

Wisconsin Retirement System

GASB Statement No. 67 Plan Reporting and
Accounting Schedules

December 31, 2022



Table of Contents

Page

Section A	Executive Summary	
	Executive Summary.....	1
	Discussion.....	2
Section B	Financial Statements	
	Statement of Fiduciary Net Position.....	6
	Statement of Changes in Fiduciary Net Position	7
Section C	Required Supplementary Information	
	Multiyear Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios	8
	Multiyear Schedule of the Net Pension Liability/(Asset).....	9
	Multiyear Schedule of Contributions.....	10
	Notes to Schedule of Contributions.....	11
	Multiyear Schedule of Investment Returns.....	12
Section D	Notes to Financial Statements	
	Asset Allocation.....	13
	Sensitivity of Net Pension Liability/(Asset) to the Single Discount Rate Assumption	14
	Summary of Population Statistics	15
Section E	Calculation of the Single Discount Rate	
	Calculation of the Single Discount Rate.....	16
	Projection of Contributions.....	17
	Projection of Plan Fiduciary Net Position	19
	Present Values of Projected Benefits.....	21
Section F	Summary of Assumptions	23
Section G	Plan Provisions	29
Section H	Glossary of Terms	32





August 2, 2023

Employee Trust Funds Board
Wisconsin Department of Employee Trust Funds
4822 Madison Yards Way
Madison, WI 53705-9100

This report provides certain information requested by the Wisconsin Retirement System (“WRS”) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 “Accounting and Financial Reporting for Pension Plans.”

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

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. 67 may produce significantly different results. This report may be provided to parties other than the WRS only in its entirety and only with the permission of the WRS. GRS is not responsible for unauthorized use of this report.

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

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

This 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.

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



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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2022

	2022	2021
Actuarial Valuation Date	December 31, 2022	December 31, 2021
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	December 31, 2022	December 31, 2021
Membership		
Number of		
- Retirees and Beneficiaries	233,804	228,161
- Inactive, Nonretired Members	181,758	174,799
- Active Members	259,592	257,683
- Total	675,154	660,643
Covered Payroll ⁽¹⁾	\$ 16,361,316,730	\$ 15,780,837,258
Net Pension Liability/(Asset)		
Total Pension Liability	\$ 122,538,998,583	\$ 134,192,007,769
Plan Fiduciary Net Position	118,368,225,822	141,847,700,859
Net Pension Liability/(Asset)	\$ 4,170,772,761	\$ (7,655,693,090)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability/(Asset)	96.60%	105.71%
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	25.49%	-48.51%
Development of the Single Discount Rate		
Single Discount Rate	6.80%	6.80%
Long-Term Expected Rate of Return	6.80%	6.80%
Long-Term Municipal Bond Rate ⁽²⁾	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

⁽¹⁾ Covered Payroll is for 2022 and was provided by DETF.

⁽²⁾ Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-year Municipal GO AA Index" as of December 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 pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, “Financial Reporting for Pension Plans,” replaces the requirements of GASB Statement No. 25, “Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans,” and GASB Statement No. 50, “Pension Disclosures.” GASB Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability of employers and non-employer contributing entities for benefits provided through the pension plan.

The following discussion provides a summary of the information that is required to be disclosed under this accounting standard. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report, and your internal staff will be responsible for preparing that information to comply with this accounting standard.

Financial Statements

GASB Statement No. 67 requires defined benefit pension plans to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position.

The *statement of fiduciary net position* presents the following items as of the end of the pension plan’s reporting period, such as:

- Assets;
- Deferred inflows and outflows of resources;
- Liabilities; and
- Fiduciary net position (assets, plus deferred outflows, minus liabilities, minus deferred inflows).

The *statement of changes in fiduciary net position* presents the following for the plan’s reporting period:

- Additions, such as contributions and investment income;
- Deductions, such as benefit payments and expenses; and
- Net increase or decrease in the fiduciary net position (the difference between additions and deductions).

Notes to Financial Statements

GASB Statement No. 67 also requires the notes of the plan's financial statements to include additional disclosure information. This disclosure information should include:

- 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;
- The composition of the pension plan's Board and the authority under which benefit terms may be amended;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- A description of how fair value is determined;
- Concentrations of investments greater than or equal to 5%;
- Annual money-weighted rate of return on pension plan investments;
- The portion of the present value of benefits to be provided through the pension plan to current active and inactive plan members;
- The pension plan's fiduciary net position;
- The net pension liability/(asset);
- The pension plan's fiduciary net position as a percentage of the total pension liability;
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

Required Supplementary Information

GASB Statement No. 67 requires a 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;
- Comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy; and
- The annual money-weighted rate of return on pension plan investments for each year.

These tables may be built prospectively.

Measurement of the Net Pension Liability/(Asset)

The net pension liability/(asset) is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be 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).

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 6.8% 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. If the actuarial valuation is not calculated as of the plan's fiscal year end, the total pension liability is required to be rolled forward from the actuarial valuation date to the pension plan's fiscal year end.

The total pension liability shown in this report is based on an actuarial valuation performed as of December 31, 2022 and a measurement date of December 31, 2022.

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 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% (based on the weekly 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 asset values used in this study are taken from the December 31, 2022 actuarial valuation report of the Wisconsin Retirement System. Therefore, the actuarial assumptions and methods employed for purposes of our Actuarial Study are the same actuarial assumptions and methods shown in the actuarial valuation report.

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

The Wisconsin Retirement System uses the Frozen Entry Age cost method for determining funding requirements. GASB Statement No. 67 requires the use of the Entry Age Normal cost method for accounting purposes. Therefore, we developed the Entry Age Normal Accrued Liability to reflect the Total Pension Liability for GASB purposes.

SECTION B

FINANCIAL STATEMENTS

Statement of Fiduciary Net Position as of December 31, 2022

	2022
Assets	
Cash and Deposits	\$ 6,676,179,882
Receivables	
Accounts Receivable - Sale of Investments	\$ 5,569,609,010
Accrued Interest and Other Dividends	504,248,658
Contributions	240,028,501
Accounts Receivable - Other	9,966,062
Total Receivables	\$ 6,323,852,231
Investments	
Fixed Income	\$ 44,730,410,063
Domestic and International Equities	56,639,942,151
Real Estate	-
Other	41,223,937,655
Total Investments	\$ 142,594,289,869
Total Assets	\$ 155,594,321,982
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ 36,569,624,471
Accrued Expenses	3,902,411
Accounts Payable - Other	652,569,278
Total Liabilities	\$ 37,226,096,160
Net Position Restricted for Pensions	\$ 118,368,225,822

Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2022

	2022
Additions	
Contributions	
Employer	\$ 1,175,881,349
Employee	1,082,039,863
Other	-
Total Contributions	\$ 2,257,921,212
Investment Income	
Net Appreciation in Fair Value of Investments	\$ (20,454,085,426)
Interest and Dividends	2,606,476,333
Less Investment Expense	(854,698,952)
Net Investment Income	\$ (18,702,308,045)
Other	\$ -
Total Additions	\$ (16,444,386,833)
 Deductions	
Benefit payments, including refunds of employee contributions	\$ 7,003,916,362
Pension Plan Administrative Expense	31,171,842
Other Benefit Expenses	-
Total Deductions	\$ 7,035,088,204
Net Increase in Net Position	\$ (23,479,475,037)
 Net Position Restricted for Pensions	
Beginning of Year	\$ 141,847,700,859
End of Year	\$ 118,368,225,822

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedules of Required Supplementary Information

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

Last 10 Fiscal Years

Fiscal year ending December 31,	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Total Pension Liability										
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	8,961,006,689	8,208,246,306	7,552,358,592	6,846,131,206	7,194,603,494	6,604,529,732	6,363,034,249	6,349,703,745	6,089,287,273	5,680,664,977
Benefit Changes	-	-	-	-	-	-	-	-	-	-
Experience ⁽¹⁾	(15,789,020,591)	8,748,236,745	6,006,411,525	7,137,987,427	(5,980,346,708)	5,142,055,157	318,473,379	(4,488,825,613)	473,101,546	2,659,920,220
Assumption Changes	-	2,162,583,701	-	-	404,242,989	-	-	1,484,977,863	-	-
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)
Net Change in Total Pension Liability	(11,653,009,186)	14,743,625,744	9,556,319,887	10,196,256,911	(2,076,986,386)	8,339,839,123	3,433,445,998	272,497,394	3,744,760,674	5,827,662,298
Total Pension Liability - Beginning	134,192,007,769	119,448,382,025	109,892,062,138	99,695,805,227	101,772,791,613	93,432,952,490	89,999,506,492	89,727,009,098	85,982,248,424	80,154,586,126
Total Pension Liability - Ending (a)⁽²⁾	\$ 122,538,998,583	\$ 134,192,007,769	\$ 119,448,382,025	\$ 109,892,062,138	\$ 99,695,805,227	\$ 101,772,791,613	\$ 93,432,952,490	\$ 89,999,506,492	\$ 89,727,009,098	\$ 85,982,248,424
Plan Fiduciary Net Position										
Employer Contributions ⁽³⁾	\$ 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)	-	-	-	-	-
Net Change in Plan Fiduciary Net Position	(23,479,475,037)	16,881,306,928	12,873,635,509	15,355,677,167	(7,659,381,072)	11,582,668,299	4,075,432,186	(3,642,101,238)	2,222,024,921	8,852,425,076
Plan Fiduciary Net Position - Beginning⁽⁴⁾	141,847,700,859	124,966,393,931	112,092,758,422	96,737,081,255	104,396,462,327	92,813,794,028	88,504,670,309	92,146,771,547	89,924,746,626	81,072,321,550
Plan Fiduciary Net Position - Ending (b)	\$ 118,368,225,822	\$ 141,847,700,859	\$ 124,966,393,931	\$ 112,092,758,422	\$ 96,737,081,255	\$ 104,396,462,327	\$ 92,580,102,495	\$ 88,504,670,309	\$ 92,146,771,547	\$ 89,924,746,626
Net Pension Liability/(Asset) - Ending (a) - (b)	4,170,772,761	(7,655,693,090)	(5,518,011,906)	(2,200,696,284)	2,958,723,972	(2,623,670,714)	852,849,995	1,494,836,183	(2,419,762,449)	(3,942,498,202)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	96.60 %	105.71 %	104.62 %	102.00 %	97.03 %	102.58 %	99.09 %	98.34 %	102.70 %	104.59 %
Covered-Employee Payroll⁽⁵⁾	\$ 16,361,316,730	\$ 15,780,837,258	\$ 15,359,928,023	\$ 14,832,491,878	\$ 14,301,446,269	\$ 13,943,116,649	\$ 13,706,000,000	\$ 13,530,500,000	\$ 13,219,500,000	\$ 12,884,800,000
Net Pension Liability/(Asset) as a Percentage of Covered-Employee Payroll	25.49 %	(48.51)%	(35.92)%	(14.84)%	20.69 %	(18.82)%	6.22 %	11.05 %	(18.30)%	(30.60)%

Notes to Schedule:

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

⁽²⁾ In 2017, end of year liabilities were adjusted to reflect the Long Term Disability Insurance (LTDI) program.

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

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

⁽⁵⁾ Covered payroll provided by DETF.



Schedules of Required Supplementary Information

Multiyear Schedule of the Net Pension Liability/(Asset)

Last 10 Fiscal Years

FY Ending December 31,	Total Pension Liability	Plan Net Position	Net Pension Liability/(Asset)	Plan Net Position as a % of Total Pension Liability	Covered Payroll ⁽¹⁾	Net Pension Liability/(Asset) as a % of Covered Payroll
2013	\$ 85,982,248,424	\$ 89,924,746,626	\$ (3,942,498,202)	104.59%	\$ 12,884,800,000	(30.60)%
2014	89,727,009,098	92,146,771,547	(2,419,762,449)	102.70%	13,219,500,000	(18.30)%
2015	89,999,506,492	88,504,670,309	1,494,836,183	98.34%	13,530,500,000	11.05 %
2016	93,432,952,490	92,580,102,495	852,849,995	99.09%	13,706,000,000	6.22 %
2017	101,772,791,613	104,396,462,327	(2,623,670,714)	102.58%	13,943,116,649	(18.82)%
2018	99,695,805,227	96,737,081,255	2,958,723,972	97.03%	14,301,446,269	20.69 %
2019	109,892,062,138	112,092,758,422	(2,200,696,284)	102.00%	14,832,491,878	(14.84)%
2020	119,448,382,025	124,966,393,931	(5,518,011,906)	104.62%	15,359,928,023	(35.92)%
2021	134,192,007,769	141,847,700,859	(7,655,693,090)	105.71%	15,780,837,258	(48.51)%
2022	122,538,998,583	118,368,225,822	4,170,772,761	96.60%	16,361,316,730	25.49 %

⁽¹⁾ Covered payroll provided by DETF.

Multiyear Schedule of Contributions

Last 10 Fiscal Years

<u>FY Ending December 31,</u>	<u>Actuarially Determined Contribution^{(1),(2)}</u>	<u>Actual Contribution</u>	<u>Contribution Deficiency (Excess)</u>	<u>Covered Payroll⁽³⁾</u>	<u>Actual Contribution as a % of Covered Payroll</u>
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%

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

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

⁽³⁾ Covered payroll provided by DETF.

Notes to Schedule of Contributions

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 Percentage of Payroll - Closed Amortization Period
Amortization Period	30-Year closed from date of participation in WRS
Asset Valuation Method	5-Year smoothed value
Inflation	2.0% to 2.5% -- approximate; No explicit price inflation assumption is used in this valuation.
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 2022 was determined from the December 31, 2020 actuarial valuation.

Multiyear Schedule of Investment Returns

Last 10 Fiscal Years

<u>FY Ending December 31,</u>	<u>Core Annual Return¹</u>	<u>Variable Annual Return¹</u>
2013	13.18 %	28.78 %
2014	5.44 %	7.24 %
2015	(0.63)%	(1.11)%
2016	8.29 %	10.49 %
2017	15.85 %	23.27 %
2018	(3.56)%	(7.61)%
2019	19.49 %	28.80 %
2020	15.06 %	17.05 %
2021	17.03 %	19.98 %
2022	(12.94)%	(18.02)%

¹ Annual money-weighted rate of return, net of investment expenses.

The money weighted rate of return expresses investment performance net of pension plan investment expense, adjusted for the changing amounts actually invested.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. The long-term expected rate of return is reviewed every three years in conjunction with the WRS experience study. For each major asset class that is included in the pension plan's target asset allocation as of December 31, 2022, these best estimates of geometric real rates of return were provided by DETF and are summarized in the following tables:

Core Asset Allocation

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>
Public Equity	48.00%	5.00%
Public Fixed Income	25.00%	2.70%
Inflation Sens. Assets	19.00%	1.10%
Real Estate	8.00%	2.60%
Private Equity/Debt	15.00%	6.90%
Cash	-15.00%	0.90%
Total	100.00%	

Variable Asset Allocation

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>
U.S. Equity	70.00%	4.60%
International Equity	30.00%	5.50%
Total	100.00%	

Single Discount Rate

A single discount rate of 6.80% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 6.80% and a long-term bond rate of 4.05%. 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. For purposes of the single discount rate, it was assumed that the dividend would always be paid. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments (including expected dividends) of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

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

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

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	5.80%	6.80%	7.80%
Ultimate Dividend Rate	1.70%	1.70%	1.70%
Total Pension Liability	\$ 135,030,971,937	\$ 122,538,998,583	\$ 113,661,337,037
Plan Fiduciary Net Position	118,368,225,822	118,368,225,822	118,368,225,822
Net Pension Liability/(Asset)	\$ 16,662,746,115	\$ 4,170,772,761	\$ (4,706,888,785)

This schedule 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 0.80% for the 5.8% discount rate, 1.70% for the 6.8% discount rate, and 2.70% for the 7.8% discount rate.

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	5.80%	6.80%	7.80%
Ultimate Dividend Rate	0.80%	1.70%	2.70%
Total Pension Liability	\$ 127,561,818,007	\$ 122,538,998,583	\$ 118,837,204,815
Plan Fiduciary Net Position	118,368,225,822	118,368,225,822	118,368,225,822
Net Pension Liability/(Asset)	\$ 9,193,592,185	\$ 4,170,772,761	\$ 468,978,993



Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	233,804
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	181,758
Active Plan Members	<u>259,592</u>
Total Plan Members	675,154

SECTION E

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 single discount rate is 6.80%.

The tables in this section provide background for the development of the single discount rate.

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%) and the second-year contribution was developed from the 2022 actuarial valuation (14.70%). Expected contribution rates gradually increase as the unrecognized asset losses from the Market Recognition Account are phased-in over the next 5 years. The expected contribution rate then decreases over time as the Experience Amortization Reserve (EAR) component is paid down and is assumed to migrate to the ultimate contribution rate of 14.09% once the Experience Amortization Reserve (EAR) component is paid down.

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 modeled with 100% accuracy. In reality, assets that appear to be left over after all benefit obligations are satisfied 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
0	\$ 16,025,883,087				
1	15,953,530,904	\$ 1,077,437,663	\$ 1,219,870,787	\$ -	\$ 2,297,308,450
2	15,396,895,566	1,061,508,171	1,201,835,477	-	2,263,343,648
3	14,914,404,434	1,004,580,576	1,137,382,272	-	2,141,962,848
4	14,462,864,064	984,446,974	1,114,587,086	-	2,099,034,060
5	14,028,011,091	987,225,654	1,117,733,097	-	2,104,958,751
6	13,605,028,260	1,017,349,451	1,151,839,143	-	2,169,188,594
7	13,191,415,333	982,231,752	1,112,079,019	-	2,094,310,771
8	12,783,601,314	947,951,779	1,073,267,367	-	2,021,219,146
9	12,378,450,590	914,253,705	1,035,114,536	-	1,949,368,241
10	11,973,384,135	880,927,431	997,382,657	-	1,878,310,088
11	11,565,931,139	847,774,588	959,847,134	-	1,807,621,722
12	11,151,681,490	814,458,551	922,126,846	-	1,736,585,397
13	10,725,243,054	780,576,324	883,765,518	-	1,664,341,842
14	10,287,336,908	746,173,956	844,815,289	-	1,590,989,245
15	9,839,429,925	711,350,770	805,388,611	-	1,516,739,381
16	9,381,368,382	676,088,033	765,464,277	-	1,441,552,310
17	8,914,932,386	640,506,252	725,178,721	-	1,365,684,973
18	8,442,404,763	604,760,583	684,707,612	-	1,289,468,195
19	7,963,734,689	568,837,858	644,036,039	-	1,212,873,897
20	7,476,654,050	532,567,341	602,970,699	-	1,135,538,040
21	6,979,861,270	495,849,014	561,398,350	-	1,057,247,364
22	6,473,792,373	458,707,154	519,346,480	-	978,053,634
23	5,962,000,770	421,386,226	477,091,867	-	898,478,093
24	5,448,578,276	384,166,403	434,951,727	-	819,118,130
25	4,936,863,270	347,272,470	393,180,557	-	740,453,027
26	4,431,310,996	311,005,915	352,119,703	-	663,125,618
27	3,935,484,343	275,603,539	312,037,270	-	587,640,809
28	3,453,273,581	241,323,577	273,225,627	-	514,549,204
29	2,986,788,110	208,298,583	235,834,856	-	444,133,439
30	2,537,394,734	176,609,091	199,956,134	-	376,565,225
31	2,116,692,825	147,046,605	166,485,602	-	313,532,207
32	1,736,404,432	120,406,045	136,323,262	-	256,729,307
33	1,399,887,915	96,898,734	109,708,375	-	206,607,109
34	1,109,480,610	76,665,205	86,800,051	-	163,465,256
35	866,647,240	59,786,090	67,689,581	-	127,475,671
36	669,203,646	46,091,403	52,184,509	-	98,275,912
37	511,057,197	35,144,616	39,790,599	-	74,935,215
38	385,430,865	26,465,889	29,964,579	-	56,430,468
39	286,813,260	19,665,828	22,265,574	-	41,931,402
40	210,606,748	14,420,484	16,326,817	-	30,747,301
41	152,754,358	10,445,195	11,826,010	-	22,271,205
42	109,641,225	7,487,423	8,477,232	-	15,964,655
43	77,824,986	5,308,021	6,009,720	-	11,317,741
44	54,751,201	3,729,761	4,222,822	-	7,952,583
45	38,387,231	2,611,959	2,957,249	-	5,569,208
46	26,712,793	1,815,551	2,055,560	-	3,871,111
47	18,354,673	1,246,127	1,410,861	-	2,656,988
48	12,384,778	839,938	950,974	-	1,790,912
49	8,104,279	549,076	621,661	-	1,170,737
50	5,092,198	344,665	390,229	-	734,894



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	\$ 2,984,345	\$ 201,804	\$ 228,482	\$ -	\$ 430,286
52	1,551,444	104,814	118,671	-	223,485
53	707,431	47,751	54,064	-	101,815
54	313,203	21,123	23,916	-	45,039
55	143,577	9,675	10,955	-	20,630
56	53,438	3,598	4,074	-	7,672
57	12,454	838	949	-	1,787
58	373	25	28	-	53
59	2	-	-	-	-
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	\$ 2,297,308,450	\$ 7,331,162,384	\$ 7,880,702,978	\$ 121,215,074,866
2	121,215,074,866	2,263,343,648	7,784,344,991	8,057,998,088	123,752,071,611
3	123,752,071,611	2,141,962,848	7,925,423,545	8,221,737,001	126,190,347,916
4	126,190,347,916	2,099,034,060	7,992,695,411	8,383,854,586	128,680,541,151
5	128,680,541,151	2,104,958,751	7,928,165,847	8,555,543,776	131,412,877,831
6	131,412,877,831	2,169,188,594	8,143,935,530	8,736,275,049	134,174,405,944
7	134,174,405,944	2,094,310,771	8,368,466,772	8,914,046,466	136,814,296,409
8	136,814,296,409	2,021,219,146	8,595,434,773	9,083,524,767	139,323,605,549
9	139,323,605,549	1,949,368,241	8,815,666,999	9,244,390,279	141,701,697,070
10	141,701,697,070	1,878,310,088	9,033,676,515	9,396,433,832	143,942,764,475
11	143,942,764,475	1,807,621,722	9,260,630,303	9,538,873,008	146,028,628,902
12	146,028,628,902	1,736,585,397	9,492,328,589	9,670,588,085	147,943,473,794
13	147,943,473,794	1,664,341,842	9,720,465,612	9,790,752,554	149,678,102,579
14	149,678,102,579	1,590,989,245	9,944,094,528	9,898,775,996	151,223,773,292
15	151,223,773,292	1,516,739,381	10,157,198,864	9,994,272,234	152,577,586,043
16	152,577,586,043	1,441,552,310	10,361,893,948	10,076,972,003	153,734,216,408
17	153,734,216,408	1,365,684,973	10,557,448,611	10,146,546,284	154,688,999,055
18	154,688,999,055	1,289,468,195	10,750,150,755	10,202,478,626	155,430,795,120
19	155,430,795,120	1,212,873,897	10,945,450,374	10,243,828,393	155,942,047,037
20	155,942,047,037	1,135,538,040	11,147,953,450	10,269,235,470	156,198,867,097
21	156,198,867,097	1,057,247,364	11,352,910,694	10,277,227,182	156,180,430,949
22	156,180,430,949	978,053,634	11,550,541,283	10,266,716,282	155,874,659,582
23	155,874,659,582	898,478,093	11,741,446,455	10,236,878,723	155,268,569,943
24	155,268,569,943	819,118,130	11,928,827,664	10,186,744,575	154,345,604,984
25	154,345,604,984	740,453,027	12,103,372,688	10,115,515,394	153,098,200,717
26	153,098,200,717	663,125,618	12,260,233,691	10,022,860,444	151,523,953,087
27	151,523,953,087	587,640,809	12,398,107,272	9,908,676,718	149,622,163,343
28	149,622,163,343	514,549,204	12,526,460,199	9,772,618,538	147,382,870,885
29	147,382,870,885	444,133,439	12,641,789,789	9,614,135,167	144,799,349,703
30	144,799,349,703	376,565,225	12,702,984,999	9,434,149,768	141,907,079,697
31	141,907,079,697	313,532,207	12,713,311,812	9,235,022,192	138,742,322,284
32	138,742,322,284	256,729,307	12,697,101,521	9,018,461,237	135,320,411,307
33	135,320,411,307	206,607,109	12,647,874,822	8,785,741,344	131,664,884,937
34	131,664,884,937	163,465,256	12,557,606,394	8,538,741,504	127,809,485,304
35	127,809,485,304	127,475,671	12,425,793,497	8,279,778,742	123,790,946,220
36	123,790,946,220	98,275,912	12,267,171,937	8,010,846,060	119,632,896,254
37	119,632,896,254	74,935,215	12,091,045,487	7,733,207,949	115,349,993,931
38	115,349,993,931	56,430,468	11,896,612,725	7,447,853,774	110,957,665,447
39	110,957,665,447	41,931,402	11,685,452,351	7,155,751,959	106,469,896,458
40	106,469,896,458	30,747,301	11,457,671,420	6,857,826,851	101,900,799,190
41	101,900,799,190	22,271,205	11,213,285,536	6,555,017,262	97,264,802,120
42	97,264,802,120	15,964,655	10,949,136,564	6,248,391,932	92,580,022,143
43	92,580,022,143	11,317,741	10,660,931,911	5,939,309,306	87,869,717,280
44	87,869,717,280	7,952,583	10,348,381,761	5,629,347,986	83,158,636,088
45	83,158,636,088	5,569,208	10,017,840,132	5,319,968,358	78,466,333,521
46	78,466,333,521	3,871,111	9,674,213,688	5,012,326,159	73,808,317,103
47	73,808,317,103	2,656,988	9,318,426,191	4,707,438,279	69,199,986,180
48	69,199,986,180	1,790,912	8,951,735,906	4,406,305,251	64,656,346,436
49	64,656,346,436	1,170,737	8,575,731,818	4,109,890,907	60,191,676,262
50	60,191,676,262	734,894	8,191,943,187	3,819,112,980	55,819,580,949



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	\$ 55,819,580,949	\$ 430,286	\$ 7,801,241,615	\$ 3,534,865,707	\$ 51,553,635,327
52	51,553,635,327	223,485	7,404,626,740	3,258,037,629	47,407,269,701
53	47,407,269,701	101,815	7,003,252,092	2,989,503,009	43,393,622,433
54	43,393,622,433	45,039	6,598,431,399	2,730,110,646	39,525,346,720
55	39,525,346,720	20,630	6,191,628,055	2,480,670,933	35,814,410,227
56	35,814,410,227	7,672	5,784,446,135	2,241,943,330	32,271,915,094
57	32,271,915,094	1,787	5,378,616,359	2,014,624,758	28,907,925,281
58	28,907,925,281	53	4,975,967,107	1,799,338,328	25,731,296,555
59	25,731,296,555	-	4,578,409,242	1,596,622,248	22,749,509,560
60	22,749,509,560	-	4,187,928,608	1,406,918,738	19,968,499,691
61	19,968,499,691	-	3,806,549,962	1,230,563,695	17,392,513,425
62	17,392,513,425	-	3,436,308,323	1,067,777,826	15,023,982,927
63	15,023,982,927	-	3,079,218,152	918,659,152	12,863,423,928
64	12,863,423,928	-	2,737,229,467	783,177,534	10,909,371,995
65	10,909,371,995	-	2,412,194,890	661,171,437	9,158,348,542
66	9,158,348,542	-	2,105,829,650	552,346,958	7,604,865,850
67	7,604,865,850	-	1,819,664,414	456,279,745	6,241,481,180
68	6,241,481,180	-	1,555,010,124	372,419,853	5,058,890,909
69	5,058,890,909	-	1,312,918,467	300,099,466	4,046,071,909
70	4,046,071,909	-	1,094,133,727	238,544,123	3,190,482,304
71	3,190,482,304	-	899,045,440	186,887,949	2,478,324,813
72	2,478,324,813	-	727,639,681	144,193,194	1,894,878,326
73	1,894,878,326	-	579,455,475	109,474,240	1,424,897,092
74	1,424,897,092	-	453,563,703	81,725,444	1,053,058,833
75	1,053,058,833	-	348,583,308	59,951,077	764,426,602
76	764,426,602	-	262,747,028	43,194,524	544,874,098
77	544,874,098	-	194,010,380	30,563,566	381,427,284
78	381,427,284	-	140,168,621	21,249,697	262,508,360
79	262,508,360	-	98,966,446	14,541,046	178,082,960
80	178,082,960	-	68,202,388	9,828,895	119,709,467
81	119,709,467	-	45,819,058	6,608,015	80,498,424
82	80,498,424	-	29,970,713	4,471,647	54,999,357
83	54,999,357	-	19,065,026	3,102,406	39,036,737
84	39,036,737	-	11,780,797	2,260,538	29,516,479
85	29,516,479	-	7,063,934	1,770,897	24,223,441
86	24,223,441	-	4,106,164	1,509,880	21,627,157
87	21,627,157	-	2,312,052	1,393,330	20,708,434
88	20,708,434	-	1,260,367	1,366,026	20,814,093
89	20,814,093	-	665,108	1,393,117	21,542,102
90	21,542,102	-	339,932	1,453,495	22,655,665
91	22,655,665	-	168,409	1,534,954	24,022,210
92	24,022,210	-	80,935	1,630,804	25,572,079
93	25,572,079	-	37,759	1,737,639	27,271,959
94	27,271,959	-	17,120	1,853,921	29,108,760
95	29,108,760	-	7,545	1,979,143	31,080,358
96	31,080,358	-	3,218	2,113,357	33,190,497
97	33,190,497	-	1,312	2,256,910	35,446,095
98	35,446,095	-	505	2,410,318	37,855,907
99	37,855,907	-	186	2,574,196	40,429,917
100	40,429,917	-	86	2,749,232	43,179,063



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		(f)=(d)*v^n((a)-.5)	(g)=(e)*vf^n((a)-.5)	(h)=(c)/(1+sdr)^n(a-.5)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	\$ 118,368,225,822	\$ 7,331,162,384	\$ 7,331,162,384	\$ -	\$ 7,093,935,131	\$ -	\$ 7,093,935,131
2	121,215,074,866	7,784,344,991	7,784,344,991	-	7,052,858,909	-	7,052,858,909
3	123,752,071,611	7,925,423,545	7,925,423,545	-	6,723,483,587	-	6,723,483,587
4	126,190,347,916	7,992,695,411	7,992,695,411	-	6,348,832,635	-	6,348,832,635
5	128,680,541,151	7,928,165,847	7,928,165,847	-	5,896,605,719	-	5,896,605,719
6	131,412,877,831	8,143,935,530	8,143,935,530	-	5,671,428,185	-	5,671,428,185
7	134,174,405,944	8,368,466,772	8,368,466,772	-	5,456,733,621	-	5,456,733,621
8	136,814,296,409	8,595,434,773	8,595,434,773	-	5,247,874,660	-	5,247,874,660
9	139,323,605,549	8,815,666,999	8,815,666,999	-	5,039,640,171	-	5,039,640,171
10	141,701,697,070	9,033,676,515	9,033,676,515	-	4,835,458,211	-	4,835,458,211
11	143,942,764,475	9,260,630,303	9,260,630,303	-	4,641,329,419	-	4,641,329,419
12	146,028,628,902	9,492,328,589	9,492,328,589	-	4,454,545,071	-	4,454,545,071
13	147,943,473,794	9,720,465,612	9,720,465,612	-	4,271,165,595	-	4,271,165,595
14	149,678,102,579	9,944,094,528	9,944,094,528	-	4,091,224,700	-	4,091,224,700
15	151,223,773,292	10,157,198,864	10,157,198,864	-	3,912,828,304	-	3,912,828,304
16	152,577,586,043	10,361,893,948	10,361,893,948	-	3,737,530,336	-	3,737,530,336
17	153,734,216,408	10,557,448,611	10,557,448,611	-	3,565,605,629	-	3,565,605,629
18	154,688,999,055	10,750,150,755	10,750,150,755	-	3,399,520,250	-	3,399,520,250
19	155,430,795,120	10,945,450,374	10,945,450,374	-	3,240,898,736	-	3,240,898,736
20	155,942,047,037	11,147,953,450	11,147,953,450	-	3,090,691,936	-	3,090,691,936
21	156,198,867,097	11,352,910,694	11,352,910,694	-	2,947,111,325	-	2,947,111,325
22	156,180,430,949	11,550,541,283	11,550,541,283	-	2,807,504,130	-	2,807,504,130
23	155,874,659,582	11,741,446,455	11,741,446,455	-	2,672,196,657	-	2,672,196,657
24	155,268,569,943	11,928,827,664	11,928,827,664	-	2,541,987,005	-	2,541,987,005
25	154,345,604,984	12,103,372,688	12,103,372,688	-	2,414,964,302	-	2,414,964,302
26	153,098,200,717	12,260,233,691	12,260,233,691	-	2,290,507,956	-	2,290,507,956
27	151,523,953,087	12,398,107,272	12,398,107,272	-	2,168,788,458	-	2,168,788,458
28	149,622,163,343	12,526,460,199	12,526,460,199	-	2,051,723,883	-	2,051,723,883
29	147,382,870,885	12,641,789,789	12,641,789,789	-	1,938,777,017	-	1,938,777,017
30	144,799,349,703	12,702,984,999	12,702,984,999	-	1,824,121,788	-	1,824,121,788
31	141,907,079,697	12,713,311,812	12,713,311,812	-	1,709,367,694	-	1,709,367,694
32	138,742,322,284	12,697,101,521	12,697,101,521	-	1,598,490,768	-	1,598,490,768
33	135,320,411,307	12,647,874,822	12,647,874,822	-	1,490,911,437	-	1,490,911,437
34	131,664,884,937	12,557,606,394	12,557,606,394	-	1,386,021,290	-	1,386,021,290
35	127,809,485,304	12,425,793,497	12,425,793,497	-	1,284,150,467	-	1,284,150,467
36	123,790,946,220	12,267,171,937	12,267,171,937	-	1,187,038,983	-	1,187,038,983
37	119,632,896,254	12,091,045,487	12,091,045,487	-	1,095,501,891	-	1,095,501,891
38	115,349,993,931	11,896,612,725	11,896,612,725	-	1,009,256,019	-	1,009,256,019
39	110,957,665,447	11,685,452,351	11,685,452,351	-	928,222,946	-	928,222,946
40	106,469,896,458	11,457,671,420	11,457,671,420	-	852,181,069	-	852,181,069
41	101,900,799,190	11,213,285,536	11,213,285,536	-	780,903,101	-	780,903,101
42	97,264,802,120	10,949,136,564	10,949,136,564	-	713,958,364	-	713,958,364
43	92,580,022,143	10,660,931,911	10,660,931,911	-	650,903,985	-	650,903,985
44	87,869,717,280	10,348,381,761	10,348,381,761	-	591,592,895	-	591,592,895
45	83,158,636,088	10,017,840,132	10,017,840,132	-	536,232,771	-	536,232,771
46	78,466,333,521	9,674,213,688	9,674,213,688	-	484,868,174	-	484,868,174
47	73,808,317,103	9,318,426,191	9,318,426,191	-	437,299,841	-	437,299,841
48	69,199,986,180	8,951,735,906	8,951,735,906	-	393,344,207	-	393,344,207
49	64,656,346,436	8,575,731,818	8,575,731,818	-	352,829,944	-	352,829,944
50	60,191,676,262	8,191,943,187	8,191,943,187	-	315,580,328	-	315,580,328



Single Discount Rate Development

Present Values of Projected Benefits Ending December 31, 2122(Concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit		Unfunded Portion of Benefit Payments	Present Value of	Present Value of	Present Value of
		Payments Including Dividends	Funded Portion of Benefit Payments		Funded Benefit Payments using Expected Return Rate (v)	Unfunded Benefit Payments using Municipal Bond Rate (vf)	Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^{(a)-5}	(g)=(e)*vf ^{(a)-5}	(h)=(c)/(1+sdr) ^{(a)-5}
51	\$ 55,819,580,949	\$ 7,801,241,615	\$ 7,801,241,615	\$ -	\$ 281,394,411	\$ -	\$ 281,394,411
52	51,553,635,327	7,404,626,740	7,404,626,740	-	250,082,705	-	250,082,705
53	47,407,269,701	7,003,252,092	7,003,252,092	-	221,466,985	-	221,466,985
54	43,393,622,433	6,598,431,399	6,598,431,399	-	195,379,362	-	195,379,362
55	39,525,346,720	6,191,628,055	6,191,628,055	-	171,660,980	-	171,660,980
56	35,814,410,227	5,784,446,135	5,784,446,135	-	150,161,036	-	150,161,036
57	32,271,915,094	5,378,616,359	5,378,616,359	-	130,735,879	-	130,735,879
58	28,907,925,281	4,975,967,107	4,975,967,107	-	113,247,982	-	113,247,982
59	25,731,296,555	4,578,409,242	4,578,409,242	-	97,565,512	-	97,565,512
60	22,749,509,560	4,187,928,608	4,187,928,608	-	83,562,175	-	83,562,175
61	19,968,499,691	3,806,549,962	3,806,549,962	-	71,116,561	-	71,116,561
62	17,392,513,425	3,436,308,323	3,436,308,323	-	60,111,849	-	60,111,849
63	15,023,982,927	3,079,218,152	3,079,218,152	-	50,435,597	-	50,435,597
64	12,863,423,928	2,737,229,467	2,737,229,467	-	41,979,442	-	41,979,442
65	10,909,371,995	2,412,194,890	2,412,194,890	-	34,639,100	-	34,639,100
66	9,158,348,542	2,105,829,650	2,105,829,650	-	28,314,323	-	28,314,323
67	7,604,865,850	1,819,664,414	1,819,664,414	-	22,908,835	-	22,908,835
68	6,241,481,180	1,555,010,124	1,555,010,124	-	18,330,473	-	18,330,473
69	5,058,890,909	1,312,918,467	1,312,918,467	-	14,491,287	-	14,491,287
70	4,046,071,909	1,094,133,727	1,094,133,727	-	11,307,545	-	11,307,545
71	3,190,482,304	899,045,440	899,045,440	-	8,699,781	-	8,699,781
72	2,478,324,813	727,639,681	727,639,681	-	6,592,829	-	6,592,829
73	1,894,878,326	579,455,475	579,455,475	-	4,915,914	-	4,915,914
74	1,424,897,092	453,563,703	453,563,703	-	3,602,892	-	3,602,892
75	1,053,058,833	348,583,308	348,583,308	-	2,592,676	-	2,592,676
76	764,426,602	262,747,028	262,747,028	-	1,829,819	-	1,829,819
77	544,874,098	194,010,380	194,010,380	-	1,265,098	-	1,265,098
78	381,427,284	140,168,621	140,168,621	-	855,813	-	855,813
79	262,508,360	98,966,446	98,966,446	-	565,776	-	565,776
80	178,082,960	68,202,388	68,202,388	-	365,077	-	365,077
81	119,709,467	45,819,058	45,819,058	-	229,647	-	229,647
82	80,498,424	29,970,713	29,970,713	-	140,650	-	140,650
83	54,999,357	19,065,026	19,065,026	-	83,774	-	83,774
84	39,036,737	11,780,797	11,780,797	-	48,470	-	48,470
85	29,516,479	7,063,934	7,063,934	-	27,213	-	27,213
86	24,223,441	4,106,164	4,106,164	-	14,811	-	14,811
87	21,627,157	2,312,052	2,312,052	-	7,809	-	7,809
88	20,708,434	1,260,367	1,260,367	-	3,986	-	3,986
89	20,814,093	665,108	665,108	-	1,969	-	1,969
90	21,542,102	339,932	339,932	-	942	-	942
91	22,655,665	168,409	168,409	-	437	-	437
92	24,022,210	80,935	80,935	-	197	-	197
93	25,572,079	37,759	37,759	-	86	-	86
94	27,271,959	17,120	17,120	-	36	-	36
95	29,108,760	7,545	7,545	-	15	-	15
96	31,080,358	3,218	3,218	-	6	-	6
97	33,190,497	1,312	1,312	-	2	-	2
98	35,446,095	505	505	-	1	-	1
99	37,855,907	186	186	-	0	-	0
100	40,429,917	86	86	-	0	-	0
Totals					\$ 141,309,267,264	\$ -	\$ 141,309,267,264



SECTION F

SUMMARY OF ASSUMPTIONS

Summary of Assumptions Used to Develop Total Pension Liability Assumptions Adopted by ETF Board after Consulting with Actuary

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

Economic Assumptions

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

2023: 1.6% Core, -21.0% Variable
2024: 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)	Executive & Elected Non-State	Executive & Elected State	University Teachers State	Public School Teachers Non-State	Protective With SS Non-State	Protective With SS State	Protective Without SS Non-State
1	3.5%	3.5%	2.5%	2.5%	3.0%	5.6%	4.8%	4.8%	5.5%
2	3.5%	3.5%	2.5%	2.5%	3.0%	5.6%	4.8%	4.8%	5.5%
3	3.1%	3.1%	2.0%	2.0%	2.9%	5.2%	4.1%	4.1%	4.7%
4	2.8%	2.8%	1.6%	1.6%	2.8%	4.7%	3.5%	3.5%	3.8%
5	2.5%	2.5%	1.1%	1.1%	2.7%	4.3%	2.8%	2.8%	3.0%
10	1.5%	1.5%	0.2%	0.2%	2.2%	2.6%	1.1%	1.1%	0.9%
15	1.1%	1.1%	0.2%	0.2%	1.7%	1.4%	0.8%	0.8%	0.5%
20	0.9%	0.9%	0.2%	0.2%	1.2%	0.6%	0.7%	0.7%	0.4%
25	0.6%	0.6%	0.2%	0.2%	0.9%	0.3%	0.6%	0.6%	0.3%
30	0.4%	0.4%	0.2%	0.2%	0.7%	0.2%	0.5%	0.5%	0.2%

Decrement Probabilities

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

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

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

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

The values shown above are for non-disabled participants in 2022. For disabled participants, the following table was used:

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

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

Active Participant Mortality Rates

Sample Attained Ages in 2022	Mortality Rates ¹	
	Males	Females
20	0.000400	0.000165
25	0.000214	0.000129
30	0.000351	0.000226
35	0.000512	0.000325
40	0.000640	0.000428
45	0.000820	0.000544
50	0.001190	0.000783
55	0.001879	0.001245
60	0.003102	0.001962
65	0.005005	0.003016
70	0.007489	0.004983
75	0.010923	0.009507
80	0.021800	0.019586

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

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

Rates of Retirement for Those Eligible to Retire

Normal Retirement

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

* Includes reduced retirements for Protective with 20+ years of service.

Reduced Retirement

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

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

Assumed Termination Rates by Attained Age and Years of Service

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

Disability Rates

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

SECTION G

PLAN PROVISIONS

Summary of Benefit Provisions

Normal Retirement Eligibility

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

General, Public School, and University		Protective		Executive & Elected [#]	
Age	Service	Age	Service	Age	Service
65	Any*	54	Any*	62	Any*
57	30	53	25	57	30

* Participants first employed after 1989 and terminated before April 24, 1998 must have creditable service in 5 calendar years.

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

Normal Retirement Annuity

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

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

FAE is generally the average of the 3 highest years of earnings (July 1 - June 30 for teachers, educational support staff, and judges; calendar year for others) preceding retirement. These years do not have to be consecutive. For legislators and state constitutional officers who are ineligible to receive pay increases during their term, FAE is the statutory rate of earnings at termination.

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



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

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

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

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

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

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

The **service requirement** is that during the 7 years preceding application the individual must have earned:

- At least 6 months of service credit in 5 of those years; or
- A total of 5 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.
- 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 H

GLOSSARY OF TERMS

Glossary of Terms

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

Glossary of Terms

<i>Amortization Method</i>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<i>Covered-Employee Payroll</i>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<i>Deferred Inflows and Outflows</i>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. 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 should be included in the deferred inflows or outflows of resources.
<i>Deferred Retirement Option Program (DROP)</i>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<i>Discount Rate</i>	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

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

Glossary of Terms

<i>Other Postemployment Benefits (OPEB)</i>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment health care benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
<i>Real Rate of Return</i>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<i>Service Cost</i>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<i>Total Pension Expense</i>	The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year: <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
<i>Total Pension Liability (TPL)</i>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<i>Unfunded Actuarial Accrued Liability (UAAL)</i>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<i>Valuation Assets</i>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of the GASB Statement No. 67, the valuation asset is equal to the market value of assets.