Actuarial Valuation of
The Duty Disability Insurance Program

As of December 31, 2020

For The State of Wisconsin
Department of Employee Trust Funds

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May 19, 2021

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May 19, 2021

Ms. Cindy Klimke, CPA
Chief Trust Finance Officer
State of Wisconsin
Department of Employee Trust Funds
4822 Madison Yards Way
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RE: Actuarial Valuation of Duty Disability Program as of December 31, 2020

Dear Cindy:

This report contains the results of an actuarial valuation of the Duty Disability insurance program as of December 31, 2020. The results include estimated claim liabilities as of December 31, 2020, 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 do 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, 2020, and for claims incurred but not reported as of December 31, 2020. 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:

a) ETF may provide a copy of Milliman's work, in its entirety, to ETF's auditors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit ETF.

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, FSA, MAAA
Principal and Consulting Actuary
Milliman, Inc.

Daniel D. Skwire, FSA, MAAA
Principal and Consulting Actuary
Milliman, Inc.

Section I: Introduction and Executive Summary

The estimated liabilities for the Duty Disability insurance program as of December 31, 2020 are summarized in Table 1.1 below:

Table 1.1 Estimated Liabilities for the Duty Disability Program As of December 31, 2020	
Liability Component	Estimated Liability
Open Claims	$413,524,714
Future Survivors	$21,037,538
IBNR Claims	$23,966,544
Loss Adjustment Expenses	$9,191,378
Total	**$467,720,173**

The liability for open claims includes estimated liabilities for 967 disabled members and 59 survivors (i.e., spouses and domestic partners) who were receiving benefits on December 31, 2020. 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, 2020 as well as claims that were reported as of December 31, 2020 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 $693 million on December 31, 2020. The estimated surplus in the Duty Disability fund was equal to 48% of program liabilities as of December 31, 2020, as shown in Table 1.2 below:

Table 1.2: Duty Disability Funding Analysis	
Balance Sheet Item	2020
Beginning of Year Balance	$659,050,876
Plus: Investment Income (Smoothed)	$67,455,529
Plus: Premium Contributions and Miscellaneous Income	$4,104,762
Less: Insurance Claims	$36,591,380
Less: Administrative Expenses	$793,512
End of Year Balance	$693,226,275
Estimated Liability as of December 31, 2020	$467,720,173
Surplus ($)	$225,506,102
Surplus (% of Estimated Liability)	48%

We have projected future financial experience and expected fund levels from 2021 through 2029. 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, 2020 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, 2020. There were 967 disabled members and 59 survivors reported in the claim data as of December 31, 2020.

- 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, 2020 as well as claims that had been reported as of December 31, 2020 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, 2019 and December 31, 2020 is provided below in Table 2.1.

Table 2.1: Comparison of Estimated Liabilities
December 31, 2019 vs. December 31, 2020

Liability Component	December 31, 2019	December 31, 2020
Open Claims	$412,357,049	$413,524,714
Future Survivors	$20,390,585	$21,037,538
IBNR Claims	$24,400,599	$23,966,544
Loss Adjustment Expense	$9,173,828	$9,191,378
Total	**$466,322,061**	**$467,720,173**

Open Claims

The estimated liability for open claims increased by approximately 0.3% from $412 million as of December 31, 2019 to $414 million as of December 31, 2020. The number of open claims remained the same at 1,026 open claims on December 31, 2019 and on December 31, 2020, and the average monthly benefit amount increased by 0.5% from $2,917 as of December 31, 2019 to $2,933 as of December 31, 2020.

The liability for open claims was calculated using the same claim termination rate assumptions as last year, based on the mortality rates specified in the *2015 - 2017 Wisconsin Retirement System Three-Year Experience Study* report. These rates are adjusted to reflect Duty Disability claim trends. The claim termination rates are provided in Appendix B. The estimated offset assumptions are also the same as last year and are based on results from an experience study performed by Milliman in 2020. The estimated offset assumptions are provided in Appendix B. Finally, a 7.0% discount rate was used to compute the liability for open claims. This discount rate was prescribed by ETF and we have performed no independent assessment of the reasonableness of this assumption.

We tested these assumptions, other than the discount rate, by performing retrospective runoff studies using Duty Disability claim experience from 2016 through 2020. 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
2016	1.04%
2017	1.06%
2018	0.48%
2019	1.00%
2020	0.96%
Average	0.91%

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 2016 through 2020. 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
2016	4.07%
2017	2.44%
2018	0.22%
2019	0.31%
2020	-1.22%
Total	1.17%

The overall margin of 1.17% falls within our target margin range; although we notice that 2018 through 2020 margins are relatively low and the 2020 margin is negative. We will continue to monitor experience closely and adjust the valuation assumptions as needed.

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, 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 increased by approximately 3.2% from $20.4 million as of December 31, 2019 to $21.0 million as of December 31, 2020. This change is due primarily to a change in the demographics of disabled members.

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, 2020 valuation date, and any claims in pending status that were not reported in the claim data. 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 2020 and prior years that were unreported as of December 31, 2020.

The following table shows Duty Disability incurred claims from 2013 through 2020.

Table 2.4: Duty Disability Incurred Claims Experience Period: 2013 through 2020			
Calendar Year	Incurred Claims	Annual Payroll	Inc. Claims % of Payroll
2013	$9,699,879	$1,299,551,475	0.75%
2014	$9,525,954	$1,332,780,095	0.71%
2015	$7,109,480	$1,358,934,175	0.52%
2016	$13,282,979	$1,389,907,027	0.96%
2017	$5,928,107	$1,421,147,406	0.42%
2018	$7,210,180	$1,461,189,324	0.49%
2019	$730,954	$1,516,325,749	0.05%
2020	$788,944	$1,632,443,485	0.05%

We assumed that incurred claims experience from 2013 through 2017 is complete; i.e., we assumed that all claims incurred prior to 2018 had been reported as of December 31, 2020. Based on Duty Disability incurred claims experience from 2013 through 2017, we have assumed average incurred claims equal to 0.67% of payroll in any given year. We then calculated the cost for IBNR claims incurred in 2018 through 2020 as the difference between estimated annual incurred claims (i.e. 0.67% of payroll) and known incurred claims in those years, as shown below.

Table 2.5: Estimated Cost for IBNR Claims As of December 31, 2020			
Calendar Year	Known Incurred Claims	Estimated Incurred Claims	Estimated IBNR Cost
2018	$7,210,180	$9,783,708	$2,573,528
2019	$730,954	$10,152,886	$9,421,931
2020	$788,944	$10,930,377	$10,141,433

The estimated cost is $10.1 million for IBNR claims incurred in 2020, $9.4 million for IBNR claims incurred in 2019, and $2.6 million for IBNR claims incurred in 2018. The estimated liability for IBNR claims is the present value of these three components as of December 31, 2020, i.e., $23,966,544.

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 used the same assumptions as last year for calculating the liability for loss adjustment expenses. These assumptions were developed from an analysis of Duty Disability administrative expenses from 2015 through 2019. In calculating the liabilities, we 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, 2020:

Table 3.1 Duty Disability Funding Analysis	
Balance Sheet Item	2020
Beginning of Year Balance	$659,050,876
Plus: Smoothed Investment Income	$67,455,529
Plus: Premium Contributions and Miscellaneous Income	$4,104,762
Less: Insurance Claims	$36,591,380
Less: Administrative Expenses	$793,512
End of Year Balance	$693,226,275
Estimated Liability as of 12/31/2020	$467,720,173
Surplus ($)	$225,506,102
Surplus (%)	48%

The surplus as of December 31, 2020 ($225.5 million) is equal to 48% 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 2020 and projected values in 2021 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 0.23% for 2021 based on the projected 2021 premium contributions.

- Investment Income: Investment income is equal to 7.0% of starting fund balances throughout the projection period.

- Insurance Claims: Annual paid insurance claims are the sum of projected payments on existing claims as of December 31, 2020, and of payments on expected future claims incurred after December 31, 2020.

- Administrative Expenses: Administrative expenses are modeled as a constant percentage of paid insurance claims, based on actual values in 2020.

- 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, 2020 and of the increasing liability for claims incurred after December 31, 2020.

- 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.

- In **Scenario 1** we assume that contribution rates are reduced by 50% in 2022 then remain level throughout the projection period.

- In **Scenario 2** we assume that no contributions are required starting in 2022.

- In **Scenario 3** we assume that the current contribution rates continue throughout the projection period, and that investment income is -10% in 2021 then reverts to the 7% baseline assumption in 2022 and beyond.

- In **Scenario 4** we assume that the current contribution rates continue throughout the projection period, and that investment income is 0% in 2021 then reverts to the 7% baseline assumption in 2022 and beyond.

The financial projections for these scenarios are provided on the following pages. In the Baseline Scenario, the surplus is expected to grow to $323.9 million by the end of 2029 (61% of the estimated liability on December 31, 2029). The growth is driven, in part, by the investment income projected in future years, which was based on 7.0% interest every year.

Scenarios 1 and 2 demonstrate the sensitivity of the fund balance to different premium contributions. Because the current contributions are significantly lower than the investment income, the 50% reduction in contribution rates (Scenario 1) and the premium holiday (Scenario 2) do not have a large impact on future fund levels. In Scenario 1, the surplus is projected to increase to $301.1 million (57% of the estimated liability) on December 31, 2029. In Scenario 2, the surplus is projected to increase to $278.4 million (52% of the estimated liability) on December 31, 2029. 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 uncertainty around disability and life claims.

Scenarios 3 and 4 demonstrate the sensitivity of the fund balance to different investment income assumptions for 2021. In Scenario 3, which assumes -10% investment income in 2021 then reverts back to the 7% baseline assumption in 2022 and beyond, the funding ratio drops to 125% of the actuarial liability in 2021 then gradually reduces to 123% by December 31, 2029. In Scenario 4, which assumes 0% investment income in 2021 then reverts back to the baseline assumption in 2022 and beyond, the funding ratio is reduced to 139% of the actuarial liability in 2021 then increases to 145% by December 31, 2029.

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								
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
BOY Fund Balance	$659,050,876	$693,226,275	$708,066,651	$723,850,475	$740,647,310	$758,531,694	$776,707,392	$795,286,310	$814,486,934	$834,190,670
Premium Contributions	$4,092,905	$3,912,171	$4,029,536	$4,150,422	$4,274,935	$4,403,183	$4,535,278	$4,671,337	$4,811,477	$4,955,821
Miscellaneous Income	$11,857	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$67,455,529	$48,525,839	$49,564,666	$50,669,533	$51,845,312	$53,097,219	$54,369,517	$55,670,042	$57,014,085	$58,393,347
Total Revenues	$71,560,291	$52,438,010	$53,594,202	$54,819,955	$56,120,247	$57,500,402	$58,904,796	$60,341,378	$61,825,562	$63,349,168
Insurance Claims	$36,591,380	$36,799,607	$37,007,834	$37,216,061	$37,424,289	$38,490,018	$39,469,942	$40,267,523	$41,227,771	$42,151,183
Administrative Expense	$793,512	$798,028	$802,543	$807,059	$811,574	$834,685	$855,936	$873,232	$894,056	$914,081
Total Operating Expenses	$37,384,892	$37,597,635	$37,810,377	$38,023,120	$38,235,863	$39,324,703	$40,325,878	$41,140,754	$42,121,827	$43,065,264
Net Change in Fund Balance	$34,175,399	$14,840,376	$15,783,824	$16,796,835	$17,884,384	$18,175,698	$18,578,918	$19,200,624	$19,703,735	$20,283,905
EOY Fund Balance	$693,226,275	$708,066,651	$723,850,475	$740,647,310	$758,531,694	$776,707,392	$795,286,310	$814,486,934	$834,190,670	$854,474,574
Estimated Liability	$467,720,173	$473,269,654	$479,486,462	$486,413,909	$494,038,064	$501,493,217	$508,766,850	$516,069,209	$523,348,219	$530,616,100
Surplus / (Deficit)	$225,506,102	$234,796,997	$244,364,013	$254,233,401	$264,493,630	$275,214,176	$286,519,460	$298,417,726	$310,842,450	$323,858,474
Surplus % of Incurred Claim Liability	48%	50%	51%	52%	54%	55%	56%	58%	59%	61%

** The estimated liability shown above includes the liability for open claims and claims incurred but not reported as of December 31, 2020, as well as the liability for new claims incurred by active members and survivors in 2021 and beyond.*

Scenario 1:

Investment Income: 7.0%

Premium Contributions: Reduced by 50% in 2022 then held level

Calendar Year	Actual	Projected								
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
BOY Fund Balance	$659,050,876	$693,226,275	$708,066,651	$721,835,707	$736,416,297	$751,867,043	$767,374,624	$783,032,609	$799,039,805	$815,256,503
Premium Contributions	$4,092,905	$3,912,171	$2,014,768	$2,075,211	$2,137,467	$2,201,591	$2,267,639	$2,335,668	$2,405,738	$2,477,911
Miscellaneous Income	$11,857	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$67,455,529	$48,525,839	$49,564,666	$50,528,499	$51,549,141	$52,630,693	$53,716,224	$54,812,283	$55,932,786	$57,067,955
Total Revenues	$71,560,291	$52,438,010	$51,579,434	$52,603,711	$53,686,608	$54,832,284	$55,983,863	$57,147,951	$58,338,525	$59,545,866
Insurance Claims	$36,591,380	$36,799,607	$37,007,834	$37,216,061	$37,424,289	$38,490,018	$39,469,942	$40,267,523	$41,227,771	$42,151,183
Administrative Expense	$793,512	$798,028	$802,543	$807,059	$811,574	$834,685	$855,936	$873,232	$894,056	$914,081
Total Operating Expenses	$37,384,892	$37,597,635	$37,810,377	$38,023,120	$38,235,863	$39,324,703	$40,325,878	$41,140,754	$42,121,827	$43,065,264
Net Change in Fund Balance	$34,175,399	$14,840,376	$13,769,056	$14,580,590	$15,450,745	$15,507,581	$15,657,985	$16,007,197	$16,216,698	$16,480,602
EOY Fund Balance	$693,226,275	$708,066,651	$721,835,707	$736,416,297	$751,867,043	$767,374,624	$783,032,609	$799,039,805	$815,256,503	$831,737,106
Estimated Liability	$467,720,173	$473,269,654	$479,486,462	$486,413,909	$494,038,064	$501,493,217	$508,766,850	$516,069,209	$523,348,219	$530,616,100
Surplus / (Deficit)	$225,506,102	$234,796,997	$242,349,245	$250,002,388	$257,828,978	$265,881,408	$274,265,759	$282,970,597	$291,908,284	$301,121,006
Surplus % of Incurred Claim Liability	48%	50%	51%	51%	52%	53%	54%	55%	56%	57%

Scenario 2:

Investment Income: 7.0%

Premium Contributions: Waived in 2022 and beyond

Calendar Year	Actual	Projected								
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
BOY Fund Balance	$659,050,876	$693,226,275	$708,066,651	$719,820,939	$732,185,284	$745,202,391	$758,041,856	$770,778,908	$783,592,677	$796,322,337
Premium Contributions	$4,092,905	$3,912,171	$0	$0	$0	$0	$0	$0	$0	$0
Miscellaneous Income	$11,857	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$67,455,529	$48,525,839	$49,564,666	$50,387,466	$51,252,970	$52,164,167	$53,062,930	$53,954,524	$54,851,487	$55,742,564
Total Revenues	$71,560,291	$52,438,010	$49,564,666	$50,387,466	$51,252,970	$52,164,167	$53,062,930	$53,954,524	$54,851,487	$55,742,564
Insurance Claims	$36,591,380	$36,799,607	$37,007,834	$37,216,061	$37,424,289	$38,490,018	$39,469,942	$40,267,523	$41,227,771	$42,151,183
Administrative Expense	$793,512	$798,028	$802,543	$807,059	$811,574	$834,685	$855,936	$873,232	$894,056	$914,081
Total Operating Expenses	$37,384,892	$37,597,635	$37,810,377	$38,023,120	$38,235,863	$39,324,703	$40,325,878	$41,140,754	$42,121,827	$43,065,264
Net Change in Fund Balance	$34,175,399	$14,840,376	$11,754,288	$12,364,346	$13,017,107	$12,839,464	$12,737,052	$12,813,769	$12,729,660	$12,677,300
EOY Fund Balance	$693,226,275	$708,066,651	$719,820,939	$732,185,284	$745,202,391	$758,041,856	$770,778,908	$783,592,677	$796,322,337	$808,999,637
Estimated Liability	$467,720,173	$473,269,654	$479,486,462	$486,413,909	$494,038,064	$501,493,217	$508,766,850	$516,069,209	$523,348,219	$530,616,100
Surplus / (Deficit)	$225,506,102	$234,796,997	$240,334,477	$245,771,375	$251,164,327	$256,548,639	$262,012,058	$267,523,468	$272,974,118	$278,383,537
Surplus % of Incurred Claim Liability	48%	50%	50%	51%	51%	51%	51%	52%	52%	52%

Scenario 3:

Investment Income: -10% in 2021, 7% in 2022 and beyond

Premium Contributions: Current contribution rates

Calendar Year	Actual	Projected								
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
BOY Fund Balance	$659,050,876	$693,226,275	$590,218,184	$597,752,615	$605,722,601	$614,162,255	$622,232,092	$629,997,739	$637,628,163	$644,951,785
Premium Contributions	$4,092,905	$3,912,171	$4,029,536	$4,150,422	$4,274,935	$4,403,183	$4,535,278	$4,671,337	$4,811,477	$4,955,821
Miscellaneous Income	$11,857	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$67,455,529	-$69,322,628	$41,315,273	$41,842,683	$42,400,582	$42,991,358	$43,556,246	$44,099,842	$44,633,971	$45,146,625
Total Revenues	$71,560,291	-$65,410,457	$45,344,809	$45,993,105	$46,675,517	$47,394,541	$48,091,525	$48,771,179	$49,445,448	$50,102,446
Insurance Claims	$36,591,380	$36,799,607	$37,007,834	$37,216,061	$37,424,289	$38,490,018	$39,469,942	$40,267,523	$41,227,771	$42,151,183
Administrative Expense	$793,512	$798,028	$802,543	$807,059	$811,574	$834,685	$855,936	$873,232	$894,056	$914,081
Total Operating Expenses	$37,384,892	$37,597,635	$37,810,377	$38,023,120	$38,235,863	$39,324,703	$40,325,878	$41,140,754	$42,121,827	$43,065,264
Net Change in Fund Balance	$34,175,399	-$103,008,091	$7,534,432	$7,969,985	$8,439,654	$8,069,838	$7,765,647	$7,630,424	$7,323,621	$7,037,183
EOY Fund Balance	$693,226,275	$590,218,184	$597,752,615	$605,722,601	$614,162,255	$622,232,092	$629,997,739	$637,628,163	$644,951,785	$651,988,967
Estimated Liability	$467,720,173	$473,269,654	$479,486,462	$486,413,909	$494,038,064	$501,493,217	$508,766,850	$516,069,209	$523,348,219	$530,616,100
Surplus / (Deficit)	$225,506,102	$116,948,530	$118,266,153	$119,308,691	$120,124,190	$120,738,876	$121,230,889	$121,558,955	$121,603,565	$121,372,868
Surplus % of Incurred Claim Liability	48%	25%	25%	25%	24%	24%	24%	24%	23%	23%

Scenario 4:
Investment Income: 0% in 2021, 7% in 2022 and beyond
Premium Contributions: Current contribution rates

Calendar Year	Actual	Projected								
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
BOY Fund Balance	$659,050,876	$693,226,275	$659,540,811	$671,927,827	$685,090,077	$699,085,454	$713,099,916	$727,226,310	$741,662,734	$756,268,776
Premium Contributions	$4,092,905	$3,912,171	$4,029,536	$4,150,422	$4,274,935	$4,403,183	$4,535,278	$4,671,337	$4,811,477	$4,955,821
Miscellaneous Income	$11,857	$0	$0	$0	$0	$0	$0	$0	$0	$0
Investment Income	$67,455,529	$0	$46,167,857	$47,034,948	$47,956,305	$48,935,982	$49,916,994	$50,905,842	$51,916,391	$52,938,814
Total Revenues	$71,560,291	$3,912,171	$50,197,393	$51,185,370	$52,231,240	$53,339,165	$54,452,273	$55,577,178	$56,727,868	$57,894,635
Insurance Claims	$36,591,380	$36,799,607	$37,007,834	$37,216,061	$37,424,289	$38,490,018	$39,469,942	$40,267,523	$41,227,771	$42,151,183
Administrative Expense	$793,512	$798,028	$802,543	$807,059	$811,574	$834,685	$855,936	$873,232	$894,056	$914,081
Total Operating Expenses	$37,384,892	$37,597,635	$37,810,377	$38,023,120	$38,235,863	$39,324,703	$40,325,878	$41,140,754	$42,121,827	$43,065,264
Net Change in Fund Balance	$34,175,399	-$33,685,464	$12,387,016	$13,162,250	$13,995,377	$14,014,462	$14,126,394	$14,436,424	$14,606,041	$14,829,372
EOY Fund Balance	$693,226,275	$659,540,811	$671,927,827	$685,090,077	$699,085,454	$713,099,916	$727,226,310	$741,662,734	$756,268,776	$771,098,148
Estimated Liability	$467,720,173	$473,269,654	$479,486,462	$486,413,909	$494,038,064	$501,493,217	$508,766,850	$516,069,209	$523,348,219	$530,616,100
Surplus / (Deficit)	$225,506,102	$186,271,157	$192,441,365	$198,676,167	$205,047,390	$211,606,699	$218,459,460	$225,593,526	$232,920,556	$240,482,048
Surplus % of Incurred Claim Liability	48%	39%	40%	41%	42%	42%	43%	44%	45%	45%

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

Survivor Benefits: 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, 2020

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

<u>Death Benefits</u>: 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.

2021 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, 2020, 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