Wyoming Law Enforcement Retirement Fund

Actuarial Valuation Report
for the Year Beginning January 1, 2022

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June 1, 2022

Board of Trustees
Wyoming Law Enforcement Retirement Fund
6101 Yellowstone Road
Suite 500
Cheyenne, WY 82002

Dear Board of Trustees:

Subject: Actuarial Valuation as of January 1, 2022

We are pleased to present the report of the actuarial valuation of the Wyoming Law Enforcement Retirement Fund ("the Fund") for the plan year commencing January 1, 2022. This report describes the current actuarial condition of the Fund, determines the calculated employer contribution rate (the actuarially determined contribution rate), and analyzes changes in this contribution rate from the prior year. Valuations are prepared annually, as of January 1, the first day of the Fund's plan year.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

Financing objectives and funding policy

The employer and employee contribution rates are specified in the statute. The purposes of the valuation are to measure the System's funding progress and to determine whether or not the statutory contribution is sufficient to meet the obligations of the Fund. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

Progress toward realization of financing objectives

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. The funded ratio, based upon the assumption of no further cost-of-living adjustment increases, as of January 1, 2022 is 84.67%. As of January 1, 2021, this funded ratio, based on the assumption of no future COLAs and the actuarial value of assets, was 85.91%. On a market value of assets basis, the funded ratio increased from 90.98% as of January 1, 2021 to 94.62% as of January 1, 2022. The funded status alone is not appropriate for assessing the need for future contributions. The funded status is also not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Benefit provisions

The benefit provisions reflected in this valuation are those, which were in effect on January 1, 2022. 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. Therefore, this valuation does not include any liability for future cost-of-living increases.

The benefit provisions are summarized in Appendix B of the report.

Assumptions and methods

Actuarial assumptions and methods are set by the Board, based upon recommendations made by the plan's actuary. The current assumptions used in the actuarial valuation were adopted by the Board at the November 17, 2021 and February 17, 2022 meetings and were first utilized with the January 1, 2022 valuation report. 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. All actuarial assumptions used in this report are reasonable for the purposes of this valuation.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution amounts and funding periods. The actuarial calculations presented in the report are intended to provide information for rational decision making.

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.

The 8.60% employer contribution and the 8.60% employee contribution are the rates that comply with State law. Due to the many factors affecting a retirement system, users of this report should be aware that contributions made at that rate do not necessarily guarantee long-term benefit security.

The actuarially determined employer contribution in Table 1 of this report is determined using the actuarial assumptions and methods disclosed in Appendix A of this report. This report includes risk metrics in Appendix C but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

All assumptions and methods are described in Appendix A of our report.

Data

Member data for retired, active and inactive members was supplied as of January 1, 2022 by the System's staff. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data.

Asset and financial information as of January 1, 2022 was prepared by the Wyoming Retirement System and is the responsibility of management. Eide Bailly, LLP provided us the asset and financial information and will opine on Wyoming Retirement System's statements.

We relied on the System's staff for the accuracy and completeness of the information.

Plan experience

As part of each valuation, we examine the Fund's experience relative to the assumptions. Experience in a given year will deviate from the assumptions and a gain occurs if the liabilities grow slower than the assumption set anticipates, and a loss occurs if the liabilities grow faster. This past fiscal year the Fund had a total experience gain of approximately $32.7 million due to an investment gain of $31.4 million, a contribution loss of $3.3 million and a liability gain of $4.6 million. Additionally, the liabilities increased by $57.3 million due to newly adopted assumptions. The aggregate results of these analyses are disclosed in Tables 4 and 5 under Section III of the report.

Actuarial certification

All of the tables contained in this actuarial valuation report were prepared by Gabriel, Roeder, Smith & Company. Historical information for years prior to 2010 was prepared by the prior actuarial firm and was not subjected to our actuarial review.

We certify that the information presented herein is accurate and fairly portrays the actuarial position of the System as of January 1, 2022.

All of our work conforms with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of state law and, where applicable, the Internal Revenue Code and ERISA.

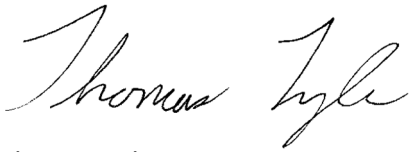
The undersigned are independent actuaries and consultants.

Thomas Lyle and Dana Woolfrey are Enrolled Actuaries and Paul Wood, Thomas Lyle, and Dana Woolfrey are Members of the American Academy of Actuaries, and all three meet all the Qualification Standards of the American Academy of Actuaries.

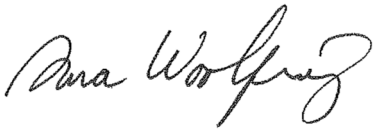
Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA
Senior Consultant and Team Leader



Thomas Lyle, FSA, FCA, EA, MAAA
Consultant



Dana Woolfrey, FSA, FCA, EA, MAAA
Senior Consultant

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SECTION I

EXECUTIVE SUMMARY

Executive Summary

Item	January 1, 2022 No COLA	January 1, 2021 No COLA
1. Contributions:		
a. Total normal cost	16.38%	14.20%
b. Employee contributions	(8.60%)	(8.60%)
c. Other expected contributions	0.00%	0.00%
d. Net employer normal cost	7.78%	5.60%
e. Amortization payment	6.01%	4.74%
f. Administrative expenses	0.47%	0.41%
g. Required contribution	14.26%	10.75%
h. Statutory	(8.60%)	(8.60%)
i. Shortfall/(surplus)	5.66%	2.15%
2. Funding Elements:		
a. Market value of assets (MVA)	$882,352,248	$765,011,012
b. Actuarial value of assets (AVA)	$789,572,141	$722,308,507
c. Actuarial accrued liability (AAL)	$932,553,503	$840,812,836
d. Unfunded/(overfunded) actuarial accrued liability	$142,981,362	$118,504,329
3. Contributions and Ratios:		
a. Actuarially determined contribution	$23,603,760	$18,309,732
b. Actual contributions	N/A	14,567,813
i. Employer	*N/A*	*14,113,663*
ii. Other	*N/A*	*454,150*
c. Percentage contributed	N/A	79.56%
d. Funded ratio on an actuarial basis (AVA/AAL)	84.67%	85.91%
e. Funded ratio on a market basis (MVA/AAL)	94.62%	90.98%
f. Projected payroll	$165,440,506	$170,284,524

SECTION II

DISCUSSION

Contribution Requirements

- Exhibits throughout this report are based primarily, unless stated otherwise, on the assumption of no future cost-of-living adjustments (COLAs).
- 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. The actuarial value funded ratio is 84.67% and the market value funded ratio is 94.62%.
- There were no changes to the benefit provisions reflected in this actuarial valuation.
- The actuarial assumptions have been updated since the prior valuation. 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.
- An Actuarially Determined Contribution (ADC) is calculated as part of this valuation. Because contribution rates are set in statutes, the ADC could be thought of as a metric to which one could compare the statutory rate. The amortization payment for the purpose of calculating the ADC is based upon the following assumptions:
  - The funding period is based on a 30-year closed period for the initial base as of January 1, 2018 and 20-year closed period layers for future gains and losses
  - Amortization payment amounts are calculated in such a way that they will increase as a level percentage of payroll
  - Total payroll increases are assumed at 2.50% per year
  - Future growth in the number of active members is not reflected in the annual valuation
- The analysis of the changes in the ADC is shown in Table 5 under Section III of the report
- Using the current statutory contribution of 8.60% of pay and an open group projection, the plan is not projected to reach full funding. Rather, the plan is expected to remain approximately 90% funded for the next 30 years.
- As of the prior valuation, a rate increase was recommended. Even though there were better than expect assets returns, a rate increase could still be considered in order to mitigate future downside funded ratio risk.

Calculation of Contribution Rates

The funds available to pay benefits come from two sources, contributions as specified in the statute and investment income on those contributions (the majority of the funds available to pay benefits typically come from investment income). The Fund receives contributions from two sources, employer contributions and member contributions which are both determined as a percentage of pay. An Actuarially Determined Contribution (ADC) is calculated as part of this valuation. Because contribution rates are set in statutes, the ADC could be thought of as a metric to which one could compare the statutory rate. As shown in Table 1 under Section III of the report, the employer contribution rate has three components:

- The normal cost percentage (NC%)
- The amortization percentage (UAAL%)
- The administrative expenses

The NC% is the theoretical amount which would be required to pay the members' benefits if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. The NC% is shown in Table 3 under Section III of the report.

Members are required to make employee contributions and only the excess of the NC% over the member contribution rate is included in the employer contribution rate.

The actuarial accrued liability (AAL) is the difference between (i) the actuarial present value of all future benefits for all current participants of the fund, including active, inactive and retired members, and (ii) the actuarial present value of future normal costs. Thus, the AAL represents the liability associated with past years. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and the actuarial value of assets (AVA). It is the shortfall/excess between the liability associated with prior years (the AAL) and the assets actually accumulated (the AVA). This shortfall/excess can arise from several sources, including actuarial gains and losses, which are caused by differences between actual experience and the plan's assumptions, changes to the plan's actuarial assumptions, and amendments to the benefit provisions.

The UAAL% is the amount required to fund this difference. It is the amount, expressed as a level percentage of payroll, necessary to amortize the UAAL. Amortization bases are established each year and amortized based on the Board's policy. The Board's policy for purposes of calculating the ADC 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 Executive Summary shows the UAAL%, called Amortization Payment, compared to that of last year.

Administrative expenses are the average of the actual expenses for the prior two years, with each year projected at 2.50% to the valuation date.

The ADC is calculated for the twelve-month period beginning January 1, 2022. Note that the statutory employer contribution is set at 8.60% of payroll. Therefore, the ADC will not be fully contributed. This is detailed in the Executive Summary.

Financial Data and Experience

As of January 1, 2022, the Fund has a total market value of about $882 million. Financial information was received from Eide Bailly, LLP.

Table 7 under Section III of the report shows a reconciliation of the market values between the beginning and end of 2021.

During 2021, the total investment return on the market value of assets (MVA), as reported by Meketa Investment Group, Inc., was 17.19%, as shown in Table 10 under Section III of the report.

In determining the contribution rates and funded status of the Fund, an actuarial value of assets (AVA) is used rather than the market 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 (or less than) expected investment income. 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.

The development of the AVA is shown in Table 9 under Section III of the report. The AVA is $790 million. The AVA is 89.48% of the MVA as of December 31, 2021, compared to 94.42% last year. The difference between the AVA and the MVA is the deferred gains and losses. As of January 1, 2021, the total deferred gain was $42.7 million. As of January 1, 2022, the total deferred gain was $92.8 million. Having a deferred gain in the AVA is an indicator that the funded ratio will have an upward “tilt” in the near term, and the ADC will likewise have downward pressure.

In addition to the market return, Table 10 also shows the return on the actuarial value of assets for the Fund. For 2021, this return was 11.40%. Because this is more than the assumed 7.00% investment return for the prior year, an actuarial gain occurred, decreasing the unfunded actuarial accrued liabilities of the Fund by $31.5 million.

Member Data

Member data as of January 1, 2022 was supplied electronically by the Fund's staff. While we did not audit this data, we did perform various tests to ensure that it was internally consistent, consistent with the prior year's data, and was reasonable overall.

Table 15 under Section III of the report shows the number of members by category (active, inactive, retired, etc.) along with member statistics. Tables 16 through 28 show summaries of certain historical data and include membership statistics.

The total payroll shown on the statistical tables is the amount that was supplied by the Fund, annualized, if necessary. For the cost calculations, the pay amounts were adjusted in accordance with the actuarial assumptions to reflect one year's salary increase.

Total active member payroll decreased 2.84%, compared with a 3.35% increase the prior year.

The average of the final average salaries for participants who retired or became disabled this year is $66,120.

Of the 2,579 active participants, 384 are eligible or will become eligible for normal retirement in 2022, and 552 are eligible or will become eligible for early retirement in 2022.

Changes in payroll are significant because the Fund receives its statutory contributions as a percent of pay. If payroll does not grow at the assumed rate, then fewer contributions will be made to the plan and the funding of the Fund will be delayed. Furthermore, the methodology used in the valuation to amortize the unfunded actuarial accrued liability assumes a growing payroll into the future. If the payroll does not grow at the assumed 2.50% per year average, then the current amortization payments may be understated and the funding position of the Fund will not strengthen as assumed over time. Higher than expected payroll growth, however, has the opposite effect of this and the funded position of the Fund should trend toward 100%. Table 5 under Section III of the report shows, for the past year, payroll for the plan decreased more than expected, so the effect is an increase in the calculated contribution rate of 0.23% of payroll.

Benefit Provisions

Appendix B of the report includes a more detailed summary of the benefit provisions for the Fund. A brief summary from W.S. 9-3-432 is as follows:

- *Normal Retirement Eligibility*
  - Age 60 with at least four years of service as a law enforcement officer or any age with at least twenty years of service as a law enforcement officer.
- *Normal Retirement Benefit*
  - 2.50% of highest average five-year salary not to exceed 75.0% of highest average five-year salary.
- *Normal Form of Payment*
  - 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.
- *Employee Contributions* are required
  - 8.60% of pay.
- *Post-retirement Cost-of-Living Adjustments (COLAs)*
  - 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.

Pursuant to Enrolled Act No. 25, interest crediting for non-vested inactive members on a prospective basis is eliminated beginning July 1, 2019.

Actuarial Methods and Assumptions

Appendix A of the report includes a summary of the actuarial assumptions and methods used in this valuation. A few highlights are listed as follows:

- Costs are determined using the Entry Age Normal actuarial cost method, calculated as a level percentage of payroll.
- The unfunded actuarial accrued liability is amortized over an effective 22 year closed period as a level percent of payroll. Future valuations will include additional amortization layers on a closed 20 year basis.
- The assumed annual investment return rate is 6.80%, with assumed inflation of 2.25%.
- Payroll is assumed to increase at 2.50% per year.
- Inactive vested participants are assumed to retire at age 60 or the valuation date if over age 60. Those with over 20 years of service are assumed to retire immediately.
- No benefit data is available for all members entitled to deferred benefits. The present value of benefits expected to be paid to vested inactive non-retired members is approximated using the data provided.

The average future lifetime for current pensioners is 23.2 years.

The actuarial assumptions and methods were reviewed in detail as part of the 2021 Experience Study covering the five year period ending December 31, 2020. Please see Appendix A for a summary of the new assumptions.

Below is a summary of the changes in assumptions:

1. **Real rate of return:** lower the current assumption from 4.75% to 4.55%.
2. **Nominal rate of return:** decrease the nominal investment return assumption (the sum of inflation and the real rate of return) from 7.00% to 6.80%.
3. **Post-retirement mortality, disabled lives mortality, active life mortality:** Updated to the Pub-2010 tables, projected generationally using the ultimate MP-2020 scale.
4. **Disability:** decrease in the disability rates.
5. **Retirement (unreduced retirement):** slight increase in the retirement rates for ages 57 and lower.
6. **Termination (withdrawal):** change to service-based rates only.

The assumption changes increased the accrued liability by $57.3 million.

GASB and Funding Progress

Governmental Accounting Standards Board Statement Number 67 (GASB 67) contains certain accounting requirements for the Fund. Schedules, notes and required supplementary information are provided under separate cover.

SECTION III

SUPPORTING EXHIBITS

Table 1A

Calculation of Actuarially Determined Employer Contribution Rate

(Assumes No Future Cost-Of-Living Increases)

Item	January 1, 2022	January 1, 2021
1. Projected valuation payroll	$165,440,506	$170,284,524
2. Present value of future pay	$1,221,579,122	$1,231,387,285
3. Employer normal cost rate	7.78%	5.60%
4. Actuarial accrued liability for active members		
a. Present value of future benefits for active members	$599,323,321	$526,536,659
b. Less: present value of future employer normal costs	(92,759,134)	(65,412,281)
c. Less: present value of future employee contributions	(105,055,805)	(105,899,308)
d. Actuarial accrued liability	$401,508,382	$355,225,070
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	$432,023,567	$401,057,418
b. Disabled members	64,908,278	54,445,397
Duty	*42,165,839*	*38,780,443*
Non-duty	*22,742,439*	*15,664,954*
c. Inactive members	34,113,276	30,084,951
d. Active members (Item 4d)	401,508,382	355,225,070
e. Total	$932,553,503	$840,812,836
6. Actuarial value of assets (Table 9)	$789,572,141	$722,308,507
7. Unfunded actuarial accrued liability (UAAL) (Item 5e - Item 6)	$142,981,362	$118,504,329
8. Effective UAAL amortization period	22 years	24 years
9. Assumed payroll growth rate	2.50%	2.50%
10. Actuarially Determined Employer Contribution		
a. UAAL amortization payment as % of pay	6.01%	4.74%
b. Employer normal cost	7.78%	5.60%
c. Administrative expense	0.47%	0.41%
d. Employer contribution (a + b + c)	14.26%	10.75%

Table 1B

Calculation of UAAL Amortization Payment
(Assumes No Future Cost-Of-Living Increases)

UAAL as of January 1, 2022	$142,981,362
Total Prior Remaining Amortization Bases as of January 1, 2022	118,446,366
2022 Amortization Base as of January 1, 2022	**$24,534,996**
2022 Payment (20 years, level percent of pay amortization)	**$1,821,657**

		As of January 1, 2022		
Base Year	**Initial Base**	**Remaining Base**	**Years Remaining**	**Amortization Payment**
2022 Experience Gain	$ (32,736,377)	$ (32,736,377)	20	$ (2,430,586)
2022 Assumption Changes	57,271,373	57,271,373	20	4,252,243
2021 Experience Gain	(4,812,047)	(4,773,307)	19	(366,464)
2020 Experience Gain	14,645,499	14,372,863	18	1,144,019
2019 Experience Gain	24,129,271	23,359,054	17	1,933,327
2018 Experience Gain	83,395,794	85,487,756	26	5,418,431
Total		**$ 142,981,362**		**$ 9,950,970**

Table 2

Cost Breakdown

(Assumes No Future Cost-Of-Living Increases)

Item	Present Value of Future Normal Costs (1)	Actuarial Accrued Liabilities (2)	Total Present Value of Benefits (3) = (1) + (2)
Age and service allowances based on total service and disability benefits likely to be rendered by present active members	$160,688,261	$404,749,654	$565,437,915
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	4,028,267	2,166,896	6,195,163
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	33,098,411	(5,408,168)	27,690,243
Benefits likely to be paid to vested inactive members	0	28,576,272	28,576,272
Benefits to be paid to members due refunds	0	5,537,004	5,537,004
Benefits to be paid to current retirees, disabled members, beneficiaries, and future beneficiaries of current retirees	0	496,931,845	496,931,845
Total	$197,814,939	$932,553,503	$1,130,368,442
Actuarial Value of Assets	0	789,572,141	789,572,141
Liabilities to be covered by future contributions	$197,814,939	$142,981,362	$340,796,301

Table 3

History of Total Normal Cost
(Assumes No Future Cost-Of-Living Increases)

Fiscal Year Ending December 31	Normal Cost as Percent of Payroll
2007	13.56%
2008	13.42%
2009	13.46%
2010	14.14%
2011	14.13%
2012	14.14%
2013	14.12%
2014	14.56%
2015	14.54%
2016	14.46%
2017	14.26%
2018	14.30%
2019	14.31%
2020	14.26%
2021	14.20%
2022	16.38%

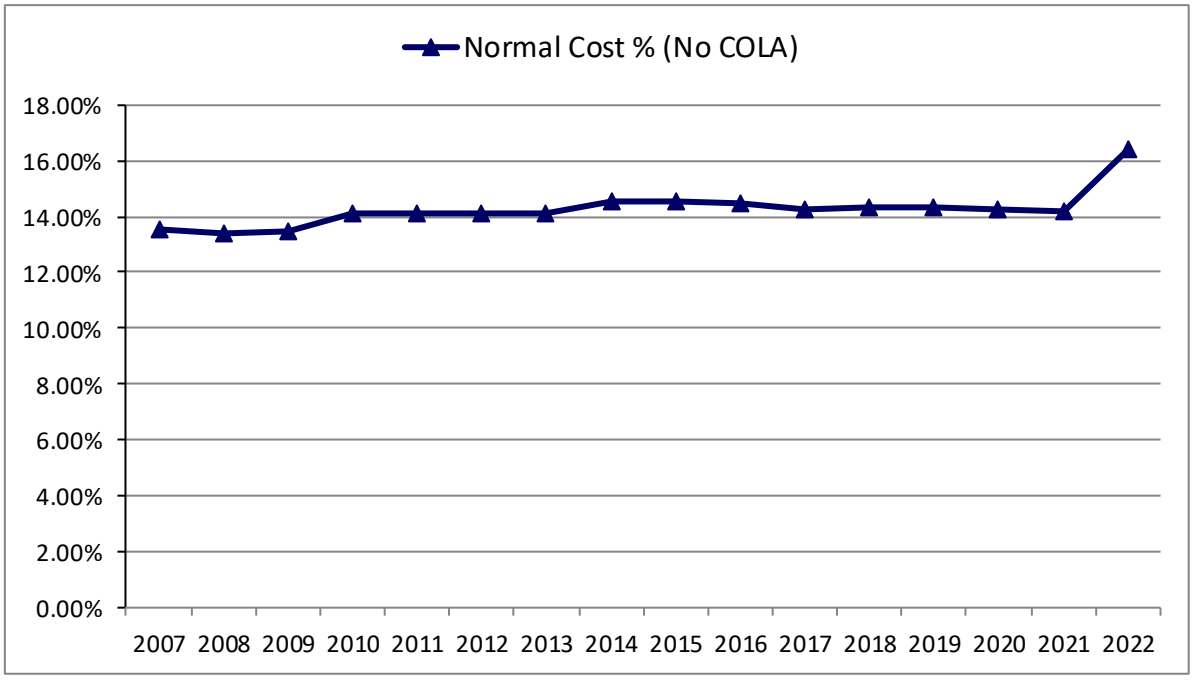

Table 4

Calculation of Total Actuarial Gain/(Loss)

Assumes No Future Cost-Of-Living Increases

Item	January 1, 2022
1. Derivation of Experience Gain/(Loss)	
a. Unfunded actuarial accrued liability (UAAL) - previous valuation	$118,504,329
b. Normal cost (NC) for fiscal year ending December 31, 2021	24,181,094
c. Expected administrative expenses for fiscal year ending December 31, 2021	697,700
d. Actuarially determined contribution for fiscal year ending December 31, 2021	32,954,201
e. Interest accrual:	
(i) For whole year on (a)	8,295,303
(ii) For half year on (b) + (c) - (d)	(277,859)
(iii) Total interest: (e)(i) + (e)(ii)	8,017,444
f. Change in UAAL due to plan changes	0
g. Change in UAAL due to assumption change	57,271,373
h. Expected UAAL current year: (a) + (b) + (c) - (d) + (e)(iii) + (f) + (g)	175,717,739
i. Actual UAAL current year	142,981,362
j. Experience gain/(loss): (h) - (i)	32,736,377
k. Experience gain/(loss) as a % of actuarial accrued liability	3.51%
2. Approximate Portion of Gain/(Loss) Due to Investments (at Actuarial Value)	$31,466,865
3. Approximate Portion of Gain/(Loss) Due to Contributions and Administrative Expenses higher or lower than expected*	($3,334,286)
4. Approximate Portion of Gain/(Loss) Due to Liabilities: (1)(j) - (2) - (3)	$4,603,798
a. Age & service retirements	(1,975,983)
b. Non-duty disability retirements	324,712
c. Duty disability retirements	(730,481)
d. Death-in-service	2,025,975
e. Withdrawal from employment	(3,199,268)
f. Rehires	(326,849)
g. Pay increases	11,887,824
h. Death after Retirement	(557,685)
i. Service Purchases	(1,086,036)
j. Other	(1,758,411)
k. Other as a % of actuarial accrued liability	-0.19%

**Includes $1.10 million in additional employee contributions for service purchases. These additional contributions offset the liability loss due to service purchases.*

Table 5

Change in Calculated Contribution Rate Since the Prior Valuation

Assumes No Future Cost-Of-Living Increases

Item	January 1, 2022
1. Calculated contribution rate as of January 1, 2021	10.75%
2. Change in contribution rate during year	
a. Change in employer normal cost	-0.02%
b. Assumption changes	4.64%
c. Actuarial (gain) loss from investments on actuarial value of assets	-1.34%
d. Actuarial (gain) loss from liability sources and administrative expenses	-0.14%
e. Difference between contributions made and required contributions	0.14%
f. Effect of payroll growing (faster)/slower than assumption	0.23%
g. Other changes	0.00%
h. Total change	3.51%
3. Calculated contribution rate as of January 1, 2022	14.26%

Table 6

Statement of Plan Net Assets

Assets at Market Value		
Item	**FYE 2021**	**FYE 2020**
1. Cash and Cash Equivalents (Operating Cash)	$43,454,200	$14,921,739
2. Receivables		
a. Insurance premium tax	$0	$0
b. Buy backs	0	0
c. Employer contributions	969,988	907,044
d. Employee contributions	962,957	948,190
e. Securities sold	857,999	1,525,051
f. Accrued interest and dividends	2,057,313	1,419,124
g. Currency contract receivable	71,155,925	79,016,681
h. Other	34,076	48,010
i. Rebate and fee income receivable	0	0
j. Total receivables	$76,038,258	$83,864,100
3. Investments, at fair value	$884,842,655	$781,379,496
4. Liabilities		
a. Benefits and refunds payable	($80,604)	($106,419)
b. Securities purchased	(3,084,086)	(4,033,147)
c. Administrative and consulting fees payable	(1,146,873)	(1,213,941)
d. Currency contract payable	(70,696,209)	(80,719,683)
e. Securities lending collateral	(46,975,093)	(29,081,133)
f. Total liabilities	($121,982,865)	($115,154,323)
5. Total Market Value of Assets Available for Benefits	$882,352,248	$765,011,012

Table 7

Reconciliation of Plan Net Assets

Assets at Market Value		
Item	**FYE 2021**	**FYE 2020**
A. Market Value of Assets at Beginning of Year	$765,011,012	$700,886,675
B. Contribution Income:		
1. Contributions		
a. Employee	$14,160,550	$14,446,521
b. Employer	14,113,663	14,489,569
c. Other	1,540,186	1,817,902
d. Total	$29,814,399	$30,753,992
2. Investment Income		
a. Interest, dividends, and other income	$14,471,892	$9,535,558
b. Net appreciation	122,031,188	68,925,763
c. Investment expenses	(4,965,077)	(4,153,031)
d. Net investment income	$131,538,003	$74,308,290
3. Securities Lending		
a. Gross income	$90,480	$382,939
b. Deductions	(13,550)	(212,275)
c. Net investment income	$76,930	$170,664
4. Benefits and Refunds		
a. Refunds	($3,117,493)	($2,781,885)
b. Regular monthly benefits	(40,189,329)	(37,604,942)
c. Total	($43,306,822)	($40,386,827)
5. Administrative and Miscellaneous Expenses	($781,274)	($721,782)
C. Market Value of Assets at End of Year	$882,352,248	$765,011,012

Table 8

Progress of Fund Through December 31, 2021

Plan Year Ending December 31	Employer Contributions*	Employee Contributions*	Administrative Expenses	Net Investment Income**	Benefit Payments	Transfers	Actuarial Value of Assets
Total	$264,397,130	$236,311,571	($7,122,150)	$497,332,874	($448,641,995)	$8,655,176	
2003	$7,229,011	$8,646,962	($67,842)	$9,479,413	($6,475,594)	-	$204,892,219
2004	12,902,452	8,415,620	(83,082)	12,318,566	(7,747,280)	-	230,698,495
2005	11,155,211	8,185,299	(138,060)	16,938,900	(10,532,309)	$8,655,176	264,962,712
2006	34,228,475	9,114,022	(101,237)	25,935,590	(11,170,034)	-	322,969,528
2007	10,591,387	10,072,138	(113,629)	34,419,422	(13,215,795)	-	364,723,051
2008	11,861,638	11,267,854	(158,229)	(46,711,706)	(15,036,756)	-	325,945,852
2009	11,779,557	11,867,348	(184,662)	4,176,581	(16,785,935)	-	389,358,007
2010	13,166,633	12,811,136	(219,040)	13,106,593	(18,656,300)	-	409,567,029
2011	13,497,836	12,838,756	(345,446)	7,312,027	(20,667,243)	-	422,202,959
2012	13,364,655	12,963,835	(416,632)	12,335,269	(23,214,588)	-	437,235,498
2013	13,558,586	13,043,663	(470,177)	49,168,273	(25,717,983)	-	486,817,860
2014	13,496,913	13,928,652	(414,331)	42,034,212	(27,320,442)	-	528,542,864
2015	12,706,883	15,397,475	(442,876)	31,040,707	(30,119,285)	-	557,125,768
2016	13,730,305	14,442,190	(544,008)	37,077,027	(31,364,891)	-	590,466,391
2017	13,614,406	13,691,494	(631,865)	42,084,105	(33,662,493)	-	625,562,038
2018	13,781,011	13,846,377	(664,066)	24,801,449	(35,984,464)	-	641,342,345
2019	14,270,844	14,671,686	(623,912)	39,362,935	(37,276,954)	-	671,746,944
2020	14,893,513	15,860,479	(721,782)	60,916,180	(40,386,827)	-	722,308,507
2021	14,567,813	15,246,586	(781,274)	81,537,331	(43,306,822)	-	789,572,141

* Employer contributions include other funding sources and employee contributions may include member redeposits and member service purchase contributions

** Net of investment expenses

Table 9

Development of Actuarial Value of Assets

Item	FYE 2021	FYE 2020
1. Actuarial value of assets, beginning of year (before corridor)	$722,308,507	$671,746,944
2. Market value, end of year	$882,352,248	$765,011,012
3. Market value, beginning of year	$765,011,012	$700,886,675
4. Non-investment/administrative net cash flow:		
a. Employee contributions	$14,160,550	$14,446,521
b. Employer contributions	14,113,663	14,489,569
c. Other contributions	1,540,186	1,817,902
d. Refund of employee accounts	(3,117,493)	(2,781,885)
e. Retirement benefits	(40,189,329)	(37,604,942)
f. Administrative expenses	(781,274)	(721,782)
g. Total net cash flow: [sum of (4a) through (4f)]	($14,273,697)	($10,354,617)
5. Investments and securities lending:		
a. Interest and dividends on investments	$14,471,892	$9,535,558
b. Gross income from securities lending	90,480	382,939
c. Fees and expenses	(4,978,627)	(4,365,306)
d. Total net income: [sum of (5a) through (5c)]	$9,583,745	$5,553,191
6. Investment income:		
a. Actual market return: (2) - (3) - (4g) - (5d)	$122,031,188	$68,925,763
b. Assumed rate of return	7.00%	7.00%
c. Assumed amount of return	43,475,896	43,152,594
d. Amount subject to phase-in: (6a) - (6c)	$78,555,292	$25,773,169
7. Phase-in recognition of investment income:		
a. Current year: 0.20 * (6d)	$15,711,058	$5,154,634
b. First prior year	5,154,634	13,833,557
c. Second prior year	13,833,557	(13,195,137)
d. Third prior year	(13,195,137)	6,973,578
e. Fourth prior year	6,973,578	(556,237)
f. Total recognition	$28,477,690	$12,210,395
8. Actuarial value of assets, end of year		
a. Preliminary actuarial value of assets, end of year: (1) + (4g) + (5d) + (6c) + (7f)	$789,572,141	$722,308,507
b. Upper corridor limit: 120% * (2)	1,058,822,698	918,013,214
c. Lower corridor limit: 80% * (2)	705,881,798	612,008,810
d. Actuarial value of assets, end of year	$789,572,141	$722,308,507
9. Difference between market and actuarial value of assets	$92,780,107	$42,702,505
10. Actuarial rate of return	11.40%	9.14%
11. Market rate of return*	17.19%	11.03%
12. Ratio of actuarial value to market value of assets	89.48%	94.42%

* Current year market rate of return is based on unaudited data and is supplied by the plan's investment consultant.

Table 10

History of Investment Returns

Plan Year	Market Value	Actuarial Value
(1)	(2)	(3)
2004	11.54%	5.82%
2005	8.22%	7.08%
2006	12.63%	9.23%
2007	7.44%	10.54%
2008	-29.63%	-12.67%
2009	23.72%	17.23%
2010	13.80%	3.34%
2011	-0.90%	1.77%
2012	14.05%	2.91%
2013	13.53%	11.24%
2014	4.70%	8.64%
2015	-0.26%	5.89%
2016	7.60%	6.68%
2017	14.20%	7.17%
2018	-3.52%	3.99%
2019	18.72%	6.18%
2020	11.03%	9.14%
2021	17.19%	11.40%
Average returns:		
Last five years:	11.22%	7.55%
Last ten years:	9.49%	7.29%

The market returns above are gross of investment expenses and were provided by the plan's investment consultant. The actuarial returns above are based on the financial information provided by the plan's auditors.

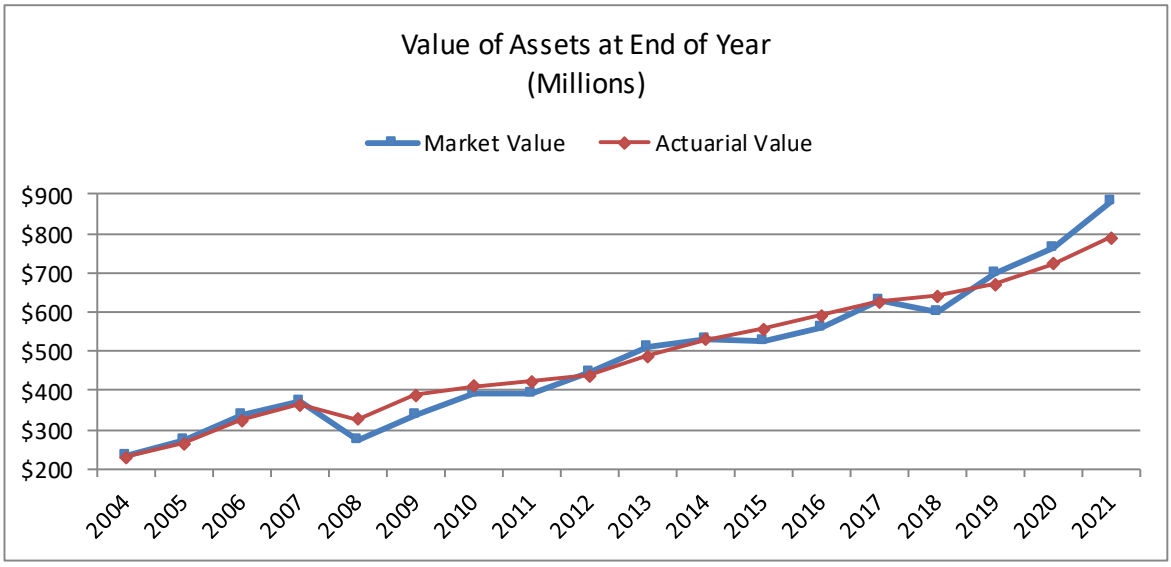

Table 11

Solvency Test

Valuation Date January 1	Total Active Member Contributions (1)	Inactive and Pensioner Liability (2)	Active Accrued Liability (3)	Actuarial Value of Assets	Percentage of Liabilities Covered by Assets		
					(1)	(2)	(3)
2005	$61,842,876	$87,958,000	$110,225,000	$230,698,495	100%	100%	73.4%
2006	66,827,791	109,836,100	119,969,000	264,962,712	100%	100%	73.6%
2007	72,004,612	130,672,200	128,806,000	322,969,528	100%	100%	93.4%
2008	74,889,713	163,621,400	141,901,000	364,723,051	100%	100%	88.9%
2009	82,306,146	173,849,000	134,790,000	325,945,852	100%	100%	51.8%
2010	92,241,086	166,797,234	121,992,468	389,358,007	100%	100%	100.0%
2011	100,333,051	186,200,382	123,626,373	409,567,029	100%	100%	99.5%
2012	106,871,965	210,366,572	123,266,327	422,202,959	100%	100%	85.2%
2013	116,002,787	229,727,100	127,814,770	437,235,498	100%	100%	71.6%
2014	121,915,804	260,467,214	144,399,452	486,817,860	100%	100%	72.3%
2015	128,198,774	286,399,991	149,642,588	528,542,864	100%	100%	76.1%
2016	133,911,728	309,474,214	153,470,235	557,125,768	100%	100%	74.1%
2017	137,264,555	335,396,840	155,423,417	590,466,391	100%	100%	75.8%
2018	140,028,844	389,301,860	179,627,128	625,562,038	100%	100%	53.6%
2019	140,663,665	421,538,730	187,322,490	641,342,345	100%	100%	42.2%
2020	142,463,869	453,526,381	198,964,475	671,746,944	100%	100%	38.1%
2021	146,445,081	485,587,766	208,779,989	722,308,507	100%	100%	43.2%
2022	147,980,630	531,045,121	253,527,752	789,572,141	100%	100%	43.6%

Effective January 1, 2010, liabilities are calculated assuming no future cost-of-living increases.

Table 12

Schedule of Funding Progress

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Valuation Date January 1	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Unfunded AAL (UAAL) [(3) - (2)]	Funded Ratio [(2)/(3)]	Covered Payroll	UAAL as a Percentage of Covered Payroll [(4)/(6)]
2003	$186,080,269	$206,395,100	$20,314,831	90.16%	$79,217,700	25.64%
2004	204,892,219	236,441,300	31,549,081	86.66%	84,242,600	37.45%
2005	230,698,495	260,025,800	29,327,305	88.72%	89,351,600	32.82%
2006	264,962,712	296,633,400	31,670,688	89.32%	98,070,700	32.29%
2007	322,969,528	331,483,200	8,513,672	97.43%	108,350,000	7.86%
2008	364,723,051	380,413,100	15,690,049	95.88%	119,165,000	13.17%
2009	325,945,852	390,945,700	64,999,848	83.37%	132,701,500	48.98%
2010	389,358,007	381,030,788	(8,327,219)	102.19%	149,481,383	-5.57%
2011	409,567,029	410,159,806	592,777	99.86%	154,652,284	0.38%
2012	422,202,959	440,504,864	18,301,905	95.85%	155,481,933	11.77%
2013	437,235,498	473,544,657	36,309,158	92.33%	157,764,488	23.01%
2014	486,817,860	526,782,470	39,964,610	92.41%	154,071,943	25.94%
2015	528,542,864	564,241,353	35,698,489	93.67%	156,791,728	22.77%
2016	557,125,768	596,856,177	39,730,409	93.34%	161,357,314	24.62%
2017	590,466,391	628,084,812	37,618,421	94.01%	160,072,828	23.50%
2018	625,562,038	708,957,832	83,395,794	88.24%	155,696,162	53.56%
2019	641,342,345	749,524,885	108,182,540	85.57%	159,747,760	67.72%
2020	671,746,944	794,954,725	123,207,781	84.50%	164,757,930	74.78%
2021	722,308,507	840,812,836	118,504,329	85.91%	170,284,524	69.59%
2022	789,572,141	932,553,503	142,981,362	84.67%	165,440,506	86.42%

Effective January 1, 2010, liabilities are calculated assuming no future cost-of-living increases.

Table 13

Schedule of Contributions from the Employer(s) and Other Contributing Entities

(1)	(2)	(3)	(4)	(5)	(6)
Fiscal Year Ending December 31	Actuarially Determined Contribution		Employer Contributions*		Percentage of Actuarially Determined Contributions Contributed
	% of Payroll	Amount	% of Payroll	Amount	[(5)/(3)]
2004	7.95%	$6,693,300	15.32%	$12,902,452	192.77%
2005	8.81%	7,873,900	12.48%	11,155,211	141.67%
2006	7.28%	7,138,000	34.90%	34,228,475	479.52%
2007	7.21%	7,810,100	9.78%	10,591,387	135.61%
2008	7.62%	9,084,200	9.95%	11,861,638	130.57%
2009	8.60%	11,413,400	8.88%	11,779,557	103.21%
2010	5.37%	8,029,651	8.81%	13,166,633	163.98%
2011	5.69%	8,806,599	8.73%	13,497,836	153.27%
2012	6.37%	9,899,466	8.60%	13,364,655	135.00%
2013	7.01%	11,071,525	8.59%	13,558,586	122.46%
2014	7.67%	11,812,078	8.76%	13,496,913	114.26%
2015	7.47%	11,708,248	8.10%	12,706,883	108.53%
2016	7.48%	12,063,684	8.76%	13,730,305	113.82%
2017	7.26%	11,623,441	8.51%	13,614,406	117.13%
2018	9.31%	14,493,422	8.61%	13,781,011	95.08%
2019	10.48%	16,754,321	8.92%	14,270,844	85.18%
2020	11.07%	18,231,644	9.04%	14,893,513	81.69%
2021	10.75%	18,309,732	8.55%	14,567,813	79.56%
2022	14.26%	23,603,760	-	-	-

Effective January 1, 2010, liabilities are calculated assuming no future cost-of-living increases.

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

Table 14

Reconciliation of Participant Data

	Active Participants	Vested Former Participants	Retired Participants	Disableds	Beneficiaries	Participants Due Refunds	Total
Number as of January 1, 2021	**2,646**	**409**	**1,130**	**159**	**153**	**1,153**	**5,650**
New participants	252	6	-	-	2	48	308
Vested terminations	(76)	77	-	-	-	(1)	-
Retirements	(75)	(9)	84	-	-	-	-
Disability	(11)	(1)	-	12	-	-	-
Deceased with beneficiary	(2)	-	(12)	(2)	16	-	-
Deceased without beneficiary	(3)	-	(10)	(1)	(6)	(1)	(21)
Due refunds	(123)	-	-	-	-	123	-
Lump sum payoffs	(48)	(17)	-	-	-	(48)	(113)
Rehires/return to active	19	(8)	-	-	-	(11)	-
Certain period expired	-	-	-	-	(3)	-	(3)
Reclassifications	-	-	-	-	-	-	-
Data corrections	-	-	-	-	-	-	-
Number as of January 1, 2022	**2,579**	**457**	**1,192**	**168**	**162**	**1,263**	**5,821**

Table 15

Demographic Statistics

	January 1		
	2022	2021	Change
Active Participants			
Number	2,579	2,646	-2.5%
Vested	*1,768*	*1,793*	
Not vested	*811*	*853*	
Average age (years)	39.52	39.37	0.4%
Average service (years)	8.98	8.80	2.0%
Average entry age (years)	30.54	30.57	-0.1%
Total payroll*	$165,440,506	$170,284,524	-2.8%
Average payroll*	$64,149	$64,355	-0.3%
Total employee contributions with interest	$147,980,630	$146,445,081	1.0%
Average employee contributions with interest	$57,379	$55,346	3.7%
Vested Former Participants			
Number	457	409	11.7%
Average age (years)	45.24	45.52	-0.6%
Total employee contributions with interest	$22,049,998	$19,907,911	10.8%
Average employee contributions with interest	$48,249	$48,675	-0.9%
Service Retirees			
Number	1,192	1,130	5.5%
Average age (years)	64.79	64.63	0.2%
Total annual benefits	$33,165,187	$30,952,174	7.1%
Average annual benefit	$27,823	$27,391	1.6%
Disability Retirees			
Number	168	159	5.7%
Average age (years)	56.73	56.94	-0.4%
Total annual benefits	$5,118,667	$4,773,560	7.2%
Average annual benefit	$30,468	$30,022	1.5%
Beneficiaries			
Number	162	153	5.9%
Average age (years)	66.71	66.12	0.9%
Total annual benefits	$2,891,670	$2,699,529	7.1%
Average annual benefit	$17,850	$17,644	1.2%
Participants Due Refunds			
Number	1,263	1,153	9.5%
Total Refunds Due	$5,537,004	$4,892,448	13.2%

* Projected payroll for the upcoming valuation year

Table 16

Distribution of Male Active Members by Age and by Years of Service

Average Age = 39.6 Average Service = 9.3

Age Last Birthday		Whole Years of Service at Valuation Date							
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 20	Count	5	-	-	-	-	-	-	5
	Avg. Salary	$42,033	-	-	-	-	-	-	$42,033
20-24	Count	106	-	-	-	-	-	-	106
	Avg. Salary	$49,220	-	-	-	-	-	-	$49,220
25-29	Count	169	60	1	-	-	-	-	230
	Avg. Salary	53,630	$61,764	*	-	-	-	-	55,745
30-34	Count	149	152	56	2	-	-	-	359
	Avg. Salary	55,573	64,484	$70,061	*	-	-	-	61,696
35-39	Count	83	87	134	34	-	-	-	338
	Avg. Salary	57,641	65,658	70,522	$79,548	-	-	-	67,015
40-44	Count	73	52	81	68	14	-	-	288
	Avg. Salary	54,383	64,346	71,610	73,006	$77,369	-	-	66,542
45-49	Count	28	29	56	64	33	2	-	212
	Avg. Salary	58,676	66,901	64,449	75,251	82,421	*	-	70,233
50-54	Count	20	20	32	51	35	9	1	168
	Avg. Salary	57,267	66,258	68,254	70,129	84,904	90,268	*	72,101
55-59	Count	12	13	26	35	12	9	3	110
	Avg. Salary	60,804	64,426	65,718	72,373	72,410	84,304	*	70,782
60-64	Count	4	9	14	9	1	2	6	45
	Avg. Salary	52,335	57,415	64,969	78,892	*	*	$84,804	67,909
65-69	Count	-	3	1	3	4	-	3	14
	Avg. Salary	-	*	*	*	69,574	-	*	72,275
70 & Over	Count	-	-	-	-	-	-	1	1
	Avg. Salary	-	-	-	-	-	-	*	*
Totals	Count	**649**	**425**	**401**	**266**	**99**	**22**	**14**	**1,876**
	Avg. Salary	**$54,319**	**$64,410**	**$69,045**	**$73,929**	**$80,580**	**$85,381**	**$91,915**	**$64,564**

Average Salary represents annualized salary earned in 2021 and is not shown for cells with counts less than or equal to three participants

Table 17

Distribution of Female Active Members by Age and by Years of Service

Average Age = 39.2 Average Service = 8.1

Age Last Birthday		Whole Years of Service at Valuation Date							
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 20	Count	1	-	-	-	-	-	-	1
	Avg. Salary	*	-	-	-	-	-	-	*
20-24	Count	63	-	-	-	-	-	-	63
	Avg. Salary	$45,485	-	-	-	-	-	-	$45,485
25-29	Count	76	19	-	-	-	-	-	95
	Avg. Salary	52,964	$62,365	-	-	-	-	-	54,844
30-34	Count	69	46	16	1	-	-	-	132
	Avg. Salary	50,516	60,640	$63,693	*	-	-	-	55,798
35-39	Count	46	24	19	12	-	-	-	101
	Avg. Salary	49,525	58,711	65,590	$77,970	-	-	-	58,109
40-44	Count	26	23	27	25	3	-	-	104
	Avg. Salary	52,326	57,138	65,066	68,005	*	-	-	61,031
45-49	Count	15	14	17	21	6	-	-	73
	Avg. Salary	49,011	64,551	60,856	66,650	$72,789	-	-	61,778
50-54	Count	8	9	17	15	11	2	-	62
	Avg. Salary	46,935	59,668	57,437	64,773	69,296	*	-	60,863
55-59	Count	7	8	10	9	3	3	2	42
	Avg. Salary	45,861	61,346	59,287	60,315	*	*	*	59,871
60-64	Count	4	1	4	7	4	3	-	23
	Avg. Salary	42,402	*	55,287	63,985	64,634	*	-	58,651
65-69	Count	-	1	-	2	3	-	-	6
	Avg. Salary	-	*	-	*	*	-	-	57,910
70 & Over	Count	-	-	-	-	-	-	1	1
	Avg. Salary	-	-	-	-	-	-	*	*
Totals	Count	**315**	**145**	**110**	**92**	**30**	**8**	**3**	**703**
	Avg. Salary	**$49,709**	**$60,266**	**$62,246**	**$67,468**	**$69,160**	**$68,374**	*	**$57,302**

Average Salary represents annualized salary earned in 2021 and is not shown for cells with counts less than or equal to three participants

Table 18

Distribution of Total Active Members by Age and by Years of Service

Average Age = 39.5 Average Service = 9.0

Age Last Birthday		Whole Years of Service at Valuation Date							
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 20	Count	6	-	-	-	-	-	-	6
	Avg. Salary	$42,026	-	-	-	-	-	-	$42,026
20-24	Count	169	-	-	-	-	-	-	169
	Avg. Salary	$47,828	-	-	-	-	-	-	47,828
25-29	Count	245	79	1	-	-	-	-	325
	Avg. Salary	53,423	$61,909	*	-	-	-	-	55,482
30-34	Count	218	198	72	3	-	-	-	491
	Avg. Salary	53,973	63,591	$68,646	*	-	-	-	60,111
35-39	Count	129	111	153	46	-	-	-	439
	Avg. Salary	54,747	64,156	69,910	$79,136	-	-	-	64,966
40-44	Count	99	75	108	93	17	-	-	392
	Avg. Salary	53,843	62,136	69,974	71,662	$76,406	-	-	65,080
45-49	Count	43	43	73	85	39	2	-	285
	Avg. Salary	55,305	66,136	63,612	73,126	80,940	*	-	68,067
50-54	Count	28	29	49	66	46	11	1	230
	Avg. Salary	54,315	64,213	64,501	68,912	81,172	87,559	*	69,072
55-59	Count	19	21	36	44	15	12	5	152
	Avg. Salary	55,299	63,252	63,932	69,906	73,241	81,265	$94,081	67,767
60-64	Count	8	10	18	16	5	5	6	68
	Avg. Salary	47,369	58,869	62,818	72,370	62,796	65,158	$84,804	64,778
65-69	Count	-	4	1	5	7	-	3	20
	Avg. Salary	-	56,617	*	71,007	64,307	-	*	67,966
70 & Over	Count	-	-	-	-	-	-	2	2
	Avg. Salary	-	-	-	-	-	-	*	*
Totals	Count	**964**	**570**	**511**	**358**	**129**	**30**	**17**	**2,579**
	Avg. Salary	**$52,812**	**$63,356**	**$67,582**	**$72,269**	**$77,924**	**$80,846**	**$88,095**	**$62,584**

Average Salary represents annualized salary earned in 2021 and is not shown for cells with counts less than or equal to three participants

Table 19

Distribution of Male Deferred Members by Age and by Years of Service

Average Age = 45.2 Average Service = 8.0

Age Last Birthday	Whole Years of Service at Valuation Date							
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 20	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-
25-29	-	1	9	-	-	-	-	10
30-34	-	9	21	-	-	-	-	30
35-39	-	13	35	9	-	-	-	57
40-44	-	17	21	11	1	-	-	50
45-49	-	1	29	17	4	-	-	51
50-54	1	6	30	13	-	-	-	50
55-59	-	3	14	7	4	-	-	28
60-64	-	1	5	3	1	-	-	10
65-69	-	-	1	3	-	-	-	4
70 & Over	-	-	-	-	-	-	-	-
Totals	**1**	**51**	**165**	**63**	**10**	**-**	**-**	**290**

Table 20

Distribution of Female Deferred Members by Age and by Years of Service

Average Age = 45.3 Average Service = 7.8

Age Last Birthday	Whole Years of Service at Valuation Date							
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 20	-	-	-	-	-	-	-	-
20-24	-	1	-	-	-	-	-	1
25-29	-	3	3	-	-	-	-	6
30-34	-	5	13	-	-	-	-	18
35-39	1	7	15	4	3	-	-	30
40-44	-	3	19	3	3	-	-	28
45-49	1	3	17	3	-	-	-	24
50-54	1	1	21	8	2	-	-	33
55-59	-	1	14	6	-	-	-	21
60-64	-	-	2	2	-	-	-	4
65-69	-	1	1	-	-	-	-	2
70 & Over	-	-	-	-	-	-	-	-
Totals	**3**	**25**	**105**	**26**	**8**	**-**	**-**	**167**

Table 21

Distribution of Total Deferred Members by Age and by Years of Service

Average Age = 45.2 Average Service = 7.9

Age	Whole Years of Service at Valuation Date							
Last Birthday	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 20	-	-	-	-	-	-	-	-
20-24	-	1	-	-	-	-	-	1
25-29	-	4	12	-	-	-	-	16
30-34	-	14	34	-	-	-	-	48
35-39	1	20	50	13	3	-	-	87
40-44	-	20	40	14	4	-	-	78
45-49	1	4	46	20	4	-	-	75
50-54	2	7	51	21	2	-	-	83
55-59	-	4	28	13	4	-	-	49
60-64	-	1	7	5	1	-	-	14
65-69	-	1	2	3	-	-	-	6
70 & Over	-	-	-	-	-	-	-	-
Totals	**4**	**76**	**270**	**89**	**18**	**-**	**-**	**457**

Table 22

Schedule of Pension Recipients Added to and Removed from Rolls

Fiscal Year Ending December 31	Added to Rolls*		Removed from Rolls		Total		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	Count	Annual Pension Benefits	Count	Annual Pension Benefits	Count	Annual Pension Benefits		
2008	72	$1,651,841	11	($9,251)	610	$13,605,759	13.91%	$22,305
2009	55	1,154,341	9	(65,125)	656	14,694,975	8.01%	22,401
2010	75	1,881,618	12	(109,159)	719	16,467,434	12.06%	22,903
2011	93	2,330,905	7	(101,024)	805	18,697,315	13.54%	23,226
2012	54	1,418,567	7	(62,989)	852	20,052,893	7.25%	23,536
2013	77	2,048,141	12	(155,942)	917	21,945,092	9.44%	23,931
2014	98	2,598,158	14	(250,849)	1,001	24,292,401	10.70%	24,268
2020	83	2,229,651	14	(234,679)	1,070	26,287,373	8.21%	24,568
2016	91	2,618,016	14	(239,572)	1,147	28,665,817	9.05%	24,992
2017	83	2,325,313	28	(478,242)	1,202	30,512,888	6.44%	25,385
2018	89	2,817,707	17	(254,449)	1,274	33,076,146	8.40%	25,962
2019	111	3,086,125	22	(461,992)	1,363	35,700,279	7.93%	26,192
2020	106	3,212,958	27	(487,974)	1,442	38,425,263	7.63%	26,647
2021	114	3,265,415	34	(515,154)	1,522	41,175,524	7.16%	27,054

* Includes cost-of-living increases

Table 23

Retired and Disabled Members by Option Code

	Count			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Option Code*						
1	205	117	322	$489,581	$217,960	$707,541
2	465	67	532	1,168,384	130,453	1,298,837
2P	192	38	230	466,470	81,296	547,766
3	39	10	49	95,498	23,929	119,427
3P	37	8	45	96,276	19,522	115,798
4	24	10	34	64,040	22,993	87,033
5	32	17	49	66,466	36,260	102,726
Other**	97	2	99	206,645	4,548	211,193
Total	**1091**	**269**	**1,360**	**$2,653,360**	**$536,961**	**$3,190,321**
Beneficiaries	**9**	**153**	**162**	**$10,051**	**$230,922**	**$240,973**
Grand Total	**1100**	**422**	**1,522**	**$2,663,411**	**$767,883**	**$3,431,294**

*See optional forms of payment in Appendix B.

**66.67% joint and survivor option for grandfathered employees.

Table 24

Pensioners by Monthly Benefit and Option Code

Males	Option Code								
Benefit Amount	**1**	**2**	**2P**	**3**	**3P**	**4***	**5**	**Other**	**Total**
Under $200	2	2	-	-	-	-	-	-	4
$200-$399	9	6	6	1	-	5	2	-	29
$400-$599	4	14	10	3	2	2	4	-	39
$600-$799	11	10	6	-	2	1	2	1	33
$800-$999	7	9	8	1	-	1	2	3	31
$1,000-$1,499	15	33	14	3	4	-	5	8	82
$1,500-$1,999	23	65	25	4	4	-	1	30	152
$2,000-$2,499	33	103	33	4	7	4	5	30	219
$2,500 & over	101	223	90	23	18	15	16	25	511
Total	**205**	**465**	**192**	**39**	**37**	**28**	**37**	**97**	**1100**
Females									
Benefit Amount	**1**	**2**	**2P**	**3**	**3P**	**4***	**5**	**Other**	**Total**
Under $200	1	-	-	-	-	-	4	-	5
$200-$399	6	2	1	-	-	2	13	-	24
$400-$599	9	5	1	-	-	1	14	-	30
$600-$799	6	2	1	-	-	-	14	-	23
$800-$999	8	4	1	-	2	1	7	-	23
$1,000-$1,499	16	5	5	-	-	1	45	-	72
$1,500-$1,999	16	10	5	4	2	1	24	1	63
$2,000-$2,499	24	21	11	2	2	2	14	-	76
$2,500 & over	31	18	13	4	2	4	33	1	106
Total	**117**	**67**	**38**	**10**	**8**	**12**	**168**	**2**	**422**
Males & Females									
Benefit Amount	**1**	**2**	**2P**	**3**	**3P**	**4***	**5**	**Other**	**Total**
Under $200	3	2	-	-	-	-	4	-	9
$200-$399	15	8	7	1	-	7	15	-	53
$400-$599	13	19	11	3	2	3	18	-	69
$600-$799	17	12	7	-	2	1	16	1	56
$800-$999	15	13	9	1	2	2	9	3	54
$1,000-$1,499	31	38	19	3	4	1	50	8	154
$1,500-$1,999	39	75	30	8	6	1	25	31	215
$2,000-$2,499	57	124	44	6	9	6	19	30	295
$2,500 & over	132	241	103	27	20	19	49	26	617
Total	**322**	**532**	**230**	**49**	**45**	**40**	**205**	**99**	**1,522**

**Includes 6 beneficiaries who are receiving a certain only benefit.*

Table 25

Pensioners by Age and Option Code

Average Age Male = 63.8 Average Age Female = 65.0 Average Age Total = 64.1

Males	Option Code								
Age Last Birthday	**1**	**2**	**2P**	**3**	**3P**	**4***	**5**	**Other**	**Total**
Under 50	25	39	23	4	2	4	1	-	98
50-54	26	46	23	3	5	4	3	-	110
55-59	24	68	21	11	5	4	2	2	137
60-64	39	96	36	1	6	5	7	10	200
65-69	30	107	42	7	9	3	12	19	229
70-74	34	79	31	9	5	6	9	35	208
75-79	19	23	15	3	3	2	1	15	81
80-84	6	6	1	-	2	-	2	11	28
85 & over	2	1	-	1	-	-	-	5	9
Total	**205**	**465**	**192**	**39**	**37**	**28**	**37**	**97**	**1,100**
Females									
Age Last Birthday	**1**	**2**	**2P**	**3**	**3P**	**4***	**5**	**Other**	**Total**
Under 50	9	6	3	4	-	2	12	-	36
50-54	9	4	7	1	2	2	11	-	36
55-59	12	8	7	1	1	2	13	-	44
60-64	20	20	9	1	3	2	22	-	77
65-69	38	18	4	2	-	3	32	1	98
70-74	17	11	8	1	2	-	34	-	73
75-79	9	-	-	-	-	1	21	1	32
80-84	3	-	-	-	-	-	13	-	16
85 & over	-	-	-	-	-	-	10	-	10
Total	**117**	**67**	**38**	**10**	**8**	**12**	**168**	**2**	**422**
Males & Females									
Age Last Birthday	**1**	**2**	**2P**	**3**	**3P**	**4***	**5**	**Other**	**Total**
Under 50	34	45	26	8	2	6	13	-	134
50-54	35	50	30	4	7	6	14	-	146
55-59	36	76	28	12	6	6	15	2	181
60-64	59	116	45	2	9	7	29	10	277
65-69	68	125	46	9	9	6	44	20	327
70-74	51	90	39	10	7	6	43	35	281
75-79	28	23	15	3	3	3	22	16	113
80-84	9	6	1	-	2	-	15	11	44
85 & over	2	1	-	1	-	-	10	5	19
Total	**322**	**532**	**230**	**49**	**45**	**40**	**205**	**99**	**1,522**

**Includes 6 beneficiaries who are receiving a certain only benefit.*

Table 26

Pensions Awarded in 2021 by Option Code

Average Age = 53.3

Males & Females	Option Code								
Benefit Amount	**1**	**2**	**2P**	**3**	**3P**	**4**	**5**	**Other**	**Total**
Under $200	-	-	-	-	-	-	-	-	0
$200-$399	2	2	-	-	-	-	1	-	5
$400-$599	-	1	-	-	-	-	3	1	5
$600-$799	-	-	-	-	-	-	1	-	1
$800-$999	3	2	-	-	-	-	1	-	6
$1,000-$1,499	2	2	-	1	-	-	8	-	13
$1,500-$1,999	1	13	2	-	-	-	1	-	17
$2,000-$2,499	3	5	3	-	1	-	-	-	12
$2,500 & over	11	26	11	1	3	-	3	-	55
Total	**22**	**51**	**16**	**2**	**4**	**0**	**18**	**1**	**114**
Males & Females									
Age Last Birthday	**1**	**2**	**2P**	**3**	**3P**	**4**	**5**	**Other**	**Total**
Under 50	7	16	7	-	1	-	2	1	34
50-54	4	6	4	1	1	-	1	-	17
55-59	4	11	2	-	2	-	3	-	22
60-64	5	13	1	-	-	-	3	-	22
65-69	2	5	2	1	-	-	2	-	12
70-74	-	-	-	-	-	-	4	-	4
75-79	-	-	-	-	-	-	3	-	3
80-84	-	-	-	-	-	-	-	-	0
85 & over	-	-	-	-	-	-	-	-	-
Total	**22**	**51**	**16**	**2**	**4**	**-**	**18**	**1**	**114**

Table 27

Retirees and Disabled Members by Service at Retirement and Years Since Retirement

Average Service at Retirement = 17.8 Average Years Since Retirement = 10.1

Service at Retirement		Years Elapsed Since Retirement							
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals
Less than 5	Count	10	11	13	13	41	25	25	138
	Avg. Benefit	$2,218	$3,058	$4,024	$4,650	$2,249	$2,214	$1,649	$1,845
5-9	Count	32	46	40	19	1	-	-	138
	Avg. Benefit	1,072	775	1,019	1,115	366	-	-	959
10-14	Count	72	50	31	21	-	1	1	176
	Avg. Benefit	1,793	1,735	1,742	1,483	-	1,861	1,233	1,728
15-19	Count	41	28	31	30	-	2	-	132
	Avg. Benefit	2,263	1,873	2,011	1,636	-	1,898	-	1,973
20-24	Count	181	121	114	96	1	3	-	516
	Avg. Benefit	2,839	2,688	2,354	2,099	1,809	1,866	-	2,551
25-29	Count	49	45	39	38	-	2	-	173
	Avg. Benefit	3,923	3,508	3,111	2,708	-	2,559	-	3,350
30-34	Count	20	25	21	8	-	1	-	75
	Avg. Benefit	4,245	3,903	3,725	3,403	-	3,030	-	3,879
35 & Over	Count	6	4	2	-	-	-	-	12
	Avg. Benefit	4,908	4,128	3,105	-	-	-	-	4,348
Totals	Count	**411**	**330**	**291**	**225**	**43**	**34**	**26**	**1,360**
	Avg. Benefit	**$2,653**	**$2,365**	**$2,218**	**$2,056**	**$2,195**	**$2,199**	**$1,633**	**$2,346**

Table 28

Retirees and Disabled Members by Year of Retirement

January 1, 2022 Total = 1,360

Year of Retirement	Count	Year of Retirement	Count
Under 1960	-	1991	4
1960	-	1992	3
1961	-	1993	7
1962	-	1994	4
1963	-	1995	10
1964	-	1996	9
1965	-	1997	5
1966	-	1998	13
1967	-	1999	4
1968	-	2000	9
1969	-	2001	11
1970	-	2002	28
1971	-	2003	40
1972	-	2004	42
1973	-	2005	59
1974	-	2006	49
1975	-	2007	71
1976	-	2008	56
1977	-	2009	37
1978	-	2010	57
1979	1	2011	73
1980	1	2012	49
1981	2	2013	59
1982	-	2014	77
1983	2	2015	79
1984	-	2016	72
1985	2	2017	68
1986	2	2018	71
1987	1	2019	95
1988	2	2020	86
1989	6	2021*	91
1990	3		

**May include retirements as of January 1, 2022*

Table 29

Thirty Year Closed Group Projected Benefit Payments

Year Ending December 31	Actives	Retirees*	Total
2022	$ 4,103,762	$ 41,291,936	$ 45,395,699
2023	6,728,890	41,214,630	47,943,520
2024	9,316,897	41,140,998	50,457,896
2025	11,876,399	41,020,461	52,896,860
2026	14,744,085	40,900,160	55,644,246
2027	17,814,128	40,742,863	58,556,991
2028	21,144,447	40,624,747	61,769,194
2029	24,693,345	40,420,215	65,113,560
2030	28,394,375	40,187,950	68,582,325
2031	32,167,281	39,911,493	72,078,774
2032	35,995,902	39,624,979	75,620,881
2033	39,841,169	39,266,978	79,108,148
2034	43,697,524	38,836,280	82,533,804
2035	47,633,285	38,318,969	85,952,254
2036	51,610,928	37,826,625	89,437,553
2037	55,543,100	37,291,048	92,834,148
2038	59,473,720	36,660,486	96,134,206
2039	63,417,801	35,920,529	99,338,330
2040	67,276,729	35,142,252	102,418,981
2041	71,022,037	34,286,791	105,308,828
2042	74,466,111	33,444,983	107,911,094
2043	77,380,380	32,555,051	109,935,432
2044	79,854,886	31,583,126	111,438,011
2045	81,935,404	30,532,881	112,468,285
2046	83,630,835	29,422,603	113,053,438
2047	84,942,532	28,311,149	113,253,681
2048	85,916,478	27,152,424	113,068,903
2049	86,636,936	25,925,067	112,562,003
2050	87,023,418	24,630,585	111,654,003
2051	87,064,019	23,321,347	110,385,366

* Includes Disabled Members, Beneficiaries, and Deferred Vested Members. Retirement benefit payments for deferred vested members are assumed to commence at age 60.

APPENDIX A

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Assumptions and Methods

The following methods and assumptions were used in preparing the January 1, 2022 actuarial valuation report.

1. Valuation Date

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

2. Actuarial Cost Method

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

   a. The valuation is prepared on the projected benefit basis, under which the present value, at the investment return rate assumed to be earned in the future (currently 6.80%), of each participant's expected benefit payable at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability, or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable for the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Fund on account of the present group of participants and beneficiaries.

   b. The employer contributions required to support the benefits of the Fund are determined using a level funding approach, and consist of a normal cost contribution and an 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.

a. Salary increase rate

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

b. 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.

c. 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

b. Rates Before Retirement

Healthy Pre-Retirement Mortality:

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

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

Healthy Post-Retirement Mortality:

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

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

Disabled Mortality:

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

Males: No set back with a multiplier of 100%

Females: No set back with a multiplier of 100%

	Pre-Retirement		Post-Retirement		Disabled	
	Projected to 2022 using the MP-2020 Ultimate Scale					
Age	Male	Female	Male	Female	Male	Female
20	0.03%	0.01%	0.03%	0.01%	0.10%	0.05%
25	0.03%	0.02%	0.03%	0.02%	0.09%	0.06%
30	0.03%	0.02%	0.03%	0.02%	0.10%	0.08%
35	0.04%	0.03%	0.04%	0.03%	0.12%	0.10%
40	0.05%	0.04%	0.05%	0.04%	0.15%	0.14%
45	0.07%	0.06%	0.10%	0.07%	0.21%	0.19%
50	0.10%	0.08%	0.16%	0.13%	0.30%	0.26%
55	0.15%	0.10%	0.26%	0.22%	0.41%	0.39%
60	0.22%	0.14%	0.43%	0.38%	0.62%	0.59%
65	0.35%	0.19%	0.75%	0.66%	1.01%	0.91%
70	0.66%	0.39%	1.35%	1.14%	1.64%	1.39%
75			2.45%	1.99%	2.81%	2.12%
80			4.47%	3.47%	4.90%	3.47%
85			8.23%	6.16%	8.30%	6.16%
90			14.70%	10.95%	14.70%	10.95%
95			22.73%	18.07%	22.73%	18.07%
100			31.45%	27.16%	31.45%	27.16%

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

c. Disability

Age	Disability	
	Non-Duty	Duty
20	0.03%	0.02%
25	0.03%	0.02%
30	0.03%	0.02%
35	0.04%	0.02%
40	0.09%	0.05%
45	0.19%	0.12%
50	0.33%	0.20%
55	0.57%	0.34%
60	1.11%	0.67%
65	1.53%	0.92%
70	1.53%	0.92%
75	1.53%	0.92%

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

d. Withdrawal

Service	Withdrawal	
	Male	Female
1	12.00%	18.00%
2-4	12.00%	16.00%
5	12.00%	14.00%
6	10.00%	14.00%
7	10.00%	12.00%
8	9.00%	11.00%
9	7.00%	8.00%
10-11	6.00%	8.00%
12	5.00%	7.00%
13	4.00%	6.00%
14	4.00%	5.00%
15	3.00%	4.00%
16	3.00%	3.00%
17-18	2.00%	2.00%
19-20	1.00%	1.00%
21+	0.00%	0.00%

e. Retirement Rates

Age	Normal	Early
50	25.00%	2.00%
51-56	18.00%	2.00%
57-60	20.00%	2.00%
61-62	17.00%	
63-64	20.00%	
65-69	50.00%	
70+	100.00%	

15% is assumed for members with at least 20 years of service before age 50

6. Other Assumptions

a. Percent married: 85% of employees are assumed to be married. (No beneficiaries other than the spouse assumed.)

b. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

c. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.

d. Percent electing deferred termination benefit: It is assumed that 45% of active members who terminate with a vested deferred benefit will elect to have their contributions refunded.

e. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available, which for this plan is age 60.

f. No benefit data is available for members entitled to deferred benefits. The benefit is estimated using the final average compensation and service provided by WRS.

g. There will be no recoveries once disabled.

h. No children are assumed for purposes of valuing the ordinary death benefit.

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. 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.

n. Benefit Service: All members are assumed to accrue one year of service each year.

APPENDIX B

SUMMARY OF PLAN PROVISIONS

Summary of Plan Provisions

Covered Members	County sheriffs, deputy county sheriffs, municipal police officers; Investigator of the Wyoming Livestock Board; meeting the specifications of W.S.7-2-101(a)(iv)(E), investigators employed by the Wyoming State Board of Outfitters and professional guides meeting the specifications of W.S. 7-2-101(a)(iv)(J); Correctional officers, probation and parole agents employed by the Wyoming Department of Corrections, Wyoming Law Enforcement Academy instructors, University of Wyoming campus police officers; And full-time dispatchers or detention officers for law enforcement agencies.
Final Average Salary	Employee's average annual salary for the highest paid five continuous years of service.
Service Retirement	
Eligibility	Age 60 with four or more years of service as a law enforcement officer or any age with at least twenty years of service as a law enforcement officer. Early retirement benefits are payable to any law enforcement officer who has at least four but less than twenty years of service and are at least age 50. Early retirement benefits are actuarially reduced by 5% per year before age 60.
Monthly Benefit	2.50% of employee's highest five-year average salary for each year of credited service, not to exceed 75.0% of final average salary.
Vesting	Any employee who has left employment with four or more years of service, and who has not withdrawn accumulated contributions, is eligible to receive the above benefit or can elect to receive a lump-sum refund of contributions with interest. An employee who terminates with less than four years of service is only eligible for the lump-sum benefit.
Duty Disability Retirement	
Eligibility	No age or service eligibility requirements. Partial or total disability resulting from an individual and specific act, the type of which would normally occur only while employed as an employee, or as otherwise defined under W.S. 9-3-432(h).
Monthly Benefit	62.5% of Final Salary.
Non-duty Disability Retirement	
Eligibility	10 years of credited service. Partial or total disability, but not eligible for duty disability.
Monthly Benefit	50.0% of Final Salary.

Pre-retirement Duty Death Benefit

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

Pre-retirement Non-duty Death Benefit

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

Contributions

Employee	8.6% of salary. The employer may subsidize all or part of the employee contributions.
Employer	8.6% of salary.
Interest	3.0% annually. (0.0% for non-vested inactive members after July 1, 2019)

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

Optional Forms of Payment

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

APPENDIX C

RISKS ASSOCIATED WITH MEASURING THE ACCRUED LIABILITY AND ACTUARIALLY DETERMINED CONTRIBUTION

RISKS ASSOCIATED WITH MEASURING THE ACCRUED LIABILITY AND ACTUARIALLY DETERMINED CONTRIBUTION

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution rate shown on page 13 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	January 1, 2022	January 1, 2021
Ratio of the market value of assets to total payroll	5.3	4.5
Ratio of actuarial accrued liability to payroll	5.6	4.9
Ratio of actives to retirees and beneficiaries	1.7	1.8
Ratio of net cash flows to market value of assets	-2%	-1%
Duration of the actuarial accrued liability	13.5	13.5

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 4.0 times the payroll, a return on assets 5% different than assumed would equal 20% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 5.5 times the payroll, a change in liability 2% other than assumed would equal 11% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

DURATION OF ACTUARIAL ACCRUED LIABILITY

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability