

Wisconsin Retirement System

GASB Statement No. 67 Plan Reporting and
Accounting Schedules

December 31, 2018



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August 29, 2019

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.

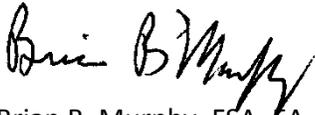
The report was based upon information, furnished by the Department of Employee Trust Funds (DETF), concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit 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, 2018 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

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. Brian B. Murphy, Mark Buis and James D. Anderson are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the Academy of Actuaries to render the actuarial opinions herein. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,



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Mark Buis, FSA, EA, FCA, MAAA



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

BBM/MB/JDA:sc

SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2018

	2018
Actuarial Valuation Date	December 31, 2018
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	December 31, 2018
 Membership	
Number of	
- Retirees and Beneficiaries	211,126
- Inactive, Nonretired Members	167,778
- Active Members	256,933
- Total	635,837
Covered Payroll ⁽¹⁾	\$ 14,301,446,269
 Net Pension Liability/(Asset)	
Total Pension Liability	\$ 99,695,805,227
Plan Fiduciary Net Position	96,737,081,255
Net Pension Liability/(Asset)	\$ 2,958,723,972
Plan Fiduciary Net Position as a Percentage of Total Pension Liability/(Asset)	97.03%
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	20.69%
 Development of the Single Discount Rate	
Single Discount Rate	7.00%
Long-Term Expected Rate of Return	7.00%
Long-Term Municipal Bond Rate ⁽²⁾	3.71%
Last year ending December 31 in the 2019 to 2118 projection period for which projected benefit payments are fully funded	2118

⁽¹⁾ Covered Payroll 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 31, 2018. 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.

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.

While the first two tables may be built prospectively as the information becomes available, sufficient information is currently available for the third and fourth tables.

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 7.0% 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 2118. 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, 2018 and a measurement date of December 31, 2018.

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 7.00%; the municipal bond rate is 3.71% (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 7.00%.

Actuarial Assumptions and Methods and Member Census Data

The liability and asset values used in this study are taken from the December 31, 2018 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, 2018 Actuarial Valuation Reports of the Retirement System.

The Wisconsin Retirement System uses the Frozen Initial Liability cost method for determining funding requirements. GASB Statement No. 67 requires the use of the Entry Age Normal 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, 2018

	2018
Assets	
Cash and Deposits	\$ 4,513,226,094
Receivables	
Accounts Receivable - Sale of Investments	\$ 3,567,892,433
Accrued Interest and Other Dividends	306,976,864
Contributions	161,976,637
Accounts Receivable - Other	12,514,358
Total Receivables	\$ 4,049,360,292
Investments	
Fixed Income	\$ 31,739,324,158
Domestic and International Equities	54,849,647,193
Real Estate	1,372,027,366
Other	20,358,630,023
Total Investments	\$ 108,319,628,740
Total Assets	\$ 116,882,215,126
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ 19,617,766,647
Accrued Expenses	7,752,111
Accounts Payable - Other	519,615,113
Total Liabilities	\$ 20,145,133,871
Net Position Restricted for Pensions	\$ 96,737,081,255

Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2018

	2018
Additions	
Contributions	
Employer	\$ 1,030,507,544
Employee	972,950,131
Other	-
Total Contributions	\$ 2,003,457,675
Investment Income	
Net Appreciation in Fair Value of Investments	\$ (5,357,973,262)
Interest and Dividends	2,010,680,816
Less Investment Expense	(702,062,131)
Net Investment Income	\$ (4,049,354,577)
Other	\$ -
Total Additions	\$ (2,045,896,902)
 Deductions	
Benefit payments, including refunds of employee contributions	\$ 5,556,423,286
Pension Plan Administrative Expense	31,612,198
Other Benefit Expenses	25,448,686
Total Deductions	\$ 5,613,484,170
Net Increase in Net Position	\$ (7,659,381,072)
 Net Position Restricted for Pensions	
Beginning of Year	\$ 104,396,462,327
End of Year	\$ 96,737,081,255

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 (which may be built prospectively)

Fiscal year ending December 31,	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Pension Liability										
Service Cost	\$ 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	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	-	-	-	-	-	-				
Difference between Expected and Actual Experience	(5,980,346,708)	5,142,055,157	318,473,379	(4,488,825,613)	473,101,546	2,659,920,220				
Assumption Changes	404,242,989	-	-	1,484,977,863	-	-				
Benefit Payments	(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	(40,234,768)	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)	(33,271,143)				
Net Change in Total Pension Liability	(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	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)⁽¹⁾	\$ 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	\$ 1,030,507,544	\$ 1,017,558,990	\$ 963,121,911	\$ 977,733,921	\$ 987,792,834	\$ 914,698,118				
Employee Contributions	972,950,131	965,452,633	921,863,806	937,225,184	941,903,267	871,259,789				
Pension Plan Net Investment Income	(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	(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	(40,234,768)	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)	(33,271,143)				
Pension Plan Administrative Expense	(31,612,198)	(26,132,873)	(20,426,189)	(22,708,614)	(24,036,951)	(22,857,502)				
Other	(25,448,686)	-	-	-	-	-				
Net Change in Plan Fiduciary Net Position	(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⁽²⁾	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)	\$ 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)	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	97.03 %	102.58 %	99.09 %	98.34 %	102.70 %	104.59 %				
Covered-Employee Payroll⁽³⁾	\$ 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	20.69 %	(18.82)%	6.22 %	11.05 %	(18.30)%	(30.60)%				

Notes to Schedule:

⁽¹⁾ In 2017, end of year liabilities were adjusted to reflect the Long Term Disability Insurance (LTDI) program.

⁽²⁾ 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.

⁽³⁾ Covered payroll provided by DETF.

Schedules of Required Supplementary Information

Multiyear Schedule of the Net Pension Liability/(Asset)

Last 10 Fiscal Years (which may be built prospectively)

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
2009						
2010						
2011						
2012						
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 %

⁽¹⁾ Covered payroll provided by DETF.

Multiyear Schedule of Contributions

Last 10 Fiscal Years (which may be built prospectively)

FY Ending December 31,	Actuarially Determined Contribution ⁽¹⁾	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll ⁽³⁾	Actual Contribution as a % of Covered Payroll
2009					
2010					
2011					
2012					
2013	\$ 905,148,514	\$ 905,148,514	-	\$ 12,884,800,000	7.02%
2014 ⁽²⁾	977,068,988	977,068,988	-	13,219,500,000	7.39%
2015 ⁽²⁾	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%

⁽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⁾ The Actuarially Determined Contribution (ADC) included Prior Service Contributions, Early Retirement Contributions, Employer Additional Contributions, and Employer Required Contributions.

⁽³⁾ Covered payroll provided by DETF.

Multiyear Schedule of Investment Returns

Last 10 Fiscal Years (which may be built prospectively)

<u>FY Ending December 31,</u>	<u>Core Annual Return¹</u>	<u>Variable Annual Return¹</u>
2009		
2010		
2011		
2012		
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)%

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, 2018, 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>
Equities	49.00%	5.50%
Fixed Income	24.50%	1.50%
Inflation Sens. Assets	15.50%	1.30%
Real Estate	9.00%	3.90%
Private Equity/Debt	8.00%	6.70%
Multi-asset	4.00%	4.10%
Cash	-10.00%	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>
Domestic Equity	70.00%	5.00%
International Equity	30.00%	5.90%
Fixed Income	N/A	N/A
Inflation Sens. Assets	N/A	N/A
Real Estate	N/A	N/A
Private Equity/Debt	N/A	N/A
Multi-asset	N/A	N/A
Cash	N/A	N/A
Total	100.00%	

Single Discount Rate

A single discount rate of 7.00% 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 7.00% and a long-term bond rate of 3.71%. Because of the unique structure of WRS, the 7.00% expected rate of return implies that a dividend of approximately 1.9% 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 7.00%, 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

Discount Rate	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	6.00%	7.00%	8.00%
Ultimate Dividend Rate	1.90%	1.90%	1.90%
Total Pension Liability	\$ 110,371,675,328	\$ 99,695,805,227	\$ 91,693,815,036
Plan Fiduciary Net Position	96,737,081,255	96,737,081,255	96,737,081,255
Net Pension Liability/(Asset)	\$ 13,634,594,073	\$ 2,958,723,972	\$ (5,043,266,219)

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 1.00% for the 6.0% discount rate, 1.90% for the 7.0% discount rate, and 2.89% for the 8.0% 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	6.00%	7.00%	8.00%
Ultimate Dividend Rate	1.00%	1.90%	2.89%
Total Pension Liability	\$ 103,993,866,304	\$ 99,695,805,227	\$ 96,402,345,806
Plan Fiduciary Net Position	96,737,081,255	96,737,081,255	96,737,081,255
Net Pension Liability/(Asset)	\$ 7,256,785,049	\$ 2,958,723,972	\$ (334,735,449)

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	211,126
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	167,778
Active Plan Members	<u>256,933</u>
Total Plan Members	635,837

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 7.00%; the municipal bond rate is 3.71%; and the resulting single discount rate is 7.00%.

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 2017 actuarial valuations (13.65%). 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 remains level for 20 years and is assumed to migrate to the ultimate contribution rate of 13.75% 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 modelled 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, 2118

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
0	\$ 14,041,392,316				
1	13,988,805,822	\$ 916,546,558	\$ 992,925,437	\$ -	\$ 1,909,471,995
2	13,524,858,380	925,100,313	1,002,192,006	-	1,927,292,319
3	13,111,088,833	903,091,799	978,349,448	-	1,881,441,247
4	12,713,441,456	881,804,299	955,287,991	-	1,837,092,290
5	12,323,236,890	884,315,479	958,008,436	-	1,842,323,915
6	11,938,748,595	856,724,599	928,118,316	-	1,784,842,915
7	11,556,909,686	829,323,839	898,434,159	-	1,727,757,998
8	11,176,756,683	802,044,060	868,881,064	-	1,670,925,124
9	10,798,761,831	774,919,149	839,495,745	-	1,614,414,894
10	10,421,757,335	747,865,307	810,187,415	-	1,558,052,722
11	10,043,277,245	720,705,575	780,764,373	-	1,501,469,948
12	9,661,043,509	693,276,482	751,049,523	-	1,444,326,005
13	9,273,675,312	665,478,940	720,935,519	-	1,386,414,459
14	8,879,581,372	637,198,759	690,298,656	-	1,327,497,415
15	8,479,853,754	608,514,305	659,223,831	-	1,267,738,136
16	8,075,784,722	579,518,312	627,811,504	-	1,207,329,816
17	7,665,343,278	550,065,034	595,903,786	-	1,145,968,820
18	7,249,189,077	520,201,808	563,551,959	-	1,083,753,767
19	6,828,505,226	490,013,535	530,847,996	-	1,020,861,531
20	6,404,277,512	459,570,954	497,868,534	-	957,439,488
21	5,978,538,651	429,019,933	464,771,595	-	893,791,528
22	5,553,610,274	398,527,073	431,737,663	-	830,264,736
23	5,129,682,079	368,105,986	398,781,485	-	766,887,471
24	4,704,601,586	337,602,210	365,735,727	-	703,337,937
25	4,276,368,144	306,872,178	332,444,860	-	639,317,038
26	3,845,188,445	275,930,723	298,924,950	-	574,855,673
27	3,415,136,289	245,070,180	265,492,695	-	510,562,875
28	2,990,940,794	197,402,092	213,852,267	-	411,254,359
29	2,576,734,916	170,064,504	184,236,547	-	354,301,051
30	2,179,135,457	143,822,940	155,808,185	-	299,631,125
31	1,810,132,348	119,468,735	129,424,463	-	248,893,198
32	1,479,379,733	97,639,062	105,775,651	-	203,414,713
33	1,189,615,705	78,514,636	85,057,523	-	163,572,159
34	942,083,084	62,177,484	67,358,940	-	129,536,424
35	736,661,312	48,619,646	52,671,284	-	101,290,930
36	570,037,757	37,622,492	40,757,700	-	78,380,192
37	436,478,268	28,807,566	31,208,196	-	60,015,762
38	329,968,544	21,777,924	23,592,751	-	45,370,675
39	246,079,462	16,241,244	17,594,682	-	33,835,926
40	181,626,448	11,987,346	12,986,291	-	24,973,637
41	132,922,621	8,772,893	9,503,967	-	18,276,860
42	96,387,513	6,361,576	6,891,707	-	13,253,283
43	69,342,143	4,576,582	4,957,963	-	9,534,545
44	49,601,496	3,273,699	3,546,507	-	6,820,206
45	35,269,598	2,327,794	2,521,776	-	4,849,570
46	24,962,438	1,647,521	1,784,814	-	3,432,335
47	17,404,876	1,148,722	1,244,448	-	2,393,170
48	11,827,239	780,598	845,647	-	1,626,245
49	7,800,809	514,853	557,758	-	1,072,611
50	4,848,676	320,013	346,680	-	666,693

Single Discount Rate Development

Projection of Contributions Ending December 31, 2118

(Concluded)

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
51	\$ 2,736,160	\$ 180,587	\$ 195,635	\$ -	\$ 376,222
52	1,364,261	90,041	97,545	-	187,586
53	605,474	39,961	43,292	-	83,253
54	262,318	17,313	18,756	-	36,069
55	115,533	7,625	8,261	-	15,886
56	39,052	2,578	2,792	-	5,370
57	7,309	482	523	-	1,005
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, 2118

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
1	\$ 96,737,081,255	\$ 1,909,471,995	\$ 5,577,989,868	\$ 6,645,369,166	\$ 99,713,932,548
2	99,713,932,548	1,927,292,319	5,696,634,696	6,850,279,583	102,794,869,753
3	102,794,869,753	1,881,441,247	5,856,028,564	7,058,883,110	105,879,165,547
4	105,879,165,547	1,837,092,290	6,024,997,852	7,267,443,952	108,958,703,937
5	108,958,703,937	1,842,323,915	6,160,775,592	7,478,519,803	112,118,772,063
6	112,118,772,063	1,784,842,915	6,404,536,242	7,689,359,437	115,188,438,173
7	115,188,438,173	1,727,757,998	6,664,370,035	7,893,331,511	118,145,157,647
8	118,145,157,647	1,670,925,124	6,928,726,922	8,089,250,363	120,976,606,212
9	120,976,606,212	1,614,414,894	7,195,109,614	8,276,341,649	123,672,253,142
10	123,672,253,142	1,558,052,722	7,467,048,465	8,453,740,739	126,216,998,138
11	126,216,998,138	1,501,469,948	7,746,365,616	8,620,315,229	128,592,417,699
12	128,592,417,699	1,444,326,005	8,024,189,928	8,775,068,996	130,787,622,772
13	130,787,622,772	1,386,414,459	8,293,634,823	8,917,469,657	132,797,872,065
14	132,797,872,065	1,327,497,415	8,556,308,193	9,047,121,810	134,616,183,098
15	134,616,183,098	1,267,738,136	8,809,856,033	9,163,623,298	136,237,688,499
16	136,237,688,499	1,207,329,816	9,062,895,482	9,266,343,552	137,648,466,385
17	137,648,466,385	1,145,968,820	9,313,666,840	9,354,358,140	138,835,126,505
18	138,835,126,505	1,083,753,767	9,555,121,626	9,426,975,663	139,790,734,309
19	139,790,734,309	1,020,861,531	9,782,346,229	9,483,885,857	140,513,135,468
20	140,513,135,468	957,439,488	9,994,580,105	9,524,969,157	141,000,964,009
21	141,000,964,009	893,791,528	10,197,759,161	9,549,936,160	141,246,932,535
22	141,246,932,535	830,264,736	10,390,535,898	9,558,335,054	141,244,996,427
23	141,244,996,427	766,887,471	10,568,821,740	9,549,884,371	140,992,946,529
24	140,992,946,529	703,337,937	10,738,289,132	9,524,223,222	140,482,218,556
25	140,482,218,556	639,317,038	10,899,223,879	9,480,731,980	139,703,043,695
26	139,703,043,695	574,855,673	11,051,743,715	9,418,723,841	138,644,879,495
27	138,644,879,495	510,562,875	11,195,620,046	9,337,489,655	137,297,311,979
28	137,297,311,979	411,254,359	11,328,128,067	9,235,183,576	135,615,621,847
29	135,615,621,847	354,301,051	11,447,383,138	9,111,402,281	133,633,942,041
30	133,633,942,041	299,631,125	11,547,612,729	8,967,354,905	131,353,315,342
31	131,353,315,342	248,893,198	11,625,376,133	8,803,289,557	128,780,121,964
32	128,780,121,964	203,414,713	11,677,062,114	8,619,822,781	125,926,297,343
33	125,926,297,343	163,572,159	11,696,023,787	8,418,031,719	122,811,877,434
34	122,811,877,434	129,536,424	11,681,436,439	8,199,353,145	119,459,330,564
35	119,459,330,564	101,290,930	11,634,559,867	7,965,315,923	115,891,377,549
36	115,891,377,549	78,380,192	11,554,406,744	7,717,528,810	112,132,879,807
37	112,132,879,807	60,015,762	11,443,286,562	7,457,625,512	108,207,234,520
38	108,207,234,520	45,370,675	11,303,131,580	7,187,148,892	104,136,622,506
39	104,136,622,506	33,835,926	11,133,743,696	6,907,637,468	99,944,352,205
40	99,944,352,205	24,973,637	10,936,173,036	6,620,671,633	95,653,824,439
41	95,653,824,439	18,276,860	10,711,737,837	6,327,826,643	91,288,190,105
42	91,288,190,105	13,253,283	10,459,108,704	6,030,751,862	86,873,086,546
43	86,873,086,546	9,534,545	10,177,619,168	5,731,252,162	82,436,254,085
44	82,436,254,085	6,820,206	9,872,080,419	5,431,093,486	78,002,087,358
45	78,002,087,358	4,849,570	9,549,539,913	5,131,731,997	73,589,129,012
46	73,589,129,012	3,432,335	9,213,930,286	4,834,323,819	69,212,954,880
47	69,212,954,880	2,393,170	8,866,997,332	4,539,893,158	64,888,243,876
48	64,888,243,876	1,626,245	8,510,357,414	4,249,408,281	60,628,920,988
49	60,628,920,988	1,072,611	8,145,555,943	3,963,788,734	56,448,226,390
50	56,448,226,390	666,693	7,774,145,296	3,683,905,659	52,358,653,446

Single Discount Rate Development

Projection of Plan Fiduciary Net Position Ending December 31, 2118 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
51	\$ 52,358,653,446	\$ 376,222	\$ 7,397,201,991	\$ 3,410,595,440	\$ 48,372,423,118
52	48,372,423,118	187,586	7,015,630,478	3,144,681,956	44,501,662,182
53	44,501,662,182	83,253	6,630,424,291	2,886,979,291	40,758,300,435
54	40,758,300,435	36,069	6,242,817,728	2,638,279,129	37,153,797,905
55	37,153,797,905	15,886	5,854,267,050	2,399,332,526	33,698,879,267
56	33,698,879,267	5,370	5,466,264,933	2,170,838,253	30,403,457,957
57	30,403,457,957	1,005	5,080,333,257	1,953,437,765	27,276,563,471
58	27,276,563,471	-	4,698,184,275	1,747,704,115	24,326,083,311
59	24,326,083,311	-	4,321,673,821	1,554,125,492	21,558,534,982
60	21,558,534,982	-	3,952,718,826	1,373,092,128	18,978,908,284
61	18,978,908,284	-	3,593,278,043	1,204,885,913	16,590,516,155
62	16,590,516,155	-	3,245,317,992	1,049,671,089	14,394,869,251
63	14,394,869,251	-	2,910,726,609	907,488,440	12,391,631,083
64	12,391,631,083	-	2,591,288,751	778,253,000	10,578,595,333
65	10,578,595,333	-	2,288,649,698	661,753,715	8,951,699,350
66	8,951,699,350	-	2,004,226,249	557,657,451	7,505,130,552
67	7,505,130,552	-	1,739,168,426	465,517,756	6,231,479,882
68	6,231,479,882	-	1,494,384,808	384,784,735	5,121,879,808
69	5,121,879,808	-	1,270,555,199	314,814,268	4,166,138,878
70	4,166,138,878	-	1,068,132,829	254,877,361	3,352,883,410
71	3,352,883,410	-	887,334,446	204,170,397	2,669,719,361
72	2,669,719,361	-	728,085,263	161,828,366	2,103,462,464
73	2,103,462,464	-	589,955,514	126,943,158	1,640,450,108
74	1,640,450,108	-	472,113,688	98,586,999	1,266,923,419
75	1,266,923,419	-	373,284,416	75,840,653	969,479,656
76	969,479,656	-	291,765,499	57,824,496	735,538,653
77	735,538,653	-	225,551,806	43,726,909	553,713,756
78	553,713,756	-	172,516,429	32,824,010	414,021,338
79	414,021,338	-	130,572,507	24,488,749	307,937,580
80	307,937,580	-	97,788,293	18,190,927	228,340,214
81	228,340,214	-	72,449,643	13,490,965	169,381,536
82	169,381,536	-	53,080,660	10,030,306	126,331,181
83	126,331,181	-	38,438,591	7,520,586	95,413,176
84	95,413,176	-	27,493,367	5,732,929	73,652,739
85	73,652,739	-	19,406,630	4,487,948	58,734,057
86	58,734,057	-	13,503,847	3,646,743	48,876,952
87	48,876,952	-	9,250,884	3,103,082	42,729,150
88	42,729,150	-	6,232,940	2,776,577	39,272,788
89	39,272,788	-	4,126,511	2,607,110	37,753,386
90	37,753,386	-	2,681,497	2,550,472	37,622,361
91	37,622,361	-	1,708,314	2,574,786	38,488,832
92	38,488,832	-	1,064,310	2,657,597	40,082,119
93	40,082,119	-	645,570	2,783,536	42,220,085
94	42,220,085	-	378,665	2,942,377	44,783,797
95	44,783,797	-	211,703	3,127,581	47,699,675
96	47,699,675	-	109,700	3,335,203	50,925,177
97	50,925,177	-	51,202	3,563,001	54,436,976
98	54,436,976	-	21,767	3,809,839	58,225,049
99	58,225,049	-	9,004	4,075,444	62,291,488
100	62,291,488	-	4,694	4,360,243	66,647,037

Single Discount Rate Development

Present Values of Projected Benefits Ending December 31, 2118

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 ^{(a)-.5}	(g)=(e)*vf ^{(a)-.5}	(h)=(c)/(1+sdr) ^{(a)-.5}
1	\$ 96,737,081,255	\$ 5,577,989,868	\$ 5,577,989,868	\$ -	\$ 5,392,446,341	\$ -	\$ 5,392,446,341
2	99,713,932,548	5,696,634,696	5,696,634,696	-	5,146,864,136	-	5,146,864,136
3	102,794,869,753	5,856,028,564	5,856,028,564	-	4,944,743,203	-	4,944,743,203
4	105,879,165,547	6,024,997,852	6,024,997,852	-	4,754,596,590	-	4,754,596,590
5	108,958,703,937	6,160,775,592	6,160,775,592	-	4,543,686,829	-	4,543,686,829
6	112,118,772,063	6,404,536,242	6,404,536,242	-	4,414,453,132	-	4,414,453,132
7	115,188,438,173	6,664,370,035	6,664,370,035	-	4,293,036,175	-	4,293,036,175
8	118,145,157,647	6,928,726,922	6,928,726,922	-	4,171,335,413	-	4,171,335,413
9	120,976,606,212	7,195,109,614	7,195,109,614	-	4,048,324,383	-	4,048,324,383
10	123,672,253,142	7,467,048,465	7,467,048,465	-	3,926,477,220	-	3,926,477,220
11	126,216,998,138	7,746,365,616	7,746,365,616	-	3,806,872,446	-	3,806,872,446
12	128,592,417,699	8,024,189,928	8,024,189,928	-	3,685,426,517	-	3,685,426,517
13	130,787,622,772	8,293,634,823	8,293,634,823	-	3,559,981,065	-	3,559,981,065
14	132,797,872,065	8,556,308,193	8,556,308,193	-	3,432,459,490	-	3,432,459,490
15	134,616,183,098	8,809,856,033	8,809,856,033	-	3,302,965,481	-	3,302,965,481
16	136,237,688,499	9,062,895,482	9,062,895,482	-	3,175,546,067	-	3,175,546,067
17	137,648,466,385	9,313,666,840	9,313,666,840	-	3,049,919,431	-	3,049,919,431
18	138,835,126,505	9,555,121,626	9,555,121,626	-	2,924,287,784	-	2,924,287,784
19	139,790,734,309	9,782,346,229	9,782,346,229	-	2,797,970,574	-	2,797,970,574
20	140,513,135,468	9,994,580,105	9,994,580,105	-	2,671,658,155	-	2,671,658,155
21	141,000,964,009	10,197,759,161	10,197,759,161	-	2,547,635,597	-	2,547,635,597
22	141,246,932,535	10,390,535,898	10,390,535,898	-	2,425,977,267	-	2,425,977,267
23	141,244,996,427	10,568,821,740	10,568,821,740	-	2,306,171,363	-	2,306,171,363
24	140,992,946,529	10,738,289,132	10,738,289,132	-	2,189,859,833	-	2,189,859,833
25	140,482,218,556	10,899,223,879	10,899,223,879	-	2,077,270,340	-	2,077,270,340
26	139,703,043,695	11,051,743,715	11,051,743,715	-	1,968,541,044	-	1,968,541,044
27	138,644,879,495	11,195,620,046	11,195,620,046	-	1,863,708,742	-	1,863,708,742
28	137,297,311,979	11,328,128,067	11,328,128,067	-	1,762,399,106	-	1,762,399,106
29	135,615,621,847	11,447,383,138	11,447,383,138	-	1,664,441,573	-	1,664,441,573
30	133,633,942,041	11,547,612,729	11,547,612,729	-	1,569,172,791	-	1,569,172,791
31	131,353,315,342	11,625,376,133	11,625,376,133	-	1,476,392,376	-	1,476,392,376
32	128,780,121,964	11,677,062,114	11,677,062,114	-	1,385,940,524	-	1,385,940,524
33	125,926,297,343	11,696,023,787	11,696,023,787	-	1,297,374,830	-	1,297,374,830
34	122,811,877,434	11,681,436,439	11,681,436,439	-	1,210,987,605	-	1,210,987,605
35	119,459,330,564	11,634,559,867	11,634,559,867	-	1,127,222,447	-	1,127,222,447
36	115,891,377,549	11,554,406,744	11,554,406,744	-	1,046,221,267	-	1,046,221,267
37	112,132,879,807	11,443,286,562	11,443,286,562	-	968,373,482	-	968,373,482
38	108,207,234,520	11,303,131,580	11,303,131,580	-	893,937,426	-	893,937,426
39	104,136,622,506	11,133,743,696	11,133,743,696	-	822,935,464	-	822,935,464
40	99,944,352,205	10,936,173,036	10,936,173,036	-	755,450,746	-	755,450,746
41	95,653,824,439	10,711,737,837	10,711,737,837	-	691,539,416	-	691,539,416
42	91,288,190,105	10,459,108,704	10,459,108,704	-	631,056,004	-	631,056,004
43	86,873,086,546	10,177,619,168	10,177,619,168	-	573,899,233	-	573,899,233
44	82,436,254,085	9,872,080,419	9,872,080,419	-	520,252,715	-	520,252,715
45	78,002,087,358	9,549,539,913	9,549,539,913	-	470,331,798	-	470,331,798
46	73,589,129,012	9,213,930,286	9,213,930,286	-	424,114,419	-	424,114,419
47	69,212,954,880	8,866,997,332	8,866,997,332	-	381,444,112	-	381,444,112
48	64,888,243,876	8,510,357,414	8,510,357,414	-	342,151,430	-	342,151,430
49	60,628,920,988	8,145,555,943	8,145,555,943	-	306,060,662	-	306,060,662
50	56,448,226,390	7,774,145,296	7,774,145,296	-	272,995,607	-	272,995,607

Single Discount Rate Development

Present Values of Projected Benefits Ending December 31, 2118(Concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit		Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
		Payments Including Dividends	Funded Portion of Benefit Payments				
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^{-(a)-.5}	(g)=(e)*vf ^{-(a)-.5}	(h)=(c)/(1+sdr) ^{-(a)-.5}
51	\$ 52,358,653,446	\$ 7,397,201,991	\$ 7,397,201,991	\$ -	\$ 242,765,353	\$ -	\$ 242,765,353
52	48,372,423,118	7,015,630,478	7,015,630,478	-	215,180,125	-	215,180,125
53	44,501,662,182	6,630,424,291	6,630,424,291	-	190,060,992	-	190,060,992
54	40,758,300,435	6,242,817,728	6,242,817,728	-	167,243,231	-	167,243,231
55	37,153,797,905	5,854,267,050	5,854,267,050	-	146,573,901	-	146,573,901
56	33,698,879,267	5,466,264,933	5,466,264,933	-	127,906,029	-	127,906,029
57	30,403,457,957	5,080,333,257	5,080,333,257	-	111,098,645	-	111,098,645
58	27,276,563,471	4,698,184,275	4,698,184,275	-	96,020,249	-	96,020,249
59	24,326,083,311	4,321,673,821	4,321,673,821	-	82,546,942	-	82,546,942
60	21,558,534,982	3,952,718,826	3,952,718,826	-	70,560,419	-	70,560,419
61	18,978,908,284	3,593,278,043	3,593,278,043	-	59,947,665	-	59,947,665
62	16,590,516,155	3,245,317,992	3,245,317,992	-	50,600,514	-	50,600,514
63	14,394,869,251	2,910,726,609	2,910,726,609	-	42,414,594	-	42,414,594
64	12,391,631,083	2,591,288,751	2,591,288,751	-	35,289,534	-	35,289,534
65	10,578,595,333	2,288,649,698	2,288,649,698	-	29,129,006	-	29,129,006
66	8,951,699,350	2,004,226,249	2,004,226,249	-	23,840,168	-	23,840,168
67	7,505,130,552	1,739,168,426	1,739,168,426	-	19,333,943	-	19,333,943
68	6,231,479,882	1,494,384,808	1,494,384,808	-	15,525,924	-	15,525,924
69	5,121,879,808	1,270,555,199	1,270,555,199	-	12,336,864	-	12,336,864
70	4,166,138,878	1,068,132,829	1,068,132,829	-	9,692,877	-	9,692,877
71	3,352,883,410	887,334,446	887,334,446	-	7,525,425	-	7,525,425
72	2,669,719,361	728,085,263	728,085,263	-	5,770,881	-	5,770,881
73	2,103,462,464	589,955,514	589,955,514	-	4,370,140	-	4,370,140
74	1,640,450,108	472,113,688	472,113,688	-	3,268,428	-	3,268,428
75	1,266,923,419	373,284,416	373,284,416	-	2,415,174	-	2,415,174
76	969,479,656	291,765,499	291,765,499	-	1,764,244	-	1,764,244
77	735,538,653	225,551,806	225,551,806	-	1,274,639	-	1,274,639
78	553,713,756	172,516,429	172,516,429	-	911,145	-	911,145
79	414,021,338	130,572,507	130,572,507	-	644,503	-	644,503
80	307,937,580	97,788,293	97,788,293	-	451,104	-	451,104
81	228,340,214	72,449,643	72,449,643	-	312,350	-	312,350
82	169,381,536	53,080,660	53,080,660	-	213,874	-	213,874
83	126,331,181	38,438,591	38,438,591	-	144,746	-	144,746
84	95,413,176	27,493,367	27,493,367	-	96,757	-	96,757
85	73,652,739	19,406,630	19,406,630	-	63,829	-	63,829
86	58,734,057	13,503,847	13,503,847	-	41,509	-	41,509
87	48,876,952	9,250,884	9,250,884	-	26,576	-	26,576
88	42,729,150	6,232,940	6,232,940	-	16,734	-	16,734
89	39,272,788	4,126,511	4,126,511	-	10,354	-	10,354
90	37,753,386	2,681,497	2,681,497	-	6,288	-	6,288
91	37,622,361	1,708,314	1,708,314	-	3,744	-	3,744
92	38,488,832	1,064,310	1,064,310	-	2,180	-	2,180
93	40,082,119	645,570	645,570	-	1,236	-	1,236
94	42,220,085	378,665	378,665	-	677	-	677
95	44,783,797	211,703	211,703	-	354	-	354
96	47,699,675	109,700	109,700	-	171	-	171
97	50,925,177	51,202	51,202	-	75	-	75
98	54,436,976	21,767	21,767	-	30	-	30
99	58,225,049	9,004	9,004	-	11	-	11
100	62,291,488	4,694	4,694	-	6	-	6
Totals					\$ 115,794,313,810	\$ -	\$ 115,794,313,810

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, 2015 through December 31, 2017. While sample rates are illustrated in this section, please refer to the Wisconsin Experience Study report dated November 19, 2018 which supplies a full listing of actuarial assumptions at every age and a rationale for the selection of assumptions. Please note that minor technical adjustments were made to the mortality rates subsequent to publication of the 2015-2017 Experience Study. Please refer to page 25 for the most current mortality assumptions.

Economic Assumptions

In determining plan liabilities for accounting purposes, a discount rate of 7.0% is used for both actives and retirees. However, a long term assumed dividend of 1.9% 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 7.0% return assumption. The dividend rates used in developing the Total Pension Liability for accounting purposes is as follows:

2019: 0.0% Core, -10.0% Variable
2020: 0.0% Core, 1.9% Variable
2021: 0.8% Core, 1.9% Variable
2022: 0.9% Core, 1.9% Variable
2023: 0.0% Core, 1.9% Variable
2024 and later: 1.9% Core, 1.9% Variable

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

No specific **Price Inflation** assumption is required to perform this valuation. The price inflation assumption used to evaluate the investment return assumption is 2.5%.

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 7.0% pre-retirement investment return rate translates to an assumed real rate of return over wage inflation of 4.0%. The assumed real rate of return over price inflation is 4.5% considering an inflation assumption of 2.5%.

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.

% Merit and Longevity Increase Next Year						
Service	Gen.	University Teachers	Public School Teachers	Protective		Exec. & Elec.
				With S.S.	W/O S.S.	
1	3.5%	3.0%	5.6%	4.8%	5.5%	2.5%
2	3.5%	3.0%	5.6%	4.8%	5.5%	2.5%
3	3.1%	2.9%	5.2%	4.1%	4.7%	2.0%
4	2.8%	2.8%	4.7%	3.5%	3.8%	1.6%
5	2.5%	2.7%	4.3%	2.8%	3.0%	1.1%
10	1.5%	2.2%	2.6%	1.1%	0.9%	0.2%
15	1.1%	1.7%	1.4%	0.8%	0.5%	0.2%
20	0.9%	1.2%	0.6%	0.7%	0.4%	0.2%
25	0.6%	0.9%	0.3%	0.6%	0.3%	0.2%
30	0.4%	0.7%	0.2%	0.5%	0.2%	0.2%

Decrement Probabilities

The mortality table used to measure mortality for retired participants was the Wisconsin 2018 Mortality Table. The rates in this table were based on actual WRS experience with a base year of 2017 adjusted for future mortality improvements using the MP-2018 fully generational improvement scale (multiplied by 60%). This mortality assumption was adopted by the Board in connection with the 2015-2017 Experience Study. 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
Wisconsin 2018 Mortality Table with 5% Interest**

Sample Attained Ages in 2018	Present Value of \$1 Monthly for Life*		Future Life Expectancy (years)*		Mortality Rates*	
	Males	Females	Males	Females	Males	Females
40	\$212.90	\$217.57	45.2	48.2	0.000978	0.000608
45	204.56	210.20	40.2	43.1	0.001233	0.000919
50	194.06	201.03	35.2	38.1	0.001621	0.001343
55	181.39	189.85	30.3	33.1	0.003778	0.002415
60	167.14	176.59	25.7	28.3	0.005441	0.003507
65	150.16	160.61	21.3	23.7	0.008316	0.005262
70	130.92	141.58	17.1	19.2	0.013518	0.008775
75	109.41	119.90	13.2	14.9	0.022764	0.015900
80	86.66	96.54	9.7	11.1	0.041815	0.029897
85	65.27	73.38	6.8	7.8	0.078176	0.060047

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

The values shown above are for non-disabled participants in 2018. For disabled participants, the following table was used:

Sample Attained Ages in 2018	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Mortality Rates*	
	Males	Females	Males	Females	Males	Females
40	\$199.47	\$207.75	37.7	41.7	0.001409	0.001010
45	187.81	198.03	32.7	36.7	0.002340	0.001532
50	174.32	186.22	28.0	31.8	0.004674	0.002715
55	158.54	172.11	23.4	27.0	0.006317	0.003984
60	140.06	155.27	19.0	22.4	0.010961	0.006118
65	119.73	135.60	15.0	17.9	0.017766	0.010514
70	97.72	113.56	11.3	13.8	0.030729	0.019083
75	75.52	90.06	8.1	10.1	0.058413	0.036082
80	55.90	67.48	5.7	7.1	0.107657	0.073711
85	39.92	49.35	3.8	4.9	0.173675	0.127108

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

Active Participant Mortality Rates

Sample Attained Ages in 2018	Mortality Rates*	
	Males	Females
20	0.000134	0.000081
25	0.000164	0.000090
30	0.000211	0.000122
35	0.000371	0.000220
40	0.000489	0.000305
45	0.000617	0.000460
50	0.000810	0.000672
55	0.001889	0.001209
60	0.002720	0.001755
65	0.004158	0.002634
70	0.006759	0.004392
75	0.011382	0.007958
80	0.020907	0.014964

** With a fully generational mortality table, the mortality rate depends on the year of birth. Later years of birth will 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	General		Public School		University		Protective*		Exec. & Elected
	Male	Female	Male	Female	Male	Female	With S.S.	W/O S.S.	
50							6%	2%	
51							8%	4%	
52							10%	4%	
53							25%	17%	
54							20%	23%	
55							20%	25%	
56							20%	25%	
57	19%	17%	33%	27%	12%	15%	20%	25%	8%
58	19%	17%	29%	27%	12%	15%	20%	33%	8%
59	19%	17%	24%	27%	12%	10%	20%	33%	8%
60	19%	17%	25%	27%	12%	12%	20%	20%	20%
61	19%	17%	25%	27%	12%	16%	20%	20%	12%
62	26%	27%	35%	37%	12%	15%	30%	40%	12%
63	29%	27%	32%	30%	12%	20%	30%	40%	12%
64	28%	27%	29%	28%	12%	20%	30%	40%	15%
65	30%	30%	29%	37%	15%	20%	40%	40%	15%
66	35%	35%	35%	39%	20%	24%	40%	100%	15%
67	30%	30%	33%	33%	20%	20%	40%	100%	15%
68	19%	25%	27%	30%	18%	17%	40%	100%	15%
69	19%	25%	23%	28%	16%	17%	40%	100%	20%
70	19%	25%	25%	38%	20%	18%	100%	100%	20%
71	19%	20%	20%	20%	18%	18%	100%	100%	20%
72	19%	20%	15%	20%	16%	18%	100%	100%	20%
73	19%	20%	15%	20%	16%	15%	100%	100%	20%
74	19%	20%	15%	20%	16%	15%	100%	100%	20%
75	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

Reduced Retirement

Age	% Retiring Next Year							Exec. & Elected
	General		Public School		University			
	Male	Female	Male	Female	Male	Female		
55	8.0%	7.0%	13.0%	12.0%	3.0%	5.0%	3.0%	
56	8.0%	7.0%	13.0%	12.0%	3.0%	5.0%	3.0%	
57	4.8%	5.5%	12.0%	12.0%	3.0%	5.0%	3.0%	
58	5.7%	6.5%	13.0%	12.0%	3.0%	5.0%	3.0%	
59	6.8%	7.0%	14.0%	13.0%	4.0%	5.0%	3.0%	
60	8.5%	9.5%	14.0%	17.0%	5.5%	9.0%	5.0%	
61	9.0%	9.5%	15.0%	17.0%	5.5%	9.0%	5.0%	
62	17.0%	16.0%	21.0%	23.0%	7.4%	12.0%	2.0%	
63	18.0%	18.0%	21.0%	23.0%	7.4%	12.0%	2.0%	
64	17.0%	18.0%	21.0%	23.0%	10.0%	15.0%	2.0%	

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 Terminating								
		Protective		Public Schools		University		Exec. & Elected	General	
		With Soc. Sec.	Without Soc. Sec.	Males	Females	Males	Females		Males	Females
	0	16.0%	4.0%	18.5%	15.0%	16.0%	14.5%	14.0%	17.0%	20.0%
	1	9.5%	3.5%	11.0%	11.0%	15.0%	14.0%	13.0%	12.3%	15.0%
	2	6.0%	1.5%	8.0%	8.0%	13.0%	13.0%	12.0%	9.3%	11.5%
	3	5.0%	1.3%	6.5%	6.0%	11.0%	10.0%	10.0%	7.6%	10.0%
	4	4.5%	1.2%	5.5%	5.5%	9.0%	9.5%	10.0%	7.5%	9.5%
	5	4.0%	1.1%	4.0%	5.0%	8.0%	9.0%	5.0%	5.8%	7.8%
	6	3.8%	1.0%	3.5%	4.0%	7.5%	7.0%	5.0%	4.8%	7.0%
	7	3.5%	0.9%	3.2%	3.7%	6.0%	6.0%	5.0%	4.7%	6.0%
	8	3.0%	0.8%	3.0%	3.3%	5.5%	5.0%	5.0%	4.1%	5.7%
	9	2.5%	0.7%	2.8%	3.0%	5.0%	4.0%	5.0%	4.0%	5.3%
25	10 & Over	2.5%	0.7%	2.5%	2.5%	5.0%	4.0%	5.0%	4.0%	5.0%
30		2.3%	0.7%	2.2%	2.4%	4.7%	4.0%	5.0%	3.7%	4.7%
35		2.0%	0.7%	1.8%	1.9%	4.2%	4.0%	5.0%	3.0%	3.9%
40		1.6%	0.6%	1.5%	1.5%	3.4%	3.7%	5.0%	2.4%	3.2%
45		1.4%	0.6%	1.4%	1.3%	2.7%	3.2%	4.7%	2.0%	2.7%
50		1.2%	0.5%	1.3%	1.2%	2.2%	2.7%	4.2%	1.7%	2.2%
55		1.2%	0.5%	1.3%	1.2%	2.0%	2.5%	4.0%	1.6%	2.0%
60		1.2%	0.5%	1.3%	1.2%	2.0%	2.5%	4.0%	1.6%	2.0%

Disability Rates

Age	% of Active Participants Becoming Disabled									
	Protective		Public Schools		University		Exec. & Elected		General	
	With SS	W/O SS	Males	Females	Males	Females	Males	Females	Males	Females
20	0.01%	0.03%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
25	0.01%	0.03%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30	0.01%	0.03%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%
35	0.01%	0.03%	0.00%	0.01%	0.00%	0.02%	0.01%	0.01%	0.01%	0.02%
40	0.02%	0.04%	0.01%	0.01%	0.00%	0.02%	0.01%	0.01%	0.02%	0.03%
45	0.02%	0.08%	0.02%	0.04%	0.01%	0.02%	0.01%	0.01%	0.04%	0.04%
50	0.04%	0.46%	0.06%	0.07%	0.01%	0.04%	0.02%	0.02%	0.09%	0.06%
55	0.61%	0.34%	0.12%	0.10%	0.04%	0.06%	0.09%	0.09%	0.17%	0.12%
60	1.02%	0.10%	0.19%	0.15%	0.06%	0.09%	0.11%	0.11%	0.30%	0.16%

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		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.

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

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

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

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

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

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

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

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

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 early 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	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).

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>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>Accrued Service</i>	Service credited under the system which was rendered before the date of the actuarial valuation.
<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 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 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 Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<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>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 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>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>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>GASB</i>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<i>Fiduciary Net Position</i>	The fiduciary net position is the value of the assets of the trust.
<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 healthcare benefits regardless of the manner in which they are provided. Other post-employment 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.