# North Dakota Teachers' Fund for Retirement

ACTUARIAL VALUATION REPORT AS OF

July 1, 2024

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October 1, 2024

Board of Trustees
**North Dakota Teachers' Fund for Retirement**
3442 East Century Avenue
Bismarck, ND 58507-7100

**Re: Actuarial Valuation of the North Dakota Teachers' Fund for Retirement as of July 1, 2024**

Dear Trustees:

We are pleased to provide our formal annual Actuarial Valuation Report as of July 1, 2024, for the North Dakota Teachers' Fund for Retirement ("NDTFFR"). This report was prepared at the request of the Board and is intended for use by NDTFFR and those designated or approved by the Board. This report may be provided to parties other than NDTFFR only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure the funding progress of NDTFFR, to determine the actuarially determined employer contribution rate for the Plan Year commencing July 1, 2024, analyze changes in this rate and determine the sufficiency of statutory contribution rates. In addition, the report provides various summaries of the data. 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. Accounting information for purposes of complying with Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 is provided in separate reports.

***Financing Objectives***

The current member and employer contribution rates of 11.75% and 12.75%, respectively, are in accordance with those established in Section 15-39.1-09 of the North Dakota century Code. These rates are expected to remain in effect until NDTFFR is 100% funded on an actuarial basis. The member and employer rates will revert to the 7.75% rate established in 1997 once NDTFFR is 100% funded on an actuarial basis.

Per Board objectives, the combined member and employer contributions are intended to be sufficient to pay the normal cost and to amortize the Unfunded Actuarial Accrued Liability (UAAL) over a period of 19 years beginning July 1, 2024.

***Progress Toward Realization of Financing Objectives***

Based on the current valuation, the contribution rates are expected to fully fund NDTFFR in 2043, and as such, **the current Member and Employer contribution rates are expected to be sufficient to meet the Board financing objectives.**

The net employer Actuarially Determined Contribution (ADC) as a percentage of pay for the year beginning July 1, 2024 is 12.46%. The expected employer contribution is 12.75% of pay which creates a contribution surplus of 0.29% of pay. The ADC based on the prior valuation was 12.50%. The ADC decreased due to total payroll greater than expected which decreases the amortization of the unfunded liability as a rate of pay.

The funded ratio (ratio of the actuarial value of assets to the actuarial accrued liability) on an actuarial value of assets basis increased from 71.21% to 71.63% and increased on a fair value basis from 69.34% to 70.42%.

***Benefit Provisions***

All of the benefit provisions reflected in this valuation are those which were in effect on July 1, 2024. There have been no material changes to the benefit provisions since the prior report. The benefit provisions are summarized in Section F of this Report.

***Assumptions and Methods***

The assumptions and methods used in this valuation are those that were adopted by the Board in March 2020, first effective in the July 1, 2020 valuation. The assumptions and methods are detailed in Section I of this Report. The Board has sole authority to determine the actuarial assumptions used for NDTFFR. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. All actuarial assumptions and methods used in the valuation follow the guidance in the applicable Actuarial Standards of Practice and are expected to have no significant bias.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; 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 NDTFFR's funded status); and changes in plan provisions or applicable law. The actuarial calculations presented in this report are intended to provide information for rational decision making.

***Data***

The findings in this report are based on data and other information through July 1, 2024. The valuation was based upon information furnished by the North Dakota Teachers' Fund for Retirement staff, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. 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 North Dakota Teachers' Fund for Retirement staff.

***Other Disclosures***

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. This report was prepared using our proprietary valuation model which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

***Certification***

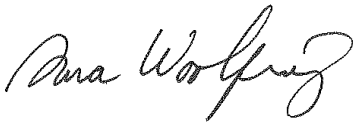
This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the North Dakota Teachers' Fund for Retirement as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The signing actuaries are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation and Report with the Board of Trustees and to answer any questions pertaining to the valuation.

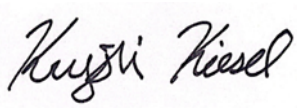
Respectfully submitted,

**Gabriel, Roeder, Smith & Company**



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

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



Krysti Kiesel, ASA, MAAA
Consultant

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# SECTION A

## EXECUTIVE SUMMARY

# Comments of the Actuarial Valuation

## Purpose

Valuations are prepared annually, as of July 1 of each year. The purposes of the valuation are to measure the funding progress of NDTFFR, to determine the actuarially determined employer contribution rate for the Plan Year commencing July 1, 2024, analyze changes in this rate and determine the sufficiency of statutory contribution rates.

In addition, the report provides summaries of the member data, financial data, plan provisions, and actuarial assumptions and methods.

## Financing Objectives

The North Dakota Teachers' Fund for Retirement is supported by member contributions, employer contributions and net earnings on the investment of the fund. Contribution rates are set by statute, and are currently 11.75% and 12.75%, respectively, for the members and employers. Per Board objectives, the combined member and employer contributions are intended to be sufficient to pay the normal cost and to amortize the Unfunded Actuarial Accrued Liability (UAAL) over a period of 19 years beginning July 1, 2024. If the contributions made are equal to the ADC, and if all actuarial assumptions are met, there will not be an unfunded accrued liability at the end of the 19-year period. Accordingly, the Actuarially Determined Contribution under the Board funding policy can be considered a "Reasonable Actuarially Determined Contribution" as required by the Actuarial Standards of Practice.

Based on the current valuation, the contribution rates are expected to fully fund NDTFFR in 2043, and as such, **the current Member and Employer contribution rates are expected to be sufficient to meet the Board financing objectives.**

## Assumption Changes

There were no changes to assumptions since the prior valuation. The assumptions are summarized in Section I of the report.

## Benefit Provisions

There were no material changes to benefit provisions since the prior valuation. The benefit provisions are summarized in Section F of the report.

## Experience During the Year

*Demographic experience*

The plan experienced a liability loss of $32.4 million during fiscal year 2024. Details on the liability loss can be found on page 8.

Salary increases more than expected created liability losses of $19 million. These liability losses decreased the funded ratio and increased the unfunded liability as of July 1, 2024. However, the gain of contributions from this higher pay will increase the funded ratio and decrease the unfunded liability over time such that the change to long-term funding trajectory is minimal.

Active counts increased from 11,766 to 11,945 and total payroll increased by 6.9% which is more than the expected 3.25% payroll growth. This puts downward pressure on the amortization of the unfunded liability as a percentage of pay.

*Asset experience*

On a fair value basis, NDTFFR assets had an investment return of approximately 7.9 percent (net of investment expenses). On an actuarial value of asset basis, NDTFFR assets had an investment return of approximately 6.9 percent, which compares to the assumed rate of return of 7.25 percent. As of July 1, 2024, the amount of outstanding asset losses not yet recognized in the actuarial value of assets was $57.5 million, down from $85.6 million the prior year. The net asset losses currently being deferred will be phased into the actuarial value of assets over the next four years and will put adverse pressure on the results in coming years.

The plan experienced an actuarial asset loss of $12.8 million during fiscal year ending 2024. This loss was due to the actuarial value of assets earning a return less than the assumed 7.25%.

## Financial Position and Summary of Results

*Primary Results*

The funded ratio (ratio of the actuarial value of assets to the actuarial accrued liability) on an actuarial value of assets basis increased from July 1, 2023 to July 1, 2024 from 71.21% to 71.63% despite the losses noted above.

The net employer Actuarially Determined Contribution (ADC) as a percentage of pay for the year beginning July 1, 2024 decreased from 12.50% as of the prior valuation to 12.46%. The expected employer contribution is 12.75% of pay which creates a contribution surplus of 0.29% of pay. The ADC decreased due to total contributory payroll more than expected which decreases the amortization of the unfunded liability as a rate of pay.

Due to funding progress based on the funding policy, the effective amortization period, or time until full funding, decreased from 20 years to 19 years.

*Fair Value Results*

Due to the deferred investment losses in the smoothed assets used, the results using the fair value of assets are slightly less favorable. The funded ratio on a fair value basis as of July 1, 2024 is 70.42%. Without investment recovery, these investment losses will put adverse pressure on future valuation results.

# Summary of Actuarial Valuation Results

| | July 1, 2024 | July 1, 2023 |
|---|---|---|
| 1. Statutory Contributions (% of payroll): | | |
| a. Member Contribution Rate | 11.75% | 11.75% |
| b. Employer Contribution Rate | 12.75% | 12.75% |
| c. Actuarially Determined Contribution Rate | 12.46% | 12.50% |
| d. Margin Available [Contribution Shortfall/(Surplus)] | (0.29)% | (0.25)% |
| e. Effective Funding Period | 19 years | 20 years |
| 2. Funded Status | | |
| a. Actuarial Accrued Liability | $ 4,758,417,607 | $ 4,577,220,667 |
| b. Actuarial Value of Assets (AVA) | 3,408,483,045 | 3,259,558,143 |
| c. Unfunded Liability (AVA-basis) | 1,349,934,562 | 1,317,662,524 |
| d. Funded Ratio (AVA-basis) | 71.6% | 71.2% |
| e. Return on AVA | 6.9% | 6.3% |
| f. Fair Value of Assets (FVA) | $ 3,351,007,841 | $ 3,173,908,455 |
| g. Unfunded Liability (FVA-basis) | 1,407,409,766 | 1,403,312,212 |
| h. Funded Ratio (FVA-basis) | 70.4% | 69.3% |
| i. Return on FVA | 7.9% | 7.3% |
| j. Ratio of Actuarial Value of Assets to Fair Value of Assets | 101.7% | 102.7% |
| 3. Summary of Census Data | | |
| a. Actives | | |
| i. Total Active Count | 11,945 | 11,766 |
| ii. Total Annual Compensation | $ 831,008,910 | $ 777,724,718 |
| iii. Average Projected Compensation | 69,570 | 66,099 |
| iv. Average Age | 41.3 | 41.2 |
| v. Average Service | 11.3 | 11.3 |
| b. Members with Refunds Due | 1,878 | 1,711 |
| c. Deferred Vested Member Counts | 2,147 | 2,010 |
| d. Retiree Counts | 8,603 | 8,567 |
| e. Beneficiary and Alternate Payee Counts | 963 | 925 |
| f. Disability Counts | 127 | 123 |
| g. Total Members Included in Valuation | 25,663 | 25,102 |

The funded ratio may not be appropriate for assessing the need for future contributions. The funded ratio is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

# SECTION B

## VALUATION RESULTS

## Exhibit B.1
## Actuarial Accrued Liability

| | July 1, 2024 | July 1, 2023 |
|---|---|---|
| 1. Active Members | | |
| a. Retirement Benefits | $ 1,748,416,839 | $ 1,640,072,036 |
| b. Withdrawal Benefits | (5,473,805) | (1,065,446) |
| c. Disability Benefits | 28,252,609 | 26,114,035 |
| d. Death Benefits | 21,933,447 | 20,580,333 |
| e. Total | $ 1,793,129,090 | $ 1,685,700,958 |
| 2. Members with Deferred Benefits | $ 187,322,276 | $ 158,074,152 |
| 3. Members with Refunds Due | $ 28,847,776 | $ 23,291,800 |
| 4. Members Receiving Benefits | $ 2,749,118,465 | $ 2,710,153,757 |
| 5. Total | $ 4,758,417,607 | $ 4,577,220,667 |
| 6. Actuarial Value of Assets | $ 3,408,483,045 | $ 3,259,558,143 |
| 7. Unfunded Actuarial Accrued Liability | $ 1,349,934,562 | $ 1,317,662,524 |

**Exhibit B.2**
**Normal Cost for Fiscal Year Ending July 1, 2025**

| | July 1, 2024 | July 1, 2023 |
|---|---|---|
| 1. Dollar Normal Cost | | |
| a. Retirement Benefits | $ 86,468,869 | $ 80,978,491 |
| b. Withdrawal Benefits | 17,830,306 | 16,518,508 |
| c. Disability Benefits | 2,047,826 | 1,910,331 |
| d. Death Benefits | 1,555,577 | 1,461,890 |
| e. Total | $ 107,902,578 | $ 100,869,220 |
| 2. Normal Cost as a Percentage of Pay | 12.27% | 12.26% |
| 3. Projected Payroll | $ 879,276,401 | $ 823,019,784 |

**Exhibit B.3**
**Present Value of Projected Benefits**

| | July 1, 2024 | July 1, 2023 |
|---|---|---|
| 1. Active Members | | |
| a. Retirement Benefits | $ 2,726,358,934 | $ 2,555,445,401 |
| b. Withdrawal Benefits | 217,080,927 | 205,298,168 |
| c. Disability Benefits | 52,216,226 | 48,523,838 |
| d. Death Benefits | 39,411,062 | 37,044,118 |
| e. Total | $ 3,035,067,149 | $ 2,846,311,525 |
| 2. Members with Deferred Benefits | $ 187,322,276 | $ 158,074,152 |
| 3. Members with Refunds Due | $ 28,847,776 | $ 23,291,800 |
| 4. Members Receiving Benefits | | |
| a. Healthy Retirees | $ 2,597,576,918 | $ 2,568,683,530 |
| b. Disabled Retirees | 19,492,929 | 17,806,091 |
| c. Beneficiaries | 132,048,618 | 123,664,136 |
| d. Total | $ 2,749,118,465 | $ 2,710,153,757 |
| 5. Total | $ 6,000,355,666 | $ 5,737,831,234 |

**Exhibit B.4**
**Development of the Actuarially Determined Contribution**

| | July 1, 2024 | | July 1, 2023 | |
|---|---|---|---|---|
| | Dollar | Percent of Pay | Dollar | Percent of Pay |
| 1. Total Normal Cost | $ 107,902,578 | 12.27% | $ 100,869,219 | 12.26% |
| 2. Amortization of Unfunded Actuarial Liability | 101,359,283 | 11.53% | 95,570,065 | 11.61% |
| 3. Assumed Administrative Expenses | 3,585,808 | 0.41% | 3,129,790 | 0.38% |
| 4. Total Actuarially Determined Contribution (ADC) | $ 212,847,669 | 24.21% | $ 199,569,074 | 24.25% |
| 5. Estimated Member Contribution | 103,314,977 | 11.75% | 96,704,825 | 11.75% |
| 6. Actuarially Determined Employer Contribution | $ 109,532,692 | 12.46% | $ 102,864,249 | 12.50% |
| 7. Estimated Employer Contribution | 112,107,741 | 12.75% | 104,935,022 | 12.75% |
| 8. Contribution Shortfall/(Surplus) | $ (2,575,049) | (0.29)% | $ (2,070,773) | (0.25)% |
| 9. Effective Funding Period | 19 years | | 20 years | |
| 10. Total Payroll supplied by the System, annualized | $ 831,008,910 | | $ 777,724,718 | |
| 11. Annual Projected Payroll for Upcoming Year | $ 879,276,401 | | $ 823,019,784 | |

## Exhibit B.5
## Plan Experience for Fiscal Year 2024

| | |
|---|---|
| **Liabilities** | |
| 1. Actuarial Accrued Liability at July 1, 2023 | $ 4,577,220,667 |
| 2. Normal Cost during Fiscal Year 2024 | 100,869,220 |
| 3. Benefit Payments during Fiscal Year 2024 | 277,660,534 |
| 4. Interest on Items 1-3 to End of Year | 325,551,942 |
| 5. Change in Actuarial Accrued Liability Due to Assumption Changes | 0 |
| 6. Change in Actuarial Accrued Liability Due to Provision Changes | 0 |
| 7. Expected Actuarial Accrued Liability at July 1, 2024 | 4,725,981,295 |
| 8. Actual Actuarial Accrued Liability at July 1, 2024 | 4,758,417,607 |
| 9. Liability (Gain)/Loss | 32,436,312 |
| **Assets** | |
| 10. Actuarial Value of Assets at July 1, 2023 | $ 3,259,558,143 |
| 11. Benefit Payments and Administrative Expenses during Fiscal Year 2024 | 280,973,307 |
| 12. Contributions during Fiscal Year 2024 | 208,981,973 |
| 13. Interest on Items 10-12 to End of Year | 233,753,939 |
| 14. Expected Actuarial Value of Assets at July 1, 2024 | 3,421,320,748 |
| 15. Actual Actuarial Value of Assets at July 1, 2024 | 3,408,483,045 |
| 16. Total Asset (Gain)/Loss | 12,837,703 |
| **Total** | |
| 17. Total (Gain)/Loss [9. + 16.] | **$ 45,274,015** |

**Exhibit B.6**
**Plan Experience for Fiscal Year 2024**
**(Gain)/Loss by Source**

| | | |
|---|---|---|
| 1. Liability (Gain)/Loss | | |
| a. Salary (Gain)/Loss | $ | 19,380,468 |
| b. New Members and Rehire (Gain)/Loss | | 8,973,615 |
| c. Withdrawal (Gain)/Loss | | (5,161,087) |
| d. Retirement (Gain)/Loss | | 3,503,211 |
| e. Annuitant Mortality (Gain)/Loss | | 4,308,042 |
| f. Other Demographic (Gain)/Loss | | 1,432,063 |
| g. Total | | 32,436,312 |
| 2. Asset (Gain)/Loss | $ | 12,837,703 |
| 3. Total (Gain)/Loss | **$** | **45,274,015** |

## Exhibit B.7
## Reconciliation of Actuarially Determined Contribution

| | July 1, 2024 | July 1, 2023 |
|---|---|---|
| 1. Actuarially Determined Contribution at Prior Valuation | 12.50% | 12.12% |
| 2. Increases/(Decreases) Due to: | | |
| a. Effect of Change in Covered Payroll and Normal Cost | (0.39)% | 0.16% |
| b. Effect of Contributions (more)/less than ADC | (0.08)% | (0.04)% |
| c. Effect of Gains and Losses on AAL and Administrative Expenses | 0.32% | (0.14)% |
| d. Effect of Investment (Gain)/Loss | 0.11% | 0.27% |
| e. Effect of Legislative Changes | 0.00% | 0.00% |
| f. Effect of Change in Actuarial Assumptions | 0.00% | 0.00% |
| g. Effect of Change in Valuation System | 0.00% | 0.13% |
| h. Net Effect of Other Changes | (0.00)% | (0.00)% |
| i. Total Change | (0.04)% | 0.38% |
| 3. Actuarially Determined Contribution at Current Valuation | 12.46% | 12.50% |
| 4. Statutory Employer Contribution Rate | 12.75% | 12.75% |
| 5. Contribution Rate Shortfall/(Surplus) | (0.29)% | (0.25)% |

# SECTION C

## PLAN ASSETS

# Statement of Fiduciary Net Position

**Exhibit C.1**
**Statement of Plan Net Assets**

| | June 30, 2024 | June 30, 2023 |
|---|---|---|
| 1. Cash and Cash Equivalents | $ 35,869,526 | $ 26,543,393 |
| 2. Investments: | | |
| a. Equities | $ 1,842,466,840 | $ 1,765,727,972 |
| b. Debt | 877,328,837 | 785,396,084 |
| c. Real Assets | 519,442,836 | 550,692,368 |
| d. Invested Cash | 43,215,803 | 11,465,710 |
| e. Total Investments at Fair Value | $ 3,282,454,316 | $ 3,113,282,134 |
| 3. Accounts Receivable | $ 39,722,125 | $ 40,829,685 |
| 4. Total Assets [1. + 2.e. + 3.] | $ 3,358,045,967 | $ 3,180,655,212 |
| 5. Accounts Payable | $ 7,038,126 | $ 6,746,757 |
| 6. Net Assets at Fair Value [4. - 5.] | $ 3,351,007,841 | $ 3,173,908,455 |

**Exhibit C.2**
**Statement of Changes in Plan Net Assets**

| | Year Ended June 30, 2024 | Year Ended June 30, 2023 |
|---|---|---|
| 1. Fair Value of Assets at the Beginning of Year | $ 3,173,908,455 | $ 3,023,920,243 |
| 2. Contributions | | |
| a. Employer Contributions | $ 108,087,909 | $ 102,307,888 |
| b. Employee Contributions | 99,610,414 | 94,283,739 |
| c. Other Contributions | 1,283,650 | 1,098,198 |
| d. Less Administrative Expense | (3,312,773) | (2,891,047) |
| e. Net Contribution Income | $ 205,669,200 | $ 194,798,778 |
| 3. Investment Income | | |
| a. Interest, Dividends, and Other Income | $ 52,287,673 | $ 49,646,004 |
| b. Net Appreciation in Fair Value of Investments | 203,096,798 | 175,293,526 |
| c. Less Investment expense | (6,293,751) | (7,468,043) |
| d. Net investment income | $ 249,090,720 | $ 217,471,487 |
| 4. Benefit payments | | |
| a. Refunds | $ 12,225,640 | $ 7,920,125 |
| b. Regular Benefits | 264,450,311 | 253,704,476 |
| c. Partial Lump Sum | 984,583 | 657,452 |
| d. Net Benefit Payments | $ 277,660,534 | $ 262,282,053 |
| 5. Change in Net Assets [2.e. + 3.d. - 4.d.] | $ 177,099,386 | $ 149,988,212 |
| 6. Fair Value of Assets at the End of Year [1. + 5.] | $ 3,351,007,841 | $ 3,173,908,455 |

## Exhibit C.3
## Development of the Actuarial Value of Assets

| | | Year Ending June 30, 2024 |
|---|---|---|
| 1. | Actuarial Value of Assets, Beginning of Year | $ 3,259,558,143 |
| 2. | Fair Value of Assets, Beginning of Year | $ 3,173,908,455 |
| 3. | Fair Value of Assets, End of Year | $ 3,351,007,841 |
| 4. | Net Cash Flow | |
| | a. Contributions | $ 208,981,973 |
| | b. Benefit Payments | (265,434,894) |
| | c. Refunds | (12,225,640) |
| | d. Administrative Expenses | (3,312,773) |
| | e. Net Cash Flow | $ (71,991,334) |
| 5. | Expected Return on Fair Value of Assets [2.* 7.25% + 4.e.* (1+7.25%)^0.5-1] | $ 227,544,337 |
| 6. | Actual Return | $ 249,090,720 |
| 7. | Excess return [6. - 5.] | $ 21,546,383 |
| 8. | Recognition of Gains/(Losses) | |

| | Year Ended June 30, | Gain/(Loss) | Percent Deferred | Amount Deferred |
|---|---|---|---|---|
| a. | 2024 | $ 21,546,383 | 80% | $ 17,237,106 |
| b. | 2023 | 640,737 | 60% | 384,442 |
| c. | 2022 | (434,694,288) | 40% | (173,877,715) |
| d. | 2021 | 493,904,813 | 20% | 98,780,963 |
| e. | 2020 | (114,538,151) | 0% | 0 |
| f. | Total Recognition | | | $ (57,475,204) |

| | | |
|---|---|---|
| 9. | Actuarial Value of Assets, End of Year | |
| | a. Preliminary Actuarial Value of Assets [3. - 8.f.] | $ 3,408,483,045 |
| | b. Lower Corridor Limit [80% * 3.] | 2,680,806,273 |
| | c. Upper Corridor Limit [120% * 3.] | 4,021,209,409 |
| | d. Actuarial Value of Assets, End of Year | 3,408,483,045 |
| 10. | Estimated Rate of Return | 6.9% |
| 11. | Ratio of Actuarial to Fair Value of Assets | 101.7% |

**Exhibit C.4**
**History of Investment Returns**

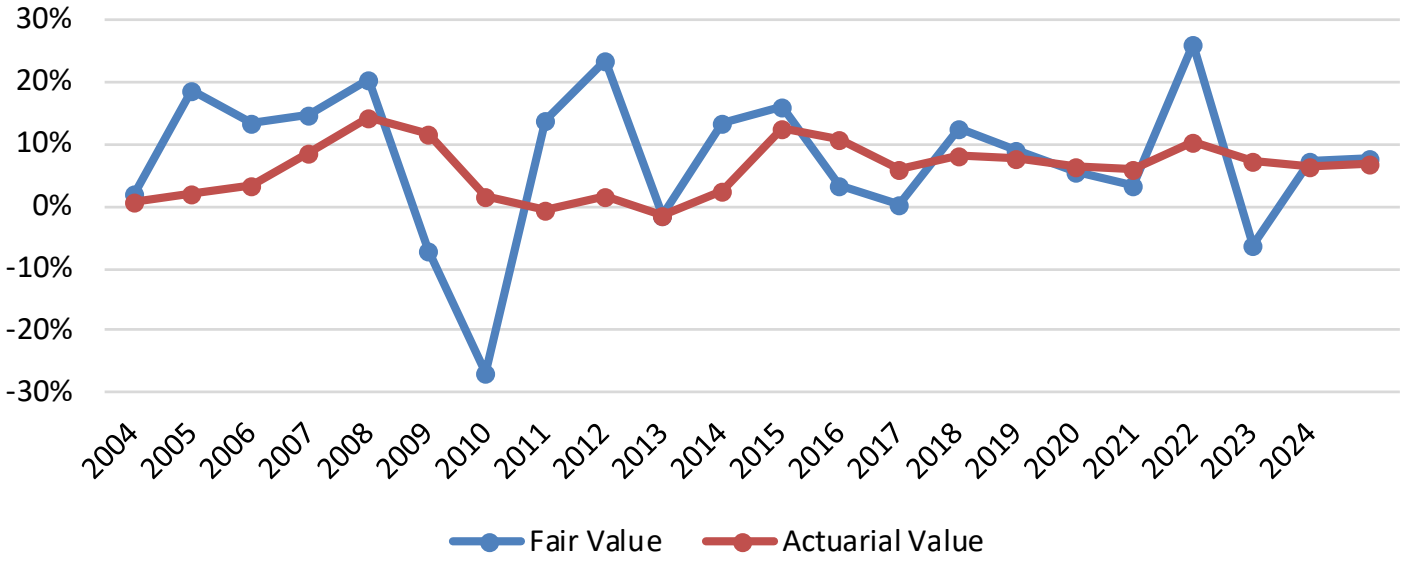
| Year Ended June 30 | Fair Value | Actuarial Value |
|---|---|---|
| 1994 | 1.2% | 7.0% |
| 1995 | 13.6% | 9.1% |
| 1996 | 15.6% | 11.3% |
| 1997 | 18.5% | 12.6% |
| 1998 | 13.2% | 12.6% |
| 1999 | 11.5% | 13.5% |
| 2000 | 11.6% | 13.3% |
| 2001 | (7.6)% | 8.6% |
| 2002 | (8.6)% | 3.0% |
| 2003 | 2.1% | 0.6% |
| 2004 | 18.9% | 1.9% |
| 2005 | 13.3% | 3.3% |
| 2006 | 14.6% | 8.5% |
| 2007 | 20.4% | 14.4% |
| 2008 | (7.0)% | 11.6% |
| 2009 | (27.0)% | 1.7% |
| 2010 | 13.9% | (0.5)% |
| 2011 | 23.5% | 1.4% |
| 2012 | (1.4)% | (1.4)% |
| 2013 | 13.4% | 2.7% |
| 2014 | 16.1% | 12.6% |
| 2015 | 3.5% | 10.7% |
| 2016 | 0.4% | 6.2% |
| 2017 | 12.6% | 8.2% |
| 2018 | 9.0% | 7.9% |
| 2019 | 5.4% | 6.4% |
| 2020 | 3.3% | 6.2% |
| 2021 | 26.1% | 10.3% |
| 2022 | (6.1)% | 7.4% |
| 2023 | 7.3% | 6.3% |
| 2024 | 7.9% | 6.9% |

| Average Returns: | Fair Value | Actuarial Value |
|---|---|---|
| Last 5 Years | 7.2% | 7.4% |
| Last 10 Years | 6.7% | 7.6% |
| Last 15 Years | 8.7% | 6.0% |
| Last 20 Years | 6.7% | 6.5% |
| Last 30 Years | 7.3% | 7.1% |

*Investment returns prior to year ended June 30, 2023 were calculated by the prior actuary.*

# History of Investment Returns

**Exhibit C.5**
**Fair Value and Actuarial Value Rates of Return**



# SECTION D

## PROJECTIONS AND RISK ANALYSIS

# Deterministic Projection

**Exhibit D.1**
**Deterministic Projection of the Unfunded Liability**
**$ in Millions**

| As of July 1, (a) | Payroll For Next FY (b) | Contribution as % of Payroll (c) | Normal Cost and Admin as % of Payroll (d) | Net Amortization [c - d] * b (e) | UAAL BOY (f) | Interest (g) | Net Principal Contribution e - g (h) | Funding Period (i) |
|---|---|---|---|---|---|---|---|---|
| 2024 | $879 | 24.50% | 12.68% | $104 | $1,350 | $94 | $10 | 19 |
| 2025 | 908 | 24.50% | 12.67% | 107 | 1,340 | 93 | 14 | 18 |
| 2026 | 937 | 24.50% | 12.66% | 111 | 1,326 | 92 | 19 | 17 |
| 2027 | 968 | 24.50% | 12.66% | 115 | 1,307 | 91 | 24 | 16 |
| 2028 | 999 | 24.50% | 12.65% | 118 | 1,283 | 89 | 30 | 15 |
| 2029 | 1,032 | 24.50% | 12.64% | 122 | 1,254 | 87 | 36 | 14 |
| 2030 | 1,065 | 24.50% | 12.64% | 126 | 1,218 | 84 | 43 | 13 |
| 2031 | 1,100 | 24.50% | 12.63% | 131 | 1,175 | 81 | 50 | 12 |
| 2032 | 1,136 | 24.50% | 12.63% | 135 | 1,126 | 77 | 58 | 11 |
| 2033 | 1,173 | 24.50% | 12.63% | 139 | 1,068 | 72 | 67 | 10 |
| 2034 | 1,211 | 24.50% | 12.62% | 144 | 1,001 | 67 | 76 | 9 |
| 2035 | 1,250 | 24.50% | 12.62% | 149 | 924 | 62 | 87 | 8 |
| 2036 | 1,291 | 24.50% | 12.61% | 153 | 838 | 55 | 98 | 7 |
| 2037 | 1,333 | 24.50% | 12.61% | 158 | 739 | 48 | 110 | 6 |
| 2038 | 1,376 | 24.50% | 12.61% | 164 | 629 | 40 | 124 | 5 |
| 2039 | 1,421 | 24.50% | 12.60% | 169 | 505 | 31 | 138 | 4 |
| 2040 | 1,467 | 24.50% | 12.60% | 175 | 367 | 20 | 154 | 3 |
| 2041 | 1,514 | 24.50% | 12.59% | 180 | 212 | 9 | 171 | 2 |
| 2042 | 1,564 | 24.50% | 12.59% | 186 | 41 | (4) | 190 | 1 |
| 2043 | 1,614 | 15.50% | 12.59% | 47 | (149) | (12) | 59 | - |
| 2044 | 1,667 | 15.50% | 12.58% | 49 | (208) | (17) | 65 | - |

*If all assumptions are met each year, in particular, the 7.25% assumed investment return, then the unfunded liability as of July 1, 2024 is expected to be paid off by July 1, 2043. This shows the projected payoff pattern of the unfunded liability assuming all assumptions are met, including 7.25% investment return on the smoothed value of assets.*

# 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.

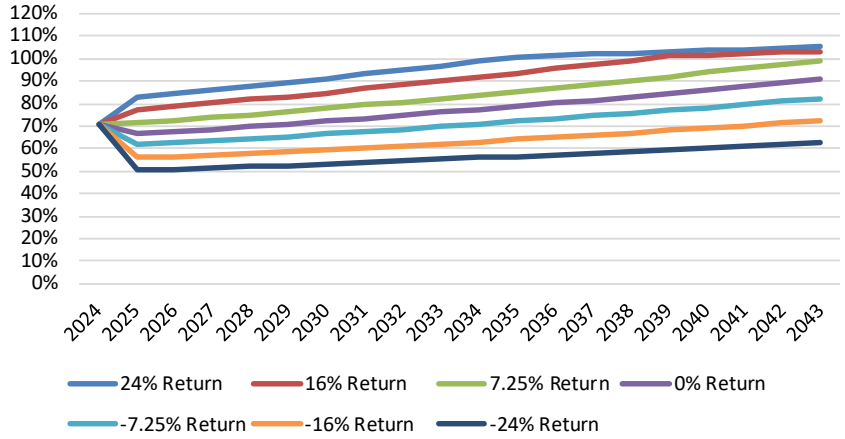
The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening),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

The computed contribution rate shown on Exhibit B.4 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.

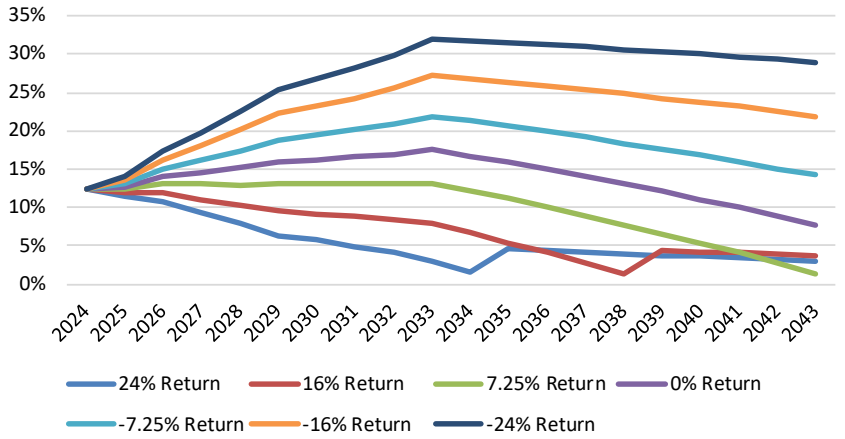
# Risks Measures – Plan Maturity Measures

The following exhibits are intended to give the user a sense of the impact of short and long-term investment risk on NDTFFR funded status and actuarial contributions. The first set of projections assume the fair value earns the shown assumed return in fiscal year 2025 with investment returns of 7.25% in fiscal year 2026 and thereafter. For the purposes of showing the Actuarially Determined Employer contribution below, when the remaining amortization period reaches 10 years, it is assumed to operate as 10-year open.

Funded Ratio



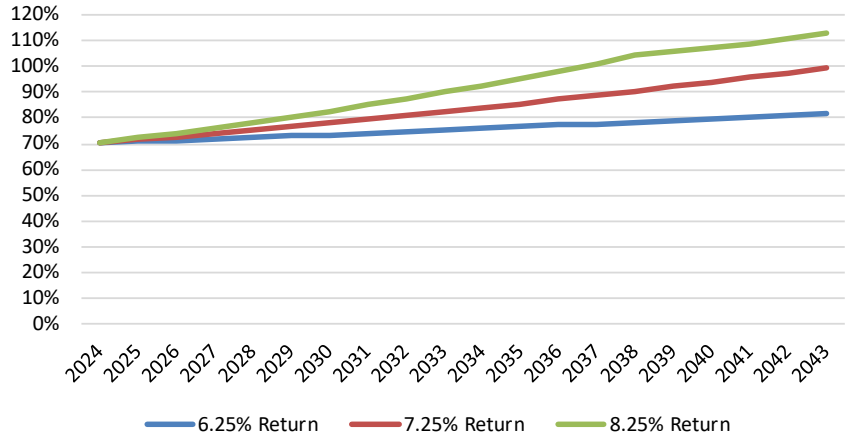

Actuarially Determined Employer Contribution



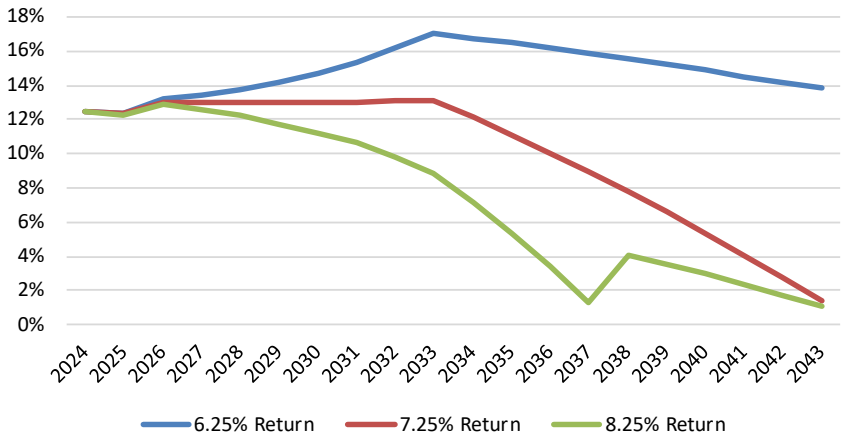
# Risks Measures – Plan Maturity Measures

The second set of projections show the effects of long-term over or underperformance as compared to the 7.25% assumed investment return. Again, for the purposes of showing the Actuarially Determined Employer contribution below, when the remaining amortization period reaches 10 years, it is assumed to operate as 10-year open.

Funded Ratio




Actuarially Deteremined Employer Contribution



# Risks Measures – 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:

| | July 1, 2024 | July 1, 2023 | July 1, 2022 |
|---|---|---|---|
| Ratio of the fair value of assets to total payroll | 4.0 | 4.1 | 3.9 |
| Ratio of actuarial accrued liability to payroll | 5.7 | 5.9 | 5.8 |
| Ratio of actives to retirees and beneficiaries | 1.2 | 1.2 | 1.3 |
| Ratio of net cash flows to fair value of assets | -2% | -2% | -2% |
| Duration of the actuarial accrued liability | 12.1 | 12.0 | 12.2 |

## Ratio of Fair 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 fair 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 Fair 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.

# Risks Measures – Low Default Risk Obligation Measure

## Introduction

In December 2021, the Actuarial Standards Board (ASB) adopted a revision to Actuarial Standard of Practice (ASOP) No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions. The revised ASOP No. 4 requires the calculation and disclosure of a liability referred to by the ASOP as the "Low-Default-Risk Obligation Measure" (LDROM). The rationale that the ASB cited for the calculation and disclosure of the LDROM was included in the Transmittal Memorandum of ASOP No. 4 and is presented below (emphasis added):

> "The ASB believes that the calculation and disclosure of this measure provides **appropriate, useful information for the intended user regarding the funded status of a pension plan.** The calculation and disclosure of this additional measure is **not intended to suggest that this is the "right" liability measure** for a pension plan. However, the ASB does believe that **this additional disclosure provides a more complete assessment of a plan's funded status and provides additional information regarding the security of benefits that members have earned as of the measurement date."**

## Comparing the Accrued Liabilities and the LDROM

One of the fundamental financial objectives of the North Dakota Teachers' Fund for Retirement (TFFR) is to finance each member's retirement benefits over the period from the member's date of hire until the member's projected date of retirement (entry age actuarial cost method) as a level percentage of payroll. To fulfill this objective, the discount rate that is used to value the accrued liabilities of TFFR is set equal to the **expected return** on the Fund's diversified portfolio of assets (referred to sometimes as the investment return assumption). For TFFR, the investment return assumption is 7.25%.

The LDROM is meant to approximately represent the lump sum cost to a plan to purchase low-default-risk fixed income securities whose resulting cash flows essentially replicate in timing and amount the benefits earned (or the costs accrued) as of the measurement date. The LDROM is very dependent upon market interest rates at the time of the LDROM measurement. The lower the market interest rates, the higher the LDROM, and vice versa. The LDROM results presented in this report are based on the entry age actuarial cost method and discount rates based upon the intermediate rate from the FTSE Pension Discount Curve and Liability Index published by the Society of Actuaries. This rate is 5.32% as of June 30, 2024. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures (Valuation and LDROM) is one illustration of the savings the sponsor anticipates by taking on risk in a diversified portfolio.

| Valuation Accrued Liabilities | LDROM |
|---|---|
| $4,758,417,607 | $5,978,192,701 |

# SECTION E

## HISTORICAL EXHIBITS

# Schedule of Funding Progress

**Exhibit E.1**
**Schedule of Funding Progress**

| Actuarial Valuation Date | Actuarial Value of Assets | Actuarial Accrued Liability (AAL) | Unfunded AAL (UAAL) | Funded Ratio | Covered Payroll | UAAL as a Percentage of Covered Payroll |
|---|---|---|---|---|---|---|
| 7/1/2015 | $ 2,125,017,451 | $ 3,449,775,982 | $ 1,324,758,531 | 61.6% | $ 589,783,780 | 224.6% |
| 7/1/2016 | 2,229,292,988 | 3,589,393,851 | 1,360,100,863 | 62.1% | 627,002,353 | 216.9% |
| 7/1/2017 | 2,379,811,205 | 3,734,016,828 | 1,354,205,623 | 63.7% | 650,052,674 | 208.3% |
| 7/1/2018 | 2,526,058,269 | 3,863,515,726 | 1,337,457,457 | 65.4% | 653,456,893 | 204.7% |
| 7/1/2019 | 2,635,557,447 | 3,993,424,160 | 1,357,866,713 | 66.0% | 680,481,816 | 199.5% |
| 7/1/2020 | 2,745,012,472 | 4,181,035,763 | 1,436,023,291 | 65.7% | 711,039,756 | 202.0% |
| 7/1/2021 | 2,973,668,612 | 4,336,060,141 | 1,362,391,529 | 68.6% | 749,414,372 | 181.8% |
| 7/1/2022 | 3,132,980,715 | 4,479,973,211 | 1,346,992,496 | 69.9% | 766,139,460 | 175.8% |
| 7/1/2023 | 3,259,558,143 | 4,577,220,667 | 1,317,662,524 | 71.2% | 777,724,718 | 169.4% |
| 7/1/2024 | 3,408,483,045 | 4,758,417,607 | 1,349,934,562 | 71.6% | 831,008,910 | 162.4% |

*Results prior to July 1, 2023 were calculated by the prior actuary.*

# History of Cash Flows

**Exhibit E.2**
**History of Cash Flows**

| Year Ended June 30 | Contributions | Disbursements or Expenditures: Benefit Payments | Disbursements or Expenditures: Refunds | Disbursements or Expenditures: Administrative Expenses | Disbursements or Expenditures: Total Disbursements | Net Cash Flow | Fair Value of Assets | Net Cash Flow as a Percent of Fair Value |
|---|---|---|---|---|---|---|---|---|
| 2015 | $ 152,463,762 | $ (168,349,762) | $ (3,889,671) | $ (1,923,392) | $ (174,162,825) | $ (21,699,063) | $ 2,141,920,800 | (1.0)% |
| 2016 | 161,995,828 | (180,617,784) | (5,350,896) | (1,851,656) | (187,820,336) | (25,824,508) | 2,124,335,288 | (1.2)% |
| 2017 | 168,157,111 | (191,104,694) | (5,411,850) | (2,173,431) | (198,689,975) | (30,532,864) | 2,360,491,075 | (1.3)% |
| 2018 | 168,928,460 | (202,417,031) | (5,561,668) | (2,128,794) | (210,107,493) | (41,179,033) | 2,530,657,411 | (1.6)% |
| 2019 | 173,949,975 | (215,328,174) | (5,900,392) | (2,251,083) | (223,479,649) | (49,529,649) | 2,616,171,056 | (1.9)% |
| 2020 | 181,101,767 | (224,361,530) | (6,489,704) | (2,095,405) | (232,946,639) | (51,844,872) | 2,650,532,301 | (2.0)% |
| 2021 | 191,506,645 | (235,205,084) | (5,923,187) | (2,678,375) | (243,806,646) | (52,300,001) | 3,282,404,830 | (1.6)% |
| 2022 | 194,835,791 | (244,705,096) | (7,142,359) | (2,592,340) | (254,439,795) | (59,604,004) | 3,023,920,243 | (2.0)% |
| 2023 | 197,689,825 | (254,361,928) | (7,920,125) | (2,891,047) | (265,173,100) | (67,483,275) | 3,173,908,455 | (2.1)% |
| 2024 | 208,981,973 | (265,434,894) | (12,225,640) | (3,312,773) | (280,973,307) | (71,991,334) | 3,351,007,841 | (2.1)% |

# Development of the Fund

**Exhibit E.3**
**Development of the Fund**

| Year Ended June 30 | Employer Contributions | Employee Contributions | Other Contributions | Net Investment Return | Administrative Expenses | Benefit Payments | Fair Value of Assets | Actuarial Value of Assets | Actuarial Value as a Percent of Fair Value |
|---|---|---|---|---|---|---|---|---|---|
| 2015 | $ 78,422,098 | $ 72,268,451 | $ 1,773,213 | $ 73,204,806 | $ 1,923,392 | $ 172,239,433 | $ 2,141,920,800 | $ 2,125,017,451 | 99.2% |
| 2016 | 82,839,932 | 76,342,685 | 2,813,211 | 8,238,996 | 1,851,656 | 185,968,680 | 2,124,335,288 | 2,229,292,988 | 104.9% |
| 2017 | 86,058,868 | 79,309,153 | 2,789,090 | 266,688,651 | 2,173,431 | 196,516,544 | 2,360,491,075 | 2,379,811,205 | 100.8% |
| 2018 | 86,675,715 | 79,877,611 | 2,375,134 | 211,345,369 | 2,128,794 | 207,978,699 | 2,530,657,411 | 2,526,058,269 | 99.8% |
| 2019 | 89,444,880 | 82,429,595 | 2,075,500 | 135,043,319 | 2,251,083 | 221,228,566 | 2,616,171,056 | 2,635,557,447 | 100.7% |
| 2020 | 93,032,453 | 85,735,134 | 2,334,180 | 86,206,117 | 2,095,405 | 230,851,234 | 2,650,532,301 | 2,745,012,472 | 103.6% |
| 2021 | 98,264,202 | 90,557,210 | 2,685,233 | 684,172,530 | 2,678,375 | 241,128,271 | 3,282,404,830 | 2,973,668,612 | 90.6% |
| 2022 | 100,331,347 | 92,462,223 | 2,042,221 | (198,880,583) | 2,592,340 | 251,847,455 | 3,023,920,243 | 3,132,980,715 | 103.6% |
| 2023 | 102,307,888 | 94,283,739 | 1,098,198 | 217,471,487 | 2,891,047 | 262,282,053 | 3,173,908,455 | 3,259,558,143 | 102.7% |
| 2024 | 108,087,909 | 99,610,414 | 1,283,650 | 249,090,720 | 3,312,773 | 277,660,534 | 3,351,007,841 | 3,408,483,045 | 101.7% |

*Results prior to July 1, 2023 were calculated by the prior actuary.*

## Exhibit E.4
## History of Employer Contributions

| Year Ended June 30 | Actuarially Determined Employer Contribution (ADC) | | Actual Employer Contributions | | |
|---|---|---|---|---|---|
| | Amount | Percentage of Payroll | Amount | Percentage of Payroll | Percent Contributed |
| 2015 | $ 71,167,632 | 11.57% | $ 78,422,098 | 12.75% | 110.19% |
| 2016 | 84,724,123 | 13.04% | 82,839,932 | 12.75% | 97.78% |
| 2017 | 89,231,211 | 13.22% | 86,059,000 | 12.75% | 96.44% |
| 2018 | 88,307,239 | 12.99% | 86,675,715 | 12.75% | 98.15% |
| 2019 | 90,777,781 | 12.94% | 89,444,881 | 12.75% | 98.53% |
| 2020 | 93,688,429 | 12.84% | 93,032,453 | 12.75% | 99.30% |
| 2021 | 101,655,277 | 13.19% | 98,264,202 | 12.75% | 96.66% |
| 2022 | 97,341,070 | 12.37% | 100,331,347 | 12.75% | 103.07% |
| 2023 | 97,252,421 | 12.12% | 102,307,888 | 12.75% | 105.20% |
| 2024 | 105,990,323 | 12.50% | 108,087,909 | 12.75% | 101.98% |

*Results prior to July 1, 2023 were calculated by the prior actuary.*

## Exhibit E.5
## Solvency Test

| Valuation Date | Aggregated Accrued Liabilities ($ in millions) | | | Actuarial Value of Assets ($ in millions) | Portion of Accrued Liabilities Covered by Reported Assets | | |
|---|---|---|---|---|---|---|---|
| | Active Members Contributions | Retirees Beneficiaries and Vested Terminations | Members (Employer Financed Portion) | | (5)/(2) Max 100% | [(5)-(2)]/(3) Max 100% | [(5)-(2)-(3)]/(4) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 7/1/2015 | $ 737.5 | $ 1,874.7 | $ 837.6 | $ 2,125.0 | 100.0% | 74.0% | 0.0% |
| 7/1/2016 | 792.8 | 1,976.3 | 820.3 | 2,229.3 | 100.0% | 72.7% | 0.0% |
| 7/1/2017 | 839.1 | 2,092.9 | 802.0 | 2,379.8 | 100.0% | 73.6% | 0.0% |
| 7/1/2018 | 881.4 | 2,222.0 | 760.1 | 2,526.1 | 100.0% | 74.0% | 0.0% |
| 7/1/2019 | 941.5 | 2,314.0 | 737.9 | 2,635.6 | 100.0% | 73.2% | 0.0% |
| 7/1/2020 | 1,010.5 | 2,397.6 | 772.9 | 2,745.0 | 100.0% | 72.3% | 0.0% |
| 7/1/2021 | 1,063.2 | 2,515.2 | 757.7 | 2,973.7 | 100.0% | 76.0% | 0.0% |
| 7/1/2022 | 1,124.0 | 2,606.5 | 749.5 | 3,133.0 | 100.0% | 77.1% | 0.0% |
| 7/1/2023 | 1,170.4 | 2,710.2 | 696.7 | 3,259.6 | 100.0% | 77.1% | 0.0% |
| 7/1/2024 | 1,251.1 | 2,749.1 | 758.2 | 3,408.5 | 100.0% | 78.5% | 0.0% |

*Results prior to July 1, 2023 were calculated by the prior actuary.*

# History of Liability Changes Due to Demographic Experience

**Exhibit E.6**
**History of Liability Changes Due to Demographic Experience**

| Valuation Date | July 1, 2024 | July 1, 2023 | July 1, 2022 | July 1, 2021 | July 1, 2020 | July 1, 2019 |
|---|---|---|---|---|---|---|
| 1. Salary (Gain)/Loss | $ 19,380,468 | $ (27,485,400) | $ (26,223,700) | $ (1,067,168) | $ (18,178,784) | $ (21,895,994) |
| 2. New Members and Rehire (Gain)/Loss | 8,973,615 | 7,460,924 | 6,137,116 | 6,123,323 | 6,931,752 | 7,394,261 |
| 3. Withdrawal (Gain)/Loss | (5,161,087) | (5,254,382) | 1,859,343 | 1,844,017 | 3,380,478 | 3,820,142 |
| 4. Retirement (Gain)/Loss | 3,503,211 | 6,660,564 | 4,117,006 | 6,174,806 | 606,373 | 1,286,280 |
| 5. Annuitant Mortality (Gain)/Loss | 4,308,042 | (10,997,287) | (5,489,934) | (5,879,360) | (9,679,603) | (9,737,737) |
| 6. Other Demographic (Gain)/Loss | 1,432,063 | (25,835,772) | 10,426,238 | 512,915 | (4,462,797) | (5,005,758) |
| 7. Total | $ 32,436,312 | $ (55,451,354) | $ (9,173,931) | $ 7,708,533 | $ (21,402,581) | $ (24,138,806) |

*Results prior to July 1, 2023 were calculated by the prior actuary.*

*Other demographic gains in 2023 include changes in the AAL due to change in actuaries*.

# SECTION F

## SUMMARY BENEFIT PROVISIONS

**Effective Date**

July 1, 1971

**Plan Year**

July 1 through June 30

**Administration**

The North Dakota Teachers' Fund for Retirement (NDTFFR) is administered by a Board of Trustees. A separate State Investment Board is responsible for the investment of the trust assets, although NDTFFR's Board establishes the asset allocation policy. The Retirement and Investment Office is the administrative agency for NDTFFR.

**Membership**

All certified teachers of any public school in the State participate in NDTFFR. This includes teachers, supervisors, principals, administrators, etc. Non-certified employees such as teacher's aides, janitors, secretaries, drivers, etc. are not allowed to participate in NDTFFR. Eligible employees become members at their date of employment.

Tier 1 members include all active, inactive, or retired members who had TFFR service credit on July 1, 2008.

Tier 1 members who were vested (3 years of service credit) and least age 55 or had the Rule of 65 or greater (age + service) as of June 30, 2013 were grandfathered under retirement eligibility provisions effective prior to July 1, 2013. Non-grandfather Tier 1 members and all Tier 2 members will use unreduced and reduced retirement provisions effective July 1, 2013.

Tier 2 members include all new members and returning refunded members who are employed on or after July 1, 2008.

**Credited Service**

A member employed full time who received compensation for at leave 700 hours in a fiscal year earns one year of service. A member who receives compensation for less than 700 hours of service earns a fractional credit equal to the number of compensated hours worked in a fiscal year divided by 700 hours. A member may not earn more than one year of service in a fiscal year. A member may purchase additional service credited under the conditions outlined in Section 15-39.1-24 of the North Dakota Century Code.

**Salary**

A member's total earnings are used for salary purposes, including overtime, etc., and including nontaxable wages under a Section 125 plan, but excluding certain extraordinary compensation, such as fringe benefits or unused sick and vacation leave.

**Member Contribution Rates**

All active members contribute 11.75% of their salary per year. The Employer may "pick up" the member's contribution under the provisions of Internal Revenue Code Section 414(h). The member contribution rate was increased from 7.75% to 9.75% effective July 1, 2012, and was increased to the current 11.75% effective July 1, 2014. The member contribution rate will remain in effect at 11.75% until TFFR is 100% funded on an actuarial basis, at which time the member contribution rate will revert to 7.75%.

**Employer Contribution Rates**

The district or other employer that employs a member contributes a percentage of the member's salary. This percentage consists of a base percentage of 7.75%, plus additions as shown below.

| Effective Date | Addition to 7.75% Base Rate | Employer Contribution Rate |
|---|---|---|
| July 1, 2008 | 0.50% | 8.25% |
| July 1, 2010 | 1.00% | 8.75% |
| July 1, 2012 | 3.00% | 10.75% |
| July 1, 2014 | 5.00% | 12.75% |

However, the additions are subject to a "sunset" provision, such that the contribution rate will revert to 7.75% once the funded ratio reaches 100%, measured using the actuarial value of assets. The contribution rate will not automatically increase if the funded ratio later falls below 100%.

**Final Average Monthly Salary (FAS)**

*Tier 1:* The average of the member's highest three annual fiscal year salaries reported to TFFR divided by 12.

*Tier 2:* The average of the member's highest five annual fiscal year salaries reported to TFFR divided by 12.

**Normal Retirement**

*Eligibility*

*Tier 1 Grandfathered:* Sum of age and credited service equals 85 or more or age 65 with 3 or more years of credited service.

*Tier 1 Non-Grandfathered:* Sum of age and credited service equals 90 or more, with a minimum age of 60, or age 65 with 3 or more years of credited service.

*Tier 2:* Sum of age and credited service equals 90 or more, with a minimum age of 60, or age 65 with 5 or more years of credited service.

*Annual Benefit*

2.00% of FAS times credited service.

**Early Retirement**

*Eligibility*
*Tier 1 Grandfathered & Tier 1 Non-Grandfathered:* Age 55 with 3 or more years of credited service.

*Tier 2:* Age 55 with 5 or more years of credited service.

*Annual Benefit*
2.00% of FAS times credited service, multiplied by a factor that will reduce the benefit by 6% for Tier 1 Grandfathered, 8% for Tier 1 Non-Grandfathered and Tier 2, for each year the member retires prior to eligibility for Normal Retirement.

**Deferred Vested Retirement**

*Eligibility:*
A Tier 1 member who terminates with 3 or more years of service credit and a Tier 2 member who terminates employment with 5 or more years of service credit and does not withdraw contributions.

*Annual Benefit:*
Accrued regular retirement amount based on credited service and FAS at the time of termination. Early Retirement reductions will apply if a member chooses to receive their benefit prior to Normal Retirement Age. Members may choose a Refund in lieu of all other benefits.

**Pre-Retirement Death Benefit**

*Eligibility:*
Death prior to retirement.

*Annual Benefit:*
Upon the death of a non-vested member, a refund of the member's contributions and interest is paid. Upon the death of a non-vested member, the beneficiary may elect; the refund benefit, or a life annuity of the normal retirement benefit based on FAS and service as of the date of death with no reduction for the member's age at death.

**Disability Retirement**

*Eligibility:*
A member is eligible once they have completed 5 or more years of credited service. Prior to July 1, 2013, a member needed to complete one or more years of credited service.

*Annual Benefit:*
Computed in the same manner as the regular retirement amount base on FAC and credited service at time of disability retirement. Prior to July 1, 2013, there was a minimum of 20 years of service applied.

**Refund of Contributions**

*Eligibility:*
Termination of a member prior to accruing 3 years of credited service for Tier 1 members, or 5 years of credited service for Tier 2 members.

*Annual Benefit:*
A lump sum payment of the member's employee contributions plus interest credited on these contributions. Interest is credited at 6% per year prior to benefit commencement.

**Normal Form of Payment**

Single Life annuity.

**Optional Forms of Payment**

Optional benefit forms are available and equal to the Actuarial Equivalent of the Life Annuity. Actuarial equivalence is based on tables adopted by the Board of Trustees.

- Single Life Annuity
- 100% Joint and Survivor Annuity
- 50% Joint and Survivor Annuity
- Ten-Year Term Certain and Life Annuity
- Twenty-Year Term Certain and Life Annuity
- Partial Lump Sum Option

**Cost of Living Increase**

From time to time, TFFR has been amended to grant certain post-retirement benefit increases. However, TFFR has no automatic cost-of-living increase features.

**Note: The summary of plan provisions is designed to outline principal plan benefits, it is not a complete statement of all plan provisions. If NDTFFR should find the plan summary not in accordance with the actual plan provisions, the actuary should immediately be alerted so the proper provisions are valued.**

# SECTION G

## SUMMARY PLAN CHANGES

**1991 Legislative Sessions:**

1. Benefit multiplier increased from 1.275% to 1.39% for all future retirees.
2. Provide a post retirement benefit increases for all annuitants receiving a monthly benefit on June 30, 1991. The monthly increase is the greater of a 10% increase or a level increase based on years of service and retirement date:
    a. $3 per year of service for retirements before 1980
    b. $2 per year of service for retirements between 1980 and 1983
    c. $1 per year of service for retirements from 1984 through June 30, 1991

    Minimum increase is $5 per month. Maximum increase is $75 per month.

**1993 Legislative Session:**

1. Benefit multiplier increased from 1.39% to 1.55% for all future retirees.
2. Provide a post-retirement benefit increase for all annuitants receiving a monthly benefit on June 30, 1993. The monthly increase is the greater of a 10% increase or a level increase based on years of service and retirement date:
    a. $3 per year of service for retirements before 1980
    b. $2.50 per year of service for retirements between 1980 and 1983
    c. $1 per year of service for retirements from 1984 through June 30, 1993

    Minimum increase is $5 per month. Maximum increase is $100 per month.
3. Minimum retirement benefit increased to $10 times years of service up to 25, plus $15 times years of service greater than 25. (Previously was $6 up to 25 years of service plus $7.50 over 25 years of service.)
4. Disability benefit changed to 1.55% of FAC times years of service using a minimum of 20 years of service.

**1995 Legislative Session:**

There were no material changes made during the 1995 legislative session.

**1997 Legislative Session:**

1. Benefit multiplier increased from 1.55% to 1.75% for all future retirees.
2. Member contribution rate and employer contribution rate increased from 6.75% to 7.75%.
3. A $30.00/month benefit improvement was granted to all retirees and beneficiaries.

**1999 Legislative Session:**

1. Active members will now be fully vested after three years (rather than five years) of service.
2. Early retirement benefits will be reduced 6% per year from the earlier of (i) age 65, or (ii) the date as of which age plus service equals 85 (rather than from age 65 in all cases).
3. An ad hoc COLA was provided for all retirees and beneficiaries. This increase is equal to an additional $2.00 per month for each year of service plus $1.00 per month for each year since the member's retirement.
4. The formula multiplier was increased from 1.75% to 1.88% effective July 1, 1999.

**2001 Legislative Session:**

1. An ad hoc COLA was provided for all retirees and beneficiaries. The ad hoc COLA increase is equal to an additional $2.00 per month for each year of service plus $1.00 per month for each year since the member's retirement. Retirees and beneficiaries will also receive two additional increases equal to 0.75% times the monthly benefit, payable July 1, 2001 and July 1, 2002. The two 0.75% increases are conditional. If the actuarial margin is a shortfall, i.e., is negative, by 60 basis points or more, or if the margin has been negative by 30 or more basis points for two years, the Board could elect to suspend the increase.
2. The formula multiplier was increased from 1.88% to 2.00% effective July 1, 2001.

**2003 Legislative Session:**

1. Partial lump-sum option adopted, equal to twelve times the monthly life annuity benefit. Not available if level-income option is elected. Not available for reduced retirement or disability retirement.
2. Five-year certain and life option replaced with 20-year certain and life. This does not impact retirees who retired under the five-years certain and life option.
3. Employer service purchase authorized.
4. Active members of the Department of Public Instruction are permitted to make a one-time irrevocable election to transfer to the State Public Employees Retirement System in FY 2004. Both assets and liabilities for all TFFR service will be transferred for electing employees. Transferred assets will be based on the actuarial present value of the member's accrued TFFR benefit, or the member's contribution account balance if larger.

**2005 Legislative Session:**

There were no material changes made during the 2005 legislative sessions.

**2007 Legislative Session:**

1. For active members hired on or after July 1, 2008 (called Tier 2 members):
    a. Members will be eligible for an unreduced retirement benefit when they reach age 65 with at least five years of service (rather than three years of service); or if earlier, when the sum of the member's age and service is at least 90 (rather than 85).
    b. Members will be eligible for a reduced (early) retirement benefit when they reach age 55 with five years of service, rather than three years of service.
    c. Members will be fully vested after five years of service (rather than three year of service).
    d. The Final Average Compensation for Tier 2 members is the average of the member's highest five plan year salaries, rather than the average of the three highest salaries.

2. The employer contribution rate increases from 7.75% to 8.25% effective July 1, 2008, but this rate will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets. (If the funded ratio later falls below 90% again, the contribution rate will not automatically return to 8.25%.)
3. Employer contributions are required on the salary of reemployed retirees.
4. Active members of the Department of Career and Technical Education are permitted to make a one-time irrevocable election to transfer to the State Public Employees Retirement System in FY 2008. Both assets and liabilities for all TFFR service will be transferred for electing employees. Transferred assets will be the actuarial present value of the member's accrued TFFR benefit, or the member's contribution account balance, if larger.

**2009 Legislative Session:**

1. An individual who retired before January 1, 2009, and is receiving monthly benefits is entitled to receive a supplemental payment from the fund. The supplemental payment is equal to an amount determined by taking twenty dollars multiplied by the member's number of years of service credit plus fifteen dollars multiplied by the number of years since the member's retirement as of January 1, 2009. The supplemental payment may not exceed the greater of 10% of the member's annual annuity or $750.00. TFFR will make the supplemental payment in December 2009.
2. The employer contribution rate increases from 8.25% to 8.75% effective July 1, 2010, but this rate will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets. (If the funded ratio later falls below 90% again, the contribution rate will not automatically return to 8.75%.)

**2011 Legislative Session:**

1. The employer contribution rate increases from 8.75% to 10.75% effective July 1, 2012, and increases thereafter to 12.75% effective July 1, 2014. The member contribution rate increases from 7.75% to 9.75% effective July 1, 2012, and increases thereafter to 11.75% effective July 1, 2014. Employer and member contributions will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets.
2. For current Tier 1 members who, as of June 30, 2013, are vested (at least 3 years of service), and at least age 55, OR the sum of the member's age and service is at least 65, are considered a Tier 1 Grandfathered member. Current Tier 1 members, who will not meet this criteria as of June 30, 2013, are considered a Tier 1 Non-grandfathered member.
3. Eligibility for normal/ unreduced retirement benefits do not change for Tier 1 Grandfathered members. For Tier 1 Non-grandfathered and Tier 2 members, effective after June 30, 2013, unreduced retirement benefits start when the member reaches age 65 and is vested (3 years for Tier 1 Non-grandfathered, 5 years for Tier 2); or if earlier, when the sum of the member's age and service is at least 90, with a minimum age of 60.
4. Early retirement benefits do not change for Tier 1 Grandfathered members. For Tier 1 Non-grandfathered and Tier 2 members, effective after June 30, 2013, the normal retirement benefit will be reduced by 8% per year from the earlier of age 65 OR the age at which the sum of the member's age and service is at least 90, with a minimum age of 60.
5. Effective after June 30, 2013, all members may retire on disability after a period of at least five years of service (rather one year of service). The amount of the benefit is based on a 2% multiplier and actual service (rather than a minimum of twenty years of service in the current calculation).

6. Effective July 1, 2012, re-employed retirees are required to pay member contributions.
7. Effective August 1, 2011, beneficiary and death benefit provisions were updated, and the 60-month death payment benefit was removed.

**2013 Legislative Session:**

1. Employer and member contribution rates will be reset to 7.75% once the Fund reaches a 100% funded ratio (rather than the 90% funded ratio enacted with the 2011 Legislation), measured using the actuarial value of assets.
2. Various technical and administrative changes that do not have an actuarial effect on the Plan were enacted.

**2015 Legislative Session:**

1. Various technical and administrative changes that do not have an actuarial effect on the Plan were enacted.

**2017 Legislative Session:**

There were no material changes made during the 2017 legislative sessions.

**2019 Legislative Session:**

There were no material changes made during the 2019 legislative sessions.

**2021 Legislative Session:**

There were no material changes made during the 2021 legislative sessions.

**2023 Legislative Session:**

1. House Bill 1219 expanded return to work options in critical shortage areas and eliminated the level income optional form of payment. The required payment to regain service credit for a teacher who has previously withdrawn from the fund and is returning to teach will be calculated on an actuarial equivalent basis.
2. House Bill 1150 enacted an exception to membership in the teachers' fund for retirement for retired military personnel.

# SECTION H

## SUMMARY PARTICIPANT DATA

**Exhibit H.1**
**Summary of Census Data**

| | July 1, 2024 | July 1, 2023 | Change from Prior Year |
|---|---|---|---|
| 1. Active Members | | | |
| a. Total Counts | 11,945 | 11,766 | 1.52% |
| i. Males | 2,864 | 2,836 | 0.99% |
| ii. Females | 9,081 | 8,930 | 1.69% |
| b. Annual Compensation | $ 831,008,910 | $ 777,724,718 | 6.85% |
| c. Average Annual Compensation | $ 69,570 | $ 66,099 | 5.25% |
| d. Average Age | 41.3 | 41.2 | 0.1 |
| e. Average Service | 11.3 | 11.3 | 0.0 |
| f. Total contributions with interest | $ 1,251,118,027 | $ 1,170,413,834 | 6.90% |
| g. Average contributions with interest | $ 104,740 | $ 99,474 | 5.29% |
| 2. Deferred Vested Members | | | |
| a. Counts | 2,147 | 2,010 | 6.82% |
| b. Average Age | 48.4 | 48.5 | (0.1) |
| c. Annual Deferred Benefits | $ 21,972,885 | $ 19,061,484 | 15.27% |
| d. Average Benefit | $ 10,234 | $ 9,483 | 7.92% |
| 3. Retired Members | | | |
| a. Counts | 8,603 | 8,567 | 0.42% |
| b. Average Age | 73.6 | 73.1 | 0.5 |
| c. Annual Benefits | $ 249,747,755 | $ 244,493,556 | 2.15% |
| d. Average Benefit | $ 29,030 | $ 28,539 | 1.72% |
| 4. Disability | | | |
| a. Counts | 127 | 123 | 3.25% |
| b. Average Age | 67.0 | 66.9 | 0.1 |
| c. Annual Benefits | $ 2,056,610 | $ 1,885,628 | 9.07% |
| d. Average Benefit | $ 16,194 | $ 15,330 | 5.63% |
| 5. Beneficiaries and QDROs | | | |
| a. Counts | 963 | 925 | 4.11% |
| b. Average Age | 75.6 | 75.4 | 0.2 |
| c. Annual Benefits | $ 17,057,422 | $ 15,953,121 | 6.92% |
| d. Average Benefit | $ 17,713 | $ 17,247 | 2.70% |
| 6. Members Due Refund | | | |
| a. Counts | 1,878 | 1,711 | 9.76% |
| b. Refunds Due | $ 28,847,776 | $ 23,291,800 | 23.85% |
| 7. Total Members Included in Valuation | 25,663 | 25,102 | 2.23% |

**Active Membership**

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 11,945 active members with an average age of 41.3 and average years of service of 11.3 years. The 11,766 active members in the prior valuation had an average age of 41.2 and average years of service of 11.3 years.

**Exhibit H.2**
**Active Statistics**

| | July 1, 2024 | July 1, 2023 |
|---|---|---|
| **Plan Eligibility** | | |
| Tier 1 Grandfathered | 432 | 567 |
| Tier 1 Non-grandfathered | 2,859 | 2,952 |
| Tier 2 | 8,654 | 8,247 |
| Total | 11,945 | 11,766 |
| **Benefit Elibility** | | |
| Non-Vested | 3,492 | 3,430 |
| Vested | 7,048 | 6,944 |
| Early Retirement | 915 | 789 |
| Normal Retirement | 490 | 603 |
| Total | 11,945 | 11,766 |

**Exhibit H.3**

**Active Member Counts and Average Salary by Age and Service as of July 1, 2024**

| | Years of Credited Service | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Attained Age | 0<br>Count & Avg. Comp. | 1<br>Count & Avg. Comp. | 2<br>Count & Avg. Comp. | 3<br>Count & Avg. Comp. | 4<br>Count & Avg. Comp. | 5-9<br>Count & Avg. Comp. | 10-14<br>Count & Avg. Comp. | 15-19<br>Count & Avg. Comp. | 20-24<br>Count & Avg. Comp. | 25-29<br>Count & Avg. Comp. | 30-34<br>Count & Avg. Comp. | 35 & Over<br>Count & Avg. Comp. | Total<br>Count & Avg. Comp. |
| **Under 25** | 36 | 223 | 88 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 356 |
| | $22,965 | $46,952 | $51,413 | $54,122 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $45,810 |
| **25-29** | 21 | 275 | 379 | 343 | 300 | 375 | 0 | 0 | 0 | 0 | 0 | 0 | 1,693 |
| | $22,926 | $49,538 | $53,480 | $53,859 | $55,786 | $58,226 | $0 | $0 | $0 | $0 | $0 | $0 | $53,997 |
| **30-34** | 26 | 128 | 129 | 129 | 115 | 998 | 237 | 0 | 0 | 0 | 0 | 0 | 1,762 |
| | $24,372 | $53,476 | $55,063 | $56,443 | $59,346 | $61,768 | $65,324 | $0 | $0 | $0 | $0 | $0 | $60,053 |
| **35-39** | 10 | 106 | 87 | 87 | 54 | 440 | 856 | 176 | 2 | 0 | 0 | 0 | 1,818 |
| | $30,142 | $53,411 | $59,934 | $58,554 | $59,814 | $65,418 | $70,792 | $75,036 | $79,146 | $0 | $0 | $0 | $67,243 |
| **40-44** | 13 | 113 | 96 | 74 | 72 | 282 | 384 | 625 | 133 | 2 | 0 | 0 | 1,794 |
| | $24,569 | $55,875 | $61,161 | $61,401 | $63,237 | $67,151 | $73,351 | $80,679 | $86,297 | $60,558 | $0 | $0 | $72,870 |
| **45-49** | 10 | 82 | 49 | 48 | 51 | 213 | 227 | 274 | 434 | 109 | 1 | 0 | 1,498 |
| | $27,809 | $57,490 | $59,632 | $60,554 | $64,524 | $70,277 | $76,250 | $84,727 | $86,212 | $92,381 | $87,680 | $0 | $78,223 |
| **50-54** | 8 | 40 | 42 | 38 | 30 | 142 | 171 | 160 | 210 | 411 | 61 | 0 | 1,313 |
| | $27,129 | $59,518 | $65,208 | $66,179 | $69,202 | $70,667 | $77,469 | $83,547 | $87,153 | $91,394 | $89,826 | $0 | $82,194 |
| **55-59** | 2 | 30 | 25 | 29 | 20 | 114 | 98 | 99 | 137 | 215 | 212 | 39 | 1,020 |
| | $22,395 | $62,666 | $68,075 | $67,221 | $86,381 | $76,141 | $78,904 | $78,636 | $83,962 | $88,545 | $90,047 | $94,282 | $83,145 |
| **60-64** | 5 | 15 | 11 | 11 | 13 | 66 | 68 | 62 | 70 | 63 | 58 | 77 | 519 |
| | $28,861 | $67,654 | $59,377 | $67,042 | $66,050 | $77,444 | $74,148 | $81,255 | $82,820 | $89,280 | $90,999 | $87,878 | $81,052 |
| **65 & Over** | 2 | 4 | 6 | 5 | 6 | 33 | 36 | 25 | 16 | 4 | 5 | 30 | 172 |
| | $23,162 | $41,558 | $60,564 | $53,049 | $68,544 | $69,011 | $76,933 | $71,572 | $76,907 | $81,402 | $91,162 | $80,639 | $72,789 |
| **Total** | 133 | 1,016 | 912 | 773 | 661 | 2,663 | 2,077 | 1,421 | 1,002 | 804 | 337 | 146 | 11,945 |
| | $24,761 | $52,234 | $56,317 | $57,249 | $60,072 | $64,691 | $72,387 | $80,806 | $85,713 | $90,474 | $90,180 | $88,101 | $69,570 |

**Inactive Membership Not in Payment Status**

In this year's valuation there were 2,147 members with a vested right to a deferred or immediate vested benefit. In addition, there were 1,878 members entitled to a return of employee contributions. Compared to 2,010 members entitle to a vested benefit and 1,711 members due refunds of employee contributions last year.

**Exhibit H.4**
**Summary of Inactive Vested Members**
**as of July 1, 2024**

| Age | Number of Members | Average Monthly Benefit |
|---|---|---|
| Under 30 | 15 | $ 6,904 |
| 30-34 | 203 | 110,735 |
| 35-39 | 298 | 210,743 |
| 40-44 | 364 | 272,979 |
| 45-49 | 299 | 257,290 |
| 50-54 | 316 | 360,926 |
| 55-59 | 321 | 361,103 |
| 60-64 | 263 | 205,282 |
| 65 & Over | 68 | 45,113 |

### Members in Payment Status

As of July 1, 2024, 8,730 retired and disabled participants and 963 beneficiaries were receiving total monthly benefits of $22,405,149. For comparison, in the previous valuation, there were 8,690 retired participants and 925 beneficiaries receiving monthly benefits of $21,861,025. As of July 1, 2024, the average monthly benefit for retirees and beneficiaries is $2,311 compared to $2,274 in the previous valuation. The average age for retirees and beneficiaries in 73.7 in the current valuation compared with 73.3 in the prior valuation.

**Exhibit H.5**
**Summary of Members in Pay Status as of July 1, 2024**

| | Service Retirees | | Disabled Retirees | | Beneficiaries/QDROs | |
|---|---|---|---|---|---|---|
| Age | Number of Members | Annual Benefit | Number of Members | Annual Benefit | Number of Members | Annual Benefit |
| Under 55 | 7 | $ 409,496 | 15 | $ 257,515 | 77 | $ 881,794 |
| 55-59 | 330 | 16,589,443 | 15 | 342,775 | 30 | 436,261 |
| 60-64 | 855 | 36,613,087 | 17 | 299,582 | 45 | 888,059 |
| 65-69 | 1,670 | 57,739,351 | 28 | 455,936 | 81 | 1,636,580 |
| 70-74 | 2,311 | 66,298,899 | 19 | 286,746 | 150 | 3,329,699 |
| 75-79 | 1,664 | 40,129,165 | 22 | 309,312 | 174 | 3,192,709 |
| 80-84 | 957 | 19,364,498 | 5 | 52,271 | 175 | 3,265,446 |
| 85-89 | 535 | 9,063,690 | 6 | 52,474 | 135 | 2,050,801 |
| 90 & Over | 274 | 3,698,271 | 0 | 0 | 96 | 1,376,074 |

## Exhibit H.6
## Schedule of Retired Members by Type as of July 1, 2024

| Monthly Benefit | # of Retirees | Type of Retirement | | |
|---|---|---|---|---|
| | | Service Retirees | Disabled Retirees | Beneficiaries/ QDROs |
| Under $200 | 266 | 219 | 0 | 47 |
| $200 - $399 | 433 | 356 | 0 | 77 |
| $400 - $599 | 433 | 348 | 11 | 74 |
| $600 - $799 | 395 | 293 | 14 | 88 |
| $800 - $999 | 382 | 278 | 16 | 88 |
| $1,000 - $1,199 | 440 | 335 | 19 | 86 |
| $1,200 - $1,399 | 445 | 358 | 19 | 68 |
| $1,400 - $1,599 | 487 | 410 | 14 | 63 |
| $1,600 - $1,799 | 574 | 493 | 9 | 72 |
| $1,800 - $1,999 | 598 | 533 | 7 | 58 |
| $2,000 - $2,199 | 571 | 521 | 5 | 45 |
| $2,200 - $2,399 | 561 | 525 | 3 | 33 |
| $2,400 - $2,599 | 466 | 431 | 2 | 33 |
| $2,600 - $2,799 | 441 | 407 | 3 | 31 |
| $2,800 - $2,999 | 454 | 431 | 2 | 21 |
| $3,000 - $3,199 | 394 | 377 | 1 | 16 |
| $3,200 - $3,399 | 371 | 357 | 0 | 14 |
| $3,400 - $3,599 | 310 | 295 | 0 | 15 |
| $3,600 - $3,799 | 285 | 277 | 1 | 7 |
| $3,800 - $3,999 | 234 | 228 | 0 | 6 |
| $4,000 & over | 1,153 | 1,131 | 1 | 21 |
| **Total** | **9,693** | **8,603** | **127** | **963** |

**Exhibit H.7**
**Schedule of Annuitants by Type of Benefit as of July 1, 2024**

| Type of Benefits/Form of Payment | Number | Annual Benefits Amount | Monthly Benefits |
|---|---|---|---|
| **Service Retirees** | | | |
| Straight Life | 3,079 | $ 79,996,923 | $ 2,165 |
| 100% J&S | 3,960 | 127,262,917 | 2,678 |
| 50% J&S | 768 | 24,158,106 | 2,621 |
| 5 Years C&L | 8 | 142,708 | 1,487 |
| 10 Years C&L | 158 | 3,787,936 | 1,998 |
| 20 Years C&L | 193 | 5,624,763 | 2,429 |
| Level | 437 | 8,774,402 | 1,673 |
| Subtotal | 8,603 | $ 249,747,755 | $ 2,419 |
| **Disability** | | | |
| Straight Life | 94 | $ 1,496,664 | $ 1,327 |
| 100% J&S | 22 | 361,058 | 1,368 |
| 50% J&S | 7 | 126,923 | 1,511 |
| 5 Years C&L | 1 | 6,254 | 521 |
| 10 Years C&L | 1 | 33,698 | 2,808 |
| 20 Years C&L | 2 | 27,913 | 1,163 |
| Level | 0 | 0 | 0 |
| Subtotal | 127 | $ 2,052,510 | $ 1,347 |
| **Beneficiaries** | | | |
| Straight Life | 879 | $ 16,309,519 | $ 1,546 |
| 10 Years C&L | 10 | 119,671 | 997 |
| 20 Years C&L | 38 | 316,107 | 693 |
| QDRO Alternate Payee | 36 | 312,125 | 723 |
| Subtotal | 963 | $ 17,057,422 | $ 1,476 |
| **Total** | 9,693 | $ 268,857,687 | $ 2,311 |

# Summary of Participant Data

**Exhibit H.8**
**Summary of Changes in Participant Status**
**During Fiscal Year 2024**

| | Active Participants | Vested Terminated | Non-Vested Terminated | Retirees | Disability | QDROs | Beneficiaries | Total |
|---|---|---|---|---|---|---|---|---|
| **A. Number as of July 1, 2023** | 11,766 | 2,010 | 1,711 | 8,567 | 123 | 31 | 894 | 25,102 |
| 1. Age Retirements | (174) | (58) | | 232 | | | | 0 |
| 2. Disability | (6) | (1) | | | 7 | | | 0 |
| 3. Deceased | (7) | (7) | (1) | (195) | (4) | (2) | (43) | (259) |
| 4. New Beneficiary | | | | | | 7 | 84 | 91 |
| 5. Terminated - Vested | (323) | 323 | | | | | | 0 |
| 6. Terminated - Nonvested | (296) | | 296 | | | | | 0 |
| 7. Cashouts | (187) | (36) | (61) | | | | | (284) |
| 8. Benefits Expired | | | | | | | (8) | (8) |
| 9. Rehired as Active | 168 | (71) | (87) | | | | | 10 |
| 10. New Members | 1,004 | | 7 | | | | | 1,011 |
| 11. Data Corrections | | (13) | 13 | (1) | 1 | | | 0 |
| **B. Number as of July 1, 2024** | **11,945** | **2,147** | **1,878** | **8,603** | **127** | **36** | **927** | **25,663** |

**Exhibit H.9**
**Historical Member Population**

| As of July 1 | Active Members | Inactive Vested Members | Inactive Non-Vested Members | Participants and Beneficiaries | Ratio of Non-actives to Actives* |
|---|---|---|---|---|---|
| 2015 | 10,514 | 1,607 | 660 | 8,025 | 0.92 |
| 2016 | 10,813 | 1,601 | 779 | 8,249 | 0.91 |
| 2017 | 10,874 | 1,600 | 878 | 8,501 | 0.93 |
| 2018 | 10,881 | 1,623 | 971 | 8,743 | 0.95 |
| 2019 | 11,175 | 1,657 | 1,035 | 8,918 | 0.95 |
| 2020 | 11,347 | 1,715 | 1,132 | 9,036 | 0.95 |
| 2021 | 11,627 | 1,754 | 1,213 | 9,262 | 0.95 |
| 2022 | 11,802 | 1,827 | 1,423 | 9,438 | 0.95 |
| 2023 | 11,766 | 2,010 | 1,711 | 9,615 | 0.99 |
| 2024 | 11,945 | 2,147 | 1,878 | 9,693 | 0.99 |

*Excludes inactive non-vested members

**Exhibit H.10**
**Historical Active Member Data Statistics**

| | Active Members | | Total Payroll Supplied by System, Annualized | | Average Salary | | | |
|---|---|---|---|---|---|---|---|---|
| As of July 1 | Number | Percent Change | Amount in Millions | Percent Change | Amount | Percent Change | Average Age | Average Service |
| 2004 | 9,826 | (0.9)% | 376.5 | 2.3% | 38,321 | 3.3% | 44.9 | 14.7 |
| 2005 | 9,801 | (0.3)% | 386.6 | 2.7% | 39,447 | 2.9% | 44.9 | 14.7 |
| 2006 | 9,585 | (2.2)% | 390.1 | 0.9% | 40,703 | 3.2% | 44.8 | 14.6 |
| 2007 | 9,599 | 0.1% | 401.3 | 2.9% | 41,810 | 2.7% | 44.7 | 14.5 |
| 2008 | 9,561 | (0.4)% | 417.7 | 4.1% | 43,684 | 4.5% | 44.6 | 14.4 |
| 2009 | 9,707 | 1.5% | 440.0 | 5.3% | 45,327 | 3.8% | 44.5 | 14.3 |
| 2010 | 9,907 | 2.1% | 465.0 | 5.7% | 46,937 | 3.6% | 44.2 | 14.0 |
| 2011 | 10,004 | 1.0% | 488.8 | 5.1% | 48,857 | 4.1% | 43.9 | 13.8 |
| 2012 | 10,014 | 0.1% | 505.3 | 3.4% | 50,458 | 3.3% | 43.7 | 13.7 |
| 2013 | 10,138 | 1.2% | 526.7 | 4.2% | 51,953 | 3.0% | 43.2 | 13.2 |
| 2014 | 10,305 | 1.6% | 557.2 | 5.8% | 54,073 | 4.1% | 42.9 | 12.8 |
| 2015 | 10,514 | 2.0% | 589.8 | 5.8% | 56,095 | 3.7% | 42.5 | 12.4 |
| 2016 | 10,813 | 2.8% | 627.0 | 6.3% | 57,986 | 3.4% | 42.3 | 12.1 |
| 2017 | 10,874 | 0.6% | 650.1 | 3.7% | 59,780 | 3.1% | 42.1 | 11.9 |
| 2018 | 10,881 | 0.1% | 653.5 | 0.5% | 60,055 | 0.5% | 41.9 | 11.8 |
| 2019 | 11,175 | 2.7% | 680.5 | 4.1% | 60,893 | 1.4% | 41.8 | 11.7 |
| 2020 | 11,347 | 1.5% | 711.0 | 4.5% | 62,663 | 2.9% | 41.8 | 11.7 |
| 2021 | 11,627 | 2.5% | 749.4 | 5.4% | 64,455 | 2.9% | 41.1 | 11.4 |
| 2022 | 11,802 | 1.5% | 766.1 | 2.2% | 64,916 | 0.7% | 41.3 | 11.3 |
| 2023 | 11,766 | (0.3)% | 777.7 | 1.5% | 66,099 | 1.8% | 41.2 | 11.3 |
| 2024 | 11,945 | 1.5% | 831.0 | 6.9% | 69,570 | 5.3% | 41.3 | 11.3 |

**Exhibit H.11**
**Historical Service Retirees Data Statistics**

| As of July 1 | Service Retirees | | Average Annual Amount | | |
|---|---|---|---|---|---|
| | Number | Percent Change | Amount | Percent Change | Average Age |
| 2015 | 7,250 | 3.7% | $ 22,976 | 3.4% | 71.0 |
| 2016 | 7,435 | 2.6% | 23,593 | 2.7% | 71.3 |
| 2017 | 7,664 | 3.1% | 24,352 | 3.2% | 71.5 |
| 2018 | 7,877 | 2.8% | 25,187 | 3.4% | 71.7 |
| 2019 | 8,019 | 1.8% | 25,887 | 2.8% | 72.0 |
| 2020 | 8,091 | 0.9% | 26,531 | 2.5% | 72.3 |
| 2021 | 8,290 | 2.5% | 27,250 | 2.7% | 72.5 |
| 2022 | 8,424 | 1.6% | 27,907 | 2.4% | 72.9 |
| 2023 | 8,567 | 1.7% | 28,539 | 2.3% | 73.1 |
| 2024 | 8,603 | 0.4% | 29,030 | 1.7% | 73.6 |

# SECTION I

## SUMMARY OF ACTUARIAL COST METHODS AND ASSUMPTIONS

# Summary of Actuarial Cost Methods and Assumptions

I. Valuation Date

The valuation date is July 1th 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.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate including administrative expenses, and (ii) a rate that will amortize the unfunded actuarial liability.

1. The valuation is prepared on the projected benefit basis. The present value of each participant's expected benefit payable at retirement or termination is determined, based on age, service, sex, compensation, and the interest rate assumed to be earned in the future (7.25%). 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 terminating with a service benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of 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 Plan on account of the present group of participants and beneficiaries.

2. The employer contributions required to support the benefits of the Plan are determined following a level percent of pay funding approach, and consist of a normal cost contribution and an unfunded accrued liability contribution, plus a component to cover administrative expenses.

3. The normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using the individual entry age actuarial cost method having the following characteristics of (i) the annual normal costs for each active member, payable from the date of entry into the system to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement, and (ii) each annual normal cost is constant percentage of the member's year-by-year projected covered pay.

4. The unfunded accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability and amortizing the result over a 30-year closed period that began July 1, 2013 as a level percentage of pay. It is assumed that payments are made throughout the year.

III. Actuarial Value of Assets

The actuarial value of assets is determined by recognizing fair value gains and losses over a five-year period. Gain and loss bases to be spread over the five-year period are determined by comparing expected returns based on the fair value of assets and cash flows during the year to actual investment returns. The actuarial value of assets must be between 80 and 120% of fair value.

IV. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.25% per annum, compounded annually. Inflation is assumed to be 2.30%.

2. Salary increase rate: Individual salary increases are composed of a price inflation component, a productivity increase componenet, and a step-rate/promotional component that varies by service. The table below combines the various components of salary increases.

| Attained Service | Percentage Increase in Salary | | | |
|---|---|---|---|---|
| | Price Inflation | Productivity Increase Rate | Step-Rate Promotional | Total |
| 0 | 2.30 % | 1.50 % | 11.00 % | 14.80 % |
| 1 | 2.30 % | 1.50 % | 3.00 % | 6.80 |
| 2 | 2.30 % | 1.50 % | 2.75 % | 6.55 |
| 3-4 | 2.30 % | 1.50 % | 2.50 % | 6.30 |
| 5-6 | 2.30 % | 1.50 % | 2.00 % | 5.80 |
| 7-8 | 2.30 % | 1.50 % | 1.75 % | 5.55 |
| 9-11 | 2.30 % | 1.50 % | 1.50 % | 5.30 |
| 12-13 | 2.30 % | 1.50 % | 1.25 % | 5.05 |
| 14-15 | 2.30 % | 1.50 % | 1.00 % | 4.80 |
| 16-18 | 2.30 % | 1.50 % | 0.75 % | 4.55 |
| 19-22 | 2.30 % | 1.50 % | 0.75 % | 4.55 |
| 23-29 | 2.30 % | 1.50 % | 0.25 % | 4.05 |
| 30+ | 2.30 % | 1.50 % | 0.00 % | 3.80 |

3. Payroll Growth Rate: 3.25% per annum. This assumption does not include any allowances for future increase in the number of members.

4. Administrative expenses are assumed to be equal to the prior year's amount, increased with inflation.

B. Demographic Assumptions

1. Rates of Mortality for Healthy and Disabled Lives: Mortality rates are based on the sex-distinct employee and annuitant mortality tables described below, including adjustment factors applied to the published tables for each group. Future mortality improvements are reflected by applying the MP-2019 Projection Scale on a generational basis to the adjusted base tables from the base year shown below.

   i) Non-Annuitant – Pub-2010, Amount-Weighted, Teachers, Employee mortality table

   (i) Healthy Annuitant – 104% Pub-2010, Amount-Weighted, Teachers, Healthy Retiree mortality table and 95% of the Pub-2010 Contingent Survivor Table.

   (ii) Disabled Annuitant – Pub-2010, Amount-Weighted, General, Disabled Retiree mortality tables

   Sample rates, including projections to 2024, are shown below.

| Sample Attained Ages | Probability of Death Pre-Retirement | |
|---|---|---|
| | Men | Women |
| 20 | 0.030 % | 0.011 % |
| 25 | 0.014 | 0.008 |
| 30 | 0.019 | 0.012 |
| 35 | 0.026 | 0.017 |
| 40 | 0.036 | 0.027 |
| 45 | 0.058 | 0.042 |
| 50 | 0.096 | 0.063 |
| 55 | 0.149 | 0.093 |
| 60 | 0.229 | 0.140 |
| 65 | 0.378 | 0.235 |
| 70 | 0.616 | 0.421 |
| 75 | 0.936 | 0.800 |
| 80 | 1.850 | 1.586 |
| 85 | 5.687 | 4.346 |
| 90 | 11.634 | 8.852 |

| Sample Attained Ages | Probability of Death Post-Retirement | |
|---|---|---|
| | Men | Women |
| 20 | 0.035 % | 0.014 % |
| 25 | 0.017 | 0.009 |
| 30 | 0.023 | 0.015 |
| 35 | 0.034 | 0.022 |
| 40 | 0.050 | 0.035 |
| 45 | 0.078 | 0.053 |
| 50 | 0.121 | 0.082 |
| 55 | 0.213 | 0.181 |
| 60 | 0.331 | 0.269 |
| 65 | 0.563 | 0.439 |
| 70 | 1.043 | 0.755 |
| 75 | 1.933 | 1.356 |
| 80 | 3.544 | 2.568 |
| 85 | 6.668 | 4.985 |
| 90 | 12.446 | 9.564 |

| Sample Attained Ages | Probability of Death Post-Disability | |
|---|---|---|
| | Men | Women |
| 20 | 0.411 % | 0.235 % |
| 25 | 0.278 | 0.166 |
| 30 | 0.358 | 0.262 |
| 35 | 0.497 | 0.428 |
| 40 | 0.737 | 0.692 |
| 45 | 1.134 | 1.046 |
| 50 | 1.641 | 1.440 |
| 55 | 1.943 | 1.570 |
| 60 | 2.230 | 1.765 |
| 65 | 2.782 | 2.136 |
| 70 | 3.657 | 2.698 |
| 75 | 4.752 | 3.572 |
| 80 | 6.511 | 5.263 |
| 85 | 9.583 | 8.303 |
| 90 | 14.669 | 12.455 |

2. Disability rates. Sample disability rates of active members are provided in the table below. There rates apply to both male and female NDTFFR member.

| Sample Attained Ages | Probability of Disablement |
|---|---|
| 25 | 0.0088 % |
| 30 | 0.0088 |
| 35 | 0.0088 |
| 40 | 0.0264 |
| 45 | 0.0440 |
| 50 | 0.0704 |
| 55 | 0.1232 |
| 60 | 0.2376 |

3. Termination rates (for causes other than death, disability or retirement): Termination rates are based on years from hire. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates are shown below:

| Probability of Termination | | |
|---|---|---|
| Years of Service | Male | Female |
| 0 | 15.00 % | 15.00 % |
| 1 | 13.00 | 11.00 |
| 2 | 11.00 | 9.50 |
| 3 | 8.00 | 7.50 |
| 4 | 6.00 | 6.00 |
| 5 | 5.25 | 5.50 |
| 6 | 4.00 | 4.50 |
| 7 | 3.75 | 4.00 |
| 8 | 3.00 | 2.75 |
| 9-10 | 2.50 | 2.75 |
| 11-12 | 2.00 | 2.50 |
| 13 | 2.00 | 2.25 |
| 14 | 1.50 | 2.25 |
| 15-16 | 1.50 | 1.75 |
| 17-18 | 1.50 | 1.50 |
| 19-22 | 0.75 | 1.25 |
| 23-24 | 0.75 | 1.00 |
| 24+ | 0.75 | 0.75 |

4. Retirement rates

| Probability of Retirement | | | |
|---|---|---|---|
| Age | Unreduced Retirement* | | Reduced Retirement |
| | Male | Female | Unisex |
| 50-54 | 15.00 % | 15.00 % | 2.00 % |
| 55-56 | 15.00 | 15.00 | 2.00 |
| 57 | 15.00 | 15.00 | 3.00 |
| 58 | 15.00 | 15.00 | 3.50 |
| 59 | 15.00 | 15.00 | 4.00 |
| 60 | 15.00 | 15.00 | 5.00 |
| 61 | 30.00 | 25.00 | 9.00 |
| 62 | 30.00 | 30.00 | 10.00 |
| 63 | 25.00 | 30.00 | 11.00 |
| 64 | 35.00 | 40.00 | 12.00 |
| 65 | 30.00 | 35.00 | |
| 66 | 25.00 | 30.00 | |
| 67 | 25.00 | 20.00 | |
| 68-74 | 20.00 | 20.00 | |
| 75 | 100.00 | 100.00 | |

**If a member reaches eligibility for unreduced retirement before age 65 under the rule of 85 (Grandfathers Tier 1) or the Rule of 90/Age 60 (Non-Grandfathered Tier 1 and Tier 2), 12.5% is added to the rate at the age (and only this age) the member becomes first eligible for an unreduced retirement benefit.*

C. Other Assumptions

1. Percent married: 75% of employees are assumed to be married.
2. 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.
4. Percent Electing a Deferred Termination Benefit: Terminating members are assumed to elect the most valuable benefit at the time of termination. Termination benefits are assumed to commence at the first age at which unreduced benefits are available.
5. Loading Factor for New Retirees: The liability includes a 3% load for members who retired during the year leading up to the valuation date to reflect that their benefits are not finalized as of the valuation date.
5. Decrement Timing : Retirement is assumed to occur at the beginning of the year and all other decrements are assumed to occur middle of the year.

# SECTION J

## GLOSSARY

***Actuarial Accrued Liability (AAL):*** That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

***Actuarial Assumptions:*** Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

***Actuarial Cost Method*** or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

***Actuarial Gain*** or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

***Actuarially Equivalent:*** Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

***Actuarial Present Value (APV):*** The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),
b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

***Actuarial Present Value of Future Plan Benefits:*** The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

***Actuarial Valuation***: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB.

***Actuarial Value of Assets*** or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

***Actuarially Determined:*** Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

***Amortization Method:*** A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

***Amortization Payment:*** That portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

***Actuarially Determined Contribution (ADC)*** or ***Annual Required Contribution (ARC):*** A calculated contribution for a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically, the calculated contribution has a normal cost payment and an amortization payment.

***Closed Amortization Period:*** A specific number of years that is counted down by one each year and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

***Decrements:*** Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

***Defined Benefit Plan:*** An employer-sponsored retirement benefit that provides workers, upon attainment of designated age and service thresholds, with a monthly benefit based on the employee's salary and length of service. The value of a benefit from a defined benefit plan is generally not affected by the return on the assets that are invested to fund the benefit.
***Defined Contribution Plan:*** A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

***Employer Normal Cost:*** The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

***Experience Study:*** A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

***Funded Ratio:*** The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a fair funded ratio, using the fair value of assets (FVA), rather than the AVA.

***Funding Period*** or ***Amortization Period:*** The term "Funding Period" is used it two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

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

***Normal Cost:*** That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

***Open Amortization Period:*** An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

***Unfunded Actuarial Accrued Liability:*** The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.