

Wyoming Retirement System Wyoming State Highway Patrol, Game & Fish Warden and Criminal Investigator Retirement Fund

GASB Statement Nos. 67 and 68 Accounting and Financial
Reporting for Pensions
For Measurement Date as of December 31, 2021





June 2, 2022

Board of Trustees

Wyoming State Highway Patrol, Game & Fish Warden and Criminal Investigator Retirement Fund

Dear Board Members:

This report provides information required by the Wyoming State Highway Patrol, Game & Fish Warden and Criminal Investigator 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 State Highway Patrol, Game & Fish Warden and Criminal Investigator 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. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by WRS.

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, 2021 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 at the November 17, 2021 and the February 17, 2022 meetings. 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 that covered the five-year investigation period ending December 31, 2020.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.


This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the Wyoming State Highway Patrol, Game & Fish Warden and Criminal Investigator Retirement Fund as of the valuation date.

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.

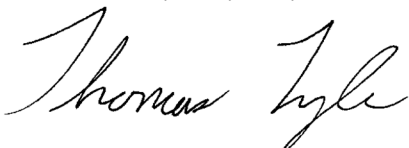
Paul T. Wood, Thomas A. Lyle, and Dana Woolfrey are members of the American Academy of Actuaries (MAAA) and are experienced in performing valuations for public retirement systems. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,

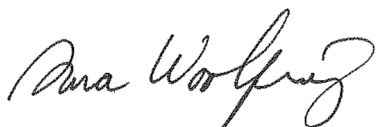
Gabriel, Roeder, Smith & Company

By 

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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2021

	2021
Actuarial Valuation Date	January 1, 2021
Measurement Date of the Net Pension Liability	December 31, 2021
Employer's Fiscal Year Ending Date (Reporting Date)	December 31, 2021

Membership

Number of	
- Retirees and Beneficiaries	354
- Inactive, Nonretired Members	86
- Active Members	315
- Total	755
Covered Payroll	\$ 24,201,407

Net Pension Liability

Total Pension Liability	\$ 209,629,644
Plan Fiduciary Net Position	190,045,699
Net Pension Liability	\$ 19,583,945
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	90.66 %
Net Pension Liability as a Percentage of Covered Payroll	80.92 %

Development of the Single Discount Rate

Single Discount Rate	6.80 %
Long-Term Expected Rate of Investment Return	6.80 %
Long-Term Municipal Bond Rate*	1.84 %
Last year ending December 31 in the 2021 to 2120 projection period for which projected benefit payments are fully funded	2120

Total Pension Expense \$ (5,367,467)

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	\$ 1,500,853	\$ 2,393,181
Changes in assumptions	3,990,971	4,214,427
Net difference between projected and actual earnings on pension plan investments	2,940,576	23,181,496
Total	\$ 8,432,400	\$ 29,789,104

**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, 2021. 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, 2021.

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 6.80% 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 slightly decrease as a percentage of payroll.
2. The unfunded liability is expected to decrease 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 gradually increase towards a 100% funded ratio.

This funding policy results in no expected crossover date and a GASB single discount rate of 6.80%. This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2120. 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.

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, 2021 and rolled forward to the measurement date of December 31, 2021.



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 6.80%, the municipal bond rate is 1.84% (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 6.80%.

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 State Highway Patrol, Game & Fish Warden and Criminal Investigator 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, 2021

A. Expense

1. Service Cost	\$	5,202,574
2. Interest on the Total Pension Liability		13,562,409
3. Current-Period Benefit Changes		0
4. Employee Contributions (made negative for addition here)		(3,859,144)
5. Projected Earnings on Plan Investments (made negative for addition here)		(11,149,540)
6. Pension Plan Administrative Expense		161,144
7. Other Changes in Plan Fiduciary Net Position		5,973
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		(2,872,537)
9. Recognition of Outflow (Inflow) of Resources due to Assets		(6,418,346)
10. Total Pension Expense	\$	(5,367,467) *

* 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, 2021

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$	(2,876,961)
2. Assumption Changes (gains) or losses	\$	4,055,904
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		4.7574
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	\$	(604,734)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for assumption changes	\$	852,546
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$	247,812
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	\$	(2,272,227)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for assumption changes	\$	3,203,358
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$	931,131

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$	(17,255,403)
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	\$	(3,451,081)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$	(13,804,322)



History of Deferred Outflows and Inflows of Resources by Source

Fiscal Year Ended December 31, 2021

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

Recognition Period	4.8205	4.8865	4.9676	4.4724	4.2551	4.1483	4.1594	4.7574		Deferred Net (Inflows)/Outflows at Measurement Date
	2014	2015	2016	2017	2018	2019	2020	2021	Total	
Total	\$ -	\$ (1,821,706)	\$ 62,315	\$ (4,722,830)	\$ (2,017,522)	\$ 1,453,141	\$ 2,116,116	\$ (2,876,961)	\$ (7,807,447)	
2014	-	-	-	-	-	-	-	-	-	-
2015	-	(372,804)	-	-	-	-	-	-	(372,804)	(372,804)
2016	-	(372,804)	12,544	-	-	-	-	-	(360,260)	(360,260)
2017	-	(372,804)	12,544	(1,055,994)	-	-	-	-	(1,416,254)	(1,416,254)
2018	-	(372,804)	12,544	(1,055,994)	(474,142)	-	-	-	(1,890,396)	(1,890,396)
2019	-	(330,490)	12,544	(1,055,994)	(474,142)	350,298	-	-	(1,497,784)	(1,497,784)
2020	-	-	12,139	(1,055,994)	(474,142)	350,298	508,755	-	(658,944)	(658,944)
2021	-	-	-	(498,854)	(474,142)	350,298	508,755	(604,734)	(718,677)	(718,677)
2022	-	-	-	-	(120,954)	350,298	508,755	(604,734)	133,365	\$ (892,328)
2023	-	-	-	-	-	51,949	508,755	(604,734)	(44,030)	
2024	-	-	-	-	-	-	81,096	(604,734)	(523,638)	
2025	-	-	-	-	-	-	-	(458,025)	(458,025)	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
Total	\$ -	\$ (1,821,706)	\$ 62,315	\$ (4,722,830)	\$ (2,017,522)	\$ 1,453,141	\$ 2,116,116	\$ (2,876,961)	\$ (7,807,447)	

Assumption changes - Net (inflows)/outflows of resources

Recognition Period	4.8205	4.8865	4.9676	4.4724	4.2551	4.1483	4.1594	4.7574		Deferred Net (Inflows)/Outflows at Measurement Date
	2014	2015	2016	2017	2018	2019	2020	2021	Total	
Total	\$ -	\$ 32,535,213	\$ (5,188,326)	\$ (22,946,444)	\$ 13,137,489	\$ (15,224,856)	\$ -	\$ 4,055,904	\$ 6,368,980	
2014	-	-	-	-	-	-	-	-	-	-
2015	-	6,658,183	-	-	-	-	-	-	6,658,183	6,658,183
2016	-	6,658,183	(1,044,433)	-	-	-	-	-	5,613,750	5,613,750
2017	-	6,658,183	(1,044,433)	(5,130,678)	-	-	-	-	483,072	483,072
2018	-	6,658,183	(1,044,433)	(5,130,678)	3,087,469	-	-	-	3,570,541	3,570,541
2019	-	5,902,481	(1,044,433)	(5,130,678)	3,087,469	(3,670,143)	-	-	(855,304)	(855,304)
2020	-	-	(1,010,594)	(5,130,678)	3,087,469	(3,670,143)	-	-	(6,723,946)	(6,723,946)
2021	-	-	-	(2,423,732)	3,087,469	(3,670,143)	-	852,546	(2,153,860)	
2022	-	-	-	-	787,613	(3,670,143)	-	852,546	(2,029,984)	\$ (223,456)
2023	-	-	-	-	-	(544,284)	-	852,546	308,262	
2024	-	-	-	-	-	-	-	852,546	852,546	
2025	-	-	-	-	-	-	-	645,720	645,720	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
Total	\$ -	\$ 32,535,213	\$ (5,188,326)	\$ (22,946,444)	\$ 13,137,489	\$ (15,224,856)	\$ -	\$ 4,055,904	\$ 6,368,980	

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	5.0000	5.0000		Deferred Net (Inflows)/Outflows at Measurement Date
	2014	2015	2016	2017	2018	2019	2020	2021	Total	
Total	\$ 3,410,288	\$ 10,785,198	\$ 682,472	\$ (8,825,212)	\$ 14,702,888	\$ (15,256,127)	\$ (5,457,870)	\$ (17,255,403)	\$ (17,213,766)	
2014	682,058	-	-	-	-	-	-	-	682,058	682,058
2015	682,058	2,157,040	-	-	-	-	-	-	2,839,098	2,839,098
2016	682,058	2,157,040	136,494	-	-	-	-	-	2,975,592	2,975,592
2017	682,058	2,157,040	136,494	(1,765,042)	-	-	-	-	1,210,550	1,210,550
2018	682,056	2,157,040	136,494	(1,765,042)	2,940,578	-	-	-	4,151,126	4,151,126
2019	-	2,157,038	136,494	(1,765,042)	2,940,578	(3,051,225)	-	-	417,843	417,843
2020	-	-	136,496	(1,765,042)	2,940,578	(3,051,225)	(1,091,574)	-	(2,830,767)	(2,830,767)
2021	-	-	-	(1,765,044)	2,940,578	(3,051,225)	(1,091,574)	(3,451,081)	(6,418,346)	
2022	-	-	-	-	2,940,576	(3,051,225)	(1,091,574)	(3,451,081)	(4,653,304)	
2023	-	-	-	-	-	(3,051,227)	(1,091,574)	(3,451,081)	(7,593,882)	\$ (20,240,920)
2024	-	-	-	-	-	-	(1,091,574)	(3,451,081)	(4,542,655)	
2025	-	-	-	-	-	-	-	(3,451,079)	(3,451,079)	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
Total	\$ 3,410,288	\$ 10,785,198	\$ 682,472	\$ (8,825,212)	\$ 14,702,888	\$ (15,256,127)	\$ (5,457,870)	\$ (17,255,403)	\$ (17,213,766)	

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

	2014	2015	2016	2017	2018	2019	2020	2021	Total	Deferred Net (Inflows)/Outflows at Measurement Date
Total	\$ 3,410,288	\$ 41,498,705	\$ (4,443,539)	\$ (36,494,486)	\$ 25,822,855	\$ (29,027,842)	\$ (3,341,754)	\$ (16,076,460)	\$ (18,652,233)	
2014	682,058	-	-	-	-	-	-	-	682,058	682,058
2015	682,058	8,442,419	-	-	-	-	-	-	9,124,477	9,124,477
2016	682,058	8,442,419	(895,395)	-	-	-	-	-	8,229,082	8,229,082
2017	682,058	8,442,419	(895,395)	(7,951,714)	-	-	-	-	277,368	277,368
2018	682,056	8,442,419	(895,395)	(7,951,714)	5,553,905	-	-	-	5,831,271	5,831,271
2019	-	7,729,029	(895,395)	(7,951,714)	5,553,905	(6,371,070)	-	-	(1,935,245)	(1,935,245)
2020	-	-	(861,959)	(7,951,714)	5,553,905	(6,371,070)	(582,819)	-	(10,213,657)	(10,213,657)
2021	-	-	-	(4,687,630)	5,553,905	(6,371,070)	(582,819)	(3,203,269)	(9,290,883)	
2022	-	-	-	-	3,607,235	(6,371,070)	(582,819)	(3,203,269)	(6,549,923)	\$ (21,356,704)
2023	-	-	-	-	-	(3,543,562)	(582,819)	(3,203,269)	(7,329,650)	
2024	-	-	-	-	-	-	(1,010,478)	(3,203,269)	(4,213,747)	
2025	-	-	-	-	-	-	-	(3,263,384)	(3,263,384)	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
Total	\$ 3,410,288	\$ 41,498,705	\$ (4,443,539)	\$ (36,494,486)	\$ 25,822,855	\$ (29,027,842)	\$ (3,341,754)	\$ (16,076,460)	\$ (18,652,233)	



Statement of Outflows and Inflows

Arising from Current and Prior Reporting Periods

Fiscal Year Ended December 31, 2021

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	\$ 4,799,068	\$ 7,671,605	\$ (2,872,537)
2. Due to Assets	2,940,578	9,358,924	(6,418,346)
3. Total	\$ 7,739,646	\$ 17,030,529	\$ (9,290,883)

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	\$ 859,053	\$ 1,577,730	\$ (718,677)
2. Assumption Changes	3,940,015	6,093,875	(2,153,860)
3. Net Difference between projected and actual earnings on pension plan investments	2,940,578	9,358,924	(6,418,346)
4. Total	\$ 7,739,646	\$ 17,030,529	\$ (9,290,883)

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	\$ 1,500,853	\$ 2,393,181	\$ (892,328)
2. Assumption Changes	3,990,971	4,214,427	(223,456)
3. Net Difference between projected and actual earnings on pension plan investments	2,940,576	23,181,496	(20,240,920)
4. Total	\$ 8,432,400	\$ 29,789,104	\$ (21,356,704)

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
2022	\$ (6,549,923)
2023	(7,329,650)
2024	(4,213,747)
2025	(3,263,384)
2026	0
Thereafter	0
Total	\$ (21,356,704)



Statement of Fiduciary Net Position as of December 31, 2021

	2021
Assets	
Cash and Deposits	\$ 10,228,749
Receivables	
Accounts Receivable - Sale of Investments	\$ 184,312
Accrued Interest and Other Dividends	442,166
Contributions	13
Accounts Receivable - Other	15,287,489
Total Receivables	\$ 15,913,980
Investments	
Fixed Income	\$ 34,915,691
Equities	91,860,784
Private Markets	19,906,551
Marketable Alternatives	33,275,324
Security Lending Collateral	10,091,022
Capital Assets, at Cost, Net of Accumulated Depreciation	41,909
Total Investments	\$ 190,091,281
Total Assets	\$ 216,234,010
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ 25,940,241
Accrued Expenses	247,097
Accounts Payable - Other	973
Total Liabilities	\$ 26,188,311
Net Position Restricted for Pensions	\$ 190,045,699



Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2021

	2021
Additions	
Contributions	
Employer	\$ 3,562,731
Employee	3,486,638
Other Employer Contributions	27,402
Other Employee Contributions	372,506
Total Contributions	\$ 7,449,277
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 26,329,300
Interest and Dividends	3,147,693
Less Investment Expense	(1,072,050)
Net Investment Income	\$ 28,404,943
Other	\$ 0
Total Additions	\$ 35,854,220
 Deductions	
Benefit Payments, including Refunds of Employee Contributions	\$ 11,853,113
Pension Plan Administrative Expense	161,144
Other	5,973
Total Deductions	\$ 12,020,230
Net Increase in Net Position	\$ 23,833,990
 Net Position Restricted for Pensions	
Beginning of Year	\$ 166,211,709
End of Year	\$ 190,045,699



SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming State Highway Patrol, Game & Fish Warden and Criminal Investigator 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, 2021

A. Total pension liability	
1. Service cost	\$ 5,202,574
2. Interest on the total pension liability	13,562,409
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the total pension liability	(2,876,961)
5. Changes of assumptions	4,055,904
6. Benefit payments, including refunds of employee contributions	(11,853,113)
7. Net change in total pension liability	<u>8,090,813</u>
8. Total pension liability – beginning	<u>201,538,831</u>
9. Total pension liability – ending	<u><u>\$ 209,629,644</u></u>
B. Plan fiduciary net position	
1. Contributions – employer	\$ 3,590,133
2. Contributions – employee	3,859,144
3. Net investment income	28,404,943
4. Benefit payments	(11,744,509)
5. Refunds	(108,604)
6. Pension plan administrative expense	(161,144)
7. Other	(5,973)
8. Net change in plan fiduciary net position	<u>23,833,990</u>
9. Plan fiduciary net position – beginning	<u>166,211,709</u>
10. Plan fiduciary net position – ending	<u><u>\$ 190,045,699</u></u>
C. Net pension liability	<u><u>\$ 19,583,945</u></u>
D. Plan fiduciary net position as a percentage of the total pension liability	90.66 %
E. Covered-employee payroll	\$ 24,201,407
F. Net pension liability as a percentage of covered-employee payroll	80.92 %



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,	2021	2020	2019	2018	2017	2016	2015	2014
Total pension liability								
Service cost	\$ 5,202,574	\$ 4,800,841	\$ 4,614,951	\$ 5,078,748	\$ 4,764,423	\$ 7,631,559	\$ 7,511,738	\$ 5,276,236
Interest on the total pension liability	13,562,409	13,412,219	12,833,018	12,084,646	12,129,167	12,213,078	11,513,094	11,490,234
Changes of benefit terms	0	0	0	0	0	0	0	0
Difference between expected and actual experience	(2,876,961)	2,116,116	1,453,141	(2,017,522)	(4,722,830)	62,315	(1,821,706)	0
Changes of assumptions	4,055,904	0	(15,224,856)	13,137,489	(22,946,444)	(5,188,326)	32,535,213	0
Benefit payments, including refunds of employee contributions	(11,853,113)	(11,638,230)	(11,132,637)	(10,612,051)	(10,304,469)	(9,719,868)	(9,046,994)	(8,732,855)
Net change in total pension liability	8,090,813	8,690,946	(7,456,383)	17,671,310	(21,080,153)	4,998,758	40,691,345	8,033,615
Total pension liability - beginning	201,538,831	192,847,885	200,304,268	182,632,958	203,713,111	198,714,353	158,023,008	149,989,393
Total pension liability - ending (a)	\$ 209,629,644	\$ 201,538,831	\$ 192,847,885	\$ 200,304,268	\$ 182,632,958	\$ 203,713,111	\$ 198,714,353	\$ 158,023,008
Plan fiduciary net position								
Employer contributions	\$ 3,590,133	\$ 3,664,996	\$ 3,639,164	\$ 3,529,976	\$ 3,552,582	\$ 3,574,065	\$ 3,355,688	\$ 3,006,277
Employee contributions	3,859,144	3,932,180	4,196,524	3,796,060	3,485,756	3,678,081	3,524,286	3,150,559
Pension plan net investment income	28,404,943	16,114,071	24,466,565	(4,908,329)	17,623,232	8,622,074	(1,199,475)	5,900,708
Benefit payments	(11,744,509)	(11,270,238)	(10,843,842)	(10,260,821)	(9,795,108)	(9,396,540)	(8,926,088)	(8,364,762)
Refunds	(108,604)	(367,992)	(288,795)	(351,230)	(509,361)	(323,328)	(120,906)	(368,093)
Pension plan administrative expense	(161,144)	(149,733)	(138,770)	(139,377)	(128,991)	(114,832)	(95,918)	(96,479)
Other	(5,973)	(5,841)	(6,039)	(5,536)	(5,897)	(5,897)	(5,850)	229,589
Net change in plan fiduciary net position	23,833,990	11,917,443	21,024,807	(8,339,257)	14,222,213	6,033,623	(3,468,263)	3,457,799
Plan fiduciary net position - beginning	166,211,709	154,294,266	133,269,459	141,608,716	127,386,503	121,352,880	124,821,143	121,363,344
Plan fiduciary net position - ending (b)	\$ 190,045,699	\$ 166,211,709	\$ 154,294,266	\$ 133,269,459	\$ 141,608,716	\$ 127,386,503	\$ 121,352,880	\$ 124,821,143
Net pension liability - ending (a) - (b)	\$ 19,583,945	\$ 35,327,122	\$ 38,553,619	\$ 67,034,809	\$ 41,024,242	\$ 76,326,608	\$ 77,361,473	\$ 33,201,865
Plan fiduciary net position as a percentage of total pension liability	90.66 %	82.47 %	80.01 %	66.53 %	77.54 %	62.53 %	61.07 %	78.99 %
Covered-employee payroll	\$ 24,201,407	\$ 24,074,484	\$ 23,118,850	\$ 23,063,176	\$ 23,641,495	\$ 23,636,482	\$ 22,196,930	\$ 21,817,686
Projected valuation payroll	\$ 24,806,442	\$ 24,676,346	\$ 23,696,821	\$ 23,639,756	\$ 24,646,258	\$ 24,641,033	\$ 23,140,300	\$ 22,744,938
Net pension liability as a percentage of covered-employee payroll	80.92 %	146.74 %	166.76 %	290.66 %	173.53 %	322.92 %	348.52 %	152.18 %

Notes to Schedule:

For 2021, 2020, 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

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	\$ 158,023,008	\$ 124,821,143	\$ 33,201,865	78.99 %	\$ 21,817,686	152.18 %
2015	198,714,353	121,352,880	77,361,473	61.07 %	22,196,930	348.52 %
2016	203,713,111	127,386,503	76,326,608	62.53 %	23,636,482	322.92 %
2017	182,632,958	141,608,716	41,024,242	77.54 %	23,641,495	173.53 %
2018	200,304,268	133,269,459	67,034,809	66.53 %	23,063,176	290.66 %
2019	192,847,885	154,294,266	38,553,619	80.01 %	23,118,850	166.76 %
2020	201,538,831	166,211,709	35,327,122	82.47 %	24,074,484	146.74 %
2021	209,629,644	190,045,699	19,583,945	90.66 %	24,201,407	80.92 %

* 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	\$ 4,037,681	\$ 3,077,515	\$ 960,166	\$ 21,817,686	14.11 %
2015	3,784,380	3,355,688	428,692	22,196,930	15.12 %
2016	4,097,473	3,574,065	523,408	23,636,482	15.12 %
2017	4,041,445	3,552,582	488,863	23,641,495	15.03 %
2018	3,607,303	3,529,976	77,327	23,063,176	15.31 %
2019	3,997,559	3,639,164	358,395	23,118,850	15.74 %
2020	4,345,242	3,664,996	680,246	24,074,484	15.22 %
2021	4,026,853	3,590,133	436,720	24,201,407	14.83 %

* 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, 2021
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	27 years
Asset Valuation Method	5-Year smoothed market
Inflation	2.25%
Salary Increases	2.50% to 8.50% 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 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 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 contributing at the rate of 14.88% of salary.
Employees are contributing at the rate of 14.56% 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 %
2020	11.03 %
2021	17.19 %

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 State Highway Patrol, Game & Fish Warden and Criminal Investigator 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 6.80% 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 6.80% and a municipal bond rate of 1.84%. 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 2120. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

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 6.80%, 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
5.80%	6.80%	7.80%
\$ 45,651,723	\$ 19,583,945	\$ (2,013,702)



Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	354
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	86
Active Plan Members	<u>315</u>
Total Plan Members	755



SECTION E

SUMMARY OF BENEFITS

Summary of Benefits

Covered Members	<p>Any person who is employed by the Wyoming state highway patrol division as a sworn law enforcement officer;</p> <p>Any person who is commissioned as a full time law enforcement officer of the Wyoming state game and fish department;</p> <p>Any criminal investigator as defined under W.S. 9-3-602(a)(iv);</p> <p>Any person designated and appointed as capitol police under W.S. 9-1-612 and qualified pursuant to W.S. 9-1-701 through 9-1-707.</p>
Final Average Salary	Employee's average annual salary for the highest paid three continuous years of service.
Service Retirement	
Eligibility	Age 50 with six or more years of service.
Monthly Benefit	2.50% of employee's highest three-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 six 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 six 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. 9-3-611(a).
Monthly Benefit	62.5% of Final Average 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 Average Salary.



Pre-retirement Duty Death Benefit

Eligibility	No age or service requirements.
Monthly Benefit	50% of member's final actual salary, payable to the surviving spouse plus 5% 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	2% for each year of credited service, not to exceed 50%, of the member's final actual salary payable to the surviving spouse plus 5% of the member's final actual salary for each unmarried child under 18. Payment shall not exceed 60% of the member's final actual salary.

Post-retirement Death Benefit

Monthly Benefit	50% of the benefit payable prior to the member's death plus 5% of the member's final actual salary for each unmarried child under 18. Payment shall not exceed 60% of the member's final actual salary.
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Contributions

Employee	14.56% of salary. The Employer may subsidize all except 1.62% of the employee contributions, which shall be paid through salary reductions.
Employer	14.88% of salary.
Interest	3.00% 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. Upon death, 50% of the benefit continues to be paid to the beneficiary.
Option 2	Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary.
Option 3	Not available under this plan.
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.



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, 2021 actuarial valuation for GASB reporting purposes and are based on assumptions adopted by the Board at the November 17, 2021 and the February 17, 2022 meetings.

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 6.80%), 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

6.80% per year, compounded annually, composed of an assumed 2.25% inflation rate and a 4.55% net real rate of return. This rate represents the assumed return, net of investment expenses.

b. Salary increase rate

Age	Rate
20	8.50%
25	8.00%
30	5.75%
35	4.00%
40	3.00%
45	3.00%
50	3.00%
55	2.50%
60	2.50%

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:

Pub-2010 Safety Healthy Active Mortality Table, amount weighted, fully generational, projected

with the MP-2020 Ultimate Scale

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

Healthy Post-Retirement Mortality:

Pub-2010 Safety Healthy Annuitant Mortality Table, amount weighted, fully generational, projected

with the MP-2020 Ultimate Scale

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

Disabled Mortality:

Pub-2010 Safety Disabled Retiree Mortality Table, amount weighted, fully generational, projected with the MP-2020 Ultimate Scale

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 2021 using the MP-2020 Ultimate Scale					
	Male	Female	Male	Female	Male	Female
20	0.04%	0.01%	0.04%	0.01%	0.10%	0.05%
25	0.03%	0.02%	0.03%	0.02%	0.09%	0.06%
30	0.04%	0.02%	0.04%	0.02%	0.11%	0.08%
35	0.04%	0.03%	0.04%	0.03%	0.12%	0.10%
40	0.05%	0.04%	0.06%	0.04%	0.15%	0.14%
45	0.07%	0.06%	0.11%	0.07%	0.21%	0.19%
50	0.10%	0.08%	0.17%	0.13%	0.30%	0.26%
55	0.15%	0.11%	0.26%	0.22%	0.41%	0.40%
60	0.23%	0.14%	0.44%	0.38%	0.63%	0.60%
65	0.35%	0.20%	0.76%	0.67%	1.03%	0.92%
70	0.67%	0.40%	1.37%	1.16%	1.66%	1.40%
75			2.48%	2.02%	2.85%	2.15%
80			4.52%	3.51%	4.96%	3.51%
85			8.30%	6.22%	8.37%	6.22%
90			14.79%	11.02%	14.79%	11.02%
95			22.82%	18.14%	22.82%	18.14%
100			31.55%	27.24%	31.55%	27.24%

100% of active deaths are assumed to be duty-related



b. Disability and Withdrawal

Age	Disability		Withdrawal	
	Male	Female	Ultimate	
			Male	Female
20	0.10%	0.10%	4.50%	4.50%
25	0.10%	0.10%	4.50%	4.50%
30	0.23%	0.23%	4.50%	4.50%
35	0.39%	0.39%	4.50%	4.50%
40	0.57%	0.57%	3.00%	3.00%
45	0.73%	0.73%	3.00%	3.00%
50	0.75%	0.75%	1.00%	1.00%
55	0.75%	0.75%	1.00%	1.00%
60	0.75%	0.75%	1.00%	1.00%

100% of active disabilities are assumed to be duty-related

c. Retirement Rates

Age	Rate
50	15.00%
51	5.00%
52	5.00%
53	5.00%
54	10.00%
55	10.00%
56	10.00%
57	15.00%
58	15.00%
59	15.00%
60	35.00%
61	40.00%
62	100.00%

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: 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 age 50.
- 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. Administrative expenses: Average of actual expenses for the prior two years, with each year projected at 2.50% 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, 2020. 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, 2020 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 6.80%; the municipal bond rate is 1.84%; and the resulting Single Discount Rate is 6.80%.

The tables in this section provide background for the development of the Single Discount Rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **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 2021 to 2070

Year	Payroll for Current Employees		Payroll for Future Employees		Total Employee Payroll		Contributions from 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)				
2021	\$ 24,344,712	\$ 461,730	\$ 24,806,442	\$ 3,859,144	\$ 3,550,589	\$ 39,544	\$ 7,449,277				
2022	23,656,585	1,770,018	25,426,603	3,444,399	3,548,488	153,713	7,146,600				
2023	22,960,386	3,101,882	26,062,268	3,343,032	3,439,466	269,470	7,051,968				
2024	22,108,138	4,605,687	26,713,825	3,218,945	3,309,588	400,541	6,929,074				
2025	21,241,317	6,140,354	27,381,671	3,092,736	3,175,577	533,864	6,802,177				
2026	20,460,531	7,605,682	28,066,213	2,979,053	3,056,803	661,835	6,697,691				
2027	19,669,076	9,098,792	28,767,868	2,863,817	2,936,593	792,648	6,593,058				
2028	18,807,862	10,679,203	29,487,065	2,738,425	2,806,133	931,621	6,476,179				
2029	17,910,878	12,313,364	30,224,242	2,607,824	2,670,512	1,075,888	6,354,224				
2030	17,053,234	13,926,614	30,979,848	2,482,951	2,542,637	1,220,489	6,246,077				
2031	16,179,090	15,575,254	31,754,344	2,355,676	2,410,684	1,367,890	6,134,250				
2032	15,287,896	17,260,307	32,548,203	2,225,918	2,277,896	1,520,712	6,024,526				
2033	14,419,902	18,942,006	33,361,908	2,099,538	2,147,123	1,672,671	5,919,332				
2034	13,564,860	20,631,096	34,195,956	1,975,044	2,019,808	1,827,892	5,822,744				
2035	12,721,203	22,329,652	35,050,855	1,852,207	1,894,187	1,985,182	5,731,576				
2036	11,869,948	24,057,178	35,927,126	1,728,264	1,767,435	2,145,805	5,641,504				
2037	11,078,487	25,746,817	36,825,304	1,613,028	1,649,587	2,304,198	5,566,813				
2038	10,318,176	27,427,761	37,745,937	1,502,326	1,535,345	2,460,119	5,497,790				
2039	9,523,824	29,165,761	38,689,585	1,386,669	1,417,145	2,624,724	5,428,538				
2040	8,741,366	30,915,459	39,656,825	1,272,743	1,300,715	2,790,952	5,364,410				
2041	8,029,828	32,618,418	40,648,246	1,169,143	1,194,838	2,954,298	5,318,279				
2042	7,334,498	34,329,954	41,664,452	1,067,903	1,091,373	3,119,296	5,278,572				
2043	6,631,254	36,074,809	42,706,063	965,511	986,731	3,288,094	5,240,336				
2044	5,928,812	37,844,903	43,773,715	863,235	882,207	3,459,670	5,205,112				
2045	5,247,639	39,620,419	44,868,058	764,056	780,849	3,632,380	5,177,285				
2046	4,577,144	41,412,615	45,989,759	666,432	681,079	3,806,990	5,154,501				
2047	3,935,680	43,203,823	47,139,503	573,035	585,629	3,981,821	5,140,485				
2048	3,366,337	44,951,654	48,317,991	490,139	500,911	4,152,842	5,143,892				
2049	2,851,060	46,674,881	49,525,941	415,114	424,238	4,321,907	5,161,259				
2050	2,362,206	48,401,884	50,764,090	343,937	351,496	4,490,972	5,186,405				
2051	1,896,228	50,136,964	52,033,192	276,091	282,159	4,660,619	5,218,869				
2052	1,473,831	51,860,191	53,334,022	214,590	219,306	4,828,401	5,262,297				
2053	1,128,699	53,538,674	54,667,373	164,339	167,950	4,991,735	5,324,024				
2054	818,988	55,215,069	56,034,057	119,245	121,865	5,154,102	5,395,212				
2055	562,295	56,872,613	57,434,908	81,870	83,670	5,313,613	5,479,153				
2056	360,435	58,510,346	58,870,781	52,479	53,633	5,470,561	5,576,673				
2057	199,779	60,142,772	60,342,551	29,088	29,727	5,625,914	5,684,729				
2058	90,173	61,760,942	61,851,115	13,129	13,418	5,779,157	5,805,704				
2059	26,314	63,371,079	63,397,393	3,831	3,915	5,930,825	5,938,571				
2060	4,690	64,977,638	64,982,328	683	698	6,081,632	6,083,013				
2061	0	66,606,886	66,606,886	0	0	6,234,256	6,234,256				
2062	0	68,272,058	68,272,058	0	0	6,390,147	6,390,147				
2063	0	69,978,859	69,978,859	0	0	6,549,967	6,549,967				
2064	0	71,728,330	71,728,330	0	0	6,713,869	6,713,869				
2065	0	73,521,538	73,521,538	0	0	6,881,945	6,881,945				
2066	0	75,359,576	75,359,576	0	0	7,054,274	7,054,274				
2067	0	77,243,565	77,243,565	0	0	7,230,955	7,230,955				
2068	0	79,174,654	79,174,654	0	0	7,412,103	7,412,103				
2069	0	81,154,020	81,154,020	0	0	7,597,832	7,597,832				
2070	0	83,182,871	83,182,871	0	0	7,788,240	7,788,240				



Single Discount Rate Development

Projection of Contributions

Ending December 31 for 2071 to 2120 (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)
2070	0	91,818,325	91,818,325	0	0	8,598,886	8,598,886
2071	0	94,113,783	94,113,783	0	0	8,814,325	8,814,325
2072	0	96,466,628	96,466,628	0	0	9,035,091	9,035,091
2073	0	98,878,294	98,878,294	0	0	9,261,295	9,261,295
2074	0	101,350,251	101,350,251	0	0	9,493,055	9,493,055
2075	0	103,884,007	103,884,007	0	0	9,730,520	9,730,520
2076	0	106,481,107	106,481,107	0	0	9,973,827	9,973,827
2077	0	109,143,135	109,143,135	0	0	10,223,118	10,223,118
2078	0	111,871,713	111,871,713	0	0	10,478,551	10,478,551
2079	0	114,668,506	114,668,506	0	0	10,740,296	10,740,296
2080	0	117,535,219	117,535,219	0	0	11,008,533	11,008,533
2081	0	120,473,599	120,473,599	0	0	11,283,440	11,283,440
2082	0	123,485,439	123,485,439	0	0	11,565,205	11,565,205
2083	0	126,572,575	126,572,575	0	0	11,854,011	11,854,011
2084	0	129,736,889	129,736,889	0	0	12,150,041	12,150,041
2085	0	132,980,311	132,980,311	0	0	12,453,490	12,453,490
2086	0	136,304,819	136,304,819	0	0	12,764,556	12,764,556
2087	0	139,712,439	139,712,439	0	0	13,083,449	13,083,449
2088	0	143,205,250	143,205,250	0	0	13,410,370	13,410,370
2089	0	146,785,381	146,785,381	0	0	13,745,520	13,745,520
2090	0	150,455,016	150,455,016	0	0	14,089,104	14,089,104
2091	0	154,216,391	154,216,391	0	0	14,441,329	14,441,329
2092	0	158,071,801	158,071,801	0	0	14,802,405	14,802,405
2093	0	162,023,596	162,023,596	0	0	15,172,548	15,172,548
2094	0	166,074,186	166,074,186	0	0	15,551,973	15,551,973
2095	0	170,226,041	170,226,041	0	0	15,940,903	15,940,903
2096	0	174,481,692	174,481,692	0	0	16,339,567	16,339,567
2097	0	178,843,734	178,843,734	0	0	16,748,199	16,748,199
2098	0	183,314,827	183,314,827	0	0	17,167,046	17,167,046
2099	0	187,897,698	187,897,698	0	0	17,596,358	17,596,358
2100	0	192,595,140	192,595,140	0	0	18,036,395	18,036,395
2101	0	197,410,019	197,410,019	0	0	18,487,420	18,487,420
2102	0	202,345,269	202,345,269	0	0	18,949,706	18,949,706
2103	0	207,403,901	207,403,901	0	0	19,423,533	19,423,533
2104	0	212,588,999	212,588,999	0	0	19,909,186	19,909,186
2105	0	217,903,724	217,903,724	0	0	20,406,961	20,406,961
2106	0	223,351,317	223,351,317	0	0	20,917,160	20,917,160
2107	0	228,935,100	228,935,100	0	0	21,440,093	21,440,093
2108	0	234,658,478	234,658,478	0	0	21,976,081	21,976,081
2109	0	240,524,940	240,524,940	0	0	22,525,451	22,525,451
2110	0	246,538,064	246,538,064	0	0	23,088,541	23,088,541
2111	0	252,701,516	252,701,516	0	0	23,665,696	23,665,696
2112	0	259,019,054	259,019,054	0	0	24,257,271	24,257,271
2113	0	265,494,530	265,494,530	0	0	24,863,630	24,863,630
2114	0	272,131,893	272,131,893	0	0	25,485,147	25,485,147
2115	0	278,935,190	278,935,190	0	0	26,122,204	26,122,204
2116	0	285,908,570	285,908,570	0	0	26,775,191	26,775,191
2117	0	293,056,284	293,056,284	0	0	86,275,770	86,275,770
2118	0	300,382,691	300,382,691	0	0	88,432,664	88,432,664
2119	0	307,892,258	307,892,258	0	0	90,643,481	90,643,481



Single Discount Rate Development

Projection of Plan Net Position

Ending December 31 for 2021 to 2070

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 6.800%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2021	\$ 166,211,709	\$ 7,449,277	\$ 11,853,113	\$ 167,117	\$ 28,404,943	\$ 190,045,699
2022	190,045,699	7,146,600	12,292,206	160,188	12,745,677	197,485,582
2023	197,485,582	7,051,968	12,750,139	164,192	13,232,977	204,856,196
2024	204,856,196	6,929,074	13,280,767	168,297	13,712,187	212,048,394
2025	212,048,394	6,802,177	13,799,394	172,505	14,179,529	219,058,201
2026	219,058,201	6,697,691	14,202,700	176,817	14,639,071	226,015,446
2027	226,015,446	6,593,058	14,632,154	181,238	15,094,155	232,889,268
2028	232,889,268	6,476,179	15,173,059	185,769	15,539,427	239,546,046
2029	239,546,046	6,354,224	15,745,080	190,413	15,968,725	245,933,502
2030	245,933,502	6,246,077	16,228,377	195,173	16,383,135	252,139,164
2031	252,139,164	6,134,250	16,719,235	200,052	16,784,802	258,138,928
2032	258,138,928	6,024,526	17,217,020	205,054	17,172,303	263,913,683
2033	263,913,683	5,919,332	17,679,667	210,180	17,545,826	269,488,993
2034	269,488,993	5,822,744	18,154,149	215,435	17,905,674	274,847,827
2035	274,847,827	5,731,576	18,650,205	220,820	18,250,258	279,958,636
2036	279,958,636	5,641,504	19,145,309	226,341	18,578,039	284,806,531
2037	284,806,531	5,566,813	19,572,295	231,999	18,890,731	289,459,780
2038	289,459,780	5,497,790	19,935,210	237,799	19,192,513	293,977,074
2039	293,977,074	5,428,538	20,345,390	243,744	19,483,458	298,299,936
2040	298,299,936	5,364,410	20,773,240	249,838	19,760,756	302,402,025
2041	302,402,025	5,318,279	21,069,280	256,084	20,028,047	306,422,987
2042	306,422,987	5,278,572	21,362,123	262,486	20,290,138	310,367,088
2043	310,367,088	5,240,336	21,639,493	269,048	20,547,563	314,246,446
2044	314,246,446	5,205,112	21,886,140	275,774	20,801,708	318,091,352
2045	318,091,352	5,177,285	22,101,916	282,669	21,054,785	321,938,838
2046	321,938,838	5,154,501	22,281,169	289,735	21,309,422	325,831,857
2047	325,831,857	5,140,485	22,406,787	296,979	21,569,235	329,837,811
2048	329,837,811	5,143,892	22,411,900	304,403	21,841,335	334,106,734
2049	334,106,734	5,161,259	22,334,599	312,013	22,134,533	338,755,914
2050	338,755,914	5,186,405	22,211,476	319,814	22,455,374	343,866,404
2051	343,866,404	5,218,869	22,056,734	327,809	22,808,881	349,509,610
2052	349,509,610	5,262,297	21,854,084	336,004	23,200,574	355,782,393
2053	355,782,393	5,324,024	21,583,060	344,404	23,637,969	362,816,921
2054	362,816,921	5,395,212	21,275,583	353,015	24,128,692	370,712,227
2055	370,712,227	5,479,153	20,918,895	361,840	24,680,013	379,590,658
2056	379,590,658	5,576,673	20,514,096	370,886	25,300,242	389,582,592
2057	389,582,592	5,684,729	20,070,526	380,158	25,997,830	400,814,467
2058	400,814,467	5,805,704	19,582,623	389,662	26,781,641	413,429,527
2059	413,429,527	5,938,571	19,054,441	399,404	27,661,246	427,575,499
2060	427,575,499	6,083,013	18,489,765	409,389	28,646,551	443,405,909
2061	443,405,909	6,234,256	17,907,062	419,623	29,747,221	461,060,700
2062	461,060,700	6,390,147	17,315,372	430,114	30,972,395	480,677,757
2063	480,677,757	6,549,967	16,718,205	440,867	32,331,310	502,399,962
2064	502,399,962	6,713,869	16,115,820	451,888	33,833,677	526,379,800
2065	526,379,800	6,881,945	15,508,615	463,186	35,489,854	552,779,797
2066	552,779,797	7,054,274	14,897,084	474,765	37,310,879	581,773,101
2067	581,773,101	7,230,955	14,281,813	486,634	39,308,511	613,544,120
2068	613,544,120	7,412,103	13,663,452	498,800	41,495,269	648,289,241
2069	648,289,241	7,597,832	13,042,721	511,270	43,884,489	686,217,571
2070	686,217,571	7,788,240	12,420,483	524,052	46,490,364	727,551,640



Single Discount Rate Development

Projection of Plan Net Position

Ending December 31 for 2071 to 2120 (concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 6.800%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2071	\$ 727,551,640	\$ 7,983,448	\$ 11,797,664	\$ 537,153	\$ 49,327,998	\$ 772,528,269
2072	772,528,269	8,183,556	11,175,197	550,582	52,413,467	821,399,513
2073	821,399,513	8,388,666	10,554,124	564,347	55,763,880	874,433,588
2074	874,433,588	8,598,886	9,935,577	578,455	59,397,440	931,915,881
2075	931,915,881	8,814,325	9,320,792	592,917	63,333,516	994,150,012
2076	994,150,012	9,035,091	8,711,086	607,740	67,592,713	1,061,458,990
2077	1,061,458,990	9,261,295	8,107,933	622,933	72,196,949	1,134,186,369
2078	1,134,186,369	9,493,055	7,513,099	638,507	77,169,532	1,212,697,350
2079	1,212,697,350	9,730,520	6,928,437	654,469	82,535,238	1,297,380,202
2080	1,297,380,202	9,973,827	6,355,907	670,831	88,320,407	1,388,647,698
2081	1,388,647,698	10,223,118	5,797,698	687,602	94,553,039	1,486,938,555
2082	1,486,938,555	10,478,551	5,256,044	704,792	101,262,898	1,592,719,168
2083	1,592,719,168	10,740,296	4,733,245	722,412	108,481,626	1,706,485,433
2084	1,706,485,433	11,008,533	4,231,687	740,472	116,242,871	1,828,764,679
2085	1,828,764,679	11,283,440	3,753,702	758,984	124,582,418	1,960,117,851
2086	1,960,117,851	11,565,205	3,301,671	777,958	133,538,338	2,101,141,765
2087	2,101,141,765	11,854,011	2,877,769	797,407	143,151,147	2,252,471,747
2088	2,252,471,747	12,150,041	2,483,851	817,342	153,463,992	2,414,784,587
2089	2,414,784,587	12,453,490	2,121,546	837,776	164,522,845	2,588,801,600
2090	2,588,801,600	12,764,556	1,791,997	858,720	176,376,724	2,775,292,164
2091	2,775,292,164	13,083,449	1,495,792	880,188	189,077,934	2,975,077,567
2092	2,975,077,567	13,410,370	1,232,965	902,193	202,682,327	3,189,035,106
2093	3,189,035,106	13,745,520	1,002,907	924,748	217,249,587	3,418,102,558
2094	3,418,102,558	14,089,104	804,382	947,867	232,843,529	3,663,282,942
2095	3,663,282,942	14,441,329	635,596	971,563	249,532,426	3,925,649,538
2096	3,925,649,538	14,802,405	494,344	995,852	267,389,340	4,206,351,087
2097	4,206,351,087	15,172,548	378,106	1,020,749	286,492,478	4,506,617,258
2098	4,506,617,258	15,551,973	284,132	1,046,267	306,925,555	4,827,764,387
2099	4,827,764,387	15,940,903	209,566	1,072,424	328,778,185	5,171,201,485
2100	5,171,201,485	16,339,567	151,560	1,099,235	352,146,282	5,538,436,539
2101	5,538,436,539	16,748,199	107,369	1,126,716	377,132,490	5,931,083,143
2102	5,931,083,143	17,167,046	74,434	1,154,883	403,846,625	6,350,867,496
2103	6,350,867,496	17,596,358	50,447	1,183,755	432,406,154	6,799,635,806
2104	6,799,635,806	18,036,395	33,391	1,213,349	462,936,695	7,279,362,156
2105	7,279,362,156	18,487,420	21,564	1,243,683	495,572,551	7,792,156,880
2106	7,792,156,880	18,949,706	13,575	1,274,775	530,457,279	8,340,275,514
2107	8,340,275,514	19,423,533	8,323	1,306,645	567,744,301	8,926,128,380
2108	8,926,128,380	19,909,186	4,968	1,339,311	607,597,556	9,552,290,843
2109	9,552,290,843	20,406,961	2,884	1,372,793	650,192,200	10,221,514,327
2110	10,221,514,327	20,917,160	1,628	1,407,113	695,715,352	10,936,738,098
2111	10,936,738,098	21,440,093	894	1,442,291	744,366,904	11,701,101,911
2112	11,701,101,911	21,976,081	477	1,478,348	796,360,376	12,517,959,542
2113	12,517,959,542	22,525,451	249	1,515,307	851,923,838	13,390,893,275
2114	13,390,893,275	23,088,541	127	1,553,190	911,300,899	14,323,729,398
2115	14,323,729,398	23,665,696	63	1,592,020	974,751,760	15,320,554,771
2116	15,320,554,771	24,257,271	30	1,631,820	1,042,554,338	16,385,734,529
2117	16,385,734,529	24,863,630	14	1,672,616	1,115,005,475	17,523,931,004
2118	17,523,931,004	25,485,147	6	1,714,431	1,192,422,221	18,740,123,935
2119	18,740,123,935	26,122,204	2	1,757,292	1,275,143,211	20,039,632,056
2120	20,039,632,056	26,775,191	1	1,801,224	1,363,530,131	21,428,136,152



Single Discount Rate Development

Present Values of Projected Benefits

Ending December 31 for 2021 to 2070

Year	Projected Plan Net Position Beginning	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)
2021	\$ 166,211,709	\$ 11,853,113	\$ 11,853,113	\$ 0	\$ 11,469,561	\$ 0	\$ 11,469,561
2022	190,045,699	12,292,206	12,292,206	0	11,137,122	0	11,137,122
2023	197,485,582	12,750,139	12,750,139	0	10,816,501	0	10,816,501
2024	204,856,196	13,280,767	13,280,767	0	10,549,303	0	10,549,303
2025	212,048,394	13,799,394	13,799,394	0	10,263,355	0	10,263,355
2026	219,058,201	14,202,700	14,202,700	0	9,890,746	0	9,890,746
2027	226,015,446	14,632,154	14,632,154	0	9,541,027	0	9,541,027
2028	232,889,268	15,173,059	15,173,059	0	9,263,791	0	9,263,791
2029	239,546,046	15,745,080	15,745,080	0	9,000,968	0	9,000,968
2030	245,933,502	16,228,377	16,228,377	0	8,686,567	0	8,686,567
2031	252,139,164	16,719,235	16,719,235	0	8,379,503	0	8,379,503
2032	258,138,928	17,217,020	17,217,020	0	8,079,576	0	8,079,576
2033	263,913,683	17,679,667	17,679,667	0	7,768,433	0	7,768,433
2034	269,488,993	18,154,149	18,154,149	0	7,469,026	0	7,469,026
2035	274,847,827	18,650,205	18,650,205	0	7,184,564	0	7,184,564
2036	279,958,636	19,145,309	19,145,309	0	6,905,704	0	6,905,704
2037	284,806,531	19,572,295	19,572,295	0	6,610,223	0	6,610,223
2038	289,459,780	19,935,210	19,935,210	0	6,304,112	0	6,304,112
2039	293,977,074	20,345,390	20,345,390	0	6,024,179	0	6,024,179
2040	298,299,936	20,773,240	20,773,240	0	5,759,235	0	5,759,235
2041	302,402,025	21,069,280	21,069,280	0	5,469,391	0	5,469,391
2042	306,422,987	21,362,123	21,362,123	0	5,192,332	0	5,192,332
2043	310,367,088	21,639,493	21,639,493	0	4,924,860	0	4,924,860
2044	314,246,446	21,886,140	21,886,140	0	4,663,852	0	4,663,852
2045	318,091,352	22,101,916	22,101,916	0	4,409,956	0	4,409,956
2046	321,938,838	22,281,169	22,281,169	0	4,162,661	0	4,162,661
2047	325,831,857	22,406,787	22,406,787	0	3,919,597	0	3,919,597
2048	329,837,811	22,411,900	22,411,900	0	3,670,872	0	3,670,872
2049	334,106,734	22,334,599	22,334,599	0	3,425,291	0	3,425,291
2050	338,755,914	22,211,476	22,211,476	0	3,189,521	0	3,189,521
2051	343,866,404	22,056,734	22,056,734	0	2,965,637	0	2,965,637
2052	349,509,610	21,854,084	21,854,084	0	2,751,301	0	2,751,301
2053	355,782,393	21,583,060	21,583,060	0	2,544,177	0	2,544,177
2054	362,816,921	21,275,583	21,275,583	0	2,348,251	0	2,348,251
2055	370,712,227	20,918,895	20,918,895	0	2,161,875	0	2,161,875
2056	379,590,658	20,514,096	20,514,096	0	1,985,057	0	1,985,057
2057	389,582,592	20,070,526	20,070,526	0	1,818,478	0	1,818,478
2058	400,814,467	19,582,623	19,582,623	0	1,661,303	0	1,661,303
2059	413,429,527	19,054,441	19,054,441	0	1,513,572	0	1,513,572
2060	427,575,499	18,489,765	18,489,765	0	1,375,203	0	1,375,203
2061	443,405,909	17,907,062	17,907,062	0	1,247,064	0	1,247,064
2062	461,060,700	17,315,372	17,315,372	0	1,129,080	0	1,129,080
2063	480,677,757	16,718,205	16,718,205	0	1,020,731	0	1,020,731
2064	502,399,962	16,115,820	16,115,820	0	921,304	0	921,304
2065	526,379,800	15,508,615	15,508,615	0	830,142	0	830,142
2066	552,779,797	14,897,084	14,897,084	0	746,637	0	746,637
2067	581,773,101	14,281,813	14,281,813	0	670,224	0	670,224
2068	613,544,120	13,663,452	13,663,452	0	600,380	0	600,380
2069	648,289,241	13,042,721	13,042,721	0	536,615	0	536,615
2070	686,217,571	12,420,483	12,420,483	0	478,477	0	478,477



Single Discount Rate Development

Present Values of Projected Benefits

Ending December 31 for 2071 to 2120 (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)
2071	\$ 727,551,640	\$ 11,797,664	\$ 11,797,664	\$ 0	\$ 425,547	\$ 0	\$ 425,547
2072	772,528,269	11,175,197	11,175,197	0	377,429	0	377,429
2073	821,399,513	10,554,124	10,554,124	0	333,758	0	333,758
2074	874,433,588	9,935,577	9,935,577	0	294,192	0	294,192
2075	931,915,881	9,320,792	9,320,792	0	258,416	0	258,416
2076	994,150,012	8,711,086	8,711,086	0	226,135	0	226,135
2077	1,061,458,990	8,107,933	8,107,933	0	197,076	0	197,076
2078	1,134,186,369	7,513,099	7,513,099	0	170,991	0	170,991
2079	1,212,697,350	6,928,437	6,928,437	0	147,644	0	147,644
2080	1,297,380,202	6,355,907	6,355,907	0	126,820	0	126,820
2081	1,388,647,698	5,797,698	5,797,698	0	108,317	0	108,317
2082	1,486,938,555	5,256,044	5,256,044	0	91,945	0	91,945
2083	1,592,719,168	4,733,245	4,733,245	0	77,527	0	77,527
2084	1,706,485,433	4,231,687	4,231,687	0	64,899	0	64,899
2085	1,828,764,679	3,753,702	3,753,702	0	53,903	0	53,903
2086	1,960,117,851	3,301,671	3,301,671	0	44,393	0	44,393
2087	2,101,141,765	2,877,769	2,877,769	0	36,230	0	36,230
2088	2,252,471,747	2,483,851	2,483,851	0	29,280	0	29,280
2089	2,414,784,587	2,121,546	2,121,546	0	23,416	0	23,416
2090	2,588,801,600	1,791,997	1,791,997	0	18,520	0	18,520
2091	2,775,292,164	1,495,792	1,495,792	0	14,474	0	14,474
2092	2,975,077,567	1,232,965	1,232,965	0	11,171	0	11,171
2093	3,189,035,106	1,002,907	1,002,907	0	8,508	0	8,508
2094	3,418,102,558	804,382	804,382	0	6,390	0	6,390
2095	3,663,282,942	635,596	635,596	0	4,727	0	4,727
2096	3,925,649,538	494,344	494,344	0	3,443	0	3,443
2097	4,206,351,087	378,106	378,106	0	2,466	0	2,466
2098	4,506,617,258	284,132	284,132	0	1,735	0	1,735
2099	4,827,764,387	209,566	209,566	0	1,198	0	1,198
2100	5,171,201,485	151,560	151,560	0	811	0	811
2101	5,538,436,539	107,369	107,369	0	538	0	538
2102	5,931,083,143	74,434	74,434	0	349	0	349
2103	6,350,867,496	50,447	50,447	0	222	0	222
2104	6,799,635,806	33,391	33,391	0	137	0	137
2105	7,279,362,156	21,564	21,564	0	83	0	83
2106	7,792,156,880	13,575	13,575	0	49	0	49
2107	8,340,275,514	8,323	8,323	0	28	0	28
2108	8,926,128,380	4,968	4,968	0	16	0	16
2109	9,552,290,843	2,884	2,884	0	9	0	9
2110	10,221,514,327	1,628	1,628	0	5	0	5
2111	10,936,738,098	894	894	0	2	0	2
2112	11,701,101,911	477	477	0	1	0	1
2113	12,517,959,542	249	249	0	1	0	1
2114	13,390,893,275	127	127	0	0	0	0
2115	14,323,729,398	63	63	0	0	0	0
2116	15,320,554,771	30	30	0	0	0	0
2117	16,385,734,529	14	14	0	0	0	0
2118	17,523,931,004	6	6	0	0	0	0
2119	18,740,123,935	2	2	0	0	0	0
2120	20,039,632,056	1	1	0	0	0	0
Totals					\$ 246,600,137	\$ 0	\$ 246,600,137



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.