

Wyoming Retirement System Law Enforcement Retirement Fund

GASB Statement Nos. 67 and 68 Accounting and Financial
Reporting for Pensions
For Measurement Date as of December 31, 2019





March 29, 2020

Board of Trustees
Wyoming Law Enforcement Retirement Fund

Dear Board Members:

This report provides information required by the Wyoming Law Enforcement Retirement Fund (WRS) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 and 68 for the Wyoming Retirement System ("WRS"). These calculations have been made on a basis that is consistent with our understanding of these Statements.

GASB Statement No. 67 is the accounting standard that applies to the stand-alone financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than the Wyoming Law Enforcement Retirement Fund only in its entirety and only with the permission of WRS. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by WRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This information was checked for internal consistency, but it was not audited.

This report complements the actuarial valuation report that was provided to WRS and should be considered in conjunction with that report. Please see the actuarial valuation report as of January 1, 2019 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions. Furthermore, this report incorporates the assumptions adopted by the Board effective August 23, 2017. For a detailed description of the experience related to these assumptions, as well as the rationale for any changes, please see our latest Wyoming Retirement System Actuarial Experience Study Report. Our experience study report was dated January 10, 2018 and it covered the five-year investigation period ending December 31, 2016.

To the best of our knowledge, the information contained with this report is accurate and fairly represents the actuarial position of the Wyoming Law Enforcement Retirement Fund. 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.

The signing individuals are independent of the plan sponsor.

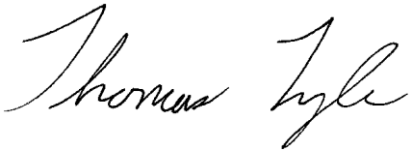
Paul T. Wood and Thomas A. Lyle are members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Gabriel, Roeder, Smith & Company



By _____
Paul T. Wood, ASA, FCA, MAAA



By _____
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Table of Contents

	<u>Page</u>
Section A Executive Summary	
Executive Summary	1
Discussion	2-5
Section B Financial Statements	
Statement of Pension Expense under GASB Statement No. 68	7
Statement of Outflows and Inflows Arising from Current Reporting Period	8
History of Deferred Outflows and Inflows of Resources by Source	9
Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods.....	10
Statement of Fiduciary Net Position	11
Statement of Changes in Fiduciary Net Position	12
Section C Required Supplementary Information	
Schedule of Changes in Net Pension Liability and Related Ratios Current Reporting Period .	14
Schedule of Changes in Net Pension Liability and Related Ratios Multiyear	15
Schedule of Net Pension Liability Multiyear	16
Schedule of Contributions Multiyear	17
Notes to Schedule of Contributions	18
Schedule of Investment Returns Multiyear.....	19
Section D Notes to Financial Statements	
Sensitivity of Net Pension Liability to the Single Discount Rate Assumption	21
Summary of Population Statistics	22
Section E Summary of Benefits	24-26
Section F Actuarial Cost Method and Actuarial Assumptions	
Actuarial Assumptions and Cost Method	28-32
Experience Analysis	33
Section G Calculation of the Single Discount Rate	
Calculation of the Single Discount Rate	35
Projection of Contributions	36-37
Projection of Plan Net Position	38-39
Present Values of Projected Benefits	40-41
Section H Glossary of Terms	43-46

SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2019

	2019
Actuarial Valuation Date	January 1, 2019
Measurement Date of the Net Pension Liability	December 31, 2019
Employer's Fiscal Year Ending Date (Reporting Date)	December 31, 2019

Membership

Number of	
- Retirees and Beneficiaries	1,274
- Inactive, Nonretired Members	1,371
- Active Members	2,662
- Total	5,307
Covered Payroll	\$ 155,851,473

Net Pension Liability

Total Pension Liability	\$ 787,085,396
Plan Fiduciary Net Position	700,886,675
Net Pension Liability	\$ 86,198,721
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	89.05 %
Net Pension Liability as a Percentage of Covered Payroll	55.31 %

Development of the Single Discount Rate

Single Discount Rate	7.00 %
Long-Term Expected Rate of Investment Return	7.00 %
Long-Term Municipal Bond Rate*	2.75 %
Last year ending December 31 in the 2019 to 2118 projection period for which projected benefit payments are fully funded	2118

Total Pension Expense \$ 27,840,103

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	\$ 15,335,702	\$ 7,193,527
Changes in assumptions	71,779,868	86,061,405
Net difference between projected and actual earnings on pension plan investments	40,141,110	70,950,773
Total	\$ 127,256,680	\$ 164,205,705

**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, 2019. 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 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, 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, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability 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).

Paragraph 34 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to WRS subsequent to the measurement date of December 31, 2019.

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

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

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 and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the type of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position and the net pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- 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.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets;
- annual money-weighted rate of return.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

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

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 7.00% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain level as a percentage of payroll.
2. The unfunded liability is expected to increase as a percentage of payroll each year in the future.
3. The unfunded liability is expected to be fully amortized during the lifetimes of current members.
4. The funded status of the plan is expected to increase over time.

This funding policy results in no expected crossover date and a GASB single discount rate of 7.00%. 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.

The single discount rate increased from 5.92% to 7.00% since the last valuation. This change in discount rate is measured as a change in assumptions.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. 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 January 1, 2019 and a measurement date of December 31, 2019.



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 (which is published by the Federal Reserve) 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 2.75% (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 7.00%.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively, earlier application is encouraged by the GASB.



SECTION B

FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Law Enforcement Retirement Fund. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Statement of Pension Expense under GASB Statement No. 68

Fiscal Year Ended December 31, 2019

A. Expense

1. Service Cost	\$	22,866,557
2. Interest on the Total Pension Liability		51,970,908
3. Current-Period Benefit Changes		0
4. Employee Contributions (made negative for addition here)		(14,671,686)
5. Projected Earnings on Plan Investments (made negative for addition here)		(41,625,390)
6. Pension Plan Administrative Expense		596,769
7. Other Changes in Plan Fiduciary Net Position		27,143
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		7,248,937 *
9. Recognition of Outflow (Inflow) of Resources due to Assets		1,426,865
10. Total Pension Expense	\$	27,840,103 **

* Includes change in the blended single discount rate from 5.92% to 7.00%

**In accordance with GASB 71, employers may need to illustrate contributions made after the measurement date

Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended December 31, 2019

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ 19,861,777
2. Assumption Changes (gains) or losses	\$ (111,460,988)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	4.3883
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	\$ 4,526,075
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for assumption changes	\$ (25,399,583)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ (20,873,507)
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	\$ 15,335,702
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for assumption changes	\$ (86,061,405)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$ (70,725,704)

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (69,167,783)
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	\$ (13,833,557)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (55,334,226)

History of Deferred Outflows and Inflows of Resources by Source

Fiscal Year Ended December 31, 2019

Differences between expected and actual experience - Net (inflows)/outflows of resources

Recognition Period	5.2360	4.9669	4.8650	4.7436	4.5560	4.3883		
	2014	2015	2016	2017	2018	2019	Total	Deferred Net (Inflows)/Outflows at Measurement Date
Total	\$ -	\$ 1,710,375	\$ (3,501,453)	\$ (6,691,047)	\$ (7,328,715)	\$ 19,861,777		
2014	-	-	-	-	-	-	-	-
2015	-	344,355	-	-	-	-	344,355	-
2016	-	344,355	(719,723)	-	-	-	(375,368)	-
2017	-	344,355	(719,723)	(1,410,542)	-	-	(1,785,910)	-
2018	-	344,355	(719,723)	(1,410,542)	(1,608,585)	-	(3,394,495)	-
2019	-	332,955	(719,723)	(1,410,542)	(1,608,585)	4,526,075	1,120,180	-
2020	-	-	(622,561)	(1,410,542)	(1,608,585)	4,526,075	884,387	\$ 8,142,175
2021	-	-	-	(1,048,879)	(1,608,585)	4,526,075	1,868,611	-
2022	-	-	-	-	(894,375)	4,526,075	3,631,700	-
2023	-	-	-	-	-	1,757,477	1,757,477	-
2024	-	-	-	-	-	-	-	-
Thereafter	-	-	-	-	-	-	-	-
	\$ -	\$ 1,710,375	\$ (3,501,453)	\$ (6,691,047)	\$ (7,328,715)	\$ 19,861,777	\$ 4,050,937	

Assumption changes - Net (inflows)/outflows of resources

Recognition Period	5.2360	4.9669	4.8650	4.7436	4.5560	4.3883		
	2014	2015	2016	2017	2018	2019	Total	
Total	\$ -	\$ -	\$ -	\$ 51,421,521	\$ 94,255,216	\$ (111,460,988)		
2014	-	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-
2017	-	-	-	10,840,189	-	-	10,840,189	-
2018	-	-	-	10,840,189	20,688,151	-	31,528,340	-
2019	-	-	-	10,840,189	20,688,151	(25,399,583)	6,128,757	-
2020	-	-	-	10,840,189	20,688,151	(25,399,583)	6,128,757	\$ (14,281,537)
2021	-	-	-	8,060,765	20,688,151	(25,399,583)	3,349,333	-
2022	-	-	-	-	11,502,612	(25,399,583)	(13,896,971)	-
2023	-	-	-	-	-	(9,862,656)	(9,862,656)	-
2024	-	-	-	-	-	-	-	-
Thereafter	-	-	-	-	-	-	-	-
	\$ -	\$ -	\$ -	\$ 51,421,521	\$ 94,255,216	\$ (111,460,988)	\$ 34,215,749	

Net Difference between projected and actual earnings on pension plan investments - Net (inflows)/outflows of resources

Recognition Period	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000		
	2014	2015	2016	2017	2018	2019	Total	
Total	\$ 14,545,212	\$ 46,589,301	\$ 2,778,485	\$ (39,041,366)	\$ 65,975,687	\$ (69,167,783)		
2014	2,909,042	-	-	-	-	-	2,909,042	-
2015	2,909,042	9,317,860	-	-	-	-	12,226,902	-
2016	2,909,042	9,317,860	555,697	-	-	-	12,782,599	-
2017	2,909,042	9,317,860	555,697	(7,808,273)	-	-	4,974,326	-
2018	2,909,044	9,317,860	555,697	(7,808,273)	13,195,137	-	18,169,465	-
2019	-	9,317,861	555,697	(7,808,273)	13,195,137	(13,833,557)	1,426,865	-
2020	-	-	555,697	(7,808,273)	13,195,137	(13,833,557)	(7,890,996)	\$ (30,809,663)
2021	-	-	-	(7,808,274)	13,195,137	(13,833,557)	(8,446,694)	-
2022	-	-	-	-	13,195,139	(13,833,557)	(638,418)	-
2023	-	-	-	-	-	(13,833,555)	(13,833,555)	-
2024	-	-	-	-	-	-	-	-
Thereafter	-	-	-	-	-	-	-	-
	\$ 14,545,212	\$ 46,589,301	\$ 2,778,485	\$ (39,041,366)	\$ 65,975,687	\$ (69,167,783)	\$ 21,679,536	

Total net differences from all sources - Net (inflows)/outflows of resources

	2014	2015	2016	2017	2018	2019	Total	
Total	\$ 14,545,212	\$ 48,299,676	\$ (722,968)	\$ 5,689,108	\$ 152,902,188	\$ (160,766,994)		
2014	2,909,042	-	-	-	-	-	2,909,042	-
2015	2,909,042	9,662,215	-	-	-	-	12,571,257	-
2016	2,909,042	9,662,215	(164,026)	-	-	-	12,407,231	-
2017	2,909,042	9,662,215	(164,026)	1,621,374	-	-	14,028,605	-
2018	2,909,044	9,662,215	(164,026)	1,621,374	32,274,703	-	46,303,310	-
2019	-	9,650,816	(164,026)	1,621,374	32,274,703	(34,707,065)	8,675,802	-
2020	-	-	(66,864)	1,621,374	32,274,703	(34,707,065)	(877,852)	\$ (36,949,025)
2021	-	-	-	(796,388)	32,274,703	(34,707,065)	(3,228,750)	-
2022	-	-	-	-	23,803,376	(34,707,065)	(10,903,689)	-
2023	-	-	-	-	-	(21,938,734)	(21,938,734)	-
2024	-	-	-	-	-	-	-	-
Thereafter	-	-	-	-	-	-	-	-
	\$ 14,545,212	\$ 48,299,676	\$ (722,968)	\$ 5,689,108	\$ 152,902,188	\$ (160,766,994)	\$ 59,946,222	



Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended December 31, 2019

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	\$ 36,387,370	\$ 29,138,433	\$ 7,248,937
2. Due to Assets	23,068,695	21,641,830	1,426,865
3. Total	\$ 59,456,065	\$ 50,780,263	\$ 8,675,802

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 4,859,030	\$ 3,738,850	\$ 1,120,180
2. Assumption Changes	31,528,340	25,399,583	6,128,757
3. Net Difference between projected and actual earnings on pension plan investments	23,068,695	21,641,830	1,426,865
4. Total	\$ 59,456,065	\$ 50,780,263	\$ 8,675,802

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	\$ 15,335,702	\$ 7,193,527	\$ 8,142,175
2. Assumption Changes	71,779,868	86,061,405	(14,281,537)
3. Net Difference between projected and actual earnings on pension plan investments	40,141,110	70,950,773	(30,809,663)
4. Total	\$ 127,256,680	\$ 164,205,705	\$ (36,949,025)

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
2020	\$ (877,852)
2021	(3,228,750)
2022	(10,903,689)
2023	(21,938,734)
2024	0
Thereafter	0
Total	\$ (36,949,025)

Statement of Fiduciary Net Position as of December 31, 2019

	2019
Assets	
Cash and Deposits	\$ 23,970,725
Receivables	
Accounts Receivable - Sale of Investments	\$ 2,548,009
Accrued Interest and Other Dividends	1,534,470
Contributions	1,734,045
Accounts Receivable - Other	15,860,682
Total Receivables	\$ 21,677,206
Investments	
Fixed Income	\$ 118,794,213
Domestic Equities	327,293,477
International Equities	113,329,839
Real Estate	117,489,484
Other	31,780,833
Total Investments	\$ 708,687,846
Total Assets	\$ 754,335,777
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ 50,913,340
Accrued Expenses	2,378,107
Accounts Payable - Other	157,655
Total Liabilities	\$ 53,449,102
Net Position Restricted for Pensions	\$ 700,886,675

Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2019

	2019
Additions	
Contributions	
Employer	\$ 13,856,199
Employee	13,880,776
Other Employer Contributions	414,645
Other Employee Contributions	790,910
Total Contributions	\$ 28,942,530
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 105,310,386
Interest and Dividends	10,766,989
Less Investment Expense	(5,284,202)
Net Investment Income	\$ 110,793,173
Other	\$ 0
Total Additions	\$ 139,735,703
 Deductions	
Benefit Payments, including Refunds of Employee Contributions	\$ 37,276,954
Pension Plan Administrative Expense	596,769
Other	27,143
Total Deductions	\$ 37,900,866
Net Increase in Net Position	\$ 101,834,837
 Net Position Restricted for Pensions	
Beginning of Year	\$ 599,051,838
End of Year	\$ 700,886,675

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Law Enforcement Retirement Fund. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Schedule of Changes in Net Pension Liability and Related Ratios

Current Reporting Period

Fiscal Year Ended December 31, 2019

A. Total pension liability	
1. Service cost	\$ 22,866,557
2. Interest on the total pension liability	51,970,908
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the total pension liability	19,861,777
5. Changes of assumptions	(111,460,988)
6. Benefit payments, including refunds of employee contributions	(37,276,954)
7. Net change in total pension liability	(54,038,700)
8. Total pension liability – beginning	841,124,096
9. Total pension liability – ending	\$ 787,085,396
B. Plan fiduciary net position	
1. Contributions – employer	\$ 14,270,844
2. Contributions – employee	14,671,686
3. Net investment income	110,793,173
4. Benefit payments	(34,850,971)
5. Refunds	(2,425,983)
6. Pension plan administrative expense	(596,769)
7. Other	(27,143)
8. Net change in plan fiduciary net position	101,834,837
9. Plan fiduciary net position – beginning	599,051,838
10. Plan fiduciary net position – ending	\$ 700,886,675
C. Net pension liability	\$ 86,198,721
D. Plan fiduciary net position as a percentage of the total pension liability	89.05 %
E. Covered-employee payroll	\$ 155,851,473
F. Net pension liability as a percentage of covered-employee payroll	55.31 %

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Last 10 Fiscal Years (which may be built prospectively)

Fiscal year ending December 31,	2019	2018	2017	2016	2015	2014
Total pension liability						
Service cost	\$ 22,866,557	\$ 26,657,347	\$ 23,241,982	\$ 23,339,214	\$ 22,790,835	\$ 22,432,708
Interest on the total pension liability	51,970,908	47,238,165	47,200,725	45,945,359	43,444,727	40,636,242
Changes of benefit terms	0	0	0	0	0	0
Difference between expected and actual experience	19,861,777	(7,328,715)	(6,691,047)	(3,501,453)	1,710,375	0
Changes of assumptions	(111,460,988)	94,255,216	51,421,521	0	0	0
Benefit payments, including refunds of employee contributions	(37,276,954)	(35,984,464)	(33,662,493)	(31,364,891)	(30,119,285)	(27,320,442)
Net change in total pension liability	(54,038,700)	124,837,549	81,510,688	34,418,229	37,826,652	35,748,508
Total pension liability - beginning	841,124,096	716,286,547	634,775,859	600,357,630	562,530,978	526,782,470
Total pension liability - ending (a)	<u>\$ 787,085,396</u>	<u>\$ 841,124,096</u>	<u>\$ 716,286,547</u>	<u>\$ 634,775,859</u>	<u>\$ 600,357,630</u>	<u>\$ 562,530,978</u>
Plan fiduciary net position						
Employer contributions	\$ 14,270,844	\$ 13,781,011	\$ 13,614,406	\$ 13,730,305	\$ 12,706,883	\$ 13,308,281
Employee contributions	14,671,686	13,846,377	13,691,494	14,442,190	15,397,475	13,314,132
Pension plan net investment income	110,793,173	(22,169,139)	77,946,645	37,782,650	(5,371,824)	24,853,352
Benefit payments	(34,850,971)	(32,013,552)	(29,621,411)	(27,873,802)	(25,459,574)	(23,209,837)
Refunds	(2,425,983)	(3,970,912)	(4,041,082)	(3,491,089)	(4,659,711)	(4,110,605)
Pension plan administrative expense	(596,769)	(639,428)	(580,221)	(518,486)	(417,893)	(408,470)
Other	(27,143)	(24,638)	(51,644)	(25,522)	(24,983)	797,291
Net change in plan fiduciary net position	101,834,837	(31,190,281)	70,958,187	34,046,246	(7,829,627)	24,544,144
Plan fiduciary net position - beginning	599,051,838	630,242,119	559,283,932	525,237,686	533,067,313	508,523,169
Plan fiduciary net position - ending (b)	<u>\$ 700,886,675</u>	<u>\$ 599,051,838</u>	<u>\$ 630,242,119</u>	<u>\$ 559,283,932</u>	<u>\$ 525,237,686</u>	<u>\$ 533,067,313</u>
Net pension liability - ending (a) - (b)	<u>\$ 86,198,721</u>	<u>\$ 242,072,258</u>	<u>\$ 86,044,428</u>	<u>\$ 75,491,927</u>	<u>\$ 75,119,944</u>	<u>\$ 29,463,665</u>
Plan fiduciary net position as a percentage of total pension liability	89.05 %	71.22 %	87.99 %	88.11 %	87.49 %	94.76 %
Covered-employee payroll	\$ 155,851,473	\$ 151,898,695	\$ 153,547,078	\$ 154,779,198	\$ 150,399,739	\$ 147,790,833
Projected valuation payroll	\$ 159,747,760	\$ 155,696,162	\$ 160,072,828	\$ 161,357,314	\$ 156,791,728	\$ 154,071,943
Net pension liability as a percentage of covered-employee payroll	55.31 %	159.36 %	56.04 %	48.77 %	49.95 %	19.94 %

Notes to Schedule:

For 2019, 2018, 2017, 2016 and 2015, "Other" changes to Plan Fiduciary Net Position includes other funding sources and depreciation expenses.

For 2014, "Other" changes also may include member redeposits and member service purchase contributions.



Schedules of Required Supplementary Information

Schedule of Net Pension Liability Multiyear

Last 10 Fiscal Years (which may be built prospectively)

FY Ending December 31,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll*	Net Pension Liability as a % of Covered Payroll
2014	\$ 562,530,978	\$ 533,067,313	\$ 29,463,665	94.76 %	\$ 147,790,833	19.94 %
2015	600,357,630	525,237,686	75,119,944	87.49 %	150,399,739	49.95 %
2016	634,775,859	559,283,932	75,491,927	88.11 %	154,779,198	48.77 %
2017	716,286,547	630,242,119	86,044,428	87.99 %	153,547,078	56.04 %
2018	841,124,096	599,051,838	242,072,258	71.22 %	151,898,695	159.36 %
2019	787,085,396	700,886,675	86,198,721	89.05 %	155,851,473	55.31 %

* Covered payroll is the amount in force as of the valuation date and likely differs from the actual payroll paid during the year.



Schedule of Contributions Multiyear Last 10 Fiscal Years

FY Ending December 31,	Actuarially Determined Contribution	Actual Contribution*	Contribution Deficiency (Excess)	Covered Payroll**	Actual Contribution as a % of Covered Payroll
2014	\$ 11,812,078	\$ 13,308,281	\$ (1,496,203)	\$ 147,790,833	9.00 %
2015	11,708,248	12,706,883	(998,635)	150,399,739	8.45 %
2016	12,063,684	13,730,305	(1,666,621)	154,779,198	8.87 %
2017	11,623,441	13,614,406	(1,990,965)	153,547,078	8.87 %
2018	14,493,422	13,781,011	712,411	151,898,695	9.07 %
2019	16,754,321	14,270,844	2,483,477	155,851,473	9.16 %

* Includes other funding sources but excludes member redeposits and member service purchase contributions.

** Covered payroll is the amount in force as of the valuation date and likely differs from the actual payroll paid during the year.

Notes to Schedule of Contributions

Valuation Date: January 1, 2019
Notes Actuarially determined contribution rates are calculated as of July 1 each year for implementation the following fiscal year.

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	29 years
Asset Valuation Method	5-Year smoothed market
Inflation	2.25%
Salary Increases	4.75% to 8.75% including inflation
Payroll Growth Rate	2.50%
Cost-of-Living Increase	0.00%
Investment Rate of Return	7.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2018 valuation pursuant to an experience study of the period 2012 - 2016.
Post-Retirement Mortality	RP-2014 Healthy Annuitant Mortality Table, fully generational, projected with Scale Males: No set back with a multiplier of 100% Females: No set back with a multiplier of 88%
Pre-Retirement Mortality	RP-2014 Employee Mortality Table, fully generational, projected with Scale MP-2017 Males: No set back with a multiplier of 100% Females: No set back with a multiplier of 100%

Other Information:

Notes There were no benefit changes during the year.
The employer is currently contributing at the rate of 8.60% of salary.
Employees are currently contributing at the rate of 8.60% of salary.
The roll-forward methodology employed for purposes of the GASB disclosures is based on generally accepted actuarial methods.



Schedule of Investment Returns Multiyear Last 10 Fiscal Years

<u>FY Ending December 31,</u>	<u>Annual Return¹</u>
2014	4.70 %
2015	(0.26)%
2016	7.60 %
2017	14.20 %
2018	(3.52)%
2019	18.72 %

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

SECTION D

NOTES TO FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Law Enforcement Retirement Fund. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

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 an expected rate of return on pension plan investments of 7.00% and a municipal bond rate of 2.75%. 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 statutory required contribution rate. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments through the year 2118. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year 2118, and the municipal bond rate was applied to all benefit payments after that date.

Sensitivity of Results

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.00%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

1% Decrease	Current Single Discount Rate Assumption	1% Increase
6.00%	7.00%	8.00%
\$ 192,166,204	\$ 86,198,721	\$ (427,735)

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	1,274
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	1,371
Active Plan Members	<u>2,662</u>
Total Plan Members	5,307

SECTION E

SUMMARY OF BENEFITS

Summary of Benefits

Covered Members

County sheriffs, deputy county sheriffs, municipal police officers; Investigator of the Wyoming Livestock Board; meeting the specifications of W.S.7-2-101(a)(iv)(E), investigators employed by the Wyoming State Board of Outfitters and professional guides meeting the specifications of W.S. 7-2-101(a)(iv)(J); Correctional officers, probation and parole agents employed by the Wyoming Department of Corrections, Wyoming Law Enforcement Academy instructors, University of Wyoming campus police officers; And full-time dispatchers or detention officers for law enforcement agencies.

Final Average Salary

Employee's average annual salary for the highest paid five continuous years of service.

Service Retirement

Eligibility

Age 60 with four or more years of service as a law enforcement officer or any age with at least twenty years of service as a law enforcement officer. Early retirement benefits are payable to any law enforcement officer who has at least four but less than twenty years of service and are at least age 50. Early retirement benefits are actuarially reduced by 5% per year before age 60.

Monthly Benefit

2.50% of employee's highest five-year average salary for each year of credited service, not to exceed 75.0% of final average salary.

Vesting

Any employee who has left employment with four or more years of service, and who has not withdrawn accumulated contributions, is eligible to receive the above benefit or can elect to receive a lump-sum refund of contributions with interest. An employee who terminates with less than four years of service is only eligible for the lump-sum benefit.

Duty Disability Retirement

Eligibility

No age or service eligibility requirements. Partial or total disability resulting from an individual and specific act, the type of which would normally occur only while employed as an employee, or as otherwise defined under W.S. 9-3-432(h).

Monthly Benefit

62.5% of Final Salary.



Non-duty Disability Retirement

Eligibility	10 years of credited service. Partial or total disability, but not eligible for duty disability.
Monthly Benefit	50.0% of Final Salary.

Pre-retirement Duty Death Benefit

Eligibility	No age or service requirements.
Monthly Benefit	62.5% of member's final actual salary, payable to the surviving spouse plus 6% of the member's final actual salary for each unmarried child under 18. Payment shall not exceed the member's final actual salary.

Pre-retirement Non-duty Death Benefit

Eligibility	No age or service requirements.
Monthly Benefit	50% of the member's final actual salary payable to the surviving spouse plus 6% of the member's final actual salary for each unmarried child under 18. Payment shall not exceed 100% of the member's final actual salary.

Contributions

Employee	8.6% of salary. The employer may subsidize all or part of the employee contributions.
Employer	8.6% of salary.
Interest	3.0% annually effective January 1, 2016.

Cost-of-Living Improvements

W.S. 9-3-454 prohibits benefit changes, including cost-of-living increases, unless the funded ratio stays above 100% plus a margin for adverse experience throughout the life of the benefit change.



Optional Forms of Payment

- Option 1 Monthly benefit for life with a lump-sum death benefit equal to the excess (if any) of the employee contributions with interest over the total benefits received.
- Option 2 Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary.
- Option 2P Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary. Benefit reverts to Option 1 amount but without the cash refund feature upon beneficiary death.
- Option 3 Monthly benefit for life. Upon death, 50% of the benefit continues to be paid to the beneficiary.
- Option 3P Monthly benefit for life. Upon death, 50% of the benefit continues to be paid to the beneficiary. Benefit reverts to Option 1 amount but without the cash refund feature upon beneficiary death.
- Option 4 Monthly benefit for life with a guarantee of 120 monthly payments.
- Option 5 The largest possible monthly benefit payable for life with no lump-sum death benefit.
- Other Grandfathered group of retirees has an optional form which, upon death, 66.67% of the benefit continues to be paid to the beneficiary.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Summary of Actuarial Assumptions and Methods

The following methods and assumptions were used in preparing the January 1, 2019 actuarial valuation report.

1. Valuation Date

The valuation date for any given year is January 1st, the first day of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

2. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal (EAN) actuarial cost method, amortized as a level percentage of payroll. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) the rate that will amortize the unfunded actuarial accrued liability (UAAL).

- a. The valuation is prepared on the projected benefit basis, under which the present value, at the investment return rate assumed to be earned in the future (currently 7.00%), of each participant's expected benefit payable at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability, or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable for the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Fund on account of the present group of participants and beneficiaries.
- b. The employer contributions required to support the benefits of the Fund are determined using a level funding approach, and consist of a normal cost contribution and a unfunded accrued liability contribution.
- c. The normal cost contribution is determined using the "entry age normal" actuarial cost method. Under this method, a calculation is made to determine the average uniform and constant percentage rate of employer contribution which, if applied to the compensation of each new participant during the entire period of his/her anticipated covered service, would be required to meet the cost of all benefits payable on his/her behalf based on the benefits provisions applicable for the individual member.
- d. The unfunded accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability. Amortization bases are established each year and amortized based on the Board's policy. The Board's policy consists of amortizing the unfunded liability as of January 1, 2018, over a closed 30 year period with each subsequent amortization base created as a result of year to year experience changes over individual 20 year closed periods. The current year amortization base is determined by taking the current unfunded liability less the outstanding amounts of prior year bases.



3. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income, with interest, dividends, and other income recognized immediately. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses. An adjustment is made if the actuarial value is not within 20% of the Market Value. For any year following a year in which the 20% of market value adjustment was applied, the actuarial value is determined as if the adjustment was not applied in the previous year.

4. Economic Assumptions

a. Investment return

7.00% per year, compounded annually, composed of an assumed 2.25% inflation rate and a 4.75% net real rate of return. This rate represents the assumed return, net of investment expenses.

b. Salary increase rate

Age	Rate
20	7.00%
25	6.50%
30	5.00%
35	4.25%
40	4.25%
45	4.00%
50	3.50%
55	3.25%
60	3.00%

c. Payroll growth rate

In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 2.50% per year. This increase rate is solely due to the effect of inflation on salaries, with no allowance for future membership growth.

d. Cost-of-Living adjustment

No cost-of-living adjustment is assumed since the policy for providing the benefit requires Board approval to make the recommendation to the Joint Appropriations Committee and the funded level of the plan shows a cost-of-living requirement would not be permitted.

5. Demographic Assumptions

a. Rates Before Retirement

Healthy Pre-Retirement Mortality:

RP-2014 Mortality Table for Healthy Employees, fully generational, projected with Scale MP-2017

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

Healthy Post-Retirement Mortality:

RP-2014 Mortality Table for Healthy Annuitants, fully generational, projected with Scale MP-2017

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 88%

Disabled Mortality:

RP-2014 Disabled Mortality Table, fully generational, projected with Scale MP-2017

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

Age	Pre-Retirement		Post-Retirement		Disabled	
	Projected to 2019 using Scale MP-2017					
	Male	Female	Male	Female	Male	Female
20	0.04%	0.02%	0.04%	0.01%	0.05%	0.02%
25	0.05%	0.02%	0.06%	0.03%	0.20%	0.09%
30	0.05%	0.02%	0.09%	0.06%	0.51%	0.24%
35	0.06%	0.03%	0.13%	0.09%	0.92%	0.45%
40	0.07%	0.04%	0.19%	0.14%	1.32%	0.68%
45	0.09%	0.06%	0.27%	0.18%	1.63%	0.90%
50	0.16%	0.11%	0.38%	0.24%	1.92%	1.15%
55	0.27%	0.17%	0.55%	0.32%	2.26%	1.45%
60	0.47%	0.25%	0.78%	0.47%	2.67%	1.74%
65	0.83%	0.36%	1.11%	0.70%	3.18%	2.05%
70	1.35%	0.60%	1.63%	1.08%	3.92%	2.69%
75			2.56%	1.76%	5.18%	3.91%
80			4.27%	2.96%	7.31%	5.88%
85			7.44%	5.18%	10.87%	8.80%
90			13.11%	9.20%	16.69%	12.94%
95			21.02%	15.32%	23.77%	19.05%
100			30.49%	23.34%	31.73%	27.24%

30% of active deaths are assumed to be duty-related

b. Disability and Withdrawal

Age	Disability		Withdrawal		Withdrawal		
	Male	Female	Ultimate		Service	First five years	
			Male	Female		Male	Female
20	0.07%	0.07%	15.00%	15.00%	1	24%	25%
25	0.07%	0.07%	11.00%	11.00%	2	20%	22%
30	0.07%	0.07%	8.50%	8.50%	3	15%	19%
35	0.08%	0.08%	6.50%	6.50%	4	13%	18%
40	0.18%	0.18%	5.50%	5.50%	5	12%	15%
45	0.38%	0.38%	5.00%	5.00%			
50	0.67%	0.67%	3.00%	3.00%			
55	1.14%	1.14%	3.00%	3.00%			
60	2.22%	2.22%	3.00%	3.00%			

30% of active disabilities are assumed to be duty-related

c. Retirement Rates

Age	Reduced Rate	Unreduced Rate	Age	Reduced Rate	Unreduced Rate
50	2.0%	20.0%	61	NA	17.0%
51	2.0%	13.0%	62	NA	17.0%
52	2.0%	13.0%	63	NA	20.0%
53	2.0%	13.0%	64	NA	20.0%
54	2.0%	13.0%	65	NA	50.0%
55	2.0%	15.0%	66	NA	50.0%
56	2.0%	15.0%	67	NA	50.0%
57	2.0%	15.0%	68	NA	50.0%
58	2.0%	20.0%	69	NA	50.0%
59	2.0%	20.0%	70	NA	100.0%
60	NA	20.0%			

10% is assumed for members with at least 20 years of service before age 50

6. Other Assumptions

- a. Percent married: 85.00% of employees are assumed to be married. (No beneficiaries other than the spouse assumed.)
- b. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.
- c. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.
- d. Percent electing deferred termination benefit: It is assumed that 45% of active members who terminate with a vested deferred benefit will elect to have their contributions refunded.
- e. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available, which for this plan is age 60.
- f. No benefit data is available for members entitled to deferred benefits. The benefit is estimated using the final average compensation and service provided by WRS.
- g. There will be no recoveries once disabled.
- h. No surviving spouse will remarry.
- i. No children are assumed for purposes of valuing the ordinary death benefit.
- j. Administrative expenses: Assumed to be the average of the prior two years, with each year projected at 2.5% to the valuation date.
- k. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pay represents amount paid to members during the year ended on the valuation date.
- l. Decrement timing: Decrements of all types are assumed to occur mid-year.
- m. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
- n. Decrement relativity: Decrement rates are converted to probabilities in order to account for multiple decrements.
- o. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in the report, and the actual payroll payable at the time contributions are made.
- p. Benefit Service: All members are assumed to accrue one year of service each year.

Experience Analysis

An experience study was conducted on behalf of all WRS' plans covering the five year period ending December 31, 2016. That study provided a detailed analysis concerning the development of the long term inflation rate, real rate of return and discount rate. The study also analyzed each major actuarial assumption (e.g. mortality, salary increases, retirement, termination and disability) and proposed assumptions consistent with the findings. For further information on the experience study and related assumption recommendation, the reader is directed to request the December 31, 2016 Wyoming Retirement System Experience Study.

SECTION G

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 Federal Reserve) 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 2.75%; 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 **Projection of Plan 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 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.

Single Discount Rate Development Projection of Contributions Ending December 31 for 2019 to 2068

Year	Payroll for Current Employees		Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Employer Contributions Related to Payroll of Future Employees	Total Contributions
	(a)	(b)=max(0,(c)-(a))	(c)	(d)	(e)=(a)*ER%	(f) = (b)*netER%	(g)=(d)+(e)+(f)	
2019	\$ 155,851,473	\$ 3,896,287	\$ 159,747,760	\$ 14,671,686	\$ 14,270,844	\$ 0	\$ 28,942,530	
2020	143,126,399	20,615,055	163,741,454	12,308,870	12,308,870	676,199	25,293,939	
2021	134,642,765	33,192,225	167,834,990	11,579,278	11,579,278	1,097,950	24,256,506	
2022	127,189,018	44,841,847	172,030,865	10,938,256	10,938,256	1,494,333	23,370,845	
2023	120,469,541	55,862,096	176,331,637	10,360,381	10,360,381	1,870,131	22,590,893	
2024	114,172,891	66,567,037	180,739,928	9,818,869	9,818,869	2,233,215	21,870,953	
2025	108,117,969	77,140,457	185,258,426	9,298,145	9,298,145	2,592,228	21,188,518	
2026	102,117,479	87,772,408	189,889,887	8,782,103	8,782,103	2,954,248	20,518,454	
2027	96,102,081	98,535,053	194,637,134	8,264,779	8,264,779	3,322,305	19,851,863	
2028	90,048,963	109,454,099	199,503,062	7,744,211	7,744,211	3,698,252	19,186,674	
2029	83,918,918	120,571,721	204,490,639	7,217,027	7,217,027	4,084,251	18,518,305	
2030	77,905,794	131,697,111	209,602,905	6,699,898	6,699,898	4,475,129	17,874,925	
2031	72,059,460	142,783,518	214,842,978	6,197,114	6,197,114	4,869,786	17,264,014	
2032	66,302,710	153,911,342	220,214,052	5,702,033	5,702,033	5,270,265	16,674,331	
2033	60,680,440	165,038,963	225,719,403	5,218,518	5,218,518	5,675,896	16,112,932	
2034	55,164,627	176,197,761	231,362,388	4,744,158	4,744,158	6,088,078	15,576,394	
2035	49,721,797	187,424,651	237,146,448	4,276,075	4,276,075	6,508,090	15,060,240	
2036	44,359,469	198,715,640	243,075,109	3,814,914	3,814,914	6,935,192	14,565,020	
2037	39,173,230	209,978,757	249,151,987	3,368,898	3,368,898	7,365,897	14,103,693	
2038	34,161,829	221,218,958	255,380,787	2,937,917	2,937,917	7,800,665	13,676,499	
2039	29,469,145	232,296,162	261,765,307	2,534,346	2,534,346	8,233,460	13,302,152	
2040	25,293,066	243,016,374	268,309,440	2,175,204	2,175,204	8,655,585	13,005,993	
2041	21,601,316	253,415,860	275,017,176	1,857,713	1,857,713	9,067,414	12,782,840	
2042	18,336,113	263,556,492	281,892,605	1,576,906	1,576,906	9,470,322	12,624,134	
2043	15,464,567	273,475,353	288,939,920	1,329,953	1,329,953	9,864,987	12,524,893	
2044	12,944,645	283,218,773	296,163,418	1,113,240	1,113,240	10,252,551	12,479,031	
2045	10,759,288	292,808,215	303,567,503	925,299	925,299	10,633,207	12,483,805	
2046	8,869,048	302,287,643	311,156,691	762,738	762,738	11,008,214	12,533,690	
2047	7,237,427	311,698,181	318,935,608	622,419	622,419	11,378,765	12,623,603	
2048	5,861,923	321,047,075	326,908,998	504,125	504,125	11,745,028	12,753,278	
2049	4,705,830	330,375,893	335,081,723	404,701	404,701	12,108,507	12,917,909	
2050	3,732,933	339,725,833	343,458,766	321,032	321,032	12,470,660	13,112,724	
2051	2,918,253	349,126,982	352,045,235	250,970	250,970	12,832,596	13,334,536	
2052	2,244,348	358,602,018	360,846,366	193,014	193,014	13,195,231	13,581,259	
2053	1,696,602	368,170,923	369,867,525	145,908	145,908	13,559,418	13,851,234	
2054	1,255,141	377,859,072	379,114,213	107,942	107,942	13,926,155	14,142,039	
2055	911,321	387,680,747	388,592,068	78,374	78,374	14,296,165	14,452,913	
2056	650,909	397,655,961	398,306,870	55,978	55,978	14,670,349	14,782,305	
2057	453,895	407,810,647	408,264,542	39,035	39,035	15,049,822	15,127,892	
2058	307,073	418,164,083	418,471,156	26,408	26,408	15,435,484	15,488,300	
2059	199,122	428,733,813	428,932,935	17,125	17,125	15,828,169	15,862,419	
2060	124,065	439,532,193	439,656,258	10,670	10,670	16,228,475	16,249,815	
2061	73,738	450,573,926	450,647,664	6,341	6,341	16,637,092	16,649,774	
2062	40,735	461,873,121	461,913,856	3,503	3,503	17,054,703	17,061,709	
2063	20,824	473,440,878	473,461,702	1,791	1,791	17,481,856	17,485,438	
2064	9,777	485,288,468	485,298,245	841	841	17,919,094	17,920,776	
2065	4,278	497,426,423	497,430,701	368	368	18,366,918	18,367,654	
2066	1,724	509,864,745	509,866,469	148	148	18,825,768	18,826,064	
2067	606	522,612,525	522,613,131	52	52	19,296,034	19,296,138	
2068	179	535,678,280	535,678,459	15	15	19,778,071	19,778,101	



Single Discount Rate Development Projection of Contributions Ending December 31 for 2069 to 2118 (concluded)

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Employer Contributions Related to Payroll of Future Employees	Total Contributions
	(a)	(b)=max(0,(c)-(a))	(c)	(d)	(e)=(a)*ER%	(f) = (b)*netER%	(g)=(d)+(e)+(f)
2069	39	549,070,381	549,070,420	3	3	20,272,216	20,272,222
2070	5	562,797,176	562,797,181	0	0	20,778,783	20,778,783
2071	0	576,867,111	576,867,111	0	0	21,298,087	21,298,087
2072	0	591,288,789	591,288,789	0	0	21,830,443	21,830,443
2073	0	606,071,009	606,071,009	0	0	22,376,174	22,376,174
2074	0	621,222,784	621,222,784	0	0	22,935,603	22,935,603
2075	0	636,753,354	636,753,354	0	0	23,509,063	23,509,063
2076	0	652,672,188	652,672,188	0	0	24,096,894	24,096,894
2077	0	668,988,993	668,988,993	0	0	24,699,446	24,699,446
2078	0	685,713,718	685,713,718	0	0	25,317,076	25,317,076
2079	0	702,856,561	702,856,561	0	0	25,950,153	25,950,153
2080	0	720,427,975	720,427,975	0	0	26,599,053	26,599,053
2081	0	738,438,674	738,438,674	0	0	27,264,166	27,264,166
2082	0	756,899,641	756,899,641	0	0	27,945,893	27,945,893
2083	0	775,822,132	775,822,132	0	0	28,644,644	28,644,644
2084	0	795,217,685	795,217,685	0	0	29,360,845	29,360,845
2085	0	815,098,127	815,098,127	0	0	30,094,929	30,094,929
2086	0	835,475,580	835,475,580	0	0	30,847,344	30,847,344
2087	0	856,362,470	856,362,470	0	0	31,618,550	31,618,550
2088	0	877,771,532	877,771,532	0	0	32,409,019	32,409,019
2089	0	899,715,820	899,715,820	0	0	33,219,234	33,219,234
2090	0	922,208,716	922,208,716	0	0	34,049,693	34,049,693
2091	0	945,263,934	945,263,934	0	0	34,900,904	34,900,904
2092	0	968,895,532	968,895,532	0	0	35,773,390	35,773,390
2093	0	993,117,920	993,117,920	0	0	36,667,685	36,667,685
2094	0	1,017,945,868	1,017,945,868	0	0	37,584,336	37,584,336
2095	0	1,043,394,515	1,043,394,515	0	0	38,523,904	38,523,904
2096	0	1,069,479,378	1,069,479,378	0	0	39,486,965	39,486,965
2097	0	1,096,216,362	1,096,216,362	0	0	40,474,107	40,474,107
2098	0	1,123,621,771	1,123,621,771	0	0	41,485,933	41,485,933
2099	0	1,151,712,315	1,151,712,315	0	0	42,523,059	42,523,059
2100	0	1,180,505,123	1,180,505,123	0	0	43,586,120	43,586,120
2101	0	1,210,017,751	1,210,017,751	0	0	44,675,762	44,675,762
2102	0	1,240,268,195	1,240,268,195	0	0	45,792,651	45,792,651
2103	0	1,271,274,900	1,271,274,900	0	0	46,937,467	46,937,467
2104	0	1,303,056,773	1,303,056,773	0	0	48,110,907	48,110,907
2105	0	1,335,633,192	1,335,633,192	0	0	49,313,686	49,313,686
2106	0	1,369,024,022	1,369,024,022	0	0	50,546,537	50,546,537
2107	0	1,403,249,623	1,403,249,623	0	0	51,810,211	51,810,211
2108	0	1,438,330,864	1,438,330,864	0	0	53,105,477	53,105,477
2109	0	1,474,289,136	1,474,289,136	0	0	54,433,126	54,433,126
2110	0	1,511,146,364	1,511,146,364	0	0	55,793,964	55,793,964
2111	0	1,548,925,023	1,548,925,023	0	0	57,188,823	57,188,823
2112	0	1,587,648,149	1,587,648,149	0	0	58,618,553	58,618,553
2113	0	1,627,339,353	1,627,339,353	0	0	60,084,024	60,084,024
2114	0	1,668,022,837	1,668,022,837	0	0	61,586,130	61,586,130
2115	0	1,709,723,408	1,709,723,408	0	0	63,125,787	63,125,787
2116	0	1,752,466,493	1,752,466,493	0	0	64,703,934	64,703,934
2117	0	1,796,278,155	1,796,278,155	0	0	66,321,534	66,321,534
2118	0	1,841,185,109	1,841,185,109	0	0	67,979,572	67,979,572
2119	0	1,887,214,737	1,887,214,737	0	0	69,679,061	69,679,061



Single Discount Rate Development

Projection of Plan Net Position

Ending December 31 for 2019 to 2068

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.000%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2019	\$ 599,051,838	\$ 28,942,530	\$ 37,276,954	\$ 623,912	\$ 110,793,173	\$ 700,886,675
2020	700,886,675	25,293,939	40,549,719	687,714	48,513,483	733,456,665
2021	733,456,665	24,256,506	42,396,326	704,907	50,693,556	765,305,494
2022	765,305,494	23,370,845	44,411,596	722,530	52,822,553	796,364,766
2023	796,364,766	22,590,893	46,660,896	740,593	54,891,850	826,446,019
2024	826,446,019	21,870,953	49,022,475	759,108	56,890,871	855,426,259
2025	855,426,259	21,188,518	51,466,612	778,085	58,811,256	883,181,336
2026	883,181,336	20,518,454	54,008,042	797,538	60,642,941	909,537,151
2027	909,537,151	19,851,863	56,637,067	817,476	62,373,766	934,308,237
2028	934,308,237	19,186,674	59,528,183	837,913	63,984,673	957,113,488
2029	957,113,488	18,518,305	62,425,600	858,861	65,457,628	977,804,959
2030	977,804,959	17,874,925	65,401,525	880,332	66,780,759	996,178,787
2031	996,178,787	17,264,014	68,306,074	902,341	67,945,210	1,012,179,595
2032	1,012,179,595	16,674,331	71,195,174	924,899	68,944,792	1,025,678,645
2033	1,025,678,645	16,112,932	74,049,518	948,021	69,771,401	1,036,565,439
2034	1,036,565,439	15,576,394	76,840,780	971,722	70,418,158	1,044,747,489
2035	1,044,747,489	15,060,240	79,578,858	996,015	70,878,094	1,050,110,950
2036	1,050,110,950	14,565,020	82,288,115	1,020,915	71,142,420	1,052,509,360
2037	1,052,509,360	14,103,693	84,875,861	1,046,438	71,204,517	1,051,895,271
2038	1,051,895,271	13,676,499	87,278,357	1,072,599	71,063,267	1,048,284,081
2039	1,048,284,081	13,302,152	89,503,118	1,099,414	70,720,131	1,041,703,833
2040	1,041,703,833	13,005,993	91,400,866	1,126,900	70,183,080	1,032,365,140
2041	1,032,365,140	12,782,840	92,899,569	1,155,072	69,469,156	1,020,562,495
2042	1,020,562,495	12,624,134	94,130,544	1,183,949	68,594,161	1,006,466,297
2043	1,006,466,297	12,524,893	94,933,723	1,213,548	67,575,358	990,419,277
2044	990,419,277	12,479,031	95,401,297	1,243,886	66,433,357	972,686,481
2045	972,686,481	12,483,805	95,582,315	1,274,984	65,184,927	953,497,913
2046	953,497,913	12,533,690	95,505,464	1,306,858	63,844,991	933,064,272
2047	933,064,272	12,623,603	95,118,103	1,339,530	62,429,934	911,660,176
2048	911,660,176	12,753,278	94,457,918	1,373,018	60,957,673	889,540,191
2049	889,540,191	12,917,909	93,511,861	1,407,343	59,446,309	866,985,205
2050	866,985,205	13,112,724	92,251,787	1,442,527	57,916,310	844,319,925
2051	844,319,925	13,334,536	90,717,266	1,478,590	56,388,931	821,847,537
2052	821,847,537	13,581,259	88,975,454	1,515,555	54,883,014	799,820,800
2053	799,820,800	13,851,234	87,051,083	1,553,444	53,415,341	778,482,849
2054	778,482,849	14,142,039	84,959,907	1,592,280	52,002,308	758,075,009
2055	758,075,009	14,452,913	82,675,139	1,632,087	50,661,700	738,882,396
2056	738,882,396	14,782,305	80,248,477	1,672,889	49,411,644	721,154,979
2057	721,154,979	15,127,892	77,708,197	1,714,711	48,268,583	705,128,546
2058	705,128,546	15,488,300	75,060,191	1,757,579	47,248,771	691,047,848
2059	691,047,848	15,862,419	72,336,921	1,801,518	46,368,186	679,140,013
2060	679,140,013	16,249,815	69,558,743	1,846,556	45,642,009	669,626,537
2061	669,626,537	16,649,774	66,750,088	1,892,720	45,084,879	662,718,383
2062	662,718,383	17,061,709	63,926,383	1,940,038	44,711,012	658,624,683
2063	658,624,683	17,485,438	61,097,457	1,988,539	44,534,702	657,558,827
2064	657,558,827	17,920,776	58,271,342	2,038,253	44,570,602	659,740,610
2065	659,740,610	18,367,654	55,455,225	2,089,209	44,833,846	665,397,676
2066	665,397,676	18,826,064	52,655,603	2,141,439	45,340,146	674,766,845
2067	674,766,845	19,296,138	49,878,173	2,194,975	46,105,886	688,095,722
2068	688,095,722	19,778,101	47,128,199	2,249,850	47,148,224	705,643,998



Single Discount Rate Development Projection of Plan Net Position Ending December 31 for 2069 to 2118 (concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.000%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2069	742,785,834	20,272,222	44,346,245	2,306,096	51,087,320	767,493,036
2070	767,493,036	20,778,783	41,671,131	2,363,748	52,924,316	797,161,256
2071	797,161,256	21,298,087	39,039,473	2,422,842	55,107,476	832,104,504
2072	832,104,504	21,830,443	36,456,550	2,483,413	57,658,610	872,653,594
2073	872,653,594	22,376,174	33,927,683	2,545,498	60,600,701	919,157,288
2074	919,157,288	22,935,603	31,458,450	2,609,136	63,957,980	971,983,285
2075	971,983,285	23,509,063	29,054,604	2,674,364	67,755,999	1,031,519,379
2076	1,031,519,379	24,096,894	26,722,020	2,741,223	72,021,711	1,098,174,741
2077	1,098,174,741	24,699,446	24,466,681	2,809,754	76,783,563	1,172,381,315
2078	1,172,381,315	25,317,076	22,294,566	2,879,998	82,071,596	1,254,595,422
2079	1,254,595,422	25,950,153	20,211,702	2,951,998	87,917,556	1,345,299,432
2080	1,345,299,432	26,599,053	18,224,049	3,025,797	94,355,016	1,445,003,655
2081	1,445,003,655	27,264,166	16,337,211	3,101,442	101,419,516	1,554,248,685
2082	1,554,248,685	27,945,893	14,556,191	3,178,978	109,148,739	1,673,608,148
2083	1,673,608,148	28,644,644	12,885,213	3,258,453	117,582,705	1,803,691,830
2084	1,803,691,830	29,360,845	11,327,592	3,339,914	126,763,997	1,945,149,167
2085	1,945,149,167	30,094,929	9,885,654	3,423,412	136,738,010	2,098,673,040
2086	2,098,673,040	30,847,344	8,560,698	3,508,997	147,553,215	2,265,003,905
2087	2,265,003,905	31,618,550	7,352,950	3,596,722	159,261,449	2,444,934,232
2088	2,444,934,232	32,409,019	6,261,425	3,686,640	171,918,234	2,639,313,420
2089	2,639,313,420	33,219,234	5,283,784	3,778,806	185,583,122	2,849,053,186
2090	2,849,053,186	34,049,693	4,416,318	3,873,277	200,320,078	3,075,133,362
2091	3,075,133,362	34,900,904	3,654,152	3,970,109	216,197,871	3,318,607,875
2092	3,318,607,875	35,773,390	2,991,463	4,069,361	233,290,494	3,580,610,936
2093	3,580,610,936	36,667,685	2,421,563	4,171,095	251,677,588	3,862,363,551
2094	3,862,363,551	37,584,336	1,937,092	4,275,373	271,444,893	4,165,180,315
2095	4,165,180,315	38,523,904	1,530,267	4,382,257	292,684,716	4,490,476,410
2096	4,490,476,410	39,486,965	1,193,046	4,491,813	315,496,413	4,839,774,929
2097	4,839,774,929	40,474,107	917,371	4,604,109	339,986,897	5,214,714,452
2098	5,214,714,452	41,485,933	695,287	4,719,211	366,271,159	5,617,057,046
2099	5,617,057,046	42,523,059	519,073	4,837,192	394,472,830	6,048,696,670
2100	6,048,696,670	43,586,120	381,480	4,958,122	424,724,755	6,511,667,943
2101	6,511,667,943	44,675,762	275,850	5,082,075	457,169,606	7,008,155,385
2102	7,008,155,385	45,792,651	196,165	5,209,126	491,960,527	7,540,503,273
2103	7,540,503,273	46,937,467	137,143	5,339,355	529,261,820	8,111,226,061
2104	8,111,226,061	48,110,907	94,239	5,472,838	569,249,674	8,723,019,565
2105	8,723,019,565	49,313,686	63,654	5,609,659	612,112,949	9,378,772,887
2106	9,378,772,887	50,546,537	42,273	5,749,901	658,054,012	10,081,581,262
2107	10,081,581,262	51,810,211	27,611	5,893,648	707,289,637	10,834,759,852
2108	10,834,759,852	53,105,477	17,755	6,040,990	760,051,976	11,641,858,559
2109	11,641,858,559	54,433,126	11,254	6,192,014	816,589,594	12,506,678,012
2110	12,506,678,012	55,793,964	7,040	6,346,815	877,168,598	13,433,286,719
2111	13,433,286,719	57,188,823	4,346	6,505,485	942,073,835	14,426,039,545
2112	14,426,039,545	58,618,553	2,646	6,668,122	1,011,610,190	15,489,597,520
2113	15,489,597,520	60,084,024	1,589	6,834,825	1,086,103,972	16,628,949,103
2114	16,628,949,103	61,586,130	937	7,005,696	1,165,904,411	17,849,433,010
2115	17,849,433,010	63,125,787	540	7,180,838	1,251,385,248	19,156,762,668
2116	19,156,762,668	64,703,934	299	7,360,359	1,342,946,457	20,557,052,400
2117	20,557,052,400	66,321,534	161	7,544,368	1,441,016,070	22,056,845,474
2118	22,056,845,474	67,979,572	89	7,732,977	1,546,052,148	23,663,144,128



Single Discount Rate Development

Present Values of Projected Benefits

Ending December 31 for 2019 to 2068

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected 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 All Benefit Payments using Single Discount Rate (SDR)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^a ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=((c)/(1+SDR) ^a (a-.5)
2019	\$ 599,051,838	\$ 37,276,954	\$ 37,276,954	\$ 0	\$ 36,036,992	\$ 0	\$ 36,036,992
2020	700,886,675	40,549,719	40,549,719	0	36,636,348	0	36,636,348
2021	733,456,665	42,396,326	42,396,326	0	35,798,825	0	35,798,825
2022	765,305,494	44,411,596	44,411,596	0	35,047,186	0	35,047,186
2023	796,364,766	46,660,896	46,660,896	0	34,413,280	0	34,413,280
2024	826,446,019	49,022,475	49,022,475	0	33,789,710	0	33,789,710
2025	855,426,259	51,466,612	51,466,612	0	33,153,626	0	33,153,626
2026	883,181,336	54,008,042	54,008,042	0	32,514,726	0	32,514,726
2027	909,537,151	56,637,067	56,637,067	0	31,866,814	0	31,866,814
2028	934,308,237	59,528,183	59,528,183	0	31,302,335	0	31,302,335
2029	957,113,488	62,425,600	62,425,600	0	30,678,425	0	30,678,425
2030	977,804,959	65,401,525	65,401,525	0	30,038,237	0	30,038,237
2031	996,178,787	68,306,074	68,306,074	0	29,319,874	0	29,319,874
2032	1,012,179,595	71,195,174	71,195,174	0	28,560,747	0	28,560,747
2033	1,025,678,645	74,049,518	74,049,518	0	27,762,429	0	27,762,429
2034	1,036,565,439	76,840,780	76,840,780	0	26,924,225	0	26,924,225
2035	1,044,747,489	79,578,858	79,578,858	0	26,059,457	0	26,059,457
2036	1,050,110,950	82,288,115	82,288,115	0	25,183,785	0	25,183,785
2037	1,052,509,360	84,875,861	84,875,861	0	24,276,401	0	24,276,401
2038	1,051,895,271	87,278,357	87,278,357	0	23,330,438	0	23,330,438
2039	1,048,284,081	89,503,118	89,503,118	0	22,359,944	0	22,359,944
2040	1,041,703,833	91,400,866	91,400,866	0	21,340,230	0	21,340,230
2041	1,032,365,140	92,899,569	92,899,569	0	20,271,165	0	20,271,165
2042	1,020,562,495	94,130,544	94,130,544	0	19,196,047	0	19,196,047
2043	1,006,466,297	94,933,723	94,933,723	0	18,093,307	0	18,093,307
2044	990,419,277	95,401,297	95,401,297	0	16,992,918	0	16,992,918
2045	972,686,481	95,582,315	95,582,315	0	15,911,365	0	15,911,365
2046	953,497,913	95,505,464	95,505,464	0	14,858,478	0	14,858,478
2047	933,064,272	95,118,103	95,118,103	0	13,830,106	0	13,830,106
2048	911,660,176	94,457,918	94,457,918	0	12,835,622	0	12,835,622
2049	889,540,191	93,511,861	93,511,861	0	11,875,762	0	11,875,762
2050	866,985,205	92,251,787	92,251,787	0	10,949,286	0	10,949,286
2051	844,319,925	90,717,266	90,717,266	0	10,062,761	0	10,062,761
2052	821,847,537	88,975,454	88,975,454	0	9,223,880	0	9,223,880
2053	799,820,800	87,051,083	87,051,083	0	8,434,005	0	8,434,005
2054	778,482,849	84,959,907	84,959,907	0	7,692,897	0	7,692,897
2055	758,075,009	82,675,139	82,675,139	0	6,996,278	0	6,996,278
2056	738,882,396	80,248,477	80,248,477	0	6,346,659	0	6,346,659
2057	721,154,979	77,708,197	77,708,197	0	5,743,695	0	5,743,695
2058	705,128,546	75,060,191	75,060,191	0	5,185,020	0	5,185,020
2059	691,047,848	72,336,921	72,336,921	0	4,670,002	0	4,670,002
2060	679,140,013	69,558,743	69,558,743	0	4,196,865	0	4,196,865
2061	669,626,537	66,750,088	66,750,088	0	3,763,928	0	3,763,928
2062	662,718,383	63,926,383	63,926,383	0	3,368,882	0	3,368,882
2063	658,624,683	61,097,457	61,097,457	0	3,009,158	0	3,009,158
2064	657,558,827	58,271,342	58,271,342	0	2,682,212	0	2,682,212
2065	659,740,610	55,455,225	55,455,225	0	2,385,596	0	2,385,596
2066	665,397,676	52,655,603	52,655,603	0	2,116,972	0	2,116,972
2067	674,766,845	49,878,173	49,878,173	0	1,874,120	0	1,874,120
2068	688,095,722	47,128,199	47,128,199	0	1,654,946	0	1,654,946



Single Discount Rate Development

Present Values of Projected Benefits

Ending December 31 for 2069 to 2118 (concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected 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 All Benefit Payments using Single Discount Rate (SDR)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ⁿ ((a)-.5)	(g)=(e)*vf ⁿ ((a)-.5)	(h)=((c)/(1+SDR)) ⁿ ((a)-.5)
2069	\$ 705,643,998	\$ 44,411,013	\$ 44,411,013	\$ 0	\$ 1,457,505	\$ 0	\$ 1,457,505
2070	727,684,274	41,731,992	41,731,992	0	1,279,984	0	1,279,984
2071	754,502,926	39,096,491	39,096,491	0	1,120,700	0	1,120,700
2072	786,401,112	36,509,795	36,509,795	0	978,087	0	978,087
2073	823,695,887	33,977,234	33,977,234	0	850,692	0	850,692
2074	866,721,285	31,504,395	31,504,395	0	737,177	0	737,177
2075	915,829,236	29,097,038	29,097,038	0	636,305	0	636,305
2076	971,390,653	26,761,048	26,761,048	0	546,935	0	546,935
2077	1,033,796,633	24,502,415	24,502,415	0	468,013	0	468,013
2078	1,103,459,776	22,327,127	22,327,127	0	398,564	0	398,564
2079	1,180,815,694	20,241,221	20,241,221	0	337,690	0	337,690
2080	1,266,324,587	18,250,665	18,250,665	0	284,562	0	284,562
2081	1,360,473,039	16,361,071	16,361,071	0	238,411	0	238,411
2082	1,463,776,244	14,577,451	14,577,451	0	198,523	0	198,523
2083	1,576,780,645	12,904,032	12,904,032	0	164,237	0	164,237
2084	1,700,066,936	11,344,136	11,344,136	0	134,938	0	134,938
2085	1,834,253,417	9,900,092	9,900,092	0	110,057	0	110,057
2086	1,979,999,653	8,573,201	8,573,201	0	89,071	0	89,071
2087	2,138,010,447	7,363,689	7,363,689	0	71,500	0	71,500
2088	2,309,040,124	6,270,570	6,270,570	0	56,903	0	56,903
2089	2,493,897,264	5,291,501	5,291,501	0	44,877	0	44,877
2090	2,693,449,917	4,422,768	4,422,768	0	35,055	0	35,055
2091	2,908,631,192	3,659,489	3,659,489	0	27,108	0	27,108
2092	3,140,445,034	2,995,832	2,995,832	0	20,740	0	20,740
2093	3,389,972,176	2,425,100	2,425,100	0	15,691	0	15,691
2094	3,658,376,420	1,939,922	1,939,922	0	11,730	0	11,730
2095	3,946,911,158	1,532,502	1,532,502	0	8,660	0	8,660
2096	4,256,926,100	1,194,789	1,194,789	0	6,310	0	6,310
2097	4,589,874,295	918,711	918,711	0	4,535	0	4,535
2098	4,947,319,388	696,303	696,303	0	3,212	0	3,212
2099	5,330,943,276	519,831	519,831	0	2,241	0	2,241
2100	5,742,554,153	382,037	382,037	0	1,539	0	1,539
2101	6,184,094,873	276,253	276,253	0	1,040	0	1,040
2102	6,657,651,784	196,451	196,451	0	691	0	691
2103	7,165,464,123	137,344	137,344	0	452	0	452
2104	7,709,933,963	94,377	94,377	0	290	0	290
2105	8,293,636,878	63,747	63,747	0	183	0	183
2106	8,919,333,316	42,335	42,335	0	114	0	114
2107	9,589,980,857	27,651	27,651	0	69	0	69
2108	10,308,747,377	17,781	17,781	0	42	0	42
2109	11,079,025,184	11,270	11,270	0	25	0	25
2110	11,904,446,283	7,051	7,051	0	14	0	14
2111	12,788,898,758	4,353	4,353	0	8	0	8
2112	13,736,544,421	2,650	2,650	0	5	0	5
2113	14,751,837,733	1,591	1,591	0	3	0	3
2114	15,839,546,128	939	939	0	1	0	1
2115	17,004,771,826	541	541	0	1	0	1
2116	18,252,975,200	300	300	0	0	0	0
2117	19,589,999,809	161	161	0	0	0	0
2118	21,022,099,202	89	89	0	0	0	0
Totals					\$ 910,960,457	\$ 0	\$ 910,960,457



SECTION H

GLOSSARY OF TERMS

Glossary of Terms

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

Amortization Method	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).
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	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.
Covered-Employee Payroll	The payroll of employees that are provided with pensions through the pension plan.
Deferred Inflows and Outflows	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.
Deferred Retirement Option Program (DROP)	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.

Glossary of Terms

Discount Rate	<p>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:</p> <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
Entry Age Actuarial Cost Method (EAN)	<p>The EAN is a cost 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.</p>
Fiduciary Net Position	<p>The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.</p>
GASB	<p>The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.</p>
Money-Weighted Rate of Return	<p>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.</p>
Multiple-Employer Defined Benefit Pension Plan	<p>A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.</p>
Municipal Bond Rate	<p>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.</p>
Net Pension Liability (NPL)	<p>The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.</p>

Glossary of Terms

Other Postemployment Benefits (OPEB)	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.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
Total Pension Expense	<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">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
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	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.