

Wyoming Retirement System Paid Firemen's Retirement Fund Plan A

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





March 29, 2020

Board of Trustees
Wyoming Paid Firemen's Retirement Fund Plan A

Dear Board Members:

This report provides information required by the Wyoming Paid Firemen's Retirement Fund Plan A (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 Paid Firemen's Retirement Fund Plan A 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, 2018 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 Paid Firemen's Retirement Fund Plan A. 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.

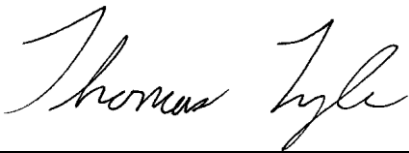
Paul T. Wood and Thomas A. Lyle are members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Gabriel, Roeder, Smith & Company



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



By _____
Thomas A Lyle, ASA, EA, MAAA



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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	276	
- Inactive, Nonretired Members	1	
- Active Members	1	
- Total	278	
Covered Payroll	\$	65,621
Net Pension Liability		
Total Pension Liability	\$	358,534,824
Plan Fiduciary Net Position	97,959,431	
Net Pension Liability	\$	260,575,393
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	27.32 %	
Net Pension Liability as a Percentage of Covered Payroll	397,094.13 %	
Development of the Single Discount Rate		
Single Discount Rate	3.09 %	
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	2029	
Total Pension Expense	\$	45,257,941
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	\$ 0	\$ 0
Changes in assumptions	0	0
Net difference between projected and actual earnings on pension plan investments	6,891,842	11,625,858
Total	\$ 6,891,842	\$ 11,625,858

*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

Assuming the suspension of contributions to the Fund, investments are the only funding source for this plan.

This funding policy results in the expectation that the plan's assets will not be able to fully pay for the promised benefits through at least 2117 and, therefore, results in an expected crossover date in 2027 and a GASB single discount rate of 3.09%. 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 decreased from 4.01% to 3.09% 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 4.01%.

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 Paid Firemen's Retirement Fund Plan A. 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	\$	40,886	
2. Interest on the Total Pension Liability		10,996,219	
3. Current-Period Benefit Changes		0	
4. Employee Contributions (made negative for addition here)		0	
5. Projected Earnings on Plan Investments (made negative for addition here)		(6,248,572)	
6. Pension Plan Administrative Expense		87,238	
7. Other Changes in Plan Fiduciary Net Position		4,405	
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		39,369,926	*
9. Recognition of Outflow (Inflow) of Resources due to Assets		1,007,839	
10. Total Pension Expense	\$	45,257,941	**

* Includes change in the blended single discount rate from 4.01% to 3.09%

** 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	\$ (3,107,578)
2. Assumption Changes (gains) or losses	\$ 42,477,504
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	1.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$ (3,107,578)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for assumption changes	\$ 42,477,504
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 39,369,926
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	\$ 0
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for assumption changes	\$ 0
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$ 0

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (10,674,946)
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	\$ (2,134,989)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (8,539,957)



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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Deferred Net (Inflows)/Outflows at Measurement Date
	2014	2015	2016	2017	2018	2019	Total	
Total	\$ -	\$ (2,479,196)	\$ (1,825,288)	\$ 1,188,594	\$ (1,673,790)	\$ (3,107,578)		
2014	-	-	-	-	-	-	-	-
2015	-	(2,479,196)	-	-	-	-	(2,479,196)	
2016	-	-	(1,825,288)	-	-	-	(1,825,288)	
2017	-	-	-	1,188,594	-	-	1,188,594	
2018	-	-	-	-	(1,673,790)	-	(1,673,790)	
2019	-	-	-	-	-	(3,107,578)	(3,107,578)	
2020	-	-	-	-	-	-	-	\$ -
2021	-	-	-	-	-	-	-	
2022	-	-	-	-	-	-	-	
2023	-	-	-	-	-	-	-	
2024	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	
	\$ -	\$ (2,479,196)	\$ (1,825,288)	\$ 1,188,594	\$ (1,673,790)	\$ (3,107,578)	\$ (7,897,258)	

Assumption changes - Net (inflows)/outflows of resources

Recognition Period	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
	2014	2015	2016	2017	2018	2019	Total	
Total	\$ 99,327,064	\$ 9,056,601	\$ (5,166,271)	\$ 41,599,453	\$ (11,600,861)	\$ 42,477,504		
2014	99,327,064	-	-	-	-	-	99,327,064	
2015	-	9,056,601	-	-	-	-	9,056,601	
2016	-	-	(5,166,271)	-	-	-	(5,166,271)	
2017	-	-	-	41,599,453	-	-	41,599,453	
2018	-	-	-	-	(11,600,861)	-	(11,600,861)	
2019	-	-	-	-	-	42,477,504	42,477,504	
2020	-	-	-	-	-	-	-	\$ -
2021	-	-	-	-	-	-	-	
2022	-	-	-	-	-	-	-	
2023	-	-	-	-	-	-	-	
2024	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	
	\$ 99,327,064	\$ 9,056,601	\$ (5,166,271)	\$ 41,599,453	\$ (11,600,861)	\$ 42,477,504	\$ 175,693,490	

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	\$ 3,803,304	\$ 11,373,619	\$ 853,305	\$ (7,714,751)	\$ 11,201,969	\$ (10,674,946)		
2014	760,661	-	-	-	-	-	760,661	
2015	760,661	2,274,724	-	-	-	-	3,035,385	
2016	760,661	2,274,724	170,661	-	-	-	3,206,046	
2017	760,661	2,274,724	170,661	(1,542,950)	-	-	1,663,096	
2018	760,660	2,274,724	170,661	(1,542,950)	2,240,394	-	3,903,489	
2019	-	2,274,723	170,661	(1,542,950)	2,240,394	(2,134,989)	1,007,839	
2020	-	-	170,661	(1,542,950)	2,240,394	(2,134,989)	(1,266,884)	\$ (4,734,016)
2021	-	-	-	(1,542,951)	2,240,394	(2,134,989)	(1,437,546)	
2022	-	-	-	-	2,240,393	(2,134,989)	105,404	
2023	-	-	-	-	-	(2,134,990)	(2,134,990)	
2024	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	
	\$ 3,803,304	\$ 11,373,619	\$ 853,305	\$ (7,714,751)	\$ 11,201,969	\$ (10,674,946)	\$ 8,842,500	

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

	2014	2015	2016	2017	2018	2019	Total	
Total	\$ 103,130,368	\$ 17,951,024	\$ (6,138,254)	\$ 35,073,296	\$ (2,072,682)	\$ 28,694,980		
2014	100,087,725	-	-	-	-	-	100,087,725	
2015	760,661	8,852,129	-	-	-	-	9,612,790	
2016	760,661	2,274,724	(6,820,898)	-	-	-	(3,785,513)	
2017	760,661	2,274,724	170,661	41,245,097	-	-	44,451,143	
2018	760,660	2,274,724	170,661	(1,542,950)	(11,034,257)	-	(9,371,162)	
2019	-	2,274,723	170,661	(1,542,950)	2,240,394	37,234,937	40,377,765	
2020	-	-	170,661	(1,542,950)	2,240,394	(2,134,989)	(1,266,884)	\$ (4,734,016)
2021	-	-	-	(1,542,951)	2,240,394	(2,134,989)	(1,437,546)	
2022	-	-	-	-	2,240,393	(2,134,989)	105,404	
2023	-	-	-	-	-	(2,134,990)	(2,134,990)	
2024	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	
	\$ 103,130,368	\$ 17,951,024	\$ (6,138,254)	\$ 35,073,296	\$ (2,072,682)	\$ 28,694,980	\$ 176,638,732	



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	\$ 42,477,504	\$ 3,107,578	\$ 39,369,926
2. Due to Assets	4,685,778	3,677,939	1,007,839
3. Total	\$ 47,163,282	\$ 6,785,517	\$ 40,377,765

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	\$ 0	\$ 3,107,578	\$ (3,107,578)
2. Assumption Changes	42,477,504	0	42,477,504
3. Net Difference between projected and actual earnings on pension plan investments	4,685,778	3,677,939	1,007,839
4. Total	\$ 47,163,282	\$ 6,785,517	\$ 40,377,765

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	\$ 0	\$ 0	\$ 0
2. Assumption Changes	0	0	0
3. Net Difference between projected and actual earnings on pension plan investments	6,891,842	11,625,858	(4,734,016)
4. Total	\$ 6,891,842	\$ 11,625,858	\$ (4,734,016)

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	\$ (1,266,884)
2021	(1,437,546)
2022	105,404
2023	(2,134,990)
2024	0
Thereafter	0
Total	\$ (4,734,016)



Statement of Fiduciary Net Position as of December 31, 2019

	2019
Assets	
Cash and Deposits	\$ 3,600,771
Receivables	
Accounts Receivable - Sale of Investments	\$ 355,825
Accrued Interest and Other Dividends	216,755
Contributions	-
Accounts Receivable - Other	2,211,123
Total Receivables	\$ 2,783,703
Investments	
Fixed Income	\$ 16,589,393
Equities	45,705,932
Private Markets	15,826,304
Marketable Alternatives	16,407,190
Other	4,488,313
Total Investments	\$ 99,017,132
Total Assets	\$ 105,401,606
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ 7,109,955
Accrued Expenses	332,220
Accounts Payable - Other	0
Total Liabilities	\$ 7,442,175
Net Position Restricted for Pensions	\$ 97,959,431

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

	2019
Additions	
Contributions	
Employer	\$ 0
Employee	0
Other	0
Total Contributions	\$ 0
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 16,062,400
Interest and Dividends	1,627,996
Less Investment Expense	(766,878)
Net Investment Income	\$ 16,923,518
Other	\$ 0
Total Additions	\$ 16,923,518
 Deductions	
Benefit Payments, including Refunds of Employee Contributions	\$ 16,093,422
Pension Plan Administrative Expense	87,238
Other	4,405
Total Deductions	\$ 16,185,065
Net Increase in Net Position	\$ 738,453
 Net Position Restricted for Pensions	
Beginning of Year	\$ 97,220,978
End of Year	\$ 97,959,431

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Paid Firemen's Retirement Fund Plan A. 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	\$ 40,886
2. Interest on the total pension liability	10,996,219
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the total pension liability	(3,107,578)
5. Changes of assumptions	42,477,504
6. Benefit payments, including refunds of employee contributions	(16,093,422)
7. Net change in total pension liability	34,313,609
8. Total pension liability – beginning	324,221,215
9. Total pension liability – ending	\$ 358,534,824
B. Plan fiduciary net position	
1. Contributions – employer	\$ 0
2. Contributions – employee	0
3. Net investment income	16,923,518
4. Benefit payments, including refunds of employee contributions	(16,093,422)
5. Pension plan administrative expense	(87,238)
6. Other	(4,405)
7. Net change in plan fiduciary net position	738,453
8. Plan fiduciary net position – beginning	97,220,978
9. Plan fiduciary net position – ending	\$ 97,959,431
C. Net pension liability	\$ 260,575,393
D. Plan fiduciary net position as a percentage of the total pension liability	27.32 %
E. Covered-employee payroll	\$ 65,621
F. Net pension liability as a percentage of covered-employee payroll	397,094.13 %



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	\$ 40,886	\$ 61,278	\$ 122,812	\$ 147,314	\$ 162,541	\$ 188,951
Interest on the total pension liability	10,996,219	12,801,237	12,582,433	12,906,407	12,910,372	13,337,846
Changes of benefit terms	0	0	0	0	0	0
Difference between expected and actual experience	(3,107,578)	(1,673,790)	1,188,594	(1,825,288)	(2,479,196)	0
Changes of assumptions	42,477,504	(11,600,861)	41,599,453	(5,166,271)	9,056,601	99,327,064
Benefit payments, including refunds of employee contributions	(16,093,422)	(15,788,064)	(15,410,878)	(15,075,912)	(14,824,715)	(14,581,980)
Net change in total pension liability	34,313,609	(16,200,200)	40,082,414	(9,013,750)	4,825,603	98,271,881
Total pension liability - beginning	324,221,215	340,421,415	300,339,001	309,352,751	304,527,148	206,255,267
Total pension liability - ending (a)	\$ 358,534,824	\$ 324,221,215	\$ 340,421,415	\$ 300,339,001	\$ 309,352,751	\$ 304,527,148
Plan fiduciary net position						
Employer contributions	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Employee contributions	0	0	0	0	0	0
Pension plan net investment income	16,923,518	(3,580,279)	15,351,989	8,160,117	(1,107,007)	7,064,066
Benefit payments, including refunds of employee contributions	(16,093,422)	(15,788,064)	(15,410,878)	(15,075,912)	(14,824,715)	(14,581,980)
Pension plan administrative expense	(87,238)	(98,669)	(108,773)	(110,274)	(102,903)	(113,705)
Other	(4,405)	(4,562)	(6,020)	(6,019)	(6,559)	(1,701)
Net change in plan fiduciary net position	738,453	(19,471,574)	(173,682)	(7,032,088)	(16,041,184)	(7,633,320)
Plan fiduciary net position - beginning	97,220,978	116,692,552	116,866,234	123,898,322	139,939,506	147,572,826
Plan fiduciary net position - ending (b)	\$ 97,959,431	\$ 97,220,978	\$ 116,692,552	\$ 116,866,234	\$ 123,898,322	\$ 139,939,506
Net pension liability - ending (a) - (b)	\$ 260,575,393	\$ 227,000,237	\$ 223,728,863	\$ 183,472,767	\$ 185,454,429	\$ 164,587,642
Plan fiduciary net position as a percentage of total pension liability	27.32 %	29.99 %	34.28 %	38.91 %	40.05 %	45.95 %
Covered-employee payroll	\$ 65,621	\$ 134,155	\$ 195,221	\$ 195,221	\$ 179,486	\$ 198,404
Projected Valuation Payroll	\$ 65,621	\$ 134,155	\$ 195,221	\$ 195,221	\$ 179,486	\$ 198,404
Net pension liability as a percentage of covered-employee payroll	397,094.13 %	169,207.64 %	114,602.87 %	93,982.30 %	103,325.47 %	82,955.64 %

Notes to Schedule:

For 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	\$ 304,527,148	\$ 139,939,506	\$ 164,587,642	45.95 %	\$ 198,404	82,955.64 %
2015	309,352,751	123,898,322	185,454,429	40.05 %	179,486	103,325.47 %
2016	300,339,001	116,866,234	183,472,767	38.91 %	195,221	93,982.30 %
2017	340,421,415	116,692,552	223,728,863	34.28 %	195,221	114,602.87 %
2018	324,221,215	97,220,978	227,000,237	29.99 %	134,155	169,207.64 %
2019	358,534,824	97,959,431	260,575,393	27.32 %	65,621	397,094.13 %

* Covered payroll is the total of first class firefighter salaries in force as of the valuation date and may differ 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	\$ 9,458,093	\$ 0	\$ 9,458,093	\$ 198,404	0.00 %
2015	9,714,697	0	9,714,697	179,486	0.00 %
2016	10,663,740	0	10,663,740	195,221	0.00 %
2017	11,734,389	0	11,734,389	195,221	0.00 %
2018	15,597,369	0	15,597,369	134,155	0.00 %
2019	16,974,397	0	16,974,397	65,621	0.00 %

* Covered payroll is the total of first class firefighter salaries in force as of the valuation date and may differ 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 Dollar, Open
Remaining Amortization Period	10 years
Asset Valuation Method	5-Year smoothed market
Inflation	2.25%
Salary Increases	4.50% including inflation
Cost-of-Living Increase	3.00%
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 MP-2017 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 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 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 Paid Firemen's Retirement Fund Plan A. 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 3.09% 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 no future contributions. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments through the year 2029. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year 2029, 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 3.09%, 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

	Current Single Discount	
1% Decrease	Rate Assumption	1% Increase
2.09%	3.09%	4.09%
\$ 315,783,695	\$ 260,575,393	\$ 216,318,321

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	276
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	1
Active Plan Members	<u>1</u>
Total Plan Members	278

SECTION E

SUMMARY OF BENEFITS

Summary of Benefits

Covered Members	Any person who is a member of Wyoming Paid Firemen's Retirement Fund Plan A. This plan only covers members hired prior to July 1, 1981.
Fireman First Class	The highest salary grade which a fireman can obtain within his department without any promotion in rank. The term specifically excludes chiefs, officers, engineers, fire equipment operators, secretaries, mechanics, inspectors and all other specialized grades, ratings and ranks.
Form of Payment	Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary.
Service Retirement	
Eligibility	20 or more years of service.
Monthly Benefit	75.0% of the maximum salary for a fireman first class for 20 years of service plus 1.5% of the maximum salary for a fireman first class for each year of service in excess of 20 years.
Vesting	Any employee who has left the service with at least 10 years of service can elect to receive a lump-sum refund of 99.5% of contributions. An employee who terminates with less than ten years of service is only eligible for the lump-sum benefit.
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. 15-5-204.
Monthly Benefit	75.0% of the maximum salary for a fireman first class for 20 years of service plus 1.5% of the maximum salary for a fireman first class for each year of service in excess of 20 years.

Pre-retirement Death Benefit

Eligibility	No age or service requirements.
Monthly Benefit	75.0% of the maximum salary for a fireman first class for 20 years of service plus 1.5% of the maximum salary for a fireman first class for each year of service in excess of 20 years.

Contributions

Employee	None
Employer	None
Interest	None

Cost-of-Living Improvements

3.0% per year, applied annually following the one-year anniversary of retirement. In the event the most current actuarial valuation indicates the market value of assets is greater than 115% of the actuarial value of liabilities, the Board may elect to grant up to a 5.0% increase if the System’s actuary determines such an increase to be actuarially sound.

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 an 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 actuarial accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability and amortizing the result over 10 years from the valuation date.



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

4.50% per year

c. Payroll growth rate

In the amortization of the unfunded actuarial accrued liability, payroll is not assumed to increase. The assumed payroll growth in a closed plan is 0%.

5. Demographic Assumptions

a. Mortality

Healthy Pre-Retirement Mortality:

RP-2014 Mortality Table for Healthy Employees 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%

Healthy Post-Retirement Mortality:

RP-2014 Mortality Table for Healthy Annuitants 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 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%

b. Disability and Withdrawal

Age	Disability		Withdrawal	
	Male	Female	Ultimate	
			Male	Female
20	0.03%	0.03%	12.00%	12.00%
25	0.03%	0.03%	8.00%	8.00%
30	0.03%	0.03%	5.00%	5.00%
35	0.19%	0.19%	3.00%	3.00%
40	0.42%	0.42%	1.00%	1.00%
45	0.65%	0.65%	1.00%	1.00%
50	0.82%	0.82%	1.00%	1.00%
55	1.81%	1.81%	0.50%	0.50%
60	2.00%	2.00%	0.50%	0.50%

c. Retirement Rates

Age	Rate	Age	Rate
50	20%	57	25%
51	25%	58	25%
52	25%	59	25%
53	25%	60	100%
54	25%	61	100%
55	25%	62	100%
56	25%		

6. Other Assumptions

- a. Percent married: 100.00% 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: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.
- 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 20 years after hire date.
- f. No benefit amount data is available for members entitled to deferred benefits. The present value of benefits expected to be paid to vested inactive non-retired members is approximated using the data provided.
- g. There will be no recoveries once disabled. We assume all members are totally disabled.
- h. No surviving spouse will remarry.
- i. Administrative expenses: Assumed to be the average of the prior two years, with each year projected at 2.5% to the valuation date.
- j. 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.
- k. Decrement timing: Decrements of all types are assumed to occur mid-year.
- l. 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.
- m. Decrement relativity: Decrement rates are converted to probabilities in order to account for multiple decrements.
- n. 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.
- o. 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 3.09%.

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	\$ 65,621	\$ 0	\$ 65,621	\$ 0	\$ 0	\$ 0	\$ 0
2020	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0
2043	0	0	0	0	0	0	0
2044	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0
2046	0	0	0	0	0	0	0
2047	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0
2049	0	0	0	0	0	0	0
2050	0	0	0	0	0	0	0
2051	0	0	0	0	0	0	0
2052	0	0	0	0	0	0	0
2053	0	0	0	0	0	0	0
2054	0	0	0	0	0	0	0
2055	0	0	0	0	0	0	0
2056	0	0	0	0	0	0	0
2057	0	0	0	0	0	0	0
2058	0	0	0	0	0	0	0
2059	0	0	0	0	0	0	0
2060	0	0	0	0	0	0	0
2061	0	0	0	0	0	0	0
2062	0	0	0	0	0	0	0
2063	0	0	0	0	0	0	0
2064	0	0	0	0	0	0	0
2065	0	0	0	0	0	0	0
2066	0	0	0	0	0	0	0
2067	0	0	0	0	0	0	0
2068	0	0	0	0	0	0	0



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	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2070	0	0	0	0	0	0	0
2071	0	0	0	0	0	0	0
2072	0	0	0	0	0	0	0
2073	0	0	0	0	0	0	0
2074	0	0	0	0	0	0	0
2075	0	0	0	0	0	0	0
2076	0	0	0	0	0	0	0
2077	0	0	0	0	0	0	0
2078	0	0	0	0	0	0	0
2079	0	0	0	0	0	0	0
2080	0	0	0	0	0	0	0
2081	0	0	0	0	0	0	0
2082	0	0	0	0	0	0	0
2083	0	0	0	0	0	0	0
2084	0	0	0	0	0	0	0
2085	0	0	0	0	0	0	0
2086	0	0	0	0	0	0	0
2087	0	0	0	0	0	0	0
2088	0	0	0	0	0	0	0
2089	0	0	0	0	0	0	0
2090	0	0	0	0	0	0	0
2091	0	0	0	0	0	0	0
2092	0	0	0	0	0	0	0
2093	0	0	0	0	0	0	0
2094	0	0	0	0	0	0	0
2095	0	0	0	0	0	0	0
2096	0	0	0	0	0	0	0
2097	0	0	0	0	0	0	0
2098	0	0	0	0	0	0	0
2099	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0
2101	0	0	0	0	0	0	0
2102	0	0	0	0	0	0	0
2103	0	0	0	0	0	0	0
2104	0	0	0	0	0	0	0
2105	0	0	0	0	0	0	0
2106	0	0	0	0	0	0	0
2107	0	0	0	0	0	0	0
2108	0	0	0	0	0	0	0
2109	0	0	0	0	0	0	0
2110	0	0	0	0	0	0	0
2111	0	0	0	0	0	0	0
2112	0	0	0	0	0	0	0
2113	0	0	0	0	0	0	0
2114	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0
2116	0	0	0	0	0	0	0
2117	0	0	0	0	0	0	0
2118	0	0	0	0	0	0	0
2119	0	0	0	0	0	0	0



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 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2019	\$ 97,220,978	\$ 0	\$ 16,093,422	\$ 91,643	\$ 16,923,518	\$ 97,959,431
2020	97,959,431	0	16,481,016	113,200	6,286,186	87,651,400
2021	87,651,400	0	16,778,111	113,200	5,554,401	76,314,490
2022	76,314,490	0	17,044,396	113,200	4,751,655	63,908,549
2023	63,908,549	0	17,279,901	113,200	3,875,136	50,390,584
2024	50,390,584	0	17,484,978	113,200	2,921,822	35,714,228
2025	35,714,228	0	17,660,094	113,200	1,888,452	19,829,385
2026	19,829,385	0	17,805,730	113,200	771,502	2,681,957
2027	2,681,957	0	17,922,237	113,200	0	0
2028	0	0	18,009,704	113,200	0	0
2029	0	0	18,067,847	113,200	0	0
2030	0	0	18,095,952	113,200	0	0
2031	0	0	18,092,938	113,200	0	0
2032	0	0	18,057,365	113,200	0	0
2033	0	0	17,987,471	113,200	0	0
2034	0	0	17,881,260	113,200	0	0
2035	0	0	17,736,550	113,200	0	0
2036	0	0	17,551,142	113,200	0	0
2037	0	0	17,322,934	113,200	0	0
2038	0	0	17,049,890	113,200	0	0
2039	0	0	16,730,264	113,200	0	0
2040	0	0	16,362,781	113,200	0	0
2041	0	0	15,946,681	113,200	0	0
2042	0	0	15,481,829	113,200	0	0
2043	0	0	14,968,677	113,200	0	0
2044	0	0	14,408,185	113,200	0	0
2045	0	0	13,801,981	113,200	0	0
2046	0	0	13,152,809	113,200	0	0
2047	0	0	12,464,499	113,200	0	0
2048	0	0	11,742,009	113,200	0	0
2049	0	0	10,991,591	113,200	0	0
2050	0	0	10,220,568	113,200	0	0
2051	0	0	9,437,261	113,200	0	0
2052	0	0	8,650,755	113,200	0	0
2053	0	0	7,870,273	113,200	0	0
2054	0	0	7,104,878	113,200	0	0
2055	0	0	6,363,363	113,200	0	0
2056	0	0	5,654,135	113,200	0	0
2057	0	0	4,984,886	113,200	0	0
2058	0	0	4,362,199	113,200	0	0
2059	0	0	3,791,077	113,200	0	0
2060	0	0	3,274,735	113,200	0	0
2061	0	0	2,814,531	113,200	0	0
2062	0	0	2,410,080	113,200	0	0
2063	0	0	2,059,493	113,200	0	0
2064	0	0	1,759,573	113,200	0	0
2065	0	0	1,506,199	113,200	0	0
2066	0	0	1,294,514	113,200	0	0
2067	0	0	1,119,257	113,200	0	0
2068	0	0	975,171	113,200	0	0



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 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2069	\$ 0	\$ 0	\$ 857,187	\$ 113,200	\$ 0	\$ 0
2070	0	0	760,570	113,200	0	0
2071	0	0	680,891	113,200	0	0
2072	0	0	614,362	113,200	0	0
2073	0	0	557,764	113,200	0	0
2074	0	0	508,412	113,200	0	0
2075	0	0	464,202	113,200	0	0
2076	0	0	423,494	113,200	0	0
2077	0	0	385,124	113,200	0	0
2078	0	0	348,475	113,200	0	0
2079	0	0	313,058	113,200	0	0
2080	0	0	278,576	113,200	0	0
2081	0	0	244,977	113,200	0	0
2082	0	0	212,446	113,200	0	0
2083	0	0	181,474	113,200	0	0
2084	0	0	152,449	113,200	0	0
2085	0	0	125,749	113,200	0	0
2086	0	0	101,667	113,200	0	0
2087	0	0	80,510	113,200	0	0
2088	0	0	62,374	113,200	0	0
2089	0	0	47,200	113,200	0	0
2090	0	0	34,802	113,200	0	0
2091	0	0	25,006	113,200	0	0
2092	0	0	17,489	113,200	0	0
2093	0	0	11,891	113,200	0	0
2094	0	0	7,844	113,200	0	0
2095	0	0	5,019	113,200	0	0
2096	0	0	3,118	113,200	0	0
2097	0	0	1,883	113,200	0	0
2098	0	0	1,109	113,200	0	0
2099	0	0	634	113,200	0	0
2100	0	0	345	113,200	0	0
2101	0	0	197	113,200	0	0
2102	0	0	113	113,200	0	0
2103	0	0	59	113,200	0	0
2104	0	0	0	113,200	0	0
2105	0	0	0	113,200	0	0
2106	0	0	0	113,200	0	0
2107	0	0	0	113,200	0	0
2108	0	0	0	113,200	0	0
2109	0	0	0	113,200	0	0
2110	0	0	0	113,200	0	0
2111	0	0	0	113,200	0	0
2112	0	0	0	113,200	0	0
2113	0	0	0	113,200	0	0
2114	0	0	0	113,200	0	0
2115	0	0	0	113,200	0	0
2116	0	0	0	113,200	0	0
2117	0	0	0	113,200	0	0
2118	0	0	0	113,200	0	0



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)-.5}	(g)=(e)*vf ^{(a)-.5}	(h)=[(c)/(1+SDR)] ^{(a)-.5}
2019	\$ 97,220,978	\$ 16,093,422	\$ 16,093,422	\$ 0	\$ 15,558,098	\$ 0	\$ 15,850,237
2020	97,959,431	16,481,016	16,481,016	0	14,890,467	0	15,745,123
2021	87,651,400	16,778,111	16,778,111	0	14,167,187	0	15,548,191
2022	76,314,490	17,044,396	17,044,396	0	13,450,499	0	15,321,213
2023	63,908,549	17,279,901	17,279,901	0	12,744,249	0	15,067,025
2024	50,390,584	17,484,978	17,484,978	0	12,051,867	0	14,788,566
2025	35,714,228	17,660,094	17,660,094	0	11,376,233	0	14,488,677
2026	19,829,385	17,805,730	17,805,730	0	10,719,671	0	14,170,012
2027	2,681,957	17,922,237	2,774,237	15,147,999	1,560,923	12,028,451	13,834,942
2028	0	18,009,704	0	18,009,704	0	13,918,075	13,485,481
2029	0	18,067,847	0	18,067,847	0	13,589,303	13,123,238
2030	0	18,095,952	0	18,095,952	0	13,246,172	12,749,429
2031	0	18,092,938	0	18,092,938	0	12,889,504	12,364,972
2032	0	18,057,365	0	18,057,365	0	12,519,865	11,970,523
2033	0	17,987,471	0	17,987,471	0	12,137,621	11,566,543
2034	0	17,881,260	0	17,881,260	0	11,743,019	11,153,376
2035	0	17,736,550	0	17,736,550	0	11,336,238	10,731,294
2036	0	17,551,142	0	17,551,142	0	10,917,504	10,300,612
2037	0	17,322,934	0	17,322,934	0	10,487,152	9,861,746
2038	0	17,049,890	0	17,049,890	0	10,045,600	9,415,181
2039	0	16,730,264	0	16,730,264	0	9,593,460	8,961,580
2040	0	16,362,781	0	16,362,781	0	9,131,619	8,501,854
2041	0	15,946,681	0	15,946,681	0	8,661,221	8,037,141
2042	0	15,481,829	0	15,481,829	0	8,183,692	7,568,821
2043	0	14,968,677	0	14,968,677	0	7,700,671	7,098,460
2044	0	14,408,185	0	14,408,185	0	7,213,941	6,627,728
2045	0	13,801,981	0	13,801,981	0	6,725,474	6,158,452
2046	0	13,152,809	0	13,152,809	0	6,237,609	5,692,767
2047	0	12,464,499	0	12,464,499	0	5,752,977	5,233,045
2048	0	11,742,009	0	11,742,009	0	5,274,465	4,781,858
2049	0	10,991,591	0	10,991,591	0	4,805,236	4,341,998
2050	0	10,220,568	0	10,220,568	0	4,348,579	3,916,326
2051	0	9,437,261	0	9,437,261	0	3,907,837	3,507,716
2052	0	8,650,755	0	8,650,755	0	3,486,283	3,118,941
2053	0	7,870,273	0	7,870,273	0	3,086,858	2,752,439
2054	0	7,104,878	0	7,104,878	0	2,712,075	2,410,235
2055	0	6,363,363	0	6,363,363	0	2,364,013	2,093,939
2056	0	5,654,135	0	5,654,135	0	2,044,314	1,804,755
2057	0	4,984,886	0	4,984,886	0	1,754,102	1,543,413
2058	0	4,362,199	0	4,362,199	0	1,493,906	1,310,108
2059	0	3,791,077	0	3,791,077	0	1,263,568	1,104,432
2060	0	3,274,735	0	3,274,735	0	1,062,258	925,395
2061	0	2,814,531	0	2,814,531	0	888,543	771,493
2062	0	2,410,080	0	2,410,080	0	740,495	640,814
2063	0	2,059,493	0	2,059,493	0	615,841	531,172
2064	0	1,759,573	0	1,759,573	0	512,075	440,207
2065	0	1,506,199	0	1,506,199	0	426,606	365,516
2066	0	1,294,514	0	1,294,514	0	356,837	304,724
2067	0	1,119,257	0	1,119,257	0	300,269	255,566
2068	0	975,171	0	975,171	0	254,613	215,988



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 ^{((a)-.5)}	(g)=(e)*vf ^{((a)-.5)}	(h)=((c)/(1+SDR)) ^{((a)-.5)}
2069	\$ 0	\$ 857,187	\$ 0	\$ 857,187	\$ 0	\$ 217,818	\$ 184,162
2070	0	760,570	0	760,570	0	188,094	158,503
2071	0	680,891	0	680,891	0	163,882	137,642
2072	0	614,362	0	614,362	0	143,912	120,468
2073	0	557,764	0	557,764	0	127,157	106,090
2074	0	508,412	0	508,412	0	112,804	93,802
2075	0	464,202	0	464,202	0	100,238	83,077
2076	0	423,494	0	423,494	0	89,000	73,518
2077	0	385,124	0	385,124	0	78,770	64,852
2078	0	348,475	0	348,475	0	69,367	56,920
2079	0	313,058	0	313,058	0	60,649	49,602
2080	0	278,576	0	278,576	0	52,524	42,814
2081	0	244,977	0	244,977	0	44,953	36,521
2082	0	212,446	0	212,446	0	37,940	30,722
2083	0	181,474	0	181,474	0	31,542	25,456
2084	0	152,449	0	152,449	0	25,788	20,743
2085	0	125,749	0	125,749	0	20,702	16,597
2086	0	101,667	0	101,667	0	16,289	13,016
2087	0	80,510	0	80,510	0	12,554	9,998
2088	0	62,374	0	62,374	0	9,466	7,514
2089	0	47,200	0	47,200	0	6,972	5,515
2090	0	34,802	0	34,802	0	5,003	3,945
2091	0	25,006	0	25,006	0	3,498	2,749
2092	0	17,489	0	17,489	0	2,381	1,865
2093	0	11,891	0	11,891	0	1,576	1,230
2094	0	7,844	0	7,844	0	1,012	787
2095	0	5,019	0	5,019	0	630	489
2096	0	3,118	0	3,118	0	381	294
2097	0	1,883	0	1,883	0	224	172
2098	0	1,109	0	1,109	0	128	99
2099	0	634	0	634	0	71	55
2100	0	345	0	345	0	38	29
2101	0	197	0	197	0	21	16
2102	0	113	0	113	0	12	9
2103	0	59	0	59	0	6	4
2104	0	0	0	0	0	0	0
2105	0	0	0	0	0	0	0
2106	0	0	0	0	0	0	0
2107	0	0	0	0	0	0	0
2108	0	0	0	0	0	0	0
2109	0	0	0	0	0	0	0
2110	0	0	0	0	0	0	0
2111	0	0	0	0	0	0	0
2112	0	0	0	0	0	0	0
2113	0	0	0	0	0	0	0
2114	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0
2116	0	0	0	0	0	0	0
2117	0	0	0	0	0	0	0
2118	0	0	0	0	0	0	0
Totals					\$ 106,519,194	\$ 257,383,344	\$ 363,902,538



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

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:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method (EAN)

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.

Fiduciary Net Position

The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Money-Weighted Rate of Return

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.

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

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.

Net Pension Liability (NPL)

The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.



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.