



STATE OF WISCONSIN POSTRETIREMENT LIFE INSURANCE PLAN (LOCAL)

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 74,557 active participants and 46,803 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 Local 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 local 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 74,557 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 1,205 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 expected present value of future employee premiums payable before age 65 to pre-65 annuitants who retired on or before 1/1/2019. There were 10,076 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 35,522 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 Local 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)	\$503	\$682
Fiduciary Net Position (FNP)	(245)	(256)
Net OPEB Liability (NOL) ⁽¹⁾	\$258	\$426
FNP as a % of TOL	49%	38%
OPEB Expense	\$26	\$46
Discount Rate	4.22%	2.87%

⁽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 \$258 million as of December 31, 2018 to \$426 million as of December 31, 2019 for the local plan. There are three significant factors impacting the change in the Net OPEB Liability:

- (1) Municipal bond rate
- (2) Expected return on plan assets assumption
- (3) 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 \$150.0 million for the local 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 2038 to 2037. The impact due to the change in the expected return on plan asset assumption was an increase in the net OPEB liability of approximately \$9.4 million for the local plan.

3. 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, 2037 for the local 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 \$12.9 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 \$69 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. All three 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 4.22% as of December 31, 2018 to 2.87% as of December 31, 2019, which caused an increase in the Net OPEB Liability of \$159.4 million.

The Net OPEB Liability is \$426 million resulting in a funded ratio of 37.6% for the local plan as of December 31, 2019.

Statement of Fiduciary Net Position

December 31, 2019

Assets

Receivables:

Due From Other Benefit Programs	\$0
Miscellaneous Receivables	126,424
Total Receivables	126,424

Investments:

Investment Contract	256,851,489
Total Investments	256,851,489

Total Assets	256,977,913
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Liabilities

Benefits Payable	293,551
Unearned Revenue	155,198
Due to Other Benefit Programs	46,048
Interfund Payables	0
Miscellaneous Payables	80,237
Total Liabilities	575,034

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

\$256,402,879

Statement of Changes in Fiduciary Net Position

December 31, 2019

Additions

Employer Contributions	\$1,807,765
Total Contributions	1,807,765
Investment Income (loss):	
Other Investment Income	7,367,787
Net Investment Income	7,367,787
Service Reimbursement Income	126,424
Total Additions	9,301,976

Deductions

Other Benefit Expenses	9,357,823
Carrier Administrative Expenses	1,257,849
Administrative Expenses	126,285
Total Deductions	10,741,957
Transfer from Active Life Insurance Program	12,944,626
Net Increase/(Decrease) in Net Position	11,504,645

Net Position Restricted For Postemployment Benefits Other Than Pensions

Beginning of Year (January 1, 2019)	244,898,234
End of Year (December 31, 2019)	\$256,402,879

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	3.13%
2018	3.10%
2019	3.05%

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	\$256,402,879	\$2,016,244	\$12,189,322	\$1,210,000	\$10,655,232	\$255,675,033
2021	255,675,033	1,884,161	13,070,057	1,236,620	10,602,210	253,854,727
2022	253,854,727	1,752,834	13,977,700	1,263,826	10,502,191	250,868,226
2023	250,868,226	1,623,185	14,921,332	1,291,630	10,351,867	246,630,317
2024	246,630,317	1,494,818	15,942,745	1,320,046	10,146,719	241,009,063
2025	241,009,063	1,368,896	16,997,470	1,349,087	9,882,110	233,913,512
2026	233,913,512	1,248,392	18,139,611	1,378,767	9,553,087	225,196,614
2027	225,196,614	1,135,196	19,348,870	1,409,099	9,153,872	214,727,712
2028	214,727,712	1,031,200	20,633,898	1,440,100	8,678,768	202,363,683
2029	202,363,683	934,314	21,964,933	1,471,782	8,122,280	187,983,562
2030	187,983,562	845,743	23,343,912	1,504,161	7,479,252	171,460,484
2031	171,460,484	766,925	24,768,201	1,537,253	6,744,377	152,666,332
2032	152,666,332	696,393	26,219,630	1,571,072	5,912,565	131,484,588
2033	131,484,588	632,076	27,684,145	1,605,636	4,979,119	107,806,002
2034	107,806,002	573,377	29,190,877	1,640,960	3,938,763	81,486,306
2035	81,486,306	520,375	30,773,088	1,677,061	2,784,660	52,341,192
2036	52,341,192	473,142	32,356,636	1,713,956	1,510,555	20,254,297
2037	20,254,297	429,630	33,776,770	1,751,663	114,958	(14,729,548)

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	\$256,402,879	\$12,189,322	\$12,189,322	\$0	\$11,938,273	\$0	\$12,018,205
2021	255,675,033	13,070,057	13,070,057	0	12,279,011	0	12,527,306
2022	253,854,727	13,977,700	13,977,700	0	12,596,374	0	13,023,750
2023	250,868,226	14,921,332	14,921,332	0	12,898,564	0	13,515,374
2024	246,630,317	15,942,745	15,942,745	0	13,219,676	0	14,037,951
2025	241,009,063	16,997,470	16,997,470	0	13,519,665	0	14,549,399
2026	233,913,512	18,139,611	18,139,611	0	13,839,919	0	15,094,157
2027	225,196,614	19,348,870	19,348,870	0	14,160,713	0	15,651,524
2028	214,727,712	20,633,898	20,633,898	0	14,485,542	0	16,225,663
2029	202,363,683	21,964,933	21,964,933	0	14,791,332	0	16,790,793
2030	187,983,562	23,343,912	23,343,912	0	15,079,084	0	17,347,428
2031	171,460,484	24,768,201	24,768,201	0	15,346,867	0	17,892,707
2032	152,666,332	26,219,630	26,219,630	0	15,583,886	0	18,413,158
2033	131,484,588	27,684,145	27,684,145	0	15,783,534	0	18,899,616
2034	107,806,002	29,190,877	29,190,877	0	15,964,092	0	19,372,655
2035	81,486,306	30,773,088	30,773,088	0	16,143,292	0	19,853,324
2036	52,341,192	32,356,636	32,356,636	0	16,282,021	0	20,292,971
2037	20,254,297	33,776,770	0	33,776,770	0	21,046,302	20,593,043
2038	0	35,165,307	0	35,165,307	0	21,327,135	20,841,884
2039	0	36,564,581	0	36,564,581	0	21,584,359	21,067,029
2040	0	37,913,655	0	37,913,655	0	21,783,850	21,235,304
2041	0	39,167,685	0	39,167,685	0	21,904,197	21,326,072
2042	0	40,414,373	0	40,414,373	0	21,998,634	21,391,388
2043	0	41,603,487	0	41,603,487	0	22,041,951	21,406,861
2044	0	42,718,637	0	42,718,637	0	22,029,170	21,367,847
2045	0	43,739,686	0	43,739,686	0	21,954,161	21,268,614
2046	0	44,627,699	0	44,627,699	0	21,802,491	21,095,419
2047	0	45,422,768	0	45,422,768	0	21,599,100	20,872,641
2048	0	46,145,895	0	46,145,895	0	21,357,754	20,613,750
2049	0	46,764,049	0	46,764,049	0	21,066,629	20,307,487
2050	0	47,337,093	0	47,337,093	0	20,756,062	19,983,235
2051	0	47,819,891	0	47,819,891	0	20,408,562	19,624,244
2052	0	48,266,438	0	48,266,438	0	20,049,775	19,255,276
2053	0	48,697,759	0	48,697,759	0	19,689,454	18,885,723
2054	0	49,039,765	0	49,039,765	0	19,298,943	18,488,137
2055	0	49,314,045	0	49,314,045	0	18,889,315	18,073,220
2056	0	49,495,915	0	49,495,915	0	18,453,356	17,634,145
2057	0	49,556,591	0	49,556,591	0	17,983,237	17,163,530
2058	0	49,497,078	0	49,497,078	0	17,482,617	16,664,983
2059	0	49,308,739	0	49,308,739	0	16,951,621	16,138,730
2060	0	48,973,269	0	48,973,269	0	16,387,279	15,582,054
2061	0	48,487,835	0	48,487,835	0	15,792,140	14,997,488
2062	0	47,872,286	0	47,872,286	0	15,175,842	14,394,283
2063	0	47,192,581	0	47,192,581	0	14,561,389	13,794,302
2064	0	46,463,678	0	46,463,678	0	13,954,141	13,202,608
2065	0	45,664,531	0	45,664,531	0	13,348,392	12,613,781
2066	0	44,794,359	0	44,794,359	0	12,744,820	12,028,452
2067	0	43,847,521	0	43,847,521	0	12,142,717	11,445,944
2068	0	42,818,463	0	42,818,463	0	11,541,502	10,865,702
2069	0	41,717,791	0	41,717,791	0	10,944,931	10,291,250
2070	0	40,561,758	0	40,561,758	0	10,357,833	9,727,108
2071	0	39,354,130	0	39,354,130	0	9,781,442	9,174,395
2072	0	38,094,410	0	38,094,410	0	9,215,826	8,633,135

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	\$36,783,468	\$0	\$36,783,468	\$0	\$8,661,361	\$8,103,639
2074	0	35,416,475	0	35,416,475	0	8,117,069	7,584,953
2075	0	33,983,215	0	33,983,215	0	7,580,866	7,075,093
2076	0	32,474,292	0	32,474,292	0	7,051,061	6,572,453
2077	0	30,888,739	0	30,888,739	0	6,527,929	6,077,264
2078	0	29,234,420	0	29,234,420	0	6,013,539	5,591,426
2079	0	27,518,032	0	27,518,032	0	5,509,516	5,116,413
2080	0	25,753,787	0	25,753,787	0	5,018,774	4,654,890
2081	0	23,955,320	0	23,955,320	0	4,543,797	4,209,112
2082	0	22,133,429	0	22,133,429	0	4,086,261	3,780,570
2083	0	20,304,166	0	20,304,166	0	3,648,573	3,371,428
2084	0	18,487,140	0	18,487,140	0	3,233,464	2,984,136
2085	0	16,692,984	0	16,692,984	0	2,841,795	2,619,407
2086	0	14,935,850	0	14,935,850	0	2,474,851	2,278,343
2087	0	13,226,600	0	13,226,600	0	2,133,182	1,961,361
2088	0	11,577,971	0	11,577,971	0	1,817,492	1,669,021
2089	0	10,001,410	0	10,001,410	0	1,528,135	1,401,557
2090	0	8,513,404	0	8,513,404	0	1,266,089	1,159,773
2091	0	7,130,555	0	7,130,555	0	1,032,154	944,307
2092	0	5,868,677	0	5,868,677	0	826,841	755,527
2093	0	4,746,721	0	4,746,721	0	650,932	594,051
2094	0	3,776,504	0	3,776,504	0	504,072	459,452
2095	0	2,960,807	0	2,960,807	0	384,657	350,171
2096	0	2,291,077	0	2,291,077	0	289,710	263,409
2097	0	1,752,212	0	1,752,212	0	215,661	195,838
2098	0	1,325,338	0	1,325,338	0	158,771	143,998
2099	0	991,457	0	991,457	0	115,606	104,719
2100	0	733,399	0	733,399	0	83,235	75,303
2101	0	536,175	0	536,175	0	59,229	53,518
2102	0	387,395	0	387,395	0	41,652	37,589
2103	0	276,536	0	276,536	0	28,940	26,085
2104	0	194,890	0	194,890	0	19,852	17,871
2105	0	135,410	0	135,410	0	13,425	12,070
2106	0	92,506	0	92,506	0	8,927	8,016
2107	0	62,074	0	62,074	0	5,830	5,229
2108	0	40,965	0	40,965	0	3,745	3,355
2109	0	26,453	0	26,453	0	2,354	2,106
2110	0	16,811	0	16,811	0	1,456	1,301
2111	0	10,502	0	10,502	0	885	790
2112	0	6,429	0	6,429	0	528	470
2113	0	3,892	0	3,892	0	311	277
2114	0	2,303	0	2,303	0	179	159
2115	0	1,287	0	1,287	0	97	86
2116	0	581	0	581	0	43	38
2117	0	199	0	199	0	14	13
2118	0	67	0	67	0	5	4
Total					243,911,845	+ 723,909,794	= 967,821,639

* 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, 2.87%

Net OPEB Liability

Net OPEB Liability	December 31, 2018	December 31, 2019
Total OPEB liability	\$502,931,976	\$682,222,365
Fiduciary net position	244,898,234	256,402,879
Net OPEB liability	258,033,742	425,819,486
Fiduciary net position as a % of total OPEB liability	48.69%	37.58%
Covered payroll	4,115,018,000	4,228,196,000
Net OPEB liability as a % of covered payroll	6.27%	10.07%

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	4.22%	2.87%
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	\$502,931,976	\$244,898,234	\$258,033,742
Changes for the year:			
Service cost	17,023,950		17,023,950
Interest on total OPEB liability	21,746,730		21,746,730
Effect of plan changes	0		0
Effect of economic/demographic gains or losses	(9,523,423)		(9,523,423)
Effect of assumptions changes or inputs	159,400,955		159,400,955
Benefit payments	(9,357,823)	(9,357,823)	0
Employer contributions		1,807,765	(1,807,765)
Transfer from active life insurance program		12,944,626	(12,944,626)
Net investment income		7,494,211	(7,494,211)
Administrative expenses		(1,384,134)	1,384,134
Balances as of December 31, 2019	682,222,365	256,402,879	425,819,486

Sensitivity Analysis

The following presents the net OPEB liability, calculated using the discount rate of 2.87%, as well as what the net OPEB liability would be if it were calculated using a discount rate that is 1 percentage point lower (1.87%) or 1 percentage point higher (3.87%) than the current rate.

	Current		
	1% Decrease 1.87%	Discount Rate 2.87%	1% Increase 3.87%
Total OPEB liability	\$844,388,251	\$682,222,365	\$558,845,689
Fiduciary net position	256,402,879	256,402,879	256,402,879
Net OPEB liability	587,985,372	425,819,486	302,442,810

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	\$17,024	\$21,103	\$18,064	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interest on total OPEB liability	21,747	20,416	19,813	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	(9,523)	(11,045)	(4,888)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Effect of assumption changes or inputs	159,401	(65,026)	33,525	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Benefit payments	(9,358)	(7,605)	(7,323)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net change in total OPEB liability	179,290	(42,157)	59,190	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total OPEB liability, beginning	502,932	545,089	485,899	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total OPEB liability, ending (a)	682,222	502,932	545,089	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary Net Position										
Employer contributions	\$1,808	\$1,927	\$2,063	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Transfer from active life insurance program	12,945	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Investment income	7,494	7,580	7,664	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Benefit payments	(9,358)	(7,605)	(7,323)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Administrative expenses	(1,384)	(1,235)	(1,284)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net change in plan fiduciary net position	11,505	667	1,119	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, beginning	244,898	244,231	243,112	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, ending (b)	256,403	244,898	244,231	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net OPEB liability, ending = (a) - (b)	\$425,819	\$258,034	\$300,858	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position as a % of total OPEB liability	37.58%	48.69%	44.81%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Covered payroll	\$4,228,196	\$4,115,018	\$4,205,286	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net OPEB liability as a % of covered payroll	10.07%	6.27%	7.15%	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	\$21,102,516	\$17,023,950
Interest on total OPEB liability	20,415,960	21,746,730
Effect of plan changes	0	0
Administrative expenses	1,235,082	1,384,134
Expected investment return net of investment expenses	(12,040,836)	(12,024,281)
Recognition of Deferred Inflows/Outflows of Resources		
Recognition of economic/demographic gains or losses	(2,193,870)	(3,537,089)
Recognition of assumption changes or inputs	(4,642,398)	17,840,106
Recognition of investment gains or losses	1,758,154	2,664,168
OPEB Expense	25,634,608	45,097,718

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	(\$19,076,154)	\$0
Changes of assumptions	(46,836,942)	157,086,707
Net difference between projected and actual earnings	0	8,032,453
Total	(65,913,096)	165,119,160
Total net deferrals		99,206,064

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	\$16,967,185
2021	16,967,185
2022	16,101,120
2023	15,209,031
2024	12,515,612
Thereafter*	21,445,931
Total net deferrals	\$99,206,064

* 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	\$4,530,070	12/31/2019	5.00	5.00	\$906,014	\$0	\$3,624,056
(gains) or losses	4,460,445	12/31/2018	5.00	4.00	892,089	0	2,676,267
	4,330,325	12/31/2017	5.00	3.00	<u>866,065</u>	<u>0</u>	<u>1,732,130</u>
		Total			2,664,168	0	8,032,453
Differences							
between expected	(9,523,423)	12/31/2019	7.09	7.09	(1,343,219)	(8,180,204)	0
and actual	(11,044,672)	12/31/2018	7.15	6.15	(1,544,709)	(7,955,254)	0
experience	(4,888,179)	12/31/2017	7.53	5.53	<u>(649,161)</u>	<u>(2,940,696)</u>	<u>0</u>
		Total			(3,537,089)	(19,076,154)	0
Assumption	159,400,955	12/31/2019	7.09	7.09	22,482,504	0	136,918,451
changes or inputs	(65,026,046)	12/31/2018	7.15	6.15	(9,094,552)	(46,836,942)	0
	33,524,718	12/31/2017	7.53	5.53	<u>4,452,154</u>	<u>0</u>	<u>20,168,256</u>
		Total			17,840,106	(46,836,942)	157,086,707
Subtotal of Deferred Inflows/Outflows						(65,913,096)	165,119,160
Total net deferrals							99,206,064

* 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	(\$502,931,976)	\$244,898,234	(\$258,033,742)	(\$69,021,314)	\$30,786,961	(\$38,234,353)	(\$296,268,095)	
Service cost	(17,023,950)		(17,023,950)					17,023,950
Interest on total OPEB liability	(21,746,730)		(21,746,730)					21,746,730
Effect of plan changes	0		0					0
Effect of liability gains or losses	9,523,423		9,523,423	(9,523,423)		(9,523,423)		
Effect of assumption changes or inputs	(159,400,955)		(159,400,955)		159,400,955	159,400,955		
Benefit payments	9,357,823	(9,357,823)	0					
Transfer from active life insurance program		12,944,626	12,944,626				12,944,626	
Administrative expenses		(1,384,134)	(1,384,134)					1,384,134
Expected investment income (net of inv expenses)		12,024,281	12,024,281					(12,024,281)
Investment gains or losses		(4,530,070)	(4,530,070)		4,530,070	4,530,070		
Employer contributions		1,807,765	1,807,765				1,807,765	
Recognition of liability gains or losses				3,537,089		3,537,089		(3,537,089)
Recognition of assumption changes or inputs				9,094,552	(26,934,658)	(17,840,106)		17,840,106
Recognition of investment gains or losses					(2,664,168)	(2,664,168)		2,664,168
Annual expense							(45,097,718)	45,097,718
Balances as of December 31, 2019	(682,222,365)	256,402,879	(425,819,486)	(65,913,096)	165,119,160	99,206,064	(326,613,422)	

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:	2.87% (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

Trend Rate: 0.00% increase in life insurance premium rates shown on page 30.

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: \$1,210,000. 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 4.22% to 2.87%. A decrease in the discount rate increases the liabilities.

The administrative expense assumption was updated from \$1,150,000 to \$1,210,000 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 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 2.87%. 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.

Trend Rate:

We have assumed no future increases in life insurance premium rates. There have been no premium rate increases since the inception of the plan.

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	50
While 67 and later	25*

* Local employers may elect to increase this to 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	Basic	Supplemental
Under 30	\$0.05	\$0.05
30-34	0.06	0.06
35-39	0.07	0.07
40-44	0.08	0.08
45-49	0.12	0.12
50-54	0.22	0.22
55-59	0.39	0.39
60-64	0.49	0.49
65-69	0.57	0.57

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

Employer Premiums:

The employer must pay these premiums while actively employed:

- 40% of Employee Premiums if 50% post-66 retiree Basic coverage
- 20% of Employee Premiums if 25% post-66 retiree Basic coverage

100% of Employer Premiums are paid to fund retiree coverage.

No Employer contribution required 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	74,557	74,481	74,447	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	45.1	45.2	45.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Service	10.3	10.3	10.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Projected Salary	\$58,130	\$57,161	\$56,488	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Disabled Participants										
Count	1,205	1,238	1,234	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	57.6	57.4	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Current Insurance	\$47,680	\$46,842	\$46,307	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C. Pre-65 Annuitants										
Count	10,076	10,195	10,571	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	61.2	61.2	61.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Current Insurance	\$64,538	\$63,470	\$62,285	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Post-64 Annuitants										
Count	35,522	34,068	31,924	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Age	74.5	74.4	74.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Current Insurance	\$12,774	\$12,455	\$14,787	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	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	ALL
<25	1,026	953	2	-	-	-	-	-	-	-	1,981
25-29	1,432	4,509	456	7	-	-	-	-	-	-	6,404
30-34	1,076	3,976	2,541	502	6	-	-	-	-	-	8,101
35-39	936	3,346	2,138	2,329	470	7	-	-	-	-	9,226
40-44	774	2,781	1,664	1,865	2,331	318	5	-	-	-	9,738
45-49	679	2,470	1,654	1,698	2,191	1,975	343	1	-	-	11,011
50-54	557	2,024	1,598	1,746	1,932	1,774	1,620	262	6	-	11,519
55-59	412	1,449	1,284	1,476	1,830	1,429	1,195	632	166	11	9,884
60-64	161	719	734	827	1,024	894	618	299	155	67	5,498
65-69	34	143	182	203	218	170	118	77	30	20	1,195
70+	-	-	-	-	-	-	-	-	-	-	-
ALL	7,087	22,370	12,253	10,653	10,002	6,567	3,899	1,271	357	98	74,557

Projected Salary											
Years of Service											
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	ALL
<25	42,453	42,536	*	-	-	-	-	-	-	-	42,496
25-29	45,415	49,416	58,008	*	-	-	-	-	-	-	49,124
30-34	47,472	50,888	59,979	65,273	*	-	-	-	-	-	54,179
35-39	48,137	52,185	61,027	67,195	67,168	*	-	-	-	-	58,373
40-44	49,049	52,806	61,280	68,176	70,797	72,226	*	-	-	-	61,834
45-49	48,845	53,481	59,875	65,685	70,793	74,864	72,258	*	-	-	63,902
50-54	47,073	51,172	56,082	61,770	65,538	71,302	75,285	68,042	*	-	62,553
55-59	45,399	49,780	53,274	56,356	58,806	61,988	67,329	68,783	61,472	*	58,004
60-64	38,714	44,719	50,131	55,151	54,562	56,110	61,543	62,274	67,087	68,348	54,285
65-69	37,179	39,112	39,984	49,457	53,175	54,116	55,921	62,050	67,036	68,469	49,977
70+	-	-	-	-	-	-	-	-	-	-	-
ALL	46,321	50,635	58,151	63,354	65,359	67,854	69,774	66,678	64,426	66,414	58,130

* 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.