</u>	<u>35-39</u>	<u>40+</u>	<u>ALL</u>
<25	\$41,363	\$45,038	*	-	-	-	-	-	-	-	\$43,423
25-29	47,711	51,999	57,851	*	-	-	-	-	-	-	51,476
30-34	54,138	57,008	62,782	59,311	*	-	-	-	-	-	58,291
35-39	57,614	62,190	67,610	66,928	63,183	*	-	-	-	-	64,007
40-44	59,583	62,877	71,951	73,490	69,306	68,061	*	-	-	-	68,080
45-49	55,783	64,034	72,154	78,487	76,158	72,448	73,405	*	-	-	71,398
50-54	57,526	63,549	69,415	74,886	78,424	78,140	75,078	70,596	*	-	72,280
55-59	57,049	63,550	67,424	68,414	76,022	78,989	79,219	78,020	66,503	*	71,721
60-64	55,237	64,064	65,953	69,022	73,412	76,102	88,707	84,985	77,330	70,500	73,241
65-69	64,553	62,052	69,614	63,275	73,938	81,698	92,031	104,016	115,125	91,656	80,184
70+	-	-	-	-	-	-	-	-	-	-	-
ALL	53,057	59,207	67,774	71,063	74,039	76,067	80,500	82,440	82,112	80,956	66,774

* Compensation shown for groups of 20 or more.

Glossary

Actuarially Determined Contribution	A target or recommended contribution to a defined benefit OPEB plan for the reporting period, determined based on the funding policy and most recent measurement available when the contribution for the reporting period was adopted.
Deferred Inflows/Outflows of Resources	Portion of changes in net OPEB liability that is not immediately recognized in OPEB Expense. These changes include differences between expected and actual experience, changes in assumptions, and differences between expected and actual earnings on plan investments.
Discount Rate	Single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the sum of: <ol style="list-style-type: none">1. The actuarial present value of benefit payments projected to be made in future periods where the plan assets are projected to be sufficient to meet benefit payments, calculated using the Long-Term Expected Rate of Return.2. The actuarial present value of projected benefit payments not included in (1), calculated using the Municipal Bond Rate.
Fiduciary Net Position	Equal to market value of assets.
Long-Term Expected Rate of Return	Long-term expected rate of return on plan investments expected to be used to finance the payment of benefits, net of investment expenses.
Money-Weighted Rate of Return	The internal rate of return on plan investments, net of investment expenses.
Municipal Bond Rate	Yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher.
Net OPEB Liability	Total OPEB Liability minus the Plan's Fiduciary Net Position.
Projected Benefit Payments	All benefits estimated to be payable through the OPEB plan to current active and inactive employees as a result of their past service and expected future service.
Service Cost	The portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
Total OPEB Liability	The portion of actuarial present value of projected benefit payments that is attributable to past periods of member service using the Entry Age Normal cost method based on the requirements of GASB 74 and 75.