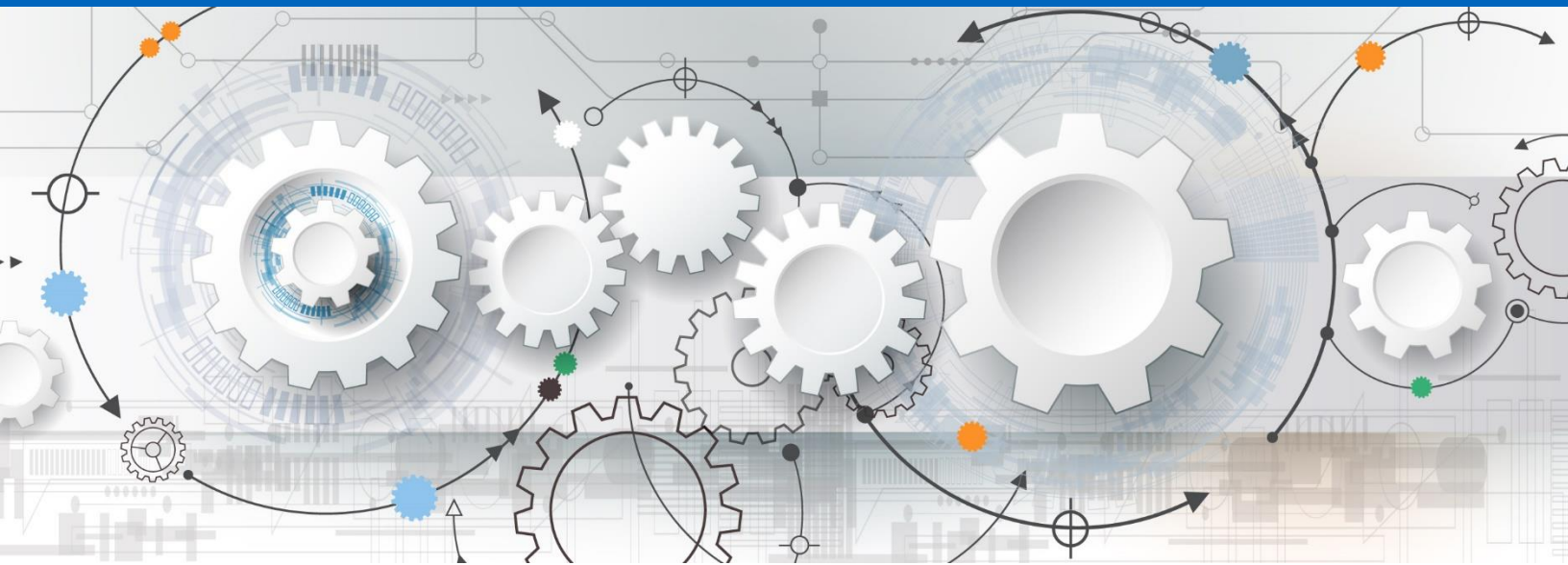


Actuarial Audit for the Actuarial Valuation of the Duty Disability Plan

As of December 31, 2018 for the
Wisconsin Department of Employee
Trust Funds

August 26, 2019





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August 26, 2019

Cindy Klimke
Wisconsin Department of Employee Trust Funds
4822 Madison Yards Way
Madison, WI 53705-9100

RE: Audit of the Duty Disability Insurance Valuation for December 31, 2018

Dear Cindy:

This report will discuss the accuracy of results presented in Milliman's May 23, 2019 report labelled, "Actuarial Valuation of the Duty Disability Insurance Program as of December 31, 2018 for the State of Wisconsin Department of Employee Trust Funds" (Milliman Valuation).

The valuation reports benefit liabilities of \$455 million, and an asset value of \$642 million. Segal's reproduction of these results produced liabilities of \$450 million.

Overall, we believe that the Milliman Valuation report following provisions of GASB 10 (Accounting and Financial Reporting for Risk Financing and Related Insurance Issues) accurately reflects the accounting results for the Duty Disability Insurance Program for the fiscal year ending December 31, 2018.

We appreciate the opportunity to provide this review for you, and hope that you have found it helpful. Please let us know if we can be of further assistance.

Sincerely,

A handwritten signature in black ink that reads "David A. Berger".

David A. Berger, FCA, ASA, MAAA, EA
Vice President and Consulting Actuary

A handwritten signature in black ink that reads "Andrew Perrotta".

Andrew Perrotta
Actuarial Consultant

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Executive Summary

The valuation reports benefit liabilities of \$455 million, and an asset value of \$642 million. Segal's reproduction of these results produced liabilities of \$450 million. This would typically be considered an accepted tolerance level for a Duty Disability Insurance Program.

Overall, we believe that the Milliman Valuation report following provisions of GASB 10 (Accounting and Financial Reporting for Risk Financing and Related Insurance Issues) accurately reflects the accounting results for the Wisconsin Duty Disability Insurance Program for the fiscal year ending December 31, 2018. Additionally, it is our opinion that the Milliman Valuation report satisfies the requirements of Actuarial Standard of Practice No. 5.

The primary assumptions are the discount rate, the probability of payment in a given month, and the associated assumed payment in that month for each individual. The demographic (e.g., other than the discount rate) assumptions appear to be reasonable in the aggregate, given the relatively narrow margin (0.35%) of the expected claims paid over the actual claims paid for the period 2012 – 2018.

We were able to duplicate the participant counts detailed in the Milliman Valuation.

We recommend that:

- Segal recommends that Milliman estimate the claims termination rates by blending the 2018 WRS study of mortality for healthy retirees and mortality for disabled lives. Additionally, we suggest that Milliman use a mortality improvement scale. Segal recommends that the assumptions are explicit about the use or non-use of a mortality projection scale.
- The source of several of the assumptions should be documented by Milliman every three years, via email or memorandum. These include the application of the offset assumptions and the claims termination assumptions.
- The asset smoothing method should be disclosed.
- The State should review whether the surpluses created by the Funding Projections produce the desired results and amend the scenarios, as needed.

Certification

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 herein.



David A. Berger, FCA, ASA, MAAA, EA
Vice President and Consulting Actuary

Methodology of Audit

The scope of our audit was to perform a full review. This entails the following:

- Collecting source data from the State for claims and asset information.
- Matching the participant counts reported by Milliman.
- Matching the benefits information reported by Milliman.
- Incorporating the valuation assumptions in our valuation system.
- Reviewing the reasonableness of those assumptions.
- Matching the assets displayed in the Milliman Valuation to the information received from the State.
- Matching the benefit liabilities (within tolerances) displayed in the valuation report.
- Commenting on the overall assumptions, methods, plan provision summaries, and report accuracy.

Analysis of Data

The GASB 10 methodology is to only reflect participants currently receiving benefits in the valuation. The data provided by the State was filtered to include only Open and Pending Claims, and for the Duty Disability Plan.

Segal matched the participant counts and the spouse counts.

The data provided to Segal came in a complex database. Gender was not provided, so Segal made assumptions based on first names.

The data provided did not generally include start and stop dates for offsets, and we did our best to interpret the terms of not only this plan, but as many as ten different offset benefits. Milliman provided great insight to help with the application of offsets and the estimation of future offsets not yet in payment.

Estimated Gender Age Band	Retirees		Beneficiaries		Total
	Female	Male	Female	Male	
25 - 29	1	2			3
30 - 34	1	4			5
35 - 39	1	9			10
40 - 44	8	28	2		38
45 - 49	19	47	3	2	71
50 - 54	27	84	3		114
55 - 59	35	117	2		154
60 - 64	26	135	7	2	170
65 - 69	17	152	5	2	176
70 - 74	12	113	7	1	133
75 - 79	4	79	6	4	93
80 - 84	2	33	9		44
85 - 89		10	3	1	14
Total	153	813	47	12	1,025

Analysis of Actuarial Assumptions and Methods

The primary assumptions are the discount rate, the probability of payment in a given month, and the assumed payment for each individual. To gauge the accuracy of these results in total, the estimated benefits to be paid in the upcoming year are compared to the actual benefits paid. Milliman's Valuation details the variance as 0.35% (Table 2.2, page 8) during 2012 - 2018. This variance indicates the demographic (e.g., other than the discount rate) assumptions in aggregate produce a true expectation of future experience.

Table 2.2 from Milliman's 2018 Valuation Runoff Study for Disabled Members Annual Margin as % of Initial Liability	
Experience Period	Estimated Margin
2012	0.17%
2013	0.61%
2014	0.05%
2015	0.52%
2016	0.55%
2017	0.52%
2018	0.05%
Average	0.35%

However, Milliman suggests that the annual margin for this sort of plan is typically 1% - 5%. The rates are relatively constant, as Milliman contends, and the plan has some surplus to draw on, if there should be a decrease in the margin.

One source for the margin is the claims termination rates. These rates are less than the rates in the WRS pension assumption study for disabled employees. That is, the rates used in this analysis produce longer expected lifetimes than the rates in the WRS assumption study. The longer lifetime would mean benefits would be paid over a longer period, and the estimated margin is increased.

The Valuation Date is December 31, 2018.

Discount Rate

The discount rate is 7.00%.

The Plan is funded, and the expected rate of return used for the Pension Plan is used as the discount rate. The assets by investment class are not disclosed in the valuation. Our understanding is that the assets in this Trust are invested in the same investments and asset mix as the pension plan.

Claim Termination Rates

This assumption acts much the way a mortality (death) assumption works for pension plans. It is essentially the probability of death, plus the probability that the participant recovers from the disability.

The assumption used in this valuation is 50% of the Disabled Mortality from the 2012-2014 WRS assumption study, set back one year for females. For example, the female disabled mortality from the 2012-2014 study for age 80 is half of the age 81 rate from the table ($8.8396\% / 2 = 4.4198\%$).

There are a few things interesting about this selection of a table and adjustments:

- There are updated tables that were produced in the 2018 WRS assumption study.
- The mortality in the WRS assumption study uses an “improvement scale,” essentially assuming a lower percentage of people die at each age subsequent to the valuation date.
- The definition of disability in the WRS retirement plan uses a more restrictive definition of disability, so that the direct application of the disability mortality table is not appropriate.
- Lastly, at various ages the rates are less than the corresponding rates for WRS Healthy Mortality.

Ultimately, Segal believes that a better way to estimate the claims termination rates would be to blend the 2018 WRS study mortality for healthy retirees and mortality for disabled lives. That is, a blend of 90% healthy and 10% disabled mortality might address some of the issues at the younger and older ages without materially changing the liabilities. We would also suggest using a mortality improvement scale.

Segal recommends that the assumptions are explicit about the use of a mortality projection scale. That is, even if no projection scale is used, that the assumptions specifically state that the mortality is not projected.

Future Offset Amounts, Timing and Applicability

The algorithm for developing assumed offsets is complicated. Based on information in the Summary Plan Description and information provided by Milliman, we produced the following estimated offsets:

Segal's Offset Assumptions	Probability of Estimated Benefit, if not Already Receiving a Benefit	Assumed Start Date	Assumed Ending Date	Assumed Benefit (an Offset to the Duty Disability Benefit)	Assumed Increases
Social Security					
Age 62 PIA	100% if age 62 or older, otherwise 90%	Age 62	Life	PIA formula assumes current "salary," 3.20% salary scale and TWB increases, 2.50% COLA (includes future earnings)	2.50%
SSDI	10% if younger than 62	Immediate	Life	PIA formula assumes current "salary," 3.20% salary scale and TWB increases, 2.50% COLA (no future earnings)	2.50%
SSI	None	N/A	N/A	N/A	N/A
WRS Benefit					
Disability Benefit or LTDI	20%	Immediate	Life	Based on average disability benefit	Salary Index
Separation Benefit	10% if under 50 and are not eligible for a disability or LTDI benefit	Immediate	Life	Based on average separation benefit	Salary Index
Retirement Benefit	Remainder of participants	Age 50	Life	Based on average retirement benefit	Salary Index
Other					
Unemployment Compensation	0%	N/A	N/A	N/A	N/A
Worker's Compensation, Other Earnings, Other	100%	Immediate	Age 60	3% of Gross Benefit before offsets	Salary Index
Death Benefit Offsets					
<p>If receiving a Worker's Compensation Benefit, a one-time death benefit per WI Stat. 102 is applied.</p> <p>No other offsets are assumed for Local Government Employees that became disabled prior to May 3, 1988 and all State Employees.</p> <p>For Local Government Employees that became disabled after May 3, 1988, offsets equal the Income Sources based on the participant's earnings record, and increase with the Salary Index.</p>					

Incurred But Not Reported Claims (IBNR)

Incurred But Not Reported Claims are assumed to be the estimated incurred claims less the Open Claims for the last three years.

The expected incurred claims are 0.65% of payroll for 2017 and 2018, based on experience from 2012 – 2015. However, experience in 2016 was adjusted based on the expected percentage of the ultimate claim had been paid by year three. That is, it was assumed that 78% of the expected claims had been incurred by the end of 2018.

The 2016 claims incurred is already 0.71% of 2016 payroll. The estimation method puts the expected claims at 0.91% of 2016 payroll. While this estimate seems to be quite a bit higher than the other years, we find that it adequately estimates the expected claims incurred but not reported for that year.

Loss Adjustment Expenses

The Loss Adjustment are an estimate of administrative expenses. These were 1.9% of the liability for Open Claims, and 3.9% of the IBNR liabilities.

Based on the information provided, these appear to be appropriate.

Overpayment Credits

The Overpayment Credit is attributable to Social Security awards that are backdated. The assumption is that 75% of the overpayment balance reported by ETF as of the Valuation Date is expected to be repaid by participants.

The Overpayment Credit adjustment reduces the liabilities. The figure for the December 31, 2018 valuation is \$296,063, and the subsequent adjustment to the liabilities is \$222,048.

Suggested Changes to and Documentation of Assumptions

The source of several of the assumptions should be documented by Milliman every three years, via email or memorandum. These include the application of the offset assumptions and the claims termination assumptions.

Segal recommends that Milliman estimate the claims termination rates by blending the 2018 WRS study mortality for Healthy retirees and mortality for Disabled lives. Additionally, we suggest that Milliman use a mortality improvement scale.

Segal recommends that the assumptions are explicit about the use or non-use of a mortality projection scale.

Plan Design

Segal used the description on page 20 of the Milliman Valuation, as well as the Plan's Summary Plan Description secured from the internet as the basis for the Plan Design.

The basic benefit design is a gross benefit, less offsets (either actual or assumed). The gross benefit is 80% of salary, but is reduced to 75% for local employees not eligible for a Social Security disability award, a WRS disability benefit, or LTDI. Certain adjustments may apply for long service individuals.

The monthly gross benefit amounts are provided in the participant data.

The offsets are provided in the participant data for some participants. Offsets include amounts for Social Security, unemployment compensation, Worker's Compensation, WRS benefits, and work earnings. If the participant data does not have an offset, then an offset is estimated and a probability of the offset reducing the payment is applied.

The annual benefit increases are based on either salary index (assumed to be 3.20%) or core annuity dividend (assumed to be 2.10%). To receive the better increase the participant has to be either under age 60, receiving a regular disability retirement or LTDI, or receiving a Duty Disability Benefit based on 1998 Law.

Survivor benefits are payable if the disabled member dies from the same condition that triggered the onset of disability. Different benefits are payable for participants that applied prior to May 3, 1988.

Plan Assets

The Trust values appear to be reasonable based on the prior year information. The State provided us the asset detail, and it matched the detail in the Milliman Valuation. We did not perform any further audit of these results.

The assets use a smoothing method, which would typically be described in the actuarial assumptions.

Accuracy of Results

Below are the Segal results compared to Table 1.1 of the Milliman valuation:

Actuarial Liabilities for the Duty Disability Plan as of December 31, 2018			
Liability Component	Milliman Valuation Results	Segal Replication	Ratio of Segal Replication to Milliman Valuation Results
Open Claims	\$398,952,462	\$392,815,067	98.5%
Future Survivors	27,044,242	29,118,117	107.7%
IBNR Claims	19,725,319	19,725,319	100.0%
Loss Adjustment Expense	8,863,225	\$8,786,018	99.1%
Total	\$454,585,247	\$450,444,521	99.1%

The results are close, and most likely the Open Claims and Future Survivor liabilities vary due to differences in the assumed offsets, indexing differences, and application of the different increases to the Gross Benefit.

The IBNR claims are developed based on existing data, and so match exactly. The Loss Adjustment is 1.9% of the Open Claims and Future Survivors, and 3.9% of the IBNR Claims.

Funding Projections

We did not try to duplicate the Actuarial Liability or the projected Insurance Claims in these projections. Given the GASB 10 methodology does not include a liability for active employees, we find using the percentage of payroll estimation method would likely be the method for estimating new claims that we would use.

The sensitivity run (No change to contributions, fund earns 3.5%) suggests the Plan may not stay in surplus if asset returns were poor for an extended period, as the surplus falls to 6% in 2028 in this scenario.

Projected Funding Results in Milliman Valuation				
\$ millions	Actuarial Liability	Assets	Surplus / (Deficit)	Funded Ratio
December 31, 2018	\$455	\$642	\$187	141%
December 31, 2022				
Current Plan, incurred claims are 0.65% of payroll and fund will earn 7.00% per year	\$481	\$711	\$230	148%
Contribution rates in 2020 and beyond reduced to 0.325%	\$481	\$699	\$218	145%
Contribution rates in 2020 and beyond reduced to 0.1625%	\$481	\$692	\$211	144%
No change to contributions, fund earns 3.5%	\$480	\$613	\$133	128%
Contributions waived in year 2020 and beyond	\$481	\$686	\$205	143%
December 31, 2028				
Current Plan, incurred claims are 0.65% of payroll and fund will earn 7.00% per year	\$514	\$838	\$324	163%
Contribution rates in 2020 and beyond reduced to 0.325%	\$514	\$788	\$274	153%
Contribution rates in 2020 and beyond reduced to 0.1625%	\$514	\$762	\$248	148%
No change to contributions, fund earns 3.5%	\$512	\$543	\$31	106%
Contributions waived in year 2020 and beyond	\$514	\$737	\$223	143%

Conclusion

The valuation reports benefit liabilities of \$455 million, and an asset value of \$642 million. Segal's reproduction of these results produced liabilities of \$450 million. This would typically be considered an accepted tolerance level for a Duty Disability Insurance Program.

Overall, we believe that the Milliman Valuation report following provisions of GASB 10 (Accounting and Financial Reporting for Risk Financing and Related Insurance Issues) accurately reflects the accounting results for the Duty Disability Insurance Program for the fiscal year ending December 31, 2018.

The primary assumptions are the discount rate, the probability of payment in a given month, and the associated assumed payment in that month for each individual. These assumptions appear to be reasonable in the aggregate, given the relatively narrow margin (0.35%) of the expected claims paid over the actual claims paid for the period 2012 – 2018.

We recommend that:

- Segal recommends that Milliman estimate the claims termination rates by blending the 2018 WRS study mortality for healthy retirees and mortality for disabled lives. Additionally, we suggest that Milliman use a mortality improvement scale. Segal recommends that the assumptions are explicit about the use or non-use of a mortality projection scale.
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- The asset smoothing method should be disclosed.
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