

# Wisconsin Retirement System

Forty-Third Annual Actuarial Valuation and  
Gain/Loss Analysis  
December 31, 2023



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May 22, 2024

Employee Trust Funds Board  
Wisconsin Department of Employee  
Trust Funds  
4822 Madison Yards Way  
Madison, Wisconsin 53705

Ladies and Gentlemen:

The results of the December 31, 2023 **annual actuarial valuations of non-retired members covered by the Wisconsin Retirement System** are presented in this report. The valuations establish contribution rates for the 2025 calendar year in conformance with Chapter 40 of the Wisconsin Statutes. This report should not be relied upon for any other purpose. This report may be distributed to parties other than the ETF Board and Staff only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different. The change in the total normal cost rates from last year are shown below:

<b>General, Executive &amp; Elected</b>	<b>Protective with SS</b>	<b>Protective without SS</b>
0.1%	0.7%	-0.1%

The valuations are based upon our understanding of the main plan provisions related to General, Executive and Elected, and Protective Occupation employment with and without Social Security coverage. The plan provisions evaluated are summarized in Section G of this report. Please advise us of any material misstatements in the summary and do not rely on this report until such are resolved.

The individual member statistical data required for the valuations was furnished by the Department of Employee Trust Funds (DETF), together with pertinent data on financial operations. The cooperation of DETF staff in furnishing these materials is acknowledged with appreciation. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by others.

Actuarial valuations are based upon assumptions regarding future activity in specific risk areas including the rates of investment return and payroll growth, eligibility for the various classes of benefits, and longevity among retired lives. The Board adopts these assumptions after considering the advice of the actuary and other professionals. Each actuarial valuation takes into account all prior differences between actual and assumed experience in each risk area and adjusts the contribution rates as needed. The December 31, 2023 valuations were based upon assumptions that were recommended in connection with a study of experience during 2018-2020 and benefit provisions in effect on December 31, 2023. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. The combined effect of the assumptions, excluding prescribed assumptions or methods set by law, is expected to have no significant bias (i.e., not significantly optimistic or pessimistic).

Future actuarial measurements may differ significantly from those presented in this report due to such factors as experience differing from that anticipated by actuarial assumptions, changes in plan provisions, actuarial assumptions/methods or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements.


This report includes various risk factors, but does not include an assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. However, an additional assessment of risk including stress testing for the Wisconsin Retirement System was conducted in the fall of 2023 in conjunction with the State of Wisconsin Investment Board. Additional discussion of various risk factors is included on pages B-9 to B-13 of this report.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

To the best of our knowledge, this report is complete and accurate and was made in accordance with generally recognized actuarial methods. Mark Buis, James D. Anderson, and Richard C. Koch Jr. are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

The valuations were completed by qualified actuaries in accordance with accepted actuarial procedures as prescribed by the Actuarial Standards Board. It is our opinion that the Wisconsin Retirement System is operating in accordance with actuarial principles of level percent-of-payroll financing.

Respectfully submitted,  
Gabriel, Roeder, Smith & Company



Mark Buis, FSA, EA, FCA, MAAA



James D. Anderson, FSA, EA, FCA, MAAA



Richard C. Koch Jr., FSA, EA, MAAA

MB/JDA/RCK:dj



## **SECTION A**

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### **EXECUTIVE SUMMARY**

# Executive Summary

## 1. Required Employer Contributions to Support Retirement System Benefits

	General, Executive & Elected Officials		Protective Occupation				Average 2025
			With Soc. Sec.		Without Soc. Sec.		
	2025	2024	2025	2024	2025	2024	
Employer Normal Cost	6.95%	6.90%	14.95%	14.30%	18.95%	19.10%	7.90%
Participant Normal Cost	6.95%	6.90%	6.95%	6.90%	6.95%	6.90%	6.95%
<b>Total Normal Cost</b>	<b>13.9%</b>	<b>13.8%</b>	<b>21.9%</b>	<b>21.2%</b>	<b>25.9%</b>	<b>26.0%</b>	<b>14.85%</b>

All employers are required to contribute the employer normal cost shown above. Certain employers are required to make additional contributions to fund their “Frozen Initial Liability” which are liabilities that they either brought on when they joined the WRS, or when they increased their prior service percentage. Related information is provided on page B-2.

Under Section 40.05 of the Wisconsin statutes updated for Acts 10 and 32 of 2011, contribution rates are split evenly between the employer normal cost and the participant normal cost for both General Participants and Executive and Elected Officials. For protective occupations, the participant normal cost is set equal to the participant normal cost for General Participants.

Contributions to support the Section 40.65 Duty Disability Program and the Accumulated Sick Leave Conversion Credit Program are in addition to the WRS rates shown above.

## Executive Summary

### 2. Reasons for Change

There are three general reasons why contribution rates change from one valuation to the next. The first is a change in the benefits or eligibility conditions of the plan. The second is a change in the valuation assumptions used to project future occurrences. The third is the difference during the year between the plan’s actual experience and what the assumptions predicted.

In Wisconsin, there is a fourth reason. When the contribution rate changes for any of the first three reasons, the effect of the change is split evenly between employers and participants, except for protective occupation participants. When the participant normal cost changes, projected future participant account balances also change. By statute, the value of the participant retirement benefits must be at least equal to twice the account balance at retirement. This then changes the value of the retirement benefit, which then changes the total normal cost, which is then split between employers and participants. This final effect on normal cost is referred to as the “Money Purchase Effect.”

In total, changes in the contribution rate are illustrated in the following chart. Additional detail on gains and losses can be found in Section D of this report.

	<b>General, Executive &amp; Elected Officials</b>	<b>Protective with Soc. Sec.</b>	<b>Protective without Soc. Sec.</b>
2024 Normal Cost Rate	13.80%	21.20%	26.00%
Effect of Benefit Change	0.00%	0.00%	0.00%
Effect of Assumption Change	0.00%	0.00%	0.00%
Effect of Asset Performance	(0.20)%	(0.41)%	(0.65)%
Effect of Salary Experience	0.25%	1.01%	0.37%
Effect of Money Purchase Benefit	0.04%	0.02%	0.00%
Demographic and Other Experience	0.01%	0.08%	0.18%
2025 Normal Cost Rate	13.90%	21.90%	25.90%

Although the investment income is allocated proportionately to each group, the effect on the contribution rate will be different because the ratio of assets to payroll is different for each group.

# Executive Summary

## 3. General Comments

Based upon this valuation, normal cost contribution rates increased for all groups except for Protective without Social Security. The increase in contribution rates is primarily due to higher than expected pay increases. Partially offsetting the increases due to pay increases was favorable investment performance from prior years flowing through the Market Recognition Account (MRA).

In total, during 2023, investment return was above the assumed 2023 level of 6.80% on a market value basis. Under the asset valuation method (using the MRA), gains and losses are phased-in over a five-year period, resulting in a 8.8% return on an Actuarial Value of Assets basis in the Core Fund. The Actuarial Value of Assets exceeds the Market Value of Assets by approximately 3.7% as of the valuation date. The statutory asset valuation method will recognize all of the differences between actuarial value and market value of -\$4.7 billion over four future years putting upward pressure on future contribution rates, given that all assumptions are realized.

**Conclusion.** Based upon the results of the December 31, 2023 regular annual actuarial valuation, it is our opinion that *the Wisconsin Retirement System continues to operate in accordance with actuarial principles of level percent-of-payroll financing.*



## Other Observations

### General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 6.80% on the actuarial value of assets), it is expected that:

- (1) The normal cost as a percentage of pay will decrease to the level of the entry age normal cost as time passes.
- (2) The unfunded liability will decrease in dollar amount until it is fully funded.
- (3) The funded status of the plan will remain very close to a 100% funded ratio.

### Limitations of Funded Status Measurements

Unless otherwise indicated, a funded ratio measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amount of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon actuarial assumptions. A funded ratio measurement in this report of 100% is not synonymous with no required future contributions. If the funded ratio were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

### Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

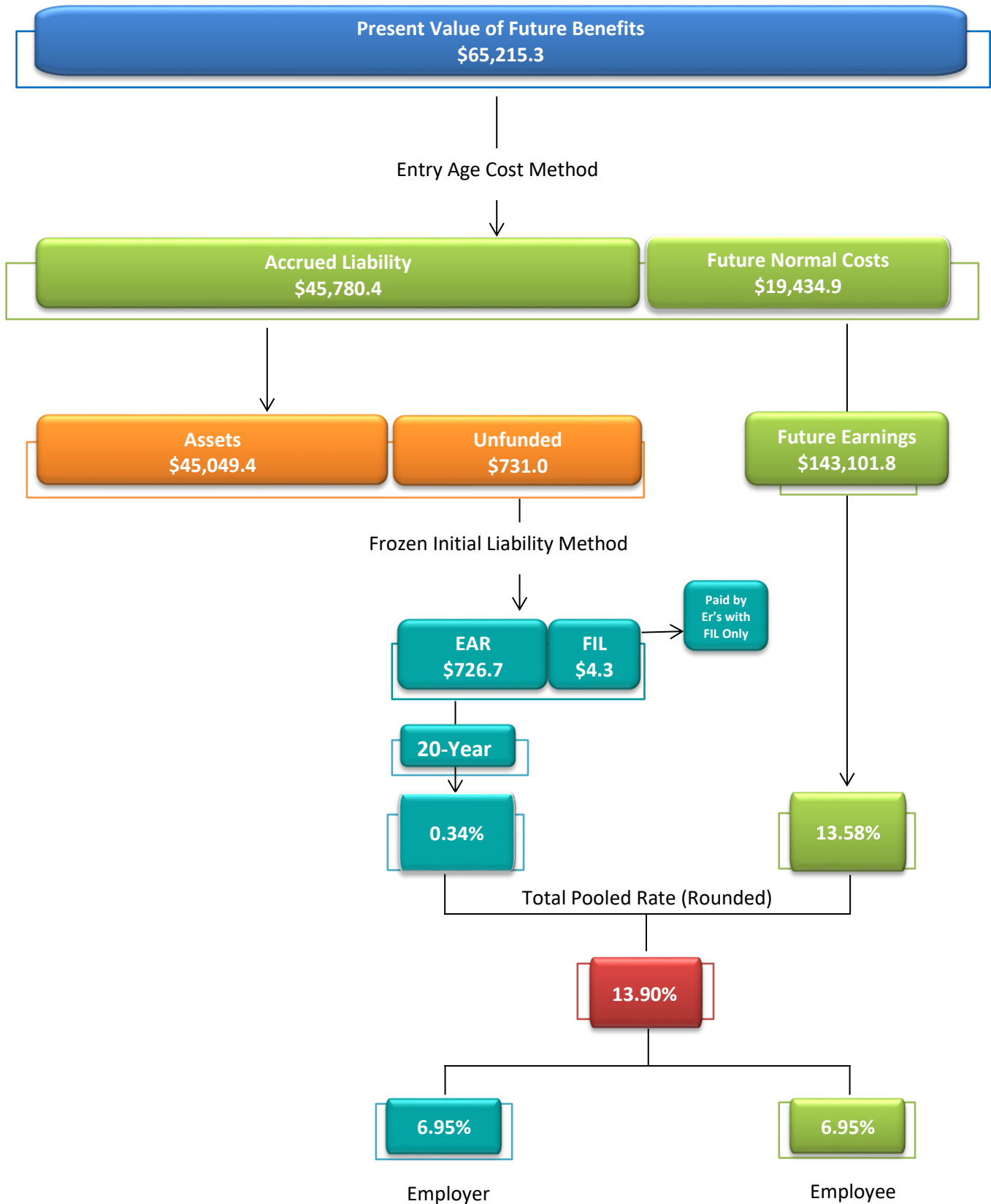


## **SECTION B**

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### **VALUATION RESULTS**

# Actuarial Valuation Process (Illustration for General/Elected Group – not to scale) \$ Millions -- %'s of Payroll



# Wisconsin Retirement System

## December 31, 2023 Valuation Overview

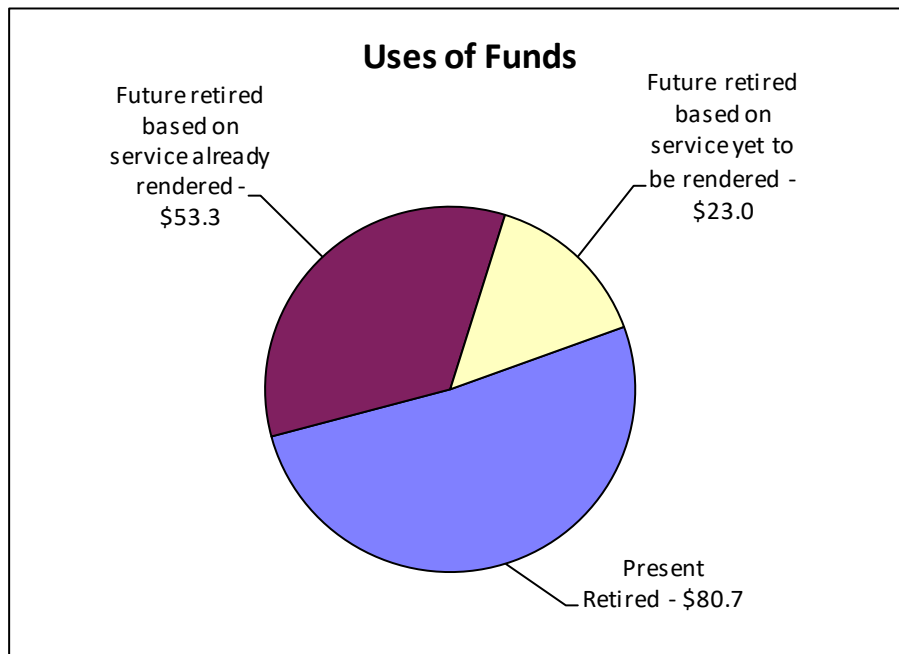
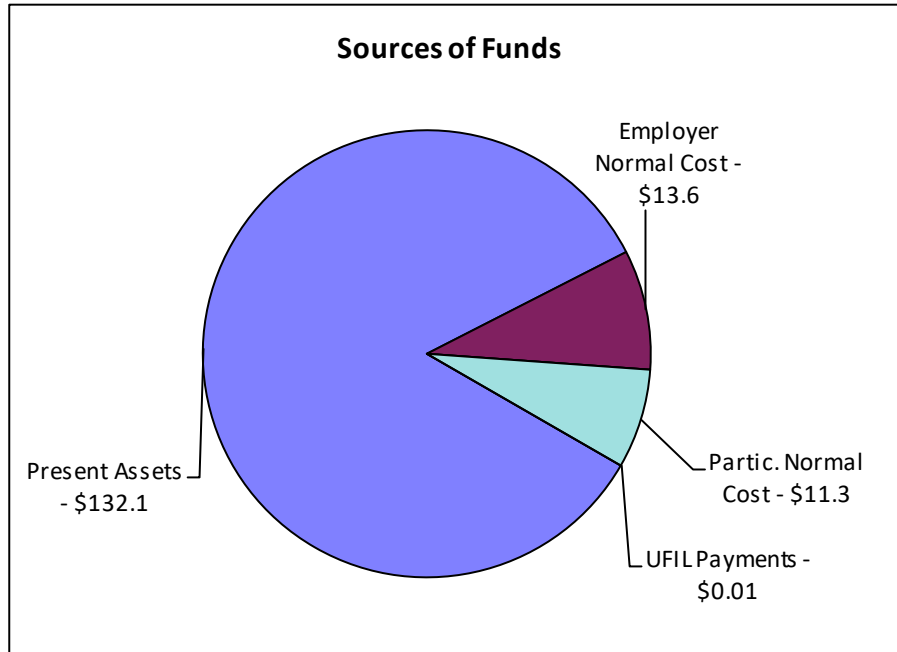
		\$ Millions					
		Non-Retired			Unallocated		
		Protective					
		General, Executives & Elected Officials	With Soc. Sec.	Without Soc. Sec.	Add 'l Contribs	Retired	Total/Average
1	Number of People						
	a. Active	241,527	19,338	2,872			263,737
	b. Inactive, not retired	178,326	8,340	311			186,977
	c. Total	419,853	27,678	3,183		238,111	688,825
2	Current Earnings	\$15,200.3	\$1,670.0	\$265.9			\$17,136.2
3	<b>Present Values of</b>						
	Future Benefits for						
	a. Active	\$55,007.6	\$8,023.2	\$1,764.2			\$64,795.0
	b. Inactive, not retired	\$9,396.2	\$846.0	\$79.3			\$10,321.5
	c. Variable Adjustment	\$811.5	\$71.1	\$15.1			\$897.7
	d. Total	\$65,215.3	\$8,940.3	\$1,858.6	\$294.0	\$80,672.8	\$156,981.0
4	Future Entry Age Normal Costs	\$19,434.9	\$2,899.4	\$652.3			\$22,986.6
5	Future Earnings	\$143,101.8	\$16,501.0	\$2,879.6			\$162,482.4
6	<b>Pooled Entry Age Normal Cost (4/5)</b>	<b>13.58%</b>	<b>17.57%</b>	<b>22.65%</b>			<b>14.15%</b>
7	Entry Age Accrued Liability (3d-4)	\$45,780.4	\$6,040.9	\$1,206.3	\$294.0	\$80,672.8	\$133,994.4
8	Assets	\$45,049.4	\$5,029.6	\$1,087.0	\$294.0	\$80,672.8	\$132,132.8
9	<b>Total Entry Age Unfunded Liability (7-8)</b>	<b>\$731.0</b>	<b>\$1,011.3</b>	<b>\$119.3</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$1,861.6</b>
10	Frozen Initial Liability Portion	\$4.3	\$0.7	\$0.0	\$0.0	\$0.0	\$5.0
11	Pooled Unfunded Liability (EAR) (9-10)	\$726.7	\$1,010.6	\$119.3	\$0.0	\$0.0	\$1,856.6
12	20-year amortization factor	14.0212	14.0212	14.0212			14.0212
13	<b>Pooled Amortization % (11/12/2)</b>	<b>0.34%</b>	<b>4.32%</b>	<b>3.20%</b>			<b>0.77%</b>
14	<b>Total Pooled Rate Rounded (6+13)</b>	<b>13.9%</b>	<b>21.9%</b>	<b>25.9%</b>			<b>14.9%</b>
15	<b>2025 F-I-L Normal Cost Rates</b>						
16	Participant (0.5x14 (Gen'l))	6.95%	6.95%	6.95%			6.95%
17	Employer (14-16)	6.95%	14.95%	18.95%			7.95%
18	<b>Total (16+17)</b>	<b>13.9%</b>	<b>21.9%</b>	<b>25.9%</b>			<b>14.90%</b>
19	Entry Age Funded Ratio (8/7)	98.4%	83.3%	90.1%	100.0%	100.0%	98.6%

		Unfunded Frozen Initial Liability (UFIL)				
		Protective				
		General, Executives & Elected Officials	With Soc. Sec.	Without Soc Sec		
					Total	
	Balance January 1, 2023	\$4,382,666	\$712,643	\$0		\$5,095,309
	New Employers	\$13,256	\$0	\$0		\$13,256
	Payments and Adjustments	\$(376,771)	\$(50,408)	\$0		\$(427,179)
	Interest	\$273,303	\$45,032	\$0		\$318,335
	<b>Balance December 31, 2023</b>	<b>\$4,292,454</b>	<b>\$707,267</b>	<b>\$0</b>		<b>\$4,999,721</b>
	<b>WRS Average UFIL Contribution</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>		<b>0.00%</b>

Each employer contributes the Employer Normal Cost shown in line 17 above. Each participant contributes an identical percentage of pay as indicated. Some employers have an unfunded Frozen Initial Liability and contribute an additional amount to amortize that liability. The retirement system provides the information regarding the remaining unfunded frozen initial liability.



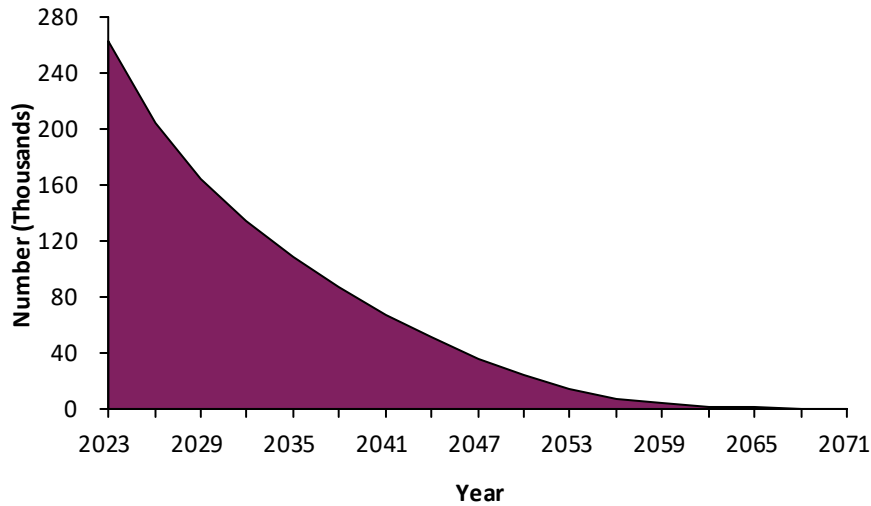
# Financing \$157.0 Billion<sup>1</sup> of Benefit Promises for Present Active and Retired Participants December 31, 2023



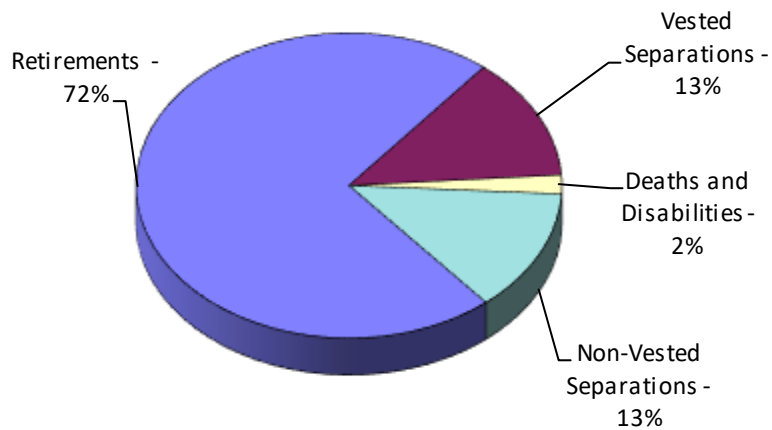
<sup>1</sup> Present value of future benefits; all divisions combined.

# Expected Development of Present Population December 31, 2023

## Closed Group Active Population Projection



## Expected Terminations from Active Employment for Current Active Members



The charts above show the expected future development of the present population in simplified terms. The retirement system presently covers 263,737 active members. Eventually, 13% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for a monthly benefit. About 85% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. The remaining 2% of the present population is expected to become eligible for death-in-service or disability benefits. Within 10 years, over half of the covered membership is expected to consist of new hires.

## Comparative Statement of Computed Contribution Rates

Valuation 12/31	Rate Effective 1/1	General				Executive and Elected			
		Participant	Benefit Adj. Contr.	Employer <sup>1</sup>	Total	Participant	Benefit Adj. Contr.	Employer <sup>1</sup>	Total
1999	2001	5.00 %	0.20 %	5.10 %	10.30 %	3.90 %	0.00 %	10.40 %	14.30 %
2000	2002	5.00 %	0.20 %	5.10 %	10.30 %	3.10 %	0.00 %	9.60 %	12.70 %
2001 <sup>2</sup>	2003	5.00 %	0.40 %	5.23 %	10.63 %	2.60 %	0.00 %	9.06 %	11.66 %
2002	2004	5.00 %	0.60 %	5.22 %	10.82 %	2.60 %	0.00 %	8.91 %	11.51 %
2003	2005	5.00 %	0.80 %	4.70 %	10.50 %	2.80 %	0.00 %	8.40 %	11.20 %
2004	2006	5.00 %	0.90 %	4.73 %	10.63 %	2.90 %	0.00 %	8.47 %	11.37 %
2005	2007	5.00 %	1.00 %	4.81 %	10.81 %	3.00 %	0.00 %	8.56 %	11.56 %
2006	2008	5.00 %	1.00 %	4.79 %	10.79 %	3.00 %	0.00 %	8.56 %	11.56 %
2007	2009	5.00 %	0.90 %	4.68 %	10.58 %	3.00 %	0.00 %	8.55 %	11.55 %
2008	2010	5.00 %	1.20 %	4.95 %	11.15 %	3.20 %	0.00 %	8.75 %	11.95 %
2009	2011	5.00 %	1.50 %	5.22 %	11.72 %	3.90 %	0.00 %	9.45 %	13.35 %
2010	2012	5.00 %	1.60 %	5.30 %	11.90 %	4.30 %	0.00 %	9.80 %	14.10 %
2011 <sup>3</sup>	2013	6.65 %	N/A	6.75 %	13.40 %	7.00 %	N/A	7.00 %	14.00 %
2012	2014	7.00 %	N/A	7.00 %	14.00 %	7.75 %	N/A	7.75 %	15.50 %
2013	2015	6.80 %	N/A	6.80 %	13.60 %	7.70 %	N/A	7.70 %	15.40 %
2014	2016	6.60 %	N/A	6.60 %	13.20 %	7.80 %	N/A	7.80 %	15.60 %
2015 <sup>4</sup>	2017	6.80 %	N/A	6.87 %	13.67 %	6.80 %	N/A	6.87 %	13.67 %
2016	2018	6.70 %	N/A	6.73 %	13.43 %	6.70 %	N/A	6.73 %	13.43 %
2017	2019	6.55 %	N/A	6.57 %	13.12 %	6.55 %	N/A	6.57 %	13.12 %
2018	2020	6.75 %	N/A	6.79 %	13.54 %	6.75 %	N/A	6.79 %	13.54 %
2019	2021	6.75 %	N/A	6.78 %	13.53 %	6.75 %	N/A	6.78 %	13.53 %
2020	2022	6.50 %	N/A	6.50 %	13.00 %	6.50 %	N/A	6.50 %	13.00 %
2021	2023	6.80 %	N/A	6.80 %	13.60 %	6.80 %	N/A	6.80 %	13.60 %
2022	2024	6.90 %	N/A	6.91 %	13.81 %	6.90 %	N/A	6.91 %	13.81 %
2023	2025	6.95 %	N/A	6.95 %	13.90 %	6.95 %	N/A	6.95 %	13.90 %

<sup>1</sup> Employer normal cost plus weighted-average of unfunded Frozen Initial liability contribution rates.

<sup>2</sup> Act 11 of 1999 was implemented in 2001.

<sup>3</sup> Act 10 and Act 32 were implemented in 2011.

<sup>4</sup> Contribution rates for General and Executive and Elected Officials groups were combined beginning with the 2015 valuation. Actual 2016 Participant and Employer contribution rates for the Executive and Elected Officials group were each 6.6%, respectively.



## Comparative Statement of Computed Contribution Rates

Valuation 12/31	Rate Effective 1/1	Protective with Social Security				Protective without Social Security			
		Participant	Benefit Adj. Contr.	Employer <sup>1</sup>	Total	Participant	Benefit Adj. Contr.	Employer <sup>1</sup>	Total
1999	2001	3.80 %	0.00 %	7.60 %	11.40 %	3.30 %		12.20 %	15.50 %
2000	2002	4.00 %	0.00 %	7.80 %	11.80 %	3.00 %		11.90 %	14.90 %
2001 <sup>2</sup>	2003	4.00 %	0.00 %	7.68 %	11.68 %	2.40 %		11.28 %	13.68 %
2002	2004	4.50 %	0.00 %	8.02 %	12.52 %	3.20 %		11.81 %	15.01 %
2003	2005	4.90 %	0.00 %	8.10 %	13.00 %	3.30 %		11.30 %	14.60 %
2004	2006	5.00 %	0.00 %	8.19 %	13.19 %	3.30 %		11.11 %	14.41 %
2005	2007	5.10 %	0.00 %	8.28 %	13.38 %	3.40 %		11.16 %	14.56 %
2006	2008	5.10 %	0.00 %	8.27 %	13.37 %	3.40 %		11.17 %	14.57 %
2007	2009	5.00 %	0.00 %	8.15 %	13.15 %	3.20 %		10.89 %	14.09 %
2008	2010	5.50 %	0.00 %	8.64 %	14.14 %	3.90 %		11.56 %	15.46 %
2009	2011	5.80 %	0.00 %	8.94 %	14.74 %	4.80 %		12.46 %	17.26 %
2010	2012	5.90 %	0.00 %	9.00 %	14.90 %	4.90 %		12.60 %	17.50 %
2011 <sup>3</sup>	2013	6.65 %	N/A	9.75 %	16.40 %	6.65 %		12.65 %	19.30 %
2012	2014	7.00 %	N/A	10.10 %	17.10 %	7.00 %		14.00 %	21.00 %
2013	2015	6.80 %	N/A	9.50 %	16.30 %	6.80 %		13.40 %	20.20 %
2014	2016	6.60 %	N/A	9.40 %	16.00 %	6.60 %		13.40 %	20.00 %
2015	2017	6.80 %	N/A	10.70 %	17.50 %	6.80 %		15.00 %	21.80 %
2016	2018	6.70 %	N/A	10.73 %	17.43 %	6.70 %		14.95 %	21.65 %
2017	2019	6.55 %	N/A	10.55 %	17.10 %	6.55 %		15.04 %	21.59 %
2018	2020	6.75 %	N/A	11.66 %	18.41 %	6.75 %		16.27 %	23.02 %
2019	2021	6.75 %	N/A	11.76 %	18.51 %	6.75 %		16.36 %	23.11 %
2020	2022	6.50 %	N/A	12.02 %	18.52 %	6.50 %		17.36 %	23.86 %
2021	2023	6.80 %	N/A	13.23 %	20.03 %	6.80 %		18.10 %	24.90 %
2022	2024	6.90 %	N/A	14.30 %	21.20 %	6.90 %		19.10 %	26.00 %
2023	2025	6.95 %	N/A	14.95 %	21.90 %	6.95 %		18.95 %	25.90 %

<sup>1</sup> Employer normal cost plus weighted-average of unfunded Frozen Initial liability contribution rates.

<sup>2</sup> Act 11 of 1999 was implemented in 2001.

<sup>3</sup> Act 10 and Act 32 were implemented in 2011.





## Schedule of Funding Progress & Accrued Liabilities (\$ Millions)

### Frozen Initial Liability Method

Valuation Date Dec. 31	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Frozen Entry Age (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a)/(b)	Covered Payroll <sup>1</sup> (c)	UAAL as a Percent of Covered Payroll [(b) - (a)] / (c)
2014	\$ 89,360.4	\$ 89,392.1	\$ 31.7	100.0 %	\$ 13,219.5	0.2 %
2015	91,502.4	91,526.5	24.1	100.0 %	13,530.5	0.2 %
2016	95,396.2	95,414.0	17.8	100.0 %	13,706.0	0.1 %
2017	100,802.5	100,819.3	16.8	100.0 %	13,943.1	0.1 %
2018	101,410.5	101,422.3	11.8	100.0 %	14,301.4	0.1 %
2019	106,524.4	106,532.4	8.0	100.0 %	14,832.5	0.1 %
2020	114,259.2	114,265.0	5.8	100.0 %	15,359.9	0.0 %
2021	124,665.4	124,671.2	5.8	100.0 %	15,780.8	0.0 %
2022	125,111.5	125,116.6	5.1	100.0 %	16,361.3	0.0 %
2023	132,132.8	132,137.8	5.0	100.0 %	17,435.3	0.0 %

### Entry Age Method

Valuation Date Dec. 31	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a)/(b)	Covered Payroll <sup>1</sup> (c)	UAAL as a Percent of Covered Payroll [(b) - (a)] / (c)
2014	\$ 89,360.4	\$ 89,794.0	\$ 433.6	99.5 %	\$ 13,219.5	3.3 %
2015	91,502.4	92,736.3	1,233.9	98.7 %	13,530.5	9.1 %
2016	95,396.2	96,351.2	955.0	99.0 %	13,706.0	7.0 %
2017	100,802.5	101,321.9	519.4	99.5 %	13,943.1	3.7 %
2018	101,410.5	102,823.3	1,412.8	98.6 %	14,301.4	9.9 %
2019	106,524.4	108,053.7	1,529.3	98.6 %	14,832.5	10.3 %
2020	114,259.2	115,250.3	991.1	99.1 %	15,359.9	6.5 %
2021	124,665.4	125,488.0	822.6	99.3 %	15,780.8	5.2 %
2022	125,111.5	126,582.0	1,470.5	98.8 %	16,361.3	9.0 %
2023	132,132.8	133,994.4	1,861.6	98.6 %	17,435.3	10.7 %

<sup>1</sup> As reported by ETF staff. This figure is intended to represent the total pay upon which contributions were based during the year ended on the valuation date and does not necessarily match other figures in this report.

# Funding Metrics (\$ Millions)

## Frozen Initial Liability Method

Valuation Date Dec. 31	Actuarial Value of Assets	F-I-L Accrued Liability for				Percent Funded for			
		Annuitants and Beneficiaries	Member Contribs.	Active & Inactive Members	Total	Annuitants and Beneficiaries	Participant Contributions	Active & Inactive Members	Total
2014	\$89,360.4	\$51,131.1	\$16,259.3	\$22,001.7	\$89,392.1	100.0%	100.0%	99.9%	100.0%
2015	91,502.4	52,851.8	16,707.2	21,967.5	91,526.5	100.0%	100.0%	99.9%	100.0%
2016	95,396.2	55,764.0	17,361.7	22,288.3	95,414.0	100.0%	100.0%	99.9%	100.0%
2017	100,802.5	59,224.9	18,434.4	23,160.0	100,819.3	100.0%	100.0%	99.9%	100.0%
2018	101,410.5	60,242.9	18,455.6	22,723.9	101,422.3	100.0%	100.0%	99.9%	100.0%
2019	106,524.4	63,657.8	19,487.0	23,387.6	106,532.4	100.0%	100.0%	100.0%	100.0%
2020	114,259.2	68,759.8	20,884.4	24,620.8	114,265.0	100.0%	100.0%	100.0%	100.0%
2021	124,665.4	75,528.7	22,737.5	26,405.0	124,671.2	100.0%	100.0%	100.0%	100.0%
2022	125,111.5	76,511.4	22,575.3	26,029.8	125,116.6	100.0%	100.0%	100.0%	100.0%
2023	132,132.8	80,672.8	24,055.5	27,409.5	132,137.8	100.0%	100.0%	100.0%	100.0%

## Entry Age Method

Valuation Date Dec. 31	Actuarial Value of Assets	Entry Age Accrued Liability for				Percent Funded for			
		Annuitants and Beneficiaries	Member Contribs.	Active & Inactive Members	Total	Annuitants and Beneficiaries	Participant Contributions	Active & Inactive Members	Total
2014	\$89,360.4	\$51,131.1	\$16,259.3	\$22,403.6	\$89,794.0	100.0%	100.0%	98.1%	99.5%
2015	91,502.4	52,851.8	16,707.2	23,177.3	92,736.3	100.0%	100.0%	94.7%	98.7%
2016	95,396.2	55,764.0	17,361.7	23,225.5	96,351.2	100.0%	100.0%	95.9%	99.0%
2017	100,802.5	59,224.9	18,434.4	23,662.6	101,321.9	100.0%	100.0%	97.8%	99.5%
2018	101,410.5	60,242.9	18,455.6	24,124.8	102,823.3	100.0%	100.0%	94.1%	98.6%
2019	106,524.4	63,657.8	19,487.0	24,908.9	108,053.7	100.0%	100.0%	93.9%	98.6%
2020	114,259.2	68,759.8	20,884.4	25,606.1	115,250.3	100.0%	100.0%	96.1%	99.1%
2021	124,665.4	75,528.7	22,737.5	27,221.8	125,488.0	100.0%	100.0%	97.0%	99.3%
2022	125,111.5	76,511.4	22,575.3	27,495.3	126,582.0	100.0%	100.0%	94.7%	98.8%
2023	132,132.8	80,672.8	24,055.5	29,266.1	133,994.4	100.0%	100.0%	93.6%	98.6%



## Discussion of Risk/Maturity Measures

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. GRS investigates gains or losses due to economic and demographic experience explicitly as they arise each year in this Annual Actuarial Valuation and Gain/Loss Analysis Report. The results of each valuation report then serves as the underlying basis for the three-year experience study, which investigates and adjusts assumptions so that future gains and losses are minimized. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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 due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements; because of the way most public retirement systems invest, this tends to be synonymous with investment risk;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The contribution rates shown on page A-1 and A-2 may be considered as minimum contribution rates that comply with the Board's funding policy and statutes. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.



# Discussion of Risk/Maturity Measures

## PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following: ratio of the market value of assets to total payroll, ratio of actuarial accrued liability to payroll, ratio of actives to retirees and beneficiaries, and the ratio of net cash flow to market value of assets.

### RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll. In the WRS, this volatility is mitigated by the extensive risk sharing features that are present in the plan.

### RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. In the WRS, this volatility is mitigated by the extensive risk sharing features that are present in the plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time. The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

### RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

### RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

## ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. Additional assessment of risk including stress testing for the Wisconsin Retirement System was conducted in the fall of 2019 in conjunction with the State of Wisconsin Investment Board and a separate study commissioned in the fall of 2020 by the Department of Employee Trust Funds.



## Risk/Maturity Measures

\$ Millions									
Valuation Date	(1) Entry Age Accrued Liabilities (AAL)	(2) Market Value of Assets	(3) (Overfunded)/ Unfunded AAL (1) - (2)	(4) Valuation Payroll	(5) Change in Valuation Payroll	(6) Funded Ratio (2)/(1)	(7) Annuitant Liabilities (AnnLiab)	(8) AnnLiab/ AAL (7)/(1)	(9) AAL/ Valuation Payroll (1)/(4)
2017	\$101,321.9	\$104,159.6	\$(2,837.7)	\$13,720.5	1.7%	102.8%	\$59,224.9	58.5%	738.5%
2018	102,823.3	96,734.3	6,089.0	14,041.3	2.3%	94.1%	60,242.9	58.6%	732.3%
2019	108,053.7	112,098.6	(4,044.9)	14,583.7	3.9%	103.7%	63,657.8	58.9%	740.9%
2020	115,250.3	124,966.8	(9,716.5)	15,065.6	3.3%	108.4%	68,759.8	59.7%	765.0%
2021	125,488.0	141,847.8	(16,359.8)	15,410.0	2.3%	113.0%	75,528.7	60.2%	814.3%
2022	126,582.0	118,366.4	8,215.6	16,025.9	4.0%	93.5%	76,511.4	60.4%	789.9%
2023	133,994.4	127,697.1	6,297.3	17,136.2	6.9%	95.3%	80,672.8	60.2%	781.9%

*These Risk Measures were based on assumptions in place on the valuation date. For the current valuation, this includes 6.8% future investment return, Entry Age Normal accrued liabilities and Market Value of Assets.*

*The Risk/Maturity measures shown on this page and on the following page have been developed in response to Actuarial Standard of Practice ("ASOP") No. 51 entitled "Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions." In a maturing plan, the ratio of retiree liabilities to total liabilities increases, and the ratios of both assets and liabilities to payroll increases, and contribution rates tend to become increasingly volatile. The risk/maturity measures and associated commentary are intended to help keep stakeholders informed of some of the risks that the plan faces, and the potential contribution rate volatility. In the WRS, however, contribution volatility is mitigated by the extensive risk sharing features of the plan, including the dividend process, the Money Purchase Effect, the sharing of contribution rate changes, etc. Thus, these measures, while interesting, have somewhat less meaning for the WRS than they do for most systems.*

**Notes:**

The measures shown above provide information in accordance with Actuarial Standard of Practice No. 51.

Columns (1) to (4). These columns provide various items for comparison in Columns 5 through 16.

Column (5). When payroll grows at or faster than the assumed rate of 3.0%, funding of unfunded accrued liabilities is likely to proceed at least at the scheduled rate. Payroll growing slower than the assumed rate can lead to underfunding of the plan because expected contributions for unfunded liability may not be received.

Column (6). The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

Columns (7) and (8). The ratio of Annuitant liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the investment policy may need to change. A ratio on the order of 50% indicates a maturing system. Ratios near or above 50% are common today.

Column (9). The ratio of liabilities to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll. In the WRS, this potential difficulty is mitigated by the many risk sharing features inherent in the plan design since liabilities are impacted by the dividend process and the impact on money purchase benefits.

## Risk/Maturity Measures (Concluded)

\$ Millions								
Valuation Date	(10) Assets/ Payroll (2)/(4)	(11) Core Trust Fund Portfolio StdDev	(12) Std Dev % of Pay (10)x(11)	(13) Unfunded/ Payroll (3)/(4)	(14) Net External Cash Flow (NECF)	(15) NECF/ Assets (14)/(2)	(16) Core Trust Fund NOF Return	(17) Ratio of Actives to Retirees
2017	759.2%	12.0%	91.1%	-	\$(3,055.1)	-2.9%	15.8%	1.26
2018	688.9%	11.8%	81.3%	43.4%	(3,282.2)	-3.4%	-3.6%	1.18
2019	768.7%	11.8%	90.7%	-	(3,481.2)	-3.1%	16.8%	1.19
2020	829.5%	11.8%	97.9%	-	(3,484.9)	-2.8%	15.0%	1.16
2021	920.5%	11.8%	108.6%	-	(3,854.1)	-2.7%	16.9%	1.13
2022	738.6%	11.8%	87.2%	51.3%	(4,483.2)	-3.8%	-13.0%	1.11
2023	745.2%	11.8%	87.9%	36.7%	(4,645.8)	-3.6%	11.4%	1.11

**Notes:**

Column (10). The ratio of assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll. In the WRS, this potential difficulty is mitigated by the many risk sharing features inherent in the plan design.

Columns (11) and(12). The portfolio standard deviation measures the volatility of investment return. When multiplied by the ratio of assets to payroll it gives the effect of a one standard deviation asset move as a percent of payroll. This figure helps users understand the difficulty of dealing with investment volatility and the challenges volatility brings to sustainability. In the WRS, the potential threat to sustainability is mitigated by the many risk sharing features inherent in the plan design. The portfolio standard deviation represents the standard deviation of the Core Trust Fund.

Column (13). The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

Columns (14) and (15). The ratio of Net External Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately -4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

Column (16). Investment return is probably the largest single risk that most systems face. The year by year return gives an indicator of the performance of the portfolio versus the system's assumed return.

Column (17). In the 1970's and 1980's it was common for the ratio of actives to retirees to be 3 or 4 to 1. As plans mature, this ratio can drop significantly. Ratios below 2 are common today. A ratio significantly below 1 usually indicates a closed plan, a shrinking workforce or other special situation.

## Low-Default-Risk Obligation Measure

Actuarial Standards of Practice No. 4 (ASOP No. 4) was revised and reissued in December 2021 by the Actuarial Standards Board (ASB). It includes a new calculation called a Low-Default-Risk Obligation Measure (LDROM) to be prepared and issued annually for defined benefit pension plans. The transmittal memorandum for ASOP No. 4 includes the following explanation:

*“The ASB believes that the calculation and disclosure of this measure provides appropriate, useful information for the intended user regarding the funded status of a pension plan. The calculation and disclosure of this additional measure is not intended to suggest that this is the “right” liability measure for a pension plan. However, the ASB does believe that this additional disclosure provides a more complete assessment of a plan’s funded status and provides additional information regarding the security of benefits that members have earned as of the measurement date.”*

The LDROM estimates the amount of money the plan would need to invest in low risk securities to provide the benefits with greater certainty. The current model expects lower costs but with higher risk, which creates less certainty and a possibility of higher costs. The LDROM model creates higher expected costs but more predictability when compared to the current model. Thus, the difference between the two measures (Valuation and LDROM) is one illustration of the possible costs the sponsor could incur if there was a reduction in the investment risk in comparison to the current diversified portfolio.

The following information has been prepared in compliance with this new requirement. The Entry Age Normal Cost method is used in the liability comparison below. Unless otherwise noted, the measurement date and assumptions used are consistent with this actuarial valuation report.

Entry Age Normal Accrued Liabilities	LDROM
(in \$ Millions)	
\$ 133,994.4	\$ 149,400.2

ASOP No. 4 requires commentary to help the intended user understand the significance of the LDROM with respect to the funded status of the plan, plan contributions, and the security of participant benefits. Specifically, if plan assets were changed to be invested exclusively in low-default-risk securities, the funded status would be lower and the contributions would have to immediately be higher. While investing in a portfolio with low-default-risk securities may be more likely to reduce the standard deviation of investment volatility, the higher necessary contributions would produce a larger ratio of assets to payroll, and thus it is not self-evident that the volatility of the employer contributions would be any lower. In addition, the portfolio would be expected to generate less investment earnings over time, increasing the likelihood of higher employer contributions and/or lower benefits (and, potentially, depletion of dividends).

Disclosures: Discount rates used to calculate LDROM were based upon the December 2023 Treasury Yield Curve Spot Rates (end of month). The 1-, 5-, 10- and 30-year rates follow: 4.96%, 4.06%, 3.94% and 4.15%. This measure is not appropriate for assessing the need for or amount of future contributions as the current portfolio is expected to generate significantly more investment earnings than the low-default-risk portfolio. This measure is also not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan’s benefit obligation as this measure includes projections of salary increases and the ability for current members to continue to accrue eligibility and vesting service.



## Employer Contributions Required and Contributions Made

Year Ended December 31	Annual Required Contribution (\$ millions)	Percent Contributed <sup>1</sup>
2014	\$ 977.1	100.0%
2015	966.5	100.0%
2016	954.2	100.0%
2017	1,014.9	100.0%
2018	1,028.4	100.0%
2019	1,045.0	100.0%
2020	1,131.5	100.0%
2021	1,162.8	100.0%
2022	1,174.7	100.0%
2023	1,327.6	100.0%

<sup>1</sup> Includes additional UAAL payments when amount is greater than 100%.



**SECTION C**

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**FUND ASSETS**

## Total Valuation Assets (Reserves)

	Valuation Assets at December 31	
	2023	2022
Non Retired		
Participant Statutory		
Core	\$ 21,436,637,176	\$ 20,296,390,936
Variable	2,324,858,670	2,002,958,772
Total Statutory	23,761,495,846	22,299,349,708
Additional <sup>1</sup>	293,952,760	276,033,257
Total Participant	24,055,448,606	22,575,382,965
Employer		
Core	25,079,661,027	24,021,786,505
Variable	2,324,858,670	2,002,958,772
Total Employer	27,404,519,697	26,024,745,277
<b>Total Non Retired</b>	<b>51,459,968,303</b>	<b>48,600,128,242</b>
Retired Assets		
Core	75,583,575,468	72,108,369,192
Variable	5,089,210,569	4,403,020,630
<b>Total Retired Assets</b>	<b>80,672,786,037</b>	<b>76,511,389,822</b>
<b>Total Assets used in Valuation</b>	<b>132,132,754,340</b>	<b>125,111,518,064</b>

	Valuation Assets at December 31	
	2023	2022
Core Assets	\$ 122,375,166,002	\$ 116,687,322,215
Variable Assets	9,757,588,338	8,424,195,849
<b>Total Assets</b>	<b>132,132,754,340</b>	<b>125,111,518,064</b>

<sup>1</sup> Includes employer, employee, and tax deferred additional contributions.

## Reserves for Non-Retired Participants Balances by Valuation Group

	Reserve for Year Ended			
	December 31, 2023			December 31, 2022
	Participant (Statutory)	Employer	Total <sup>1</sup>	Total
General, Executives & Elected	\$22,215,513,071	\$22,833,886,569	\$45,049,399,640	\$42,493,662,470
Protective with Soc. Sec.	1,381,111,936	3,648,505,497	5,029,617,433	4,756,795,593
Protective w/o Soc. Sec.	164,870,839	922,127,631	1,086,998,470	1,073,636,922
<b>Total</b>	<b>\$23,761,495,846</b>	<b>\$27,404,519,697</b>	<b>\$51,166,015,543</b>	<b>\$48,324,094,985</b>

<sup>1</sup> Totals differ slightly from page C-1 due to rounding and additional contributions.

The above schedule shows the distribution of Participant and Employer reserves among the valuation groups according to WRS accounting records. This separation of assets is needed because the valuation groups are separately experience rated. The assets are pooled for investment purposes.

## Development of Participant and Employer Reserves during the Year

	Participant Accumulation			Employer Accumulation			Grand Total
	Core	Variable	Total	Core	Variable	Total	
Ending Balance December 31, 2022	\$20,296,390,936	\$2,002,958,772	\$22,299,349,708	\$24,021,786,505	\$2,002,958,772	\$26,024,745,277	\$48,324,094,985
Closing Adjustments	255,691	1	255,692	2,347,077	1	2,347,078	2,602,770
Beginning Balance January 1, 2023	20,296,646,627	2,002,958,773	22,299,605,400	24,024,133,582	2,002,958,773	26,027,092,355	48,326,697,755
<b>Revenues:</b>							
Employer Contributions	0	0	0	1,235,478,226	91,592,613	1,327,070,839	1,327,070,839
Participant Contributions	1,097,544,444	91,866,963	1,189,411,407	0	0	0	1,189,411,407
Total Revenues	1,097,544,444	91,866,963	1,189,411,407	1,235,478,226	91,592,613	1,327,070,839	2,516,482,246
<b>Expenditures</b>							
Separations	52,331,617	1,723,463	54,055,080	0	0	0	54,055,080
Retirement Single Sums	31,452,094	1,334,981	32,787,075	30,040,170	1,155,148	31,195,318	63,982,393
Death Benefits	23,296,379	1,648,840	24,945,219	15,578,525	1,092,213	16,670,738	41,615,957
Disability Benefits	0	0	0	0	0	0	0
Total Expenditures	107,080,090	4,707,284	111,787,374	45,618,695	2,247,361	47,866,056	159,653,430
<b>Transfers:</b>							
Earnings Allocation	1,720,760,012	407,816,793	2,128,576,805	2,129,145,707	391,050,794	2,520,196,501	4,648,773,306
Annuities Awarded	(1,607,438,838)	(136,795,826)	(1,744,234,664)	(2,260,882,725)	(158,215,155)	(2,419,097,880)	(4,163,332,544)
Intra-Fund Transfers	(162,788)	87,060	(75,728)	(2,937,333)	61,271	(2,876,062)	(2,951,790)
Inter-Fund Transfers	36,367,809	(36,367,809)	0	36,367,805	(36,367,805)	0	0
Variable Equalization Transfer	0	0	0	(36,025,540)	36,025,540	0	0
Net Transfers	149,526,195	234,740,218	384,266,413	(134,332,086)	232,554,645	98,222,559	482,488,972
<b>Ending December 31, 2023</b>	<b>\$21,436,637,176</b>	<b>\$2,324,858,670</b>	<b>\$23,761,495,846</b>	<b>\$25,079,661,027</b>	<b>\$2,324,858,670</b>	<b>\$27,404,519,697</b>	<b>\$51,166,015,543</b>
Internal Rate of Return	8.6%	20.8%	9.7%	9.1%	19.9%	9.9%	9.8%

This page does not include additional contributions.



## Development of Retiree Reserves during the Year

	<b>Core</b>	<b>Variable</b>	<b>Total</b>
Balance December 31, 2022	\$ 72,108,369,192	\$ 4,403,020,630	\$ 76,511,389,822
Closing Adjustments	920,759	(2,505,158)	(1,584,399)
Variable Terminations	37,858,401	(37,858,401)	0
Beginning Balance	72,147,148,352	4,362,657,071	76,509,805,423
Additions			
Reserve transfers	\$ 3,891,562,586	\$ 295,555,316	\$ 4,187,117,902
Earnings	6,144,270,435	0	6,144,270,435
Other	0	917,726,496	917,726,496
Total Additions	10,035,833,021	1,213,281,812	11,249,114,833
Subtractions			
Annuities and Lump Sums	\$ 6,599,405,905	\$ 486,728,314	\$ 7,086,134,219
Credit reestablishments	0	0	0
Other	0	0	0
Total Subtractions	6,599,405,905	486,728,314	7,086,134,219
Ending Balance December 31, 2023	\$ 75,583,575,468	\$ 5,089,210,569	\$ 80,672,786,037

## Statement of Net Plan Assets (\$ Thousands) (Market Value)

	2023	2022
<b>Assets</b>		
Cash and Cash Equivalents	\$ 4,564,488	\$ 4,947,833
Securities Lending Collateral	2,279,822	1,702,300
Prepaid Expenses	28,367	26,047
<b>Total Short Term Assets</b>	<b>6,872,677</b>	<b>6,676,180</b>
<b>Receivables</b>		
Contributions	236,624	234,898
Prior Service Contributions	5,039	5,130
Benefits Overpayment	3,369	2,666
Due from Other Trust Funds	4,396	2,775
Miscellaneous	47	71
Securities Lending	3,335	4,454
Interest and Dividends	555,572	504,249
Investment Sales	6,297,495	5,569,609
<b>Total Receivables</b>	<b>7,105,877</b>	<b>6,323,852</b>
<b>Investments at Fair Value</b>		
Fixed Income	49,962,333	43,319,858
Financial Futures Contracts	202,229	(3,065)
Preferred Securities	338,482	512,888
Convertible Securities	12,855	12,862
Stocks	63,919,632	58,050,495
Options	1,398	(103)
Limited Partnerships	0	0
Real Estate	34,301,859	31,718,665
Foreign Currency Contracts	53,231	51,004
Multi Asset Investments	8,077,847	7,682,286
Swaps	56,928	(22,874)
To Be Announced Securities	1,163,849	1,263,200
<b>Total Investments</b>	<b>158,090,643</b>	<b>142,585,216</b>
<b>Capital Assets</b>	<b>76,273</b>	<b>9,075</b>
<b>Total Assets</b>	<b>172,145,470</b>	<b>155,594,323</b>
<b>Liabilities</b>		
Core Investment Due Other Programs	4,221,799	4,084,843
Variable Investment Due Other Programs	20,174	19,242
Obligation Under Reverse Repo Agreement	18,524,619	17,689,749
Short Sell Obligations	5,806,320	3,643,331
Securities Lending Collateral Liability	7,640,822	5,413,300
Collateral Due to Counterparty	183,709	47,028
Benefits Payable	516,294	507,597
Leases and SBITAS	52,876	0
Unearned Revenue	7	8
Due to Other Trust Funds	7,240	3,902
Miscellaneous Payables	147,192	144,963
Investment Payables	7,327,321	5,673,918
<b>Total Liabilities</b>	<b>44,448,373</b>	<b>37,227,881</b>
<b>Net Assets in Trust for Pension Benefits</b>	<b>\$127,697,097</b>	<b>\$118,366,442</b>

## Statement of Changes in Assets (\$ Thousands) (Market Value)

	Activity During Year	
	2023	2022
Additions:		
Contributions:		
Employer Contributions	\$ 1,327,553	\$ 1,175,881
Employee Contributions	1,204,469	1,082,040
Total Contributions	2,532,022	2,257,921
Investment Income:		
Net Appreciation (Depreciation) in Fair Value of Investments	13,755,032	(21,239,109)
Interest and Dividends	2,420,390	2,606,476
Securities Lending Income	365,092	140,328
Other	0	0
Less		
Current Income Distributed	(460,433)	642,584
SWIB Investment Expense	(1,696,455)	(778,521)
Investment Income Distributed to Securities Lending Rebates and Fees	(308,759)	(76,178)
Net Investment Income	14,074,867	(18,704,420)
Interest on Prior Service Receivable	318	324
Miscellaneous Income	300	0
Total Additions	16,607,507	(16,446,175)
Deductions:		
Benefits and Refunds:		
Retirement, Disability, and Beneficiary	7,195,370	6,949,119
Separation Benefits	54,205	54,797
Total Benefits and Refunds	7,249,575	7,003,916
ETF Administrative Expenses	0	384
Other Expenses	29,061	30,788
Total Deductions	7,278,636	7,035,088
Net Increase (Decrease)	9,328,871	(23,481,263)
Net Assets Held in Trust:		
Beginning of Year <sup>1</sup>	\$118,368,226	\$141,847,701
End of Year	\$127,697,097	\$118,366,439

<sup>1</sup> Report uses preliminary financial statements due to timing of valuation. Any change between the prior year ending balance and the current year beginning balance reflects differences between preliminary and final financial statements.

The figures on this page do not always reconcile exactly to the amounts used in the valuation.



## Core Investment Trust: Market Recognition Account

	For the Year Ended December 31						
	2021	2022	2023	2024	2025	2026	2027
Beginning of year							
a. Funding value	\$108,808,559,030	\$118,333,790,482	\$121,173,270,675	\$126,941,090,673	\$127,068,776,008	\$125,423,103,331	\$121,282,526,316
b. Market value	119,878,132,107	135,992,928,312	114,135,127,323	122,210,365,932	122,210,365,932	122,210,365,932	122,210,365,932
End of year							
c. Market value	135,992,928,312	114,135,127,323	122,210,365,932				
d. Non-investment cash flow (contributions minus benefits)	(3,841,859,532)	(4,412,394,190)	(4,645,785,177)				
e. Investment income							
e1. Total investment income	19,956,655,737	(17,445,406,799)	12,721,023,786				
e2. Assumed rate	7.0%	6.8%	6.8%				
e3. Amount for immediate recognition	7,482,134,048	7,896,676,350	8,081,825,710	-	-	-	-
e4. Amount for phased-in recognition: e1-e3	12,474,521,689	(25,342,083,149)	4,639,198,076	-	-	-	-
f. Phased-in recognition of investment income							
f1. Current year: 0.2 x e4	2,494,904,338	(5,068,416,630)	927,839,615	-	-	-	-
f2. First prior year	1,773,358,012	2,494,904,338	(5,068,416,630)	927,839,615	-	-	-
f3. Second prior year	2,204,094,130	1,773,358,012	2,494,904,338	(5,068,416,630)	927,839,615	-	-
f4. Third prior year	(2,048,741,818)	2,204,094,130	1,773,358,012	2,494,904,338	(5,068,416,630)	927,839,615	-
f5. Fourth prior year	1,461,342,274	(2,048,741,818)	2,204,094,130	1,773,358,012	2,494,904,338	(5,068,416,630)	927,839,615
f6. Total MRA recognition	5,884,956,936	(644,801,968)	2,331,779,465	127,685,335	(1,645,672,677)	(4,140,577,015)	927,839,615
f7. Amount for MRA recognition	-	-	-	-	-	-	-
f8. Total recognized gain (loss)	5,884,956,936	(644,801,968)	2,331,779,465	127,685,335	(1,645,672,677)	(4,140,577,015)	927,839,615
g. Total recognized investment income: e3 + f8	13,367,090,984	7,251,874,382	10,413,605,175	127,685,335	(1,645,672,677)	(4,140,577,015)	927,839,615
h. Funding value end of year: a + d + e3 + f8	118,333,790,482	121,173,270,675	126,941,090,673	127,068,776,008	125,423,103,331	121,282,526,316	122,210,365,931
i. Difference between market and funding values	17,659,137,830	(7,038,143,352)	(4,730,724,741)	(4,858,410,077)	(3,212,737,400)	927,839,615	-
j. Recognized rate of return: g / (a + 0.5 * d)	12.5%	6.2%	8.8%				
k. Market rate of return (net of fee): e1 / (b + 0.5 * d)	16.9%	-13.0%	11.4%				

The Core Investment Trust includes all WRS core assets, as well as the assets of certain other programs. The Market Recognition Account is a statutory method applicable to all assets invested in the Core Trust. Considerable additional information would be required to reconcile these figures to other asset figures in this report. Note that the market rate of return is calculated by GRS and may differ from rates of return calculated by SWIB and ETF.





## SECTION D

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**GAIN/LOSS**

## Active Member Gain/Loss Analysis

**Purpose of Gain/Loss Analysis.** Regular actuarial valuations provide information about the composite change in computed contribution rates and total liabilities -- whether or not the rates and related liabilities are increasing or decreasing, and by how much. However, valuations do not show the portion of the change attributable to each risk area within the Wisconsin Retirement System financial mechanism: the rate of recognized investment income on plan assets; the rates of withdrawal of active participants who leave covered employment; the rates of mortality; the rates of disability; the rates of salary increases; and the assumed ages at actual retirement. In an actuarial valuation, assumptions are made as to what these rates will be for the next year and for decades in the future.

Assumptions should be carefully chosen and continually monitored. A poor initial choice of assumptions or continued use of outdated assumptions can lead to understated costs resulting in either an inability to pay benefits when due, or sharp increases in required contributions at some point in the future or overstated costs resulting in either benefit levels that are kept below the level that could be supported by the computed rate or an unnecessarily large burden on the current generation of participants, employers and taxpayers. The actuarial assumptions for the Wisconsin Retirement System are reviewed and updated as necessary every three years in an experience study. This triennial review is intended to manage the potential for future gains and losses.

***The objective of a gain and loss analysis is to determine the portion of the change that is attributable to each risk area.***

The fact that actual experience differs from assumed experience should be expected. The future cannot be predicted with complete precision. Further, year-to-year statistical fluctuations occur, even in very large groups. This year's report reflects just a single year's experience. Changes in the valuation assumed experience for a risk area should be made only when the differences between assumed and actual experience have been observed to be sizable and persistent. One year's gain and loss analysis may or may not be indicative of ***long-term trends, which are the basis of actuarial assumptions.*** However, a persistent series of gains and losses can indicate a need for an assumption change or a method change, even if on a demographic basis, the assumptions appear to model reality well. In the Wisconsin Retirement System, longer term trends are reviewed in connection with the regular three-year investigation of experience (the most recent three-year investigation covered the period January 1, 2018 to December 31, 2020). It is the results of the three-year investigation that lead to recommendations for changes in the actuarial assumptions.

### Overall Experience

Overall experience resulted in a net actuarial loss of \$459 million for the 2023 calendar year. The development of this figure is shown on the following page, reflecting losses from economic (investment return, salary increases) and demographic (retirement, death, withdrawal, etc.) experience.



## Development of Total Actuarial Gain (Loss) Calendar Year December 31, 2023 (\$ Millions)

	Year Ended December 31, 2023				
	General	Executive & Elected	Protective		Total
			With S.S.	Without S.S.	
(1) Entry Age UAAL at start of year	\$ 433.6	\$ 136.4	\$ 779.7	\$ 120.8	\$ 1,470.5
(2) Entry Age Normal cost from last valuation	2,002.4	15.7	275.4	60.3	2,353.8
(3) Actual contributions	2,091.0	17.4	340.5	67.5	2,516.4
(4) Interest	26.5	9.2	50.8	8.0	94.5
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	371.5	143.9	765.4	121.6	1,402.4
(6) Change in actuarial assumptions	0.0	0.0	0.0	0.0	0.0
(7) Other changes	0.0	0.0	0.0	0.0	0.0
(8) Expected UAAL after changes: (5) + (6) + (7)	371.5	143.9	765.4	121.6	1,402.4
(9) Actual Entry Age UAAL at end of year	572.2	158.8	1,011.3	119.3	1,861.6
<b>(10) Gain (loss): (8) - (9)</b>	<b>\$ (200.7)</b>	<b>\$ (14.9)</b>	<b>\$ (245.9)</b>	<b>\$ 2.3</b>	<b>\$ (459.2)</b>

The gain/loss analysis is intended to explain the financial effect of differences between actual and assumed experience in basic risk areas: investment income, pay increases, retirement rates, turnover rates, etc. In order for the gain/loss analysis to proceed, the change in the Entry Age Unfunded Actuarial Accrued Liabilities from one year to the next is analyzed to remove the effect of expected changes. The table above develops this year's gain or loss (line 10) which is subtracted from the Experience Amortization Reserve (EAR). When the EAR decreases "unexpectedly," this is favorable experience and downward pressure is exerted on contribution rates. Similarly, an unexpected increase in the EAR is unfavorable experience and upward pressure is exerted on contribution rates.

By measuring gains and losses each year and, to the extent possible, determining the "responsible" assumptions, insight is gained into how well the actuarial assumptions estimate WRS liabilities. Such information aids in understanding financial effects of emerging trends and is particularly useful during preparation of the WRS experience study.



## Population Development during Calendar Year 2023

	General	Executive & Elected	Protective		Total	Expected
			With S.S.	Without S.S.		
<b>Beginning Census</b>	236,592	1,234	18,961	2,805	259,592	
(-) Normal Retirement	3,400	61	506	100	4,067	4,767
(-) Reduced Retirement	3,146	19	108	18	3,291	3,958
(-) Death	116	1	10	0	127	272
(-) Disability Retirement						
-Total disabilities approved	181	0	15	7	203	150
-Less pending at beginning of year	57	0	9	0	66	
-Net new from active status	124	0	6	7	137	
(-) Other Separations	15,922	73	796	51	16,842	14,383
(-) Transfers Out	2,912	28	402	21	3,363	
(+) Transfers In	2,870	86	345	62	3,363	
(+) New Entrants	26,477	70	1,860	202	28,609	
<b>Ending Census</b>	240,319	1,208	19,338	2,872	263,737	

This schedule reconciles the active member populations reported in connection with the December 31, 2023 and the prior year valuations. Assumptions related to population development are a primary focus of the gain/loss analysis. They generally tend to be more stable than economic assumptions and, therefore, measurements have more meaning. Please note also that the table above represents changes in actual and expected counts of members. Beginning with the 2009 valuations, some of the actuarial assumptions (retirement, turnover, etc.) are based on liability weighted rates. Therefore, comparing actual to expected number counts alone may not form the basis for our conclusions.

Transfers for the General group include transfer between subgroups (teachers, university, general employees, etc.). Please note that the number of new retirees shown in the table above may include a small cohort of retirees (primarily members retiring during the end of December) that were not included in the Retired Lives Valuation. This is due to the lag in reporting dates and they will be included in the following year Retired Lives Valuation.



# Gain (Loss) Overview

## Population Results

**Normal Retirements** varied by group and gender. Overall normal retirements were less than expected. In general, fewer normal retirements than assumed often creates a gain. However, looking at counts alone is not always an accurate predictor of whether a gain or loss occurs. If there are fewer retirements in shorter service, lower paid groups and more retirements than expected in longer service, higher paid groups, there will be a net loss to the System even if the actual total counts might be equal to or less than expected. In order to account for this, retirement rates are now developed partially on a liability weighted methodology. The net result for this past year was a small loss.

**Reduced Retirements** were less than expected, overall producing a small loss.

**Disabilities** were slightly more than expected and overall produced a small gain.

**Deaths** among active participants were less than expected. The net result for the past year was a small loss.

**Other Separations** varied by group, gender, and service but were overall higher than expected. The net result for the past year was a small loss.

**In total**, the population risk areas (retirement, death, disability, and other separations) varied by decrement, producing a net loss during 2023.

## Economic Results

On a market recognition account basis net of fee **investment return** was 8.8% and investment activity produced a gain for all groups except Executive and Elected due to the combined effect of this year's gain and the continued recognition of prior gains and losses. The total recognized investment gain of \$1,424 million was partially offset by a \$840 million increase in the combined value of variable excess benefits and money purchase benefits (as shown on page D-7), resulting in a net recognized investment gain of about \$584 million.

**Pay Increases** were overall higher than expected, producing a loss.



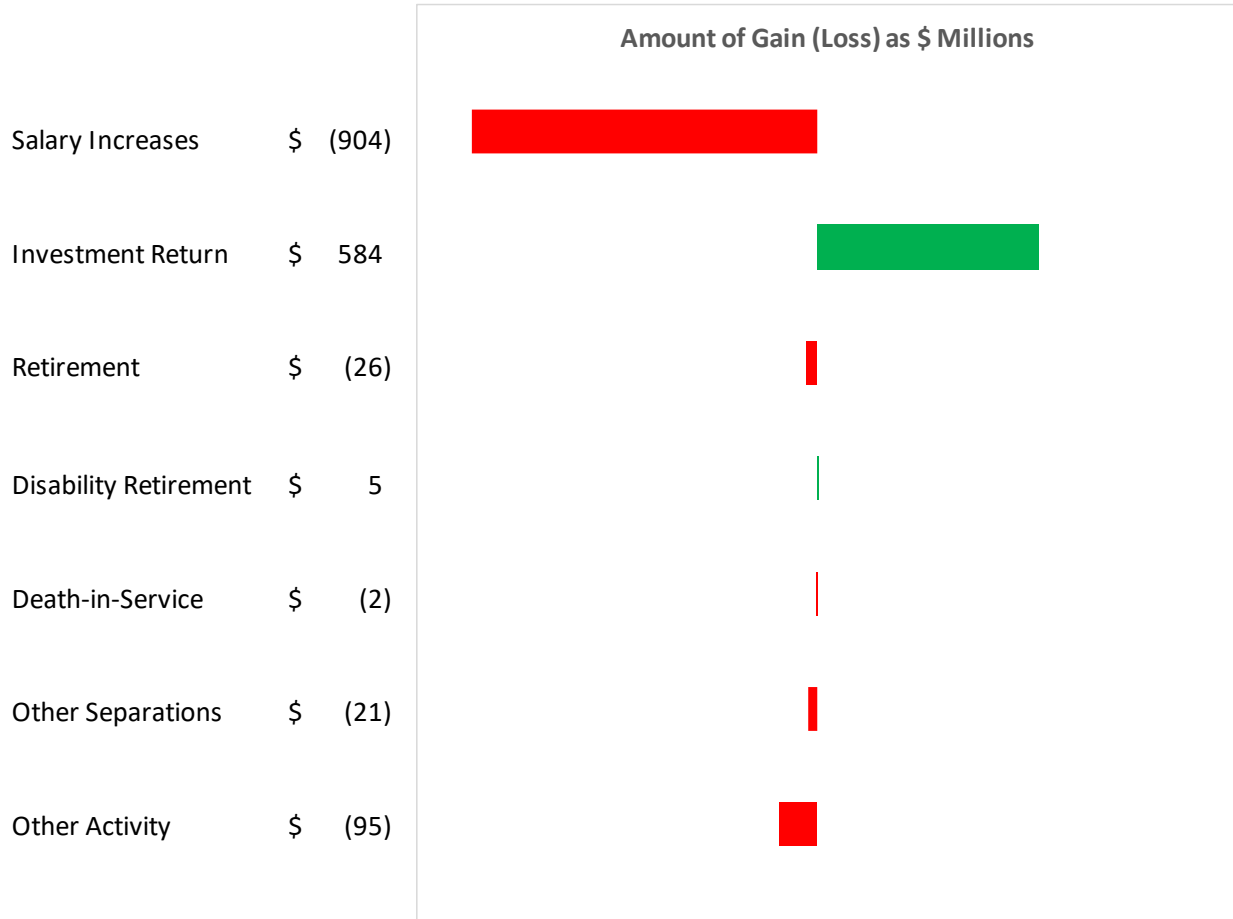
## Gain (Loss) Detail (\$ Millions)

Type of Activity	General	Executive & Elected	Protective		Total	Prior Year
			With S.S.	Without S.S.		
<b>Decrement Risk Areas</b>						
Normal Retirement	\$ 9.6	\$ (0.3)	\$ (15.8)	\$ (8.2)	\$ (14.7)	\$ (36.4)
Reduced Retirement	(10.9)	(0.1)	0.6	(0.4)	(10.8)	(24.2)
Disability Retirement	4.4	0.0	(0.1)	0.3	4.6	2.0
Death with Benefit	(1.1)	0.0	(0.4)	(0.2)	(1.7)	(2.0)
Other Separations	(19.1)	0.3	(3.2)	1.1	(20.9)	37.5
<b>Economic Risk Areas</b>						
Salary Increases	(562.4)	(4.8)	(326.0)	(10.8)	(904.0)	(357.0)
Investment Return	460.3	(3.6)	101.1	25.8	583.6	(131.8)
<b>Other Activity</b>	(81.5)	(6.4)	(2.1)	(5.3)	(95.3)	(75.8)
<b>Total Gain (Loss)</b>	<b>\$ (200.7)</b>	<b>\$ (14.9)</b>	<b>\$ (245.9)</b>	<b>\$ 2.3</b>	<b>\$(459.2)</b>	<b>\$(587.7)</b>
<b>-% of Accrued Liability</b>	<b>(0.4)%</b>	<b>(10.3)%</b>	<b>(4.9)%</b>	<b>0.2%</b>	<b>(0.9)%</b>	<b>(1.2)%</b>

Page D-8 presents a partial explanation of the other activity shown in this schedule.



# Gain/Loss Analysis 2023 Experience Divisions Combined



## Gain (Loss) from Investment Income during Calendar Year 2023 (\$ Millions)

	General	Executive & Elected	Protective		Total
			With SS	Without SS	
(1) Beginning of Year Active Participant Assets					
(a) Participant Accumulation Reserve	\$20,752.7	\$ 4.9	\$1,350.3	\$191.5	\$22,299.4
(b) PAR Closing Adjustment	0.2	0.0	0.0	0.0	0.2
(c) Employer Accumulation Reserve	21,583.3	152.8	3,406.5	882.1	26,024.7
(d) EAR Closing Adjustment	1.9	0.0	0.3	0.1	2.3
(e) Total	42,338.1	157.7	4,757.1	1,073.7	48,326.6
(2) End of Year Active Participant Assets					
(a) Participant Accumulation Reserve	22,220.1	(4.6)	1,381.1	164.9	23,761.5
(b) Employer Accumulation Reserve	22,684.3	149.6	3,648.5	922.1	27,404.5
(c) Total	44,904.4	145.0	5,029.6	1,087.0	51,166.0
(3) Investment Earnings Credited					
(a) Participant Accumulation Reserve	1,973.6	(0.9)	135.9	20.0	2,128.6
(b) Employer Accumulation Reserve	2,099.4	12.4	325.3	83.1	2,520.2
(c) Total	4,073.0	11.5	461.2	103.1	4,648.8
(4) Average Balance: $.5 \times \{(1e)+(2c)-(3c)\}$	41,584.8	145.6	4,662.8	1,028.8	47,422.0
(5) Expected Earnings: $.068 \times (4)$	2,827.8	9.9	317.1	70.0	3,224.8
(6) Gain (Loss) for Year from Investment Experience: $(3c)-(5)$	1,245.2	1.6	144.1	33.1	1,424.0
(7) Portion applied to Change in Variable Excess Reserve and Money Purchase Minimum Benefit	784.9	5.2	43.0	7.3	840.4
<b>(8) Remaining Gain (Loss): (6)-(7)</b>	<b>\$ 460.3</b>	<b>\$ (3.6)</b>	<b>\$ 101.1</b>	<b>\$ 25.8</b>	<b>\$ 583.6</b>



## Analysis of “Other” Activity (\$ Millions)

“Other” activity refers to gain or loss activity that is not directly related to the main actuarial assumptions. Other activity this year resulted in a loss of \$95.3 million as shown on page D-5. The schedule below analyzes this activity. The **Reserve Difference** produced a loss of about \$20 million. There are two identifiable sources for this loss. The first relates to cases where the service credit or final average salary at retirement differed from what was expected based upon the prior valuation. The second relates to final computations of annuities that were originally based on estimates. The **Re-established Liability** represents the liability for new or rehired active members who were not active in the prior year. Typically, it is expected that a new hire will have very little liability. However, often new members appear with more than one year of service or with liability greater than contributions made on their behalf. Although this amount is difficult to determine accurately due to the timing of contribution amounts, we estimate the Re-established Liability loss at about \$81 million.

	General	Executive & Elected	Protective		Total
			With S.S.	Without S.S.	
Expected Reserve Transfers					
Normal Retirement	\$1,838	\$29	\$ 411	\$129	\$2,407
Reduced Retirement	1,131	5	82	19	1,237
Death	17	0	2	0	19
Disability Retirement	45	0	3	6	54
Deferred Retirement	412	4	31	3	450
Expected Total Reserve Transfers	3,443	38	529	157	4,167
Actual Reserve Transfer (From Retiree Report)	3,475	41	516	155	4,187
<b>Reserve Difference</b>	(32)	(3)	13	2	(20)
Expected Refunds	78	0	4	0	82
Actual Refunds	51	0	3	0	54
<b>Refund Difference</b>	27	0	1	0	28
<b>Re-established Liability</b>	(66)	1	(14)	(2)	(81)
Total Explained Difference	(71)	(2)	0	0	(73)
Unknown Difference	(11)	(4)	(2)	(5)	(22)
Total Other Activity	(82)	(6)	(2)	(5)	(95)
Other Activity as % of Liabilities	(0.18)%	(4.14)%	(0.04)%	(0.46)%	(0.19)%

## Comparative Schedule of Experience 5-Year History of Gains and Losses (\$ Millions)

Year	Retmt.	Disability Retmt.	Other Separations*	Salary Increases	Investment Return	Other	Total
<b>GENERAL</b>							
2019	\$ (11.6)	\$ (3.3)	\$ (17.2)	\$ (32.6)	\$ 117.7	\$ (111.4)	\$ (58.4)
2020	(35.1)	(6.5)	(34.4)	(264.0)	1,012.9	(113.3)	559.6
2021	(25.0)	3.7	10.9	89.1	899.8	(73.5)	905.0
2022	(36.2)	3.6	35.0	(116.3)	(83.1)	(67.6)	(264.6)
<b>2023</b>	<b>(1.3)</b>	<b>4.4</b>	<b>(20.2)</b>	<b>(562.4)</b>	<b>460.3</b>	<b>(81.5)</b>	<b>(200.7)</b>
<b>EXECUTIVE &amp; ELECTED</b>							
2019	\$ (0.8)	\$ (0.1)	\$ 1.3	\$ (1.8)	\$ (1.3)	\$ (4.5)	\$ (7.2)
2020	(0.8)	0.1	(0.4)	(3.3)	4.1	(5.5)	(5.8)
2021	(0.2)	-	(0.4)	2.9	1.4	(15.3)	(11.6)
2022	(0.1)	-	(0.4)	(0.8)	8.9	(4.6)	3.0
<b>2023</b>	<b>(0.4)</b>	<b>-</b>	<b>0.3</b>	<b>(4.8)</b>	<b>(3.6)</b>	<b>(6.4)</b>	<b>(14.9)</b>
<b>PROTECTIVE WITH SOCIAL SECURITY</b>							
2019	\$ (22.0)	\$ (2.6)	\$ (1.0)	\$ (26.6)	\$ 34.6	\$ (4.9)	\$ (22.5)
2020	(17.5)	(3.4)	(6.6)	(150.5)	145.7	(23.6)	(55.9)
2021	(19.4)	0.1	6.2	65.8	187.9	1.3	241.9
2022	(18.5)	(1.7)	0.7	(221.3)	(45.9)	(2.3)	(289.0)
<b>2023</b>	<b>(15.2)</b>	<b>(0.1)</b>	<b>(3.6)</b>	<b>(326.0)</b>	<b>101.1</b>	<b>(2.1)</b>	<b>(245.9)</b>
<b>PROTECTIVE WITHOUT SOCIAL SECURITY</b>							
2019	\$ (4.0)	\$ 0.5	\$ (0.3)	\$ (4.5)	\$ 9.2	\$ (1.3)	\$ (0.4)
2020	(2.8)	(0.7)	(0.7)	(21.3)	36.0	(6.6)	3.9
2021	(3.7)	0.4	0.4	1.5	40.2	(2.7)	36.1
2022	(5.8)	0.1	0.2	(18.6)	(11.7)	(1.3)	(37.1)
<b>2023</b>	<b>(8.6)</b>	<b>0.3</b>	<b>0.9</b>	<b>(10.8)</b>	<b>25.8</b>	<b>(5.3)</b>	<b>2.3</b>

\* Includes separation due to death.



**SECTION E**

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**CENSUS DATA**

## Total Participants Included in Valuations December 31, 2023

Valuation Group	Number	Average Annual Earnings/Benefits <sup>1</sup>
Actives	263,737	\$64,974
Inactives	186,977	\$22,026
Retirees & Beneficiaries	238,111	\$29,805
<b>Total Participants</b>	<b>688,825</b>	

<sup>1</sup> For inactives, average money purchase balance.

## Active Participants Included in Valuations December 31, 2023

**Active participants** included in the valuations totaled 263,737 with an annual payroll totaling \$17,136.2 million, as follows:

Valuation Group	Number	Annual Earnings (\$ Millions)	Group Averages			
			Earnings	Age	Years of Service	Contribs.
General	240,319	\$15,075.2	\$62,730	44.7	10.6	\$70,421
Executive Group & Elected Officials	1,208	125.1	103,550	54.3	14.4	140,421
Protective Occupation with Social Security	19,338	1,670.0	86,358	39.3	11.5	84,092
Protective Occupation without Social Security	2,872	265.9	92,586	39.4	12.5	98,521
<b>Total Active Participants</b>	<b>263,737</b>	<b>\$17,136.2</b>	<b>\$64,974</b>	<b>44.2</b>	<b>10.7</b>	<b>\$72,050</b>
Prior Year	259,592	\$16,025.9	\$61,735	44.4	10.9	\$69,712

Group averages are not used in the valuation, but are shown here for their general interest.

## Inactive Participants Included in Valuations December 31, 2023

Inactive participants included in the valuations totaled 186,977 as follows:

Valuation Group	Number	Group Averages		
		Age	Service	Money Purchase Balance
General	177,761	45.9	3.5	\$21,710
Executive Group & Elected Officials	565	54.1	5.0	46,072
Protective Occupation with Social Security	8,340	40.6	4.0	26,308
Protective Occupation without Social Security	311	41.0	5.8	44,243
<b>Total Inactive Participants</b>	<b>186,977</b>	<b>45.7</b>	<b>3.5</b>	<b>\$22,026</b>
Prior Year	181,758	46.7	3.5	\$20,892

The valuations also included 3,430 Qualified Domestic Relations Order cases whose average age was 53.1 years. These accounts for divorced spouses of WRS participants have been established in accordance with Wisconsin Domestic Relations Law.

## General Participants as of December 31, 2023 by Attained Age and Years of Service

Attained Ages	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	332							332	\$ 10,362,131
20-24	8,305	11						8,316	327,734,484
25-29	18,437	2,429	5					20,871	1,023,541,110
30-34	13,177	11,008	1,417	5				25,607	1,424,529,465
35-39	11,622	8,930	8,422	1,235	9			30,218	1,839,118,963
40-44	10,553	7,425	6,459	7,540	1,347	4		33,328	2,169,443,316
45-49	7,979	5,987	4,740	5,190	7,473	1,154	5	32,528	2,239,206,636
50-54	6,329	5,222	4,188	4,145	5,480	6,332	929	32,625	2,314,548,780
55	1,149	961	795	811	995	1,066	828	6,605	463,293,597
56	1,108	932	743	732	842	916	812	6,085	424,497,174
57	1,047	868	710	720	790	790	860	5,785	395,760,932
58	1,011	824	680	739	799	669	734	5,456	368,245,278
59	960	819	693	669	698	551	658	5,048	335,645,684
60	953	765	680	660	686	491	583	4,818	313,528,354
61	862	682	616	575	638	434	557	4,364	281,807,719
62	763	666	531	583	551	406	512	4,012	253,221,068
63	667	559	477	452	488	306	407	3,356	211,657,369
64	497	453	377	387	387	257	359	2,717	170,527,611
65	403	371	305	304	279	216	277	2,155	136,790,684
66	338	281	197	177	154	150	206	1,503	97,261,184
67	239	198	163	114	133	109	168	1,124	72,311,727
68	181	164	98	97	95	45	107	787	50,472,218
69	145	103	74	58	67	46	92	585	39,280,475
70	138	87	56	38	48	34	57	458	25,885,852
71	124	72	30	35	29	16	52	358	19,602,274
72	102	43	27	29	25	17	53	296	17,213,168
73	76	40	33	23	16	15	35	238	14,261,446
74	51	44	18	20	15	9	26	183	9,598,245
75 & Up	190	121	57	45	36	26	86	561	25,823,796
<b>Totals</b>	<b>87,738</b>	<b>50,065</b>	<b>32,591</b>	<b>25,383</b>	<b>22,080</b>	<b>14,059</b>	<b>8,403</b>	<b>240,319</b>	<b>\$15,075,170,740</b>



**Executive Group and Elected Officials  
as of December 31, 2023  
by Attained Age and Years of Service**

Attained Ages	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	1							1	\$ 28,050
25-29	9	2						11	735,848
30-34	18	13	1					32	2,239,000
35-39	17	23	20	2				62	5,662,959
40-44	38	29	41	22	4			134	13,948,050
45-49	33	27	30	29	25	4		148	15,985,134
50-54	35	31	27	29	30	29	7	188	20,813,853
55	6	11	9	7	10	9	4	56	6,226,454
56	4	5	8	6	6	8	7	44	4,954,451
57	8	6	11	7	8	2	8	50	6,018,831
58	4	9	7	4	6	8	6	44	4,836,993
59	3	10	3	3	4	6	5	34	3,243,430
60	8	5	7	10	6	4	8	48	5,036,585
61	8	10	6	4	3	8	5	44	4,646,382
62	2	7	11	3	4	5	9	41	4,010,937
63	5	8	4	4	6	4	10	41	4,341,446
64	6	9	2	4	4	4	4	33	3,620,509
65	6	5	5	7	1	2	11	37	4,244,941
66	5	7	2	3	5	3	2	27	2,958,729
67	2	4	1	2	3		2	14	1,443,535
68	3	1	3	2	2	2	2	15	1,843,905
69	3	5	5			1	2	16	1,105,145
70	3	2	2	2		2	3	14	1,315,209
71	2	3	1	1	1	3	2	13	1,574,037
72	3	2	3	1	1		4	14	991,485
73		1	1			1	2	5	510,882
74	2	2	1		1		1	7	640,722
75 & Up	9	9	6	4	4	1	2	35	2,110,926
<b>Totals</b>	<b>243</b>	<b>246</b>	<b>217</b>	<b>156</b>	<b>134</b>	<b>106</b>	<b>106</b>	<b>1,208</b>	<b>\$125,088,428</b>





## Protective Occupation Participants with Social Security as of December 31, 2023 by Attained Age and Years of Service

Attained Ages	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	41							41	\$ 1,861,387
20-24	1,167	1						1,168	68,347,849
25-29	1,997	724	1					2,722	200,359,232
30-34	1,064	1,780	376	5				3,225	262,700,703
35-39	545	865	1,090	471	5			2,976	257,129,361
40-44	397	424	481	1,124	453	10		2,889	264,974,466
45-49	221	224	265	494	1,096	422	3	2,725	261,870,480
50	46	29	27	73	140	189	3	507	49,397,169
51	33	32	31	53	139	202	10	500	49,301,801
52	42	28	28	52	108	223	27	508	52,217,031
53	45	28	36	53	131	186	46	525	52,208,042
54	30	36	24	41	76	92	34	333	32,643,391
55	29	27	23	31	50	56	30	246	23,848,649
56	24	18	20	24	24	42	29	181	17,436,236
57	12	17	18	20	29	26	21	143	14,611,801
58	19	12	12	26	27	17	15	128	12,016,775
59	20	6	9	15	23	11	12	96	9,407,610
60	13	8	12	15	12	8	9	77	7,693,494
61	12	12	12	16	16	11	16	95	8,973,359
62	6	12	13	18	20	10	9	88	8,239,482
63	5	9	4	9	3	4	3	37	3,725,384
64	8	6	3	4	11	2	4	38	3,572,056
65	4	3	2	6	6	3	1	25	2,157,579
66	5	1	1	6	6	1	3	23	2,194,733
67	2	2		1	2	1	1	9	1,059,300
68	2		2	2	2		2	10	828,699
69	1			1			1	3	280,197
70 & Up	6	8		3	1		2	20	935,336
<b>Totals</b>	<b>5,796</b>	<b>4,312</b>	<b>2,490</b>	<b>2,563</b>	<b>2,380</b>	<b>1,516</b>	<b>281</b>	<b>19,338</b>	<b>\$1,669,991,602</b>

**Protective Occupation Participants without Social Security  
as of December 31, 2023  
by Attained Age and Years of Service**

Attained Ages	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	1							1	\$ 34,366
20-24	172	1						173	10,295,765
25-29	235	77						312	22,480,255
30-34	156	247	62					465	38,939,604
35-39	91	130	213	80				514	47,062,383
40-44	49	69	127	186	53			484	46,519,702
45-49	13	26	35	95	186	60		415	42,771,401
50	2	2	10	10	33	37		94	10,317,663
51	2		5	11	25	38	3	84	9,333,193
52	1	1	6	12	26	30	8	84	9,799,104
53	1	1	3	9	20	32	12	78	9,120,563
54	1		1	7	20	20	5	54	6,068,348
55	2	1		1	14	11	1	30	3,299,313
56			2	4	6	3	3	18	1,995,444
57	3	1	3		10	6		23	2,578,044
58			1	2	2	7	3	15	1,873,704
59		1			3	1	3	8	925,636
60		1			2	1	2	6	766,673
61		1	1	1			1	4	511,585
62			1		1	1		3	420,554
63				1				1	108,096
64		1				1		2	287,129
65					1	1	1	3	397,554
68	1							1	1,549
<b>Totals</b>	<b>730</b>	<b>560</b>	<b>470</b>	<b>419</b>	<b>402</b>	<b>249</b>	<b>42</b>	<b>2,872</b>	<b>\$265,907,628</b>

## Active Participants as of December 31, 2023 by Years of Service and Gender

Completed Years of Service	Males	Females	Totals	Valuation Payroll	
				Total	Average
0	8,404	17,589	25,993	\$ 930,987,566	\$35,817
1	7,977	15,234	23,211	1,148,557,077	49,483
2	6,008	11,354	17,362	919,886,206	52,983
3	4,712	9,143	13,855	767,198,344	55,373
4	5,201	8,885	14,086	831,981,545	59,064
5	4,627	8,144	12,771	770,185,633	60,307
6	4,297	7,401	11,698	733,828,019	62,731
7	4,217	6,778	10,995	714,066,065	64,945
8	3,835	6,188	10,023	661,114,342	65,960
9	3,699	5,997	9,696	652,639,595	67,310
10	3,403	5,679	9,082	623,054,165	68,603
11	3,256	4,876	8,132	574,070,567	70,594
12	2,738	4,433	7,171	511,795,226	71,370
13	2,277	3,593	5,870	429,664,507	73,197
14	2,014	3,499	5,513	407,767,578	73,965
15 & Up	31,550	46,729	78,279	6,459,361,963	82,517
<b>Totals</b>	<b>98,215</b>	<b>165,522</b>	<b>263,737</b>	<b>\$17,136,158,398</b>	<b>\$64,974</b>

Average

Age	44.3	44.2	44.2
Service	11.3	10.4	10.7

## Comparative Statement of Active Participants in Valuations

Valuation 12/31	General				Executive and Elected			
	No.	Earnings			No.	Earnings		
		\$ Millions	Average	% Incr.		\$ Millions	Average	% Incr.
1999 <sup>1</sup>	229,657	\$ 7,704	\$ 34,445	4.9%	1,468	\$ 77	\$53,263	5.1 %
2000	234,076	8,335	35,610	3.4%	1,486	83	55,582	4.4 %
2001	238,944	8,746	36,605	2.8%	1,486	85	57,060	2.7 %
2002	240,990	9,007	37,377	2.1%	1,476	87	58,865	3.2 %
2003	239,696	9,273	38,686	3.5%	1,468	86	58,336	(0.9)%
2004	238,943	9,501	39,764	2.8%	1,469	89	60,379	3.5 %
2005	237,501	9,661	40,678	2.3%	1,452	90	61,788	2.3 %
2006	236,877	9,933	41,935	3.1%	1,436	93	64,480	4.4 %
2007	237,124	10,278	43,344	3.4%	1,427	95	66,320	2.9 %
2008 <sup>2</sup>	238,994	10,806	45,216	4.3%	1,430	101	70,316	6.0 %
2009	240,401	11,098	46,165	2.1%	1,427	101	70,786	0.7 %
2010	239,959	11,195	46,655	1.1%	1,418	101	71,394	0.9 %
2011	232,518	10,947	47,080	0.9%	1,393	99	70,802	(0.8)%
2012	231,765	11,041	47,639	1.2%	1,408	104	73,968	4.5 %
2013	231,973	11,270	48,584	2.0%	1,397	106	76,125	2.9 %
2014	232,433	11,574	49,794	2.5%	1,401	109	77,998	2.5 %
2015	231,631	11,786	50,881	2.2%	1,380	108	78,230	0.3 %
2016	232,684	11,964	51,417	1.1%	1,347	106	78,667	0.6 %
2017	232,874	12,167	52,249	1.6%	1,335	107	80,366	2.2 %
2018	233,462	12,445	53,307	2.0%	1,302	108	82,986	3.3 %
2019	235,645	12,926	54,855	2.9%	1,302	112	86,269	4.0 %
2020 <sup>2</sup>	234,628	13,295	56,663	3.3%	1,280	116	90,894	5.4 %
2021	234,494	13,643	58,179	2.7%	1,252	117	93,428	2.8 %
2022	236,592	14,149	59,802	2.8%	1,234	120	97,250	4.1 %
2023	240,319	15,075	62,730	4.9%	1,208	125	103,550	6.5 %

<sup>1</sup> After change in method of calculating average pay.

<sup>2</sup> Some groups had a 27-period payroll during 2008 and 2020.



## Comparative Statement of Active Participants in Valuations

Valuation 12/31	Protective with Social Security				Protective without Social Security			
	No.	Earnings			No.	Earnings		
		\$ Millions	Average	% Incr.		\$ Millions	Average	% Incr.
1999 <sup>1</sup>	16,483	\$ 649	\$ 39,864	3.5%	2,691	\$131	\$48,947	2.5 %
2000	16,970	717	42,263	6.0%	2,685	135	50,423	3.0 %
2001 <sup>1</sup>	17,981	772	42,914	1.5%	2,715	142	52,339	3.8 %
2002	18,325	804	43,871	2.2%	2,709	148	54,603	4.3 %
2003	18,660	856	45,891	4.6%	2,714	154	56,673	3.8 %
2004	18,964	896	47,266	3.0%	2,709	159	58,546	3.3 %
2005	19,036	920	48,330	2.3%	2,689	162	60,241	2.9 %
2006	19,297	977	50,622	4.7%	2,692	167	62,153	3.2 %
2007	19,757	1,036	52,419	3.5%	2,695	174	64,449	3.7 %
2008 <sup>2</sup>	20,038	1,099	54,859	4.7%	2,724	181	66,502	3.2 %
2009	20,205	1,124	55,636	1.4%	2,733	189	69,149	4.0 %
2010	20,019	1,125	56,184	1.0%	2,754	189	68,559	(0.9)%
2011	19,610	1,119	57,065	1.6%	2,711	189	69,898	2.0 %
2012	19,353	1,105	57,104	0.1%	2,727	193	70,949	1.5 %
2013	19,290	1,121	58,127	1.8%	2,736	197	71,960	1.4 %
2014	19,533	1,151	58,916	1.4%	2,733	204	74,487	3.5 %
2015	19,273	1,171	60,755	3.1%	2,730	209	76,376	2.5 %
2016	19,431	1,203	61,924	1.9%	2,746	213	77,553	1.5 %
2017	19,431	1,227	63,145	2.0%	2,743	219	79,753	2.8 %
2018	19,399	1,263	65,113	3.1%	2,770	225	81,206	1.8 %
2019	19,528	1,314	67,310	3.4%	2,759	231	83,619	3.0 %
2020 <sup>2</sup>	19,676	1,415	71,893	6.8%	2,754	240	87,136	4.2 %
2021	19,175	1,405	73,249	1.9%	2,762	246	89,016	2.2 %
2022	18,961	1,501	79,189	8.1%	2,805	256	91,155	2.4 %
2023	19,338	1,670	86,358	9.1%	2,872	266	92,586	1.6 %

<sup>1</sup> After change in method of calculating average pay.

<sup>2</sup> Some groups had a 27-period payroll during 2008 and 2020.

## Core Annuities Being Paid Tabulated by Attained Ages

Attained Ages	Regular		Disability		Death-in-Service		Totals	
	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount
Under 20	0	\$ 0	0	\$ 0	10	\$ 60,377	10	\$ 60,377
20-24	0	0	3	56,739	7	80,855	10	137,594
25-29	0	0	4	42,364	16	142,520	20	184,884
30-34	0	0	15	328,450	27	231,907	42	560,357
35-39	2	14,332	57	1,359,158	35	253,906	94	1,627,396
40-44	6	106,212	122	3,427,700	48	448,025	176	3,981,937
45-49	44	704,601	267	6,907,337	43	543,599	354	8,155,537
50-54	1,675	61,587,854	537	14,853,885	86	1,263,784	2,298	77,705,523
55-59	12,842	421,934,925	921	25,709,569	115	2,039,524	13,878	449,684,018
60-64	28,218	795,949,297	1,469	37,445,573	202	3,524,093	29,889	836,918,963
65-69	45,474	1,207,786,613	1,070	29,801,385	253	5,155,189	46,797	1,242,743,187
70-74	51,217	1,474,766,136	1,097	29,551,068	227	5,365,863	52,541	1,509,683,067
75-79	41,413	1,172,483,852	851	21,409,509	171	3,925,279	42,435	1,197,818,640
80-84	24,716	664,481,482	593	13,770,006	110	2,210,116	25,419	680,461,604
85-89	14,087	370,183,661	361	7,597,007	62	1,069,573	14,510	378,850,241
90-94	6,341	172,822,123	132	2,432,464	31	321,880	6,504	175,576,467
95 & Up	1,804	43,664,845	33	552,535	14	259,263	1,851	44,476,643
Certain Only*	1,252	29,831,538	0	0	31	613,923	1,283	30,445,461
<b>Totals</b>	<b>229,091</b>	<b>\$6,416,317,471</b>	<b>7,532</b>	<b>\$195,244,749</b>	<b>1,488</b>	<b>\$27,509,676</b>	<b>238,111</b>	<b>\$6,639,071,896</b>

### Averages in Years

Age at retirement	59.9	50.7	52.1	59.7
Attained age	71.9	65.4	66.9	71.7

<sup>1</sup> Certain Only category consists of continuations of 5-, 10- and 15-year certain and life annuities to beneficiaries of deceased annuitants.

## Variable Annuities Being Paid Tabulated by Attained Ages

Attained Ages	Regular		Disability		Death-in-Service		Totals	
	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount
Under 20	0	\$ 0	0	\$ 0	3	\$ 2,851	3	\$ 2,851
20-24	0	0	1	1,325	1	742	2	2,067
25-29	0	0	2	2,267	5	7,897	7	10,164
30-34	0	0	5	12,895	4	3,910	9	16,805
35-39	0	0	9	23,999	7	6,621	16	30,620
40-44	1	6,878	17	69,473	10	27,681	28	104,032
45-49	14	103,167	25	126,813	12	60,593	51	290,573
50-54	271	3,178,386	88	487,313	29	171,399	388	3,837,098
55-59	2,301	27,657,736	141	800,969	26	160,320	2,468	28,619,025
60-64	4,723	37,101,297	187	867,201	56	292,322	4,966	38,260,820
65-69	7,417	46,312,717	206	743,636	49	236,129	7,672	47,292,482
70-74	8,860	67,188,678	214	1,007,317	54	264,002	9,128	68,459,997
75-79	8,235	99,125,130	157	1,435,778	44	410,242	8,436	100,971,150
80-84	4,491	76,269,408	94	1,116,420	33	422,049	4,618	77,807,877
85-89	2,635	53,846,582	79	812,761	11	137,977	2,725	54,797,320
90-94	1,397	27,335,216	28	224,681	9	132,839	1,434	27,692,736
95 & Up	444	7,839,601	5	35,488	9	90,538	458	7,965,627
Certain Only*	1,142	1,613,838	1	0	8	42,795	1,151	1,656,633
<b>Totals</b>	<b>41,931</b>	<b>\$447,578,634</b>	<b>1,259</b>	<b>\$7,768,336</b>	<b>370</b>	<b>\$2,470,907</b>	<b>43,560</b>	<b>\$457,817,877</b>

Averages in Years

Age at retirement	59.2	52.7	51.6	59.0
Attained age	71.8	66.8	66.8	71.6

<sup>1</sup> Certain Only category consists of continuations of 5-, 10- and 15-year certain and life annuities to beneficiaries of deceased annuitants.



## **SECTION F**

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### **METHODS AND ASSUMPTIONS**



# Summary of Actuarial Assumptions and Methods

Valuation Date	December 31, 2023
Actuarial Cost Method	Frozen Entry Age
Amortization Method	Level Percent -- Closed Period
Amortization Period	30-Year closed from date of participation in WRS
Asset Valuation Method	5-Year Smoothed Market (Closed)

## Actuarial Assumptions

### Assumed Rates of Investment Return for:

Retired participants	5.0%
Post-retirement active participants	5.0%
Pre-retirement active participants	6.8%
Weighted Average Investment Rate of Return	5.4%
Projected Salary Increases <sup>1</sup>	3.1% to 8.6%
Payroll Growth Rate	3.0%
Population Growth Rate	0.0%

<sup>1</sup> Includes merit and seniority increases that vary by service plus wage inflation of 3.0%/year.

# Financial Principles and Operational Techniques of the Wisconsin Retirement System

**Benefit Promises Made Which Must Be Paid For.** A retirement program is an orderly means of handing out, keeping track of, and financing contingent retirement promises. As each participant of the Retirement System acquires a unit of service credit he is, in effect, handed an “IOU” which reads: “The Wisconsin Retirement System promises to pay you one unit of annuity benefits, payments in cash commencing when you retire.”

The principal related financial question is: ***When shall the money required to cover the “IOU” be contributed?*** This year, when the benefit of the participant’s unit of service is received? Or, some future year, when the “IOU” becomes a cash demand?

***The law governing the Wisconsin Retirement System financing intends that the money to cover an “IOU” is contributed in the year the “IOU” is handed out.*** In this way contribution rates expressed as percents of participant payroll can be determined so as to remain approximately level from year to year and decade to decade as long as the basic experience and make-up of the group of participants does not change significantly. This means that for equivalent benefits each generation of Wisconsin taxpayers will contribute at approximately the same payroll rates.

Translated into actuarial terminology, the level percent-of-payroll contribution objective means that the contribution rate must total at least:

**Normal Cost** (the current discounted value of benefits likely to be paid on account of participants’ service rendered in the current year)

... plus ...

**Amortization of any Unfunded Frozen Initial Liabilities (UFIL)**

If contributions to the system are less than the preceding amount, the difference, **plus investment earnings not realized thereon**, will have to be contributed at some later time, or benefits will have to be reduced, to satisfy the fundamental equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

Benefit payments to any group of participants and their beneficiaries cannot exceed

Contributions received on behalf of the group

... plus ...

Investment earnings on those contributions

... minus ...

Expenses incurred in operating the program.

There are retirement programs (Social Security is an example) designed to defer the bulk of contributions far into the future. The present contribution rate for such systems is artificially low, but is destined to increase relentlessly to a level which may be greatly in excess of the level percent-of-payroll rate.

A by-product of a level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. Investment income becomes the third and largest contributor to the retirement system and the amount is directly related to the amount of contributions and investment performance.

**Computing Contribution Rates to Finance Benefits.** From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rates **by means of an actuarial valuation** – the technique of assigning monetary values to the risks assumed in operating a retirement program.

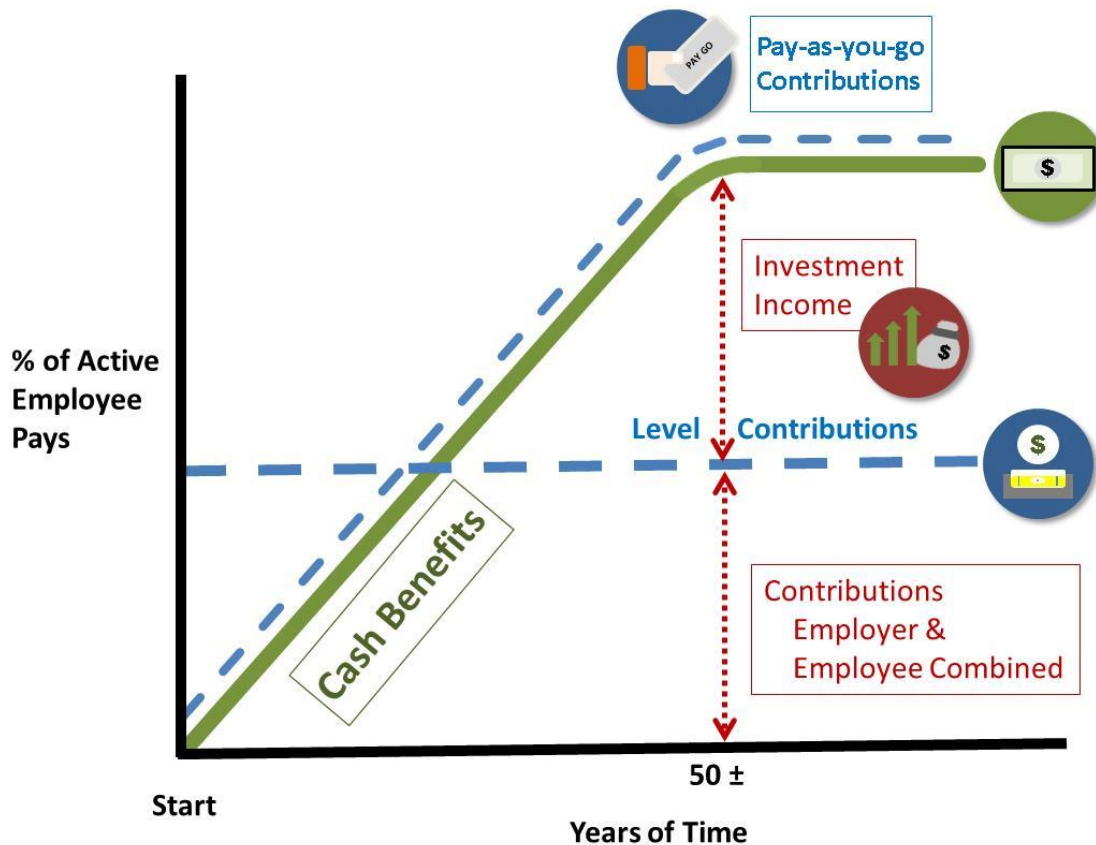
# Actuarial Method and Assumptions Used in Valuations

The principal actuarial assumptions relate to:

- Long-term **rates of investment income** likely to be generated by system assets;
- **Rates of mortality** among participants, retirants and beneficiaries;
- **Rates of withdrawal** of active participants;
- **Rates of disability** among participants;
- **Patterns of salary increases** to be experienced by participants; and
- The age and service **distribution of actual retirements**.

In an actuarial valuation, the actuary projects the monetary effect of each assumption for each distinct experience group, for the next year and for each year over the next half-century or longer.

Once actual risk experience has occurred and been observed, it will not coincide exactly with assumed risk experience, regardless of the skill of the actuary, the completeness of the data, and the precision of the calculations. Each valuation provides a complete recalculation of assumed future risk experience and takes into account all past differences between assumed and actual risk experience. The result is a continual series of small adjustments to the computed contribution rate. From time to time it becomes necessary to adjust the package of risk measurements to reflect basic experience trends – but not random year-to-year fluctuations.



**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

## Actuarial Valuation Method

The actuarial funding method prescribed in the statute for WRS is the Frozen Entry Age Method which is also referred to as the Frozen Initial Liability (FIL) method in this report. Under this method, the amount of remaining unfunded actuarial accrued liabilities at any valuation date is affected only by the monthly amortization payments, compound interest, the added liability created by new employer units, and any added liabilities caused by changes in benefit provisions.

Actuarial gains or losses arising from the difference between actual and assumed experience are reflected in the determination of the normal cost. In this manner, experience gains or losses in any year are amortized (spread) over the average future working lifetime of the active participant group – a period of approximately 12 years. Hence, the computed normal cost is made up of two parts:

- The pure entry-age normal cost (EANC) determined without regard to past gains or losses; and
- An experience amortization component.

Section 40.04(1) of the Wisconsin Statutes provides authority to maintain accounts and reserves determined to be “useful in achieving the funds’ purposes - -”. A fundamental WRS objective is stable contribution rates. Accordingly, based on the authority granted under Section 40.04, the experience portion of the normal cost is separately calculated each year and the amortization period is varied upward or downward in order to minimize short-term rate fluctuations. The policy regarding the EAR amortization period is described below:

- The standard period is set to 20 years.
- The standard period is reconsidered as part of each triennial experience study (no changes were made with the most recent experience study).
- Temporary interim changes in the period are made only when there are large, but mostly offsetting market gains and losses known to be flowing through the MRA that would otherwise result in contribution rate volatility. Large changes would be defined as those which, over a 2-year period, were expected to result in contribution rate changes of at least 0.4% of payroll.
- The minimum and maximum EAR amortization periods are 10 years and 30 years respectively.
- The amortization policy will be applied in the same manner to market gains and losses flowing through the MRA.
- For 2023, a 20-year period was used.

## Asset Valuation Method

An essential step in the valuation process is comparing valuation assets with computed liabilities. Computed liabilities result from actuarial calculations involving the covered population, the benefits, and actuarial assumptions. Valuation assets are those assets that are recognized and available to fund the System's liabilities. WRS assets are invested in the Core Investment Trust, and in the Variable Investment Trust, both of which are managed by the State of Wisconsin Investment Board (SWIB). Assets in the Variable Investment Trust are marked to market each year. Assets in the Core Investment Trust (most of the assets) are valued (or recognized) using an "asset valuation method."

Asset valuation methods are distinguished by the timing of the recognition of investment return. Total investment return is the sum of ordinary income and capital value changes. Under a book value approach, ordinary income is recognized immediately and capital gains (or losses) are recognized only when securities are sold. Book value investment return is directly affected by the timing of sales activity and underlying experience may be distorted. Under a pure market value approach, ordinary investment income and all capital value changes are recognized immediately. Because of market volatility, use of pure market values in retirement funding can result in volatile contribution rates and unstable financial ratios, contrary to WRS objectives.

The asset valuation method used for WRS valuations is statutory, and is referred to as the "Market Recognition Account" or MRA. Act 11 of 1999 closed the former Transaction Amortization Account (TAA) and created the Market Recognition Account (MRA). The MRA recognizes assumed returns fully each year. Differences between actual and assumed returns are phased-in over a closed five-year period. The objective is to give recognition to long-term changes in asset values while minimizing the effect of short-term fluctuations in the capital markets. In accordance with its smoothing objective, the MRA will tend to exceed the market value when the markets are doing poorly, and will fall short of the market value when markets are doing well. Some retirement systems set limits on the amount by which the recognized value of assets can differ from the market value.

# Annual Actuarial Valuations Assumptions Adopted by ETF Board after Consulting with Actuary

## ECONOMIC ASSUMPTIONS

The rationale for these assumptions is based upon an experience study covering the period 2018-2020. Beginning with the December 31, 2021 actuarial valuation, separate demographic assumptions were developed and used for State and Non-State employees.

For determining plan liabilities, the discount rate is 5.0% for retired participants, 5.0% for active and inactive participants following retirement, and 6.8% for active and inactive participants prior to their retirement. A valuation performed assuming a 5.4% discount rate for all participants at all stages of life, reproduces the results of an actuarial valuation using the 5.0% post-retirement and 6.8% pre-retirement assumptions. Thus, it can be said that **the net discount rate assumed in the valuations was 5.4% per year, compounded annually (net after administrative expenses).**

The **Wage Inflation Rate** assumed in this valuation was 3.0% per year. The wage inflation rate is defined to be the portion of total pay increases for an individual that are due to macroeconomic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes rated to individual merit and seniority effects.

No specific **Price Inflation** assumption is required to perform this valuation. The price inflation assumption used to evaluate the investment return assumption is 2.4%.

The assumed **Real Rate of Return** over wage inflation is defined to be the portion of total investment return that is more than the assumed total wage growth rate. Considering other economic assumptions, the 6.8% pre-retirement investment return rate translates to an assumed real rate of return over wage inflation of 3.8%. The assumed real rate of return over price inflation is 4.4% considering an inflation assumption of 2.4%.

**Merit and Longevity pay increase assumptions** for individual active members are shown for sample services below. An additional 3.0% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces.

Service	% Merit Increases in Salaries Next Year								
	General Non-State (Not Including Schools)	General State (Not Including Schools)	Executive & Elected Non-State	Executive & Elected State	University Teachers State	Public School Teachers Non-State	Protective With SS Non-State	Protective With SS State	Protective Without SS Non-State
1	3.5%	3.5%	2.5%	2.5%	3.0%	5.6%	4.8%	4.8%	5.5%
2	3.5%	3.5%	2.5%	2.5%	3.0%	5.6%	4.8%	4.8%	5.5%
3	3.1%	3.1%	2.0%	2.0%	2.9%	5.2%	4.1%	4.1%	4.7%
4	2.8%	2.8%	1.6%	1.6%	2.8%	4.7%	3.5%	3.5%	3.8%
5	2.5%	2.5%	1.1%	1.1%	2.7%	4.3%	2.8%	2.8%	3.0%
10	1.5%	1.5%	0.2%	0.2%	2.2%	2.6%	1.1%	1.1%	0.9%
15	1.1%	1.1%	0.2%	0.2%	1.7%	1.4%	0.8%	0.8%	0.5%
20	0.9%	0.9%	0.2%	0.2%	1.2%	0.6%	0.7%	0.7%	0.4%
25	0.6%	0.6%	0.2%	0.2%	0.9%	0.3%	0.6%	0.6%	0.3%
30	0.4%	0.4%	0.2%	0.2%	0.7%	0.2%	0.5%	0.5%	0.2%



## Decrement Probabilities

The Active Member Population is assumed to remain constant. For purposes of financing the unfunded liabilities and amortizing the EAR, total payroll is assumed to grow at the wage inflation rate – 3.00% per year.

The mortality table used was the 2020 WRS Experience Tables adopted by the Board in connection with the 2018-2020 Experience Study. The rates in this table were based on actual WRS experience adjusted for future mortality improvements using the MP-2021 fully generational improvement scale from a base year of 2010. Sample retirement values from this table are shown below. This assumption is used to measure the probabilities of participants dying before retirement and the probabilities of each benefit payment being made after retirement.

### Single Life Retirement Values 2020 WRS Experience Table with 5% Interest

Sample Attained Ages in 2023	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Mortality Rates <sup>1</sup>	
	Males	Females	Males	Females	Males	Females
	40	\$216.74	\$219.82	47.2	49.3	0.000652
45	208.80	212.54	42.0	44.0	0.000831	0.000546
50	198.73	203.22	36.8	38.8	0.001224	0.000862
55	186.28	191.78	31.7	33.7	0.002419	0.002222
60	171.45	178.39	26.7	28.8	0.004164	0.003473
65	154.03	162.27	22.0	24.0	0.006785	0.004964
70	133.88	142.87	17.5	19.3	0.011257	0.007859
75	111.37	120.45	13.4	15.0	0.020453	0.014926
80	87.79	96.46	9.8	11.0	0.039021	0.029941
85	65.19	73.04	6.8	7.8	0.075327	0.059093

<sup>1</sup> With a fully generational mortality table, the mortality rate depends on the year of birth. Later years of birth will typically correspond to a lower mortality rate at a given age.

The values shown above are for non-disabled participants in 2023. For disabled participants, the following table was used:

Sample Attained Ages in 2023	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Mortality Rates <sup>1</sup>	
	Males	Females	Males	Females	Males	Females
	40	\$175.71	\$182.52	32.3	35.1	0.010009
45	165.16	172.90	28.3	31.0	0.012486	0.011210
50	153.72	162.61	24.6	27.3	0.017241	0.015782
55	142.05	152.43	21.3	23.8	0.022935	0.020053
60	130.34	142.10	18.3	20.7	0.029197	0.023669
65	118.28	130.04	15.5	17.6	0.034886	0.025111
70	104.86	114.54	12.9	14.4	0.041042	0.029211
75	89.25	96.25	10.2	11.3	0.052285	0.040895
80	72.37	77.37	7.8	8.5	0.074551	0.063825
85	56.23	60.33	5.7	6.3	0.112584	0.102376

<sup>1</sup> With a fully generational mortality table, the mortality rate depends on the year of birth. Later years of birth will typically correspond to a lower mortality rate at a given age.

## Active Participant Mortality Rates

Sample Attained Ages in 2023	Mortality Rates <sup>1</sup>	
	Males	Females
20	0.000400	0.000166
25	0.000215	0.000130
30	0.000353	0.000227
35	0.000521	0.000330
40	0.000652	0.000433
45	0.000831	0.000546
50	0.001192	0.000777
55	0.001866	0.001232
60	0.003079	0.001948
65	0.004985	0.003006
70	0.007459	0.004950
75	0.010846	0.009409
80	0.021611	0.019401

<sup>1</sup> With a fully generational mortality table, the mortality rate depends on the year of birth. Later years of birth will typically correspond to a lower mortality rate at a given age.

This assumption is used to measure the probability of participants dying while in service.

# Rates of Retirement for Those Eligible to Retire

## Normal Retirement

Age	% of Active Participants Retiring													
	General Non-State		General State		Executive & Elected Non-State	Executive & Elected State	University State		Public Schools Non-State		Protective			
	Male	Female	Male	Female			Male	Female	Male	Female	With SS Non-State <sup>1</sup>	With SS State <sup>1</sup>	Without SS Non-State <sup>1</sup>	
50												6.0%	7.5%	3.0%
51												8.0%	9.0%	3.5%
52												11.0%	11.0%	4.5%
53												34.0%	25.0%	17.0%
54												32.0%	20.0%	24.0%
55												26.0%	20.0%	29.0%
56												23.0%	20.0%	32.0%
57	20.0%	17.0%	19.0%	19.0%	10.0%	12.0%	12.0%	10.0%	31.0%	27.5%		27.0%	20.0%	23.0%
58	20.0%	18.0%	19.0%	19.0%	10.0%	12.0%	16.0%	20.0%	29.0%	27.5%		21.0%	20.0%	27.0%
59	20.0%	14.0%	19.0%	19.0%	10.0%	12.0%	9.0%	12.0%	28.0%	26.0%		23.0%	20.0%	40.0%
60	20.0%	20.0%	19.0%	21.0%	10.0%	12.0%	15.0%	14.0%	27.0%	29.0%		22.0%	20.0%	25.0%
61	20.0%	18.0%	19.0%	25.0%	10.0%	12.0%	9.0%	13.0%	26.0%	27.0%		30.0%	20.0%	25.0%
62	30.0%	24.0%	28.0%	29.0%	10.0%	18.0%	10.0%	15.0%	39.0%	36.0%		35.0%	25.0%	31.0%
63	30.0%	29.0%	30.0%	28.0%	10.0%	18.0%	11.0%	19.0%	33.0%	31.0%		27.0%	25.0%	40.0%
64	30.0%	23.0%	25.0%	31.0%	15.0%	18.0%	15.5%	17.0%	30.0%	30.0%		30.0%	36.0%	40.0%
65	30.0%	35.0%	27.0%	31.0%	15.0%	18.0%	15.5%	21.0%	32.0%	38.5%		34.0%	38.0%	40.0%
66	40.0%	39.0%	35.0%	36.0%	15.0%	18.0%	21.0%	25.0%	35.0%	44.0%		35.0%	38.0%	100.0%
67	32.0%	33.0%	32.0%	33.0%	15.0%	18.0%	18.0%	25.0%	31.0%	31.0%		35.0%	38.0%	100.0%
68	32.0%	30.0%	21.0%	25.0%	10.0%	18.0%	19.0%	18.0%	28.0%	30.0%		35.0%	38.0%	100.0%
69	28.0%	22.0%	21.0%	27.0%	10.0%	18.0%	14.0%	16.5%	20.0%	30.0%		35.0%	38.0%	100.0%
70	28.0%	26.0%	21.0%	29.0%	10.0%	18.0%	21.0%	22.0%	30.0%	32.0%		100.0%	100.0%	100.0%
71	28.0%	28.0%	21.0%	34.0%	10.0%	15.0%	24.0%	16.5%	25.0%	25.0%		100.0%	100.0%	100.0%
72	28.0%	30.0%	21.0%	33.0%	10.0%	15.0%	24.0%	17.0%	25.0%	25.0%		100.0%	100.0%	100.0%
73	18.0%	30.0%	30.0%	24.0%	20.0%	15.0%	24.0%	21.0%	25.0%	25.0%		100.0%	100.0%	100.0%
74	18.0%	16.0%	30.0%	18.0%	20.0%	15.0%	24.0%	14.0%	25.0%	25.0%		100.0%	100.0%	100.0%
75	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%

<sup>1</sup> Includes reduced retirements for Protective with 20+ years of service.

## Reduced Retirement

Age	% of Active Participants Retiring									
	General Non-State		General State		Executive & Elected Non-State	Executive & Elected State	University State		Public Schools Non-State	
	Male	Female	Male	Female			Male	Female	Male	Female
55	7.3%	7.0%	5.5%	6.0%	2.5%	6.0%	3.3%	5.0%	12.0%	11.0%
56	6.0%	7.0%	6.5%	8.0%	2.5%	6.0%	3.3%	5.0%	13.0%	13.0%
57	5.2%	5.5%	5.5%	6.0%	2.5%	6.0%	4.0%	5.0%	13.0%	12.0%
58	5.6%	6.5%	5.5%	9.0%	2.5%	6.0%	4.0%	5.5%	12.0%	13.0%
59	5.9%	7.0%	6.5%	7.5%	2.5%	6.0%	4.4%	6.0%	14.3%	13.5%
60	9.3%	9.5%	9.0%	10.0%	5.0%	6.0%	4.8%	7.5%	16.0%	17.0%
61	8.0%	9.5%	12.5%	11.0%	5.0%	6.0%	4.8%	9.0%	16.0%	17.0%
62	19.0%	16.0%	16.0%	18.0%	1.0%	6.0%	7.0%	11.0%	23.0%	24.0%
63	20.0%	18.0%	17.0%	19.5%	1.0%	3.0%	8.3%	12.0%	21.0%	24.0%
64	18.0%	18.0%	21.0%	18.0%	1.0%	3.0%	11.5%	14.5%	21.0%	24.0%

The assumed rates of separation from employment prior to service retirement due to disability and other causes are shown below for sample ages. For other terminations it was assumed that a percentage, depending on age of participants terminating after age 35 with 5 or more years of service, will leave their contributions on deposit and be paid a benefit at normal retirement age and that the remaining participants would take a separation benefit. The percentage taking a separation benefit is 25% at age 35, grading downward to 0% at retirement eligibility. All participants terminating prior to normal retirement age with less than five years of service were assumed to take a separation benefit.

### Assumed Termination Rates by Attained Age and Years of Service

Age	Service	% of Active Participants Withdrawing												
		General Non-State		General State		Executive & Elected Non-State	Executive & Elected State	University State		Public Schools Non-State		Protective		
		Male	Female	Male	Female			Male	Female	Male	Female	With SS Non-State	With SS State	Without SS Non-State
Under 30	0-1	17.7%	20.0%	17.2%	19.5%	25.0%	19.0%	14.0%	14.1%	12.6%	12.0%	15.6%	18.8%	4.5%
	1-2	12.5%	15.0%	12.9%	15.5%	20.0%	16.0%	13.8%	14.0%	11.6%	10.0%	9.4%	15.5%	4.0%
	2-3	9.0%	11.5%	9.5%	12.5%	17.0%	13.0%	12.6%	12.7%	8.5%	8.5%	5.3%	10.5%	2.0%
	3-4	7.1%	9.6%	7.4%	10.0%	16.0%	12.5%	11.0%	10.0%	6.0%	6.2%	4.4%	6.5%	1.8%
	4-5	6.6%	9.0%	7.3%	8.7%	13.0%	12.0%	8.6%	9.3%	5.6%	5.8%	4.2%	5.5%	1.7%
	5-6	5.3%	7.4%	6.1%	7.8%	4.0%	6.0%	8.5%	8.1%	4.5%	4.8%	3.3%	5.0%	1.3%
	6-7	4.8%	6.3%	5.2%	6.9%	4.0%	6.0%	7.0%	7.0%	3.7%	4.1%	3.2%	4.5%	1.2%
	7-8	4.6%	6.0%	5.1%	6.0%	4.0%	6.0%	5.6%	5.6%	2.9%	3.5%	3.0%	4.0%	0.9%
	8-9	4.1%	5.7%	4.5%	5.6%	4.0%	6.0%	4.6%	4.9%	2.6%	3.4%	2.7%	3.5%	0.8%
	9-10	4.0%	5.0%	3.6%	5.5%	4.0%	6.0%	4.3%	4.3%	2.5%	3.0%	2.3%	3.3%	0.7%
35	10 & Up	3.2%	4.9%	3.1%	4.8%	4.5%	4.5%	4.2%	4.0%	2.0%	2.2%	2.1%	2.9%	0.7%
	35	2.8%	4.1%	2.7%	3.9%	4.5%	4.5%	4.0%	4.0%	1.6%	1.9%	1.8%	2.4%	0.6%
	40	2.4%	3.2%	2.6%	3.0%	4.2%	4.5%	3.4%	3.7%	1.4%	1.6%	1.5%	1.8%	0.6%
	45	2.0%	2.9%	2.4%	2.7%	3.7%	4.2%	2.8%	3.2%	1.4%	1.4%	1.4%	1.4%	0.5%
	50	1.7%	2.5%	1.9%	2.1%	3.2%	3.7%	2.3%	2.7%	1.3%	1.2%	1.3%	1.2%	0.5%
54	1.6%	2.2%	1.7%	1.8%	3.0%	3.5%	2.2%	2.5%	1.3%	1.2%	1.3%	1.2%	0.5%	

### Disability Rates

Age	% of Active Participants Becoming Disabled													
	General Non-State		General State		Executive & Elected Non-State	Executive & Elected State	University State		Public Schools Non-State		Protective			
	Male	Female	Male	Female			Male	Female	Male	Female	With SS Non-State	With SS State	Without SS Non-State	
20	0.01%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.03%
25	0.01%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.03%
30	0.01%	0.02%	0.01%	0.04%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.03%
35	0.01%	0.02%	0.01%	0.05%	0.01%	0.01%	0.00%	0.03%	0.01%	0.01%	0.01%	0.03%	0.03%	0.03%
40	0.03%	0.03%	0.03%	0.07%	0.01%	0.01%	0.01%	0.04%	0.01%	0.02%	0.04%	0.05%	0.05%	0.05%
45	0.06%	0.05%	0.06%	0.10%	0.01%	0.01%	0.02%	0.04%	0.03%	0.05%	0.05%	0.07%	0.10%	0.10%
50	0.13%	0.07%	0.13%	0.16%	0.02%	0.02%	0.03%	0.07%	0.08%	0.10%	0.09%	0.11%	0.55%	0.55%
55	0.24%	0.13%	0.24%	0.29%	0.09%	0.09%	0.08%	0.11%	0.14%	0.14%	1.39%	1.73%	0.41%	0.41%
60	0.43%	0.18%	0.43%	0.41%	0.11%	0.11%	0.11%	0.17%	0.24%	0.21%	2.34%	2.92%	0.12%	0.12%



## Miscellaneous and Technical Assumptions

<b>Amortization Payoff Reserve:</b>	Additional reserves in the amount of \$4,613,237 (discounted from the year 2029 to the current valuation date) were added to general group liabilities to account for the possibility that some non-state employers may never be able to pay off their unfunded actuarial accrued liability.
<b>Assumed Retirement for Deferred Members:</b>	Members with a deferred vested benefit were assumed to retire at age 65 for General members, age 54 for Protective members and age 62 for Executive and Elected members.
<b>Benefit Service:</b>	Exact fractional service on the decrement date is used to determine the amount of benefit payable.
<b>Decrement Operation:</b>	Disability operates during the retirement pattern.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Timing:</b>	Decrements of all types are assumed to occur mid-year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined based upon the age nearest birthday and total service (in all benefit groups) nearest whole year on the date the decrement is assumed to occur.
<b>Expenses:</b>	Assumed investment return is net of administrative and investment expenses.
<b>Final Average Salary:</b>	For present value of future benefit purposes, final average salary was calculated in accordance with pay increase assumptions, but was not permitted to fall below the final average salary reported in the data.
<b>Incidence of Contributions:</b>	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
<b>Liability Adjustments:</b>	Final Average Salaries were increased 3.5% (4.0% for Executive and Elected and 4.5% for Protectives) to account for additional contingencies in actual benefit amount calculated at the time of retirement.
<b>Marriage Assumption:</b>	75% of males and 55% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.



## Miscellaneous and Technical Assumptions (Concluded)

<b>Non-Benefit Service:</b>	Liabilities for service in divisions other than the division in which the individual is currently active are calculated as indexed deferred vested benefits. Benefits are indexed in accordance with the salary adjustment factors for the division where the member is currently employed. People are assumed to retire at the earliest age that full benefits will become available. The liabilities are assigned to the division in which the service was rendered.
<b>Normal Form of Benefit:</b>	The assumed normal form of benefit is a straight life benefit, except where otherwise noted.
<b>Pay Annualization:</b>	Reported pay for members with less than 12 contributing months was annualized by the ratio of 12 to the number of contributing months in the year.
<b>Pay Increase Timing:</b>	Beginning of (calendar) year for most people. Middle of calendar year for teachers.
<b>Service Credit Accruals:</b>	It is assumed that members accrue one year of service credit per year.
<b>Variable Excess Benefits:</b>	These benefits are valued by increasing the otherwise calculated liabilities by an amount equal to twice the value of the variable excess. The variable excess is the difference between the variable account and the variable at core account, summed over all participants.

## **SECTION G**

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### **PLAN PROVISIONS**

# Summary of Benefit Provisions Evaluated December 31, 2023 Actuarial Valuation

## Normal Retirement Eligibility

The age a participant becomes eligible for an unreduced age and service annuity is:

General, Public School, & University		Protective		Executive & Elected <sup>#</sup>	
Age	Service	Age	Service	Age	Service
65	Any*	54	Any*	62	Any*
57	30	53	25	57	30

\* Participants first employed after 1989 and terminated before April 24, 1998 must have creditable service in five calendar years.

# These conditions apply to those people hired on or before December 31, 2016. For others, the General eligibility conditions apply.

## Normal Retirement Annuity

The age and service annuity payable at Normal Retirement Age is based on Final Average Earnings (FAE) and Creditable Service (CS) as follows:

Multiplier for Service Rendered			Group
Before 2000	Between 2000 & 2011	After 2011	
2.165%	2.0%	1.6%	Executive group and elected officials
2.165%	2.0%	2.0%	Protective occupation participants covered by Social Security
2.665%	2.5%	2.5%	Protective occupation participants not covered by Social Security
1.765%	1.6%	1.6%	All other participants

FAE is generally the average of the three highest years of earnings (July 1 - June 30 for teachers, educational support staff, and judges; calendar year for others) preceding retirement. These years do not have to be consecutive. For legislators and state constitutional officers who are ineligible to receive pay increases during their term, FAE is the statutory rate of earnings at termination.

Maximum formula annuity is 85% of FAE for protective occupation participants not covered by Social Security, 65% of FAE for protectives covered by Social Security, and 70% for all other participants. If greater than the formula amount, an annuity equal to the actuarial equivalent of two times the required accumulated contributions is paid in lieu of the formula amount (i.e., the Money Purchase Minimum).





**Reduced Retirement.** Any participant who has attained age 55 and any Protective occupation participant who has attained age 50 may apply for a reduced retirement annuity. The benefit is reduced 0.4% for each month that the annuity effective date precedes the Normal Retirement Age. For Non-Protective participants terminating after 6/30/90, the 0.4% is reduced for months after the attainment of age 57 and before the annuity effective date by .001111% for each month of creditable service.

**Voluntary Termination Before Immediate Benefit Eligibility.** Participant may either (i) receive a refund of accumulated contributions, or (ii) leave contributions on deposit and apply for a retirement annuity on or after the minimum retirement age based upon age and accrued service at time of termination.

**Post-Retirement Adjustments.** Annuities are increased annually if the investment income credited to retired life funds is in excess of the assumed benefit rate (presently 5%), other plan experiences are within projected ranges, and the resulting adjustment would be at least 0.5% (2.0% for the variable fund).

**Disability Benefits.** Generally, disability means the inability to engage in any substantial gainful activity by reason of a medically determinable physical or mental impairment which can be expected to result in death or to be of long-continued and indefinite duration. Disability applicants must be participating employees who are under normal retirement age, have not already taken a WRS benefit and who meet a service requirement.

For this purpose, **normal retirement age** is:

- 65 for general employees and executives and elected officials hired after December 31, 2016
- 62 for executives and elected officials hired on or before December 31, 2016
- 53 for protective occupation employees with 25 or more years of creditable service
- 54 for other protective occupation employees

The **service requirement** is that during the seven years preceding application the individual must have earned:

- At least 6 months of service credit in five of those years or
- A total of five years of service credit.

The service credit requirement may be waived if the disability is work related.

Protective occupation employees who become disabled between the ages of 50 and 55, who have at least 15 years of service, and who can no longer perform the duties of their position may apply for a special disability benefit until age 55.

**Disability Amount:** The disability benefit is the WRS formula benefit based upon service projected to normal retirement age as described above, without regard to the reduced retirement reduction.

#### **Death-in-Service.**

- (a) Prior to age 50 for Protective participants, age 55 for others, the benefit is the equivalent of twice the accumulated employee contributions required and all additional contributions and employer amounts contributed prior to 1974 for teachers, or 1966 for others.
- (b) After age 50 for Protective participants, age 55 for others, the benefit is the amount that would have been paid if participant had retired and elected 100% survivor option. Benefit is payable to an eligible beneficiary who must be a natural living person. If there is no eligible beneficiary, a refund of contributions is paid to the estate.



**Interest Credits.** For years after 1999, and for people with some active service after 1999, participant core accounts (including the variable at core accounts) are credited with interest at the full (core) effective rate. For others, accounts are credited with interest as follows:

Date of Participation	Rate Credited for Purpose of	
	Money Purchase Minimum	Refunds
Prior to 1982	Actual	Actual
January 1, 1982 & Later	5%	3%

Participant variable accounts are credited with interest based on the earnings in the variable portfolio.

**Contribution Rates.** The financial objective of WRS is to establish and receive contributions that will remain level from year to year and decade to decade.

Statutory required participant contributions prior to July 1, 2011 were as follows:

General, Public School, and University	5.0%
Executives & Elected Officials	5.5
Protectives	
- With Social Security	6.0
- Without Social Security	8.0

Statutory required participant contributions after July 1, 2011 are set equal to one-half of the actuarially determined rate for General participants and Executive and Elected Officials. Participant contributions for Protective participants are set equal to the participant contribution for General members.

**Normal Form of Benefit.** The normal form of benefit is a straight life annuity with no death benefits. Optional forms of benefit which are actuarially reduced are listed below:

- A life annuity with 60 or 180 monthly payments guaranteed.
- A joint survivorship annuity with 75% continued to beneficiary.
- A joint survivorship annuity with 100% continued to beneficiary.
- A joint survivorship annuity reduced 25% upon either your death or your beneficiary's death.
- A joint survivorship annuity with 100% continued to beneficiary combined with 180 monthly payments guaranteed.

For formula benefit calculations, optional forms are calculated at the lower of the current age or age 62 (Normal Retirement Age for Protective occupations). If a retiree (and beneficiary if in receipt of a joint survivorship annuity) dies prior to receiving benefits which, in total, are at least equal to the members contributions, a "residual refund" for the difference is paid.

**Vesting.** Participants hired prior to July 1, 2011 vest immediately. After July 1, 2011, participants vest after five years of service.



## **SECTION H**

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### **GAIN/LOSS STATISTICAL SUMMARY**

# General Males Non-State Withdrawal Experience during Calendar Year 2023

## Male Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	439	1,953	0.2248	0.1770	346
2	578	3,450	0.1675	0.1250	431
3	279	2,235	0.1248	0.0900	201
4	188	2,021	0.0930	0.0710	143
5	134	1,981	0.0676	0.0660	131
6	126	1,684	0.0748	0.0530	89
7	112	1,655	0.0677	0.0480	79
8	66	1,410	0.0468	0.0460	65
9	71	1,367	0.0519	0.0410	56
10	58	1,176	0.0493	0.0400	47
Totals	2,051	18,932	0.1083	0.0839	1,588

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

## Male Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	1	0.0000	0.0350	-
30-34	8	194	0.0412	0.0300	6
35-39	30	860	0.0349	0.0260	22
40-44	43	1,504	0.0286	0.0220	33
45-49	52	1,873	0.0278	0.0180	34
50-54	62	2,478	0.0250	0.0160	40
Over 54	79	5,998	0.0132		79
Totals	274	12,908	0.0212	0.0166	214

# General Males State Withdrawal Experience during Calendar Year 2023

## Male Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	154	858	0.1795	0.1720	148
2	232	1,431	0.1621	0.1290	185
3	117	955	0.1225	0.0950	91
4	86	943	0.0912	0.0740	70
5	54	895	0.0603	0.0730	65
6	61	822	0.0742	0.0610	50
7	50	821	0.0609	0.0520	43
8	36	733	0.0491	0.0510	37
9	29	706	0.0411	0.0450	32
10	23	674	0.0341	0.0360	24
Totals	842	8,838	0.0953	0.0843	745

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

## Male Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	2	0.0000	0.0350	-
30-34	3	80	0.0375	0.0280	2
35-39	24	543	0.0442	0.0270	15
40-44	37	837	0.0442	0.0260	22
45-49	27	964	0.0280	0.0220	21
50-54	25	1,261	0.0198	0.0170	21
Over 54	16	2,873	0.0056		16
Totals	132	6,560	0.0201	0.0148	97

# General Females Non-State Withdrawal Experience during Calendar Year 2023

## Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	1,246	5,514	0.2260	0.2000	1,103
2	1,364	8,049	0.1695	0.1500	1,207
3	697	5,270	0.1323	0.1150	606
4	474	4,487	0.1056	0.0960	431
5	332	3,837	0.0865	0.0900	345
6	318	3,356	0.0948	0.0740	248
7	248	2,904	0.0854	0.0630	183
8	172	2,456	0.0700	0.0600	147
9	123	2,245	0.0548	0.0570	128
10	120	2,028	0.0592	0.0500	101
Totals	5,094	40,146	0.1269	0.1121	4,499

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

## Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	1	0.0000	0.0500	-
30-34	9	182	0.0495	0.0480	9
35-39	39	1,068	0.0365	0.0360	38
40-44	72	1,869	0.0385	0.0300	56
45-49	76	2,604	0.0292	0.0290	76
50-54	132	3,599	0.0367	0.0220	79
Over 54	205	10,676	0.0192		205
Totals	533	19,999	0.0267	0.0232	463

# General Females State Withdrawal Experience during Calendar Year 2023

## Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	351	1,672	0.2099	0.1950	326
2	488	2,714	0.1798	0.1550	421
3	234	1,803	0.1298	0.1250	225
4	156	1,720	0.0907	0.1000	172
5	134	1,541	0.0870	0.0870	134
6	113	1,445	0.0782	0.0780	113
7	113	1,485	0.0761	0.0690	102
8	68	1,182	0.0575	0.0600	71
9	64	1,125	0.0569	0.0560	63
10	47	974	0.0483	0.0550	54
Totals	1,768	15,661	0.1129	0.1073	1,681

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

## Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0500	-
30-34	9	149	0.0604	0.0470	7
35-39	41	895	0.0458	0.0340	30
40-44	40	1,351	0.0296	0.0280	38
45-49	44	1,637	0.0269	0.0260	43
50-54	38	1,820	0.0209	0.0180	33
Over 54	31	4,231	0.0073		31
Totals	203	10,083	0.0201	0.0181	182

## Public Schools Males Non-State Withdrawal Experience during Calendar Year 2023

### Male Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	82	603	0.1360	0.1260	76
2	135	1,129	0.1196	0.1160	131
3	105	885	0.1186	0.0850	75
4	80	902	0.0887	0.0600	54
5	55	779	0.0706	0.0560	44
6	45	780	0.0577	0.0450	35
7	37	714	0.0518	0.0370	26
8	29	756	0.0384	0.0290	22
9	36	755	0.0477	0.0260	20
10	27	718	0.0376	0.0250	18
Totals	631	8,021	0.0787	0.0625	501

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Male Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0250	-
30-34	3	192	0.0156	0.0170	3
35-39	30	1,359	0.0221	0.0150	20
40-44	44	2,212	0.0199	0.0140	31
45-49	38	2,692	0.0141	0.0135	36
50-54	48	2,906	0.0165	0.0130	38
Over 54	28	3,019	0.0093		28
Totals	191	12,380	0.0154	0.0126	156



## Public Schools Females Non-State Withdrawal Experience during Calendar Year 2023

### Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	216	1,801	0.1199	0.1200	216
2	366	3,356	0.1091	0.1000	336
3	268	2,840	0.0944	0.0850	241
4	214	2,705	0.0791	0.0620	168
5	220	2,598	0.0847	0.0580	151
6	188	2,489	0.0755	0.0480	119
7	145	2,355	0.0616	0.0410	97
8	120	2,245	0.0535	0.0350	79
9	122	2,396	0.0509	0.0340	81
10	118	2,388	0.0494	0.0300	72
Totals	1,977	25,173	0.0785	0.0620	1,560

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0250	-
30-34	21	680	0.0309	0.0200	14
35-39	115	4,169	0.0276	0.0180	75
40-44	135	6,141	0.0220	0.0145	89
45-49	144	6,758	0.0213	0.0130	88
50-54	149	7,231	0.0206	0.0115	83
Over 54	101	8,258	0.0122		101
Totals	665	33,237	0.0200	0.0135	450

# University Males State Withdrawal Experience during Calendar Year 2023

## Male Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	47	362	0.1298	0.1400	51
2	141	782	0.1803	0.1380	108
3	107	667	0.1604	0.1260	84
4	59	612	0.0964	0.1100	67
5	63	636	0.0991	0.0860	55
6	41	548	0.0748	0.0850	47
7	35	503	0.0696	0.0700	35
8	28	448	0.0625	0.0560	25
9	22	412	0.0534	0.0460	19
10	13	392	0.0332	0.0430	17
Totals	556	5,362	0.1037	0.0947	508

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

## Male Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0430	-
30-34	-	44	0.0000	0.0410	2
35-39	14	236	0.0593	0.0385	9
40-44	19	565	0.0336	0.0305	17
45-49	17	896	0.0190	0.0255	23
50-54	21	1,022	0.0205	0.0220	22
Over 54	18	2,342	0.0077		18
Totals	89	5,105	0.0174	0.0178	91

# University Females State Withdrawal Experience during Calendar Year 2023

## Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	105	582	0.1804	0.1410	82
2	177	1,132	0.1564	0.1400	158
3	121	932	0.1298	0.1270	118
4	100	825	0.1212	0.1000	83
5	82	894	0.0917	0.0930	83
6	61	828	0.0737	0.0810	67
7	69	759	0.0909	0.0700	53
8	43	656	0.0655	0.0560	37
9	36	622	0.0579	0.0490	30
10	18	547	0.0329	0.0430	24
Totals	812	7,777	0.1044	0.0945	735

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

## Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0400	-
30-34	1	47	0.0213	0.0400	2
35-39	13	412	0.0316	0.0400	16
40-44	20	828	0.0242	0.0350	29
45-49	23	1,119	0.0206	0.0300	34
50-54	30	1,135	0.0264	0.0250	28
Over 54	17	2,271	0.0075		17
Totals	104	5,812	0.0179	0.0217	126

## Protective with Social Security Non-State Withdrawal Experience during Calendar Year 2023

### Male and Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	38	313	0.1214	0.1560	49
2	68	799	0.0851	0.0940	75
3	56	678	0.0826	0.0530	36
4	35	639	0.0548	0.0440	28
5	26	648	0.0401	0.0420	27
6	26	572	0.0455	0.0330	19
7	25	546	0.0458	0.0320	17
8	17	509	0.0334	0.0300	15
9	10	436	0.0229	0.0270	12
10	12	407	0.0295	0.0230	9
Totals	313	5,547	0.0564	0.0517	287

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Male and Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	2	0.0000	0.0220	-
30-34	6	236	0.0254	0.0200	5
35-39	17	1,115	0.0152	0.0160	18
40-44	31	1,361	0.0228	0.0150	20
45-49	30	1,409	0.0213	0.0140	20
50-54	11	1,319	0.0083	0.0130	17
Totals	95	5,442	0.0175	0.0147	80

## Protective with Social Security State Withdrawal Experience during Calendar Year 2023

### Male and Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	67	251	0.2669	0.1880	47
2	81	412	0.1966	0.1550	64
3	37	407	0.0909	0.1050	43
4	31	479	0.0647	0.0650	31
5	28	411	0.0681	0.0550	23
6	27	387	0.0698	0.0500	19
7	32	428	0.0748	0.0450	19
8	12	381	0.0315	0.0400	15
9	10	282	0.0355	0.0350	10
10	14	303	0.0462	0.0330	10
Totals	339	3,741	0.0906	0.0751	281

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Male and Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	2	0.0000	0.0300	-
30-34	2	119	0.0168	0.0280	3
35-39	7	461	0.0152	0.0220	10
40-44	9	745	0.0121	0.0160	12
45-49	14	890	0.0157	0.0130	12
50-54	9	922	0.0098	0.0120	11
Totals	41	3,139	0.0131	0.0153	48

## Protective without Social Security Non-State Withdrawal Experience during Calendar Year 2023

### Male and Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	5	56	0.0893	0.0450	3
2	6	144	0.0417	0.0400	6
3	2	143	0.0140	0.0200	3
4	3	115	0.0261	0.0180	2
5	1	115	0.0087	0.0170	2
6	5	127	0.0394	0.0130	2
7	2	111	0.0180	0.0120	1
8	5	111	0.0450	0.0090	1
9	5	109	0.0459	0.0080	1
10	4	111	0.0360	0.0070	1
Totals	38	1,142	0.0333	0.0193	22

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Male and Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0070	-
30-34	-	66	0.0000	0.0065	-
35-39	4	286	0.0140	0.0060	2
40-44	4	361	0.0111	0.0055	2
45-49	3	392	0.0077	0.0050	2
50-54	2	424	0.0047	0.0045	2
Totals	13	1,529	0.0085	0.0052	8

## Executive and Elected Non-State Withdrawal Experience during Calendar Year 2023

### Male and Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	7	19	0.3684	0.2500	5
2	9	17	0.5294	0.2000	3
3	8	31	0.2581	0.1700	5
4	6	17	0.3529	0.1600	3
5	4	22	0.1818	0.1300	3
6	1	13	0.0769	0.0400	1
7	-	30	0.0000	0.0400	1
8	-	13	0.0000	0.0400	1
9	2	17	0.1176	0.0400	1
10	-	12	0.0000	0.0400	-
Totals	37	191	0.1937	0.1204	23

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Male and Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0450	-
30-34	-	-	N/A	0.0450	-
35-39	-	6	0.0000	0.0450	-
40-44	-	17	0.0000	0.0400	1
45-49	-	36	0.0000	0.0350	1
50-54	1	44	0.0227	0.0300	1
Over 54	3	185	0.0162		3
Totals	4	288	0.0139	0.0208	6

## Executive and Elected State Withdrawal Experience during Calendar Year 2023

### Male and Female Service-Based Withdrawals All Ages

Service Index	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
1	2	11	0.1818	0.2500	3
2	1	13	0.0769	0.2000	3
3	2	31	0.0645	0.1700	5
4	3	21	0.1429	0.1600	3
5	6	44	0.1364	0.1300	6
6	1	20	0.0500	0.0400	1
7	-	32	0.0000	0.0400	1
8	-	23	0.0000	0.0400	1
9	2	40	0.0500	0.0400	2
10	1	12	0.0833	0.0400	-
Totals	18	247	0.0729	0.0000	25

Service index 1 corresponds to service between 0 and 1 years, service index 2 corresponds to service between 1 and 2 years of service, etc. As such, service index 10 corresponds to service between 9 and 10 years of service.

### Male and Female Age-Based Withdrawals 10+ Years of Service

Age	Withdrawals	Exposure	Crude Rates	Current Rates	Expected Withdrawals
25-29	-	-	N/A	0.0450	-
30-34	-	-	N/A	0.0450	-
35-39	1	20	0.0500	0.0450	1
40-44	2	42	0.0476	0.0400	2
45-49	5	54	0.0926	0.0350	2
50-54	6	72	0.0833	0.0300	2
Over 54	-	262	0.0000		-
Totals	14	450	0.0311	0.0156	7



# General Non-State Disability Experience during Calendar Year 2023

## Male Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0001	-
20-24	-	12	0.0000	0.0001	-
25-29	-	479	0.0000	0.0001	-
30-34	-	1,500	0.0000	0.0001	-
35-39	1	2,280	0.0004	0.0002	-
40-44	-	2,793	0.0000	0.0005	1
45-49	-	2,887	0.0000	0.0006	2
50-54	8	3,360	0.0024	0.0017	6
55-59	8	3,249	0.0025	0.0030	10
60-64	6	2,523	0.0024	0.0059	15
65-69	1	-	N/A	0.0023	-
70-74	-	-	N/A	0.0020	-
75 and over	-	-	N/A	0.0020	-
Totals	24	19,083	0.0013	0.0018	34

## Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0000	-
20-24	-	8	0.0000	0.0000	-
25-29	-	557	0.0000	0.0000	-
30-34	-	1,983	0.0000	0.0002	-
35-39	1	3,165	0.0003	0.0002	1
40-44	1	3,870	0.0003	0.0004	1
45-49	-	4,724	0.0000	0.0005	2
50-54	5	5,863	0.0009	0.0009	5
55-59	7	6,334	0.0011	0.0016	10
60-64	6	5,133	0.0012	0.0020	10
65-69	-	-	N/A	0.0016	-
70-74	-	-	N/A	0.0014	-
75 and over	-	-	N/A	0.0014	-
Totals	20	31,637	0.0006	0.0009	29

The people shown on this page are cases involving \$40.63 disability benefits and includes those who were either active or inactive with pending benefits at the beginning of the year.



# General State Disability Experience during Calendar Year 2023

## Male Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0001	-
20-24	-	5	0.0000	0.0001	-
25-29	-	173	0.0000	0.0001	-
30-34	-	867	0.0000	0.0001	-
35-39	-	1,331	0.0000	0.0002	-
40-44	1	1,472	0.0007	0.0005	1
45-49	1	1,417	0.0007	0.0006	1
50-54	4	1,712	0.0023	0.0017	3
55-59	9	1,512	0.0060	0.0030	4
60-64	1	1,076	0.0009	0.0059	6
65-69	-	-	N/A	0.0023	-
70-74	-	-	N/A	0.0020	-
75 and over	-	-	N/A	0.0020	-
Totals	16	9,565	0.0017	0.0016	15

## Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0000	-
20-24	-	7	0.0000	0.0000	-
25-29	-	433	0.0000	0.0000	-
30-34	1	1,679	0.0006	0.0002	-
35-39	-	2,262	0.0000	0.0002	1
40-44	1	2,345	0.0004	0.0004	1
45-49	-	2,351	0.0000	0.0005	1
50-54	9	2,492	0.0036	0.0009	2
55-59	8	2,321	0.0034	0.0016	4
60-64	6	1,721	0.0035	0.0020	3
65-69	-	-	N/A	0.0016	-
70-74	-	-	N/A	0.0014	-
75 and over	-	-	N/A	0.0014	-
Totals	25	15,611	0.0016	0.0008	12

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## Public Schools Non-State Disability Experience during Calendar Year 2023

### Male Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0001	-
20-24	-	-	N/A	0.0001	-
25-29	-	354	0.0000	0.0001	-
30-34	-	1,522	0.0000	0.0001	-
35-39	-	2,210	0.0000	0.0001	-
40-44	-	2,767	0.0000	0.0002	-
45-49	-	3,069	0.0000	0.0003	1
50-54	4	3,182	0.0013	0.0012	4
55-59	4	1,852	0.0022	0.0016	3
60-64	1	581	0.0017	0.0028	2
65-69	-	-	N/A	0.0040	-
70-74	-	-	N/A	0.0041	-
75 and over	-	-	N/A	0.0041	-
Totals	9	15,537	0.0006	0.0006	10

### Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0001	-
20-24	-	-	N/A	0.0001	-
25-29	-	1,402	0.0000	0.0001	-
30-34	-	5,360	0.0000	0.0001	-
35-39	-	6,511	0.0000	0.0001	-
40-44	1	7,785	0.0001	0.0002	2
45-49	1	7,983	0.0001	0.0008	7
50-54	8	8,116	0.0010	0.0011	9
55-59	10	5,228	0.0019	0.0017	9
60-64	1	1,826	0.0005	0.0024	4
65-69	-	-	N/A	0.0014	-
70-74	-	-	N/A	0.0011	-
75 and over	-	-	N/A	0.0011	-
Totals	21	44,211	0.0005	0.0007	31

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# University State Disability Experience during Calendar Year 2023

## Male Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0000	-
20-24	-	-	N/A	0.0000	-
25-29	-	80	0.0000	0.0000	-
30-34	-	360	0.0000	0.0000	-
35-39	-	845	0.0000	0.0000	-
40-44	-	1,169	0.0000	0.0001	-
45-49	-	1,245	0.0000	0.0002	-
50-54	3	1,236	0.0024	0.0004	-
55-59	2	1,069	0.0019	0.0012	1
60-64	1	722	0.0014	0.0011	1
65-69	-	-	N/A	0.0014	-
70-74	-	-	N/A	0.0012	-
75 and over	-	-	N/A	0.0012	-
Totals	6	6,726	0.0009	0.0003	2

## Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0001	-
20-24	-	-	N/A	0.0001	-
25-29	-	137	0.0000	0.0001	-
30-34	-	760	0.0000	0.0001	-
35-39	-	1,280	0.0000	0.0004	-
40-44	-	1,568	0.0000	0.0005	1
45-49	1	1,568	0.0006	0.0004	1
50-54	1	1,468	0.0007	0.0009	1
55-59	1	1,250	0.0008	0.0013	2
60-64	-	818	0.0000	0.0020	2
65-69	-	-	N/A	0.0013	-
70-74	-	-	N/A	0.0011	-
75 and over	-	-	N/A	0.0011	-
Totals	3	8,849	0.0003	0.0008	7

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# Protective without Social Security Non-State Disability Experience during Calendar Year 2023

## Male and Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0003	-
20-24	-	1	0.0000	0.0003	-
25-29	-	98	0.0000	0.0003	-
30-34	-	331	0.0000	0.0003	-
35-39	-	432	0.0000	0.0004	-
40-44	-	440	0.0000	0.0006	-
45-49	-	415	0.0000	0.0012	-
50-54	7	302	0.0232	0.0084	3
55-59	-	-	N/A	0.0012	-
60-64	-	-	N/A	0.0012	-
65-69	-	-	N/A	0.0012	-
70-74	-	-	N/A	0.0012	-
75 and over	-	-	N/A	0.0012	-
Totals	7	2,019	0.0035	0.0015	3

The people shown on this page are cases involving \$40.63 disability benefits and includes those who were either active or inactive with pending benefits at the beginning of the year.

## Protective with Social Security Non-State Disability Experience during Calendar Year 2023

### Male and Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0002	-
20-24	-	2	0.0000	0.0002	-
25-29	-	633	0.0000	0.0002	-
30-34	-	1,480	0.0000	0.0002	-
35-39	1	1,673	0.0006	0.0003	1
40-44	2	1,569	0.0013	0.0004	1
45-49	1	1,501	0.0007	0.0006	1
50-54	1	1,029	0.0010	0.0010	1
55-59	-	-	N/A	0.0224	-
60-64	-	-	N/A	0.0240	-
65-69	-	-	N/A	0.0016	-
70-74	-	-	N/A	0.0016	-
75 and over	-	-	N/A	0.0016	-
Totals	5	7,887	0.0006	0.0005	4

The people shown on this page are cases involving \$40.63 disability benefits and includes those who were either active or inactive with pending benefits at the beginning of the year.

# Protective with Social Security State Disability Experience during Calendar Year 2023

## Male and Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0002	-
20-24	-	2	0.0000	0.0002	-
25-29	-	317	0.0000	0.0002	-
30-34	-	804	0.0000	0.0002	-
35-39	-	861	0.0000	0.0004	-
40-44	1	1,006	0.0010	0.0005	1
45-49	-	1,041	0.0000	0.0008	1
50-54	-	745	0.0000	0.0013	1
55-59	-	-	N/A	0.0280	-
60-64	-	-	N/A	0.0300	-
65-69	-	-	N/A	0.0020	-
70-74	-	-	N/A	0.0020	-
75 and over	-	-	N/A	0.0020	-
Totals	1	4,776	0.0002	0.0006	3

The people shown on this page are cases involving \$40.63 disability benefits and includes those who were either active or inactive with pending benefits at the beginning of the year.

## Executive and Elected Non-State Disability Experience during Calendar Year 2023

### Male and Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0000	-
20-24	-	-	N/A	0.0000	-
25-29	-	-	N/A	0.0000	-
30-34	-	5	0.0000	0.0000	-
35-39	-	11	0.0000	0.0001	-
40-44	-	29	0.0000	0.0001	-
45-49	-	42	0.0000	0.0002	-
50-54	-	55	0.0000	0.0003	-
55-59	-	83	0.0000	0.0012	-
60-64	-	36	0.0000	0.0011	-
65-69	-	-	N/A	0.0009	-
70-74	-	-	N/A	0.0009	-
75 and over	-	-	N/A	0.0009	-
Totals	-	261	N/A	N/A	-

The people shown on this page are cases involving \$40.63 disability benefits and includes those who were either active or inactive with pending benefits at the beginning of the year.



## Executive and Elected State Disability Experience during Calendar Year 2023

### Male and Female Disability Experience

Age	Disabilities	Exposure	Crude Rates	Current Rates	Expected Disabilities
Under 20	-	-	N/A	0.0000	-
20-24	-	1	0.0000	0.0000	-
25-29	-	-	N/A	0.0000	-
30-34	-	7	0.0000	0.0000	-
35-39	-	42	0.0000	0.0001	-
40-44	-	57	0.0000	0.0001	-
45-49	-	73	0.0000	0.0002	-
50-54	-	94	0.0000	0.0003	-
55-59	-	113	0.0000	0.0012	-
60-64	-	32	0.0000	0.0011	-
65-69	-	-	N/A	0.0009	-
70-74	-	-	N/A	0.0009	-
75 and over	-	-	N/A	0.0009	-
Totals	-	419	N/A	N/A	-

The people shown on this page are cases involving \$40.63 disability benefits and includes those who were either active or inactive with pending benefits at the beginning of the year.

## General Non-State Pay Increase Assumption during Calendar Year 2023

### Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	32,369	12.22 %	6.45 %
6-10	18,386	7.83 %	4.90 %
11-15	10,114	6.99 %	4.25 %
16-20	7,461	6.35 %	4.00 %
21-25	6,093	5.96 %	3.75 %
26-30	3,378	5.94 %	3.50 %
31-35	1,719	5.70 %	3.30 %
36-40	534	5.82 %	3.20 %
Over 40	168	4.78 %	3.10 %
Total	80,222		

# General State Pay Increase Assumption during Calendar Year 2023

## Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	12,117	18.99 %	6.45 %
6-10	9,008	8.13 %	4.90 %
11-15	5,149	7.50 %	4.25 %
16-20	3,639	6.57 %	4.00 %
21-25	3,146	6.31 %	3.75 %
26-30	1,712	6.09 %	3.50 %
31-35	1,051	5.68 %	3.30 %
36-40	294	5.76 %	3.20 %
Over 40	88	4.98 %	3.10 %
Total	36,204		

## Public Schools Non-State Pay Increase Assumption during Calendar Year 2023

### Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	15,692	14.08 %	8.60 %
6-10	14,546	7.04 %	6.40 %
11-15	11,715	6.39 %	5.10 %
16-20	10,678	5.44 %	4.00 %
21-25	10,350	4.77 %	3.35 %
26-30	6,821	4.26 %	3.20 %
31-35	2,511	4.04 %	3.15 %
36-40	382	3.98 %	3.10 %
Over 40	43	4.25 %	3.05 %
Total	72,738		

# University State Pay Increase Assumption during Calendar Year 2023

## Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	6,337	23.08 %	6.00 %
6-10	5,234	7.65 %	5.50 %
11-15	3,701	6.43 %	5.00 %
16-20	2,683	6.06 %	4.50 %
21-25	2,085	5.29 %	3.95 %
26-30	1,018	4.86 %	3.80 %
31-35	476	4.72 %	3.60 %
36-40	204	3.74 %	3.20 %
Over 40	70	2.90 %	3.10 %
Total	21,808		

## Protective with Social Security Non-State Pay Increase Assumption during Calendar Year 2023

### Male and Female Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	2,776	20.07 %	7.75 %
6-10	2,353	7.21 %	4.50 %
11-15	1,597	5.66 %	3.90 %
16-20	1,511	6.07 %	3.80 %
21-25	1,422	6.22 %	3.70 %
26-30	722	7.43 %	3.60 %
31-35	113	5.15 %	3.50 %
36-40	17	7.89 %	3.40 %
Over 40	6	16.52 %	3.20 %
Total	10,517		

## Protective with Social Security State Pay Increase Assumption during Calendar Year 2023

### Male and Female Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	1,620	32.01 %	7.75 %
6-10	1,615	20.50 %	4.50 %
11-15	785	18.45 %	3.90 %
16-20	942	17.73 %	3.80 %
21-25	1,005	18.64 %	3.70 %
26-30	575	17.65 %	3.60 %
31-35	67	15.94 %	3.50 %
36-40	5	7.59 %	3.40 %
Over 40	2	9.34 %	3.20 %
Total	6,616		

## Protective without Social Security Non-State Pay Increase Assumption during Calendar Year 2023

### Male and Female Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	545	19.65 %	8.50 %
6-10	545	5.50 %	4.30 %
11-15	462	3.84 %	3.60 %
16-20	394	4.15 %	3.50 %
21-25	416	3.97 %	3.40 %
26-30	212	4.30 %	3.30 %
31-35	33	3.68 %	3.20 %
36-40	-	N/A	3.10 %
Over 40	1	3.93 %	3.05 %
Total	2,608		



## Executive and Elected Non-State Pay Increase Assumption during Calendar Year 2023

### Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	91	7.41 %	5.50 %
6-10	85	3.95 %	3.20 %
11-15	74	4.03 %	3.20 %
16-20	54	5.25 %	3.20 %
21-25	55	4.10 %	3.20 %
26-30	35	4.26 %	3.20 %
31-35	30	3.23 %	3.20 %
36-40	4	3.22 %	3.20 %
Over 40	7	1.71 %	3.20 %
Total	435		

## Executive and Elected State Pay Increase Assumption during Calendar Year 2023

### Service-Based Pay Increase Experience

Service Group		Total % Increase	
Beginning of Year	Number	Actual	Expected
1-5	107	16.38 %	5.50 %
6-10	119	6.20 %	3.20 %
11-15	124	5.96 %	3.20 %
16-20	86	6.47 %	3.20 %
21-25	69	6.14 %	3.20 %
26-30	56	5.51 %	3.20 %
31-35	35	6.43 %	3.20 %
36-40	18	6.32 %	3.20 %
Over 40	3	5.21 %	3.20 %
Total	617		

# General Males Non-State Normal Retirement Experience during Calendar Year 2023

## Male Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	33	134	0.2463	0.2000	27
58	18	114	0.1579	0.2000	23
59	17	113	0.1504	0.2000	23
60	35	124	0.2823	0.2000	25
61	23	131	0.1756	0.2000	26
62	45	156	0.2885	0.3000	47
63	33	106	0.3113	0.3000	32
64	16	83	0.1928	0.3000	25
65	124	441	0.2812	0.3000	132
66	70	311	0.2251	0.4000	124
67	56	221	0.2534	0.3200	71
68	24	153	0.1569	0.3200	49
69	15	125	0.1200	0.2800	35
70	10	97	0.1031	0.2800	27
71	10	76	0.1316	0.2800	21
72	6	76	0.0789	0.2800	21
73	4	56	0.0714	0.1800	10
74	6	44	0.1364	0.1800	8
Totals	545	2,561	0.2128	0.2835	726
75 & Over	10	137			137
Totals	555	2,698			863

# General Males State Normal Retirement Experience during Calendar Year 2023

## Male Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	19	58	0.3276	0.1900	11
58	10	63	0.1587	0.1900	12
59	10	64	0.1563	0.1900	12
60	6	60	0.1000	0.1900	11
61	8	48	0.1667	0.1900	9
62	13	58	0.2241	0.2800	16
63	16	63	0.2540	0.3000	19
64	12	37	0.3243	0.2500	9
65	42	232	0.1810	0.2700	63
66	35	176	0.1989	0.3500	62
67	31	134	0.2313	0.3200	43
68	13	74	0.1757	0.2100	16
69	15	84	0.1786	0.2100	18
70	3	43	0.0698	0.2100	9
71	5	45	0.1111	0.2100	9
72	4	27	0.1481	0.2100	6
73	5	27	0.1852	0.3000	8
74	5	24	0.2083	0.3000	7
Totals	252	1,317	0.1913	0.2582	340
75 & Over	10	49			49
Totals	262	1,366			389

## General Males Non-State Reduced Retirement Experience during Calendar Year 2023

### Male Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	37	724	0.0511	0.0730	53
56	37	703	0.0526	0.0600	42
57	36	613	0.0587	0.0520	32
58	35	579	0.0604	0.0560	32
59	34	630	0.0540	0.0590	37
60	37	564	0.0656	0.0930	52
61	45	599	0.0751	0.0800	48
62	60	536	0.1119	0.1900	102
63	61	453	0.1347	0.2000	91
64	60	371	0.1617	0.1800	67
Totals	442	5,772	0.0766	0.0963	556

## General Males State Reduced Retirement Experience during Calendar Year 2023

### Male Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	9	336	0.0268	0.0550	18
56	16	336	0.0476	0.0650	22
57	15	297	0.0505	0.0550	16
58	9	299	0.0301	0.0550	16
59	12	244	0.0492	0.0650	16
60	16	248	0.0645	0.0900	22
61	21	249	0.0843	0.1250	31
62	27	218	0.1239	0.1600	35
63	28	199	0.1407	0.1700	34
64	18	162	0.1111	0.2100	34
Totals	171	2,588	0.0661	0.0943	244

## General Females Non-State Normal Retirement Experience during Calendar Year 2023

### Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	26	132	0.1970	0.1700	22
58	28	145	0.1931	0.1800	26
59	20	147	0.1361	0.1400	21
60	30	156	0.1923	0.2000	31
61	20	135	0.1481	0.1800	24
62	40	161	0.2484	0.2400	39
63	37	119	0.3109	0.2900	35
64	31	116	0.2672	0.2300	27
65	225	797	0.2823	0.3500	279
66	155	645	0.2403	0.3900	252
67	92	382	0.2408	0.3300	126
68	35	253	0.1383	0.3000	76
69	34	191	0.1780	0.2200	42
70	18	154	0.1169	0.2600	40
71	25	133	0.1880	0.2800	37
72	10	102	0.0980	0.3000	31
73	6	63	0.0952	0.3000	19
74	4	54	0.0741	0.1600	9
Totals	836	3,885	0.2152	0.2924	1,136
75 & Over	17	197			197
Totals	853	4,082			1,333

# General Females State Normal Retirement Experience during Calendar Year 2023

## Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	20	91	0.2198	0.1900	17
58	18	96	0.1875	0.1900	18
59	24	97	0.2474	0.1900	18
60	17	89	0.1910	0.2100	19
61	24	90	0.2667	0.2500	23
62	20	73	0.2740	0.2900	21
63	17	67	0.2537	0.2800	19
64	16	53	0.3019	0.3100	16
65	56	286	0.1958	0.3100	89
66	55	207	0.2657	0.3600	75
67	36	146	0.2466	0.3300	48
68	13	84	0.1548	0.2500	21
69	15	92	0.1630	0.2700	25
70	10	52	0.1923	0.2900	15
71	9	31	0.2903	0.3400	11
72	5	26	0.1923	0.3300	9
73	1	16	0.0625	0.2400	4
74	3	16	0.1875	0.1800	3
Totals	359	1,612	0.2227	0.2798	451
75 & Over	5	33			33
Totals	364	1,645			484



## General Females Non-State Reduced Retirement Experience during Calendar Year 2023

### Female Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	67	1,354	0.0495	0.0700	95
56	49	1,291	0.0380	0.0700	90
57	49	1,224	0.0400	0.0550	67
58	62	1,255	0.0494	0.0650	82
59	54	1,210	0.0446	0.0700	85
60	102	1,229	0.0830	0.0950	117
61	85	1,127	0.0754	0.0950	107
62	138	1,080	0.1278	0.1600	173
63	146	935	0.1561	0.1800	168
64	122	762	0.1601	0.1800	137
Totals	874	11,467	0.0762	0.0978	1,121

## General Females State Reduced Retirement Experience during Calendar Year 2023

### Female Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	21	554	0.0379	0.0600	33
56	22	507	0.0434	0.0800	41
57	19	439	0.0433	0.0600	26
58	20	408	0.0490	0.0900	37
59	25	413	0.0605	0.0750	31
60	29	382	0.0759	0.1000	38
61	24	389	0.0617	0.1100	43
62	34	352	0.0966	0.1800	63
63	46	333	0.1381	0.1950	65
64	51	265	0.1925	0.1800	48
Totals	291	4,042	0.0720	0.1051	425

# Public School Males Non-State Normal Retirement Experience during Calendar Year 2023

## Male Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	68	185	0.3676	0.3100	57
58	47	138	0.3406	0.2900	40
59	39	100	0.3900	0.2800	28
60	23	73	0.3151	0.2700	20
61	21	53	0.3962	0.2600	14
62	14	44	0.3182	0.3900	17
63	15	29	0.5172	0.3300	10
64	6	19	0.3158	0.3000	6
65	40	110	0.3636	0.3200	35
66	24	69	0.3478	0.3500	24
67	9	37	0.2432	0.3100	11
68	5	37	0.1351	0.2800	10
69	8	32	0.2500	0.2000	6
70	5	23	0.2174	0.3000	7
71	5	23	0.2174	0.2500	6
72	3	19	0.1579	0.2500	5
73	-	10	0.0000	0.2500	3
74	3	14	0.2143	0.2500	4
Totals	335	1,015	0.3300	0.2985	303
75 & Over	3	27			27
Totals	338	1,042			330

## Public School Males Non-State Reduced Retirement Experience during Calendar Year 2023

### Male Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	60	580	0.1034	0.1200	70
56	70	519	0.1349	0.1300	67
57	27	307	0.0879	0.1300	40
58	23	245	0.0939	0.1200	29
59	24	201	0.1194	0.1430	29
60	16	150	0.1067	0.1600	24
61	22	134	0.1642	0.1600	21
62	20	120	0.1667	0.2300	28
63	20	101	0.1980	0.2100	21
64	18	76	0.2368	0.2100	16
Totals	300	2,433	0.1233	0.1418	345

## Public School Females Non-State Normal Retirement Experience during Calendar Year 2023

### Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	133	469	0.2836	0.2750	129
58	103	302	0.3411	0.2750	83
59	77	254	0.3031	0.2600	66
60	56	178	0.3146	0.2900	52
61	32	137	0.2336	0.2700	37
62	44	126	0.3492	0.3600	45
63	27	75	0.3600	0.3100	23
64	20	70	0.2857	0.3000	21
65	73	259	0.2819	0.3850	100
66	46	162	0.2840	0.4400	71
67	33	106	0.3113	0.3100	33
68	18	77	0.2338	0.3000	23
69	9	48	0.1875	0.3000	14
70	5	32	0.1563	0.3200	10
71	4	29	0.1379	0.2500	7
72	6	34	0.1765	0.2500	9
73	2	14	0.1429	0.2500	4
74	-	23	0.0000	0.2500	6
Totals	688	2,395	0.2873	0.3061	733
75 & Over	2	37			37
Totals	690	2,432			770

## Public School Females Non-State Reduced Retirement Experience during Calendar Year 2023

### Female Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	157	1,679	0.0935	0.1100	185
56	177	1,454	0.1217	0.1300	189
57	73	836	0.0873	0.1200	100
58	91	684	0.1330	0.1300	89
59	69	575	0.1200	0.1350	78
60	67	498	0.1345	0.1700	85
61	63	449	0.1403	0.1700	76
62	56	336	0.1667	0.2400	81
63	60	318	0.1887	0.2400	76
64	46	225	0.2044	0.2400	54
Totals	859	7,054	0.1218	0.1436	1,013

# University Males State Normal Retirement Experience during Calendar Year 2023

## Male Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	3	17	0.1765	0.1200	2
58	4	14	0.2857	0.1600	2
59	3	25	0.1200	0.0900	2
60	3	24	0.1250	0.1500	4
61	2	27	0.0741	0.0900	2
62	7	30	0.2333	0.1000	3
63	10	35	0.2857	0.1100	4
64	7	38	0.1842	0.1550	6
65	23	166	0.1386	0.1550	26
66	27	160	0.1688	0.2100	34
67	20	114	0.1754	0.1800	21
68	11	88	0.1250	0.1900	17
69	13	72	0.1806	0.1400	10
70	20	54	0.3704	0.2100	11
71	8	41	0.1951	0.2400	10
72	5	39	0.1282	0.2400	9
73	7	30	0.2333	0.2400	7
74	4	21	0.1905	0.2400	5
Totals	177	995	0.1779	0.1759	175
75 & Over	22	80			80
Totals	199	1,075			255

# University Males State Reduced Retirement Experience during Calendar Year 2023

## Male Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	8	255	0.0314	0.0330	8
56	10	211	0.0474	0.0330	7
57	5	192	0.0260	0.0400	8
58	6	196	0.0306	0.0400	8
59	5	215	0.0233	0.0440	9
60	5	184	0.0272	0.0480	9
61	5	159	0.0314	0.0480	8
62	10	126	0.0794	0.0700	9
63	10	130	0.0769	0.0830	11
64	14	123	0.1138	0.1150	14
Totals	78	1,791	0.0436	0.0508	91



# University Females State Normal Retirement Experience during Calendar Year 2023

## Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	1	24	0.0417	0.1000	2
58	4	28	0.1429	0.2000	6
59	4	35	0.1143	0.1200	4
60	3	24	0.1250	0.1400	3
61	2	34	0.0588	0.1300	4
62	4	26	0.1538	0.1500	4
63	7	24	0.2917	0.1900	5
64	5	26	0.1923	0.1700	4
65	25	125	0.2000	0.2100	26
66	24	105	0.2286	0.2500	26
67	20	95	0.2105	0.2500	24
68	9	60	0.1500	0.1800	11
69	7	48	0.1458	0.1650	8
70	5	29	0.1724	0.2200	6
71	7	26	0.2692	0.1650	4
72	2	20	0.1000	0.1700	3
73	2	17	0.1176	0.2100	4
74	2	10	0.2000	0.1400	1
Totals	133	756	0.1759	0.1918	145
75 & Over	6	38			38
Totals	139	794			183

# University Females State Reduced Retirement Experience during Calendar Year 2023

## Female Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	9	279	0.0323	0.0500	14
56	7	250	0.0280	0.0500	13
57	10	242	0.0413	0.0500	12
58	11	246	0.0447	0.0550	14
59	15	233	0.0644	0.0600	14
60	10	200	0.0500	0.0750	15
61	14	186	0.0753	0.0900	17
62	15	169	0.0888	0.1100	19
63	24	143	0.1678	0.1200	17
64	16	120	0.1333	0.1450	17
Totals	131	2,068	0.0633	0.0735	152

# Protective with Social Security Non-State Normal Retirement Experience during Calendar Year 2023

## Male and Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
50	12	220	0.0545	0.0600	13
51	30	244	0.1230	0.0800	20
52	26	241	0.1079	0.1100	27
53	89	253	0.3518	0.3400	86
54	58	170	0.3412	0.3200	54
55	35	121	0.2893	0.2600	31
56	27	93	0.2903	0.2300	21
57	16	57	0.2807	0.2700	15
58	14	61	0.2295	0.2100	13
59	8	34	0.2353	0.2300	8
60	5	31	0.1613	0.2200	7
61	6	36	0.1667	0.3000	11
62	7	25	0.2800	0.3500	9
63	8	17	0.4706	0.2700	5
64	3	9	0.3333	0.3000	3
65	4	8	0.5000	0.3400	3
66	2	4	0.5000	0.3500	1
67	2	7	0.2857	0.3500	2
68	-	2	0.0000	0.3500	1
69	3	6	0.5000	0.3500	2
70	-	-	N/A	1.0000	-
71	-	1	0.0000	1.0000	1
72	-	1	0.0000	1.0000	1
73	-	1	0.0000	1.0000	1
74	-	-	N/A	1.0000	-
Totals	355	1,642	0.2162	0.2040	335
75 & Over	-	4			4
Totals	355	1,646			339

**Protective with Social Security State  
Normal Retirement Experience  
during Calendar Year 2023**

**Male and Female Age-Based Retirement Experience**

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
50	8	137	0.0584	0.0750	10
51	13	140	0.0929	0.0900	13
52	16	164	0.0976	0.1100	18
53	45	178	0.2528	0.2500	45
54	30	171	0.1754	0.2000	34
55	22	130	0.1692	0.2000	26
56	12	91	0.1319	0.2000	18
57	18	97	0.1856	0.2000	19
58	17	65	0.2615	0.2000	13
59	10	61	0.1639	0.2000	12
60	12	55	0.2182	0.2000	11
61	6	71	0.0845	0.2000	14
62	8	38	0.2105	0.2500	10
63	14	41	0.3415	0.2500	10
64	4	23	0.1739	0.3600	8
65	9	27	0.3333	0.3800	10
66	5	14	0.3571	0.3800	5
67	6	6	1.0000	0.3800	2
68	1	5	0.2000	0.3800	2
69	1	6	0.1667	0.3800	2
70	1	4	0.2500	1.0000	4
71	-	-	N/A	1.0000	-
72	1	2	0.5000	1.0000	2
73	-	-	N/A	1.0000	-
74	-	-	N/A	1.0000	-
Totals	259	1,526	0.1697	0.1887	288
75 & Over	-	-			-
Totals	259	1,526			288

**Protective without Social Security Non-State  
Normal Retirement Experience  
during Calendar Year 2023**

**Male and Female Age-Based Retirement Experience**

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
50	5	70	0.0714	0.0300	2
51	3	74	0.0405	0.0350	3
52	8	75	0.1067	0.0450	3
53	21	74	0.2838	0.1700	13
54	27	76	0.3553	0.2400	18
55	10	24	0.4167	0.2900	7
56	5	24	0.2083	0.3200	8
57	12	30	0.4000	0.2300	7
58	8	21	0.3810	0.2700	6
59	7	14	0.5000	0.4000	6
60	4	10	0.4000	0.2500	3
61	4	6	0.6667	0.2500	2
62	-	3	0.0000	0.3100	1
63	1	2	0.5000	0.4000	1
64	2	5	0.4000	0.4000	2
65	1	2	0.5000	0.4000	1
66	-	-	N/A	1.0000	-
67	-	-	N/A	1.0000	-
68	-	-	N/A	1.0000	-
69	-	-	N/A	1.0000	-
70	-	-	N/A	1.0000	-
71	-	-	N/A	1.0000	-
72	-	-	N/A	1.0000	-
73	-	-	N/A	1.0000	-
74	-	-	N/A	1.0000	-
Totals	118	510	0.2314	0.1627	83
75 & Over	-	-	N/A		-
Totals	118	510			83

## Executive and Elected Non-State Normal Retirement Experience during Calendar Year 2023

### Male and Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	1	3	0.3333	0.1000	-
58	1	3	0.3333	0.1000	-
59	-	2	0.0000	0.1000	-
60	2	5	0.4000	0.1000	1
61	2	7	0.2857	0.1000	1
62	2	19	0.1053	0.1000	2
63	2	14	0.1429	0.1000	1
64	3	15	0.2000	0.1500	2
65	5	12	0.4167	0.1500	2
66	4	10	0.4000	0.1500	2
67	1	8	0.1250	0.1500	1
68	2	6	0.3333	0.1000	1
69	1	6	0.1667	0.1000	1
70	-	3	0.0000	0.1000	-
71	-	3	0.0000	0.1000	-
72	-	4	0.0000	0.1000	-
73	-	3	0.0000	0.2000	1
74	-	1	0.0000	0.2000	-
Totals	26	124	0.2097	0.1210	15
75 & Over	1	18			18
Totals	27	142			33

## Executive and Elected State Normal Retirement Experience during Calendar Year 2023

### Male and Female Age-Based Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
57	1	5	0.2000	0.1200	1
58	2	7	0.2857	0.1200	1
59	-	1	0.0000	0.1200	-
60	2	5	0.4000	0.1200	1
61	1	5	0.2000	0.1200	1
62	-	20	0.0000	0.1800	4
63	4	22	0.1818	0.1800	4
64	3	19	0.1579	0.1800	3
65	1	20	0.0500	0.1800	4
66	1	18	0.0556	0.1800	3
67	1	11	0.0909	0.1800	2
68	1	10	0.1000	0.1800	2
69	1	7	0.1429	0.1800	1
70	3	10	0.3000	0.1800	2
71	1	11	0.0909	0.1500	2
72	4	7	0.5714	0.1500	1
73	3	7	0.4286	0.1500	1
74	-	2	0.0000	0.1500	-
Totals	29	187	0.1551	0.1765	33
75 & Over	5	14			14
Totals	34	201			47

## Executive and Elected Non-State Reduced Retirement Experience during Calendar Year 2023

### Male and Female Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	-	23	0.0000	0.0250	1
56	-	13	0.0000	0.0250	-
57	1	18	0.0556	0.0250	-
58	-	12	0.0000	0.0250	-
59	2	17	0.1176	0.0250	-
60	2	15	0.1333	0.0500	1
61	2	21	0.0952	0.0500	1
62	-	2	0.0000	0.0100	-
63	-	5	0.0000	0.0100	-
64	-	1	0.0000	0.0100	-
Over 64	1	37	0.0270		
Totals	8	164			3



## Executive and Elected State Reduced Retirement Experience during Calendar Year 2023

### Male and Female Age-Based Reduced Retirement Experience

Age	Retirements	Exposure	Crude Rates	Current Rates	Expected Retirements
55	-	28	0.0000	0.0600	2
56	1	22	0.0455	0.0600	1
57	1	23	0.0435	0.0600	1
58	3	21	0.1429	0.0600	1
59	3	19	0.1579	0.0600	1
60	2	19	0.1053	0.0600	1
61	-	13	0.0000	0.0600	1
62	-	1	0.0000	0.0600	-
63	-	2	0.0000	0.0300	-
64	-	4	0.0000	0.0300	-
Over 64	1	8	0.1250		
Totals	11	160			8

## Death-in-Service during Calendar Year 2023

### Male

Age	Deaths	Exposure	Crude Rates	Current Rates	Expected Deaths
Under 20	-	58	0.0000	0.0004	-
20-24	1	2,436	0.0004	0.0003	1
25-29	-	7,896	0.0000	0.0002	2
30-34	4	10,651	0.0004	0.0003	3
35-39	1	12,600	0.0001	0.0004	5
40-44	5	13,563	0.0004	0.0006	8
45-49	7	13,051	0.0005	0.0009	12
50-54	11	13,568	0.0008	0.0015	20
55-59	10	10,996	0.0009	0.0023	25
60-64	14	7,644	0.0018	0.0036	28
65-69	6	2,986	0.0020	0.0060	18
70-74	2	832	0.0024	0.0094	8
75 and over	2	2	1.0000	0.0157	-
Totals	63	96,283	0.0007	0.0014	130

### Female

Age	Deaths	Exposure	Crude Rates	Current Rates	Expected Deaths
Under 20	-	96	0.0000	0.0001	-
20-24	1	4,539	0.0002	0.0001	1
25-29	2	14,469	0.0001	0.0001	2
30-34	1	17,832	0.0001	0.0002	3
35-39	3	20,326	0.0001	0.0003	6
40-44	3	22,240	0.0001	0.0004	10
45-49	8	21,980	0.0004	0.0007	15
50-54	9	22,233	0.0004	0.0010	22
55-59	6	20,289	0.0003	0.0014	29
60-64	19	13,499	0.0014	0.0023	31
65-69	5	4,243	0.0012	0.0039	17
70-74	6	894	0.0067	0.0071	6
75 and over	1	-	N/A	0.0137	-
Totals	64	162,640	0.0004	0.0009	142

## **APPENDIX**

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### **GLOSSARY**

## Glossary

**Accrued Service.** The service credited under the plan which was rendered before the date of the actuarial valuation.

**Actuarial Accrued Liability.** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”

**Actuarial Assumptions.** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Equivalent.** A series of payments is called an actuarial equivalent of another series of payments if the two series have the same actuarial present value.

**Actuarial Present Value.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

**Experience Gain (Loss).** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

**Normal Cost.** The annual cost assumed, under the actuarial funding method, for current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Plan Termination Liability.** The actuarial present value of future plan benefits based on the assumption that there will be no future accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a “going-concern” basis and is not normally determined in a routine actuarial valuation.

**Reserve Account.** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.



## Glossary (Concluded)

**Unfunded Actuarial Accrued Liability.** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”

**Valuation Assets.** The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.