

# Wisconsin Retirement System

GASB Statement No. 68

Employer Reporting Accounting Schedules

December 31, 2017



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August 20, 2018

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

This report provides certain information requested by the Wisconsin Retirement System (“WRS”) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 68 “Accounting and Financial Reporting for Pension Plans.” This report replaces our earlier report dated May 10, 2018.

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

The total pension liability shown in this report is based on a roll-forward of the December 31, 2016 valuation liabilities to December 31, 2017. The calculation of the plan’s liability for this report is not applicable for funding purposes of the plan. A calculation of the plan’s liability for purposes other than satisfying the requirements of GASB Statement No. 68 may produce significantly different results. This report may be provided to parties other than the WRS only in its entirety and only with the permission of the WRS. GRS is not responsible for unauthorized use of this report.

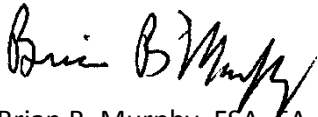
The report was based upon information, furnished by the Department of Employee Trust Funds (DETF), concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit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

This report complements the actuarial valuation report that we provided to the Board and should be considered in conjunction with that report. Please see the actuarial valuation report as of December 31, 2016 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

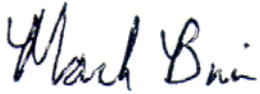
This system-wide report is intended to assist in preparation of the financial statements of WRS and its participating employers. Financial statements are the responsibility of the reporting entity and not the actuary. The statements are subject to an auditor’s review. Please let us know if the plan’s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

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.

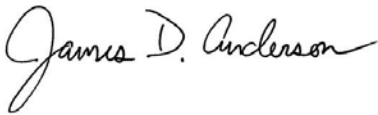
Respectfully submitted,



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



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BBM/MB/JDA:sc



## **SECTION A**

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### **EXECUTIVE SUMMARY**

# Executive Summary as of December 31, 2017

	<b>2017</b>
Actuarial Valuation Date	December 31, 2016
Measurement Date of the Net Pension Liability/(Asset)	December 31, 2017

## Membership as of December 31, 2016

Number of	
- Retirees and Beneficiaries	197,647
- Inactive, Nonretired Members	160,897
- Active Members	256,208
- Total	614,752
Covered Payroll <sup>(1)</sup>	\$ 13,943,116,649

## Net Pension Liability/(Asset)

Total Pension Liability	\$ 101,427,343,669
Plan Fiduciary Net Position	104,396,462,327
Net Pension Liability/(Asset)	\$ (2,969,118,658)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	102.93%
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	-21.29%

## Development of the Single Discount Rate

Single Discount Rate	7.20%
Long-Term Expected Rate of Investment Return	7.20%
Long-Term Municipal Bond Rate <sup>(2)</sup>	3.31%
Last year ending December 31 in the 2018 to 2117 projection period for which projected benefit payments are fully funded	2117

**Total Pension Expense** \$ 1,287,882,753

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

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	\$ 3,772,339,398	\$ 1,764,575,294
Changes in assumptions	586,639,914	-
Net difference between projected and actual earnings on pension plan investments	-	4,080,777,404
<b>Total</b>	<b>\$ 4,358,979,312</b>	<b>\$ 5,845,352,698</b>

<sup>(1)</sup> Covered payroll is for 2017 and was provided by DETF.

<sup>(2)</sup> Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-year Municipal GO AA Index" as of December 29, 2017. 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 state and local government employers (as well as certain non-employers) that contribute to a Defined Benefit (DB) pension plan administered through a trust or equivalent arrangement, Governmental Accounting Standards Board (GASB) Statement No. 68 establishes standards for pension accounting and financial reporting. Under GASB Statement No. 68, the employer must account for and disclose the net pension liability/(asset), pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

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

## Financial Statements

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

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

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

## Notes to Financial Statements

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

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

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

## Required Supplementary Information

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

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

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



## 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 7.2% 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 2117. 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 a unrelated third party in an arm's length market value type transaction.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the actuarial value of assets were used instead of the market value of assets.

### Limitation of Project Scope

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

## Timing of the Valuation

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

The total pension liability shown in this report is based on an actuarial valuation performed as of December 31, 2016 with roll-forward to December 31, 2017 and a measurement date of December 31, 2017. The roll-forward included adjustments in the liability due to changes in dividend adjustments for current and future retired members.

## Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.20%; the municipal bond rate is 3.31% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 7.20%.

## **SECTION B**

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### **FINANCIAL STATEMENTS**

Auditor's Note – This information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

# Statement of Pension Expense Under GASB Statement No. 68

## Fiscal Year Ended December 31, 2017

### A. Expense

1. Service Cost	\$ 1,842,879,321
2. Interest on the Total Pension Liability	6,627,171,441
3. Current-Period Benefit Changes	0
4. Employee Contributions (made negative for addition here)	(965,452,633)
5. Projected Earnings on Plan Investments (made negative for addition here)	(6,564,054,302)
6. Pension Plan Administrative Expense	26,132,873
7. Other Changes in Plan Fiduciary Net Position	0
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	448,989,584
9. Recognition of Outflow (Inflow) of Resources due to Assets	<u>(127,783,531)</u>
<b>10. Total Pension Expense</b>	<b>\$ 1,287,882,753</b>

# Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended December 31, 2017

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

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses <sup>(1)</sup>	\$ 4,459,497,323
2. Assumption Changes (gains) or losses	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	5.0080
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$ 890,474,705
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ -
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 890,474,705
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	\$ 3,569,022,618
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$ -
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$ 3,569,022,618

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

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$(8,311,360,334)
2. Recognition period for Assets {in years}	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$(1,662,272,067)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$(6,649,088,267)

<sup>(1)</sup>Starting with 2015, this item includes the impact of known Market Recognition Account deferred gains/losses on the liability for dividend payments. See page 22 for a full description.

# Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended December 31, 2017

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	\$ 1,276,573,907	\$ 827,584,323	\$ 448,989,584
2. Due to Assets	-	127,783,531	(127,783,531)
<b>3. Total</b>	<b>\$ 1,276,573,907</b>	<b>\$ 955,367,854</b>	<b>\$ 321,206,053</b>

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 1,001,440,283	\$ 827,584,323	\$ 173,855,960
2. Assumption Changes	275,133,624	-	275,133,624
3. Net Difference between projected and actual earnings on pension plan investments	-	127,783,531	(127,783,531)
<b>4. Total</b>	<b>\$ 1,276,573,907</b>	<b>\$ 955,367,854</b>	<b>\$ 321,206,053</b>

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

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 3,772,339,398	\$ 1,764,575,294	\$ 2,007,764,104
2. Assumption Changes	586,639,914	-	586,639,914
3. Net Difference between projected and actual earnings on pension plan investments	-	4,080,777,404	(4,080,777,404)
<b>4. Total</b>	<b>\$ 4,358,979,312</b>	<b>\$ 5,845,352,698</b>	<b>\$ (1,486,373,386)</b>

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

Year Ending December 31	Net Deferred Outflows of Resources
2018	\$ 321,206,052
2019	(26,120,498)
2020	(1,018,217,939)
2021	(770,364,799)
2022	7,123,798
Thereafter	-
<b>Total</b>	<b>\$ (1,486,373,386)</b>

# Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Current Period

## Fiscal Year Ended December 31, 2017

<b>A. Total pension liability</b>	
1. Service Cost	\$ 1,842,879,321
2. Interest on the total pension liability	6,627,171,441
3. Changes of benefit terms	-
4. Difference between expected and actual experience of the total pension liability	4,459,497,323
5. Changes of assumptions	-
6. Benefit payments, including refunds of employee contributions	(5,249,625,087)
7. Net change in total pension liability	\$ 7,679,922,998
8. Total pension liability – beginning <sup>(1)</sup>	93,747,420,671
9. Total pension liability – ending	<b>\$ 101,427,343,669</b>
<b>B. Plan fiduciary net position</b>	
1. Contributions – employer	\$ 1,017,558,990
2. Contributions – employee	965,452,633
3. Net investment income	14,875,414,636
4. Benefit payments, including refunds of employee contributions	(5,249,625,087)
5. Pension plan administrative expense	(26,132,873)
6. Other	-
7. Net change in plan fiduciary net position	\$ 11,582,668,299
8. Plan fiduciary net position – beginning <sup>(2)</sup>	92,813,794,028
9. Plan fiduciary net position – ending	<b>\$ 104,396,462,327</b>
<b>C. Net pension liability/(asset)</b>	<b>\$ (2,969,118,658)</b>
<b>D. Plan fiduciary net position as a percentage of the total pension liability</b>	<b>102.93%</b>
<b>E. Covered-employee payroll<sup>(3)</sup></b>	<b>\$ 13,943,116,649</b>
<b>F. Net pension liability/(asset) as a percentage of covered-employee payroll</b>	<b>-21.29%</b>

<sup>(1)</sup>Includes \$343,079,422 liability adjustment for Long Term Disability Insurance (LTDI) program (provided by Milliman).

<sup>(2)</sup>Includes \$233,691,533 asset adjustment for LTDI (provided by DETF).

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

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

## Last 10 Fiscal Years (which may be built prospectively)

Fiscal year ending December 31,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
<b>Total Pension Liability</b>										
Service Cost	\$ 1,842,879,321	\$ 1,814,134,799	\$ 1,787,870,316	\$ 1,757,020,910						
Interest on the Total Pension Liability	6,627,171,441	6,372,404,646	6,347,123,575	6,089,287,273						
Benefit Changes	-	-	-	-						
Experience <sup>(1)</sup>	4,459,497,323	150,347,332	(4,247,328,263)	437,265,852						
Assumption Changes	-	-	1,412,040,786	-						
Benefit Payments	(5,211,266,989)	(5,022,920,827)	(4,823,586,513)	(4,540,247,874)						
Refunds	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)						
<b>Net Change in Total Pension Liability</b>	<b>7,679,922,998</b>	<b>3,274,690,348</b>	<b>438,477,497</b>	<b>3,708,924,980</b>						
<b>Total Pension Liability - Beginning<sup>(2)</sup></b>	<b>93,747,420,671</b>	<b>90,129,650,901</b>	<b>89,691,173,404</b>	<b>85,982,248,424</b>						
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 101,427,343,669</b>	<b>\$ 93,404,341,249</b>	<b>\$ 90,129,650,901</b>	<b>\$ 89,691,173,404</b>						
<b>Plan Fiduciary Net Position</b>										
Employer Contributions	\$ 1,017,558,990	\$ 963,121,911	\$ 977,733,921	\$ 987,792,834						
Employee Contributions	965,452,633	921,863,806	937,225,184	941,903,267						
Pension Plan Net Investment Income	14,875,414,636	7,273,069,087	(673,122,812)	4,891,014,826						
Benefit Payments	(5,211,266,989)	(5,022,920,827)	(4,823,586,513)	(4,540,247,874)						
Refunds	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)						
Pension Plan Administrative Expense	(26,132,873)	(20,426,189)	(22,708,614)	(24,036,951)						
Other	-	-	-	-						
<b>Net Change in Plan Fiduciary Net Position</b>	<b>11,582,668,299</b>	<b>4,075,432,186</b>	<b>(3,642,101,238)</b>	<b>2,222,024,921</b>						
<b>Plan Fiduciary Net Position - Beginning<sup>(3)</sup></b>	<b>92,813,794,028</b>	<b>88,504,670,309</b>	<b>92,146,771,547</b>	<b>89,924,746,626</b>						
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 104,396,462,327</b>	<b>\$ 92,580,102,495</b>	<b>\$ 88,504,670,309</b>	<b>\$ 92,146,771,547</b>						
<b>Net Pension Liability/(Asset) - Ending (a) - (b)</b>	<b>(2,969,118,658)</b>	<b>824,238,754</b>	<b>1,624,980,592</b>	<b>(2,455,598,143)</b>						
<b>Plan Fiduciary Net Position as a Percentage of Total Pension Liability</b>	<b>102.93 %</b>	<b>99.12 %</b>	<b>98.20 %</b>	<b>102.74 %</b>						
<b>Covered-Employee Payroll<sup>(4)</sup></b>	<b>\$ 13,943,116,649</b>	<b>\$ 13,706,000,000</b>	<b>\$ 13,530,500,000</b>	<b>\$ 13,219,500,000</b>						
<b>Net Pension Liability/(Asset) as a Percentage of Covered-Employee Payroll</b>	<b>(21.29)%</b>	<b>6.01 %</b>	<b>12.01 %</b>	<b>(18.58)%</b>						
<b>Notes to Schedule:</b>										

<sup>(1)</sup> Starting with 2015, this item includes the impact of known Market Recognition Account deferred gains/losses on the liability for dividend payments. See page 22 for a full description.

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

<sup>(3)</sup> As of calendar year 2017, the LTDI program is reported within the Wisconsin Retirement System (WRS). Accordingly, there is an adjustment to the calendar year 2017 beginning net position of \$233,691,533 to reflect LTDI assets.

<sup>(4)</sup> Covered payroll provided by DETF.



# Schedule of Contributions Multiyear

## Last 10 Fiscal Years

<u>FY Ending December 31,</u>	<u>Actuarially Determined Contribution<sup>(1)</sup></u>	<u>Actual Contribution</u>	<u>Contribution Deficiency (Excess)</u>	<u>Covered Payroll<sup>(3)</sup></u>	<u>Actual Contribution as a % of Covered Payroll</u>
2008					
2009					
2010					
2011					
2012					
2013					
2014 <sup>(2)</sup>	\$ 977,068,988	\$ 977,068,988	\$ -	\$ 13,219,500,000	7.39%
2015 <sup>(2)</sup>	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%

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

<sup>(2)</sup> The Annual Determined Contribution (ADC) included Prior Service Contributions, Early Retirement Contributions, Employer Additional Contributions, and Employer Required Contributions.

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

# Notes to Schedule of Contributions

## Summary of Actuarial Methods and Assumptions Used in the Calculation of the 2017 Contribution Rate

**Valuation Date:** December 31, 2015

**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	30-Year closed from date of participation in WRS
Asset Valuation Method	5-Year smoothed value
Inflation	2.0% to 2.7% -- approximate; No explicit price inflation assumption is used in this valuation.
Salary Increases	3.2% to 8.8% including inflation
Net Investment Rate of Return	5.50%
Weighted based on assumed rate for:	
Retired participants	5.00%
Active participants	
Post-retirement participants	5.00%
Pre-retirement participants	7.20%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2009 - 2011.
Mortality	WRS experience projected to 2017 with scale BB

**Other Information:**

Notes The actuarially determined contribution for calendar year 2017 was determined from the December 31, 2015 actuarial valuation.

## Single Discount Rate

A single discount rate of 7.20% was used to measure the total pension liability, which was based on the expected rate of return on pension plan investments. Because of the unique structure of WRS, the 7.20% expected rate of return implies that a dividend of approximately 2.1% will always be paid after reflecting known changes in the Market Recognition Account. For purposes of the single discount rate, it was assumed that the dividend would always be paid. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments (including expected dividends) of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability/(asset) to changes in the single discount rate, the following presents the plan's net pension liability/(asset), calculated using a single discount rate of 7.20%, as well as what the plan's net pension liability/(asset) would be if it were calculated using a single discount rate that is 100 basis points lower or 100 basis points higher:

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

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	<b>6.20%</b>	<b>7.20%</b>	<b>8.20%</b>
Ultimate Dividend Rate	<b>2.10%</b>	<b>2.10%</b>	<b>2.10%</b>
Total Pension Liability	\$ 112,078,586,022	\$ 101,427,343,669	\$ 93,332,069,967
Plan Fiduciary Net Position	104,396,462,327	104,396,462,327	104,396,462,327
Net Pension Liability/(Asset)	\$ 7,682,123,695	\$ (2,969,118,658)	\$ (11,064,392,360)

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 1.1% for the 6.2% discount rate, 2.1% for the 7.2% discount rate, and 3.0% for the 8.2% discount rate.

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

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	<b>6.20%</b>	<b>7.20%</b>	<b>8.20%</b>
Ultimate Dividend Rate	<b>1.10%</b>	<b>2.10%</b>	<b>3.00%</b>
Total Pension Liability	\$ 105,073,778,412	\$ 101,427,343,669	\$ 97,604,334,484
Plan Fiduciary Net Position	104,396,462,327	104,396,462,327	104,396,462,327
Net Pension Liability/(Asset)	\$ 677,316,085	\$ (2,969,118,658)	\$ (6,792,127,843)

## SECTION C

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### **CALCULATION OF THE SINGLE DISCOUNT RATE**

Auditor's Note – This information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

## 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 7.20%; the municipal bond rate is 3.31%; and the resulting SDR is 7.20%.

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

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities). The contribution rate for the first year was developed from the 2016 actuarial valuation (13.90%). 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 13.4% 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, 2117

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
0	\$ 13,488,469,796				
1	13,137,309,133	\$ 880,173,438	\$ 945,912,532	\$ -	\$ 1,826,085,970
2	12,829,789,533	859,570,239	923,770,506	-	1,783,340,745
3	12,528,986,221	833,378,047	895,622,051	-	1,729,000,098
4	12,224,805,193	795,468,074	854,880,627	-	1,650,348,701
5	11,915,025,181	758,081,562	814,701,762	-	1,572,783,324
6	11,599,764,671	738,023,428	793,145,509	-	1,531,168,937
7	11,279,417,962	717,641,688	771,241,483	-	1,488,883,171
8	10,950,151,045	696,692,410	748,727,528	-	1,445,419,938
9	10,612,141,225	675,186,873	725,615,769	-	1,400,802,642
10	10,266,866,136	653,219,091	702,007,239	-	1,355,226,330
11	9,912,344,360	630,662,998	677,766,458	-	1,308,429,456
12	9,547,351,903	607,440,717	652,809,734	-	1,260,250,451
13	9,173,778,478	583,672,482	627,266,277	-	1,210,938,759
14	8,792,704,615	559,427,038	601,209,971	-	1,160,637,009
15	8,401,952,039	534,565,796	574,491,873	-	1,109,057,669
16	8,003,270,706	509,200,095	547,231,638	-	1,056,431,733
17	7,597,992,525	483,414,676	519,520,337	-	1,002,935,013
18	7,183,759,803	457,059,534	491,196,760	-	948,256,294
19	6,761,937,528	430,221,513	462,354,241	-	892,575,754
20	6,335,052,587	403,061,386	433,165,555	-	836,226,941
21	5,904,240,279	375,651,384	403,708,333	-	779,359,717
22	5,470,959,866	348,084,350	374,082,352	-	722,166,702
23	5,037,798,368	320,524,884	344,464,501	-	664,989,385
24	4,605,526,244	293,022,002	314,907,462	-	607,929,464
25	4,172,717,841	265,485,000	285,313,755	-	550,798,755
26	3,738,044,735	237,829,358	255,592,547	-	493,421,905
27	3,301,908,062	210,080,598	225,771,266	-	435,851,864
28	2,868,431,728	185,266,269	199,103,583	-	384,369,852
29	2,445,941,631	157,978,478	169,777,701	-	327,756,179
30	2,049,008,908	132,341,388	142,225,806	-	274,567,194
31	1,689,889,202	109,146,564	117,298,589	-	226,445,153
32	1,372,887,647	88,672,067	95,294,878	-	183,966,945
33	1,101,125,436	71,119,489	76,431,319	-	147,550,808
34	874,463,909	56,479,875	60,698,289	-	117,178,164
35	688,492,204	44,468,334	47,789,621	-	92,257,955
36	537,149,151	34,693,389	37,284,597	-	71,977,986
37	414,716,319	26,785,698	28,786,289	-	55,571,987
38	316,854,594	20,465,005	21,993,511	-	42,458,516
39	239,689,150	15,481,043	16,637,303	-	32,118,346
40	179,617,531	11,601,137	12,467,612	-	24,068,749
41	133,622,407	8,630,404	9,274,998	-	17,905,402
42	98,593,313	6,367,945	6,843,559	-	13,211,504
43	71,975,711	4,648,767	4,995,978	-	9,644,745
44	52,074,514	3,363,389	3,614,596	-	6,977,985
45	37,212,875	2,403,505	2,583,020	-	4,986,525
46	26,036,834	1,681,667	1,807,269	-	3,488,936
47	17,805,931	1,150,050	1,235,945	-	2,385,995
48	11,710,057	756,329	812,819	-	1,569,148
49	7,218,039	466,199	501,018	-	967,217
50	4,118,943	266,034	285,904	-	551,938

# Single Discount Rate Development

## Projection of Contributions Ending December 31, 2117

### (Concluded)

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
51	\$ 2,106,380	\$ 136,047	\$ 146,208	\$ -	\$ 282,255
52	941,847	60,832	65,375	-	126,207
53	412,047	26,613	28,601	-	55,214
54	186,592	12,051	12,952	-	25,003
55	66,773	4,313	4,635	-	8,948
56	14,343	926	996	-	1,922
57	588	38	41	-	79
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, 2117

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 7.20%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
1	\$ 104,396,462,327	\$ 1,826,085,970	\$ 5,419,191,291	\$ 7,389,441,600	\$ 108,192,798,606
2	108,192,798,606	1,783,340,745	5,615,319,111	7,654,327,838	112,015,148,077
3	112,015,148,077	1,729,000,098	5,829,751,928	7,920,029,319	115,834,425,566
4	115,834,425,566	1,650,348,701	6,126,138,962	8,181,750,566	119,540,385,871
5	119,540,385,871	1,572,783,324	6,447,507,122	8,434,467,702	123,100,129,775
6	123,100,129,775	1,531,168,937	6,726,974,144	8,679,411,224	126,583,735,792
7	126,583,735,792	1,488,883,171	7,010,875,498	8,918,692,207	129,980,435,672
8	129,980,435,672	1,445,419,938	7,303,596,797	9,151,362,296	133,273,621,109
9	133,273,621,109	1,400,802,642	7,595,754,311	9,376,558,465	136,455,227,904
10	136,455,227,904	1,355,226,330	7,896,411,760	9,593,386,367	139,507,428,842
11	139,507,428,842	1,308,429,456	8,201,540,635	9,800,695,698	142,415,013,360
12	142,415,013,360	1,260,250,451	8,502,747,941	9,997,682,477	145,170,198,347
13	145,170,198,347	1,210,938,759	8,796,510,949	10,183,919,759	147,768,545,917
14	147,768,545,917	1,160,637,009	9,078,543,870	10,359,244,668	150,209,883,723
15	150,209,883,723	1,109,057,669	9,359,750,818	10,523,248,899	152,482,439,473
16	152,482,439,473	1,056,431,733	9,636,155,893	10,675,233,662	154,577,948,974
17	154,577,948,974	1,002,935,013	9,903,655,057	10,814,755,332	156,491,984,262
18	156,491,984,262	948,256,294	10,163,054,918	10,941,455,554	158,218,641,192
19	158,218,641,192	892,575,754	10,410,747,433	11,055,043,235	159,755,512,747
20	159,755,512,747	836,226,941	10,640,211,225	11,155,587,558	161,107,116,021
21	161,107,116,021	779,359,717	10,851,643,829	11,243,412,067	162,278,243,976
22	162,278,243,976	722,166,702	11,050,775,579	11,318,665,964	163,268,301,063
23	163,268,301,063	664,989,385	11,236,303,160	11,381,364,551	164,078,351,839
24	164,078,351,839	607,929,464	11,404,718,103	11,431,712,185	164,713,275,385
25	164,713,275,385	550,798,755	11,560,286,405	11,469,902,596	165,173,690,330
26	165,173,690,330	493,421,905	11,703,964,146	11,495,940,301	165,459,088,390
27	165,459,088,390	435,851,864	11,835,927,569	11,509,784,342	165,568,797,027
28	165,568,797,027	384,369,852	11,955,603,987	11,511,628,749	165,509,191,641
29	165,509,191,641	327,756,179	12,058,655,610	11,501,689,109	165,279,981,319
30	165,279,981,319	274,567,194	12,138,064,505	11,480,495,405	164,896,979,412
31	164,896,979,412	226,445,153	12,185,348,033	11,449,544,359	164,387,620,892
32	164,387,620,892	183,966,945	12,199,573,499	11,410,864,692	163,782,879,029
33	163,782,879,029	147,550,808	12,181,469,406	11,366,675,501	163,115,635,932
34	163,115,635,932	117,178,164	12,126,960,635	11,319,487,797	162,425,341,258
35	162,425,341,258	92,257,955	12,038,858,460	11,272,021,601	161,750,762,354
36	161,750,762,354	71,977,986	11,921,997,395	11,226,868,411	161,127,611,357
37	161,127,611,357	55,571,987	11,776,697,805	11,186,561,063	160,593,046,601
38	160,593,046,601	42,458,516	11,603,672,925	11,153,729,160	160,185,561,352
39	160,185,561,352	32,118,346	11,402,694,628	11,131,133,917	159,946,118,987
40	159,946,118,987	24,068,749	11,172,356,424	11,121,757,377	159,919,588,689
41	159,919,588,689	17,905,402	10,912,247,127	11,128,830,363	160,154,077,327
42	160,154,077,327	13,211,504	10,623,860,860	11,155,748,972	160,699,176,944
43	160,699,176,944	9,644,745	10,310,875,817	11,205,941,609	161,603,887,480
44	161,603,887,480	6,977,985	9,979,189,232	11,282,719,623	162,914,395,856
45	162,914,395,856	4,986,525	9,633,269,442	11,389,242,459	164,675,355,399
46	164,675,355,399	3,488,936	9,274,828,973	11,528,658,161	166,932,673,522
47	166,932,673,522	2,385,995	8,904,936,293	11,704,230,755	169,734,353,980
48	169,734,353,980	1,569,148	8,525,283,210	11,919,352,826	173,129,992,744
49	173,129,992,744	967,217	8,137,266,599	12,177,543,351	177,171,236,713
50	177,171,236,713	551,938	7,741,843,500	12,482,486,053	181,912,431,204

# Single Discount Rate Development Projection of Plan Fiduciary Net Position Ending December 31, 2117 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 7.20%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
51	\$ 181,912,431,204	\$ 282,255	\$ 7,340,402,350	\$ 12,838,043,228	\$ 187,410,354,336
52	187,410,354,336	126,207	6,934,385,665	13,248,250,741	193,724,345,619
53	193,724,345,619	55,214	6,525,263,255	13,717,328,032	200,916,465,610
54	200,916,465,610	25,003	6,114,793,216	14,249,679,705	209,051,377,101
55	209,051,377,101	8,948	5,704,650,066	14,849,901,303	218,196,637,285
56	218,196,637,285	1,922	5,296,411,729	15,522,800,944	228,423,028,423
57	228,423,028,423	79	4,891,842,236	16,273,412,415	239,804,598,681
58	239,804,598,681	-	4,492,894,260	17,106,997,988	252,418,702,409
59	252,418,702,409	-	4,101,676,205	18,029,052,532	266,346,078,736
60	266,346,078,736	-	3,720,405,156	19,045,310,835	281,670,984,416
61	281,670,984,416	-	3,351,337,094	20,161,759,579	298,481,406,900
62	298,481,406,900	-	2,996,701,867	21,384,654,981	316,869,360,014
63	316,869,360,014	-	2,658,614,512	22,720,547,218	336,931,292,720
64	336,931,292,720	-	2,338,945,736	24,176,314,441	358,768,661,425
65	358,768,661,425	-	2,039,267,035	25,759,205,921	382,488,600,310
66	382,488,600,310	-	1,760,835,086	27,476,890,864	408,204,656,088
67	408,204,656,088	-	1,504,588,287	29,337,511,438	436,037,579,240
68	436,037,579,240	-	1,271,187,958	31,349,738,285	466,116,129,566
69	466,116,129,566	-	1,061,054,087	33,522,827,253	498,577,902,732
70	498,577,902,732	-	874,348,520	35,866,679,505	533,570,233,717
71	533,570,233,717	-	710,929,583	38,391,908,171	571,251,212,304
72	571,251,212,304	-	570,277,455	41,109,914,104	611,790,848,954
73	611,790,848,954	-	451,391,926	44,032,973,438	655,372,430,466
74	655,372,430,466	-	352,747,776	47,174,336,778	702,194,019,468
75	702,194,019,468	-	272,351,733	50,548,335,142	752,470,002,877
76	752,470,002,877	-	207,892,700	54,170,486,142	806,432,596,319
77	806,432,596,319	-	156,960,274	58,057,594,571	864,333,230,617
78	864,333,230,617	-	117,242,724	62,227,845,222	926,443,833,114
79	926,443,833,114	-	86,644,414	66,700,890,996	993,058,079,696
80	993,058,079,696	-	63,339,070	71,497,941,161	1,064,492,681,787
81	1,064,492,681,787	-	45,785,667	76,641,853,451	1,141,088,749,571
82	1,141,088,749,571	-	32,711,302	82,157,232,829	1,223,213,271,098
83	1,223,213,271,098	-	23,081,223	88,070,539,036	1,311,260,728,911
84	1,311,260,728,911	-	16,069,299	94,410,204,041	1,405,654,863,653
85	1,405,654,863,653	-	11,025,246	101,206,760,172	1,506,850,598,579
86	1,506,850,598,579	-	7,445,843	108,492,979,706	1,615,336,132,442
87	1,615,336,132,442	-	4,944,314	116,304,026,634	1,731,635,214,762
88	1,731,635,214,762	-	3,224,988	124,677,621,381	1,856,309,611,156
89	1,856,309,611,156	-	2,065,408	133,654,218,941	1,989,961,764,688
90	1,989,961,764,688	-	1,297,421	143,277,201,162	2,133,237,668,429
91	2,133,237,668,429	-	797,275	153,593,083,924	2,286,829,955,078
92	2,286,829,955,078	-	477,312	164,651,739,881	2,451,481,217,647
93	2,451,481,217,647	-	276,079	176,506,637,904	2,627,987,579,472
94	2,627,987,579,472	-	151,905	189,215,100,348	2,817,202,527,915
95	2,817,202,527,915	-	77,749	202,838,579,260	3,020,041,029,425
96	3,020,041,029,425	-	36,108	217,442,952,841	3,237,483,946,159
97	3,237,483,946,159	-	15,228	233,098,843,585	3,470,582,774,515
98	3,470,582,774,515	-	6,339	249,881,959,541	3,720,464,727,717
99	3,720,464,727,717	-	3,733	267,873,460,264	3,988,338,184,247
100	3,988,338,184,247	-	-	287,160,349,266	4,275,498,533,513

# Single Discount Rate Development

## Present Values of Projected Benefits Ending December 31, 2117

Year	Projected Beginning Plan Net Position*	Projected Benefit Payments Including Dividends	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>n</sup> ((a)-.5)	(g)=(e)*vf <sup>n</sup> ((a)-.5)	(h)=(c)/(1+sdr) <sup>n</sup> ((a)-.5)
1	\$ 104,396,462,327	\$ 5,419,191,291	\$ 5,419,191,291	\$ -	\$ 5,234,040,619	\$ -	\$ 5,234,040,619
2	108,192,798,606	5,615,319,111	5,615,319,111	-	5,059,204,839	-	5,059,204,839
3	112,015,148,077	5,829,751,928	5,829,751,928	-	4,899,628,040	-	4,899,628,040
4	115,834,425,566	6,126,138,962	6,126,138,962	-	4,802,917,150	-	4,802,917,150
5	119,540,385,871	6,447,507,122	6,447,507,122	-	4,715,364,792	-	4,715,364,792
6	123,100,129,775	6,726,974,144	6,726,974,144	-	4,589,321,037	-	4,589,321,037
7	126,583,735,792	7,010,875,498	7,010,875,498	-	4,461,759,428	-	4,461,759,428
8	129,980,435,672	7,303,596,797	7,303,596,797	-	4,335,866,474	-	4,335,866,474
9	133,273,621,109	7,595,754,311	7,595,754,311	-	4,206,445,179	-	4,206,445,179
10	136,455,227,904	7,896,411,760	7,896,411,760	-	4,079,240,640	-	4,079,240,640
11	139,507,428,842	8,201,540,635	8,201,540,635	-	3,952,302,661	-	3,952,302,661
12	142,415,013,360	8,502,747,941	8,502,747,941	-	3,822,251,619	-	3,822,251,619
13	145,170,198,347	8,796,510,949	8,796,510,949	-	3,688,719,492	-	3,688,719,492
14	147,768,545,917	9,078,543,870	9,078,543,870	-	3,551,293,727	-	3,551,293,727
15	150,209,883,723	9,359,750,818	9,359,750,818	-	3,415,386,828	-	3,415,386,828
16	152,482,439,473	9,636,155,893	9,636,155,893	-	3,280,081,573	-	3,280,081,573
17	154,577,948,974	9,903,655,057	9,903,655,057	-	3,144,716,846	-	3,144,716,846
18	156,491,984,262	10,163,054,918	10,163,054,918	-	3,010,339,856	-	3,010,339,856
19	158,218,641,192	10,410,747,433	10,410,747,433	-	2,876,592,749	-	2,876,592,749
20	159,755,512,747	10,640,211,225	10,640,211,225	-	2,742,533,461	-	2,742,533,461
21	161,107,116,021	10,851,643,829	10,851,643,829	-	2,609,170,329	-	2,609,170,329
22	162,278,243,976	11,050,775,579	11,050,775,579	-	2,478,591,033	-	2,478,591,033
23	163,268,301,063	11,236,303,160	11,236,303,160	-	2,350,935,844	-	2,350,935,844
24	164,078,351,839	11,404,718,103	11,404,718,103	-	2,225,907,430	-	2,225,907,430
25	164,713,275,385	11,560,286,405	11,560,286,405	-	2,104,729,812	-	2,104,729,812
26	165,173,690,330	11,703,964,146	11,703,964,146	-	1,987,769,196	-	1,987,769,196
27	165,459,088,390	11,835,927,569	11,835,927,569	-	1,875,169,312	-	1,875,169,312
28	165,568,797,027	11,955,603,987	11,955,603,987	-	1,766,912,015	-	1,766,912,015
29	165,509,191,641	12,058,655,610	12,058,655,610	-	1,662,445,855	-	1,662,445,855
30	165,279,981,319	12,138,064,505	12,138,064,505	-	1,561,001,330	-	1,561,001,330
31	164,896,979,412	12,185,348,033	12,185,348,033	-	1,461,830,384	-	1,461,830,384
32	164,387,620,892	12,199,573,499	12,199,573,499	-	1,365,239,701	-	1,365,239,701
33	163,782,879,029	12,181,469,406	12,181,469,406	-	1,271,654,565	-	1,271,654,565
34	163,115,635,932	12,126,960,635	12,126,960,635	-	1,180,936,806	-	1,180,936,806
35	162,425,341,258	12,038,858,460	12,038,858,460	-	1,093,616,902	-	1,093,616,902
36	161,750,762,354	11,921,997,395	11,921,997,395	-	1,010,262,290	-	1,010,262,290
37	161,127,611,357	11,776,697,805	11,776,697,805	-	930,923,225	-	930,923,225
38	160,593,046,601	11,603,672,925	11,603,672,925	-	855,639,899	-	855,639,899
39	160,185,561,352	11,402,694,628	11,402,694,628	-	784,347,032	-	784,347,032
40	159,946,118,987	11,172,356,424	11,172,356,424	-	716,887,092	-	716,887,092
41	159,919,588,689	10,912,247,127	10,912,247,127	-	653,168,731	-	653,168,731
42	160,154,077,327	10,623,860,860	10,623,860,860	-	593,196,776	-	593,196,776
43	160,699,176,944	10,310,875,817	10,310,875,817	-	537,053,039	-	537,053,039
44	161,603,887,480	9,979,189,232	9,979,189,232	-	484,866,406	-	484,866,406
45	162,914,395,856	9,633,269,442	9,633,269,442	-	436,622,145	-	436,622,145
46	164,675,355,399	9,274,828,973	9,274,828,973	-	392,141,835	-	392,141,835
47	166,932,673,522	8,904,936,293	8,904,936,293	-	351,215,196	-	351,215,196
48	169,734,353,980	8,525,283,210	8,525,283,210	-	313,658,102	-	313,658,102
49	173,129,992,744	8,137,266,599	8,137,266,599	-	279,274,611	-	279,274,611
50	177,171,236,713	7,741,843,500	7,741,843,500	-	247,857,756	-	247,857,756

# Single Discount Rate Development

## Present Values of Projected Benefits Ending December 31, 2117 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments Including Dividends	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>(a)-.5</sup>	(g)=(e)*vf <sup>(a)-.5</sup>	(h)=(c)/(1+sdr) <sup>(a)-.5</sup>
51	\$ 181,912,431,204	\$ 7,340,402,350	\$ 7,340,402,350	\$ -	\$ 219,221,530	\$ -	\$ 219,221,530
52	187,410,354,336	6,934,385,665	6,934,385,665	-	193,186,398	-	193,186,398
53	193,724,345,619	6,525,263,255	6,525,263,255	-	169,578,897	-	169,578,897
54	200,916,465,610	6,114,793,216	6,114,793,216	-	148,238,414	-	148,238,414
55	209,051,377,101	5,704,650,066	5,704,650,066	-	129,006,980	-	129,006,980
56	218,196,637,285	5,296,411,729	5,296,411,729	-	111,730,348	-	111,730,348
57	228,423,028,423	4,891,842,236	4,891,842,236	-	96,264,702	-	96,264,702
58	239,804,598,681	4,492,894,260	4,492,894,260	-	82,475,706	-	82,475,706
59	252,418,702,409	4,101,676,205	4,101,676,205	-	70,237,077	-	70,237,077
60	266,346,078,736	3,720,405,156	3,720,405,156	-	59,429,285	-	59,429,285
61	281,670,984,416	3,351,337,094	3,351,337,094	-	49,938,282	-	49,938,282
62	298,481,406,900	2,996,701,867	2,996,701,867	-	41,654,722	-	41,654,722
63	316,869,360,014	2,658,614,512	2,658,614,512	-	34,473,175	-	34,473,175
64	336,931,292,720	2,338,945,736	2,338,945,736	-	28,291,194	-	28,291,194
65	358,768,661,425	2,039,267,035	2,039,267,035	-	23,009,673	-	23,009,673
66	382,488,600,310	1,760,835,086	1,760,835,086	-	18,533,619	-	18,533,619
67	408,204,656,088	1,504,588,287	1,504,588,287	-	14,772,856	-	14,772,856
68	436,037,579,240	1,271,187,958	1,271,187,958	-	11,642,916	-	11,642,916
69	466,116,129,566	1,061,054,087	1,061,054,087	-	9,065,562	-	9,065,562
70	498,577,902,732	874,348,520	874,348,520	-	6,968,623	-	6,968,623
71	533,570,233,717	710,929,583	710,929,583	-	5,285,599	-	5,285,599
72	571,251,212,304	570,277,455	570,277,455	-	3,955,114	-	3,955,114
73	611,790,848,954	451,391,926	451,391,926	-	2,920,329	-	2,920,329
74	655,372,430,466	352,747,776	352,747,776	-	2,128,862	-	2,128,862
75	702,194,019,468	272,351,733	272,351,733	-	1,533,270	-	1,533,270
76	752,470,002,877	207,892,700	207,892,700	-	1,091,774	-	1,091,774
77	806,432,596,319	156,960,274	156,960,274	-	768,933	-	768,933
78	864,333,230,617	117,242,724	117,242,724	-	535,784	-	535,784
79	926,443,833,114	86,644,414	86,644,414	-	369,360	-	369,360
80	993,058,079,696	63,339,070	63,339,070	-	251,876	-	251,876
81	1,064,492,681,787	45,785,667	45,785,667	-	169,844	-	169,844
82	1,141,088,749,571	32,711,302	32,711,302	-	113,194	-	113,194
83	1,223,213,271,098	23,081,223	23,081,223	-	74,506	-	74,506
84	1,311,260,728,911	16,069,299	16,069,299	-	48,387	-	48,387
85	1,405,654,863,653	11,025,246	11,025,246	-	30,969	-	30,969
86	1,506,850,598,579	7,445,843	7,445,843	-	19,510	-	19,510
87	1,615,336,132,442	4,944,314	4,944,314	-	12,085	-	12,085
88	1,731,635,214,762	3,224,988	3,224,988	-	7,353	-	7,353
89	1,856,309,611,156	2,065,408	2,065,408	-	4,393	-	4,393
90	1,989,961,764,688	1,297,421	1,297,421	-	2,574	-	2,574
91	2,133,237,668,429	797,275	797,275	-	1,476	-	1,476
92	2,286,829,955,078	477,312	477,312	-	824	-	824
93	2,451,481,217,647	276,079	276,079	-	445	-	445
94	2,627,987,579,472	151,905	151,905	-	228	-	228
95	2,817,202,527,915	77,749	77,749	-	109	-	109
96	3,020,041,029,425	36,108	36,108	-	47	-	47
97	3,237,483,946,159	15,228	15,228	-	19	-	19
98	3,470,582,774,515	6,339	6,339	-	7	-	7
99	3,988,338,187,980	3,733	3,733	-	4	-	4
100	3,988,338,184,247	-	-	-	-	-	-
<b>Totals</b>					\$ 116,988,078,494	\$ -	\$ 116,988,078,494

## **SECTION D**

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### **SUMMARY OF ASSUMPTIONS**

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

## Economic Assumptions

In determining plan liabilities for accounting purposes, a discount rate of 7.2% is used for both actives and retirees. However, a long-term assumed dividend of 2.1% 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 7.2% return assumption. The dividend rates used in developing the Total Pension Liability for accounting purposes is as follows:

2017: 2.0% Core, 4.0% Variable  
2018: 2.4% Core, 17.0% Variable  
2019: 1.8% Core, 2.1% Variable  
2020: 2.0% Core, 2.1% Variable  
2021: 3.3% Core, 2.1% Variable  
2022: 3.2% Core, 2.1% Variable  
2023 and later: 2.1% Core, 2.1% Variable

The **Wage Inflation Rate** assumed in this valuation was 3.20% 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, since there are no benefits that are linked to price increases. However, a price inflation assumption on the order of 2.0% to 2.7% would be consistent with the other economic assumptions.

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 7.2% 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 would be higher – on the order of 4.5% to 5.2%, considering both an inflation assumption and an average expense provision.

**Pay increase assumptions** for individual active members are shown for sample services below. Part of the assumption for each age is for merit and/or seniority increase, and the other 3.2% recognizes wage inflation, including price inflation, productivity increases, and other macro-economic forces.

<b>% Merit and Longevity Increase Next Year</b>						
<b>Service</b>	<b>Gen.</b>	<b>University Teachers</b>	<b>Public School Teachers</b>	<b>Protective</b>		<b>Exec. &amp; Elec.</b>
				<b>With S.S.</b>	<b>W/O S.S.</b>	
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 2012 Mortality Table. The rates in this table were based on actual WRS experience and adjusted for future mortality improvements using the MP-2015 fully generational improvement scale (multiplied by 50%). The mortality table was adopted by the Board in connection with the 2012-2014 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 2012 Mortality Table with 5% Interest (without projection)**

Sample Attained Ages in 2016	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)	
	Males	Females	Males	Females
40	\$212.18	\$217.30	44.6	47.9
45	203.58	209.85	39.6	42.8
50	192.84	200.64	34.6	37.8
55	179.99	189.45	29.8	32.9
60	165.62	176.13	25.3	28.1
65	148.39	159.99	20.8	23.5
70	128.80	140.83	16.6	19.0
75	107.08	119.17	12.8	14.8
80	84.34	95.93	9.3	11.0
85	63.12	72.84	6.5	7.8

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

Sample Attained Ages in 2016	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)	
	Males	Females	Males	Females
40	\$198.68	\$207.47	37.2	41.4
45	186.71	197.67	32.2	36.4
50	172.91	185.79	27.5	31.6
55	156.89	171.64	22.9	26.8
60	138.23	154.74	18.6	22.2
65	117.74	134.96	14.6	17.8
70	95.51	112.80	11.0	13.7
75	73.23	89.31	7.8	10.0
80	53.78	66.82	5.4	7.0
85	38.08	48.76	3.6	4.8



## Active Participant Mortality Rates

Sample Attained Ages in 2016	Mortality Rates	
	Males	Females
20	0.000135	0.000078
25	0.000162	0.000086
30	0.000203	0.000117
35	0.000356	0.000210
40	0.000480	0.000297
45	0.000632	0.000462
50	0.000854	0.000685
55	0.001997	0.001219
60	0.002845	0.001750
65	0.004333	0.002664
70	0.007145	0.004516
75	0.012149	0.008194
80	0.022343	0.015345

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%	4%	
51							7%	4%	
52							9%	5%	
53							23%	17%	
54							19%	25%	
55							19%	21%	
56							19%	27%	
57	18%	15%	36%	28%	12%	14%	19%	30%	12%
58	18%	15%	31%	28%	12%	12%	18%	30%	12%
59	18%	15%	24%	28%	12%	10%	16%	30%	12%
60	18%	15%	30%	28%	12%	12%	20%	26%	12%
61	18%	15%	28%	28%	12%	16%	20%	15%	12%
62	25%	25%	37%	36%	12%	14%	22%	20%	12%
63	30%	25%	32%	30%	12%	19%	26%	40%	12%
64	25%	25%	27%	27%	12%	13%	17%	40%	12%
65	25%	28%	29%	35%	15%	18%	30%	40%	12%
66	32%	32%	33%	35%	17%	22%	25%	40%	20%
67	26%	26%	27%	30%	16%	17%	30%	40%	15%
68	19%	22%	24%	30%	16%	16%	30%	40%	15%
69	19%	20%	24%	30%	16%	14%	30%	40%	10%
70	19%	20%	20%	35%	16%	18%	100%	100%	10%
71	19%	20%	20%	30%	18%	18%	100%	100%	10%
72	19%	20%	20%	22%	14%	18%	100%	100%	15%
73	19%	20%	20%	22%	14%	18%	100%	100%	15%
74	19%	20%	20%	22%	10%	18%	100%	100%	15%
75	100%	100%	100%	100%	100%	100%	100%	100%	100%

\* Includes early retirements.

### Early Retirement

Age	% Retiring Next Year						
	General		Public School		University		Exec. & Elected
	Male	Female	Male	Female	Male	Female	
55	9.0%	7.0%	13.0%	12.0%	4.0%	5.5%	3.0%
56	9.0%	7.0%	13.0%	12.0%	3.0%	5.5%	3.0%
57	4.8%	5.0%	12.0%	12.0%	2.5%	4.0%	3.0%
58	5.8%	6.0%	13.0%	12.0%	2.5%	5.5%	3.0%
59	6.5%	6.0%	14.0%	13.0%	3.0%	6.5%	3.0%
60	8.5%	8.5%	14.0%	17.0%	4.3%	8.0%	5.0%
61	8.5%	8.5%	15.0%	17.0%	5.0%	6.0%	5.0%
62	16.0%	16.0%	21.0%	23.0%	6.0%	12.0%	
63	17.0%	16.0%	21.0%	23.0%	7.0%	12.0%	
64	17.0%	16.0%	21.0%	23.0%	7.0%	12.0%	

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 service will leave their contributions on deposit and be paid a benefit at normal retirement age and that the remaining participants would take a separation benefit. The percentage taking a separation benefit is 25% at age 35, grading downward to 0% at retirement eligibility. All participants terminating prior to normal retirement age with less than 5 years of service were assumed to take a separation benefit.

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

Age	Service	% of Active Participants Terminating								
		Protective		Public Schools		University		Exec. & Elected	General	
		With Soc. Sec.	Without Soc. Sec.	Males	Females	Males	Females		Males	Females
	0	17.0%	4.0%	18.3%	16.0%	16.0%	16.0%	18.0%	16.8%	20.0%
	1	8.0%	3.5%	11.0%	10.8%	14.0%	15.0%	14.0%	12.7%	14.1%
	2	5.0%	1.5%	7.8%	7.7%	12.0%	13.0%	12.0%	9.0%	11.0%
	3	4.3%	1.3%	5.9%	5.8%	10.0%	10.0%	10.0%	7.3%	8.9%
	4	3.8%	1.2%	4.9%	5.0%	8.5%	9.9%	10.0%	7.0%	8.5%
	5	3.1%	1.1%	3.6%	4.3%	8.0%	8.4%	8.0%	4.8%	6.7%
	6	3.0%	1.0%	3.2%	3.8%	7.5%	6.4%	7.0%	4.3%	5.6%
	7	2.9%	0.9%	2.6%	3.4%	5.7%	5.7%	6.0%	4.2%	5.0%
	8	2.5%	0.8%	2.6%	2.8%	4.6%	4.7%	6.0%	3.4%	4.7%
	9	2.2%	0.7%	2.4%	2.5%	4.0%	4.2%	6.0%	3.1%	4.5%
25	10 & Over	2.0%	0.7%	1.3%	2.2%	4.0%	5.0%	6.0%	2.5%	4.5%
30		1.8%	0.7%	1.3%	1.9%	3.9%	4.6%	5.1%	2.5%	4.3%
35		1.6%	0.7%	1.3%	1.6%	3.6%	4.2%	4.3%	2.4%	3.5%
40		1.3%	0.6%	1.3%	1.3%	3.1%	3.4%	4.1%	2.1%	2.7%
45		1.1%	0.6%	1.3%	1.1%	2.3%	2.6%	3.2%	1.8%	2.2%
50		1.0%	0.5%	1.3%	1.0%	1.9%	2.1%	2.5%	1.5%	1.9%
55		1.0%	0.5%	1.3%	1.0%	1.8%	2.0%	2.4%	1.5%	1.8%
60		1.0%	0.5%	1.3%	1.0%	1.8%	2.0%	2.4%	1.5%	1.8%

### 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%	0.04%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
25	0.01%	0.04%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
30	0.01%	0.04%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%
35	0.02%	0.04%	0.01%	0.01%	0.00%	0.02%	0.01%	0.01%	0.01%	0.03%
40	0.02%	0.06%	0.01%	0.02%	0.01%	0.03%	0.01%	0.01%	0.03%	0.04%
45	0.03%	0.11%	0.03%	0.05%	0.01%	0.03%	0.01%	0.01%	0.06%	0.06%
50	0.06%	0.64%	0.08%	0.10%	0.02%	0.06%	0.02%	0.02%	0.13%	0.09%
55	0.87%	0.48%	0.16%	0.14%	0.05%	0.09%	0.09%	0.09%	0.24%	0.16%
60	1.46%	0.14%	0.26%	0.21%	0.07%	0.13%	0.11%	0.11%	0.43%	0.23%

## **SECTION E**

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### **PLAN PROVISIONS**

## Summary of Benefit Provisions

### Normal Retirement Eligibility

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

General		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.

### 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%.

**Disability Annuity.** Eligibility: generally total and permanent incapacity to engage in gainful employment. Participant must have completed at least 6 months of creditable service (in at least 5 out of the last 7 calendar years) preceding application for disability. Service requirement is waived if disability is from service-related causes.

For protective occupations, eligibility also can be met if a member has 15 years of service, is between the ages of 50 and 55 and unable to safely and efficiently perform one's duties.

**Disability Amounts.** Amounts payable in case of disability depend upon the plan from which payment is made and are described below.

	<b>Pre-10/16/92 WRS Plan</b>	<b>Post-10/15/92 LTDI Plan</b>
<b>Participants covered</b>	Participants hired before 10/16/92 who do not elect LTDI coverage.	Participants entering after 10/15/92 and participants on 10/15/92 who elect LTDI coverage.
<b>Benefit to age 65*</b>	WRS formula benefit based on service projected to normal retirement age.	40% of FAE for participants covered by Social Security; 50% of FAE for non-covered participants who cannot qualify for Social Security disability benefits.
<b>Benefit at age 65*</b>	Continuation of pre-65 amount.	WRS benefit accrued to date of disability plus 7% of FAE money purchase benefit during disability period, both of which are adjusted in accordance with dividend rate.

\* Conversion age is later for participants becoming disabled after age 61.

**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.

**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:

<b>Date of Participation</b>	<b>Rate Credited for Purpose of</b>	
	<b>Money Purchase Minimum</b>	<b>Refunds</b>
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 F

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### **GLOSSARY OF TERMS**

Auditor's Note – This information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

## Glossary of Terms

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

## Glossary of Terms

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

## Glossary of Terms

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

## Glossary of Terms

<b><i>Other Postemployment Benefits (OPEB)</i></b>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
<b><i>Real Rate of Return</i></b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b><i>Service Cost</i></b>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<b><i>Total Pension Expense</i></b>	<p>The total pension expense is the sum of the following items that are recognized at the end of the employer’s fiscal year:</p> <ol style="list-style-type: none"><li>1. Service Cost</li><li>2. Interest on the Total Pension Liability</li><li>3. Current-Period Benefit Changes</li><li>4. Employee Contributions (made negative for addition here)</li><li>5. Projected Earnings on Plan Investments (made negative for addition here)</li><li>6. Pension Plan Administrative Expense</li><li>7. Other Changes in Plan Fiduciary Net Position</li><li>8. Recognition of Outflow (Inflow) of Resources due to Liabilities</li><li>9. Recognition of Outflow (Inflow) of Resources due to Assets</li></ol>
<b><i>Total Pension Liability (TPL)</i></b>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<b><i>Unfunded Actuarial Accrued Liability (UAAL)</i></b>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<b><i>Valuation Assets</i></b>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.