

# Wyoming Retirement System – Public Employee Plan

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 Retirement System

Dear Board Members:

This report provides information required by the Wyoming Retirement System (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 Retirement System ("WRS") 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 Retirement System as of the valuation date.

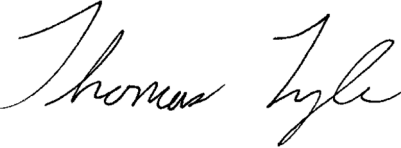
All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

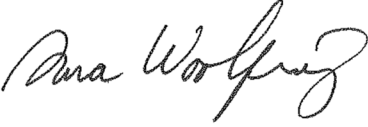
Paul T. Wood, Thomas A. Lyle, and Dana Woolfrey are members of the American Academy of Actuaries (MAAA) and are experienced in performing valuations for public retirement systems. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing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

Respectfully submitted,

**Gabriel, Roeder, Smith & Company**

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# SECTION A

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## EXECUTIVE SUMMARY

# Executive Summary as of December 31, 2021

	<b>2021</b>	
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	
<b>Membership</b>		
Number of		
- Retirees and Beneficiaries	29,407	
- Inactive, Nonretired Members	33,237	
- Active Members	35,110	
- Total	97,754	
Covered Payroll	\$ 1,819,927,957	
<b>Net Pension Liability</b>		
Total Pension Liability	\$ 10,914,588,147	
Plan Fiduciary Net Position	9,389,866,647	
Net Pension Liability	\$ 1,524,721,500	
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	86.03 %	
Net Pension Liability as a Percentage of Covered Payroll	83.78 %	
<b>Development of the Single Discount Rate</b>		
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	
<b>Total Pension Expense</b>	<b>\$ (54,646,902)</b>	
<b>Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses</b>		
	<b>Deferred Outflows of Resources</b>	<b>Deferred Inflows of Resources</b>
Difference between expected and actual experience	\$ 28,595,763	\$ 2,342,664
Changes in assumptions	123,381,033	0
Net difference between projected and actual earnings on pension plan investments	151,643,998	1,165,179,142
Total	\$ 303,620,794	\$ 1,167,521,806

\*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 decrease slightly as a percentage of payroll.
2. The unfunded liability is expected to decrease as a percentage of payroll.
3. The unfunded liability is expected to be fully amortized during the lifetimes of current members.
4. The funded status of the plan is expected to increase gradually 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 a 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**

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### **FINANCIAL STATEMENTS**

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Retirement System. 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	\$	214,075,814
2. Interest on the Total Pension Liability		709,100,401
3. Current-Period Benefit Changes		0
4. Employee Contributions (made negative for addition here)		(169,867,368)
5. Projected Earnings on Plan Investments (made negative for addition here)		(553,331,600)
6. Pension Plan Administrative Expense		7,725,813
7. Other Changes in Plan Fiduciary Net Position		298,065
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		61,872,075
9. Recognition of Outflow (Inflow) of Resources due to Assets		(324,520,102)
<b>10. Total Pension Expense</b>	<b>\$</b>	<b>(54,646,902) *</b>

\* 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	\$ 2,186,282
2. Assumption Changes (gains) or losses	\$ 173,419,980
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	3.4657
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	\$ 630,834
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for assumption changes	\$ 50,038,947
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 50,669,782
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	\$ 1,555,448
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for assumption changes	\$ 123,381,033
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$ 124,936,480

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

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (861,568,742)
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	\$ (172,313,748)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (689,254,994)



# 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	4.0139	3.9136	3.8583	4.1947	4.0527	3.9563	3.8962	3.4657		Deferred Net (Inflows)/Outflows at Measurement Date
	2014	2015	2016	2017	2018	2019	2020	2021	Total	
<b>Total</b>	\$ -	\$ (66,191,620)	\$ (43,790,701)	\$ (56,701,091)	\$ (49,213,548)	\$ (7,044,256)	\$ 55,560,847	\$ 2,186,282		
2014	-	-	-	-	-	-	-	-	-	-
2015	-	(16,913,231)	-	-	-	-	-	-	(16,913,231)	(16,913,231)
2016	-	(16,913,231)	(11,349,740)	-	-	-	-	-	(28,262,971)	(28,262,971)
2017	-	(16,913,231)	(11,349,740)	(13,517,317)	-	-	-	-	(41,780,288)	(41,780,288)
2018	-	(15,451,927)	(11,349,740)	(13,517,317)	(12,143,398)	-	-	-	(52,462,382)	(52,462,382)
2019	-	-	(9,741,481)	(13,517,317)	(12,143,398)	(1,780,516)	-	-	(37,182,712)	(37,182,712)
2020	-	-	-	(13,517,317)	(12,143,398)	(1,780,516)	14,260,266	-	(13,180,965)	(13,180,965)
2021	-	-	-	(2,631,823)	(12,143,398)	(1,780,516)	14,260,266	630,834	(1,664,637)	(1,664,637)
2022	-	-	-	-	(639,956)	(1,702,708)	-	630,834	12,548,436	\$ 26,253,099
2023	-	-	-	-	-	-	12,780,049	630,834	13,410,883	
2024	-	-	-	-	-	-	-	293,780	293,780	
2025	-	-	-	-	-	-	-	-	-	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
<b>Total</b>	\$ -	\$ (66,191,620)	\$ (43,790,701)	\$ (56,701,091)	\$ (49,213,548)	\$ (7,044,256)	\$ 55,560,847	\$ 2,186,282	\$ (165,194,087)	

### Assumption changes - Net (inflows)/outflows of resources

Recognition Period	4.0139	3.9136	3.8583	4.1947	4.0527	3.9563	3.8962	3.4657		
	2014	2015	2016	2017	2018	2019	2020	2021	Total	
<b>Total</b>	\$ -	\$ -	\$ -	\$ 290,801,601	\$ -	\$ -	\$ -	\$ 173,419,980		
2014	-	-	-	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-	-
2017	-	-	-	69,325,959	-	-	-	-	69,325,959	69,325,959
2018	-	-	-	69,325,959	-	-	-	-	69,325,959	69,325,959
2019	-	-	-	69,325,959	-	-	-	-	69,325,959	69,325,959
2020	-	-	-	69,325,959	-	-	-	-	69,325,959	69,325,959
2021	-	-	-	13,497,765	-	-	-	50,038,947	63,536,712	
2022	-	-	-	-	-	-	-	50,038,947	50,038,947	\$ 123,381,033
2023	-	-	-	-	-	-	-	50,038,947	50,038,947	
2024	-	-	-	-	-	-	-	23,303,139	23,303,139	
2025	-	-	-	-	-	-	-	-	-	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
<b>Total</b>	\$ -	\$ -	\$ -	\$ 290,801,601	\$ -	\$ -	\$ -	\$ 173,419,980	\$ 464,221,581	

### 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		
	2014	2015	2016	2017	2018	2019	2020	2021	Total	
<b>Total</b>	\$ 180,861,863	\$ 577,381,461	\$ 35,536,046	\$ (464,917,747)	\$ 758,219,998	\$ (783,381,316)	\$ (270,952,701)	\$ (861,568,742)		
2014	36,172,373	-	-	-	-	-	-	-	36,172,373	
2015	36,172,373	115,476,292	-	-	-	-	-	-	151,648,665	
2016	36,172,373	115,476,292	7,107,209	-	-	-	-	-	158,755,874	
2017	36,172,373	115,476,292	7,107,209	(92,983,549)	-	-	-	-	65,772,325	
2018	36,172,371	115,476,292	7,107,209	(92,983,549)	151,644,000	-	-	-	217,416,323	
2019	-	115,476,293	7,107,209	(92,983,549)	151,644,000	(156,676,263)	-	-	24,567,690	
2020	-	-	7,107,210	(92,983,549)	151,644,000	(156,676,263)	(54,190,540)	-	(145,099,142)	
2021	-	-	-	(92,983,551)	151,643,998	(156,676,263)	(54,190,540)	(172,313,748)	(324,520,102)	
2022	-	-	-	-	151,643,998	(156,676,263)	(54,190,540)	(172,313,748)	(231,536,553)	\$ (1,013,535,144)
2023	-	-	-	-	-	(156,676,264)	(54,190,540)	(172,313,748)	(383,180,552)	
2024	-	-	-	-	-	-	(54,190,541)	(172,313,748)	(226,504,289)	
2025	-	-	-	-	-	-	-	(172,313,750)	(172,313,750)	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
<b>Total</b>	\$ 180,861,863	\$ 577,381,461	\$ 35,536,046	\$ (464,917,747)	\$ 758,219,998	\$ (783,381,316)	\$ (270,952,701)	\$ (861,568,742)	\$ (828,821,138)	

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

	2014	2015	2016	2017	2018	2019	2020	2021	Total	
<b>Total</b>	\$ 180,861,863	\$ 511,189,841	\$ (8,254,655)	\$ (230,817,237)	\$ 709,006,450	\$ (790,425,572)	\$ (215,391,854)	\$ (685,962,480)		
2014	36,172,373	-	-	-	-	-	-	-	36,172,373	
2015	36,172,373	98,563,061	-	-	-	-	-	-	134,735,434	
2016	36,172,373	98,563,061	(4,242,531)	-	-	-	-	-	130,492,903	
2017	36,172,373	98,563,061	(4,242,531)	(37,174,907)	-	-	-	-	93,317,996	
2018	36,172,371	100,024,365	(4,242,531)	(37,174,907)	139,500,602	-	-	-	234,279,900	
2019	-	115,476,293	(2,634,272)	(37,174,907)	139,500,602	(158,456,779)	-	-	56,710,937	
2020	-	-	7,107,210	(37,174,907)	139,500,602	(158,456,779)	(39,930,274)	-	(88,954,148)	
2021	-	-	-	(82,117,609)	139,500,602	(158,456,779)	(39,930,274)	(121,643,967)	(262,648,027)	
2022	-	-	-	-	151,004,042	(158,378,971)	(39,930,274)	(121,643,967)	(168,949,170)	\$ (863,901,012)
2023	-	-	-	-	-	(156,676,264)	(41,410,491)	(121,643,967)	(319,730,722)	
2024	-	-	-	-	-	-	(54,190,541)	(148,716,829)	(202,907,370)	
2025	-	-	-	-	-	-	-	(172,313,750)	(172,313,750)	
2026	-	-	-	-	-	-	-	-	-	
Thereafter	-	-	-	-	-	-	-	-	-	
<b>Total</b>	\$ 180,861,863	\$ 511,189,841	\$ (8,254,655)	\$ (230,817,237)	\$ 709,006,450	\$ (790,425,572)	\$ (215,391,854)	\$ (685,962,480)	\$ (529,793,644)	



# 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	\$ 78,427,812	\$ 16,555,737	\$ 61,872,075
2. Due to Assets	151,644,000	476,164,102	(324,520,102)
<b>3. Total</b>	<b>\$ 230,071,812</b>	<b>\$ 492,719,839</b>	<b>\$ (262,648,027)</b>

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 14,891,100	\$ 16,555,737	\$ (1,664,637)
2. Assumption Changes	63,536,712	0	63,536,712
3. Net Difference between projected and actual earnings on pension plan investments	151,644,000	476,164,102	(324,520,102)
<b>4. Total</b>	<b>\$ 230,071,812</b>	<b>\$ 492,719,839</b>	<b>\$ (262,648,027)</b>

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

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 28,595,763	\$ 2,342,664	\$ 26,253,099
2. Assumption Changes	123,381,033	0	123,381,033
3. Net Difference between projected and actual earnings on pension plan investments	151,643,998	1,165,179,142	(1,013,535,144)
<b>4. Total</b>	<b>\$ 303,620,794</b>	<b>\$ 1,167,521,806</b>	<b>\$ (863,901,012)</b>

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

Year Ending December 31	Net Deferred Outflows of Resources
2022	\$ (168,949,170)
2023	(319,730,722)
2024	(202,907,370)
2025	(172,313,750)
2026	0
Thereafter	0
<b>Total</b>	<b>\$ (863,901,012)</b>



## Statement of Fiduciary Net Position as of December 31, 2021

	<b>2021</b>
<b>Assets</b>	
Cash and Deposits	\$ 459,356,639
Receivables	
Accounts Receivable - Sale of Investments	\$ 9,134,653
Accrued Interest and Other Dividends	21,901,115
Contributions	18,332,505
Accounts Receivable - Other	757,675,255
Total Receivables	\$ 807,043,528
Investments	
Fixed Income	\$ 1,730,448,135
Equities	4,552,690,130
Private Markets	986,583,756
Marketable Alternatives	1,649,150,285
Security Lending Collateral	500,118,689
Capital Assets, at Cost, Net of Accumulated Depreciation	2,344,145
Total Investments	\$ 9,421,335,140
<b>Total Assets</b>	<b>\$ 10,687,735,307</b>
<b>Liabilities</b>	
Payables	
Accounts Payable - Purchase of Investments	\$ 1,285,618,019
Accrued Expenses	11,548,297
Accounts Payable - Other	702,344
Total Liabilities	\$ 1,297,868,660
<b>Net Position Restricted for Pensions</b>	<b>\$ 9,389,866,647</b>



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

	<b>2021</b>
<b>Additions</b>	
Contributions	
Employer	\$ 168,461,347
Employee	166,331,964
Other Employer Contributions	2,215,544
Other Employee Contributions	3,535,404
<b>Total Contributions</b>	<b>\$ 340,544,259</b>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 1,312,107,813
Interest and Dividends	156,088,626
Less Investment Expense	(53,296,097)
<b>Net Investment Income</b>	<b>\$ 1,414,900,342</b>
Other	\$ 0
<b>Total Additions</b>	<b>\$ 1,755,444,601</b>
 <b>Deductions</b>	
Benefit Payments, including Refunds of Employee Contributions	\$ 651,795,973
Pension Plan Administrative Expense	7,725,813
Other	298,065
<b>Total Deductions</b>	<b>\$ 659,819,851</b>
<b>Net Increase in Net Position</b>	<b>\$ 1,095,624,750</b>
 <b>Net Position Restricted for Pensions</b>	
Beginning of Year	\$ 8,294,241,897
End of Year	<b>\$ 9,389,866,647</b>

## SECTION C

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### **REQUIRED SUPPLEMENTARY INFORMATION**

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Retirement System. 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

<b>A. Total pension liability</b>	
1. Service cost	\$ 214,075,814
2. Interest on the total pension liability	709,100,401
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the total pension liability	2,186,282
5. Changes of assumptions	173,419,980
6. Benefit payments, including refunds of employee contributions	(651,795,973)
<b>7. Net change in total pension liability</b>	<b>446,986,504</b>
<b>8. Total pension liability – beginning</b>	<b>10,467,601,643</b>
<b>9. Total pension liability – ending</b>	<b>\$ 10,914,588,147</b>
<b>B. Plan fiduciary net position</b>	
1. Contributions – employer	\$ 170,676,891
2. Contributions – employee	169,867,368
3. Net investment income	1,414,900,342
4. Benefit payments, including refunds of employee contributions	(651,795,973)
5. Pension plan administrative expense	(7,725,813)
6. Other	(298,065)
<b>7. Net change in plan fiduciary net position</b>	<b>1,095,624,750</b>
<b>8. Plan fiduciary net position – beginning</b>	<b>8,294,241,897</b>
<b>9. Plan fiduciary net position – ending</b>	<b>\$ 9,389,866,647</b>
<b>C. Net pension liability</b>	<b>\$ 1,524,721,500</b>
<b>D. Plan fiduciary net position as a percentage of the total pension liability</b>	<b>86.03 %</b>
<b>E. Covered-employee payroll</b>	<b>\$ 1,819,927,957</b>
<b>F. Net pension liability as a percentage of covered-employee payroll</b>	<b>83.78 %</b>

# 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
<b>Total pension liability</b>								
Service cost	\$ 214,075,814	\$ 198,288,435	\$ 194,455,298	\$ 195,575,014	\$ 201,824,345	\$ 219,893,113	\$ 217,488,957	\$ 213,059,299
Interest on the total pension liability	709,100,401	699,015,173	676,902,286	658,459,157	641,429,003	664,368,366	638,943,600	614,848,444
Changes of benefit terms	0	0	0	0	0	0	0	0
Difference between expected and actual experience	2,186,282	55,560,847	(7,044,256)	(49,213,548)	(56,701,091)	(43,790,701)	(66,191,620)	0
Changes of assumptions	173,419,980	0	0	0	290,801,601	0	0	0
Benefit payments, including refunds of employee contributions	(651,795,973)	(625,747,935)	(600,487,685)	(566,027,667)	(535,492,257)	(501,610,080)	(469,954,814)	(436,096,614)
<b>Net change in total pension liability</b>	446,986,504	327,116,520	263,825,643	238,792,956	541,861,601	338,860,698	320,286,123	391,811,130
<b>Total pension liability - beginning</b>	10,467,601,643	10,140,485,123	9,876,659,480	9,637,866,524	9,096,004,923	8,757,144,225	8,436,858,102	8,045,046,972
<b>Total pension liability - ending (a)</b>	<u>\$ 10,914,588,147</u>	<u>\$ 10,467,601,643</u>	<u>\$ 10,140,485,123</u>	<u>\$ 9,876,659,480</u>	<u>\$ 9,637,866,524</u>	<u>\$ 9,096,004,923</u>	<u>\$ 8,757,144,225</u>	<u>\$ 8,436,858,102</u>
<b>Plan fiduciary net position</b>								
Employer contributions	\$ 170,676,891	\$ 165,984,825	\$ 157,385,096	\$ 147,632,510	\$ 148,746,669	\$ 151,488,715	\$ 144,622,373	\$ 127,929,930
Employee contributions	169,867,368	165,086,190	157,610,787	151,130,515	149,752,251	152,422,538	153,529,134	137,144,565
Pension plan net investment income	1,414,900,342	805,893,355	1,251,518,669	(252,571,153)	923,878,089	454,712,993	(67,155,642)	318,184,952
Benefit payments, including refunds of employee contributions	(651,795,973)	(625,747,935)	(600,487,685)	(566,027,667)	(535,492,257)	(501,610,080)	(469,954,814)	(436,096,614)
Pension plan administrative expense	(7,725,813)	(7,238,487)	(6,527,091)	(7,033,951)	(6,551,109)	(5,993,529)	(5,097,818)	(5,182,863)
Other	(298,065)	(294,893)	(309,531)	(287,669)	(312,336)	(312,336)	(312,704)	5,539,339
<b>Net change in plan fiduciary net position</b>	1,095,624,750	503,683,055	959,190,245	(527,157,415)	680,021,307	250,708,301	(244,369,471)	147,519,309
<b>Plan fiduciary net position - beginning</b>	8,294,241,897	7,790,558,842	6,831,368,597	7,358,526,012	6,678,504,705	6,427,796,404	6,672,165,875	6,524,646,566
<b>Plan fiduciary net position - ending (b)</b>	<u>\$ 9,389,866,647</u>	<u>\$ 8,294,241,897</u>	<u>\$ 7,790,558,842</u>	<u>\$ 6,831,368,597</u>	<u>\$ 7,358,526,012</u>	<u>\$ 6,678,504,705</u>	<u>\$ 6,427,796,404</u>	<u>\$ 6,672,165,875</u>
<b>Net pension liability - ending (a) - (b)</b>	<u>\$ 1,524,721,500</u>	<u>\$ 2,173,359,746</u>	<u>\$ 2,349,926,281</u>	<u>\$ 3,045,290,883</u>	<u>\$ 2,279,340,512</u>	<u>\$ 2,417,500,218</u>	<u>\$ 2,329,347,821</u>	<u>\$ 1,764,692,227</u>
<b>Plan fiduciary net position as a percentage of total pension liability</b>	86.03 %	79.24 %	76.83 %	69.17 %	76.35 %	73.42 %	73.40 %	79.08 %
<b>Covered-employee payroll</b>	\$ 1,819,927,957	\$ 1,780,467,331	\$ 1,738,212,750	\$ 1,741,354,609	\$ 1,776,377,586	\$ 1,782,905,215	\$ 1,744,073,882	\$ 1,709,412,443
<b>Projected valuation payroll</b>	\$ 1,865,426,156	\$ 1,824,979,015	\$ 1,781,668,069	\$ 1,784,888,475	\$ 1,820,787,026	\$ 1,858,678,687	\$ 1,818,197,022	\$ 1,782,062,471
<b>Net pension liability as a percentage of covered-employee payroll</b>	83.78 %	122.07 %	135.19 %	174.88 %	128.31 %	135.59 %	133.56 %	103.23 %

**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	\$ 8,436,858,102	\$ 6,672,165,875	\$ 1,764,692,227	79.08 %	\$ 1,709,412,443	103.23 %
2015	8,757,144,225	6,427,796,404	2,329,347,821	73.40 %	1,744,073,882	133.56 %
2016	9,096,004,923	6,678,504,705	2,417,500,218	73.42 %	1,782,905,215	135.59 %
2017	9,637,866,524	7,358,526,012	2,279,340,512	76.35 %	1,776,377,586	128.31 %
2018	9,876,659,480	6,831,368,597	3,045,290,883	69.17 %	1,741,354,609	174.88 %
2019	10,140,485,123	7,790,558,842	2,349,926,281	76.83 %	1,738,212,750	135.19 %
2020	10,467,601,643	8,294,241,897	2,173,359,746	79.24 %	1,780,467,331	122.07 %
2021	10,914,588,147	9,389,866,647	1,524,721,500	86.03 %	1,819,927,957	83.78 %

\* 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	\$ 183,086,430	\$ 129,627,747	\$ 53,458,683	\$ 1,709,412,443	7.58 %
2015	168,411,742	144,622,373	23,789,369	1,744,073,882	8.29 %
2016	174,211,753	151,488,715	22,723,038	1,782,905,215	8.50 %
2017	167,125,230	148,746,669	18,378,561	1,776,377,586	8.37 %
2018	191,677,662	147,632,510	44,045,152	1,741,354,609	8.48 %
2019	207,518,684	157,385,096	50,133,588	1,738,212,750	9.05 %
2020	219,815,919	165,984,825	53,831,094	1,780,467,331	9.32 %
2021	212,378,768	170,676,891	41,701,877	1,819,927,957	9.38 %

\* 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	26 years
Asset Valuation Method	5-Year smoothed market
Inflation	2.25%
Salary Increases	2.5% to 6.5% 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 9.37% of salary plus, effective March 5, 2015, an additional 1.00% for park rangers. Employees are contributing at the rate of 9.25% 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 Return<sup>1</sup></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 %

<sup>1</sup> Annual money-weighted rate of return, net of investment expenses.



## SECTION D

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### NOTES TO FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Wyoming Retirement System. 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 the expected rate of return on pension plan investments of 6.80%. 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 contribution rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

## 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%
\$ 2,813,092,405	\$ 1,524,721,500	\$ 456,735,193

## Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	29,407
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	33,237
Active Plan Members	<u>35,110</u>
Total Plan Members	97,754

# SECTION E

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## SUMMARY OF BENEFITS

## Summary of Benefits

<b>Covered Members</b>	Any full-time or regular part-time employee of an employer as defined under W.S. 9-3-402(a)(vii)
<b>Tier</b>	Members who join the State of Wyoming Retirement System by August 31, 2012 are in Tier 1, while members who join on or after September 1, 2012 are in Tier 2.
<b>Final Average Salary</b>	For Tier 1 member: employee's average annual salary for the highest paid three continuous years of service. For Tier 2 member: employee's average annual salary for the highest paid five continuous years of service.
<b>Service Retirement</b>	
Eligibility	Tier 1 members may retire upon normal retirement on the date he/she attains age 60 with four or more years of service while Tier 2 members may retire upon normal retirement on the date he/she attains age 65 with four or more years of service. All employees may also retire upon normal retirement on the date that the sum of the member's age and service is at least 85. Tier 1 members are eligible for a reduced benefit at age 50 with four or more years of service and Tier 2 members are eligible for a reduced benefit at age 55 with four or more years of service. All members are eligible for a reduced benefit at any age with 25 or more years of service.
Monthly Benefit	For Tier 1 member: 2.125% of employee's Final Average Salary for each year of credited service for the first 15 years of service credit plus 2.25% of Final Average Salary for any years of service credit exceeding 15 years. For Tier 2 member: 2.000% of employee's Final (5-year) Average Salary for each year of credited service.  This amount is reduced by 5.00% per year that the employee is under age 60 for Tier 1 and under age 65 for Tier 2. However, members retiring with a combined age and service of at least 85 receive an unreduced benefit. Employees hired prior to July 1, 1981 may be entitled to benefits earned under a different formula.
Vesting	Any employee who has left employment with four or more years of service, and who has not withdrawn accumulated contributions, is eligible to receive the above benefit or can elect to receive a lump-sum refund of employee contributions with interest. An employee who terminates with less than four years of service is only eligible for the lump-sum benefit.



## Disability Benefit

Eligibility	Ten or more years of service.
Benefit	Service retirement benefit earned as of the date of disability, payable immediately.
Park Rangers	Effective March 5, 2015, for eligible peace officers as defined under W.S. 6-1-104(a)(vi)(P) whose disability is duty-related, the member shall be eligible immediately for a benefit of 62.5% of the member's final salary.

## Pre-retirement Death Benefit

Eligibility	No age or service requirements.
Benefit	A lump sum equal to two times the employee contributions with interest. If the employee is vested, the beneficiary can elect, in lieu of this lump sum, to receive a monthly annuity equal to the actuarial equivalent of the retirement benefit that would be due the employee.
Park Rangers	Effective March 5, 2015, for eligible peace officers as defined under W.S. 6-1-104(a)(vi)(P) whose death is duty-related, the member shall be eligible immediately for a benefit of 62.5% of member's final actual salary, payable to the surviving spouse plus 6% of the member's final actual salary for each unmarried child under age 18. Payment shall not exceed the member's final actual salary.

## Contributions

Employee	9.25% of salary
Employer	9.37% of salary plus an additional 1.00% for park rangers.

Interest	3.00% annually (0.00% for non-vested members).
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**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

All options include the choice to elect a reduced benefit with a self-funded annual COLA of 1%, 2%, or 3% per year. COLAs commence on the July 1<sup>st</sup> following the two-year anniversary of retirement.

- |           |   |
|-----------|---|
| Option 1  | Monthly benefit for life with a lump-sum death benefit equal to the excess (if any) of the employee contributions with interest over the total benefits received.                                 |
| Option 2  | Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary.  |
| Option 2P | Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary. Benefit reverts to Option 1 amount but without the cash refund feature upon beneficiary death. |
| Option 3  | Monthly benefit for life. Upon death, 50% of the benefit continues to be paid to the beneficiary.   |
| Option 3P | Monthly benefit for life. Upon death, 50% of the benefit continues to be paid to the beneficiary. Benefit reverts to Option 1 amount but without the cash refund feature upon beneficiary death.  |
| Option 4a | Monthly benefit for life with a guarantee of 120 monthly payments   |
| Option 4b | Monthly benefit for life with a guarantee of 240 monthly payments   |
| Option 5  | The largest possible monthly benefit payable for life with no lump-sum death benefit.   |

## **SECTION F**

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### **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 1<sup>st</sup>, 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 consider 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

Service	Rate
1	6.50%
2	6.50%
3	6.50%
4	6.00%
5	5.25%
6	4.75%
7	4.25%
8	4.00%
9	4.00%
10	3.50%
11	3.50%
12	3.50%
13	3.50%
14	3.25%
15	3.00%
16	3.00%
17	2.75%
18	2.75%
19	2.75%
20	2.75%
21+	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. Mortality

Healthy Pre-Retirement Mortality:

Pub-2010 General 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 General 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 103%

Disabled Mortality

Pub-2010 General 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	0.03%	0.01%	0.03%	0.01%	0.35%	0.20%
25	0.02%	0.01%	0.02%	0.01%	0.24%	0.14%
30	0.03%	0.01%	0.03%	0.01%	0.30%	0.22%
35	0.04%	0.02%	0.04%	0.02%	0.39%	0.35%
40	0.06%	0.03%	0.06%	0.03%	0.56%	0.54%
45	0.08%	0.05%	0.09%	0.06%	0.87%	0.85%
50	0.13%	0.07%	0.26%	0.20%	1.38%	1.28%
55	0.19%	0.11%	0.37%	0.25%	1.82%	1.50%
60	0.27%	0.16%	0.53%	0.34%	2.16%	1.68%
65	0.40%	0.26%	0.79%	0.55%	2.63%	1.95%
70	0.61%	0.43%	1.33%	0.95%	3.40%	2.49%
75			2.35%	1.70%	4.56%	3.52%
80			4.23%	3.06%	6.51%	5.32%
85			7.80%	5.81%	9.82%	8.48%
90			13.69%	11.04%	15.16%	12.75%
95			21.90%	18.55%	22.60%	18.47%
100			31.55%	28.06%	31.55%	27.24%

b. Disability

Age	Male	Female
20	0.01%	0.01%
25	0.01%	0.01%
30	0.01%	0.01%
35	0.01%	0.01%
40	0.01%	0.01%
45	0.02%	0.02%
50	0.12%	0.05%
55+	0.24%	0.12%

c. Withdrawal

Service	Male	Female
1-4	13.00%	14.00%
5	13.00%	13.00%
6	11.00%	11.00%
7	10.00%	10.00%
8	9.00%	9.00%
9	8.00%	8.00%
10	8.00%	8.00%
11	8.00%	8.00%
12	8.00%	7.00%
13	7.00%	7.00%
14	6.00%	7.00%
15	6.00%	6.00%
16	5.00%	6.00%
17	5.00%	6.00%
18	4.00%	6.00%
19+	3.00%	6.00%

d. Retirement Rates

Age	Retirement	
	Unreduced	Reduced
<50	15.00%	0.20%
50-54	15.00%	0.20%
55-59	17.00%	0.20%
60-61	13.00%	0.20%
62	18.00%	0.30%
63-64	15.00%	0.50%
65	30.00%	1.00%
66	35.00%	1.00%
67	28.00%	1.00%
68	25.00%	1.50%
69	25.00%	2.00%
70	25.00%	2.50%
71-73	20.00%	2.50%
74-79	15.00%	2.50%
80+	100.00%	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. It is assumed that the active members will elect the maximum value of the refund of deferred benefit when they terminate.
- e. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available, which for this plan is age 60 (65 for Tier 2).
- f. No benefit amount 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. 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 2.50% 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. Exact fractional service is used to determine the amount of benefit payable.

## 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**

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### **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	Projected Payroll for		Total Employee Payroll	Contributions from Current Employees	Employer Contributions Related to Payroll of		Total Contributions
	Current Employees	Payroll for Future Employees			Current Employees	Future Employees	
	(a)	(b)=max(0,(c)-(a))	(c)	(d)	(e)=(a)*ER%	(f) = (b)*netER%	(g)=(d)+(e)+(f)
2021	\$ 1,819,927,957	\$ 45,498,199	\$ 1,865,426,156	\$ 169,867,368	\$ 168,313,032	\$ 3,683,719	\$ 341,864,119
2022	1,803,267,944	108,793,866	1,912,061,810	166,802,285	168,966,206	8,808,393	344,576,884
2023	1,692,694,528	267,168,827	1,959,863,355	156,574,244	158,605,477	21,634,557	336,814,278
2024	1,591,273,442	417,586,497	2,008,859,939	147,192,793	149,102,322	33,819,052	330,114,167
2025	1,498,422,813	560,658,624	2,059,081,437	138,604,110	140,402,218	45,374,102	324,380,430
2026	1,413,579,038	696,979,435	2,110,558,473	130,756,061	132,452,356	56,316,556	319,524,973
2027	1,334,790,742	828,531,693	2,163,322,435	123,468,144	125,069,893	66,828,353	315,366,390
2028	1,260,786,468	956,619,028	2,217,405,496	116,622,748	118,135,692	77,036,664	311,795,104
2029	1,190,572,465	1,082,268,168	2,272,840,633	110,127,953	111,556,640	87,045,979	308,730,572
2030	1,122,524,958	1,207,136,691	2,329,661,649	103,833,559	105,180,589	97,006,677	306,020,825
2031	1,056,110,418	1,331,792,772	2,387,903,190	97,690,214	98,957,546	106,976,198	303,623,958
2032	991,573,927	1,456,026,843	2,447,600,770	91,720,588	92,910,477	116,948,029	301,579,094
2033	928,820,577	1,579,970,212	2,508,790,789	85,915,903	87,030,488	126,945,259	299,891,650
2034	867,247,609	1,704,262,950	2,571,510,559	80,220,404	81,261,101	137,028,286	298,509,791
2035	806,902,192	1,828,896,131	2,635,798,323	74,638,453	75,606,735	147,202,344	297,447,532
2036	747,788,623	1,953,904,658	2,701,693,281	69,170,448	70,067,794	157,476,793	296,715,035
2037	689,713,120	2,079,522,493	2,769,235,613	63,798,464	64,626,119	167,870,672	296,295,255
2038	633,394,557	2,205,071,946	2,838,466,503	58,588,997	59,349,070	178,324,424	296,262,491
2039	579,487,319	2,329,940,847	2,909,428,166	53,602,577	54,297,962	188,783,458	296,683,997
2040	527,900,339	2,454,263,531	2,982,163,870	48,830,781	49,464,262	199,253,694	297,548,737
2041	478,459,150	2,578,258,817	3,056,717,967	44,257,471	44,831,622	209,746,730	298,835,823
2042	431,324,382	2,701,811,534	3,133,135,916	39,897,505	40,415,095	220,247,282	300,559,882
2043	386,422,530	2,825,041,784	3,211,464,314	35,744,084	36,207,791	230,759,224	302,711,099
2044	343,908,545	2,947,842,377	3,291,750,922	31,811,540	32,224,231	241,267,845	305,303,616
2045	304,301,642	3,069,743,053	3,374,044,695	28,147,902	28,513,064	251,727,587	308,388,553
2046	267,834,956	3,190,560,856	3,458,395,812	24,774,733	25,096,135	262,122,866	311,993,734
2047	234,308,360	3,310,547,347	3,544,855,707	21,673,523	21,954,693	272,472,822	316,101,038
2048	203,401,717	3,430,075,383	3,633,477,100	18,814,659	19,058,741	282,798,082	320,671,482
2049	175,062,342	3,549,251,686	3,724,314,028	16,193,267	16,403,341	293,097,351	325,693,959
2050	149,191,237	3,668,230,642	3,817,421,879	13,800,189	13,979,219	303,373,954	331,153,362
2051	125,727,500	3,787,129,926	3,912,857,426	11,629,794	11,780,667	313,627,582	337,038,043
2052	104,823,590	3,905,855,272	4,010,678,862	9,696,182	9,821,970	323,839,645	343,357,797
2053	86,642,173	4,024,303,661	4,110,945,834	8,014,401	8,118,372	333,994,068	350,126,841
2054	71,082,758	4,142,636,722	4,213,719,480	6,575,155	6,660,454	344,103,778	357,339,387
2055	57,964,862	4,261,097,605	4,319,062,467	5,361,750	5,431,308	354,192,191	364,985,249
2056	47,038,624	4,380,000,405	4,427,039,029	4,351,073	4,407,519	364,289,420	373,048,012
2057	38,000,278	4,499,714,727	4,537,715,005	3,515,026	3,560,626	374,429,770	381,505,422
2058	30,543,426	4,620,614,454	4,651,157,880	2,825,267	2,861,919	384,647,203	390,334,389
2059	24,402,476	4,743,034,351	4,767,436,827	2,257,229	2,286,512	394,972,086	399,515,827
2060	19,375,632	4,867,247,116	4,886,622,748	1,792,246	1,815,497	405,428,924	409,036,667
2061	15,253,148	4,993,535,169	5,008,788,317	1,410,916	1,429,220	416,042,792	418,882,928
2062	11,909,257	5,122,098,768	5,134,008,025	1,101,606	1,115,897	426,831,837	429,049,340
2063	9,224,966	5,253,133,260	5,262,358,226	853,309	864,379	437,813,480	439,531,168
2064	7,070,576	5,386,846,606	5,393,917,182	654,028	662,513	449,006,447	450,322,988
2065	5,375,699	5,523,389,413	5,528,765,112	497,252	503,703	460,425,138	461,426,093
2066	4,076,868	5,662,907,372	5,666,984,240	377,110	382,003	472,083,477	472,842,590
2067	3,094,005	5,805,564,841	5,808,658,846	286,195	289,908	483,996,490	484,572,593
2068	2,347,913	5,951,527,404	5,953,875,317	217,182	219,999	496,179,173	496,616,354
2069	1,779,696	6,100,942,504	6,102,722,200	164,622	166,757	508,644,842	508,976,221
2070	1,347,951	6,253,942,304	6,255,290,255	124,685	126,303	521,405,434	521,656,422



# Single Discount Rate Development Projection of Contributions Ending December 31 for 2071 to 2120 (concluded)

Year	Projected Payroll for		Total Employee Payroll	Contributions from Current Employees	Employer Contributions for		Total Contributions
	Current Employees	Payroll for Future Employees			Current Employees	Employer Contributions Related to Payroll of Future Employees	
	(a)	(b)=max(0,(c)-(a))	(c)	(d)	(e)=(a)*ER%	(f) = (b)*netER%	(g)=(d)+(e)+(f)
2071	\$ 1,015,856	\$ 6,410,656,655	\$ 6,411,672,511	\$ 93,967	\$ 95,186	\$ 534,472,492	\$ 534,661,645
2072	757,743	6,571,206,581	6,571,964,324	70,091	71,000	547,856,770	547,997,861
2073	561,472	6,735,701,960	6,736,263,432	51,936	52,610	561,567,993	561,672,539
2074	406,328	6,904,263,690	6,904,670,018	37,585	38,073	575,616,695	575,692,353
2075	286,229	7,077,000,539	7,077,286,768	26,476	26,820	590,012,457	590,065,753
2076	194,362	7,254,024,575	7,254,218,937	17,979	18,212	604,765,030	604,801,221
2077	124,979	7,435,449,431	7,435,574,410	11,561	11,711	619,884,187	619,907,459
2078	75,127	7,621,388,643	7,621,463,770	6,949	7,039	635,379,737	635,393,725
2079	40,979	7,811,959,385	7,812,000,364	3,791	3,840	651,261,724	651,269,355
2080	21,089	8,007,279,284	8,007,300,373	1,951	1,976	667,540,199	667,544,126
2081	10,370	8,207,472,512	8,207,482,882	959	972	684,225,662	684,227,593
2082	3,704	8,412,666,250	8,412,669,954	343	347	701,328,744	701,329,434
2083	843	8,622,985,860	8,622,986,703	78	79	718,859,905	718,860,062
2084	34	8,838,561,337	8,838,561,371	3	3	736,829,948	736,829,954
2085	0	9,059,525,405	9,059,525,405	0	0	755,249,887	755,249,887
2086	0	9,286,013,540	9,286,013,540	0	0	774,130,960	774,130,960
2087	0	9,518,163,879	9,518,163,879	0	0	793,484,622	793,484,622
2088	0	9,756,117,976	9,756,117,976	0	0	813,322,605	813,322,605
2089	0	10,000,020,925	10,000,020,925	0	0	833,656,932	833,656,932
2090	0	10,250,021,448	10,250,021,448	0	0	854,499,915	854,499,915
2091	0	10,506,271,984	10,506,271,984	0	0	875,864,178	875,864,178
2092	0	10,768,928,784	10,768,928,784	0	0	897,762,662	897,762,662
2093	0	11,038,152,004	11,038,152,004	0	0	920,208,644	920,208,644
2094	0	11,314,105,804	11,314,105,804	0	0	943,215,742	943,215,742
2095	0	11,596,958,449	11,596,958,449	0	0	966,797,927	966,797,927
2096	0	11,886,882,410	11,886,882,410	0	0	990,969,534	990,969,534
2097	0	12,184,054,470	12,184,054,470	0	0	1,015,745,267	1,015,745,267
2098	0	12,488,655,832	12,488,655,832	0	0	1,041,140,206	1,041,140,206
2099	0	12,800,872,228	12,800,872,228	0	0	1,067,169,819	1,067,169,819
2100	0	13,120,894,034	13,120,894,034	0	0	1,093,849,966	1,093,849,966
2101	0	13,448,916,385	13,448,916,385	0	0	1,121,196,911	1,121,196,911
2102	0	13,785,139,295	13,785,139,295	0	0	1,149,227,328	1,149,227,328
2103	0	14,129,767,777	14,129,767,777	0	0	1,177,958,316	1,177,958,316
2104	0	14,483,011,971	14,483,011,971	0	0	1,207,407,404	1,207,407,404
2105	0	14,845,087,270	14,845,087,270	0	0	1,237,592,562	1,237,592,562
2106	0	15,216,214,452	15,216,214,452	0	0	1,268,532,215	1,268,532,215
2107	0	15,596,619,813	15,596,619,813	0	0	1,300,245,247	1,300,245,247
2108	0	15,986,535,308	15,986,535,308	0	0	1,332,751,018	1,332,751,018
2109	0	16,386,198,691	16,386,198,691	0	0	1,366,069,371	1,366,069,371
2110	0	16,795,853,658	16,795,853,658	0	0	1,400,220,643	1,400,220,643
2111	0	17,215,749,999	17,215,749,999	0	0	1,435,225,678	1,435,225,678
2112	0	17,646,143,749	17,646,143,749	0	0	1,471,105,841	1,471,105,841
2113	0	18,087,297,343	18,087,297,343	0	0	1,507,883,024	1,507,883,024
2114	0	18,539,479,777	18,539,479,777	0	0	1,545,579,666	1,545,579,666
2115	0	19,002,966,771	19,002,966,771	0	0	1,584,218,762	1,584,218,762
2116	0	19,478,040,940	19,478,040,940	0	0	1,623,823,882	1,623,823,882
2117	0	19,964,991,964	19,964,991,964	0	0	1,664,419,181	1,664,419,181
2118	0	20,464,116,763	20,464,116,763	0	0	1,706,029,415	1,706,029,415
2119	0	20,975,719,682	20,975,719,682	0	0	1,748,679,958	1,748,679,958
2120	0	21,500,112,674	21,500,112,674	0	0	1,792,396,817	1,792,396,817



# 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	\$ 8,294,241,897	\$ 340,544,259	\$ 651,795,973	\$ 8,023,878	\$ 1,414,900,342	\$ 9,389,866,647
2022	9,389,866,647	344,576,884	673,097,796	7,265,835	627,281,936	9,681,361,836
2023	9,681,361,836	336,814,278	693,267,663	7,447,481	646,163,449	9,963,624,418
2024	9,963,624,418	330,114,167	712,593,883	7,633,668	664,480,735	10,237,991,770
2025	10,237,991,770	324,380,430	735,200,168	7,824,509	682,183,619	10,501,531,142
2026	10,501,531,142	319,524,973	757,238,110	8,020,122	699,198,416	10,754,996,299
2027	10,754,996,299	315,366,390	778,981,781	8,220,625	715,561,149	10,998,721,431
2028	10,998,721,431	311,795,104	799,723,201	8,426,141	731,314,547	11,233,681,741
2029	11,233,681,741	308,730,572	820,656,242	8,636,794	746,482,305	11,459,601,582
2030	11,459,601,582	306,020,825	841,038,951	8,852,714	761,065,402	11,676,796,144
2031	11,676,796,144	303,623,958	860,629,382	9,074,032	775,091,957	11,885,808,644
2032	11,885,808,644	301,579,094	879,406,812	9,300,883	788,600,906	12,087,280,949
2033	12,087,280,949	299,891,650	897,476,257	9,533,405	801,632,559	12,281,795,496
2034	12,281,795,496	298,509,791	915,402,126	9,771,740	814,205,912	12,469,337,333
2035	12,469,337,333	297,447,532	932,905,637	10,016,034	826,329,732	12,650,192,925
2036	12,650,192,925	296,715,035	949,372,511	10,266,434	838,044,377	12,825,313,392
2037	12,825,313,392	296,295,255	964,599,146	10,523,095	849,420,756	12,995,907,163
2038	12,995,907,163	296,262,491	978,016,846	10,786,173	860,562,540	13,163,929,175
2039	13,163,929,175	296,683,997	989,585,692	11,055,827	871,606,243	13,331,577,895
2040	13,331,577,895	297,548,737	999,425,623	11,332,223	882,696,975	13,501,065,761
2041	13,501,065,761	298,835,823	1,006,950,876	11,615,528	894,004,066	13,675,339,247
2042	13,675,339,247	300,559,882	1,012,510,377	11,905,916	905,716,692	13,857,199,528
2043	13,857,199,528	302,711,099	1,015,821,463	12,203,564	918,034,450	14,049,920,049
2044	14,049,920,049	305,303,616	1,016,611,892	12,508,654	931,189,507	14,257,292,626
2045	14,257,292,626	308,388,553	1,015,113,822	12,821,370	945,433,644	14,483,179,631
2046	14,483,179,631	311,993,734	1,010,781,322	13,141,904	961,048,684	14,732,298,823
2047	14,732,298,823	316,101,038	1,003,990,802	13,470,452	978,342,235	15,009,280,842
2048	15,009,280,842	320,671,482	994,962,338	13,807,213	997,620,510	15,318,803,283
2049	15,318,803,283	325,693,959	983,668,038	14,152,393	1,019,202,140	15,665,878,950
2050	15,665,878,950	331,153,362	970,144,512	14,506,203	1,043,426,259	16,055,807,856
2051	16,055,807,856	337,038,043	954,287,095	14,868,858	1,070,656,371	16,494,346,317
2052	16,494,346,317	343,357,797	936,442,565	15,240,580	1,101,272,630	16,987,293,599
2053	16,987,293,599	350,126,841	917,607,372	15,621,594	1,135,636,531	17,539,828,005
2054	17,539,828,005	357,339,387	897,954,158	16,012,134	1,174,094,225	18,157,295,326
2055	18,157,295,326	364,985,249	877,687,490	16,412,437	1,217,002,035	18,845,182,683
2056	18,845,182,683	373,048,012	856,545,995	16,822,748	1,264,741,270	19,609,603,221
2057	19,609,603,221	381,505,422	834,222,149	17,243,317	1,317,737,154	20,457,380,332
2058	20,457,380,332	390,334,389	811,138,895	17,674,400	1,376,438,753	21,395,340,179
2059	21,395,340,179	399,515,827	786,907,397	18,116,260	1,441,322,604	22,431,154,953
2060	22,431,154,953	409,036,667	761,567,531	18,569,166	1,512,908,635	23,572,963,558
2061	23,572,963,558	418,882,928	735,169,980	19,033,396	1,591,748,120	24,829,391,230
2062	24,829,391,230	429,049,340	707,623,276	19,509,230	1,678,430,448	26,209,738,512
2063	26,209,738,512	439,531,168	678,955,663	19,996,961	1,773,586,944	27,723,904,000
2064	27,723,904,000	450,322,988	648,819,256	20,496,885	1,877,902,154	29,382,813,001
2065	29,382,813,001	461,426,093	617,758,450	21,009,307	1,992,100,827	31,197,572,164
2066	31,197,572,164	472,842,590	586,434,604	21,534,540	2,116,916,160	33,179,361,770
2067	33,179,361,770	484,572,593	554,818,764	22,072,904	2,253,109,372	35,340,152,067
2068	35,340,152,067	496,616,354	523,167,928	22,624,726	2,401,485,843	37,692,461,609
2069	37,692,461,609	508,976,221	491,815,267	23,190,344	2,562,885,761	40,249,317,981
2070	40,249,317,981	521,656,422	460,994,638	23,770,103	2,738,187,312	43,024,396,974



# 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	\$ 43,024,396,974	\$ 534,661,645	\$ 430,782,571	\$ 24,364,356	\$ 2,928,318,034	\$ 46,032,229,727
2072	46,032,229,727	547,997,861	401,240,035	24,973,464	3,134,264,195	49,288,278,284
2073	49,288,278,284	561,672,539	372,440,938	25,597,801	3,357,074,977	52,808,987,062
2074	52,808,987,062	575,692,353	344,446,525	26,237,746	3,597,866,766	56,611,861,909
2075	56,611,861,909	590,065,753	317,320,676	26,893,690	3,857,828,090	60,715,541,386
2076	60,715,541,386	604,801,221	291,127,687	27,566,032	4,138,224,494	65,139,873,383
2077	65,139,873,383	619,907,459	265,927,037	28,255,183	4,440,403,920	69,906,002,542
2078	69,906,002,542	635,393,725	241,777,919	28,961,562	4,765,802,522	75,036,459,308
2079	75,036,459,308	651,269,355	218,733,611	29,685,601	5,115,950,886	80,555,260,337
2080	80,555,260,337	667,544,126	196,847,563	30,427,741	5,492,480,669	86,488,009,827
2081	86,488,009,827	684,227,593	176,167,635	31,188,435	5,897,131,660	92,862,013,009
2082	92,862,013,009	701,329,434	156,728,291	31,968,146	6,331,729,770	99,706,405,776
2083	99,706,405,776	718,860,062	138,556,343	32,767,349	6,798,345,677	107,052,287,823
2084	107,052,287,823	736,829,954	121,668,997	33,586,533	7,299,003,918	114,932,866,164
2085	114,932,866,164	755,249,887	106,073,775	34,426,197	7,835,992,662	123,383,608,741
2086	123,383,608,741	774,130,960	91,768,222	35,286,851	8,411,724,165	132,442,408,793
2087	132,442,408,793	793,484,622	78,740,236	36,169,023	9,028,775,938	142,149,760,094
2088	142,149,760,094	813,322,605	66,967,569	37,073,248	9,689,902,676	152,548,944,557
2089	152,548,944,557	833,656,932	56,418,391	38,000,080	10,398,048,996	163,686,232,014
2090	163,686,232,014	854,499,915	47,051,677	38,950,082	11,156,363,012	175,611,093,182
2091	175,611,093,182	875,864,178	38,816,761	39,923,834	11,968,210,830	188,376,427,595
2092	188,376,427,595	897,762,662	31,654,354	40,921,929	12,837,192,014	202,038,805,989
2093	202,038,805,989	920,208,644	25,496,926	41,944,978	13,767,156,056	216,658,728,784
2094	216,658,728,784	943,215,742	20,269,468	42,993,602	14,762,219,927	232,300,901,384
2095	232,300,901,384	966,797,927	15,890,767	44,068,442	15,826,786,756	249,034,526,857
2096	249,034,526,857	990,969,534	12,274,846	45,170,153	16,965,565,685	266,933,617,077
2097	266,933,617,077	1,015,745,267	9,333,780	46,299,407	18,183,592,930	286,077,322,086
2098	286,077,322,086	1,041,140,206	6,980,141	47,456,892	19,486,254,099	306,550,279,358
2099	306,550,279,358	1,067,169,819	5,128,745	48,643,314	20,879,307,884	328,442,985,002
2100	328,442,985,002	1,093,849,966	3,698,694	49,859,397	22,368,911,229	351,852,188,107
2101	351,852,188,107	1,121,196,911	2,615,237	51,105,882	23,961,646,094	376,881,309,993
2102	376,881,309,993	1,149,227,328	1,811,050	52,383,529	25,664,547,910	403,640,890,653
2103	403,640,890,653	1,177,958,316	1,226,984	53,693,118	27,485,135,922	432,249,064,789
2104	432,249,064,789	1,207,407,404	812,412	55,035,445	29,431,445,541	462,832,069,877
2105	462,832,069,877	1,237,592,562	525,167	56,411,332	31,512,062,899	495,524,788,840
2106	495,524,788,840	1,268,532,215	331,116	57,821,615	33,736,161,765	530,471,330,089
2107	530,471,330,089	1,300,245,247	203,439	59,267,155	36,113,543,011	567,825,647,753
2108	567,825,647,753	1,332,751,018	121,706	60,748,834	38,654,676,817	607,752,205,049
2109	607,752,205,049	1,366,069,371	70,854	62,267,555	41,370,747,821	650,426,683,832
2110	650,426,683,832	1,400,220,643	40,130	63,824,244	44,273,703,396	696,036,743,498
2111	696,036,743,498	1,435,225,678	22,115	65,419,850	47,376,305,296	744,782,832,507
2112	744,782,832,507	1,471,105,841	11,864	67,055,346	50,692,184,862	796,879,056,000
2113	796,879,056,000	1,507,883,024	6,199	68,731,730	54,235,902,050	852,554,103,145
2114	852,554,103,145	1,545,579,666	3,159	70,450,023	58,023,008,504	912,052,238,133
2115	912,052,238,133	1,584,218,762	1,572	72,211,274	62,070,114,963	975,634,359,013
2116	975,634,359,013	1,623,823,882	761	74,016,556	66,394,963,269	1,043,579,128,846
2117	1,043,579,128,846	1,664,419,181	356	75,866,969	71,016,503,293	1,116,184,183,995
2118	1,116,184,183,995	1,706,029,415	159	77,763,644	75,954,975,105	1,193,767,424,712
2119	1,193,767,424,712	1,748,679,958	68	79,707,735	81,231,996,736	1,276,668,393,603
2120	1,276,668,393,603	1,792,396,817	36	81,700,428	86,870,657,913	1,365,249,747,868



# Single Discount Rate Development

## Present Values of Projected Benefits

### Ending December 31 for 2021 to 2070

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)
2021	\$ 8,294,241,897	\$ 651,795,973	\$ 651,795,973	\$ 0	\$ 630,704,670	\$ 0	\$ 630,704,670
2022	9,389,866,647	673,097,796	673,097,796	0	609,847,559	0	609,847,559
2023	9,681,361,836	693,267,663	693,267,663	0	588,129,294	0	588,129,294
2024	9,963,624,418	712,593,883	712,593,883	0	566,034,244	0	566,034,244
2025	10,237,991,770	735,200,168	735,200,168	0	546,808,127	0	546,808,127
2026	10,501,531,142	757,238,110	757,238,110	0	527,339,828	0	527,339,828
2027	10,754,996,299	778,981,781	778,981,781	0	507,942,039	0	507,942,039
2028	10,998,721,431	799,723,201	799,723,201	0	488,264,670	0	488,264,670
2029	11,233,681,741	820,656,242	820,656,242	0	469,143,420	0	469,143,420
2030	11,459,601,582	841,038,951	841,038,951	0	450,183,122	0	450,183,122
2031	11,676,796,144	860,629,382	860,629,382	0	431,338,293	0	431,338,293
2032	11,885,808,644	879,406,812	879,406,812	0	412,686,649	0	412,686,649
2033	12,087,280,949	897,476,257	897,476,257	0	394,350,421	0	394,350,421
2034	12,281,795,496	915,402,126	915,402,126	0	376,617,074	0	376,617,074
2035	12,469,337,333	932,905,637	932,905,637	0	359,380,537	0	359,380,537
2036	12,650,192,925	949,372,511	949,372,511	0	342,438,224	0	342,438,224
2037	12,825,313,392	964,599,146	964,599,146	0	325,777,588	0	325,777,588
2038	12,995,907,163	978,016,846	978,016,846	0	309,278,274	0	309,278,274
2039	13,163,929,175	989,585,692	989,585,692	0	293,011,883	0	293,011,883
2040	13,331,577,895	999,425,623	999,425,623	0	277,083,747	0	277,083,747
2041	13,501,065,761	1,006,950,876	1,006,950,876	0	261,395,197	0	261,395,197
2042	13,675,339,247	1,012,510,377	1,012,510,377	0	246,103,364	0	246,103,364
2043	13,857,199,528	1,015,821,463	1,015,821,463	0	231,187,420	0	231,187,420
2044	14,049,920,049	1,016,611,892	1,016,611,892	0	216,636,060	0	216,636,060
2045	14,257,292,626	1,015,113,822	1,015,113,822	0	202,543,845	0	202,543,845
2046	14,483,179,631	1,010,781,322	1,010,781,322	0	188,838,379	0	188,838,379
2047	14,732,298,823	1,003,990,802	1,003,990,802	0	175,627,103	0	175,627,103
2048	15,009,280,842	994,962,338	994,962,338	0	162,966,070	0	162,966,070
2049	15,318,803,283	983,668,038	983,668,038	0	150,857,831	0	150,857,831
2050	15,665,878,950	970,144,512	970,144,512	0	139,310,701	0	139,310,701
2051	16,055,807,856	954,287,095	954,287,095	0	128,308,623	0	128,308,623
2052	16,494,346,317	936,442,565	936,442,565	0	117,892,638	0	117,892,638
2053	16,987,293,599	917,607,372	917,607,372	0	108,166,103	0	108,166,103
2054	17,539,828,005	897,954,158	897,954,158	0	99,109,937	0	99,109,937
2055	18,157,295,326	877,687,490	877,687,490	0	90,705,097	0	90,705,097
2056	18,845,182,683	856,545,995	856,545,995	0	82,884,099	0	82,884,099
2057	19,609,603,221	834,222,149	834,222,149	0	75,584,195	0	75,584,195
2058	20,457,380,332	811,138,895	811,138,895	0	68,813,437	0	68,813,437
2059	21,395,340,179	786,907,397	786,907,397	0	62,507,251	0	62,507,251
2060	22,431,154,953	761,567,531	761,567,531	0	56,642,699	0	56,642,699
2061	23,572,963,558	735,169,980	735,169,980	0	51,197,886	0	51,197,886
2062	24,829,391,230	707,623,276	707,623,276	0	46,141,863	0	46,141,863
2063	26,209,738,512	678,955,663	678,955,663	0	41,453,688	0	41,453,688
2064	27,723,904,000	648,819,256	648,819,256	0	37,091,486	0	37,091,486
2065	29,382,813,001	617,758,450	617,758,450	0	33,067,240	0	33,067,240
2066	31,197,572,164	586,434,604	586,434,604	0	29,391,895	0	29,391,895
2067	33,179,361,770	554,818,764	554,818,764	0	26,036,817	0	26,036,817
2068	35,340,152,067	523,167,928	523,167,928	0	22,988,287	0	22,988,287
2069	37,692,461,609	491,815,267	491,815,267	0	20,234,676	0	20,234,676
2070	40,249,317,981	460,994,638	460,994,638	0	17,759,015	0	17,759,015



# 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 <sup>a</sup> ((a)-.5)	(g)=(e)*vf <sup>a</sup> ((a)-.5)	(h)=((c)/(1+SDR) <sup>a</sup> ((a)-.5)
2071	\$ 43,024,396,974	\$ 430,782,571	\$ 430,782,571	\$ 0	\$ 15,538,528	\$ 0	\$ 15,538,528
2072	46,032,229,727	401,240,035	401,240,035	0	13,551,418	0	13,551,418
2073	49,288,278,284	372,440,938	372,440,938	0	11,777,867	0	11,777,867
2074	52,808,987,062	344,446,525	344,446,525	0	10,199,052	0	10,199,052
2075	56,611,861,909	317,320,676	317,320,676	0	8,797,618	0	8,797,618
2076	60,715,541,386	291,127,687	291,127,687	0	7,557,514	0	7,557,514
2077	65,139,873,383	265,927,037	265,927,037	0	6,463,782	0	6,463,782
2078	69,906,002,542	241,777,919	241,777,919	0	5,502,621	0	5,502,621
2079	75,036,459,308	218,733,611	218,733,611	0	4,661,195	0	4,661,195
2080	80,555,260,337	196,847,563	196,847,563	0	3,927,720	0	3,927,720
2081	86,488,009,827	176,167,635	176,167,635	0	3,291,284	0	3,291,284
2082	92,862,013,009	156,728,291	156,728,291	0	2,741,671	0	2,741,671
2083	99,706,405,776	138,556,343	138,556,343	0	2,269,463	0	2,269,463
2084	107,052,287,823	121,668,997	121,668,997	0	1,865,973	0	1,865,973
2085	114,932,866,164	106,073,775	106,073,775	0	1,523,219	0	1,523,219
2086	123,383,608,741	91,768,222	91,768,222	0	1,233,887	0	1,233,887
2087	132,442,408,793	78,740,236	78,740,236	0	991,308	0	991,308
2088	142,149,760,094	66,967,569	66,967,569	0	789,414	0	789,414
2089	152,548,944,557	56,418,391	56,418,391	0	622,716	0	622,716
2090	163,686,232,014	47,051,677	47,051,677	0	486,265	0	486,265
2091	175,611,093,182	38,816,761	38,816,761	0	375,618	0	375,618
2092	188,376,427,595	31,654,354	31,654,354	0	286,806	0	286,806
2093	202,038,805,989	25,496,926	25,496,926	0	216,308	0	216,308
2094	216,658,728,784	20,269,468	20,269,468	0	161,011	0	161,011
2095	232,300,901,384	15,890,767	15,890,767	0	118,192	0	118,192
2096	249,034,526,857	12,274,846	12,274,846	0	85,484	0	85,484
2097	266,933,617,077	9,333,780	9,333,780	0	60,863	0	60,863
2098	286,077,322,086	6,980,141	6,980,141	0	42,618	0	42,618
2099	306,550,279,358	5,128,745	5,128,745	0	29,320	0	29,320
2100	328,442,985,002	3,698,694	3,698,694	0	19,799	0	19,799
2101	351,852,188,107	2,615,237	2,615,237	0	13,108	0	13,108
2102	376,881,309,993	1,811,050	1,811,050	0	8,499	0	8,499
2103	403,640,890,653	1,226,984	1,226,984	0	5,392	0	5,392
2104	432,249,064,789	812,412	812,412	0	3,343	0	3,343
2105	462,832,069,877	525,167	525,167	0	2,023	0	2,023
2106	495,524,788,840	331,116	331,116	0	1,194	0	1,194
2107	530,471,330,089	203,439	203,439	0	687	0	687
2108	567,825,647,753	121,706	121,706	0	385	0	385
2109	607,752,205,049	70,854	70,854	0	210	0	210
2110	650,426,683,832	40,130	40,130	0	111	0	111
2111	696,036,743,498	22,115	22,115	0	57	0	57
2112	744,782,832,507	11,864	11,864	0	29	0	29
2113	796,879,056,000	6,199	6,199	0	14	0	14
2114	852,554,103,145	3,159	3,159	0	7	0	7
2115	912,052,238,133	1,572	1,572	0	3	0	3
2116	975,634,359,013	761	761	0	1	0	1
2117	1,043,579,128,846	356	356	0	1	0	1
2118	1,116,184,183,995	159	159	0	0	0	0
2119	1,193,767,424,712	68	68	0	0	0	0
2120	1,276,668,393,603	36	36	0	0	0	0
<b>Totals</b>					\$ 12,203,026,161	\$ 0	\$ 12,203,026,161



# SECTION H

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## GLOSSARY OF TERMS



# Glossary of Terms

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



## Glossary of Terms

<b>Amortization Method</b>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<b>Amortization Payment</b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b>Cost-of-Living Adjustments</b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</b>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<b>Covered-Employee Payroll</b>	The payroll of employees that are provided with pensions through the pension plan.
<b>Deferred Inflows and Outflows</b>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
<b>Deferred Retirement Option Program (DROP)</b>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.

# 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

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