

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.

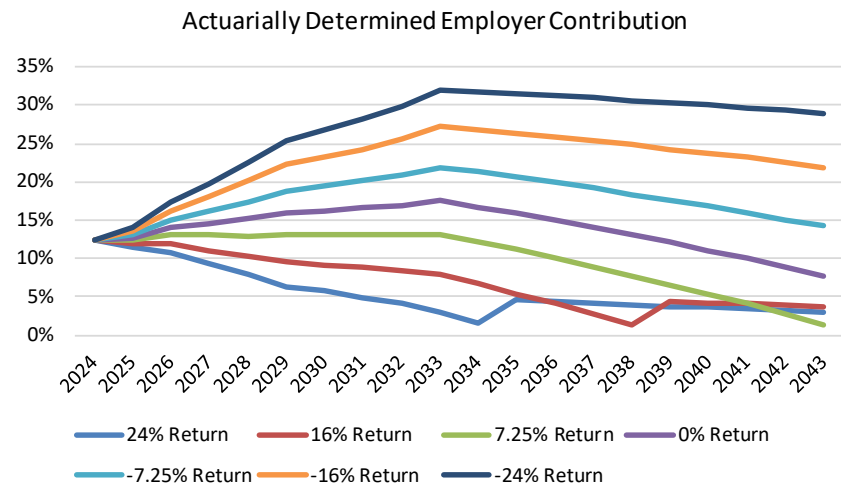
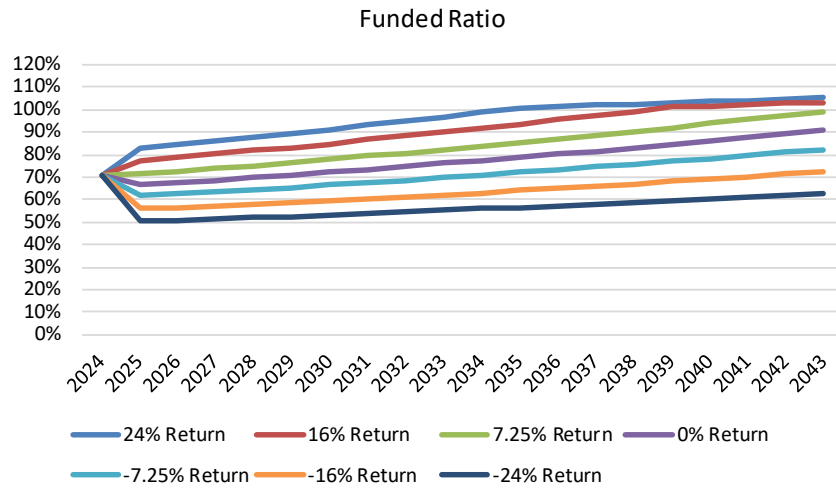
The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening),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



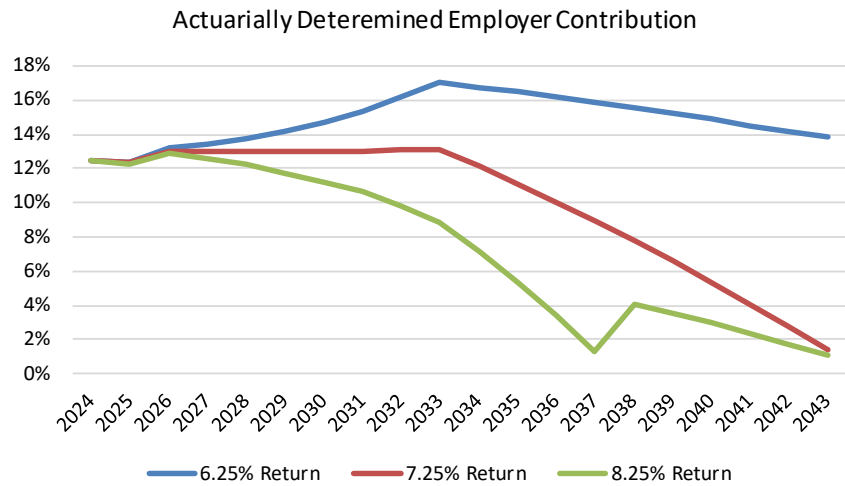
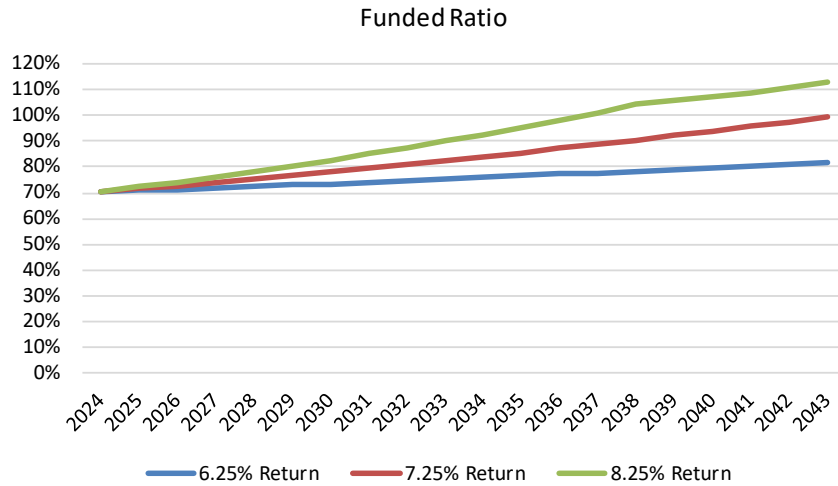
Risks Measures – Plan Maturity Measures

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.



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.



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:

	<u>July 1, 2024</u>	<u>July 1, 2023</u>	<u>July 1, 2022</u>
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.



Risks Measures – Plan Maturity Measures

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				Net Cash Flow	Fair Value of Assets	Net Cash Flow as a Percent of Fair Value
		Benefit Payments	Refunds	Administrative Expenses	Total Disbursements			
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.



History of Employer Contributions

Exhibit E.4 History of Employer Contributions

Year Ended June 30	Actuarially Determined Employer Contribution (ADC)		Actual Employer Contributions		Percent Contributed
	Amount	Percentage of Payroll	Amount	Percentage of Payroll	
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.



Solvency Test

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

Summary of 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 least 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.



Summary of Benefit Provisions

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.



Summary of Benefit Provisions

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.



Summary of Benefit Provisions

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

Summary of 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.



Summary of Plan Changes

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.



Summary of Plan Changes

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).



Summary of Plan Changes

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

Summary of Participant Data

Exhibit H.1 Summary of Census Data

	<u>July 1, 2024</u>	<u>July 1, 2023</u>	<u>Change from Prior Year</u>
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%



Summary of Participant Data

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

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



Summary of Participant Data

Exhibit H.3
Active Member Counts and Average Salary by Age and Service as of July 1, 2024

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



Summary of Participant Data

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

<u>Age</u>	<u>Number of Members</u>	<u>Average Monthly Benefit</u>
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

Summary of Participant Data

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 is 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

Age	Service Retirees		Disabled Retirees		Beneficiaries/QDROs	
	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



Summary of Participant Data

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



Summary of Participant Data

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

<u>Type of Benefits/Form of Payment</u>	<u>Number</u>	<u>Annual Benefits Amount</u>	<u>Monthly Benefits</u>
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



Summary of Participant Data

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

As of July 1	Active Members		Total Payroll Supplied by System, Annualized		Average Salary		Average Age	Average Service
	Number	Percent Change	Amount in Millions	Percent Change	Amount	Percent Change		
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



Summary of Participant Data

Exhibit H.11 Historical Service Retirees Data Statistics

As of July 1	Service Retirees		Average Annual Amount		Average Age
	Number	Percent Change	Amount	Percent Change	
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 1st 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.

Summary of Actuarial Cost Methods and Assumptions

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 component, 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.

Summary of Actuarial Cost Methods and Assumptions

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		Sample Attained Ages	Probability of Death Post-Retirement		Sample Attained Ages	Probability of Death Post-Disability	
	Men	Women		Men	Women		Men	Women
20	0.030 %	0.011 %	20	0.035 %	0.014 %	20	0.411 %	0.235 %
25	0.014	0.008	25	0.017	0.009	25	0.278	0.166
30	0.019	0.012	30	0.023	0.015	30	0.358	0.262
35	0.026	0.017	35	0.034	0.022	35	0.497	0.428
40	0.036	0.027	40	0.050	0.035	40	0.737	0.692
45	0.058	0.042	45	0.078	0.053	45	1.134	1.046
50	0.096	0.063	50	0.121	0.082	50	1.641	1.440
55	0.149	0.093	55	0.213	0.181	55	1.943	1.570
60	0.229	0.140	60	0.331	0.269	60	2.230	1.765
65	0.378	0.235	65	0.563	0.439	65	2.782	2.136
70	0.616	0.421	70	1.043	0.755	70	3.657	2.698
75	0.936	0.800	75	1.933	1.356	75	4.752	3.572
80	1.850	1.586	80	3.544	2.568	80	6.511	5.263
85	5.687	4.346	85	6.668	4.985	85	9.583	8.303
90	11.634	8.852	90	12.446	9.564	90	14.669	12.455



Summary of Actuarial Cost Methods and Assumptions

2. Disability rates. Sample disability rates of active members are provided in the table below. These 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

Summary of Actuarial Cost Methods and Assumptions

4. Retirement rates

Age	Probability of Retirement		
	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

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.



Glossary

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.



Glossary

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 in 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.



Glossary

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.