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May 26, 2016

Mr. Robert C. Willett, CPA
Chief Trust Finance Officer
State of Wisconsin
Department of Employee Trust Funds
801 West Badger Road
Madison, Wisconsin 53707-7931

Re: Duty Disability Expense and Liability Calculations Under GASB Statement 43

Dear Bob:

Enclosed is a copy of our report which presents the results of our calculations under Statement No. 43 of the Governmental Accounting Standards Board, "Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans," for the 2016 fiscal year for the State of Wisconsin Duty Disability Program.

Please note that GASB has adopted new accounting standards. It is our understanding that GASB 74 will replace GASB 43 effective for fiscal years beginning after June 15, 2016. These new requirements substantially change how costs and liabilities are calculated in the actuarial valuation and reported in financial statements. While a detailed analysis of these new accounting standards is beyond the scope of this analysis, we are happy to provide you with general information and discuss what more detailed work would be of value to you.

If you have any questions regarding this report, please contact me at dan.skwire@milliman.com or 207-771-1203.

Sincerely,

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

Enclosure

cc: T. Herman
P. Correia

State of Wisconsin Duty Disability Program

January 1, 2016 Actuarial Valuation under GASB 43

Prepared by:

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

Timothy J. Herman, FSA, EA, MAAA
Principal and Consulting Actuary

Paul L. Correia, FSA, MAAA
Consulting Actuary

Milliman, Inc.

May 26, 2016

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May 26, 2016

Mr. Robert C. Willett, CPA
Chief Trust Finance Officer
State of Wisconsin
Department of Employee Trust Funds
801 West Badger Road
Madison, Wisconsin 53707-7931

Re: January 1, 2016 Actuarial Valuation of the State of Wisconsin Duty Disability Program

Dear Bob:

As part of our engagement with the Department of Employee Trust Funds, we have completed an actuarial determination of the benefit cost and funded status relating to the future duty disability benefits of the State of Wisconsin Duty Disability Program as of January 1, 2016. The results of our calculations are set forth in the following report, as are the actuarial assumptions and methods on which our calculations have been made. Our determinations reflect the procedures and methods as prescribed in Statement No. 43 of the Governmental Accounting Standards Board, “Financial Reporting for Postemployment Benefit Plans Other Than Pensions.”

Actuarial computations under Statement No. 43 are for purposes of fulfilling certain accounting requirements. The calculations reported herein have been made on a basis consistent with our understanding of the Statement. Determinations for purposes other than meeting the plan or employer financial accounting requirements of the Statement may differ significantly from the results reported herein.

Please note that GASB has adopted new accounting standards. It is our understanding that GASB 74 will replace GASB 43 effective for fiscal years beginning after June 15, 2016. These new requirements substantially change how costs and liabilities are calculated in the actuarial valuation and reported in financial statements. Analysis of the impact of these new accounting standards are outside the scope of this report.

In preparing this report, we have relied without audit on the employee data, plan provisions, and the value of the plan assets and other plan financial information as provided by your office. We have reviewed the data for reasonableness. 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 actuarial cost method and certain actuarial assumptions, including discount rates, mortality tables, benefit increase assumptions are prescribed by the State of Wisconsin. We have performed no independent assessment of the reasonableness of these assumptions. ETF is solely responsible for establishing these assumptions and communicating any changes to Milliman for the purpose of this valuation.

This valuation report is only an estimate of the Program’s financial condition as of a single date. It can neither predict the Program’s future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Program benefits, only the timing of the Program's accounting results. While the valuation is based on an array of assumptions described in Section IV, 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; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Milliman's work is prepared solely for the use and benefit of the Department of the Employee Trust Funds. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception(s):

(a) The Department of Employee Trust Funds may provide a copy of Milliman's work, in its entirety, to its professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the Department of Employee Trust Funds.

(b) The Department of Employee Trust Funds 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.

The consultants who worked on this assignment are pension and health actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

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

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

This report and its use are subject to the terms of our contract with the Department of Employee Trust Funds effective October 1, 2014.

We, Daniel D. Skwire, Timothy J. Herman, and Paul L. Correia, are actuaries for Milliman, Inc. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. This report uses the expertise of Milliman healthcare and retirement actuaries. Daniel D. Skwire and Paul L. Correia are responsible for the work related to the disability costs and duration. Timothy J. Herman is responsible for projecting the current costs into future years using the valuation assumptions and methodology and then calculating the accounting costs and liabilities reported herein.

Respectfully submitted,

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

Timothy J. Herman, FSA, EA, MAAA
Principal and Consulting Actuary

Paul L. Correia, FSA, MAAA
Principal and Consulting Actuary

Milliman, Inc.

State of Wisconsin Duty Disability Program

January 1, 2016 Actuarial Valuation under GASB 43

I. INTRODUCTION AND PURPOSE

Milliman, Inc. prepared this report under our engagement with the Department of Employee Trust Funds to estimate the cost of the State of Wisconsin's current duty disability benefit program.

This report provides the information necessary for the Department of Employee Trust Funds' financial statement disclosures under the Statement of Governmental Accounting Standards No. 43 (GASB 43).

Since 2011, the actuarial valuation has been based on the standards required under GASB 43, which necessitate that the liabilities attributable to the current active population be accrued during their working careers. Therefore, a liability is determined for active participants based on expected future disablements in addition to current disabled participants and survivors.

As of January 1, 2016, the Plan is 115% funded on an actuarial basis.

A brief summary of the results of the current and prior GASB 43 valuations are shown below:

($ in millions)	1/1/2015	1/1/2016
Actuarial Accrued Liability		
Actives	$ 95	$ 104
Disabled Members and Survivors	353	419
Total	$ 448	$ 523
Actuarial Value of Assets	$ (593)	$ (604)
Unfunded Actuarial Accrued Liability	$ (145)	$ (81)
Funded Ratio	132%	115%
Annual Required Contribution (GASB 43)	$ 3	$ 8

The primary changes in the 1/1/2016 valuation, relative to the 1/1/2015 valuation, include losses on plan assets and a change in liability assumptions. These changes had the impact of increasing the plan's Unfunded Actuarial Accrued Liability. Further details about the changes in liabilities are provided in Section V of this report.

State of Wisconsin Duty Disability Program

January 1, 2016 Actuarial Valuation under GASB 43

II. COST PROJECTION RESULTS

A summary of the transactions during 2015 of the assets for the State of Wisconsin Duty Disability Program is shown below.

TABLE 1

($ in thousands)

1.	Market value of assets as of January 1, 2015		$608,094
2.	Income		
	Employer Contributions	$ 8,609	
	Investment Income	(4,234)	
	Total Income		$ 4,375
3.	Disbursements		
	Benefit Payments	$33,092	
	Expenses	1,083	
	Total Disbursements		$ 34,175
4.	Net Change in Assets: (2) – (3)		$ (29,800)
5.	Market Value of Assets as of December 31, 2015: (1) + (4)		$578,294
6.	Estimated Rate of Investment Return on a Market Value Basis		-0.89%

TABLE 2

The following table develops the Actuarial Value of Assets as of January 1, 2016.

($ in thousands)

1.	Market value of assets as of January 1, 2015	$608,094
2.	Contributions*	8,609
3.	Benefit Payments*	(33,092)
4.	Assumed earnings at 7.20% on (1), (2), and (3)	42,901
5.	Expected assets at January 1, 2016: (1)+(2)+(3)+(4)	$626,512
6.	Actual assets at January 1, 2016	$578,294
7.	Investment gain (loss)	
	a. Gain (loss) for 2015: (6) – (5)	$(48,218)
	b. Gain (loss) for 2014	(8,985)
	c. Gain (loss) for 2013	31,922
	d. Gain (loss) for 2012	28,608
8.	Gain (loss) not yet reflected in actuarial value of assets	
	a. 80% of 2015 gain (loss)	$(38,574)
	b. 60% of 2014 gain (loss)	(5,391)
	c. 40% of 2013 gain (loss)	12,769
	d. 20% of 2012 gain (loss)	5,722
	e. Total gain (loss) not yet reflected in actuarial value of assets:	(25,474)
9.	Actuarial value of plan assets as of January 1, 2016: (6) – (8e)	$603,768
10.	Estimated rate of return on actuarial value of assets	6.11%

* *Contributions and benefit payments are assumed to be paid evenly throughout the year.*

January 1, 2016 Actuarial Valuation under GASB 43

The actuarial balance sheet is a demonstration of the basic actuarial equation that the actuarial present value of total projected benefits to be paid to the active, and disabled participants must equal the assets on hand plus the actuarial present value of future contributions to be received. Accordingly, the status of the plan in balance sheet form as of January 1, 2016 is shown below:

TABLE 3

($ in thousands)

	January 1, 2016
I. Actuarial Present Value of Total Projected Benefits	
21,959 Active Participants[1]	$176,010
1,002 Retired Participants[1]	418,955
Grand Total Actuarial Present Value of Total Projected Benefits	$594,965
II. Assets and Future Employer Contributions	
Actuarial Value of Assets	603,768
Unfunded Actuarial Accrued Liability	(80,530)
Present Value of Future Normal Costs (including the current year)	71,727
Total Assets and Future Employer Contributions	$594,965

(1) *Participant data as of January 1, 2016 is summarized in Section VII of this report.*

Liabilities and contributions shown in this report are computed using the Projected Unit Credit Method of funding. The objective under this method is to expense each participant's benefit under the plan as it accrues. At the time the Funding Method is introduced, there will be a liability which represents the contributions which would have been accumulated if this method of funding had always been used. The difference between this liability and the assets (if any) is the unfunded liability, which is typically funded over a chosen period in accordance with an amortization schedule. These calculations for 2016 are shown below:

TABLE 4

($ in thousands)

		2016
A.	**Employer Normal Costs** (Projected Unit Credit Actuarial Cost Method)	
(1)	Current Year Normal Cost – January 1	$11,962
(2)	Assumed Interest to the End of the Year	861
(3)	Current Year Normal Cost – December 31: [(1) + (2)]	$12,823
B.	**Determination of Current Year Amortization Payment** [2]	
(1)	Unfunded Actuarial Liability (see Table 1)	$(80,530)
(2)	Amortization Period	30 years
(3)	Level Percent of Pay Amortization Factor	18.2359
(4)	Amortization Amount – January 1: [(1) / (3)]	(4,416)
(5)	Assumed Interest to the End of the Year	(318)
(6)	Amortization Amount – December 31: [(4) + (5)]	$(4,734)

(2) *When in an underfunded position, closed 15-year level percent of pay amortizations of experience gains and losses, assumption changes, and contribution deficiencies or excess contributions (contributions less than or greater than the Annual Required Contribution, respectively).*

When in an overfunded position, open, 30-year level percent of pay amortization of the unfunded actuarial accrued liability.

State of Wisconsin Duty Disability Program

January 1, 2016 Actuarial Valuation under GASB 43

DISCLOSURES

TABLE 5

($ in thousands)

	Fiscal Year-End		12/31/2016
I.	Determination of Annual Required Contribution		
	(1)	Discount Rate at Beginning of Fiscal Year	7.20%
	(2)	Normal Cost for Benefits Attributable to Service in the Year	$12,823
	(3)	Amortization of Unfunded Actuarial Accrued Liability	(4,734)
	(4)	Annual Required Contribution (ARC): (2) + (3)	$8,089

TABLE 6

Actuarial gains and losses arise from experience different from that assumed, changes in actuarial assumptions and methods, and changes in plan provisions. The following summarizes the changes in the Unfunded Actuarial Accrued Liability (UAAL) due to these sources from January 1, 2015 to January 1, 2016.

($ in thousands)

a.	UAAL as of January 1, 2015	$(144,677)
b.	Normal Cost for 2015	10,983
c.	Annual Required Contribution for 2015	3,269
d.	Interest on UAAL and Normal Cost at 7.20%	(9,626)
e.	Expected UAAL as of January 1, 2016	(140,051)
f.	2015 (Gain)/Loss	59,521
g.	UAAL as of January 1, 2016	$(80,530)

Sources of 2015 (Gain)/Loss	
Demographic (Gain)/Loss	(414)
(Gain)/Loss due to assumption changes	58,953
(Gain)/Loss due to (over)/underpayment of ARC	(5,340)
(Gain)/Loss due to asset returns	6,321
Total	$59,521

Funded Status and Funding Progress. As of January 1, 2016, the most recent actuarial valuation date, the plan is estimated to be 115% funded. The actuarial accrued liability for benefits is $523,238,000 and the actuarial value of assets is $603,768,000, resulting in an unfunded actuarial accrued liability (UAAL) of $(80,530,000).

State of Wisconsin Duty Disability Program

January 1, 2016 Actuarial Valuation under GASB 43

REQUIRED SUPPLEMENTARY INFORMATION

TABLE 7

Schedule of Funding Progress

($ in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) – Unit Credit (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/c
1/1/2006	$222,692	$427,089	$204,397	52.1%	$1,144,529	17.9%
1/1/2008	311,778	471,668	159,890	66.1	1,257,666	12.7
1/1/2010	373,048	512,785	139,737	72.7	1,370,978	10.2
1/1/2011	412,988	499,034	86,046	82.8	1,297,690	6.6
1/1/2012	449,177	476,979	27,802	94.2	1,285,854	2.2
1/1/2013	490,137	507,081	16,944	96.7	1,279,908	1.3
1/1/2014	567,329	513,165	(54,164)	110.6	1,302,765	-4.2
1/1/2015	592,774	448,097	(144,677)	132.0	1,332,810	-10.9
1/1/2016	603,768	523,238	(80,530)	115.4	1,358,934	-5.9

TABLE 8

GASB No. 43 Schedule of Employer Contributions

($ in thousands)

Year Ended	Annual Required Contribution (a)	Employer Contribution (b)	Percentage Contributed (b/a)
12/31/2006	$44,397	$44,566	100.4%
12/31/2007	46,174	47,765	103.4
12/31/2008	47,684	50,574	106.1
12/31/2009	50,193	51,556	102.7
12/31/2010	53,181	51,861	97.5
12/31/2011	50,364	52,335	103.9
12/31/2012	48,377	52,978	109.5
12/31/2013	49,755	53,902	108.3
12/31/2014	8,173	9,335	114.2
12/31/2015	3,269	8,609	263.4
12/31/2016	8,089	TBD	TBD

TABLE 9

Cash Flow Projections, the Annual Undiscounted Cash Flow Projections of GASB 43 Benefits for Current Disabled Members and Survivors Plus Current Active Employees

($ in thousands)

Year	Total
2016	32,310
2017	33,613
2018	35,223
2019	36,906
2020	38,562
2021	40,063
2022	41,591
2023	43,110
2024	44,564
2025	45,862
2026	47,177

III. ACTUARIAL COST METHOD

Projected Unit Credit Actuarial Cost Method

The actuarial cost method determines, in a systematic way, the incidence of plan sponsor contributions required to provide plan benefits. It also determines how actuarial gains and losses are recognized in other postretirement benefit costs. These gains and losses result from the difference between the actual experience under the plan and the experience by the actuarial assumptions.

The cost of the Plan is derived by making certain specific assumptions as to rates of interest, mortality, turnover, etc. which are assumed to hold for many years into the future. Since actual experience may differ somewhat from the assumptions, the costs determined by the valuation must be regarded as estimates of the true costs of the Plan.

Actuarial liabilities and comparative costs shown in this Report were computed using the **Projected Unit Credit Actuarial Cost Method**, which recognized the following cost components:

1 **The Normal Cost** is the Actuarial Present Value of benefits accruing during the valuation year. For purposes of this valuation, we have accrued costs through date of disability for benefits provided.

2 **The Actuarial Accrued Liability** is the Actuarial Present Value of benefits accrued as of the valuation date.

3 **The Actuarial Value of Assets** are determined using a Five-Year Smoothed Market Value. Under this method, the Actuarial Value of Assets equals the Market Value less a decreasing fraction (4/5, 3/5, 2/5, etc.) of the prior five years of investment gains and losses compared to the assumed rate of investment return (currently 7.20%).

4 **The Unfunded Actuarial Accrued Liability** is the excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. When in an underfunded position, closed 15-year level percent of pay amortizations of experience gains and losses, assumption changes, and contribution deficiencies or excess contributions (contributions less than or greater than the Annual Required Contribution, respectively).

When in an overfunded position, open, 30-year level percent of pay amortization of the unfunded actuarial accrued liability.

Funding Policy

The program is funded entirely by employer contributions, which vary by experience. The contribution policy (see Section VI of this report for a description of the contribution policy) does not meet the GASB 43 requirements for determining an Annual Required Contribution (ARC), which requires using a consistent amortization policy for the unfunded actuarial accrued liability.

IV. ACTUARIAL ASSUMPTIONS

The following assumptions were used in the actuarial valuation of the State of Wisconsin Duty Disability Program. Where consistent with the terms of the plan, we have utilized the proposed assumptions included in the Three-Year Experience Study January 1, 2012 – December 31, 2014 for the Wisconsin Retirement System. It is our understanding that the Retirement Board has adopted these proposed assumptions for use in the actuarial valuations of the Wisconsin Retirement System. Other assumptions have been based on our analysis of the Duty Disability Program. All assumptions are based on estimates of future experience.

Valuation Date: January 1, 2016

Census Date: January 1, 2016

Discount Rate: 7.20% (net of expenses)

Salary Increases: Salary increase assumptions for individual active members are shown for sample services below. Part of the assumption for each age is for merit and longevity increase, and another 3.20% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces.

% of Merit & Longevity Increase Next Year

Service	Protective with Social Security	Protective w/o Social Security
1	4.80%	5.50%
2	4.80	5.50
3	4.10	4.70
4	3.50	3.80
5	2.80	3.00
10	1.10	0.90
15	0.80	0.50
20	0.70	0.40
25	0.60	0.30
30	0.50	0.20

Payroll Growth: 3.20% annually

Pre-Retirement Mortality: This assumption applies to death while in service. Rates are based on the Wisconsin 2012 Mortality table (multiplied by 50% for males and females) as the base table and project future improvements with MP-2015 generational improvement scale (multiplied by 50%), as adopted by the Board in connection with the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. Sample rates of the base mortality are as follows:

Age	Males	Females
25	0.0168%	0.0089%
35	0.0362	0.0210
45	0.0652	0.0472
55	0.2025	0.1223

Beneficiary Mortality:

This assumption applies to death of beneficiaries. Rates are based on the Wisconsin 2012 Mortality Table as the base table and project future improvements with MP-2015 generational improvement scale (multiplied by 50%), as adopted by the Board in connection with the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. Sample rates of the base mortality are as follows:

Age	Males	Females
45	0.1303%	0.0943%
55	0.4050	0.2445
65	0.8752	0.5408
75	2.4683	1.6645
85	8.4634	6.2186

Post-Disability Mortality:

This assumption applies to death after disablement. Rates are based on the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System (multiplied by 50% for males and females and set forward one year for males). Sample rates of mortality are as follows:

Age	Males	Females
45	0.1256%	0.0788%
55	0.3327	0.2011
65	0.9540	0.5484
75	3.1651	1.8772
85	9.3893	6.5865

Disability:

Percent of employees expected to become disabled each year are as follows:

Age	Rate of Disablement
20	0.01%
25	0.02
30	0.09
35	0.13
40	0.18
45	0.24
50	0.35
55	0.20
60	0.20

Withdrawal:

Percent of employees expected to terminate each year within the first 10 years of employment. Rates are based on the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. Sample rates are as follows:

Service	Protective with Social Security	Protective w/o Social Security
0	17.0%	4.0%
1	8.0	3.5
2	5.0	1.5
3	4.3	1.3
4	3.8	1.2
5	3.1	1.1
6	3.0	1.0
7	2.9	0.9
8	2.5	0.8
9	2.2	0.7

Percent of employees expected to terminate each year after the first 10 years of employment. Rates are based on the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. Sample rates are as follows:

Age	Protective with Social Security	Protective w/o Social Security
25	1.8%	0.7%
30	1.8	0.7
35	1.6	0.7
40	1.3	0.6
45	1.1	0.6
50+	1.0	0.5

Retirement:

Percent of employees expected to retire each year. Rates are based on the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. Sample rates are as follows:

Age	Protective with Social Security	Protective w/o Social Security
50	6.0%	4.0%
51	7.0	4.0
52	9.0	5.0
53	23.0	17.0
54	19.0	25.0
55	19.0	21.0
56	19.0	27.0
57	19.0	30.0
58	18.0	30.0
59	16.0	30.0
60	20.0	26.0
61	20.0	15.0
62	22.0	20.0
63	26.0	40.0
64	17.0	40.0
65	30.0	40.0
66	25.0	40.0
67	30.0	40.0
68	30.0	40.0
69	30.0	40.0
70	100.0	100.0

Benefit Offsets: The following assumptions estimate the offsets to the member's basic benefit.

Offset	Valuation Estimate
WRS Benefits and LTDI:	Assume 20% of members qualify for a WRS disability benefit or LTDI. Assume 10% of members under age 50 who do not qualify for a WRS disability benefit or LTDI 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 covered by Social Security qualify for a Social Security disability award. Benefits are based on the Social Security Primary Insurance Amount formula using 2015 bend points. Benefits for currently active participants are based on Social Security formula and assuming: • 3.20% pay increases • 3.20% Social Security Taxable Wage Base increases • 2.50% cost-of-living adjustments
Unemployment Compensation:	None (No offsets observed)
Combined Offset from: • Worker's Compensation • Employer Earnings • Other Earnings	Assume 3.00% reduction to 75%/80% target benefit (Observed reduction from all these offsets was about 3.00% of target benefits as of 12/31/2015. This observation does not include a review of income tax returns or one-time earnings offsets as observation is taken from the December Payroll of each year.)

Active Members Included: Currently eligible WRS active members.

Administrative Expenses: 1.5% of paid benefits.

Future Service: All members earn a full year of service in each calendar year.

Marital Status: 100% of members are married. Husbands are assumed to be three years older than their wives.

Dependents: No dependent children are assumed to be covered at retirement.

Annual 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 Payable to Survivors: Assumed that 33% of survivors will eventually receive death benefits

Benefit Adjustments for Current Inactives: None

Changes Since Prior Valuation: Several assumptions were updated this year based on the proposed assumptions included in the Three-Year Experience Study January 1, 2012 – December 31, 2014 for the Wisconsin Retirement System. It is our understanding that the Retirement Board has adopted these proposed assumptions for use in the actuarial valuations of the Wisconsin Retirement System. We changed the following assumptions in this year's valuation:

- Withdrawal rates are higher
- Retirement rates are lower
- Pre-retirement mortality rates are lower
- Pay increases due to seniority are lower

The post-disability mortality assumption is different this year. Last year, the assumption was equal to 100% of the mortality for disabled employees reported in the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. Based on several tests performed by Milliman, this assumption seemed high for Duty Disability claimants. Therefore, we have implemented a 50% adjustment factor this year. The new assumption was developed from an analysis of historical Duty Disability claim experience which indicated that actual mortality among Duty Disability claimants is lower than the mortality for disabled members reported in the WRS Experience Study.

The IBNR assumption is also new this year. Last year, we assumed that the IBNR liability was equal to 50% of expected annual incurred claim costs. This year, we computed the IBNR liability by taking the difference between actual incurred claims reported in 2014 and 2015 and expected annual incurred claims. This new method was implemented after we observed very long claim reporting lags from historical Duty Disability claim experience.

V. Analysis of Results

The actuarial liability for the Duty Disability program discussed in this report consists of the following components:

- Active Lives: The liability for active lives represents the expected present value of future benefits payable to active participants based upon expected future disablements. There were 21,959 active protective occupation members as of 1/1/2016.

- Open Claims: The liability for open claims represents the expected present value of future benefits payable to disabled members and survivors whose claims had been reported on or before 1/1/2016. There were 947 disabled members and 55 survivors reported as of 1/1/2016.

- Future Death Benefits: The liability for future death benefits represents the expected present value of future death benefits payable to survivors of currently disabled members.

- Incurred but not Reported (IBNR) Claims: The liability for IBNR claims represents the expected present value of future benefits payable to members disabled prior to 1/1/2016 whose claims had not been reported as of that date.

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

The following table compares the 1/1/2015 and 1/1/2016 liabilities for the Duty Disability program:

Comparison of Current Year and Prior Year Liabilities for the Duty Disability Program		
Liability Component	**1/1/2015**	**1/1/2016**
Active Lives	$95,329,270	$104,282,864
Disabled Members and Survivors	$348,013,064	$413,351,046
Admin. Expenses	$4,754,596	$5,603,693
Total	$448,096,930	$523,237,603

Further detail on the liability for disabled lives and survivors is provided below:

Detail of Liability for Disabled Lives and Survivors for the Duty Disability Program		
Liability Component	**1/1/2015**	**1/1/2016**
Disabled Members	$300,495,265	$357,957,126
Survivors	$16,477,790	$15,622,416
Future Death Benefits	$28,120,984	$29,795,815
IBNR	$2,919,025	$9,975,689
Total	$348,013,064	$413,351,046

The combined liabilities for disabled members, survivors and future death benefits increased by approximately 19% (from $348,013,064 to $413,351,046) due primarily to a change in the mortality assumption for disabled members, and to a change in the calculation methods for determining the IBNR liability.

Last year, we assumed mortality for disabled members equal to 100% of the mortality for disabled employees reported in the 2012-2014 Experience Study performed by the actuary for the Wisconsin Retirement System. However, based on several tests performed this year by Milliman, this assumption seemed high for Duty Disability claimants. Therefore, we have implemented a 50% adjustment factor for the 12/31/2015 valuation. The new assumption was developed from an analysis of historical Duty Disability claim experience which indicated that actual mortality is lower than the mortality reported in the WRS Experience Study.

In order to assess the adequacy of the liability for disabled members, we performed retrospective runoff tests to determine whether the liabilities at prior valuation dates, calculated using the new valuation assumptions, would have been sufficient to cover the emerging costs of Duty Disability claims. The studies used Duty Disability claims experience from 1/1/2012 through 12/31/2015. The results, shown below, correspond to four mutually distinct 12-month runoff studies that were performed using claims experience from 2012 through 2015. “Total” results shown below represent the four 12-month studies that were combined. For comparison purposes, we have also shown corresponding results based on last year’s mortality assumption.

Liability Runoff Studies for Disabled Members Margin as % of Initial Liability		
Experience Year	Mortality Based on 12/31/2014 Valuation Assumption	Mortality Based on 12/31/2015 Valuation Assumption
2012	-0.44%	0.17%
2013	-0.13%	0.61%
2014	-0.62%	0.05%
2015	-0.21%	0.52%
Total	-0.35%	0.34%

In the preceding table, a positive margin indicates the liability was adequate to cover the runout of open disability claims during the study period, while a negative margin indicates a deficiency. The cost of the claim runout is computed as the present value of paid claims during the study period, plus the present value of the liability for these claims at the end of the study period. For this type of plan, we typically target a positive overall margin of 1% to 5%, with reasonably consistent patterns by claim duration.

The results of the runout studies that were based on the new mortality assumption show slight positive margins. Although these margins are slightly less than our target 1-5% 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 alongside the valuation assumptions to ensure that the liability estimates are adequate.

We performed separate liability runoff studies to test the mortality assumptions for survivors, because the valuation assumptions are different for survivors and disabled members. These studies used survivor claims experience from 1/1/2012 through 12/31/2015. Once again, the results correspond to four mutually distinct 12-month runoff studies that were performed using claims experience from 2012 through 2015, and the “Total” result represents the four 12-month studies that were combined.

Liability Runoff Studies for Survivors Margin as % of Initial Liability	
Experience Year	Estimated Margin
2012	2.0%
2013	0.6%
2014	1.2%
2015	3.3%
Total	1.8%

Based on the results of this analysis, we did not feel that a change in the survivor mortality assumptions would be necessary. The overall margin of 1.8% falls within our target 1 – 5% range.

The liability for IBNR claims as of 1/1/2016 represents the expected portion of the total cost attributable to disabilities incurred prior to 1/1/2016 that had not been reported as of that date. We computed the IBNR liability by first estimating the average annual incurred claim cost, and then estimating the incurred claims that were unreported as of 12/31/2015. Both of these estimates were derived from analyses of historical claim experience using claim data from 2009 through 2015. The following table shows actual annual incurred claims from 2009 through 2015:

Duty Disability Annual Incurred Claims from 2009 to 2015							
Disability Year	2009	2010	2011	2012	2013	2014	2015
Incurred Claims	$7,080,106	$6,955,966	$6,411,641	$8,314,722	$7,116,025	$2,691,941	$1,683,755

From this data, we estimated the average annual incurred claim costs from 2009 to 2013 to be $7,175,692. Based on this estimate, we then calculated the percentage of incurred claims reported in each year. In particular, we assumed that approximately 23% of claims incurred in 2015 were reported as of 12/31/2015, approximately 38% of claims incurred in 2014 were reported as of 12/31/2015, and 100% of claims incurred in prior years were reported as of the valuation date. This resulted in an estimated liability equal to $5,491,937 for IBNR claims in 2015 and $4,483,752 for IBNR claims incurred in 2014. The total IBNR liability is equal to the sum of these two components, i.e. $9,975,689.

The liability calculation for administrative expenses was based, in part, on ETF's estimated allocation of staff time for administering the plan. Last year, this estimated expense was approximately equal to 1.5% of total benefit payments made in 2014. Thus, the administrative expense liability was determined by assuming that the program's administrative costs will equal 1.5% of annual benefit payments in all future years.

VI. Summary of Principal Plan Provisions

Participants Included: State and local protective occupation active employees, and retirees and their survivors who are currently receiving duty disability program benefits

Benefit Eligibility: Member 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

Annual Increases in Member Benefits: 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

Contributions: 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 the current year's ARC.

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

Contribution Rate* (as a % of Covered Payroll)	Claims as a % of Covered Payroll	Number of Claims
0.25%	<=1.5%	1
0.50%	> 1.5% but ≤ 3.0%	2
1.00%	> 3.0% but ≤ 4.5%	3
1.75%	> 4.5% but ≤ 6.0%	4
2.75%	> 6.0% but ≤ 7.5%	5
4.00%	> 7.5% but ≤ 9.0%	6
5.50%	> 9.0% but ≤ 10.5%	7
6.60%	Claims > 10.5%	8 or more

* *Contribution rates shown above are before adjustment for the Actuarial Adjustment Rate (AAR); for FY 2016, the AAR was -65%.*

VII. Data

The participant data used in the valuation was provided by the State of Wisconsin as of January 1, 2016. While the participant data was checked for reasonableness, the data was not audited, and the valuation results presented in this report are dependent upon the accuracy of the participant data provided. The table below presents a summary of the basic participant information for the active and inactive participants covered under the terms of the Plan.

	Protective with Social Security	Protective w/o Social Security	Total
a. Active Participants			
Count	19,238	2,721	21,959
Average Age	40.6	41.1	40.7
Average Service	12.8	14.2	13.0
Average 2014 Pay	$59,915	$76,021	$61,911
b. Disabled participants and Survivors*			
Count	809	193	1,002
Average Age	61	64	62
Average Current Benefit	$2,747	$2,583	$2,715

* *Includes 54 disabled participants with zero benefits.*

VIII. GLOSSARY

The following is an explanation of many of the terms referenced by the Statement of the Governmental Accounting Standards Board, "Financial Reporting for Postemployment Benefits Other than Pension Plans."

1. **Actuarial Cost Method.** This is a procedure for determining the Actuarial Present Value of Benefits and allocating it to time periods to produce the Actuarial Accrued Liability and the Normal Cost. The Statement assumes a closed group of employees and other participants unless otherwise stated; that is, no new entrants are assumed. Six methods are permitted – Projected Unit Credit, Entry Age Normal, Attained Age, Aggregate, Frozen Entry Age, and Frozen Attained Age.

2. **Actuarial Accrued Liability.** This is the portion of the Actuarial Present Value of Benefits attributable to periods prior to the valuation date by the Actuarial Cost Method (i.e., that portion not provided by future Normal Costs).

3. **Actuarial Present Value of Benefits.** This is the value, as of the applicable date, of future payments for benefits and expenses under the Plan, where each payment is:

   (a) Multiplied by the probability of the event occurring on which the payment is conditioned, such as the probability of survival, death, disability, termination of employment, etc.; and

   (b) Discounted at the assumed discount rate.

4. **Actuarial Value of Assets.** This is the value of cash, investments and other property belonging to the Plan, as used by the actuary for the purpose of an Actuarial Valuation.

5. **Amortization Payment.** This is the amount of the contribution required to pay interest on and to amortize over a given period the Unfunded Actuarial Accrued Liability or the Unfunded Frozen Actuarial Accrued Liability. A closed amortization period is a specific number of years counted from one date and reducing to zero with the passage of time; an open amortization period is one that begins again or is recalculated at each actuarial valuation date.

6. **Annual Required Contribution ("ARC").** The level of contribution on an ongoing basis that would fund the normal cost and amortize the unfunded actuarial liability attributed to past service.. This amount is required to be calculated under GASB 43. However, there is no requirement that this amount be paid.

7. **Attribution Period.** The period of an employee's service to which the expected postretirement benefit obligation for that employee is assigned. The beginning of the attribution period is the employee's date of hire. The end of the attribution period is the full retirement eligibility date. For disability retirement, the end of the attribution period is the date of disability.

8. **Benefit Payments.** The monetary or in-kind benefits or benefit coverage to which participants may be entitled under a postemployment benefit plan, including health care benefits and life insurance not provided through a pension plan.

9. **Funding Excess.** This is the excess of the Actuarial Value of Assets over the actuarial accrued liability.

10. **Normal Cost.** This is the portion of the Actuarial Present Value of Benefits allocated to a valuation year by the Actuarial Cost Method.

11. **Other Postemployment Benefits ("OPEB").** This refers to postemployment benefits other than pension benefits, including healthcare benefits regardless of the type of plan that provides them, and all other postemployment benefits provided separately from a pension plan, excluding benefits defined as termination benefits or offers.

12. **Return on Plan Assets.** This is the actual investment return on plan assets during the fiscal year.

13. **Substantive Plan.** The terms of the postretirement benefit plan as understood by an employer that provides postretirement benefits and the employees who render services in exchange for those benefits. The substantive plan is the basis for the accounting for the plan.

14. **Unfunded Actuarial Accrued Liability.** This is the excess of the actuarial accrued liability over the Actuarial Value of Assets.

Appendix A

Summary of Participant Demographic Information

Actives - Protective without Social Security
Active Members as of January 1, 2016

	Years of Service								
Age	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	24	41	0	0	0	0	0	0	65
25-29	25	181	80	0	0	0	0	0	286
30-34	14	128	195	59	1	0	0	0	397
35-39	9	38	142	176	82	0	0	0	447
40-44	1	16	45	99	248	48	1	0	458
45-49	0	7	16	65	173	163	61	0	485
50-54	0	5	8	20	69	121	154	37	414
55-59	0	4	3	4	17	35	44	32	139
60-64	0	1	1	1	1	9	11	5	29
65+	0	0	0	0	0	0	0	1	1
ALL	73	421	490	424	591	376	271	75	2,721

Average Annual Earnings

	Years of Service								
Age	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	25,937	53,980	0	0	0	0	0	0	43,625
25-29	25,801	60,272	72,015	0	0	0	0	0	60,543
30-34	*	60,618	73,169	75,755	*	0	0	0	67,808
35-39	*	60,673	71,290	75,894	80,487	0	0	0	73,081
40-44	*	57,925	75,036	76,652	80,944	87,153	*	0	79,167
45-49	0	*	*	78,969	82,929	84,655	88,672	0	82,703
50-54	0	*	*	78,370	82,993	84,679	89,799	91,490	86,285
55-59	0	*	*	*	*	84,856	88,241	93,730	88,468
60-64	0	*	*	*	*	*	*	*	90,988
65+	0	0	0	0	0	0	0	*	*
ALL	26,342	59,929	72,832	76,745	81,747	85,123	89,335	92,572	76,020

Appendix A

Summary of Participant Demographic Information

(Continued)

Actives - Protective with Social Security
Active Members as of January 1, 2016

	Years of Service								
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	341	356	1	0	0	0	0	0	698
25-29	345	1,545	428	9	0	0	0	0	2,327
30-34	144	812	1,437	537	15	0	0	0	2,945
35-39	66	357	656	1,229	625	9	0	0	2,942
40-44	36	199	321	661	1,447	402	6	0	3,072
45-49	31	147	224	432	892	1,287	367	2	3,382
50-54	18	88	140	289	377	550	725	143	2,330
55-59	9	42	85	184	164	191	164	187	1,026
60-64	9	28	34	88	67	66	57	75	424
65+	1	16	12	17	18	13	6	9	92
ALL	1,000	3,590	3,338	3,446	3,605	2,518	1,325	416	19,238

Average Annual Earnings

	Years of Service								
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	16,038	45,947	*	0	0	0	0	0	31,323
25-29	17,882	51,165	58,651	*	0	0	0	0	47,604
30-34	17,096	49,399	62,136	61,184	*	0	0	0	56,215
35-39	15,834	46,552	58,896	63,921	64,813	*	0	0	59,776
40-44	12,762	44,808	59,056	62,213	68,782	70,706	*	0	64,406
45-49	14,854	46,524	54,572	61,235	66,099	71,918	79,133	*	67,020
50-54	*	39,646	47,082	55,291	62,904	72,246	79,059	83,650	68,303
55-59	*	39,634	48,422	51,745	61,715	71,844	74,207	82,084	65,113
60-64	*	31,720	42,661	52,050	53,422	62,439	67,392	73,979	56,964
65+	*	*	*	*	*	*	*	*	48,141
ALL	16,714	48,535	58,937	61,055	66,062	71,451	77,969	80,870	59,938

Appendix A

Summary of Participant Demographic Information

(Continued)

Total
Active Members as of January 1, 2016

	Years of Service								
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	365	397	1	0	0	0	0	0	763
25-29	370	1,726	508	9	0	0	0	0	2,613
30-34	158	940	1,632	596	16	0	0	0	3,342
35-39	75	395	798	1,405	707	9	0	0	3,389
40-44	37	215	366	760	1,695	450	7	0	3,530
45-49	31	154	240	497	1,065	1,450	428	2	3,867
50-54	18	93	148	309	446	671	879	180	2,744
55-59	9	46	88	188	181	226	208	219	1,165
60-64	9	29	35	89	68	75	68	80	453
65+	1	16	12	17	18	13	6	10	93
ALL	1,073	4,011	3,828	3,870	4,196	2,894	1,596	491	21,959

Average Annual Earnings

	Years of Service								
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	16,689	46,777	*	0	0	0	0	0	32,371
25-29	18,417	52,120	60,756	*	0	0	0	0	49,020
30-34	17,753	50,927	63,454	62,626	*	0	0	0	57,592
35-39	17,688	47,910	61,101	65,421	66,631	55,030	0	0	61,531
40-44	13,250	45,784	61,021	64,094	70,561	72,460	*	0	66,321
45-49	14,854	45,919	55,897	63,554	68,833	73,350	80,493	*	68,987
50-54	19,886	41,332	48,680	56,785	66,012	74,488	80,941	85,262	71,016
55-59	*	45,318	49,847	52,476	63,709	73,859	77,176	83,786	67,900
60-64	*	34,387	43,845	52,364	53,745	65,720	71,357	75,245	59,142
65+	*	*	*	*	*	*	*	*	48,562
ALL	17,369	49,731	60,716	62,774	68,271	73,227	79,899	82,657	61,931