

# Wisconsin Retirement System

GASB Statement No. 68

Employer Reporting Accounting Schedules

December 31, 2022



# Table of Contents

## Page

<b>Section A</b>	<b>Executive Summary</b>	
	Executive Summary.....	1
	Discussion.....	2
<b>Section B</b>	<b>Financial Statements</b>	
	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
<b>Section C</b>	<b>Calculation of the Single Discount Rate</b>	
	Calculation of the Single Discount Rate .....	16
	Projection of Contributions.....	17
	Projection of Plan Fiduciary Net Position .....	19
	Present Values of Projected Benefits.....	21
<b>Section D</b>	<b>Summary of Assumptions</b> .....	23
<b>Section E</b>	<b>Plan Provisions</b> .....	29
<b>Section F</b>	<b>Glossary of Terms</b> .....	32





August 3, 2023

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, 2021 valuation liabilities to December 31, 2022. 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, 2021 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.

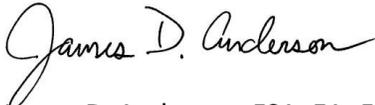
This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that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



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



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## **SECTION A**

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### **EXECUTIVE SUMMARY**

# Executive Summary as of December 31, 2022

	2022	2021
Actuarial Valuation Date	December 31, 2021	December 31, 2020
Measurement Date of the Net Pension Liability/(Asset)	December 31, 2022	December 31, 2021
<b>Membership as of December 31, 2021</b>		
Number of		
- Retirees and Beneficiaries	228,161	222,723
- Inactive, Nonretired Members	174,799	169,166
- Active Members	257,683	258,338
- Total	660,643	650,227
Covered Payroll <sup>(1)</sup>	\$ 16,361,316,730	\$ 15,780,837,258
<b>Net Pension Liability/(Asset)</b>		
Total Pension Liability	\$ 123,665,929,615	\$ 133,787,516,849
Plan Fiduciary Net Position	118,368,225,822	141,847,700,859
Net Pension Liability/(Asset)	\$ 5,297,703,793	\$ (8,060,184,010)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	95.72%	106.02%
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	32.38%	-51.08%
<b>Development of the Single Discount Rate</b>		
Single Discount Rate	6.80%	6.80%
Long-Term Expected Rate of Investment Return	6.80%	6.80%
Long-Term Municipal Bond Rate <sup>(2)</sup>	4.05%	1.84%
Last year ending December 31 in the 2023 to 2122 projection period for which projected benefit payments are fully funded	2122	2121
<b>Total Pension Expense/(Income)</b>	<b>\$ 2,694,289,124</b>	<b>\$ (696,710,877)</b>

## 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	\$ 8,437,600,772	\$ 11,085,112,759
Changes in assumptions	1,041,747,857	-
Net difference between projected and actual earnings on pension plan investments	8,999,575,144	-
Total	\$ 18,478,923,773	\$ 11,085,112,759

<sup>(1)</sup> Covered payroll is for 2022 and was provided by DETF.

<sup>(2)</sup> 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 30, 2022. 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 2122. 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, 2021 with roll-forward to December 31, 2022 and a measurement date of December 31, 2022. 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 4.05% (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, 2021 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**

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**FINANCIAL STATEMENTS**

# Statement of Pension Expense/(Income) under GASB Statement No. 68 Fiscal Year Ended December 31, 2022

## A. Expense/(Income)

1. Service Cost	\$ 2,178,921,078
2. Interest on the Total Pension Liability	8,933,501,306
3. Current-Period Benefit Changes	0
4. Employee Contributions (made negative for addition here)	(1,082,039,863)
5. Projected Earnings on Plan Investments (made negative for addition here)	(9,483,219,981)
6. Pension Plan Administrative Expense	31,171,842
7. Other Changes in Plan Fiduciary Net Position	0
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	961,303,710
9. Recognition of Outflow (Inflow) of Resources due to Assets	1,154,651,032
<b>10. Total Pension Expense/(Income)</b>	<b>\$ 2,694,289,124</b>

# Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended December 31, 2022

## A. Outflows (Inflows) of Resources Due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses <sup>(1)</sup>	\$ (14,230,093,256)
2. Assumption Changes (gains) or losses	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	4.5247
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	\$ (3,144,980,497)
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	\$ (3,144,980,497)
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	\$ (11,085,112,759)
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	\$ (11,085,112,759)

## B. Outflows (Inflows) of Resources Due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ 28,185,528,026
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	\$ 5,637,105,605
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ 22,548,422,421

<sup>(1)</sup> 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, 2022

## 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	\$ 5,045,225,928	\$ 4,083,922,218	\$ 961,303,710
2. Due to Assets	1,154,651,032	-	1,154,651,032
<b>3. Total</b>	<b>\$ 6,199,876,960</b>	<b>\$ 4,083,922,218</b>	<b>\$ 2,115,954,742</b>

## 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	\$ 4,583,219,083	\$ 4,083,922,218	\$ 499,296,865
2. Assumption Changes	462,006,845	-	462,006,845
3. Net Difference between projected and actual earnings on pension plan investments	1,154,651,032	-	1,154,651,032
<b>4. Total</b>	<b>\$ 6,199,876,960</b>	<b>\$ 4,083,922,218</b>	<b>\$ 2,115,954,742</b>

## 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	\$ 8,437,600,772	\$ 11,085,112,759	\$ (2,647,511,987)
2. Assumption Changes	1,041,747,857	-	1,041,747,857
3. Net Difference between projected and actual earnings on pension plan investments	8,999,575,144	-	8,999,575,144
<b>4. Total</b>	<b>\$ 18,478,923,773</b>	<b>\$ 11,085,112,759</b>	<b>\$ 7,393,811,014</b>

## 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
2023	\$ 306,255,767
2024	1,530,567,439
2025	1,570,053,470
2026	3,986,934,338
2027	-
Thereafter	-
<b>Total</b>	<b>\$ 7,393,811,014</b>



# Recognition of Deferred Outflows and Inflows of Resources

## Actuarial Valuation Date – December 31, 2021

## Measurement Date – December 31, 2022

## Reporting Date – December 31, 2022

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) Due to Differences between Expected and Actual Experience on Liabilities</b>					
2017	\$ 4,459,497,323	5.0080	\$ 7,123,798	\$ -	0.0000
2018	(4,968,302,189)	4.9321	(938,941,721)	-	0.0000
2019	5,473,337,212	4.6706	1,171,870,255	785,856,192	0.6706
2020	6,376,708,179	4.6559	1,369,597,324	2,267,916,207	1.6559
2021	9,453,083,785	4.6461	2,034,627,706	5,383,828,373	2.6461
2022	(14,230,093,256)	4.5247	(3,144,980,497)	(11,085,112,759)	3.5247
<b>Total</b>			<b>\$ 499,296,865</b>	<b>\$ (2,647,511,987)</b>	
<b>Deferred Outflow (Inflow) Due to Assumption Changes</b>					
2017	\$ -	5.0080	\$ -	\$ -	0.0000
2018	361,481,239	4.9321	68,315,051	-	0.0000
2019	-	4.6706	-	-	0.6706
2020	-	4.6559	-	-	1.6559
2021	1,829,131,445	4.6461	393,691,794	1,041,747,857	2.6461
2022	-	4.5247	-	-	3.5247
<b>Total</b>			<b>\$ 462,006,845</b>	<b>\$ 1,041,747,857</b>	
<b>Deferred Outflow (Inflow) Due to Differences between Projected and Actual Earnings on Plan Investments</b>					
2018	\$ 11,435,938,911	5.0000	\$ 2,287,187,783	\$ -	0.0000
2019	(12,407,231,511)	5.0000	(2,481,446,302)	(2,481,446,303)	1.0000
2020	(8,985,935,923)	5.0000	(1,797,187,185)	(3,594,374,368)	2.0000
2021	(12,455,044,344)	5.0000	(2,491,008,869)	(7,473,026,606)	3.0000
2022	28,185,528,026	5.0000	5,637,105,605	22,548,422,421	4.0000
<b>Total</b>			<b>\$ 1,154,651,032</b>	<b>\$ 8,999,575,144</b>	

### 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 2,989,237 years. Additionally, the total plan membership (active employees and inactive employees) was 660,643. 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 4.5247 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, 2022

<b>A. Total pension liability</b>	
1. Service Cost	\$ 2,178,921,078
2. Interest on the total pension liability	8,933,501,306
3. Changes of benefit terms	-
4. Difference between expected and actual experience of the total pension liability	(14,230,093,256)
5. Changes of assumptions	-
6. Benefit payments, including refunds of employee contributions	(7,003,916,362)
7. Net change in total pension liability	\$ (10,121,587,234)
8. Total pension liability – beginning	133,787,516,849
9. Total pension liability – ending	<u><u>\$ 123,665,929,615</u></u>
<b>B. Plan fiduciary net position</b>	
1. Contributions – employer	\$ 1,175,881,349
2. Contributions – employee	1,082,039,863
3. Net investment income	(18,702,308,045)
4. Benefit payments, including refunds of employee contributions	(7,003,916,362)
5. Pension plan administrative expense	(31,171,842)
6. Other	-
7. Net change in plan fiduciary net position	\$ (23,479,475,037)
8. Plan fiduciary net position – beginning	141,847,700,859
9. Plan fiduciary net position – ending	<u><u>\$ 118,368,225,822</u></u>
<b>C. Net pension liability/(asset)</b>	<u><u>\$ 5,297,703,793</u></u>
<b>D. Plan fiduciary net position as a percentage of the total pension liability</b>	<b>95.72%</b>
<b>E. Covered-employee payroll<sup>(1)</sup></b>	<b>\$ 16,361,316,730</b>
<b>F. Net pension liability/(asset) as a percentage of covered-employee payroll</b>	<b>32.38%</b>

<sup>(1)</sup> 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,	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
<b>Total Pension Liability</b>										
Service Cost	\$ 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	\$ 1,745,048,505
Interest on the Total Pension Liability	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	5,680,664,977
Benefit Changes	-	-	-	-	-	-	-	-	-	-
Difference between Expected and Actual Experience <sup>(1)</sup>	(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	2,659,920,220
Assumption Changes	-	1,829,131,445	-	-	361,481,239	-	-	1,412,040,786	-	-
Benefit Payments	(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)	(4,224,700,261)
Refunds	(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)	(33,271,143)
<b>Net Change in Total Pension Liability</b>	<b>(10,121,587,234)</b>	<b>15,064,261,651</b>	<b>9,854,953,322</b>	<b>8,573,534,076</b>	<b>(1,132,575,869)</b>	<b>7,679,922,998</b>	<b>3,274,690,348</b>	<b>438,477,497</b>	<b>3,708,924,980</b>	<b>5,827,662,298</b>
<b>Total Pension Liability - Beginning<sup>(2)</sup></b>	<b>133,787,516,849</b>	<b>118,723,255,198</b>	<b>108,868,301,876</b>	<b>100,294,767,800</b>	<b>101,427,343,669</b>	<b>93,747,420,671</b>	<b>90,129,650,901</b>	<b>89,691,173,404</b>	<b>85,982,248,424</b>	<b>80,154,586,126</b>
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 123,665,929,615</b>	<b>\$ 133,787,516,849</b>	<b>\$ 118,723,255,198</b>	<b>\$ 108,868,301,876</b>	<b>\$ 100,294,767,800</b>	<b>\$ 101,427,343,669</b>	<b>\$ 93,404,341,249</b>	<b>\$ 90,129,650,901</b>	<b>\$ 89,691,173,404</b>	<b>\$ 85,982,248,424</b>
<b>Plan Fiduciary Net Position</b>										
Employer Contributions <sup>(3)</sup>	\$ 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	\$ 914,698,118
Employee Contributions	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	871,259,789
Pension Plan Net Investment Income	(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	11,347,296,075
Benefit Payments	(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)	(4,224,700,261)
Refunds	(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)	(33,271,143)
Pension Plan Administrative Expense	(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)	(22,857,502)
Other	-	-	-	(3,901,654)	(25,448,686)	-	-	-	-	-
<b>Net Change in Plan Fiduciary Net Position</b>	<b>(23,479,475,037)</b>	<b>16,881,306,928</b>	<b>12,873,635,509</b>	<b>15,355,677,167</b>	<b>(7,659,381,072)</b>	<b>11,582,668,299</b>	<b>4,075,432,186</b>	<b>(3,642,101,238)</b>	<b>2,222,024,921</b>	<b>8,852,425,076</b>
<b>Plan Fiduciary Net Position - Beginning<sup>(4)</sup></b>	<b>141,847,700,859</b>	<b>124,966,393,931</b>	<b>112,092,758,422</b>	<b>96,737,081,255</b>	<b>104,396,462,327</b>	<b>92,813,794,028</b>	<b>88,504,670,309</b>	<b>92,146,771,547</b>	<b>89,924,746,626</b>	<b>81,072,321,550</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 118,368,225,822</b>	<b>\$ 141,847,700,859</b>	<b>\$ 124,966,393,931</b>	<b>\$ 112,092,758,422</b>	<b>\$ 96,737,081,255</b>	<b>\$ 104,396,462,327</b>	<b>\$ 92,580,102,495</b>	<b>\$ 88,504,670,309</b>	<b>\$ 92,146,771,547</b>	<b>\$ 89,924,746,626</b>
<b>Net Pension Liability/(Asset) - Ending (a) - (b)</b>	<b>5,297,703,793</b>	<b>(8,060,184,010)</b>	<b>(6,243,138,733)</b>	<b>(3,224,456,546)</b>	<b>3,557,686,545</b>	<b>(2,969,118,658)</b>	<b>824,238,754</b>	<b>1,624,980,592</b>	<b>(2,455,598,143)</b>	<b>(3,942,498,202)</b>
<b>Plan Fiduciary Net Position as a Percentage of Total Pension Liability</b>	<b>95.72 %</b>	<b>106.02 %</b>	<b>105.26 %</b>	<b>102.96 %</b>	<b>96.45 %</b>	<b>102.93 %</b>	<b>99.12 %</b>	<b>98.20 %</b>	<b>102.74 %</b>	<b>104.59 %</b>
<b>Covered-Employee Payroll<sup>(5)</sup></b>	<b>\$ 16,361,316,730</b>	<b>\$ 15,780,837,258</b>	<b>\$ 15,359,928,023</b>	<b>\$ 14,832,491,878</b>	<b>\$ 14,301,446,269</b>	<b>\$ 13,943,116,649</b>	<b>\$ 13,706,000,000</b>	<b>\$ 13,530,500,000</b>	<b>\$ 13,219,500,000</b>	<b>\$ 12,884,800,000</b>
<b>Net Pension Liability/(Asset) as a Percentage of Covered-Employee Payroll</b>	<b>32.38 %</b>	<b>(51.08)%</b>	<b>(40.65)%</b>	<b>(21.74)%</b>	<b>24.88 %</b>	<b>(21.29)%</b>	<b>6.01 %</b>	<b>12.01 %</b>	<b>(18.58)%</b>	<b>(30.60)%</b>

Notes to Schedule:

<sup>(1)</sup> 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.

<sup>(2)</sup> 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.

<sup>(3)</sup> 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.

<sup>(4)</sup> 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.

<sup>(5)</sup> Covered payroll provided by DETF.



# Schedule of Contributions Multiyear

## Last 10 Fiscal Years

<b>FY Ending December 31,</b>	<b>Actuarially Determined Contribution<sup>(1),(2)</sup></b>	<b>Actual Contribution</b>	<b>Contribution Deficiency (Excess)</b>	<b>Covered Payroll<sup>(3)</sup></b>	<b>Actual Contribution as a % of Covered Payroll</b>
2013	\$ 905,148,514	\$ 905,148,514	\$ -	\$ 12,884,800,000	7.02%
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%

<sup>(1)</sup> 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.

<sup>(2)</sup> 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.

<sup>(3)</sup> Covered payroll provided by DETF.

# Notes to Schedule of Contributions

## Summary of Actuarial Methods and Assumptions Used in the Calculation of the 2022 Actuarially Determined Contribution (ADC)

Valuation Date: December 31, 2020

### 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	7.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2018 valuation pursuant to an experience study of the period 2015-2017.
Mortality	Wisconsin 2018 mortality table adjusted for future mortality improvements using the MP-2018 fully generational improvement scale (multiplied by 60%).

### Other Information:

Notes The actuarially determined contribution for calendar year 2022 was determined from the December 31, 2020 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	<b>5.80%</b>	<b>6.80%</b>	<b>7.80%</b>
Ultimate Dividend Rate	<b>1.7%</b>	<b>1.7%</b>	<b>1.7%</b>
Total Pension Liability	\$ 135,951,131,912	\$ 123,665,929,615	\$ 115,214,763,975
Plan Fiduciary Net Position	118,368,225,822	118,368,225,822	118,368,225,822
Net Pension Liability/(Asset)	\$ 17,582,906,090	\$ 5,297,703,793	\$ (3,153,461,847)

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	<b>5.80%</b>	<b>6.80%</b>	<b>7.80%</b>
Ultimate Dividend Rate	<b>0.8%</b>	<b>1.7%</b>	<b>2.7%</b>
Total Pension Liability	\$ 128,542,567,089	\$ 123,665,929,615	\$ 120,196,564,177
Plan Fiduciary Net Position	118,368,225,822	118,368,225,822	118,368,225,822
Net Pension Liability/(Asset)	\$ 10,174,341,267	\$ 5,297,703,793	\$ 1,828,338,355

## **SECTION C**

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### **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 4.05%; 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 2021 actuarial valuation (14.40%). 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 14.01% 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, 2122

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
1	\$ 14,808,374,899	\$ 1,005,659,369	\$ 1,124,974,888	\$ -	\$ 2,130,634,257
2	14,342,729,676	982,916,863	1,099,534,118	-	2,082,450,981
3	13,902,585,008	931,448,538	1,041,959,381	-	1,973,407,919
4	13,476,283,921	913,230,428	1,021,579,800	-	1,934,810,228
5	13,061,245,108	916,953,668	1,025,744,782	-	1,942,698,450
6	12,655,111,851	947,025,469	1,059,384,424	-	2,006,409,893
7	12,254,740,082	913,250,348	1,021,602,085	-	1,934,852,433
8	11,857,649,994	880,099,890	984,518,522	-	1,864,618,412
9	11,461,712,469	847,395,917	947,934,416	-	1,795,330,333
10	11,063,082,235	814,837,223	911,512,826	-	1,726,350,049
11	10,658,105,227	782,141,598	874,938,059	-	1,657,079,657
12	10,245,213,806	749,183,759	838,069,967	-	1,587,253,726
13	9,821,328,507	715,730,157	800,647,295	-	1,516,377,452
14	9,387,514,160	681,851,483	762,749,117	-	1,444,600,600
15	8,945,274,043	647,649,263	724,489,007	-	1,372,138,270
16	8,494,796,377	613,128,904	685,873,012	-	1,299,001,916
17	8,037,659,495	578,395,902	647,019,144	-	1,225,415,046
18	7,576,033,899	543,597,148	608,091,725	-	1,151,688,873
19	7,110,467,396	508,761,978	569,123,568	-	1,077,885,546
20	6,639,025,038	473,742,514	529,949,252	-	1,003,691,766
21	6,159,624,182	438,382,203	490,393,650	-	928,775,853
22	5,672,254,859	402,673,427	450,448,240	-	853,121,667
23	5,180,677,786	366,875,807	410,403,446	-	777,279,253
24	4,688,883,839	331,262,906	370,565,284	-	701,828,190
25	4,199,999,556	296,045,110	331,169,107	-	627,214,217
26	3,718,422,417	261,520,707	292,548,588	-	554,069,295
27	3,248,022,716	227,948,883	254,993,666	-	482,942,549
28	2,793,611,016	195,653,094	218,866,173	-	414,519,267
29	2,360,552,212	164,993,600	184,569,111	-	349,562,711
30	1,958,686,535	136,640,828	152,852,452	-	289,493,280
31	1,597,551,749	111,239,996	124,437,961	-	235,677,957
32	1,280,057,027	88,971,996	99,527,996	-	188,499,992
33	1,008,791,887	69,995,513	78,300,066	-	148,295,579
34	783,796,157	54,292,784	60,734,301	-	115,027,085
35	602,140,107	41,642,023	46,582,602	-	88,224,625
36	457,510,546	31,590,374	35,338,384	-	66,928,758
37	343,104,057	23,654,960	26,461,480	-	50,116,440
38	253,914,577	17,480,315	19,554,251	-	37,034,566
39	185,505,926	12,752,827	14,265,875	-	27,018,702
40	133,850,899	9,189,209	10,279,455	-	19,468,664
41	95,355,206	6,537,773	7,313,440	-	13,851,213
42	67,293,902	4,607,967	5,154,675	-	9,762,642
43	47,161,235	3,225,419	3,608,096	-	6,833,515
44	32,829,235	2,242,578	2,508,646	-	4,751,224
45	22,699,719	1,548,855	1,732,617	-	3,281,472
46	15,433,464	1,051,900	1,176,702	-	2,228,602
47	10,234,953	696,842	779,518	-	1,476,360
48	6,582,182	447,684	500,799	-	948,483
49	4,026,269	273,573	306,031	-	579,604
50	2,277,862	154,626	172,971	-	327,597



# Single Discount Rate Development Projection of Contributions Ending December 31, 2122 (Concluded)

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
51	\$ 1,157,535	\$ 78,503	\$ 87,817	\$ -	\$ 166,320
52	523,594	35,478	39,688	-	75,166
53	234,735	15,892	17,777	-	33,669
54	108,145	7,316	8,183	-	15,499
55	37,568	2,539	2,841	-	5,380
56	6,578	444	497	-	941
57	223	15	17	-	32
58	-	-	-	-	-
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, 2122

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	\$ 118,368,225,822	\$ 2,130,634,257	\$ 7,824,652,762	\$ 7,858,626,511	\$ 120,532,833,828
2	120,532,833,828	2,082,450,981	8,208,757,047	7,991,363,790	122,397,891,553
3	122,397,891,553	1,973,407,919	8,468,990,073	8,105,838,807	124,008,148,206
4	124,008,148,206	1,934,810,228	8,680,873,157	8,206,959,968	125,469,045,246
5	125,469,045,246	1,942,698,450	8,762,978,789	8,303,819,073	126,952,583,980
6	126,952,583,980	2,006,409,893	8,752,534,601	8,407,179,535	128,613,638,807
7	128,613,638,807	1,934,852,433	8,752,604,806	8,517,735,973	130,313,622,407
8	130,313,622,407	1,864,618,412	8,856,489,951	8,627,512,164	131,949,263,031
9	131,949,263,031	1,795,330,333	9,009,457,519	8,731,303,308	133,466,439,153
10	133,466,439,153	1,726,350,049	9,213,969,752	8,825,325,460	134,804,144,910
11	134,804,144,910	1,657,079,657	9,427,685,308	8,906,826,160	135,940,365,419
12	135,940,365,419	1,587,253,726	9,607,781,787	8,975,731,536	136,895,568,894
13	136,895,568,894	1,516,377,452	9,771,124,507	9,032,852,889	137,673,674,727
14	137,673,674,727	1,444,600,600	9,917,438,459	9,078,470,942	138,279,307,810
15	138,279,307,810	1,372,138,270	10,034,109,414	9,113,329,213	138,730,665,879
16	138,730,665,879	1,299,001,916	10,123,771,907	9,138,577,429	139,044,473,318
17	139,044,473,318	1,225,415,046	10,211,988,251	9,154,505,498	139,212,405,610
18	139,212,405,610	1,151,688,873	10,315,524,198	9,159,997,097	139,208,567,381
19	139,208,567,381	1,077,885,546	10,423,046,726	9,153,672,406	139,017,078,607
20	139,017,078,607	1,003,691,766	10,542,764,616	9,134,166,597	138,612,172,355
21	138,612,172,355	928,775,853	10,661,171,973	9,100,168,076	137,979,944,311
22	137,979,944,311	853,121,667	10,766,283,583	9,051,131,607	137,117,914,002
23	137,117,914,002	777,279,253	10,874,639,175	8,986,353,807	136,006,907,887
24	136,006,907,887	701,828,190	10,987,151,535	8,904,519,734	134,626,104,276
25	134,626,104,276	627,214,217	11,088,282,120	8,804,748,040	132,969,784,413
26	132,969,784,413	554,069,295	11,165,587,867	8,687,087,090	131,045,352,931
27	131,045,352,931	482,942,549	11,220,055,642	8,552,025,761	128,860,265,600
28	128,860,265,600	414,519,267	11,270,196,681	8,399,474,931	126,404,063,116
29	126,404,063,116	349,562,711	11,273,947,737	8,230,155,520	123,709,833,611
30	123,709,833,611	289,493,280	11,228,561,015	8,046,456,912	120,817,222,787
31	120,817,222,787	235,677,957	11,165,913,505	7,850,054,732	117,737,041,970
32	117,737,041,970	188,499,992	11,077,640,888	7,641,976,676	114,489,877,751
33	114,489,877,751	148,295,579	10,958,963,632	7,423,793,708	111,103,003,406
34	111,103,003,406	115,027,085	10,814,036,763	7,197,220,204	107,601,213,933
35	107,601,213,933	88,224,625	10,649,063,681	6,963,719,064	104,004,093,941
36	104,004,093,941	66,928,758	10,475,465,818	6,724,208,013	100,319,764,894
37	100,319,764,894	50,116,440	10,293,465,877	6,479,197,653	96,555,613,111
38	96,555,613,111	37,034,566	10,099,160,237	6,229,295,610	92,722,783,050
39	92,722,783,050	27,018,702	9,895,373,873	5,975,143,017	88,829,570,895
40	88,829,570,895	19,468,664	9,682,121,923	5,717,283,438	84,884,201,074
41	84,884,201,074	13,851,213	9,454,834,871	5,456,411,111	80,899,628,528
42	80,899,628,528	9,762,642	9,210,445,668	5,193,496,036	76,892,441,538
43	76,892,441,538	6,833,515	8,949,452,258	4,929,637,211	72,879,460,006
44	72,879,460,006	4,751,224	8,676,476,987	4,665,813,360	68,873,547,603
45	68,873,547,603	3,281,472	8,394,356,743	4,402,796,509	64,885,268,840
46	64,885,268,840	2,228,602	8,102,262,541	4,141,326,224	60,926,561,125
47	60,926,561,125	1,476,360	7,800,378,039	3,882,204,219	57,009,863,665
48	57,009,863,665	948,483	7,489,789,414	3,626,237,488	53,147,260,222
49	53,147,260,222	579,604	7,171,012,958	3,374,228,276	49,351,055,144
50	49,351,055,144	327,597	6,844,442,775	3,126,998,689	45,633,938,655



# Single Discount Rate Development Projection of Plan Fiduciary Net Position Ending December 31, 2122 (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	\$ 45,633,938,655	\$ 166,320	\$ 6,510,700,780	\$ 2,885,389,992	\$ 42,008,794,187
52	42,008,794,187	75,166	6,170,636,567	2,650,249,158	38,488,481,944
53	38,488,481,944	33,669	5,825,305,774	2,422,414,695	35,085,624,534
54	35,085,624,534	15,499	5,475,963,949	2,202,702,072	31,812,378,157
55	31,812,378,157	5,380	5,124,049,817	1,991,889,290	28,680,223,009
56	28,680,223,009	941	4,771,161,826	1,790,703,467	25,699,765,592
57	25,699,765,592	32	4,419,042,600	1,599,807,500	22,880,530,524
58	22,880,530,524	-	4,069,549,531	1,419,786,861	20,230,767,854
59	20,230,767,854	-	3,724,635,260	1,251,137,228	17,757,269,822
60	17,757,269,822	-	3,386,326,414	1,094,252,699	15,465,196,106
61	15,465,196,106	-	3,056,679,786	949,415,351	13,357,931,672
62	13,357,931,672	-	2,737,748,638	816,786,699	11,436,969,733
63	11,436,969,733	-	2,431,544,764	696,401,007	9,701,825,976
64	9,701,825,976	-	2,139,989,863	588,161,076	8,149,997,189
65	8,149,997,189	-	1,864,874,811	491,836,801	6,776,959,179
66	6,776,959,179	-	1,607,812,023	407,066,616	5,576,213,772
67	5,576,213,772	-	1,370,184,524	333,362,395	4,539,391,643
68	4,539,391,643	-	1,153,099,792	270,117,989	3,656,409,840
69	3,656,409,840	-	957,338,897	216,621,638	2,915,692,582
70	2,915,692,582	-	783,306,301	172,072,663	2,304,458,944
71	2,304,458,944	-	630,984,574	135,602,545	1,809,076,915
72	1,809,076,915	-	499,898,966	106,300,182	1,415,478,131
73	1,415,478,131	-	389,112,322	83,240,264	1,109,606,073
74	1,109,606,073	-	297,260,473	65,512,569	877,858,168
75	877,858,168	-	222,631,187	52,249,378	707,476,360
76	707,476,360	-	163,275,670	42,648,314	586,849,004
77	586,849,004	-	117,121,032	35,989,105	505,717,077
78	505,717,077	-	82,074,035	31,644,135	455,287,177
79	455,287,177	-	56,118,170	29,082,888	428,251,895
80	428,251,895	-	37,393,667	27,870,653	418,728,881
81	418,728,881	-	24,253,212	27,662,516	422,138,185
82	422,138,185	-	15,293,695	28,193,962	435,038,453
83	435,038,453	-	9,365,838	29,269,413	454,942,028
84	454,942,028	-	5,564,495	30,749,976	480,127,509
85	480,127,509	-	3,204,470	32,541,510	509,464,550
86	509,464,550	-	1,787,432	34,583,816	542,260,934
87	542,260,934	-	965,304	36,841,463	578,137,092
88	578,137,092	-	504,732	39,296,444	616,928,804
89	616,928,804	-	255,663	41,942,609	658,615,750
90	658,615,750	-	125,584	44,781,671	703,271,837
91	703,271,837	-	59,878	47,820,483	751,032,442
92	751,032,442	-	27,731	51,069,279	802,073,989
93	802,073,989	-	12,486	54,540,614	856,602,117
94	856,602,117	-	5,463	58,248,761	914,845,415
95	914,845,415	-	2,309	62,209,411	977,052,518
96	977,052,518	-	930	66,439,540	1,043,491,128
97	1,043,491,128	-	353	70,957,385	1,114,448,160
98	1,114,448,160	-	129	75,782,471	1,190,230,501
99	1,190,230,501	-	57	80,935,672	1,271,166,117
100	1,271,166,117	-	-	86,439,296	1,357,605,413



# Single Discount Rate Development Present Values of Projected Benefits Ending December 31, 2122

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 <sup>(a)-.5</sup>	(g)=(e)*vf <sup>(a)-.5</sup>	(h)=(c)/(1+sdr) <sup>(a)-.5</sup>
1	\$ 118,368,225,822	\$ 7,824,652,762	\$ 7,824,652,762	\$ -	\$ 7,571,456,776	\$ -	\$ 7,571,456,776
2	120,532,833,828	8,208,757,047	8,208,757,047	-	7,437,389,444	-	7,437,389,444
3	122,397,891,553	8,468,990,073	8,468,990,073	-	7,184,614,858	-	7,184,614,858
4	124,008,148,206	8,680,873,157	8,680,873,157	-	6,895,472,424	-	6,895,472,424
5	125,469,045,246	8,762,978,789	8,762,978,789	-	6,517,501,253	-	6,517,501,253
6	126,952,583,980	8,752,534,601	8,752,534,601	-	6,095,255,942	-	6,095,255,942
7	128,613,638,807	8,752,604,806	8,752,604,806	-	5,707,214,263	-	5,707,214,263
8	130,313,622,407	8,856,489,951	8,856,489,951	-	5,407,259,832	-	5,407,259,832
9	131,949,263,031	9,009,457,519	9,009,457,519	-	5,150,424,129	-	5,150,424,129
10	133,466,439,153	9,213,969,752	9,213,969,752	-	4,931,963,815	-	4,931,963,815
11	134,804,144,910	9,427,685,308	9,427,685,308	-	4,725,055,611	-	4,725,055,611
12	135,940,365,419	9,607,781,787	9,607,781,787	-	4,508,724,767	-	4,508,724,767
13	136,895,568,894	9,771,124,507	9,771,124,507	-	4,293,425,077	-	4,293,425,077
14	137,673,674,727	9,917,438,459	9,917,438,459	-	4,080,257,793	-	4,080,257,793
15	138,279,307,810	10,034,109,414	10,034,109,414	-	3,865,410,912	-	3,865,410,912
16	138,730,665,879	10,123,771,907	10,123,771,907	-	3,651,639,826	-	3,651,639,826
17	139,044,473,318	10,211,988,251	10,211,988,251	-	3,448,932,042	-	3,448,932,042
18	139,212,405,610	10,315,524,198	10,315,524,198	-	3,262,078,291	-	3,262,078,291
19	139,208,567,381	10,423,046,726	10,423,046,726	-	3,086,217,360	-	3,086,217,360
20	139,017,078,607	10,542,764,616	10,542,764,616	-	2,922,907,575	-	2,922,907,575
21	138,612,172,355	10,661,171,973	10,661,171,973	-	2,767,542,308	-	2,767,542,308
22	137,979,944,311	10,766,283,583	10,766,283,583	-	2,616,880,446	-	2,616,880,446
23	137,117,914,002	10,874,639,175	10,874,639,175	-	2,474,922,878	-	2,474,922,878
24	136,006,907,887	10,987,151,535	10,987,151,535	-	2,341,319,467	-	2,341,319,467
25	134,626,104,276	11,088,282,120	11,088,282,120	-	2,212,425,097	-	2,212,425,097
26	132,969,784,413	11,165,587,867	11,165,587,867	-	2,086,001,661	-	2,086,001,661
27	131,045,352,931	11,220,055,642	11,220,055,642	-	1,962,713,069	-	1,962,713,069
28	128,860,265,600	11,270,196,681	11,270,196,681	-	1,845,958,980	-	1,845,958,980
29	126,404,063,116	11,273,947,737	11,273,947,737	-	1,729,001,283	-	1,729,001,283
30	123,709,833,611	11,228,561,015	11,228,561,015	-	1,612,397,622	-	1,612,397,622
31	120,817,222,787	11,165,913,505	11,165,913,505	-	1,501,312,333	-	1,501,312,333
32	117,737,041,970	11,077,640,888	11,077,640,888	-	1,394,610,152	-	1,394,610,152
33	114,489,877,751	10,958,963,632	10,958,963,632	-	1,291,825,262	-	1,291,825,262
34	111,103,003,406	10,814,036,763	10,814,036,763	-	1,193,578,196	-	1,193,578,196
35	107,601,213,933	10,649,063,681	10,649,063,681	-	1,100,533,346	-	1,100,533,346
36	104,004,093,941	10,475,465,818	10,475,465,818	-	1,013,663,651	-	1,013,663,651
37	100,319,764,894	10,293,465,877	10,293,465,877	-	932,633,274	-	932,633,274
38	96,555,613,111	10,099,160,237	10,099,160,237	-	856,768,098	-	856,768,098
39	92,722,783,050	9,895,373,873	9,895,373,873	-	786,029,741	-	786,029,741
40	88,829,570,895	9,682,121,923	9,682,121,923	-	720,121,978	-	720,121,978
41	84,884,201,074	9,454,834,871	9,454,834,871	-	658,443,044	-	658,443,044
42	80,899,628,528	9,210,445,668	9,210,445,668	-	600,583,862	-	600,583,862
43	76,892,441,538	8,949,452,258	8,949,452,258	-	546,409,468	-	546,409,468
44	72,879,460,006	8,676,476,987	8,676,476,987	-	496,013,991	-	496,013,991
45	68,873,547,603	8,394,356,743	8,394,356,743	-	449,331,305	-	449,331,305
46	64,885,268,840	8,102,262,541	8,102,262,541	-	406,082,537	-	406,082,537
47	60,926,561,125	7,800,378,039	7,800,378,039	-	366,060,106	-	366,060,106
48	57,009,863,665	7,489,789,414	7,489,789,414	-	329,105,473	-	329,105,473
49	53,147,260,222	7,171,012,958	7,171,012,958	-	295,035,824	-	295,035,824
50	49,351,055,144	6,844,442,775	6,844,442,775	-	263,670,224	-	263,670,224



# Single Discount Rate Development Present Values of Projected Benefits Ending December 31, 2122 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments Including Dividends	Funded Portion of Benefit Payments	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)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>^(a)-.5</sup>	(g)=(e)*vf <sup>^(a)-.5</sup>	(h)=(c)/(1+sdr) <sup>^(a)-.5</sup>
51	\$ 45,633,938,655	\$ 6,510,700,780	\$ 6,510,700,780	\$ -	\$ 234,844,004	\$ -	\$ 234,844,004
52	42,008,794,187	6,170,636,567	6,170,636,567	-	208,406,114	-	208,406,114
53	38,488,481,944	5,825,305,774	5,825,305,774	-	184,216,260	-	184,216,260
54	35,085,624,534	5,475,963,949	5,475,963,949	-	162,143,133	-	162,143,133
55	31,812,378,157	5,124,049,817	5,124,049,817	-	142,062,702	-	142,062,702
56	28,680,223,009	4,771,161,826	4,771,161,826	-	123,856,734	-	123,856,734
57	25,699,765,592	4,419,042,600	4,419,042,600	-	107,411,903	-	107,411,903
58	22,880,530,524	4,069,549,531	4,069,549,531	-	92,618,834	-	92,618,834
59	20,230,767,854	3,724,635,260	3,724,635,260	-	79,371,661	-	79,371,661
60	17,757,269,822	3,386,326,414	3,386,326,414	-	67,567,723	-	67,567,723
61	15,465,196,106	3,056,679,786	3,056,679,786	-	57,106,975	-	57,106,975
62	13,357,931,672	2,737,748,638	2,737,748,638	-	47,891,841	-	47,891,841
63	11,436,969,733	2,431,544,764	2,431,544,764	-	39,827,127	-	39,827,127
64	9,701,825,976	2,139,989,863	2,139,989,863	-	32,819,894	-	32,819,894
65	8,149,997,189	1,864,874,811	1,864,874,811	-	26,779,588	-	26,779,588
66	6,776,959,179	1,607,812,023	1,607,812,023	-	21,618,135	-	21,618,135
67	5,576,213,772	1,370,184,524	1,370,184,524	-	17,250,066	-	17,250,066
68	4,539,391,643	1,153,099,792	1,153,099,792	-	13,592,750	-	13,592,750
69	3,656,409,840	957,338,897	957,338,897	-	10,566,591	-	10,566,591
70	2,915,692,582	783,306,301	783,306,301	-	8,095,237	-	8,095,237
71	2,304,458,944	630,984,574	630,984,574	-	6,105,840	-	6,105,840
72	1,809,076,915	499,898,966	499,898,966	-	4,529,369	-	4,529,369
73	1,415,478,131	389,112,322	389,112,322	-	3,301,104	-	3,301,104
74	1,109,606,073	297,260,473	297,260,473	-	2,361,294	-	2,361,294
75	877,858,168	222,631,187	222,631,187	-	1,655,875	-	1,655,875
76	707,476,360	163,275,670	163,275,670	-	1,137,082	-	1,137,082
77	586,849,004	117,121,032	117,121,032	-	763,720	-	763,720
78	505,717,077	82,074,035	82,074,035	-	501,111	-	501,111
79	455,287,177	56,118,170	56,118,170	-	320,819	-	320,819
80	428,251,895	37,393,667	37,393,667	-	200,163	-	200,163
81	418,728,881	24,253,212	24,253,212	-	121,558	-	121,558
82	422,138,185	15,293,695	15,293,695	-	71,772	-	71,772
83	435,038,453	9,365,838	9,365,838	-	41,155	-	41,155
84	454,942,028	5,564,495	5,564,495	-	22,894	-	22,894
85	480,127,509	3,204,470	3,204,470	-	12,345	-	12,345
86	509,464,550	1,787,432	1,787,432	-	6,447	-	6,447
87	542,260,934	965,304	965,304	-	3,260	-	3,260
88	578,137,092	504,732	504,732	-	1,596	-	1,596
89	616,928,804	255,663	255,663	-	757	-	757
90	658,615,750	125,584	125,584	-	348	-	348
91	703,271,837	59,878	59,878	-	155	-	155
92	751,032,442	27,731	27,731	-	67	-	67
93	802,073,989	12,486	12,486	-	28	-	28
94	856,602,117	5,463	5,463	-	12	-	12
95	914,845,415	2,309	2,309	-	5	-	5
96	977,052,518	930	930	-	2	-	2
97	1,043,491,128	353	353	-	1	-	1
98	1,114,448,160	129	129	-	0	-	0
99	1,271,166,174	57	57	-	0	-	0
100	1,271,166,117	-	-	-	-	-	-
<b>Totals</b>					\$ 139,293,382,715	\$ -	\$ 139,293,382,715



## **SECTION D**

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### **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:

2022: 7.4% Core, 15.0% Variable  
2023: 1.6% Core, -21.0% Variable  
2024: 2.7% Core, 1.7% Variable  
2025: 0.9% Core, 1.7% Variable  
2026: -0.3% Core, 1.7% Variable  
2027: -2.6% Core, 1.7% Variable  
2028 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 2021	Present Value of \$1 Monthly for Life*		Future Life Expectancy (years)*		Mortality Rates*	
	Males	Females	Males	Females	Males	Females
40	\$216.52	\$219.63	47.0	49.1	0.000624	0.000421
45	208.53	212.28	41.8	43.9	0.000806	0.000543
50	198.37	202.89	36.6	38.7	0.001221	0.000875
55	185.83	191.37	31.5	33.5	0.002452	0.002269
60	170.94	177.94	26.6	28.6	0.004216	0.003514
65	153.52	161.82	21.9	23.9	0.006822	0.004991
70	133.38	142.38	17.5	19.2	0.011338	0.007968
75	110.84	119.89	13.3	14.9	0.020755	0.015244
80	87.27	95.94	9.7	11.0	0.039700	0.030501
85	64.78	72.65	6.7	7.7	0.076354	0.059821

\* 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 2021	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Mortality Rates*	
	Males	Females	Males	Females	Males	Females
40	\$175.27	\$182.00	32.1	34.8	0.009569	0.008549
45	164.66	172.22	28.1	30.8	0.012119	0.011138
50	152.97	161.70	24.4	27.0	0.017187	0.016021
55	141.07	151.41	21.1	23.6	0.023250	0.020479
60	129.40	141.24	18.1	20.5	0.029559	0.023946
65	117.53	129.37	15.4	17.5	0.035076	0.025249
70	104.23	113.85	12.7	14.3	0.041335	0.029616
75	88.61	95.50	10.1	11.2	0.053057	0.041768
80	71.78	76.74	7.7	8.4	0.075851	0.065016
85	55.79	59.91	5.7	6.2	0.114120	0.103637

\* 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 2021	Mortality Rates*	
	Males	Females
20	0.000398	0.000164
25	0.000213	0.000128
30	0.000345	0.000222
35	0.000500	0.000318
40	0.000624	0.000421
45	0.000806	0.000543
50	0.001189	0.000789
55	0.001891	0.001258
60	0.003118	0.001971
65	0.005013	0.003022
70	0.007513	0.005019
75	0.011006	0.009610
80	0.021987	0.019764

*\* 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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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%	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**

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### **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 <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 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**

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### **GLOSSARY OF TERMS**

## Glossary of Terms

<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Accrued Liability (AAL)</i></b>	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."
<b><i>Actuarial Assumptions</i></b>	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.
<b><i>Actuarial Cost Method</i></b>	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.
<b><i>Actuarial Equivalent</i></b>	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.
<b><i>Actuarial Gain (Loss)</i></b>	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.
<b><i>Actuarial Present Value (APV)</i></b>	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.
<b><i>Actuarial Valuation</i></b>	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.
<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	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

<b><i>Amortization Method</i></b>	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).
<b><i>Amortization Payment</i></b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b><i>Cost-of-Living Adjustments</i></b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b><i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i></b>	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.
<b><i>Covered-Employee Payroll</i></b>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<b><i>Deferred Inflows and Outflows</i></b>	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.
<b><i>Deferred Retirement Option Program (DROP)</i></b>	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.
<b><i>Discount Rate</i></b>	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"><li>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; and</li><li>2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.</li></ol>

## Glossary of Terms

<b><i>Entry Age Actuarial Cost Method (EAN)</i></b>	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.
<b><i>Fiduciary Net Position</i></b>	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
<b><i>GASB</i></b>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<b><i>Long-Term Expected Rate of Return</i></b>	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.
<b><i>Money-Weighted Rate of Return</i></b>	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.
<b><i>Multiple-Employer Defined Benefit Pension Plan</i></b>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<b><i>Municipal Bond Rate</i></b>	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.
<b><i>Net Pension Liability/(Asset) (NPL)</i></b>	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.
<b><i>Non-Employer Contribution Entities</i></b>	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.
<b><i>Normal Cost</i></b>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

## Glossary of Terms

<b><i>Other Postemployment Benefits (OPEB)</i></b>	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.
<b><i>Real Rate of Return</i></b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b><i>Service Cost</i></b>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<b><i>Total Pension Expense/(Income)</i></b>	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"><li>1. Service Cost</li><li>2. Interest on the Total Pension Liability</li><li>3. Current-Period Benefit Changes</li><li>4. Employee Contributions (made negative for addition here)</li><li>5. Projected Earnings on Plan Investments (made negative for addition here)</li><li>6. Pension Plan Administrative Expense</li><li>7. Other Changes in Plan Fiduciary Net Position</li><li>8. Recognition of Outflow (Inflow) of Resources due to Liabilities</li><li>9. Recognition of Outflow (Inflow) of Resources due to Assets</li></ol>
<b><i>Total Pension Liability (TPL)</i></b>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<b><i>Unfunded Actuarial Accrued Liability (UAAL)</i></b>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<b><i>Valuation Assets</i></b>	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.