

Wisconsin Retirement System

GASB Statement No. 68

Employer Reporting Accounting Schedules

December 31, 2023



Table of Contents

Page

Section A	Executive Summary	
	Executive Summary.....	1
	Discussion.....	2
Section B	Financial Statements	
	Statement of Pension Expense/(Income) under GASB Statement No. 68	6
	Statement of Outflows and Inflows Arising from Current Reporting Period	7
	Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods.....	8
	Recognition of Deferred Outflows and Inflows of Resources.....	9
	Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Current Period	10
	Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Multiyear.....	11
	Schedule of Contributions Multiyear	12
	Notes to Schedule of Contributions.....	13
	Single Discount Rate	14
	Sensitivity of Net Pension Liability/(Asset) to the Single Discount Rate Assumption	15
Section C	Calculation of the Single Discount Rate	
	Calculation of the Single Discount Rate	16
	Projection of Contributions.....	17
	Projection of Plan Fiduciary Net Position	19
	Present Values of Projected Benefits.....	21
Section D	Summary of Assumptions	23
Section E	Plan Provisions	29
Section F	Glossary of Terms	32





July 18, 2024

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

Dear Board Members:

This report provides certain information requested by the Wisconsin Retirement System (“WRS”) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 68 “Accounting and Financial Reporting for Pensions.”

The actuarial calculations in connection with this report were prepared for the purpose of complying with the requirements of GASB Statement No. 68. These calculations have been made on a basis that is consistent with our understanding of this Statement. Calculations for purposes of complying with the requirements of GASB Statement No. 67 will be provided in a separate report.

The total pension liability shown in this report is based on a roll-forward of the December 31, 2022 valuation liabilities to December 31, 2023. The calculation of the plan’s liability for this report is not applicable for funding purposes of the plan. A calculation of the plan’s liability for purposes other than satisfying the requirements of GASB Statement No. 68 may produce significantly different results. This report may be provided to parties other than the WRS only in its entirety and only with the permission of the WRS. GRS is not responsible for unauthorized use of this report.

The report was based upon information, furnished by the Department of Employee Trust Funds (DETF), concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of any data provided by DETF.

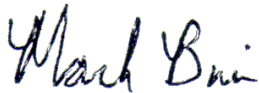
This report complements the actuarial valuation report that we provided to the Board and should be considered in conjunction with that report. Please see the actuarial valuation report as of December 31, 2022 for additional discussion of the nature of actuarial calculations and more information related to participant data, and benefit provisions.

This system-wide report is intended to assist in preparation of the financial statements of WRS and its participating employers. Financial statements are the responsibility of the reporting entity and not the actuary. The statements are subject to an auditor’s review. Please let us know if the plan’s auditor recommends any changes. Employer level schedules are developed by GRS and provided to DETF separately from this report.

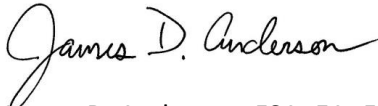
This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that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

To the best of our knowledge, the information contained in this report is accurate, and fairly represents the actuarial position of WRS. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. 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 Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



Mark Buis, FSA, EA, FCA, MAAA



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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2023

	2023	2022
Actuarial Valuation Date	December 31, 2022	December 31, 2021
Measurement Date of the Net Pension Liability/(Asset)	December 31, 2023	December 31, 2022
Membership as of the Actuarial Valuation Date		
Number of		
- Retirees and Beneficiaries	233,804	228,161
- Inactive, Nonretired Members	181,758	174,799
- Active Members	259,592	257,683
- Total	675,154	660,643
Covered Payroll ⁽¹⁾	\$ 17,435,263,354	\$ 16,361,316,730
Net Pension Liability/(Asset)		
Total Pension Liability	\$ 129,184,614,374	\$ 123,665,929,615
Plan Fiduciary Net Position	127,697,808,319	118,368,225,822
Net Pension Liability/(Asset)	\$ 1,486,806,055	\$ 5,297,703,793
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	98.85%	95.72%
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	8.53%	32.38%
Development of the Single Discount Rate		
Single Discount Rate	6.80%	6.80%
Long-Term Expected Rate of Investment Return	6.80%	6.80%
Long-Term Municipal Bond Rate ⁽²⁾	3.77%	4.05%
Last year ending December 31 in the 2024 to 2123 projection period for which projected benefit payments are fully funded	2123	2122
Total Pension Expense/(Income)	\$ 1,026,477,776	\$ 2,694,289,124

Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	\$ 5,994,786,984	\$ 7,940,132,262
Changes in assumptions	648,056,063	-
Net difference between projected and actual earnings on pension plan investments	5,181,277,291	-
Total	\$ 11,824,120,338	\$ 7,940,132,262

⁽¹⁾ Covered payroll is for 2023 and was provided by DETF.

⁽²⁾ Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-year Municipal GO AA Index" as of December 29, 2023. In describing this index, Fidelity notes that the Municipal Curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities. The municipal bond rate is used as the discount rate in years where assets are not projected to be sufficient to meet benefit payments.



Discussion

Accounting Standard

For state and local government employers (as well as certain non-employers) that contribute to a Defined Benefit (DB) pension plan administered through a trust or equivalent arrangement, Governmental Accounting Standards Board (GASB) Statement No. 68 establishes standards for pension accounting and financial reporting. Under GASB Statement No. 68, the employer must account for and disclose the net pension liability/(asset), pension expense/(income), and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information is not included in this report if it is not actuarial in nature, such as the notes to the financial statements regarding accounting policies and investments. As a result, the retirement system and/or plan sponsor is responsible for preparing and disclosing the non-actuarial information needed to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state and local government employers that contribute to DB pension plans to recognize the net pension liability/(asset) and the pension expense/(income) on their financial statements, along with the related deferred outflows of resources and deferred inflows of resources. The net pension liability/(asset) is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

The pension expense/(income) recognized each fiscal year is equal to the change in the net pension liability/(asset) from the beginning of the year to the end of the year, adjusted for deferred recognition of the certain changes in the liability and investment experience.

It is our understanding that the WRS is a cost sharing multiple employer plan. The purpose of this report is to develop the required information in aggregate. Reporting for individual employers will be developed by GRS in accordance with each employer's proportionate share and reported to each employer by the DETF.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense/(income), the pension plan's liabilities and assets, and deferred outflows of resources and inflows of resources related to pensions.

In addition, GASB Statement No. 68 requires the notes of the financial statements for the employers to include certain additional information, including:

- A description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- The number and classes of employees covered by the benefit terms;
- For the current year, sources of changes in the net pension liability/(asset);
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the Single Discount Rate;
- Certain information about mortality assumptions and the dates of experience studies;
- The date of the valuation used to determine the total pension liability;
- Information about changes of assumptions or other inputs and benefit terms;
- The basis for determining contributions to the plan, including a description of the plan's funding policy, as well as member and employer contribution requirements;
- The total pension liability, fiduciary net position, net pension liability/(asset), and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability/(asset) using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability/(asset) for financial reporting purposes; and
- A description of the system that administers the pension plan.

Required Supplementary Information

The financial statements of employers also include required supplementary information showing the 10-year fiscal history of:

- Sources of changes in the net pension liability/(asset);
- Information about the components of the net pension liability/(asset) and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability/(asset) as a percent of covered-employee payroll; and
- Comparison of actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

These schedules may be built prospectively.

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 employer normal cost as a percentage of pay will decrease to the level of the future service normal cost as time passes.
2. The unfunded liability is expected to 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.

This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2123. The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the total pension liability and the market 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 amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status 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 actuarial value of assets were used instead of the market value of assets.

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.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. For the employer's financial reporting purposes, the net pension liability/(asset) and pension expense/(income) should be measured as of the employer's "measurement date" which may not be earlier than the employer's prior fiscal year-end date. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled-forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of December 31, 2022 with roll-forward to December 31, 2023 and a measurement date of December 31, 2023. The roll-forward included adjustments in the liability due to changes in dividend adjustments, if any, for current and future retired members.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects: (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits); and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the plan's projected fiduciary net position is not sufficient to pay benefits).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.80%; the municipal bond rate is 3.77% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 6.80%.

Actuarial Assumptions and Methods and Member Census Data

The actuarial assumptions used in this study were adopted by the Board pursuant to the three-year experience study covering the period January 1, 2018 through December 31, 2020. The actuarial assumptions and methods employed for purposes of our Actuarial Study are shown in Section D of this report.

The member census data employed for purposes of our Actuarial Study was provided by DETF and is the same member census data used for the December 31, 2022 Actuarial Valuation Report of the Retirement System.

The Wisconsin Retirement System uses the Frozen Entry Age Cost Method for determining funding requirements. GASB Statement No. 68 requires the use of the Entry Age Normal Cost Method for accounting purposes. Therefore, we developed the Entry Age Normal Accrued Liability to reflect the Total Pension Liability for GASB purposes.

SECTION B

FINANCIAL STATEMENTS

**Statement of Pension Expense/(Income)
under GASB Statement No. 68
Fiscal Year Ended December 31, 2023**

A. Expense/(Income)

1. Service Cost	\$ 2,278,256,377
2. Interest on the Total Pension Liability	8,240,258,360
3. Current-Period Benefit Changes	0
4. Employee Contributions (made negative for addition here)	(1,204,469,156)
5. Projected Earnings on Plan Investments (made negative for addition here)	(7,887,654,439)
6. Pension Plan Administrative Expense	29,061,321
7. Other Changes in Plan Fiduciary Net Position	0
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	1,941,270,716
9. Recognition of Outflow (Inflow) of Resources due to Assets	<u>(2,370,245,403)</u>
10. Total Pension Expense/(Income)	\$ 1,026,477,776



Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended December 31, 2023

A. Outflows (Inflows) of Resources Due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses ⁽¹⁾	\$ 2,249,745,631
2. Assumption Changes (gains) or losses	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	4.4773
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$ 502,478,197
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ -
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 502,478,197
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	\$ 1,747,267,434
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$ -
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$ 1,747,267,434

B. Outflows (Inflows) of Resources Due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (6,188,543,256)
2. Recognition period for Assets {in years}	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$ (1,237,708,651)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (4,950,834,605)

⁽¹⁾ Starting with 2015, this item includes the impact of known Market Recognition Account deferred gains/losses on the liability for dividend payments. See page 23 for a full description.



Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended December 31, 2023

A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	\$ 5,086,251,213	\$ 3,144,980,497	\$ 1,941,270,716
2. Due to Assets	-	2,370,245,403	(2,370,245,403)
3. Total	\$ 5,086,251,213	\$ 5,515,225,900	\$ (428,974,687)

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 4,692,559,419	\$ 3,144,980,497	\$ 1,547,578,922
2. Assumption Changes	393,691,794	-	393,691,794
3. Net Difference between projected and actual earnings on pension plan investments	-	2,370,245,403	(2,370,245,403)
4. Total	\$ 5,086,251,213	\$ 5,515,225,900	\$ (428,974,687)

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 5,994,786,984	\$ 7,940,132,262	\$ (1,945,345,278)
2. Assumption Changes	648,056,063	-	648,056,063
3. Net Difference between projected and actual earnings on pension plan investments	5,181,277,291	-	5,181,277,291
4. Total	\$ 11,824,120,338	\$ 7,940,132,262	\$ 3,883,988,076

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending December 31	Net Deferred Outflows of Resources
2024	\$ 795,336,985
2025	834,823,016
2026	3,251,703,884
2027	(997,875,809)
2028	-
Thereafter	-
Total	\$ 3,883,988,076



Recognition of Deferred Outflows and Inflows of Resources
Actuarial Valuation Date – December 31, 2022
Measurement Date – December 31, 2023
Reporting Date – December 31, 2023

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) Due to Differences between Expected and Actual Experience on Liabilities					
2019	\$ 5,473,337,212	4.6706	\$ 785,856,192	\$ -	0.0000
2020	6,376,708,179	4.6559	1,369,597,324	898,318,883	0.6559
2021	9,453,083,785	4.6461	2,034,627,706	3,349,200,667	1.6461
2022	(14,230,093,256)	4.5247	(3,144,980,497)	(7,940,132,262)	2.5247
2023	2,249,745,631	4.4773	502,478,197	1,747,267,434	3.4773
Total			\$ 1,547,578,922	\$ (1,945,345,278)	
Deferred Outflow (Inflow) Due to Assumption Changes					
2019	\$ -	4.6706	\$ -	\$ -	0.0000
2020	-	4.6559	-	-	0.6559
2021	1,829,131,445	4.6461	393,691,794	648,056,063	1.6461
2022	-	4.5247	-	-	2.5247
2023	-	4.4773	-	-	3.4773
Total			\$ 393,691,794	\$ 648,056,063	
Deferred Outflow (Inflow) Due to Differences between Projected and Actual Earnings on Plan Investments					
2019	\$ (12,407,231,511)	5.0000	\$ (2,481,446,303)	\$ -	0.0000
2020	(8,985,935,923)	5.0000	(1,797,187,185)	(1,797,187,183)	1.0000
2021	(12,455,044,344)	5.0000	(2,491,008,869)	(4,982,017,737)	2.0000
2022	28,185,528,026	5.0000	5,637,105,605	16,911,316,816	3.0000
2023	(6,188,543,256)	5.0000	(1,237,708,651)	(4,950,834,605)	4.0000
Total			\$ (2,370,245,403)	\$ 5,181,277,291	

Recognition of Deferred Outflows and Inflows of Resources

According to Paragraph 33 of GASB Statement No. 68, *differences between expected and actual experience* and *changes in assumptions* are recognized in pension expense using a systematic and rational method over a closed period equal to the average of the expected remaining service lives of all employees that are provided with pensions through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.

At the beginning of the current measurement period, the expected remaining service lives of all active employees in the plan was approximately 3,022,875 years. Additionally, the total plan membership (active employees and inactive employees) was 675,154. As a result, the average of the expected remaining service lives for purposes of recognizing the applicable deferred outflows and inflows of resources established in the current measurement period is 4.4773 years.

Additionally, *differences between projected and actual earnings on pension plan investments* should be recognized in pension expense using a systematic and rational method over a closed five-year period.

In accordance with the requirements of GASB Statement No. 68, the deferred outflows and inflows of resources are recognized in the pension expense as level dollar amounts over the various remaining closed periods shown above.



Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Current Period Fiscal Year Ended December 31, 2023

A. Total pension liability	
1. Service Cost	\$ 2,278,256,377
2. Interest on the total pension liability	8,240,258,360
3. Changes of benefit terms	-
4. Difference between expected and actual experience of the total pension liability	2,249,745,631
5. Changes of assumptions	-
6. Benefit payments, including refunds of employee contributions	(7,249,575,609)
7. Net change in total pension liability	\$ 5,518,684,759
8. Total pension liability – beginning	123,665,929,615
9. Total pension liability – ending	<u><u>\$ 129,184,614,374</u></u>
B. Plan fiduciary net position	
1. Contributions – employer	\$ 1,327,552,576
2. Contributions – employee	1,204,469,156
3. Net investment income	14,076,197,695
4. Benefit payments, including refunds of employee contributions	(7,249,575,609)
5. Pension plan administrative expense	(29,061,321)
6. Other	-
7. Net change in plan fiduciary net position	\$ 9,329,582,497
8. Plan fiduciary net position – beginning	118,368,225,822
9. Plan fiduciary net position – ending	<u><u>\$ 127,697,808,319</u></u>
C. Net pension liability/(asset)	<u><u>\$ 1,486,806,055</u></u>
D. Plan fiduciary net position as a percentage of the total pension liability	98.85%
E. Covered-employee payroll⁽¹⁾	\$ 17,435,263,354
F. Net pension liability/(asset) as a percentage of covered-employee payroll	8.53%

⁽¹⁾ Covered payroll provided by DETF.

Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Multiyear

Last 10 Fiscal Years

Fiscal year ending December 31,	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability										
Service Cost	\$ 2,278,256,377	\$ 2,178,921,078	\$ 2,019,309,706	\$ 1,975,773,133	\$ 1,902,507,977	\$ 1,860,937,125	\$ 1,842,879,321	\$ 1,814,134,799	\$ 1,787,870,316	\$ 1,757,020,910
Interest on the Total Pension Liability	8,240,258,360	8,933,501,306	8,157,487,429	7,480,695,373	6,888,058,586	7,169,731,242	6,627,171,441	6,372,404,646	6,347,123,575	6,089,287,273
Benefit Changes	-	-	-	-	-	-	-	-	-	-
Experience ⁽¹⁾	2,249,745,631	(14,230,093,256)	9,453,083,785	6,376,708,179	5,473,337,212	(4,968,302,189)	4,459,497,323	150,347,332	(4,247,328,263)	437,265,852
Assumption Changes	-	-	1,829,131,445	-	-	361,481,239	-	-	1,412,040,786	-
Benefit Payments	(7,195,376,514)	(6,949,119,380)	(6,352,709,068)	(5,939,365,686)	(5,646,263,647)	(5,516,188,518)	(5,211,266,989)	(5,022,920,827)	(4,823,586,513)	(4,540,247,874)
Refunds	(54,199,095)	(54,796,982)	(42,041,646)	(38,857,677)	(44,106,052)	(40,234,768)	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)
Net Change in Total Pension Liability	5,518,684,759	(10,121,587,234)	15,064,261,651	9,854,953,322	8,573,534,076	(1,132,575,869)	7,679,922,998	3,274,690,348	438,477,497	3,708,924,980
Total Pension Liability - Beginning⁽²⁾	123,665,929,615	133,787,516,849	118,723,255,198	108,868,301,876	100,294,767,800	101,427,343,669	93,747,420,671	90,129,650,901	89,691,173,404	85,982,248,424
Total Pension Liability - Ending (a)	\$ 129,184,614,374	\$ 123,665,929,615	\$ 133,787,516,849	\$ 118,723,255,198	\$ 108,868,301,876	\$ 100,294,767,800	\$ 101,427,343,669	\$ 93,404,341,249	\$ 90,129,650,901	\$ 89,691,173,404
Plan Fiduciary Net Position										
Employer Contributions ⁽³⁾	\$ 1,327,552,576	\$ 1,175,881,349	\$ 1,164,586,150	\$ 1,133,315,516	\$ 1,046,942,283	\$ 1,030,507,544	\$ 1,017,558,990	\$ 963,121,911	\$ 977,733,921	\$ 987,792,834
Employee Contributions	1,204,469,156	1,082,039,863	1,086,781,945	1,053,242,596	987,662,027	972,950,131	965,452,633	921,863,806	937,225,184	941,903,267
Pension Plan Net Investment Income	14,076,197,695	(18,702,308,045)	21,056,558,127	16,698,556,768	19,049,541,932	(4,049,354,577)	14,875,414,636	7,273,069,087	(673,122,812)	4,891,014,826
Benefit Payments	(7,195,376,514)	(6,949,119,380)	(6,352,709,068)	(5,939,365,686)	(5,646,263,647)	(5,516,188,518)	(5,211,266,989)	(5,022,920,827)	(4,823,586,513)	(4,540,247,874)
Refunds	(54,199,095)	(54,796,982)	(42,041,646)	(38,857,677)	(44,106,052)	(40,234,768)	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)
Pension Plan Administrative Expense	(29,061,321)	(31,171,842)	(31,868,580)	(33,256,008)	(34,197,722)	(31,612,198)	(26,132,873)	(20,426,189)	(22,708,614)	(24,036,951)
Other	-	-	-	-	(3,901,654)	(25,448,686)	-	-	-	-
Net Change in Plan Fiduciary Net Position	9,329,582,497	(23,479,475,037)	16,881,306,928	12,873,635,509	15,355,677,167	(7,659,381,072)	11,582,668,299	4,075,432,186	(3,642,101,238)	2,222,024,921
Plan Fiduciary Net Position - Beginning⁽⁴⁾	118,368,225,822	141,847,700,859	124,966,393,931	112,092,758,422	96,737,081,255	104,396,462,327	92,813,794,028	88,504,670,309	92,146,771,547	89,924,746,626
Plan Fiduciary Net Position - Ending (b)	\$ 127,697,808,319	\$ 118,368,225,822	\$ 141,847,700,859	\$ 124,966,393,931	\$ 112,092,758,422	\$ 96,737,081,255	\$ 104,396,462,327	\$ 92,580,102,495	\$ 88,504,670,309	\$ 92,146,771,547
Net Pension Liability/(Asset) - Ending (a) - (b)	1,486,806,055	5,297,703,793	(8,060,184,010)	(6,243,138,733)	(3,224,456,546)	3,557,686,545	(2,969,118,658)	824,238,754	1,624,980,592	(2,455,598,143)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	98.85 %	95.72 %	106.02 %	105.26 %	102.96 %	96.45 %	102.93 %	99.12 %	98.20 %	102.74 %
Covered-Employee Payroll⁽⁵⁾	\$ 17,435,263,354	\$ 16,361,316,730	\$ 15,780,837,258	\$ 15,359,928,023	\$ 14,832,491,878	\$ 14,301,446,269	\$ 13,943,116,649	\$ 13,706,000,000	\$ 13,530,500,000	\$ 13,219,500,000
Net Pension Liability/(Asset) as a Percentage of Covered-Employee Payroll	8.53 %	32.38 %	(51.08)%	(40.65)%	(21.74)%	24.88 %	(21.29)%	6.01 %	12.01 %	(18.58)%

⁽¹⁾ Starting with 2015, this item includes the impact of known Market Recognition Account deferred gains/losses on the liability for dividend payments. See page 23 for a full description.

⁽²⁾ In 2017, beginning of year liabilities were adjusted by \$343,079,422 to reflect the Long-Term Disability Insurance (LTDI) program -- this amount was provided in Milliman Inc.'s December 31, 2016 actuarial valuation of the Long-Term Disability Insurance Plan dated April 21, 2017.

⁽³⁾ Employer contributions shown in the above table includes Employer Required Contributions in addition to contributions paid by specific employers for unique circumstances such as Prior Service Contributions, Early Retirement Contributions, and Employer Additional Contributions.

⁽⁴⁾ As of calendar year 2017, the LTDI program is reported within the Wisconsin Retirement System (WRS). Accordingly, there is an adjustment to the calendar year 2017 beginning net position of \$233,691,533 to reflect LTDI assets.

⁽⁵⁾ Covered payroll provided by DETF.



Schedule of Contributions Multiyear

Last 10 Fiscal Years

FY Ending December 31,	Actuarially Determined Contribution^{(1),(2)}	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll⁽³⁾	Actual Contribution as a % of Covered Payroll
2014	\$ 977,068,988	\$ 977,068,988	\$ -	\$ 13,219,500,000	7.39%
2015	967,730,052	967,730,052	-	13,530,500,000	7.15%
2016	954,159,009	954,159,009	-	13,706,000,000	6.96%
2017	1,014,870,679	1,014,870,679	-	13,943,116,649	7.28%
2018	1,028,390,526	1,028,390,526	-	14,301,446,269	7.19%
2019	1,044,964,610	1,044,964,610	-	14,832,491,878	7.05%
2020	1,131,486,002	1,131,486,002	-	15,359,928,023	7.37%
2021	1,162,794,127	1,162,794,127	-	15,780,837,258	7.37%
2022	1,174,661,864	1,174,661,864	-	16,361,316,730	7.18%
2023	1,326,113,389	1,326,113,389	-	17,435,263,354	7.61%

⁽¹⁾ Since it is the actuary's understanding that the System's practice is to require employers to contribute the percent-of-payroll employer contribution rate shown in the actuarial valuation report, the Actuarially Determined Contributions shown in the Schedule of Contributions are the actual contributions made by the participating employers in the fiscal year.

⁽²⁾ Starting with 2016, Actuarially Determined Contributions includes Employer Required Contributions, paid by each employer based on a percentage of payroll. This amount excludes contributions paid by specific employers for unique circumstances such as Prior Service Contributions, Early Retirement Contributions, and Employer Additional Contributions.

⁽³⁾ Covered payroll provided by DETF.

Notes to Schedule of Contributions

Summary of Actuarial Methods and Assumptions Used in the Calculation of the 2023 Actuarially Determined Contribution (ADC)

Valuation Date: December 31, 2021

Methods and Assumptions Used to Determine Actuarial Contribution on prior page:

Actuarial Cost Method	Frozen Entry Age
Amortization Method	Level Percent of Payroll - Closed Amortization Period
Amortization Period	30-Year closed from date of participation in WRS
Asset Valuation Method	5-Year smoothed value
Inflation	No specific price inflation assumption is required to perform this valuation. The price inflation assumption used to evaluate the investment return assumption is 2.5%.
Salary Increases	3.1% to 8.6% including inflation
Net Investment Rate of Return	5.40%
Weighted based on assumed rate for:	
Retired participants	5.00%
Active participants	
Post-retirement participants	5.00%
Pre-retirement participants	6.80%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2021 valuation pursuant to an experience study of the period 2018-2020.
Mortality	Wisconsin 2020 mortality table adjusted for future mortality improvements using the MP-2021 fully generational improvement scale.

Other Information:

Notes The actuarially determined contribution for calendar year 2023 was determined from the December 31, 2021 actuarial valuation.



Single Discount Rate

A single discount rate of 6.80% was used to measure the total pension liability, which was based on the expected rate of return on pension plan investments. Because of the unique structure of WRS, the 6.80% expected rate of return implies that a dividend of approximately 1.7% will always be paid after reflecting known changes in the Market Recognition Account. For purposes of the single discount rate, it was assumed that the dividend would always be paid. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments (including expected dividends) of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability/(asset) to changes in the single discount rate, the following presents the plan's net pension liability/(asset), calculated using a single discount rate of 6.80%, as well as what the plan's net pension liability/(asset) would be if it were calculated using a single discount rate that is 100 basis points lower or 100 basis points higher:

Sensitivity of Net Pension Liability/(Asset) to the Single Discount Rate Assumption

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	5.80%	6.80%	7.80%
Ultimate Dividend Rate	1.7%	1.7%	1.7%
Total Pension Liability	\$ 142,068,506,498	\$ 129,184,614,374	\$ 120,169,209,864
Plan Fiduciary Net Position	127,697,808,319	127,697,808,319	127,697,808,319
Net Pension Liability/(Asset)	\$ 14,370,698,179	\$ 1,486,806,055	\$ (7,528,598,455)

This schedule above is presented because it is required by GASB standards. Users of this report should not conclude that the authors view the upper end of the range as reasonable. For the WRS, the determination of liabilities also depends on the assumed dividend which is linked to the interest rate used in the liability calculation. Therefore, we have also shown an alternative set of Sensitivity Analysis which varies the assumed dividend in conjunction with the change in the discount rate. For the liabilities shown below, the assumed dividend was 0.8% for the 5.80% discount rate, 1.7% for the 6.80% discount rate, and 2.7% for the 7.80% discount rate.

Sensitivity of Net Pension Liability/(Asset) to the Single Discount Rate Assumption

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	5.80%	6.80%	7.80%
Ultimate Dividend Rate	0.8%	1.7%	2.7%
Total Pension Liability	\$ 134,344,778,814	\$ 129,184,614,374	\$ 125,414,935,336
Plan Fiduciary Net Position	127,697,808,319	127,697,808,319	127,697,808,319
Net Pension Liability/(Asset)	\$ 6,646,970,495	\$ 1,486,806,055	\$ (2,282,872,983)

SECTION C

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects: (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits); and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Bond Buyer Index) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.80%; the municipal bond rate is 3.77%; and the resulting SDR is 6.80%.

We deemed administrative expenses to be immaterial for the purpose of developing the single discount rate and, consequently, did not include them in the calculation.

The tables in this section provide background for the development of the SDR.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities). The contribution rate for the first year was developed from the 2022 actuarial valuation (14.70%). Expected contribution rates gradually increase as the unrecognized asset losses from the Market Recognition Account are phased in over the next five years. The expected contribution rate then decreases over time as the Experience Amortization Reserve (EAR) component is paid down and is assumed to migrate to the ultimate contribution rate of 14.09% by the end of the projection period.

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

The WRS funding policy as it affects the closed group cannot be modelled with 100% accuracy. In reality, assets that appear to be left over after all benefit obligations are satisfied, if any, would be assigned to the funding benefits of people who enter the plan after the measurement date.

Single Discount Rate Development Projection of Contributions Ending December 31, 2123

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
1	\$ 15,396,895,566	\$ 1,064,554,700	\$ 1,205,284,745	\$ -	\$ 2,269,839,445
2	14,914,404,434	994,324,339	1,125,770,201	-	2,120,094,540
3	14,462,864,064	962,096,367	1,089,281,814	-	2,051,378,181
4	14,028,011,091	955,000,725	1,081,248,155	-	2,036,248,880
5	13,605,028,260	977,472,676	1,106,690,812	-	2,084,163,488
6	13,191,415,333	934,017,704	1,057,491,260	-	1,991,508,964
7	12,783,601,314	902,984,222	1,022,355,270	-	1,925,339,492
8	12,378,450,590	872,350,820	987,672,250	-	1,860,023,070
9	11,973,384,135	841,924,931	953,224,175	-	1,795,149,106
10	11,565,931,139	811,523,673	918,803,987	-	1,730,327,660
11	11,151,681,490	780,830,240	884,053,002	-	1,664,883,242
12	10,725,243,054	749,462,017	848,538,019	-	1,598,000,036
13	10,287,336,908	717,465,845	812,312,077	-	1,529,777,922
14	9,839,429,925	684,940,127	775,486,584	-	1,460,426,711
15	9,381,368,382	651,869,962	738,044,670	-	1,389,914,632
16	8,914,932,386	618,374,751	700,121,520	-	1,318,496,271
17	8,442,404,763	584,607,955	661,890,884	-	1,246,498,839
18	7,963,734,689	550,560,803	623,342,829	-	1,173,903,632
19	7,476,654,050	516,071,680	584,294,376	-	1,100,366,056
20	6,979,861,270	481,046,717	544,639,247	-	1,025,685,964
21	6,473,792,373	445,512,270	504,407,283	-	949,919,553
22	5,962,000,770	409,708,845	463,870,781	-	873,579,626
23	5,448,578,276	373,912,650	423,342,467	-	797,255,117
24	4,936,863,270	338,346,942	383,075,110	-	721,422,052
25	4,431,310,996	303,310,497	343,406,980	-	646,717,477
26	3,935,484,343	269,039,873	304,605,912	-	573,645,785
27	3,453,273,581	235,793,189	266,964,144	-	502,757,333
28	2,986,788,110	203,706,286	230,635,475	-	434,341,761
29	2,537,394,734	172,864,229	195,716,217	-	368,580,446
30	2,116,692,825	144,048,511	163,091,172	-	307,139,683
31	1,736,404,432	118,046,156	133,651,404	-	251,697,560
32	1,399,887,915	95,073,591	107,641,954	-	202,715,545
33	1,109,480,610	75,277,837	85,229,278	-	160,507,115
34	866,647,240	58,746,928	66,513,046	-	125,259,974
35	669,203,646	45,322,159	51,313,575	-	96,635,734
36	511,057,197	34,581,587	39,153,140	-	73,734,727
37	385,430,865	26,059,026	29,503,930	-	55,562,956
38	286,813,260	19,375,812	21,937,220	-	41,313,032
39	210,606,748	14,216,551	16,095,924	-	30,312,475
40	152,754,358	10,303,593	11,665,689	-	21,969,282
41	109,641,225	7,390,155	8,367,105	-	15,757,260
42	77,824,986	5,241,968	5,934,936	-	11,176,904
43	54,751,201	3,685,321	4,172,506	-	7,857,827
44	38,387,231	2,582,171	2,923,525	-	5,505,696
45	26,712,793	1,795,743	2,033,133	-	3,828,876
46	18,354,673	1,233,127	1,396,141	-	2,629,268
47	12,384,778	831,562	941,492	-	1,773,054
48	8,104,279	543,845	615,740	-	1,159,585
49	5,092,198	341,530	386,680	-	728,210
50	2,984,345	200,053	226,499	-	426,552



Single Discount Rate Development Projection of Contributions Ending December 31, 2123 (Concluded)

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
51	\$ 1,551,444	\$ 103,947	\$ 117,688	\$ -	\$ 221,635
52	707,431	47,375	53,637	-	101,012
53	313,203	20,964	23,736	-	44,700
54	143,577	9,606	10,876	-	20,482
55	53,438	3,574	4,046	-	7,620
56	12,454	832	943	-	1,775
57	373	25	28	-	53
58	2	-	-	-	-
59	-	-	-	-	-
60	-	-	-	-	-
61	-	-	-	-	-
62	-	-	-	-	-
63	-	-	-	-	-
64	-	-	-	-	-
65	-	-	-	-	-
66	-	-	-	-	-
67	-	-	-	-	-
68	-	-	-	-	-
69	-	-	-	-	-
70	-	-	-	-	-
71	-	-	-	-	-
72	-	-	-	-	-
73	-	-	-	-	-
74	-	-	-	-	-
75	-	-	-	-	-
76	-	-	-	-	-
77	-	-	-	-	-
78	-	-	-	-	-
79	-	-	-	-	-
80	-	-	-	-	-
81	-	-	-	-	-
82	-	-	-	-	-
83	-	-	-	-	-
84	-	-	-	-	-
85	-	-	-	-	-
86	-	-	-	-	-
87	-	-	-	-	-
88	-	-	-	-	-
89	-	-	-	-	-
90	-	-	-	-	-
91	-	-	-	-	-
92	-	-	-	-	-
93	-	-	-	-	-
94	-	-	-	-	-
95	-	-	-	-	-
96	-	-	-	-	-
97	-	-	-	-	-
98	-	-	-	-	-
99	-	-	-	-	-
100	-	-	-	-	-



Single Discount Rate Development Projection of Plan Fiduciary Net Position Ending December 31, 2123

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 6.80%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
1	\$ 127,697,808,319	\$ 2,269,839,445	\$ 8,022,780,725	\$ 8,491,067,693	\$ 130,435,934,731
2	130,435,934,731	2,120,094,540	8,233,118,154	8,665,218,828	132,988,129,945
3	132,988,129,945	2,051,378,181	8,320,384,296	8,833,551,914	135,552,675,744
4	135,552,675,744	2,036,248,880	8,337,452,378	9,006,864,320	138,258,336,566
5	138,258,336,566	2,084,163,488	8,589,472,032	9,184,023,809	140,937,051,831
6	140,937,051,831	1,991,508,964	8,819,376,744	9,355,389,791	143,464,573,842
7	143,464,573,842	1,925,339,492	9,049,055,745	9,517,367,862	145,858,225,451
8	145,858,225,451	1,860,023,070	9,271,668,912	9,670,507,560	148,117,087,169
9	148,117,087,169	1,795,149,106	9,491,332,873	9,814,594,965	150,235,498,366
10	150,235,498,366	1,730,327,660	9,720,002,141	9,948,832,346	152,194,656,231
11	152,194,656,231	1,664,883,242	9,952,976,743	10,072,075,694	153,978,638,424
12	153,978,638,424	1,598,000,036	10,181,729,571	10,183,500,161	155,578,409,051
13	155,578,409,051	1,529,777,922	10,405,097,543	10,282,533,542	156,985,622,973
14	156,985,622,973	1,460,426,711	10,616,539,303	10,368,834,132	158,198,344,513
15	158,198,344,513	1,389,914,632	10,818,931,664	10,442,173,039	159,211,500,520
16	159,211,500,520	1,318,496,271	11,011,503,789	10,502,239,580	160,020,732,583
17	160,020,732,583	1,246,498,839	11,200,375,838	10,548,543,662	160,615,399,246
18	160,615,399,246	1,173,903,632	11,391,190,059	10,580,172,359	160,978,285,178
19	160,978,285,178	1,100,366,056	11,588,816,584	10,595,780,643	161,085,615,293
20	161,085,615,293	1,025,685,964	11,788,333,880	10,593,909,696	160,916,877,072
21	160,916,877,072	949,919,553	11,979,701,632	10,573,502,302	160,460,597,296
22	160,460,597,296	873,579,626	12,163,916,062	10,533,762,117	159,704,022,976
23	159,704,022,976	797,255,117	12,344,258,266	10,473,731,909	158,630,751,736
24	158,630,751,736	721,422,052	12,511,333,287	10,392,626,410	157,233,466,912
25	157,233,466,912	646,717,477	12,660,305,537	10,290,131,098	155,510,009,950
26	155,510,009,950	573,645,785	12,789,861,272	10,166,159,991	153,459,954,454
27	153,459,954,454	502,757,333	12,909,804,340	10,020,374,648	151,073,282,094
28	151,073,282,094	434,341,761	13,016,599,560	9,852,221,729	148,343,246,024
29	148,343,246,024	368,580,446	13,068,598,965	9,662,641,257	145,305,868,761
30	145,305,868,761	307,139,683	13,069,265,757	9,454,022,673	141,997,765,361
31	141,997,765,361	251,697,560	13,043,177,746	9,228,090,015	138,434,375,190
32	138,434,375,190	202,715,545	12,983,824,359	8,986,126,311	134,639,392,688
33	134,639,392,688	160,507,115	12,883,070,567	8,730,025,308	130,646,854,544
34	130,646,854,544	125,259,974	12,740,439,946	8,462,123,710	126,493,798,281
35	126,493,798,281	96,635,734	12,570,911,298	8,184,427,847	122,203,950,565
36	122,203,950,565	73,734,727	12,383,943,869	7,898,204,724	117,791,946,147
37	117,791,946,147	55,562,956	12,178,725,906	7,604,443,408	113,273,226,605
38	113,273,226,605	41,313,032	11,956,878,561	7,304,112,715	108,661,773,790
39	108,661,773,790	30,312,475	11,718,516,800	6,998,137,076	103,971,706,541
40	103,971,706,541	21,969,282	11,463,661,680	6,687,456,073	99,217,470,216
41	99,217,470,216	15,757,260	11,189,109,517	6,373,141,526	94,417,259,485
42	94,417,259,485	11,176,904	10,890,511,988	6,056,559,382	89,594,483,783
43	89,594,483,783	7,857,827	10,567,577,477	5,739,298,848	84,774,062,981
44	84,774,062,981	5,505,696	10,226,745,069	5,422,829,303	79,975,652,910
45	79,975,652,910	3,828,876	9,872,976,721	5,108,311,660	75,214,816,725
46	75,214,816,725	2,629,268	9,507,192,417	4,796,766,823	70,507,020,398
47	70,507,020,398	1,773,054	9,130,650,818	4,489,199,913	65,867,342,547
48	65,867,342,547	1,159,585	8,744,944,746	4,186,579,645	61,310,137,031
49	61,310,137,031	728,210	8,351,606,770	3,889,828,802	56,849,087,273
50	56,849,087,273	426,552	7,951,503,747	3,599,847,118	52,497,857,196



Single Discount Rate Development Projection of Plan Fiduciary Net Position Ending December 31, 2123 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 6.80%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
51	\$ 52,497,857,196	\$ 221,635	\$ 7,545,634,396	\$ 3,317,529,238	\$ 48,269,973,674
52	48,269,973,674	101,012	7,135,155,547	3,043,755,888	44,178,675,027
53	44,178,675,027	44,700	6,721,388,710	2,779,382,414	40,236,713,431
54	40,236,713,431	20,482	6,305,809,305	2,525,225,546	36,456,150,154
55	36,456,150,154	7,620	5,890,037,270	2,282,050,585	32,848,171,089
56	32,848,171,089	1,775	5,475,822,611	2,050,559,506	29,422,909,758
57	29,422,909,758	53	5,065,015,625	1,831,379,414	26,189,273,601
58	26,189,273,601	-	4,659,551,138	1,625,051,233	23,154,773,696
59	23,154,773,696	-	4,261,440,656	1,432,018,394	20,325,351,434
60	20,325,351,434	-	3,872,735,313	1,252,616,319	17,705,232,440
61	17,705,232,440	-	3,495,496,515	1,087,063,415	15,296,799,340
62	15,296,799,340	-	3,131,764,344	935,453,479	13,100,488,476
63	13,100,488,476	-	2,783,512,601	797,750,176	11,114,726,051
64	11,114,726,051	-	2,452,615,116	673,783,826	9,335,894,761
65	9,335,894,761	-	2,140,805,027	563,250,494	7,758,340,228
66	7,758,340,228	-	1,849,626,882	465,714,032	6,374,427,378
67	6,374,427,378	-	1,580,401,039	380,611,100	5,174,637,439
68	5,174,637,439	-	1,334,183,750	307,259,101	4,147,712,790
69	4,147,712,790	-	1,111,718,547	244,867,651	3,280,861,894
70	3,280,861,894	-	913,388,538	192,554,115	2,560,027,471
71	2,560,027,471	-	739,167,346	149,363,480	1,970,223,606
72	1,970,223,606	-	588,575,252	114,292,746	1,495,941,099
73	1,495,941,099	-	460,658,161	86,319,192	1,121,602,131
74	1,121,602,131	-	354,004,329	64,430,738	832,028,539
75	832,028,539	-	266,811,287	47,655,543	612,872,796
76	612,872,796	-	196,996,523	35,087,618	450,963,891
77	450,963,891	-	142,316,194	25,906,369	334,554,067
78	334,554,067	-	100,476,394	19,389,660	253,467,333
79	253,467,333	-	69,238,988	14,920,368	199,148,714
80	199,148,714	-	46,513,046	11,986,677	164,622,344
81	164,622,344	-	30,423,244	10,176,940	144,376,041
82	144,376,041	-	19,352,092	9,170,420	134,194,369
83	134,194,369	-	11,957,749	8,725,340	130,961,960
84	130,961,960	-	7,169,812	8,665,649	132,457,796
85	132,457,796	-	4,167,599	8,867,762	137,157,959
86	137,157,959	-	2,346,593	9,248,269	144,059,636
87	144,059,636	-	1,279,174	9,753,279	152,533,740
88	152,533,740	-	675,024	10,349,721	162,208,438
89	162,208,438	-	344,997	11,018,637	172,882,078
90	172,882,078	-	170,917	11,750,266	184,461,426
91	184,461,426	-	82,140	12,540,630	196,919,917
92	196,919,917	-	38,321	13,389,273	210,270,868
93	210,270,868	-	17,375	14,297,838	224,551,331
94	224,551,331	-	7,657	15,269,234	239,812,909
95	239,812,909	-	3,265	16,307,169	256,116,812
96	256,116,812	-	1,331	17,415,899	273,531,379
97	273,531,379	-	513	18,600,117	292,130,983
98	292,130,983	-	188	19,864,901	311,995,695
99	311,995,695	-	88	21,215,704	333,211,312
100	333,211,312	-	-	22,658,369	355,869,681



Single Discount Rate Development

Present Values of Projected Benefits

Ending December 31, 2123

Year	Projected Beginning Plan Net Position	Projected Benefit		Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
		Payments Including Dividends	Funded Portion of Benefit Payments				
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ⁿ /(a)-.5	(g)=(e)*vf ⁿ /(a)-.5	(h)=(c)/(1+s dr) ⁿ (a)-.5
1	\$ 127,697,808,319	\$ 8,022,780,725	\$ 8,022,780,725	\$ -	\$ 7,763,173,567	\$ -	\$ 7,763,173,567
2	130,435,934,731	8,233,118,154	8,233,118,154	-	7,459,461,366	-	7,459,461,366
3	132,988,129,945	8,320,384,296	8,320,384,296	-	7,058,546,075	-	7,058,546,075
4	135,552,675,744	8,337,452,378	8,337,452,378	-	6,622,683,216	-	6,622,683,216
5	138,258,336,566	8,589,472,032	8,589,472,032	-	6,388,454,895	-	6,388,454,895
6	140,937,051,831	8,819,376,744	8,819,376,744	-	6,141,804,740	-	6,141,804,740
7	143,464,573,842	9,049,055,745	9,049,055,745	-	5,900,517,749	-	5,900,517,749
8	145,858,225,451	9,271,668,912	9,271,668,912	-	5,660,744,060	-	5,660,744,060
9	148,117,087,169	9,491,332,873	9,491,332,873	-	5,425,897,147	-	5,425,897,147
10	150,235,498,366	9,720,002,141	9,720,002,141	-	5,202,827,894	-	5,202,827,894
11	152,194,656,231	9,952,976,743	9,952,976,743	-	4,988,326,092	-	4,988,326,092
12	153,978,638,424	10,181,729,571	10,181,729,571	-	4,778,066,083	-	4,778,066,083
13	155,578,409,051	10,405,097,543	10,405,097,543	-	4,571,992,373	-	4,571,992,373
14	156,985,622,973	10,616,539,303	10,616,539,303	-	4,367,883,642	-	4,367,883,642
15	158,198,344,513	10,818,931,664	10,818,931,664	-	4,167,745,715	-	4,167,745,715
16	159,211,500,520	11,011,503,789	11,011,503,789	-	3,971,844,304	-	3,971,844,304
17	160,020,732,583	11,200,375,838	11,200,375,838	-	3,782,743,787	-	3,782,743,787
18	160,615,399,246	11,391,190,059	11,391,190,059	-	3,602,236,114	-	3,602,236,114
19	160,978,285,178	11,588,816,584	11,588,816,584	-	3,431,396,583	-	3,431,396,583
20	161,085,615,293	11,788,333,880	11,788,333,880	-	3,268,232,921	-	3,268,232,921
21	160,916,877,072	11,979,701,632	11,979,701,632	-	3,109,820,495	-	3,109,820,495
22	160,460,597,296	12,163,916,062	12,163,916,062	-	2,956,592,574	-	2,956,592,574
23	159,704,022,976	12,344,258,266	12,344,258,266	-	2,809,388,587	-	2,809,388,587
24	158,630,751,736	12,511,333,287	12,511,333,287	-	2,666,116,699	-	2,666,116,699
25	157,233,466,912	12,660,305,537	12,660,305,537	-	2,526,088,117	-	2,526,088,117
26	155,510,009,950	12,789,861,272	12,789,861,272	-	2,389,455,188	-	2,389,455,188
27	153,459,954,454	12,909,804,340	12,909,804,340	-	2,258,299,112	-	2,258,299,112
28	151,073,282,094	13,016,599,560	13,016,599,560	-	2,132,004,394	-	2,132,004,394
29	148,343,246,024	13,068,598,965	13,068,598,965	-	2,004,233,557	-	2,004,233,557
30	145,305,868,761	13,069,265,757	13,069,265,757	-	1,876,718,931	-	1,876,718,931
31	141,997,765,361	13,043,177,746	13,043,177,746	-	1,753,719,801	-	1,753,719,801
32	138,434,375,190	12,983,824,359	12,983,824,359	-	1,634,587,495	-	1,634,587,495
33	134,639,392,688	12,883,070,567	12,883,070,567	-	1,518,635,938	-	1,518,635,938
34	130,646,854,544	12,740,439,946	12,740,439,946	-	1,406,201,186	-	1,406,201,186
35	126,493,798,281	12,570,911,298	12,570,911,298	-	1,299,147,746	-	1,299,147,746
36	122,203,950,565	12,383,943,869	12,383,943,869	-	1,198,338,477	-	1,198,338,477
37	117,791,946,147	12,178,725,906	12,178,725,906	-	1,103,446,123	-	1,103,446,123
38	113,273,226,605	11,956,878,561	11,956,878,561	-	1,014,368,706	-	1,014,368,706
39	108,661,773,790	11,718,516,800	11,718,516,800	-	930,849,390	-	930,849,390
40	103,971,706,541	11,463,661,680	11,463,661,680	-	852,626,603	-	852,626,603
41	99,217,470,216	11,189,109,517	11,189,109,517	-	779,219,461	-	779,219,461
42	94,417,259,485	10,890,511,988	10,890,511,988	-	710,135,642	-	710,135,642
43	89,594,483,783	10,567,577,477	10,567,577,477	-	645,204,223	-	645,204,223
44	84,774,062,981	10,226,745,069	10,226,745,069	-	584,639,209	-	584,639,209
45	79,975,652,910	9,872,976,721	9,872,976,721	-	528,478,554	-	528,478,554
46	75,214,816,725	9,507,192,417	9,507,192,417	-	476,497,127	-	476,497,127
47	70,507,020,398	9,130,650,818	9,130,650,818	-	428,487,823	-	428,487,823
48	65,867,342,547	8,744,944,746	8,744,944,746	-	384,257,689	-	384,257,689
49	61,310,137,031	8,351,606,770	8,351,606,770	-	343,608,803	-	343,608,803
50	56,849,087,273	7,951,503,747	7,951,503,747	-	306,317,818	-	306,317,818



Single Discount Rate Development Present Values of Projected Benefits Ending December 31, 2123 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit		Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
		Payments Including Dividends	Funded Portion of Benefit Payments				
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^a ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=(c)/(1+sdr) ^a ((a)-.5)
51	\$ 52,497,857,196	\$ 7,545,634,396	\$ 7,545,634,396	\$ -	\$ 272,174,540	\$ -	\$ 272,174,540
52	48,269,973,674	7,135,155,547	7,135,155,547	-	240,981,627	-	240,981,627
53	44,178,675,027	6,721,388,710	6,721,388,710	-	212,553,493	-	212,553,493
54	40,236,713,431	6,305,809,305	6,305,809,305	-	186,714,830	-	186,714,830
55	36,456,150,154	5,890,037,270	5,890,037,270	-	163,299,468	-	163,299,468
56	32,848,171,089	5,475,822,611	5,475,822,611	-	142,149,340	-	142,149,340
57	29,422,909,758	5,065,015,625	5,065,015,625	-	123,113,311	-	123,113,311
58	26,189,273,601	4,659,551,138	4,659,551,138	-	106,046,674	-	106,046,674
59	23,154,773,696	4,261,440,656	4,261,440,656	-	90,810,938	-	90,810,938
60	20,325,351,434	3,872,735,313	3,872,735,313	-	77,273,090	-	77,273,090
61	17,705,232,440	3,495,496,515	3,495,496,515	-	65,305,248	-	65,305,248
62	15,296,799,340	3,131,764,344	3,131,764,344	-	54,784,416	-	54,784,416
63	13,100,488,476	2,783,512,601	2,783,512,601	-	45,592,132	-	45,592,132
64	11,114,726,051	2,452,615,116	2,452,615,116	-	37,614,462	-	37,614,462
65	9,335,894,761	2,140,805,027	2,140,805,027	-	30,741,943	-	30,741,943
66	7,758,340,228	1,849,626,882	1,849,626,882	-	24,869,501	-	24,869,501
67	6,374,427,378	1,580,401,039	1,580,401,039	-	19,896,606	-	19,896,606
68	5,174,637,439	1,334,183,750	1,334,183,750	-	15,727,369	-	15,727,369
69	4,147,712,790	1,111,718,547	1,111,718,547	-	12,270,550	-	12,270,550
70	3,280,861,894	913,388,538	913,388,538	-	9,439,598	-	9,439,598
71	2,560,027,471	739,167,346	739,167,346	-	7,152,691	-	7,152,691
72	1,970,223,606	588,575,252	588,575,252	-	5,332,826	-	5,332,826
73	1,495,941,099	460,658,161	460,658,161	-	3,908,076	-	3,908,076
74	1,121,602,131	354,004,329	354,004,329	-	2,812,040	-	2,812,040
75	832,028,539	266,811,287	266,811,287	-	1,984,476	-	1,984,476
76	612,872,796	196,996,523	196,996,523	-	1,371,921	-	1,371,921
77	450,963,891	142,316,194	142,316,194	-	928,012	-	928,012
78	334,554,067	100,476,394	100,476,394	-	613,468	-	613,468
79	253,467,333	69,238,988	69,238,988	-	395,829	-	395,829
80	199,148,714	46,513,046	46,513,046	-	248,978	-	248,978
81	164,622,344	30,423,244	30,423,244	-	152,482	-	152,482
82	144,376,041	19,352,092	19,352,092	-	90,818	-	90,818
83	134,194,369	11,957,749	11,957,749	-	52,544	-	52,544
84	130,961,960	7,169,812	7,169,812	-	29,499	-	29,499
85	132,457,796	4,167,599	4,167,599	-	16,055	-	16,055
86	137,157,959	2,346,593	2,346,593	-	8,464	-	8,464
87	144,059,636	1,279,174	1,279,174	-	4,320	-	4,320
88	152,533,740	675,024	675,024	-	2,135	-	2,135
89	162,208,438	344,997	344,997	-	1,022	-	1,022
90	172,882,078	170,917	170,917	-	474	-	474
91	184,461,426	82,140	82,140	-	213	-	213
92	196,919,917	38,321	38,321	-	93	-	93
93	210,270,868	17,375	17,375	-	40	-	40
94	224,551,331	7,657	7,657	-	16	-	16
95	239,812,909	3,265	3,265	-	7	-	7
96	256,116,812	1,331	1,331	-	2	-	2
97	273,531,379	513	513	-	1	-	1
98	292,130,983	188	188	-	0	-	0
99	333,211,399	88	88	-	0	-	0
100	333,211,312	-	-	-	-	-	-
Totals					\$ 149,138,529,430	\$ -	\$ 149,138,529,430



SECTION D

SUMMARY OF ASSUMPTIONS

Summary of Assumptions Used to Develop Total Pension Liability Assumptions Adopted by DETF Board After Consulting with Actuary

The actuarial assumptions were developed based on an Experience Study covering January 1, 2018 through December 31, 2020. Separate demographic assumptions were developed for State and Non-State employees for the first time with this Experience Study. While sample rates are illustrated in this section, please refer to the Wisconsin Experience Study report dated November 19, 2021 which supplies a full listing of actuarial assumptions at every age and a rationale for the selection of assumptions.

Economic Assumptions

In determining plan liabilities for accounting purposes, a discount rate of 6.80% is used for both actives and retirees. However, a long-term assumed dividend of 1.7% is also assumed. For retirees, this produces the same result as assuming a 5% discount rate. Dividends are not guaranteed, and this valuation develops dividends that reflect known entries (phased-in gains and losses) in the Market Recognition Account (MRA), based on the 6.80% return assumption. The dividend rates used in developing the Total Pension Liability for accounting purposes is as follows:

2023: 1.6% Core, -21.0% Variable
2024: 3.6% Core, 15.0% Variable
2025: 1.9% Core, 1.7% Variable
2026: 0.0% Core, 1.7% Variable
2027: -1.2% Core, 1.7% Variable
2028: 2.2% Core, 1.7% Variable
2029 and later: 1.7% Core, 1.7% Variable

The **Wage Inflation Rate** assumed in this valuation was 3.00% per year. The wage inflation rate is defined to be the portion of total pay increases for an individual that are due to macro-economic 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 would be 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)	University Teachers State	Public School Teachers Non-State	Protective With SS Non-State	Protective With SS State	Protective Without SS Non-State	Executive & Elected Non-State	Executive & Elected State
1	3.5%	3.5%	3.0%	5.6%	4.8%	4.8%	5.5%	2.5%	2.5%
2	3.5%	3.5%	3.0%	5.6%	4.8%	4.8%	5.5%	2.5%	2.5%
3	3.1%	3.1%	2.9%	5.2%	4.1%	4.1%	4.7%	2.0%	2.0%
4	2.8%	2.8%	2.8%	4.7%	3.5%	3.5%	3.8%	1.6%	1.6%
5	2.5%	2.5%	2.7%	4.3%	2.8%	2.8%	3.0%	1.1%	1.1%
10	1.5%	1.5%	2.2%	2.6%	1.1%	1.1%	0.9%	0.2%	0.2%
15	1.1%	1.1%	1.7%	1.4%	0.8%	0.8%	0.5%	0.2%	0.2%
20	0.9%	0.9%	1.2%	0.6%	0.7%	0.7%	0.4%	0.2%	0.2%
25	0.6%	0.6%	0.9%	0.3%	0.6%	0.6%	0.3%	0.2%	0.2%
30	0.4%	0.4%	0.7%	0.2%	0.5%	0.5%	0.2%	0.2%	0.2%



Decrement Probabilities

The mortality table used was the 2020 WRS Experience Mortality Table 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 Mortality Table with 5% Interest**

Sample Attained Ages in 2022	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Mortality Rates ¹	
	Males	Females	Males	Females	Males	Females
40	\$216.63	\$219.72	47.1	49.2	0.000640	0.000428
45	208.66	212.41	41.9	44.0	0.000820	0.000544
50	198.55	203.05	36.7	38.7	0.001222	0.000868
55	186.05	191.58	31.6	33.6	0.002436	0.002245
60	171.19	178.16	26.7	28.7	0.004194	0.003498
65	153.77	162.04	22.0	23.9	0.006810	0.004982
70	133.63	142.62	17.5	19.3	0.011302	0.007910
75	111.11	120.17	13.4	14.9	0.020599	0.015081
80	87.53	96.20	9.7	11.0	0.039363	0.030226
85	64.98	72.84	6.7	7.7	0.075850	0.059473

¹ 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. For disabled participants, the following table was used:

Sample Attained Ages in 2022	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Mortality Rates ¹	
	Males	Females	Males	Females	Males	Females
40	\$175.46	\$182.24	32.2	35.0	0.009815	0.008684
45	164.89	172.56	28.2	30.9	0.012317	0.011175
50	153.34	162.16	24.5	27.1	0.017211	0.015893
55	141.56	151.92	21.2	23.7	0.023092	0.020269
60	129.85	141.65	18.2	20.6	0.029405	0.023841
65	117.89	129.69	15.4	17.5	0.035020	0.025201
70	104.54	114.20	12.8	14.4	0.041203	0.029402
75	88.93	95.88	10.2	11.2	0.052659	0.041321
80	72.07	77.05	7.8	8.4	0.075206	0.064431
85	56.01	60.11	5.7	6.2	0.113366	0.103036

¹ 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 ¹	
	Males	Females
20	0.000400	0.000165
25	0.000214	0.000129
30	0.000351	0.000226
35	0.000512	0.000325
40	0.000640	0.000428
45	0.000820	0.000544
50	0.001190	0.000783
55	0.001879	0.001245
60	0.003102	0.001962
65	0.005005	0.003016
70	0.007489	0.004983
75	0.010923	0.009507
80	0.021800	0.019586

¹ *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 *	With SS State *	Without SS Non-State*
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%

* 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 5 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		Public Schools Non-State		University State		Protective			Executive & Elected Non-State	Executive & Elected State
		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%	12.6%	12.0%	14.0%	14.1%	15.6%	18.8%	4.5%	25.0%	19.0%
	1-2	12.5%	15.0%	12.9%	15.5%	11.6%	10.0%	13.8%	14.0%	9.4%	15.5%	4.0%	20.0%	16.0%
	2-3	9.0%	11.5%	9.5%	12.5%	8.5%	8.5%	12.6%	12.7%	5.3%	10.5%	2.0%	17.0%	13.0%
	3-4	7.1%	9.6%	7.4%	10.0%	6.0%	6.2%	11.0%	10.0%	4.4%	6.5%	1.8%	16.0%	12.5%
	4-5	6.6%	9.0%	7.3%	8.7%	5.6%	5.8%	8.6%	9.3%	4.2%	5.5%	1.7%	13.0%	12.0%
	5-6	5.3%	7.4%	6.1%	7.8%	4.5%	4.8%	8.5%	8.1%	3.3%	5.0%	1.3%	4.0%	6.0%
	6-7	4.8%	6.3%	5.2%	6.9%	3.7%	4.1%	7.0%	7.0%	3.2%	4.5%	1.2%	4.0%	6.0%
	7-8	4.6%	6.0%	5.1%	6.0%	2.9%	3.5%	5.6%	5.6%	3.0%	4.0%	0.9%	4.0%	6.0%
	8-9	4.1%	5.7%	4.5%	5.6%	2.6%	3.4%	4.6%	4.9%	2.7%	3.5%	0.8%	4.0%	6.0%
	9-10	4.0%	5.0%	3.6%	5.5%	2.5%	3.0%	4.3%	4.3%	2.3%	3.3%	0.7%	4.0%	6.0%
	10 & Up	3.2%	4.9%	3.1%	4.8%	2.0%	2.2%	4.2%	4.0%	2.1%	2.9%	0.7%	4.5%	4.5%
	35	2.8%	4.1%	2.7%	3.9%	1.6%	1.9%	4.0%	4.0%	1.8%	2.4%	0.6%	4.5%	4.5%
	40	2.4%	3.2%	2.6%	3.0%	1.4%	1.6%	3.4%	3.7%	1.5%	1.8%	0.6%	4.2%	4.5%
	45	2.0%	2.9%	2.4%	2.7%	1.4%	1.4%	2.8%	3.2%	1.4%	1.4%	0.5%	3.7%	4.2%
50	1.7%	2.5%	1.9%	2.1%	1.3%	1.2%	2.3%	2.7%	1.3%	1.2%	0.5%	3.2%	3.7%	
54	1.6%	2.2%	1.7%	1.8%	1.3%	1.2%	2.2%	2.5%	1.3%	1.2%	0.5%	3.0%	3.5%	

Disability Rates

Age	% of Active Participants Becoming Disabled												
	General Non-State		General State		Public Schools Non-State		University State		Protective			Executive & Elected Non-State	Executive & Elected State
	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%	0.01%	0.01%	0.00%	0.01%	0.02%	0.02%	0.03%	0.00%	0.00%
25	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%	0.00%	0.01%	0.02%	0.02%	0.03%	0.00%	0.00%
30	0.01%	0.02%	0.01%	0.04%	0.01%	0.01%	0.00%	0.01%	0.02%	0.02%	0.03%	0.00%	0.00%
35	0.01%	0.02%	0.01%	0.05%	0.01%	0.01%	0.00%	0.03%	0.03%	0.03%	0.03%	0.01%	0.01%
40	0.03%	0.03%	0.03%	0.07%	0.01%	0.02%	0.01%	0.04%	0.04%	0.05%	0.05%	0.01%	0.01%
45	0.06%	0.05%	0.06%	0.10%	0.03%	0.05%	0.02%	0.04%	0.05%	0.07%	0.10%	0.01%	0.01%
50	0.13%	0.07%	0.13%	0.16%	0.08%	0.10%	0.03%	0.07%	0.09%	0.11%	0.55%	0.02%	0.02%
55	0.24%	0.13%	0.24%	0.29%	0.14%	0.14%	0.08%	0.11%	1.39%	1.73%	0.41%	0.09%	0.09%
60	0.43%	0.18%	0.43%	0.41%	0.24%	0.21%	0.11%	0.17%	2.34%	2.92%	0.12%	0.11%	0.11%



SECTION E

PLAN PROVISIONS

Summary of Benefit Provisions

Normal Retirement Eligibility

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

General, Public School, and University		Protective		Executive & Elected [#]	
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 5 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 and 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 3 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; and
- 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.

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 any 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; and
- 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 5 years of service.



SECTION F

GLOSSARY OF TERMS

Glossary of Terms

<i>Accrued Service</i>	Service credited under the system which was rendered before the date of the actuarial valuation.
<i>Actuarial Accrued Liability (AAL)</i>	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the AAL and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
<i>Actuarial Assumptions</i>	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
<i>Actuarial Cost Method</i>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
<i>Actuarial Equivalent</i>	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
<i>Actuarial Gain (Loss)</i>	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
<i>Actuarial Present Value (APV)</i>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<i>Actuarial Valuation</i>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
<i>Actuarial Valuation Date</i>	The date as of which an actuarial valuation is performed.
<i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i>	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically, the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms

<i>Amortization Method</i>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<i>Covered-Employee Payroll</i>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<i>Deferred Inflows and Outflows</i>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense/(income). Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense/(income) should be included in the deferred inflows or outflows of resources.
<i>Deferred Retirement Option Program (DROP)</i>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<i>Discount Rate</i>	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

<i>Entry Age Actuarial Cost Method (EAN)</i>	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit age(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
<i>Fiduciary Net Position</i>	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
<i>GASB</i>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<i>Long-Term Expected Rate of Return</i>	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
<i>Money-Weighted Rate of Return</i>	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
<i>Multiple-Employer Defined Benefit Pension Plan</i>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<i>Municipal Bond Rate</i>	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
<i>Net Pension Liability/(Asset) (NPL)</i>	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.
<i>Non-Employer Contribution Entities</i>	Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contribution entities.
<i>Normal Cost</i>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

Glossary of Terms

<i>Other Postemployment Benefits (OPEB)</i>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment health care benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
<i>Real Rate of Return</i>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<i>Service Cost</i>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<i>Total Pension Expense/(Income)</i>	The total pension expense/(income) is the sum of the following items that are recognized at the end of the employer's fiscal year: <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
<i>Total Pension Liability (TPL)</i>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<i>Unfunded Actuarial Accrued Liability (UAAL)</i>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<i>Valuation Assets</i>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.