Actuarial Valuation of
The Duty Disability Insurance Program

As of December 31, 2019

For The State of Wisconsin
Department of Employee Trust Funds

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May 19, 2020

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Appendices:

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May 19, 2020

Ms. Cindy Klimke, CPA
Chief Trust Finance Officer
State of Wisconsin
Department of Employee Trust Funds
4822 Madison Yards Way
Madison, Wisconsin 53705-9100

RE: Actuarial Valuation of Duty Disability Program as of December 31, 2019

Dear Cindy:

This report contains the results of an actuarial valuation of the Duty Disability insurance program as of December 31, 2019. The results include estimated claim liabilities as of December 31, 2019, and financial projections of Duty Disability fund balances under several different scenarios. This report also provides documentation of the valuation methods and assumptions we used for performing the analysis.

The State of Wisconsin Department of Employee Trust Funds (ETF) and its auditors have determined that the Duty Disability insurance program is not subject to the provisions of GASB 74, which govern the financial reporting of Other Post-Employment Benefits (OPEBs), and which require the use of pension accounting methods, including the calculation of a liability for active lives. We have therefore performed this valuation according to the requirements of GASB 10 ("Accounting and Reporting for Risk Financing and Related Insurance Issues"), which does not require the calculation of a liability for active lives. This approach is consistent with last year's valuation of the Duty Disability insurance program. Ultimately it is the responsibility of ETF and its auditors to determine the applicable accounting standards for the plans.

The valuation results discussed in this report include estimated liabilities for Duty Disability claims that were open on December 31, 2019, and for claims incurred but not reported as of December 31, 2019. These liabilities represent the present value of expected future benefit payments and expected costs for adjudicating claims. Because GASB 10 does not require the calculation of a liability for active lives, we have not included an estimate of future claim liabilities for active members.

This report is prepared solely for the internal business use of ETF. 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:

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b) ETF may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

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

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by ETF, including historical claim data, reserve statements, and active member data. While Milliman has not audited this data, we have reviewed it for reasonableness and it is, in our opinion, sufficient and reliable for the purposes of our calculations. If any of this information as summarized in this report is inaccurate or incomplete, the results shown could be materially affected and this report may need to be revised.

The discount rate used for this valuation was prescribed by ETF and is specified in this report. We have performed no independent assessment of the reasonableness of this assumption. ETF is solely responsible for establishing the assumption and communicating any changes to Milliman for the purpose of this valuation.

This analysis 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 employer contributions. While this report is based on the assumptions documented here, 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 such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. ETF has the final decision regarding the appropriateness of the assumptions and actuarial cost methods.

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.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

I, Paul L. Correia, FSA, MAAA, am a consulting actuary for Milliman, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Daniel D. Skwire, FSA, MAAA, am a consulting actuary for Milliman, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely,

Paul L Correia

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Principal and Consulting Actuary
Milliman, Inc.

Daniel D. Skwire, FSA, MAAA
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Section I: Introduction and Executive Summary

The estimated liabilities for the Duty Disability insurance program as of December 31, 2019 are summarized in Table 1.1 below:

Table 1.1 Estimated Liabilities for the Duty Disability Program As of December 31, 2019	
Liability Component	Estimated Liability
Open Claims	$412,357,049
Future Survivors	$20,390,585
IBNR Claims	$24,400,599
Loss Adjustment Expenses	$9,173,828
Total	**$466,322,061**

The liability for open claims includes estimated liabilities for 968 disabled members and 58 survivors (i.e. spouses and domestic partners) who were receiving benefits on December 31, 2019. The liability for future survivors represents the present value of expected future benefit payments to survivors of currently disabled members. The liability for IBNR claims represents the present value of expected future benefit payments to members and survivors whose claims were incurred but were unreported as of December 31, 2019 as well as claims that were reported as of December 31, 2019 but had not yet been approved for payment. The liability for loss adjustment expenses is the present value of expected costs arising from the ongoing management and payment of Duty Disability claims. The estimated liabilities and valuation methods are discussed in detail in Section II of this report.

We performed a funding analysis of the Duty Disability program based on a starting smoothed fund balance equal to $659 million on December 31, 2019. The estimated surplus in the Duty Disability fund was equal to 41% of program liabilities as of December 31, 2019, as shown in Table 1.2 below:

Table 1.2: Duty Disability Funding Analysis	
Balance Sheet Item	2019
Beginning of Year Balance	$642,041,947
Plus: Investment Income (Smoothed)	$46,303,564
Plus: Premium Contributions and Miscellaneous Income	$7,599,226
Less: Insurance Claims	$36,350,818
Less: Administrative Expenses	$588,120
End of Year Balance	$659,005,799
Estimated Liability as of December 31, 2019	$466,322,061
Surplus ($)	$192,683,738
Surplus (% of Estimated Liability)	41%

We projected future financial experience and expected fund levels from 2020 through 2028 under several different scenarios. The projections are provided in Section III of this report.

Section II: Actuarial Valuation

The estimated liabilities for the Duty Disability program as of December 31, 2019 consist of the following components:

- Open Claims: The liability for open claims represents the present value of expected future benefit payments to disabled members and survivors approved for Duty Disability benefits on December 31, 2019. There were 968 disabled members and 58 survivors reported in the claim data as of December 31, 2019.

- Future Survivors: Monthly death benefits are payable to surviving spouses/domestic partners if the disabled member dies as a result of the same injury or disease for which Duty Disability benefits were payable. The liability for future survivors represents the present value of expected future benefit payments to survivors of currently disabled members.

- Incurred But Not Reported (IBNR) Claims: The liability for IBNR claims represents the present value of expected future benefit payments to members and survivors whose claims were incurred but had not been reported as of December 31, 2019 as well as claims that had been reported as of December 31, 2019 but had not yet been approved for payment.

- Loss Adjustment Expenses: The liability for loss adjustment expenses represents the present value of expected future expenses related to the ongoing management and payment of Duty Disability claims.

A comparison of the estimated liabilities for the Duty Disability program between December 31, 2018 and December 31, 2019 is provided below in Table 2.1. The change in the estimated liability was driven, in part, by changes to the valuation assumptions this year.

Table 2.1: Comparison of Estimated Liabilities
December 31, 2018 vs. December 31, 2019

Liability Component	December 31, 2018	December 31, 2019
Open Claims	$398,952,462	$412,357,049
Future Survivors	27,044,242	$20,390,585
IBNR Claims	19,725,319	$24,400,599
Loss Adjustment Expense	8,863,225	$9,173,828
Total	**$454,585,247**	**$466,322,061**

Open Claims

The estimated liability for open claims increased by approximately 3.4% from $399 million as of December 31, 2018 to $412 million as of December 31, 2019. The number of open claims increased slightly from 1,025 open claims on December 31, 2018 to 1,026 open claims on December 31, 2019, and the average monthly benefit amount increased by 3.2% from $2,827 as of December 31, 2018 to $2,917 as of December 31, 2019.

An audit of Duty Disability valuation methods and assumptions was performed by an independent consulting firm in 2019. The outcome from this audit included a recommendation to update certain valuation assumptions, including claim termination and estimated offset assumptions used to project future benefit payments. Therefore, we have performed experience studies using historical Duty Disability claim experience, and we have developed new assumptions for estimating Duty Disability liabilities as of December 31, 2019.

We developed new claim termination rates based on the mortality rates specified in the *2015 - 2017 Wisconsin Retirement System Three-Year Experience Study* report, and adjusted these rates to reflect Duty Disability claim trends. For disabled members, we developed base rates by averaging the mortality rates for disabled lives and healthy retirees from the report, based on the motion approved by the Board in 2019. The base rates for survivors represent the mortality rates for WRS annuitants. We then developed adjustment factors to apply to the base rates to reflect specific trends in Duty Disability claim experience. We adjusted the base rates for disabled members by a factor of 40%, and we adjusted the base rates for survivors by a factor of 80%. The final claim termination rates are provided in Appendix B. Additional documentation of the experience studies and results are provided in a separate report.

In developing the claim termination rate adjustment factors, we considered adjusting rates for future trends in mortality improvement. However, based on the results of our experience studies, we did not notice improvement trends in Duty Disability mortality, and therefore we did not include an explicit provision for future mortality improvement in the new claim termination rate assumptions. We will continue to study this issue in our experience analysis.

We validated the new claim termination rate assumptions by performing retrospective runoff studies using Duty Disability claim experience from 2015 through 2019. The runoff studies involved calculating liabilities at prior valuation dates using current valuation assumptions, and determining whether the liabilities provided sufficient funding for the emerging cost of claims. The results are shown below in Tables 2.2 and 2.3. A positive margin indicates the liability was adequate to cover the runout of open Duty Disability claims during the study period, while a negative margin indicates a deficiency. Note that the results shown below correspond to mutually distinct 12-month runoff studies. An average annual margin is provided in the last row of the table representing the average annual margin over the five-year experience period.

Table 2.2: Runoff Study for Disabled Members Annual Margin as % of Initial Liability	
Experience Period	Annual Margin
2015	0.90%
2016	1.21%
2017	1.23%
2018	0.65%
2019	1.00%
Average	1.00%

We typically target an overall average margin of 1% to 5% for this type of program. Although the results from the runoff studies show modest positive margins, some of which are less than our target 1% to 5% range, we do not believe that the small positive margins pose a significant concern at this time due to the consistency of experience over time. We will continue to monitor Duty Disability experience along with the valuation assumptions to ensure that the liability estimates are adequate.

We also performed liability runoff studies to test the new claim termination assumptions for survivors, because those assumptions are different than the assumptions for disabled members. The runoff studies used historical experience from 2015 through 2019. The results, shown below, correspond to mutually distinct 12-month runoff studies, along with an overall average margin in the last row representing the average annual margin over the five-year experience period.

Table 2.3: Runout Study for Survivors Annual Margin as % of Initial Liability	
Experience Period	Estimated Margin
2015	3.54%
2016	4.07%
2017	2.44%
2018	0.22%
2019	0.34%
Total	2.13%

The overall margin of 2.13% falls within our target margin range; although we notice that 2018 and 2019 margins are relatively low. We will continue to monitor experience closely and adjust the valuation assumptions as needed.

We also updated the estimated offset assumptions for projecting benefit payments for disabled members—such as WRS benefits, Social Security benefits, etc. The new assumptions were derived from the results of a recent study of benefit offset approval rates and benefit offset amounts for Duty Disability claims. The new estimated offset assumptions are provided in Appendix B.

The impact of calculating the liability for open claims using these new valuation assumptions is a 0.2% increase in the estimated liability as of December 31, 2019, with all else equal.

Table 2.4 below compares the estimated liability for open claims as of December 31, 2019 based on last year's valuation assumptions to the estimated liability based on this year's valuation assumptions. In both cases, the claim inventory is the same and liabilities were calculated using 7.0% interest.

Table 2.4: Estimated Liability for Open Claims As of December 31, 2019 Prior Assumptions versus Current Assumptions	
Prior Assumptions	$411,450,427
Current Assumptions	$412,357,049
Difference ($)	$906,622
Difference (%)	0.2%

Future Survivors

The Duty Disability program provides death benefits to surviving spouses and domestic partners of disabled members who die as a result of the same injury or disease for which Duty Disability benefits were payable. We calculated a liability for future survivors by computing the present value of expected future benefits payable to survivors of currently disabled members. We have assumed that all of the disabled members are married or living with domestic partners, and that males are three years older than their spouse/domestic partner and that females are three years younger than their spouse/domestic partner. We also assumed that one third of the disabled members will die from the same injury or disease that triggered Duty Disability benefits, and therefore that one third of the spouses or domestic partners will be eligible to receive income benefits upon the death of the disabled member.

The estimated liability for future survivors decreased by approximately 25% from $27.0 million as of December 31, 2018 to $20.4 million as of December 31, 2019. This change is due primarily to the change in valuation assumptions, with a modest additional impact from the change in demographics of disabled members. The change in mortality assumptions described above, coupled with a change in the annuity factor assumptions in our model, resulted in a 27% reduction in the liability, with all else being equal.

IBNR Claims

The liability for IBNR claims represents the expected portion of program costs attributable to claims incurred but not reported as of the December 31, 2019 valuation date. We computed the liability for IBNR claims by estimating an average annual incurred claim cost, using historical claim experience, and by estimating the proportion of incurred claims from 2019 and prior years that were unreported as of December 31, 2019.

The following table shows Duty Disability incurred claims from 2012 through 2019.

Table 2.5: Duty Disability Incurred Claims Experience Period: 2012 through 2019			
Calendar Year	Incurred Claims	Annual Payroll	Inc. Claims % of Payroll
2012	$9,976,051	$1,279,908,417	0.78%
2013	$9,515,394	$1,299,551,475	0.73%
2014	$8,574,101	$1,332,780,095	0.64%
2015	$6,893,565	$1,358,934,175	0.51%
2016	$11,717,901	$1,389,907,027	0.84%
2017	$4,540,809	$1,421,147,406	0.32%
2018	$3,920,847	$1,461,189,324	0.27%
2019	$0	$1,516,325,749	0.00%

We assumed that incurred claims experience from 2012 through 2016 is complete; i.e., we assumed that all claims incurred prior to 2017 had been reported as of December 31, 2019. Based on Duty Disability incurred claims experience from 2012 through 2016, we have assumed average incurred claims equal to 0.70% of payroll in any given year. We then calculated the cost for IBNR claims incurred in 2017 through 2019 as the difference between estimated annual incurred claims (i.e. 0.7% of payroll) and known incurred claims in those years, as shown below.

Table 2.6: Estimated Cost for IBNR Claims As of December 31, 2019			
Calendar Year	Known Incurred Claims	Estimated Incurred Claims	Estimated IBNR Cost
2017	$4,540,809	$9,958,581	$5,417,772
2018	$3,920,847	$10,239,171	$6,318,324
2019	$0	$10,625,536	$10,625,536

The estimated cost is $10.6 million for IBNR claims incurred in 2019, $6.3 million for IBNR claims incurred in 2018, and $5.4 million for IBNR claims incurred in 2017. The estimated liability for IBNR claims is the present value of these three components as of December 31, 2019, i.e. $24,400,599.

Loss Adjustment Expenses

The liability for loss adjustment expenses represents the present value of expected future expenses related to the ongoing management and payment of Duty Disability claims. We developed assumptions for projecting future expenses based on an analysis of expenses for the Duty Disability program between 2015 and 2019, as shown below:

Table 2.7: Duty Disability Historical Benefit Payments and Administrative Expenses ($ millions)						
Year	2015	2016	2017	2018	2019	2015 - 2019
A. Benefit Payments	$33.1	$34.4	$35.0	$35.3	$36.4	$174.1
B. Administrative Expenses	$1.1	$1.3	$1.4	$1.2	$0.6	$5.5
C. Expense Ratio (B / A)	3.3%	3.8%	3.9%	3.3%	1.6%	3.2%

The average expense ratio from 2015 through 2019 was equal to 3.2% of annual benefit payments. Because some of the expenses are not directly related to the ongoing management and payment of Duty Disability claims, we assumed that approximately 60% of expenses are related to the ongoing management and payment of claims. We also assumed that the expenses for adjudicating new claims will be higher than the expenses related to ongoing claims. In particular, we have assumed that future expenses related to the ongoing management and payment of Duty Disability claims will be equal to 1.9% of benefit payments for open claims, and 3.9% of benefit payments for IBNR claims. The assumption is higher for IBNR claims to reflect the additional costs related to adjudicating new claims.

Section III: Discussion of Duty Disability Funding Levels

The actuarial valuation of the Duty Disability program includes an analysis of current and future funding levels. The following table shows the Duty Disability fund balance as of December 31, 2019:

Table 3.1
Duty Disability Funding Analysis

Balance Sheet Item	2019
Beginning of Year Balance	$642,041,947
Plus: Investment Income	$46,303,564
Plus: Premium Contributions and Miscellaneous Income	$7,599,226
Less: Insurance Claims	$36,350,818
Less: Administrative Expenses	$588,120
End of Year Balance	$659,005,799
Estimated Liability as of 12/31/2019	$466,322,061
Surplus ($)	$192,683,738
Surplus (%)	41%

The surplus as of December 31, 2019 ($192.7 million) is equal to 41% of the estimated liability as of the valuation date. In 2019, the Board approved a surplus target range of 25% to 35% of the estimated liability for the Duty Disability program.

We have prepared financial projections to evaluate the long-term performance of the Duty Disability fund. The projections reflect actual results for 2019 and projected values in 2020 and beyond. The key elements of these projections include the following:

- Beginning Balance: The projected beginning balance for each year is equal to the prior year's ending balance.

- Payroll: The current payroll was provided to us by ETF. Future payroll is assumed to increase by 3.0% per year, which is consistent with the assumptions used by ETF for retirement fund projections.

- Premium Contributions: Premiums are modeled as a percentage of payroll. Although actual contribution rates vary by employer, we calculated an overall contribution rate of 0.24% for 2020 based on the motion approved by the Board in 2019 for setting tier rates that target overall contributions of $3,798,224 in 2020.

- Investment Income: Investment income in the Baseline Scenario and Scenario 1 is equal to 7.0% of starting fund balances throughout the projection period. In Scenario 2, we assume negative investment income equal to -18.0% of the starting fund balance in 2020, followed by positive investment income equal to 7.0% of starting fund balances in years 2021 and beyond.

- Insurance Claims: Annual paid insurance claims are the sum of projected payments on existing claims as of December 31, 2019, and of payments on expected future claims incurred after December 31, 2019.

- Administrative Expenses: Administrative expenses are modeled as a constant percentage of paid insurance claims, based on actual values in 2019.

- Ending Balance: The ending balance equals the starting balance, plus premiums, plus investment earnings, less claims, and less expenses.

- Estimated Liability: The incurred claim liability is modeled in a similar fashion to the insurance claims. It represents the sum of the decreasing liability on claims that existed as of December 31, 2019 and of the increasing liability for claims incurred after December 31, 2019.

- Surplus or Deficit: The projected surplus or deficit equals the ending balance less the actuarial liability.

Financial projections were developed for the following scenarios:

- The **Baseline** scenario assumes that current contribution rates are held level in all years. Duty Disability fund balances are assumed to earn 7.0% interest every year.

- In Scenario 1, future contributions are waived throughout the projection starting in 2021, and fund balances are assumed to earn 7% interest. This scenario demonstrates that fund balances are not very sensitive to premium contributions, because the contributions are significantly lower than the investment income in every year.

- In **Scenario 2** we assume investment income equal to -18.0% of the starting fund balance in 2020, followed by investment income equal to 7.0% of starting fund balances in 2021 and beyond. We also assume that current contribution rates are held level in all years.

The financial projections for these scenarios are provided on the following pages. In the Baseline Scenario, the surplus is expected to grow to $269.2 million by the end of 2028 (51% of the estimated liability on December 31, 2028). The growth is driven, in part, by the investment income projected in future years, which was based on 7.0% interest every year.

Scenario 1 demonstrates the sensitivity of the fund balance to premium contributions and investment income. Because the contributions are significantly lower than the investment income, the premium holiday does not have a large impact on future fund levels. The fund is projected to increase to $753.0 million (143% of the estimated liability) on December 31,

2028. Note, however, that we would not recommend a premium holiday at this time, due to the current economic and health uncertainty, and because there could be a prolonged period of uncertain market returns, and uncertainty around disability and life claims.

Scenario 2 demonstrates the sensitivity of the projection to the assumption that investment income will equal -18% in 2020. The current contribution rates are unchanged throughout the projection. In this scenario, the surplus decreases significantly in 2020 and reduces over time. The fund is projected to run a deficit of $13.8 million by the end of 2028.

Please note that these projections depend on a variety of actuarial assumptions about future experience, including but not limited to investment earnings, payroll growth, future mortality rates, and disability claim experience. It is nearly certain that actual experience will vary from these assumptions, meaning that the plan's actual surplus or deficit will be higher or lower than the illustrated values.

Baseline Scenario
Investment Income: 7.0%
Premium Contributions: Current contribution rates

Calendar Year	Actual	Projected								
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
BOY Fund Balance	$642,041,947	$659,005,799	$671,813,493	$685,449,674	$699,975,754	$715,457,548	$731,208,278	$747,157,328	$763,406,308	$780,092,625
Premium Contributions	$7,586,588	$3,798,224	$3,912,171	$4,029,536	$4,150,422	$4,274,935	$4,403,183	$4,535,278	$4,671,336	$4,811,477
Miscellaneous Income	$12,638	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$46,303,564	$46,130,406	$47,026,944	$47,981,477	$48,998,303	$50,082,028	$51,184,579	$52,301,013	$53,438,442	$54,606,484
Total Revenues	$53,902,790	$49,928,630	$50,939,115	$52,011,013	$53,148,725	$54,356,963	$55,587,762	$56,836,291	$58,109,778	$59,417,960
Insurance Claims	$36,350,818	$36,529,918	$36,709,019	$36,888,119	$37,067,220	$37,991,568	$39,007,608	$39,941,104	$40,763,941	$41,682,924
Administrative Expense	$588,120	$591,018	$593,915	$596,813	$599,711	$614,666	$631,104	$646,207	$659,520	$674,388
Total Operating Expenses	$36,938,938	$37,120,936	$37,302,934	$37,484,932	$37,666,931	$38,606,233	$39,638,712	$40,587,311	$41,423,461	$42,357,313
Net Change in Fund Balance	$16,963,852	$12,807,694	$13,636,181	$14,526,081	$15,481,794	$15,750,730	$15,949,050	$16,248,980	$16,686,317	$17,060,648
EOY Fund Balance	$659,005,799	$671,813,493	$685,449,674	$699,975,754	$715,457,548	$731,208,278	$747,157,328	$763,406,308	$780,092,625	$797,153,272
Estimated Liability	$466,322,061	$471,670,438	$477,778,575	$484,504,716	$491,938,564	$499,328,726	$506,583,330	$513,688,331	$520,835,358	$527,928,007
Surplus / (Deficit)	$192,683,738	$200,143,055	$207,671,098	$215,471,038	$223,518,984	$231,879,552	$240,573,998	$249,717,976	$259,257,266	$269,225,265
Surplus % of Incurred Claim Liability	41%	42%	43%	44%	45%	46%	47%	49%	50%	51%

** The estimated liability shown above includes the liability for open claims and claims incurred but not reported as of December 31, 2019, as well as the liability for new claims incurred by active members and survivors in 2020 and beyond*

Scenario 1:

Investment Income: 7.0%
Premium Contributions: Waived in 2021 and beyond

Calendar Year	Actual	Projected								
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
BOY Fund Balance	$642,041,947	$659,005,799	$671,813,493	$681,537,503	$691,760,196	$702,516,479	$713,086,399	$723,363,735	$733,411,885	$743,327,256
Premium Contributions	$7,586,588	$3,798,224	$0	$0	$0	$0	$0	$0	$0	$0
Miscellaneous Income	$12,638	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$46,303,564	$46,130,406	$47,026,944	$47,707,625	$48,423,214	$49,176,154	$49,916,048	$50,635,461	$51,338,832	$52,032,908
Total Revenues	$53,902,790	$49,928,630	$47,026,944	$47,707,625	$48,423,214	$49,176,154	$49,916,048	$50,635,461	$51,338,832	$52,032,908
Insurance Claims	$36,350,818	$36,529,918	$36,709,019	$36,888,119	$37,067,220	$37,991,568	$39,007,608	$39,941,104	$40,763,941	$41,682,924
Administrative Expense	$588,120	$591,018	$593,915	$596,813	$599,711	$614,666	$631,104	$646,207	$659,520	$674,388
Total Operating Expenses	$36,938,938	$37,120,936	$37,302,934	$37,484,932	$37,666,931	$38,606,233	$39,638,712	$40,587,311	$41,423,461	$42,357,313
Net Change in Fund Balance	$16,963,852	$12,807,694	$9,724,010	$10,222,693	$10,756,283	$10,569,920	$10,277,336	$10,048,150	$9,915,371	$9,675,595
EOY Fund Balance	$659,005,799	$671,813,493	$681,537,503	$691,760,196	$702,516,479	$713,086,399	$723,363,735	$733,411,885	$743,327,256	$753,002,851
Estimated Liability	$466,322,061	$471,670,438	$477,778,575	$484,504,716	$491,938,564	$499,328,726	$506,583,330	$513,688,331	$520,835,358	$527,928,007
Surplus / (Deficit)	$192,683,738	$200,143,055	$203,758,928	$207,255,480	$210,577,915	$213,757,673	$216,780,405	$219,723,554	$222,491,898	$225,074,844
Surplus % of Incurred Claim Liability	41%	42%	43%	43%	43%	43%	43%	43%	43%	43%

Scenario 2:
Investment Income: -18% in 2020, 7.0% in 2021 and beyond
Premium Contributions: Current contribution rates

Calendar Year	Actual	Projected								
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
BOY Fund Balance	$642,041,947	$659,005,799	$507,062,043	$509,165,622	$511,351,819	$513,629,938	$515,252,735	$516,084,897	$516,158,806	$515,537,798
Premium Contributions	$7,586,588	$3,798,224	$3,912,171	$4,029,536	$4,150,422	$4,274,935	$4,403,183	$4,535,278	$4,671,336	$4,811,477
Miscellaneous Income	$12,638	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$46,303,564	-$118,621,044	$35,494,343	$35,641,594	$35,794,627	$35,954,096	$36,067,691	$36,125,943	$36,131,116	$36,087,646
Total Revenues	$53,902,790	-$114,822,820	$39,406,514	$39,671,129	$39,945,049	$40,229,030	$40,470,874	$40,661,221	$40,802,453	$40,899,122
Insurance Claims	$36,350,818	$36,529,918	$36,709,019	$36,888,119	$37,067,220	$37,991,568	$39,007,608	$39,941,104	$40,763,941	$41,682,924
Administrative Expense	$588,120	$591,018	$593,915	$596,813	$599,711	$614,666	$631,104	$646,207	$659,520	$674,388
Total Operating Expenses	$36,938,938	$37,120,936	$37,302,934	$37,484,932	$37,666,931	$38,606,233	$39,638,712	$40,587,311	$41,423,461	$42,357,313
Net Change in Fund Balance	$16,963,852	-$151,943,756	$2,103,579	$2,186,197	$2,278,119	$1,622,797	$832,162	$73,909	-$621,008	-$1,458,190
EOY Fund Balance	$659,005,799	$507,062,043	$509,165,622	$511,351,819	$513,629,938	$515,252,735	$516,084,897	$516,158,806	$515,537,798	$514,079,608
Estimated Liability	$466,322,061	$471,670,438	$477,778,575	$484,504,716	$491,938,564	$499,328,726	$506,583,330	$513,688,331	$520,835,358	$527,928,007
Surplus / (Deficit)	$192,683,738	$35,391,605	$31,387,047	$26,847,103	$21,691,374	$15,924,009	$9,501,567	$2,470,475	-$5,297,560	-$13,848,399
Surplus % of Incurred Claim Liability	41%	8%	7%	6%	4%	3%	2%	0%	-1%	-3%

Appendix A: Plan Description

A summary of the Duty Disability plan provisions is provided below:

Benefit Eligibility: Members must satisfy all of the following:

- Injured while performing duties or contracted disease due to occupation
- Disability is work-related
- Disability is expected to be permanent

Also, the disability must result in one of the following:

- Reduction in pay or position
- Assignment to light duty
- Retirement
- Impairs promotional opportunities

Member Benefits: 80% of salary (75% for local employees who are not eligible for a Social Security disability award and not eligible for a WRS disability benefit or LTDI). For local members who have been terminated but not approved for WRS disability or LTDI only, the percentage is reduced by 0.5% for each month of WRS creditable service over 25 years. For local members who have not been terminated or have been approved for WRS disability or LTDI, the percentage is reduced by 0.5% per month for every month over 30 years. For all members, the offsets are as follows (with mandatory commencement ages in parenthesis if applicable):

- Any Social Security benefit based upon the participant's work record (age 62; if not already receiving SSDI)
- Unemployment compensation
- Worker's Compensation
- Any WRS retirement, separation, or disability benefit based upon member's earnings and service
- All earnings from the employer where the disability occurred
- A percent of other earnings as follows:
  - 1/3 of earnings less than 40% of salary
  - 1/2 of earnings between 40% and 80% of salary
  - 2/3 of earnings over 80% of salary
- A 5% reduction for non-state members who have not filed a Worker's Compensation claim for permanent disability

Benefit Increases Individuals receive an annual increase of either 1 or 2 below:

1. Social Security salary index for the following individuals:

- Under age 60, or
- Older than 60 and receiving a regular disability retirement or regular LTDI, or
- Receiving a duty disability death benefit based on 1998 law.

2. Prior year's WRS core annuity dividend for the following individuals:
   - Over age 60 and receiving special disability retirement or special LTDI, or
   - Over age 60 not receiving any regular disability retirement or LTDI

<u>Survivor Benefits</u>: State employees and pre-5/3/88 applications for local employees:

- Disabled member dies from the same condition that triggered the onset of Duty Disability benefit in order for a survivor benefit to be payable
- 1/3 of the participant's monthly salary at time of death to surviving spouse (or domestic partner – State employees only), plus
- $15/month to the guardian of each unmarried child under the age of 18
- Not to exceed 65% of the participant's monthly salary at time of death
- No annual adjustments

Post-5/3/88 applications for local employees:

- Disabled member dies from the same condition that triggered the onset of Duty Disability benefit in order for a survivor benefit to be payable
- 1/2 of the participant's monthly salary at time of death to surviving spouse or domestic partner, less other income sources that are based on the participant's earnings record, plus
- 1/10 of the participant's monthly salary at time of death to each unmarried child under the age of 18
- Not to exceed 70% of the participant's monthly salary at time of death less offsets for other income
- Subject to annual adjustments based on salary indexing

Cancer Presumptive Law (state and local):

- Disabled member dies from the same condition that triggered the onset of Duty Disability benefit in order for a survivor benefit to be payable

- 70% of the participant's monthly salary at time of death to surviving spouse or domestic partner, less other income sources that are based on the participant's earnings record
- 1/10 of the participant's monthly salary at time of death to the guardian of each unmarried child under the age of 18, as long as there is no surviving spouse or domestic partner
- There is no maximum on dependent benefits
- Subject to annual adjustments based on salary indexing

Survivor benefits are offset by Chapter 102 Worker's Compensation death benefits

Appendix B: Valuation Assumptions

Valuation Date: December 31, 2019

Discount Rate: 7.00%, representing the long-term investment return for the Duty Disability fund

Claim Termination Rates:

Rates are based on the 2015 - 2017 Experience Study performed by the actuary for the Wisconsin Retirement System, adjusted for recent trends in Duty Disability claim termination experience. The rates vary by attained age and gender. Sample rates are provided below for disabled members and survivors.

Duty Disability Annual Claim Termination Rates					
Disabled Members			Survivors		
Age	Male	Female	Age	Male	Female
25	0.017%	0.009%	25	0.026%	0.014%
30	0.025%	0.014%	30	0.033%	0.019%
35	0.037%	0.022%	35	0.058%	0.035%
40	0.049%	0.033%	40	0.077%	0.048%
45	0.072%	0.049%	45	0.098%	0.073%
50	0.125%	0.080%	50	0.130%	0.108%
55	0.200%	0.128%	55	0.303%	0.193%
60	0.330%	0.195%	60	0.435%	0.279%
65	0.528%	0.319%	65	0.664%	0.421%
70	0.891%	0.559%	70	1.083%	0.705%
75	1.630%	1.041%	75	1.830%	1.279%
80	2.999%	2.076%	80	3.362%	2.402%
85	5.056%	3.756%	85	6.283%	4.818%
90	8.761%	6.788%	90	10.914%	8.738%
95	11.668%	9.817%	95	19.093%	15.763%
100	14.067%	12.113%	100	26.492%	22.891%

Estimated Offsets: We estimated the following offsets to the member's Duty Disability benefit:

Estimated Offset	Assumption
WRS Benefits:	Assume 15% of members qualify for a WRS disability benefit. Assume 10% of members under age 50 who do not qualify for a WRS disability benefit elect to receive a WRS separation benefit.

	Assume other members commence a WRS retirement benefit at age 50 (requirement of plan). Benefits are based on plan provisions and actuarial assumptions stated above.
Social Security:	Assume 10% of members under age 62 and covered by Social Security qualify for Social Security Disability Income benefits. Benefits are equal to 40% of the gross benefit amount. Assume all members under age 62 covered by Social Security will receive Social Security Retirement benefits at age 62.
Unemployment Compensation:	None (No offsets observed)
Combined Offset from: • Worker's Compensation • Employer Earnings • Other Earnings	Assume 3.00% of gross benefit amount excluding separation benefits for disabled members who do not receive WC or earnings offsets.

Benefit Increases: Annual benefit increases of either 3.20% or 2.10% were assumed based on the following criteria:

1. Assumed 3.20% annual increases for the following individuals:
   - Under age 60, or
   - Older than 60 and receiving a regular disability retirement or regular LTDI, or
   - Receiving a duty disability death benefit based on 1998 law.

2. Assumed 2.10% for the following individuals:
   - Over age 60 and receiving special disability retirement or special LTDI, or
   - Over age 60 not receiving any regular disability retirement or LTDI

Death Benefits: Assumed that 33% of survivors (i.e. spouses/domestic partners) will be eligible to receive monthly benefits upon the death of the disabled member. These benefits are payable to survivors of disabled members who die as a result of the same injury or disease that triggered the Duty Disability benefit.

Appendix C: Contribution Rates

The Plan is funded entirely by Employer contributions, which vary by experience as detailed in the following table. The contribution rate is adjusted by an Actuarial Adjustment Rate (AAR), updated each year such that expected employer contributions equal a targeted amount based on actuarial projections.

2020 Contribution Rate Schedule

Employers pay the lower of the contribution rate associated with their claims as a percentage of payroll or their number of claims.

Tier	Contribution Rate as a % of Covered Payroll	Claims as a % of Covered Payroll	Number of Claims
1	0.09%	<=1.5%	1
2	0.17%	> 1.5% but ≤ 3.0%	2
3	0.34%	> 3.0% but ≤ 4.5%	3
4	0.60%	> 4.5% but ≤ 6.0%	4
5	0.94%	> 6.0% but ≤ 7.5%	5
6	1.36%	> 7.5% but ≤ 9.0%	6
7	1.87%	> 9.0% but ≤ 10.5%	7
8	2.24%	Claims > 10.5%	8 or more

Appendix D: Reliance Items

In performing the valuation of the Duty Disability program as of December 31, 2019, we relied, without audit, on certain data and information provided by ETF. To the extent any of the data or other items were incomplete or inaccurate, the results of our work may be materially affected.

The principal items on which we relied included the following:

- Lists of active disability claims and related information
- Fund balances, premium contributions, plan expenses, payroll, and other financial information provided by ETF
- Plan descriptions provided by ETF
- Discussions with ETF