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May 22, 2017

Ms. Cindy Klimke-Armatoski, 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 Cindy:

Enclosed is 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 2017 fiscal year for the State of Wisconsin Duty Disability Program.

The results under the new GASB accounting standards will be provided in the December 31, 2017 GASB 74 report at a later date.

If you have any questions regarding this report, please contact me at paul.correia@milliman.com or 207-771-1204.

Sincerely,

A handwritten signature in black ink that reads "Paul Correia".

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

PLC/crl

Enclosure

cc: T. Herman
D. Skwire



State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

Prepared by:

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

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

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

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State of Wisconsin Duty Disability Program

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Table of Contents

Certification Letter

I.	Introduction and Purpose _____	1
II.	Cost Projection Results _____	2
III.	Actuarial Cost Method _____	7
IV.	Actuarial Assumptions _____	8
V.	Analysis of Results _____	14
VI.	Summary of Plan Provisions _____	17
VII.	Data _____	20
VIII.	Glossary _____	21
	Appendix A: Summary of Participant Demographic Information _____	23



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Chief Trust Finance Officer
State of Wisconsin
Department of Employee Trust Funds
801 West Badger Road
Madison, Wisconsin 53707-7931

Re: January 1, 2017 Actuarial Valuation of the State of Wisconsin Duty Disability Program

Dear Cindy:

As part of our engagement with the Department of Employee Trust Funds (ETF), we have completed an actuarial determination of the benefit cost and funded status relating to the future disability benefits of the State of Wisconsin Duty Disability Program as of January 1, 2017. 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.

The results under the new GASB accounting standards will be provided in the December 31, 2017 GASB 74 report at a later date.

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 ETF. 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, and 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.

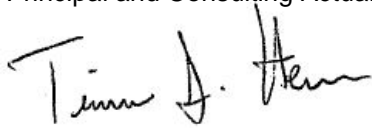
We, Paul L. Correia, Timothy J. Herman, and Daniel D. Skwire, are actuaries for Milliman, Inc. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. This report uses the expertise 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,



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



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



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

PLC/TJH/DDS/crl

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

I. INTRODUCTION AND PURPOSE

We have 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, 2017, the Plan is 110% funded on an actuarial basis.

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

	(\$ in millions)	<u>1/1/2016</u>	<u>1/1/2017</u>
Actuarial Accrued Liability			
Actives		\$ 104	\$ 105
Disabled Members and Survivors		<u>419</u>	<u>453</u>
Total		\$ 523	\$ 558
Actuarial Value of Assets		<u>\$(604)</u>	<u>\$(615)</u>
Unfunded Actuarial Accrued Liability		\$ (81)	\$ (57)
Funded Ratio		115%	110%
Annual Required Contribution (GASB 43)		\$ 8	\$ 10

The primary change from 1/1/2016 to 1/1/2017 is an increase in the disabled life liability, which is due to several factors, including an increase in the number of disabled lives and an increase in the average monthly benefit amount. 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, 2017 Actuarial Valuation under GASB 43

II. COST PROJECTION RESULTS

A summary of the transactions during 2016 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, 2016		\$578,188
2.	Income		
	Employer Contributions	\$ 3,788	
	Investment Income	<u>47,716</u>	
	Total Income		\$ 51,504
3.	Disbursements		
	Benefit Payments	\$34,390	
	Expenses	<u>1,036</u>	
	Total Disbursements		\$ 35,426
4.	Net Change in Assets: (2) – (3)		\$ 16,078
5.	Market Value of Assets as of December 31, 2016: (1) + (4)		\$594,266
6.	Estimated Rate of Investment Return on a Market Value Basis		8.29%

TABLE 2

The following table develops the Actuarial Value of Assets as of January 1, 2017.

(\$ in thousands)

1.	Market value of assets as of January 1, 2016		\$578,188
2.	Contributions*		3,788
3.	Benefit Payments*		(34,390)
4.	Assumed earnings at 7.20% on (1), (2), and (3)		<u>40,528</u>
5.	Expected assets at January 1, 2017: (1)+(2)+(3)+(4)		\$588,114
6.	Actual assets at January 1, 2017		\$594,266
7.	Investment gain (loss)		
	a. Gain (loss) for 2016: (6) – (5)		\$ 6,152
	b. Gain (loss) for 2015		(48,218)
	c. Gain (loss) for 2014		(8,985)
	d. Gain (loss) for 2013		31,922
8.	Gain (loss) not yet reflected in actuarial value of assets		
	a. 80% of 2016 gain (loss)		\$ 4,922
	b. 60% of 2015 gain (loss)		(28,931)
	c. 40% of 2014 gain (loss)		(3,594)
	d. 20% of 2013 gain (loss)		<u>6,384</u>
	e. Total gain (loss) not yet reflected in actuarial value of assets:		(21,219)
9.	Actuarial value of plan assets as of January 1, 2017: (6) – (8e)		\$615,485
10.	Estimated rate of return on actuarial value of assets		7.19%

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

State of Wisconsin Duty Disability Program

January 1, 2017 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, 2017 is shown below:

TABLE 3
(\$ in thousands)

	<u>January 1, 2017</u>
I. Actuarial Present Value of Total Projected Benefits	
22,129 Active Participants ⁽¹⁾	\$179,707
1,007 Retired Participants ⁽¹⁾	<u>453,448</u>
Grand Total Actuarial Present Value of Total Projected Benefits	\$633,155
II. Assets and Future Employer Contributions	
Actuarial Value of Assets	615,485
Unfunded Actuarial Accrued Liability	(57,152)
Present Value of Future Normal Costs (including the current year)	<u>74,822</u>
Total Assets and Future Employer Contributions	\$633,155

⁽¹⁾ Participant data as of January 1, 2017 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 2017 are shown below:

TABLE 4
(\$ in thousands)

	<u>2017</u>
A. <u>Employer Normal Costs</u> (Projected Unit Credit Actuarial Cost Method)	
(1) Current Year Normal Cost – January 1	\$12,403
(2) Assumed Interest to the End of the Year	<u>893</u>
(3) Current Year Normal Cost – December 31: [(1) + (2)]	\$13,296
B. <u>Determination of Current Year Amortization Payment</u> ⁽²⁾	
(1) Unfunded Actuarial Liability (see Table 1)	\$(57,152)
(2) Amortization Period	30 years
(3) Level Percent of Pay Amortization Factor	18.2359
(4) Amortization Amount – January 1: [(1) / (3)]	(3,134)
(5) Assumed Interest to the End of the Year	<u>(226)</u>
(6) Amortization Amount – December 31: [(4) + (5)]	\$(3,360)

⁽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, 2017 Actuarial Valuation under GASB 43

DISCLOSURES

TABLE 5

(\$ in thousands)

Fiscal Year-End	<u>12/31/2017</u>
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	\$13,296
(3) Amortization of Unfunded Actuarial Accrued Liability	<u>(3,360)</u>
(4) Annual Required Contribution (ARC): (2) + (3)	\$9,936

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, 2016 to January 1, 2017.

(\$ in thousands)

a. UAAL as of January 1, 2016	\$(80,530)
b. Normal Cost for 2016	11,962
c. Annual Required Contribution for 2016	8,089
d. Interest on UAAL and Normal Cost at 7.20%	<u>(4,937)</u>
e. Expected UAAL as of January 1, 2017	(65,416)
f. 2016 (Gain)/Loss	<u>8,264</u>
g. UAAL as of January 1, 2017	\$(57,152)
Sources of 2016 (Gain)/Loss	
Demographic (Gain)/Loss	\$3,912
(Gain)/Loss due to assumption changes	0
(Gain)/Loss due to (over)/underpayment of ARC	4,301
(Gain)/Loss due to asset returns	51
Total	\$8,264

Funded Status and Funding Progress. As of January 1, 2017, the most recent actuarial valuation date, the plan is estimated to be 110% funded. The actuarial accrued liability for benefits is \$558,333,000 and the actuarial value of assets is \$615,485,000, resulting in an unfunded actuarial accrued liability (UAAL) of (\$57,152,000).

State of Wisconsin Duty Disability Program

January 1, 2017 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
1/1/2017	615,485	558,333	(57,152)	110.2	1,390,447	-4.1

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	3,788	46.8
12/31/2017	9,936	TBD	TBD

This material assumes that the reader is familiar with the State of Wisconsin Duty Disability Program's post-employment benefit programs, their benefits, eligibility, administration and other factors. The material was prepared solely to provide assistance to the State of Wisconsin in reviewing the impact of the GASB Statement on the State's financial statements. It may not be appropriate for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. This material should only be reviewed in its entirety.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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
2017	\$34,863
2018	36,165
2019	37,908
2020	39,594
2021	41,197
2022	42,755
2023	44,337
2024	45,886
2025	47,307
2026	48,719
2027	49,974

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State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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 anticipated 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 will differ 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, this is calculated assuming 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, this is calculated using an 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.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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 assumptions included in the January 1, 2016 Actuarial Valuation for 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, 2017
Census Date: January 1, 2017
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 with future improvements with MP-2015 generational improvement scale (multiplied by 50%). 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

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State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

Beneficiary Mortality:

This assumption applies to death of beneficiaries. Rates are based on the Wisconsin 2012 Mortality Table as the base table with future improvements with MP-2015 generational improvement scale (multiplied by 50%). 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, adjusted for recent trends in the mortality experience of Duty Disability claimants. 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:

This assumptions applies to disablement while in service. Rates are based on the incidence assumptions used by the prior actuary for the valuation of the Duty Disability program. The 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

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State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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

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State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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

This material assumes that the reader is familiar with the State of Wisconsin Duty Disability Program's post-employment benefit programs, their benefits, eligibility, administration and other factors. The material was prepared solely to provide assistance to the State of Wisconsin in reviewing the impact of the GASB Statement on the State's financial statements. It may not be appropriate for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. This material should only be reviewed in its entirety.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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

Offset	Valuation Estimate
WRS Benefits and LTDI:	<p>Assume 20% of members qualify for a WRS disability benefit or LTDI.</p> <p>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.</p> <p>Assume other members commence a WRS retirement benefit at age 50 (requirement of plan).</p> <p>Benefits are based on plan provisions and actuarial assumptions stated above.</p>
Social Security:	<p>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.</p> <p>Benefits for currently active participants are based on Social Security formula and assuming:</p> <ul style="list-style-type: none"> • 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:	Assume 3.00% reduction to 75%/80% target benefit
<ul style="list-style-type: none"> • Worker's Compensation • Employer Earnings • Other Earnings 	<p>(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.)</p>

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:

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State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

- 1) Assumed 3.20% annual increases for the following individuals:
 - o Under age 60, or
 - o older than 60 and receiving a regular disability retirement or regular LTDI, or
 - o receiving a duty disability death benefit based on 1998 law.
- 2) Assumed 2.10% for the following individuals:
 - o over age 60 and receiving special disability retirement or special LTDI, or
 - o over age 60 not receiving any regular disability retirement or LTDI

Death Benefits Payable to Survivors:

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.

Benefit Adjustments for Current Inactives:

None

Changes Since Prior Valuation:

None

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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 present value of expected future benefits payable to active participants based upon expected future disablements. There were 22,129 active Duty Disability members as of 1/1/2017.
- Open Claims: The liability for open claims represents the present value of expected future benefits payable to disabled members and survivors, where the disabled member's claim had been reported before 1/1/2017. There were 950 disabled members and 57 survivors reported as of 1/1/2017.
- Future Death Benefits: Monthly death benefits may be 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 death benefits represents the present value of expected future 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 1/1/2017 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 1/1/2016 and 1/1/2017 liabilities for the Duty Disability program:

Comparison of Current Year and Prior Year Liabilities for the Duty Disability Program		
Liability Component	1/1/2016	1/1/2017
Active Lives	\$104,282,864	\$104,884,541
Disabled Members and Survivors	\$413,351,046	\$447,388,441
Admin. Expenses	\$5,603,693	\$6,059,386
Total	\$523,237,603	\$558,332,368

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	1/1/2016	1/1/2017
Disabled Members	\$357,957,126	\$385,179,701
Survivors	\$15,622,416	\$18,779,356
Future Death Benefits	\$29,795,815	\$34,724,572
IBNR	\$9,975,689	\$8,704,812
Total	\$413,351,046	\$447,388,441

This material assumes that the reader is familiar with the State of Wisconsin Duty Disability Program's post-employment benefit programs, their benefits, eligibility, administration and other factors. The material was prepared solely to provide assistance to the State of Wisconsin in reviewing the impact of the GASB Statement on the State's financial statements. It may not be appropriate for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. This material should only be reviewed in its entirety.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

The liabilities for disabled members and survivors increased by approximately 8.2%, from \$413,351,046 as of 1/1/2016 to \$447,388,441 as of 1/1/2017. The increase was primarily due to the following:

- The number of open claims for disabled members and survivors increased by approximately 0.5% from 1,002 as of 1/1/2016 to 1,007 as of 1/1/2017
- The average monthly benefit amount for disabled members increased by approximately 6.4% from \$2,762 to \$2,939
- The average monthly benefit amount for survivors increased by approximately 13.1% from \$1,908 to \$2,157
- The estimated liability for future death benefits increased by approximately 16.5%, where 10.1% of the increase was the result of data issues which were identified and resolved in 2016 by ETF.

To evaluate 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 current 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 12/31/2016. The results, shown below, correspond to five mutually distinct 12-month runoff studies. The "Total" margin shown in the last row of the table represents the combined results from the five 12-month studies.

Liability Runoff Studies for Disabled Members Margin as % of Initial Liability	
Experience Year	Estimated Margin
2012	0.17%
2013	0.61%
2014	0.05%
2015	0.52%
2016	0.55%
Total	0.38%

In the preceding table, a positive margin indicates the liability was adequate to cover the runoff of open disability claims during the study period, while a negative margin indicates a deficiency. The cost of the claim runoff 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%.

The results of the runoff studies show modest 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 along with the valuation assumptions to ensure that the liability estimates are adequate.

We also performed liability runoff studies to test the mortality assumptions for survivors, because these assumptions are different than the assumptions for disabled members. The runoff studies used claim experience corresponding to survivors from 1/1/2012 through 12/31/2016. The results, shown below, correspond to the five mutually distinct 12-month runoff studies, and the "Total" margin represents the combined results from the five 12-month studies. The total margin of 2.1% falls within our target range of 1-5%.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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%
2016	3.4%
Total	2.1%

The liability for IBNR claims represents the expected portion of the total cost attributable to disabilities incurred prior to 1/1/2017 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 the valuation date. Both of these estimates were derived from an analysis of historical claim experience from 2010 through 2016. The following table shows estimated annual incurred claims from 2010 through 2016:

Duty Disability Estimated Annual Incurred Claims from 2010 through 2016							
Disability Year	2010	2011	2012	2013	2014	2015	2016
Incurred Claims	\$8,596,126	\$7,601,758	\$9,908,649	\$9,015,095	\$5,895,501	\$4,664,874	\$3,037,166

We estimated the average annual incurred claim costs from 2010 to 2014 to be \$8.2 million. Based on this estimate, we then calculated the percentage of incurred claims unreported over the past two years. We estimated that as of 1/1/2017 approximately 37% of claims incurred in 2016 were reported, approximately 57% of claims incurred in 2015 were reported, and 100% of claims incurred in prior years were reported. These resulted in an estimated liability for IBNR claims equal to \$5,166,260 for claims incurred in 2016 and \$3,538,552 for claims incurred in 2015. The total IBNR liability is equal to the sum of these two components, i.e. \$8,704,812.

The liability calculation for administrative expenses was based, in part, on ETF's estimated allocation of staff time for administering the plan. 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. This assumption was developed from an analysis of expenses performed using historical data from 2014.

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State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

- 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

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

- 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 2017, the AAR was -20%.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

VII. Data

The participant data used in the valuation was provided by the State of Wisconsin as of January 1, 2017. 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	19,390	2,739	22,129
Average Age	40.3	41.0	40.4
Average Service	12.5	14.1	12.7
Average 2016 Pay	\$60,860	\$76,995	\$62,857
b. Disabled participants and Survivors*			
Count	814	193	1,007
Average Age	62	64	62
Average Current Benefit	\$2,924	\$2,770	\$2,895

* Includes 52 disabled participants with zero benefits.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

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. **Discount Rate.** Single interest rate used to discount expected future benefit payments back to valuation date.
10. **Funding Excess.** This is the excess of the Actuarial Value of Assets over the actuarial accrued liability.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

11. **Normal Cost.** This is the portion of the Actuarial Present Value of Benefits allocated to a valuation year by the Actuarial Cost Method.
12. **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.
13. **Return on Plan Assets.** This is the actual investment return on plan assets during the fiscal year.
14. **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.
15. **Unfunded Actuarial Accrued Liability.** This is the excess of the actuarial accrued liability over the Actuarial Value of Assets.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

Appendix A

Summary of Participant Demographic Information

Actives - Protective without Social Security Active Members as of January 1, 2017

Age	Years of Service								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	23	38	0	0	0	0	0	0	61
25-29	37	187	70	1	0	0	0	0	295
30-34	10	134	216	67	0	0	0	0	427
35-39	7	48	122	177	70	0	0	0	424
40-44	1	17	49	89	241	46	0	0	443
45-49	0	9	13	59	166	191	61	0	499
50-54	0	7	6	21	68	123	150	27	402
55-59	2	2	3	6	23	38	53	32	159
60-64	0	1	2	2	0	6	12	5	28
65+	0	0	0	0	0	0	0	1	1
ALL	80	443	481	422	568	404	276	65	2,739

Average Annual Earnings

Age	Years of Service								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	23,561	57,750	0	0	0	0	0	0	44,859
25-29	25,318	62,136	72,950	*	0	0	0	0	60,172
30-34	*	62,319	73,982	76,766	0	0	0	0	69,370
35-39	*	62,113	73,409	76,574	82,877	0	0	0	74,065
40-44	*	*	74,217	77,300	81,591	89,350	0	0	79,855
45-49	0	*	*	78,913	83,524	86,634	90,355	0	84,006
50-54	0	*	*	79,871	84,685	87,197	90,141	90,270	87,255
55-59	*	*	*	*	84,089	90,065	91,010	97,911	90,447
60-64	0	*	*	*	0	*	*	*	91,212
65+	0	0	0	0	0	0	0	*	*
ALL	23,109	61,701	74,124	77,392	82,785	87,489	90,312	94,207	76,995

* Average Annual Earnings for groups with less than 20 participants are omitted.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

Appendix A

Summary of Participant Demographic Information

(Continued)

Actives - Protective with Social Security Active Members as of January 1, 2017

Age	Years of Service								
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	441	409	2	0	0	0	0	0	852
25-29	381	1,691	395	7	0	0	0	0	2,474
30-34	181	851	1,361	498	18	0	0	0	2,909
35-39	112	373	636	1,196	630	4	0	0	2,951
40-44	58	208	300	575	1,474	356	0	0	2,971
45-49	40	152	199	368	910	1,334	369	3	3,375
50-54	31	91	131	221	401	548	770	139	2,332
55-59	14	42	82	148	210	179	182	155	1,012
60-64	12	31	41	72	90	50	52	81	429
65+	1	18	11	10	14	11	7	13	85
ALL	1,271	3,866	3,158	3,095	3,747	2,482	1,380	391	19,390

Average Annual Earnings

Age	Years of Service								
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	17,674	46,970	*	0	0	0	0	0	31,853
25-29	18,593	52,578	60,294	*	0	0	0	0	48,577
30-34	16,724	51,430	63,678	64,097	*	0	0	0	57,203
35-39	14,814	47,935	61,060	66,228	65,750	*	0	0	60,742
40-44	14,960	46,502	62,143	64,158	70,293	71,421	0	0	65,672
45-49	13,535	49,247	58,733	61,920	67,522	73,680	77,443	*	68,450
50-54	20,040	44,896	49,904	57,182	65,532	73,752	81,583	83,932	70,781
55-59	*	41,625	51,468	52,542	60,727	73,092	78,940	82,132	66,141
60-64	*	38,362	43,750	53,771	55,868	65,390	71,701	77,737	59,291
65+	*	*	*	*	*	*	*	*	46,330
ALL	17,399	50,257	60,983	63,311	67,313	73,119	79,666	81,562	60,860

* Average Annual Earnings for groups with less than 20 participants are omitted.

State of Wisconsin Duty Disability Program

January 1, 2017 Actuarial Valuation under GASB 43

Appendix A

Summary of Participant Demographic Information

(Continued)

Total Active Members as of January 1, 2017

Age	Years of Service								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	464	447	2	0	0	0	0	0	913
25-29	418	1,878	465	8	0	0	0	0	2,769
30-34	191	985	1,577	565	18	0	0	0	3,336
35-39	119	421	758	1,373	700	4	0	0	3,375
40-44	59	225	349	664	1,715	402	0	0	3,414
45-49	40	161	212	427	1,076	1,525	430	3	3,874
50-54	31	98	137	242	469	671	920	166	2,734
55-59	16	44	85	154	233	217	235	187	1,171
60-64	12	32	43	74	90	56	64	86	457
65+	1	18	11	10	14	11	7	14	86
ALL	1,351	4,309	3,639	3,517	4,315	2,886	1,656	456	22,129

Average Annual Earnings

Age	Years of Service								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	17,966	47,886	*	0	0	0	0	0	32,722
25-29	19,188	53,530	62,199	*	0	0	0	0	49,812
30-34	16,619	52,911	65,089	65,599	*	0	0	0	58,760
35-39	14,880	49,551	63,048	67,562	67,463	*	0	0	62,416
40-44	15,285	47,664	63,838	65,920	71,881	73,473	0	0	67,512
45-49	13,535	48,592	59,859	64,268	69,991	75,302	79,275	*	70,454
50-54	20,040	46,892	50,983	59,151	68,309	76,217	82,978	84,963	73,203
55-59	*	44,220	53,247	53,661	63,033	76,064	81,662	84,832	69,441
60-64	*	40,000	46,830	54,667	55,868	68,042	74,976	78,549	61,247
65+	*	*	*	*	*	*	*	*	46,890
ALL	17,737	51,434	62,720	65,001	69,350	75,131	81,440	83,364	62,857

* Average Annual Earnings for groups with less than 20 participants are omitted.