



CONSULTING GROUP

Metropolitan Board of Education Teacher Retirement Plan

Actuarial Valuation and Report

July 1, 2022

Contents

Introduction.....	1
Summary of Report.....	2
Plan Assets	4
Balance Sheet, July 1, 2022.....	4
Variance from Expected Asset Value.....	4
Historical Variances - (Gain)/Loss.....	4
Actuarial Value of Assets.....	4
Actuarial Computations	5
Determination of Actuarially Determined Contribution.....	5
Schedule of Projected Retirement Payments.....	6
Basis of Valuation	7
Summary of Actuarial Assumptions.....	7
Risk Assessment Associated with Assumptions.....	8
Summary of Provisions of the Plan.....	9
Summary of Participant Data.....	10

Introduction

This report has been prepared for the exclusive use of the Metropolitan Board of Public Education. The report summarizes the results of the actuarial valuation of the Metropolitan Board of Education Teacher Retirement Plan as of July 1, 2022. The purpose of the report is to provide an updated measurement of the plan's liabilities and provide information that will inform the financing of the plan and the financial reporting related to the plan. This report provides actuarial advice and does not constitute legal, accounting, tax or investment advice.

The actuarial calculations contained in the report are built on deterministic actuarial modeling, making a single determination of liabilities and costs. Further, these actuarial calculations are based on a combination of demographic and asset data, as well as assumptions concerning future changes in these data. As such, the actuarial calculations contained herein are an estimate of projected future occurrences.

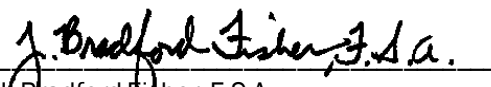
Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Due to the limited scope of the assignment, we did not perform an analysis of the potential range of such future measurements. A more detailed discussion of plan-related risks is included herein.

Certification

By signature below, I attest the following:

This report has been prepared under my supervision; I am a member of the American Academy of Actuaries, a Fellow of the Society of Actuaries, and a consulting actuary with USI Consulting Group, and have met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein. To the best of our knowledge this report has been prepared in accordance with generally accepted actuarial standards, including the overall appropriateness of the analysis, assumptions, and results and conforms to appropriate Standards of Practice as promulgated from time to time by the Actuarial Standards Board, which standards form the basis for the actuarial report. We are not aware of any direct or material indirect financial interest or relationship, including investment management or other services that could create, or appear to create, a conflict of interest that would impair the objectivity of our work.

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Summary of Report

An actuarial valuation of the Metropolitan Board of Education Teacher Retirement was performed as of July 1, 2022. The purpose of the valuation was to examine the liabilities and to determine an actuarially determined contribution sufficient to fund the plan.

Historical Perspective

When the Metropolitan Board of Education Teacher Retirement was initially developed, the intent was that funding of benefits in excess of state reimbursements would be shared in the aggregate equally by the Board and by the teachers, with the employer assuming past service costs. The concept was discarded because the plan was closed to new entrants in 1969. At that point, the membership represented an aging population with no young new entrants to create a stable population that would have permitted such a concept to continue to apply. In 1977, the Board adopted a funding method that amortized costs over the average life expectancy of all active and retired members.

The valuation performed in 1993 set forth funding levels that were significantly higher than the amount of funds available from the budget. As a result, the Board of Education, at the recommendation of the Administrative Retirement Committee, accepted an interim funding schedule, the "1994 Interim Funding Schedule". The purpose of the 1994 Interim Funding Schedule was to provide an actuarially sound method to bring the budgeted amount up to the Actuarially Determined Funding Level over time.

The 1994 Interim Funding Schedule projected that the Board could return to the Actuarially Determined Funding Level by the 2005-2006 fiscal year. Due primarily to actuarial gains from investment returns above those assumed, a return to the Actuarially Determined Funding Level was permitted during the 1999-2000 fiscal year (that is, the Actuarially Determined Funding Level for the 1999-2000 fiscal year was less than the amount set forth in the 1994 Interim Funding Schedule). In effect, the plan had "caught-up". Regardless, the actual funding was limited by continuing budget constraints.

Beginning on July 1, 2000, the Plan became a component of the Guaranteed Payment Program (GPP), an umbrella plan created by the state and local government to ensure actuarially sound funding for a group of five plans supervised by the Metro Benefit Board and the Board of Education. Under the GPP, unfunded liabilities of the aggregate plan are amortized over a period of no more than thirty years. Payments for the Plan move to a payment account from which distributions are paid to the constituent plans of the GPP as necessary to satisfy current benefit needs and to satisfy funding objectives of the GPP. Funding issues that are specific to the GPP are addressed in a separate report.

Comparison of Plan Information from Recent Valuations

	2022-23	2021-22 *	2020-21	2019-20*	2018-19*
Retired Participants					
Number	652	715	773	824	859
Average Age	82.04	81.54	81.13	80.52	79.82
Gross Pensions	\$24,932,354	\$26,556,286	\$28,311,068	\$29,567,853	\$30,372,933
Average Gross Pension	38,240	37,142	36,625	35,883	35,358
Vested Terminations					
Number	0	0	0	1	1
Gross Pensions	\$0	\$0	\$0	\$16,991	\$16,991
Average Gross Pension	0	0	0	16,991	16,991
Total Participants					
	652	715	773	825	860
Actuarial Asset Value	\$158,625,990	\$140,682,924	\$120,867,843	\$109,465,715	\$99,650,531
Present Value of Future Benefits	147,817,250	161,255,514	155,996,918	166,472,644	163,737,862
Funded Status	107.3%	87.2%	77.5%	65.8%	60.9%
Actuarially Determined Contribution	0	2,882,016	4,888,535	7,437,048	7,900,199
Actual Board Contribution	—	4,285,000	4,285,000	4,285,000	4,285,000
Transfer For Current Year From (To)					
Guaranteed Payment Program	—	22,042,618	21,065,034	20,057,682	19,240,080
Assumed Rate of Return	5.50%	5.50%	7.25%	7.25%	7.25%

* Indicates a change in actuarial assumptions and/or actuarial methods.

The Actuarial Computations section sets forth details of the determination of an actuarially determined contribution and provides a projection of expected benefit payments over the next 20 years under the existing plan. The Basis of Valuation section of this report sets forth a summary of benefits provided under the Metropolitan Board of Education Teacher Retirement, summarizes the actuarial assumptions on which the valuation was based, and summarizes the employee data on which this valuation was based.

The Administrative Retirement Committee adopted a change in actuarial assumptions (lowering the discount rate) for 2018 that increased the present value of future benefits by 1.6%. In 2019 the Administrative Retirement Committee adopted a change in actuarial assumptions (updating the mortality assumption) that increased the present value of future benefits by 6.7%. In 2021 the Administrative Retirement Committee adopted a change in actuarial assumptions (lowering the discount rate) that increased the present value of future benefits by 11.9%.

All calculations made in this report have been made utilizing employee data supplied by the Metropolitan Board of Public Education, asset information supplied by the Metropolitan Government of Nashville and Davidson County, and the actuarial assumptions summarized herein.

Plan Assets

Balance Sheet, July 1, 2022

	Market Value
Assets	
Cash & Equivalents	\$ 36,050,567
Investments	124,857,319
Net Accruals, including pending trades	3,929,993
Total assets	\$ 164,837,879
Liabilities	
Reserve for plan participants	\$ 164,837,879

Variance from Expected Asset Value

Trust Fund, July 1, 2021 (At Market)	\$ 157,919,464
Assumed Return at 5.50%	8,685,571
Employer Contributions, with Interest	27,051,627
Employee Contributions, with Interest	0
Net Withdrawals for Benefit Payments, with Interest	(18,416,079)
Expected Trust Fund, June 30, 2022	\$ 175,240,583
Actual Trust Fund, June 30, 2022	164,837,879
Variance From Expected Asset Value	\$ (10,402,704)

Historical Variances - (Gain)/Loss

2022	\$ (10,402,704)
2021	27,326,675
2020	(4,611,363)
2019	(87,041)

Actuarial Value of Assets

Market Value Assets, June 30, 2022	\$164,837,879
- 80% of prior year's Variance	8,322,163
- 60% of second prior year's Variance	(16,396,005)
- 40% of third prior year's Variance	1,844,545
- 20% of fourth prior year's Variance	17,408
Smoothed Asset Value	\$158,625,990
Valuation Assets, within 20% of Market Value	158,625,990

Actuarial Computations

Determination of Actuarially Determined Contribution

The exhibit below shows the determination of the Actuarially Determined Contribution for the plan year beginning July 1, 2022. The determination is made on an approximate basis.

Present Value of Benefits (Net of State Reimbursements)	
Active Lives	\$ 0
Retired Lives	147,817,250
Deferred Vested Lives	0
Total Present Value of Benefits	<u>\$ 147,817,250</u>
Actuarial Asset Value	(158,625,990)
Present Value of Future Employee Contributions	0
Present Value of Future Employer Costs	<u>\$ (10,808,740)</u>
Level Dollar, 30-Year Amortization of Future Costs from July 1, 2000	0
Interest Adjustment for Mid-year Payment	0
Actuarially Determined Contribution	<u>\$ 0</u>

Schedule of Projected Retirement Payments

The schedule below shows a 20-year projection of payouts from the plan, both on a gross basis and a basis net of the funding provided by the State of Tennessee.

Plan Year	Gross Pensions	State Funding	Net Pensions
2023	\$24,408,514	\$8,408,415	\$16,000,099
2024	23,704,981	7,911,800	15,793,181
2025	22,898,265	7,406,068	15,492,197
2026	21,997,145	6,894,781	15,102,364
2027	21,011,053	6,381,602	14,629,451
2028	19,950,054	5,870,265	14,079,789
2029	18,824,869	5,364,495	13,460,374
2030	17,647,000	4,868,017	12,778,983
2031	16,428,321	4,384,414	12,043,907
2032	15,181,075	3,917,092	11,263,983
2033	13,918,036	3,469,288	10,448,748
2034	12,652,509	3,043,988	9,608,521
2035	11,398,384	2,643,929	8,754,455
2036	10,169,658	2,271,455	7,898,203
2037	8,980,165	1,928,447	7,051,718
2038	7,843,486	1,616,348	6,227,138
2039	6,772,406	1,336,103	5,436,303
2040	5,778,053	1,088,012	4,690,041
2041	4,869,364	871,700	3,997,664
2042	4,053,005	686,268	3,366,737

Basis of Valuation

Summary of Actuarial Assumptions

Unless noted below, all assumptions are a combination of estimated future experience and estimates inherent in market data or plan experience.

Mortality Rates

110% of the Pub-2010 Teachers mortality table (fully generational) with mortality improvement projected forward from 2010 using mortality improvement scale MP-2018.

Pre-Retirement Decrements

Not applicable

Salary Scale

Not applicable

Discount Rate/Rate of Investment Return

5.50% per annum

Cost of Living Increases

3.00% per annum

Actuarial Valuation Method

Entry Age Normal – with Level Dollar Amortization

Asset Valuation Method

Five-year smoothing of difference between market value and expected valuation assets. The resulting actuarial value shall not exceed 120% of the market value, or be less than 80% of the market value.

Other Assumptions

Retirees receiving joint & survivor annuities are assumed to be married with female spouses four years younger than male spouses

Risk Assessment Associated with Assumptions

Risk Factor	Risk Assessment
Investment	Due to the plan's substantial equity exposure, investment returns will likely be much more volatile than liability valuations. Therefore, as the plan becomes better funded, there is a risk that the funded status of the plan, as well as required plan contributions, could be volatile.
Assumed Rate of Return	Due to the plan's estimated duration of 6 to 7, a 1% decrease in the assumed rate of investment return would increase the liability 6% to 7%. More detailed sensitivity analysis is included in the GASB 67 reporting for this plan.
Longevity	Since benefits from the plan must generally be paid as annuities, the plan is sensitive to changes in overall population longevity. As a result, the liabilities will increase if participants live longer than expected and decrease if they live shorter than expected. This risk is largely mitigated due to the maturity of the plan population. Substantially all benefits are in pay status and the average participant age exceeds 80.
Other demographic factors	No known significant risks.
Asymmetries in formula	No known significant risks.
Inflation	Inflation is a component of both cost of living allowances (COLAs) and investment returns over a long period. As a result, changes to inflation can affect funded percentages. Retiree benefits are given increases based on increases in the Consumer Price Index (CPI), a measurement of inflation. The risk associated with the COLAs is mitigated since the annual COLA is capped at 3.0%, and the assumed COLA is the maximum 3.0%. So any impact on plan liabilities due to variations of actual COLAs from assumed COLAs can only result in gains, and not losses.

USI Consulting Group can perform more detailed assessments of these risks as desired by the plan sponsor to provide a better understanding of the risks.

This summary is not a Summary Plan Description or a Plan document. You should not rely solely on this summary in making a determination of eligibility for the Plan or its benefits.

Summary of Provisions of the Plan

Eligibility Employees hired after April 1, 1963 became participants as a condition of employment. Employees on April 1, 1963, whether participants in a former plan, or not, were allowed to become a participant in the present plan provided written application was received prior to July 1, 1965. The Plan was closed to new entrants as of July 1, 1969, and employees hired after that date became members of the Tennessee Consolidated Retirement System.

Retirement Dates

- a. Normal Retirement Date Age 65, or age 60 with 20 years of service, or prior to age 60 with 25 years of service.
- b. Early Retirement Date Age 55 with 15 years of service.

Retirement Income

- a. Normal Average annual salary times 2.00% per year of service
- b. Early A benefit deferred to age 65, calculated as above, or an immediate benefit actuarially reduced.

Normal Form of Payment Single life annuity

Optional Payment Forms:

- Option A: 100% joint and survivor
- Option B: 50% joint and survivor
- Option C: Social Security option
- Option D: Life income with guaranteed payments
- Option E: 100% joint and survivor with pop-up
- Option F: 50% joint and survivor with pop-up
- Option G: Special Design

Cost of Living Adjustments Each July 1, up to 3% of the original retirement benefit is added to a member's retirement benefit. The percentage increase is based on the increase in the Consumer Price Index (all items—United States city average), but will not exceed 3%. In any year when the change of CPI is less than a 1% increase, there is no benefit adjustment made on the following July 1.

Death Benefit

(After Retirement) If a participant dies after retirement benefits have become payable, no death benefit is payable unless an optional form of benefit has been elected which provides for a death benefit.

Summary of Participant Data

Distribution of Active Participants - None

Distribution of Inactive Participants with Average Annual Benefit

Age Group	Number	Annual Pensions (Gross)	
		Total	Average
0 - 64	20	\$347,437	\$17,372
65 - 69	4	25,252	6,313
70 - 74	9	354,226	39,358
75 - 79	217	8,969,175	41,333
80 - 84	186	7,163,720	38,515
85 - 89	139	5,343,191	38,440
90+	77	2,729,353	35,446
TOTAL	652	\$24,932,354	\$38,240