MBTA Retirement Fund

A Pension Trust Fund between the Massachusetts Bay Transportation Authority and its Employees

2023 Annual Comprehensive Financial Report

For the years ended December 31, 2023 & 2022
Boston, Massachusetts

Issued by:
John P. Barry, Interim-Executive Director

MBTA Retirement Fund

A Pension Trust Fund administering benefits earned by employees of the Massachusetts Bay Transportation Authority

ANNUAL COMPREHENSIVE FINANCIAL REPORT

For the Years Ended December 31, 2023 and 2022

Prepared By
The MBTA Retirement Fund Staff

The Massachusetts Bay Transportation Authority Retirement Fund is a private trust created in 1948 by the Metropolitan Transit Authority, the predecessor agency to the Massachusetts Bay Transportation Authority ("MBTA"), and The Boston Carmen's Union, Amalgamated Transit Union Local 589. Our mission then, as now, is to provide retirement benefits to the membership consisting of the transit workers and others employed by the MBTA. To ensure that the pensions earned by active and retired members, and their beneficiaries, remain secure, we are dedicated to managing a strong and diversified investment program.

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INTRODUCTORY SECTION

(Unaudited)

June 24, 2024

To Chairperson Evers, the Trustees of the MBTA Retirement Fund, Participants and Beneficiaries:

On behalf of the Board of Trustees I am pleased to submit the Massachusetts Bay Transportation Authority Retirement Fund's Annual Comprehensive Financial Report (ACFR) for the fiscal year ended December 31, 2023. This year marks the Fund's 75th Anniversary and the ACFR reflects that our commitment to accurate and transparent financial reporting is as strong as our commitment to excellence in customer service. The document presented today is the eighth consecutive ACFR produced by the MBTA Retirement Fund.

The ultimate responsibility for the integrity of the data presented within this report and the fair presentation of the financial statements, in all material respects lies with Management. This report is intended to provide complete and reliable information on the Fund's investments, financial statements and performance returns.

To provide a reasonable basis for making these representations, management maintains a sufficient set of internal control procedures designed to implement reasonable assurance that assets are properly safeguarded, transactions are properly executed, and reliable information is utilized for the preparation of the Fund's financial statements in conformity with Generally Accepted Accounting Principles (GAAP), as promulgated by the Governmental Accounting Standards Board (GASB). The Fund's transactions are reported on the accrual basis of accounting. The objective of the internal control framework is to obtain reasonable rather than absolute assurance that the financial statements will be free from material misstatement since the cost of controls should not exceed anticipated benefits to be derived.

Our independent external auditors, KPMG LLP, have conducted an audit of the Basic Financial Statements in accordance with auditing standards generally accepted in the United States, performing tests and procedures as they deem necessary to express opinions on the Basic Financial Statements in their report to the Board.

Within the financial section, the Management Discussion & Analysis (MD&A) follows the independent auditors' report and provides an overview of the Fund's financial statement and financial results. The MD&A complements this letter of transmittal and should be read in conjunction with this letter.

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Profile of the MBTA Retirement Fund

The Fund was established on January 1, 1948, under an agreement and declaration of trust (restated on November 17, 2023 and July 19, 2019) by and among the Massachusetts Bay Transportation Authority (the Authority), and Local 589, Amalgamated Transit Union, Boston Carmen's Union, AFL CIO (collectively, the Union). The Fund is a single employer plan. It was established as a contributory defined benefit retirement plan in accordance with the Pension Agreement; effective July 1, 1970, (restated thereafter) adopted by the Authority and the Union for the purpose of receiving contributions and providing pension benefits for its Members and qualified beneficiaries.

The MBTA Retirement Fund Board (governing board) seeks to utilize its assets under management to the benefit of the membership by strategically and methodically allocating financial resources to a differentiated portfolio of investments while applying the knowledge and experience of a broad range of investment managers. An overview of the Investment Policy Statement is included in the Investment Section, on page 111.

The Board determines investment objectives, strategies, and policies of the Fund. The Executive Director of the Fund is accountable for the Fund's general management and operations. In addition, the Executive Director reports to and advises the six-member Board of Trustees. The staff of the Fund work diligently to uphold the original mission of serving Members and their families.

As of December 31, 2023, the Fund had approximately $1,694.4 million in net position restricted for pension benefits compared to $1,622.5 million for the prior calendar year, representing an increase of $71.9 million in net position. The MBTA Retirement Fund Board utilizes the services of a third-party custodian institution to assist with the settlement and accounting for investment and cash transactions.

As of December 31, 2023, the Fund had 5,805 active members compared to 5,555 as of December 31, 2022. The MBTA has been actively engaged in increasing the number of MBTA employees and it is matriculating into contributing members of the Fund. There were 6,800 retired members, beneficiaries and disabled members receiving a benefit as of year-end 2023 compared to 6,783 on December 31, 2022.

Interim-Executive Director Discussion

Following challenging overall returns in 2022, the MBTA Retirement Fund was satisfied with the 2023 come-back, resulting in a total fund gross return of 9.34%. Despite concerns of a recession, the S&P 500 rallied in 2023 and returned 26.29% due to the combination of a solid economy and an anticipated end of the Federal Reserve interest rate hikes. International and global emerging market portfolios contributed to the overall return while real estate and private equity were detractors.

The NECREIF Property Index was down (7.94%) due to office vacancies from remote work, higher interest rates, tight lending conditions and therefore a decrease in investment activity. Office transactions experienced the largest declines while the industrial sector showed signs of stabilization. While the MSCI EAFE Index gained 18.24%

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and the MSCI All Country World Index returned 22.20% in 2023 the Fund's Global Equity and Emerging Market portfolio returned 30.70%. The Board and Investment Consultant continually monitors the investment environment and makes prudent decisions on behalf of the Members.

Operational Changes

Our 75th Anniversary year, 2023, was likely the most active year for operational changes to the Fund. After seven months of intense bargaining between the negotiating parties to the Pension Agreement, Local 589, Amalgamated Transit Union, AFL-CIO (Union) and the Massachusetts Bay Transportation Authority (Authority), on March 31, 2023, the Union and the Authority reached an agreement and signed a Memorandum of Understanding (MOU) that resulted in important changes to the Pension Agreement. These changes supersede the interest arbitration award of August 26, 2022, which has been vacated in full and is of no further effect. The term of the new Pension Agreement runs from June 30, 2018, through June 30, 2028.

The new Pension Agreement made important changes including the creation of a two-tier benefit structure consisting of the Group A Plan and the Group B Plan. The Group A Plan membership includes employees who became Members of the Fund on or before June 30, 2023, they are automatically in the Group A Plan unless they elected to join the Group B Plan. The election period ended on March 29, 2024. The Group B Plan membership includes any employees who are or become Members of the Fund on or after July 1, 2023. Members of Group A were able to elect to join Group B Plan by providing written notice to the Fund between June 30, 2023, and March 29, 2024, by completing the election form of the Fund's website. A copy of the Pension Agreement is available on the Fund's website.

For the purpose of educating the membership on the changes to the Pension Agreement, several in-person information sessions were offered in June 2023, newsletters, PowerPoints and a Benefit Comparison Guide were also posted to the Fund's website. When the election period ended on March 29, 2024, following a three-month extension, 962 Qualified Member's elected to join the Group B Plan and 19 Qualified Member's revoked their original Group B election and reverted to the Group A Plan.

In addition to benefit structure adjustments in the Pension Agreement, the negotiating parties also included a Cost-of-Living Adjustment (COLA) for many of our retired members. The first $13,000 of all annual allowances under the Plan in effect on June 30, 2018, were increased by a percentage ranging from 2% to 5% depending on the date of the Retired Member's retirement. The chart can be found on our website in the Pension Agreement. The adjustments were a one-time ad hoc adjustment, effective with benefits paid commencing July 1, 2018. The retro-active wages were paid in September 2023 to qualifying retired members and beneficiaries.

As always, the Fund's benefits department stands ready to answer questions. They continue to offer walk-in capabilities for select services and appointments for services that take longer than 15 minutes. The latest operational amendments are posted on the Fund's website and are continuously updated as needed.

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Objectives and Goals

Ten years ago, in 2014, the MBTA Retirement Fund embarked on its first Strategic Plan covering the five-year period from 2015 – 2019. We are proud to stay that the initial plan, with its well-articulated mission and clear goals, led to improved customer service, superior financial reporting, professional development of staff, adoption of a more sophisticated technological infrastructure, and enhanced ethics training and accountability. In 2020, following careful analysis and comprehensive surveys, the Retirement Fund developed its Project 2020 Strategic Plan covering the period from 2020-2023 – concluding in 2023 with the 75th Anniversary of the creation of the Fund. Goals established pursuant to that Strategic Plan were ambitious and substantially achieved even while the Fund operated seamlessly through the challenges of the pandemic and implemented significant changes to the Pension Agreement during its anniversary year.

The Fund seeks to enhance financial technology capabilities to support a secure and high performing customer service environment. To improve and modernize the Fund's IT infrastructure, the Fund is implementing technological improvements consistent with legal standards and best practices, such as encryption, cyber security training and vulnerability scans, to better protect confidential information. In addition, the Fund is in the process of a complete migration to electronic records management and retention to improve storage and retrieval.

The Fund produced a webinar illustrating features and functionality of the PTG Member Self-Service Portal, which was posted to the Fund website. As a result of changes to the Pension Agreement, the staff conducted in-person information sessions in the Spring of 2023 to continue outreach to, and education of, affected members regarding changes to the benefits required by the Pension Agreement.

The Fund is constantly advancing toward its goal of cultivating a sophisticated, professional, risk-intelligent organization dedicated to customer service. To promote this culture, the Fund conducts routine employee training and offers development opportunities for its staff. The Fund must continually evaluate, revise, and refine internal policies governing operations management and risk. To that end, the Benefit Department Standard Operating Procedures (SOPs) were updated and peer reviewed. These will be updated as necessary to accommodate changes to the Pension Agreement.

To become a recognized leader in pension benefit administration, management is consistently collaborating with state regulators, public pension systems and other industry stakeholders to identify innovative best practices. On September 21, 2023, I was invited along with PERAC Chairman Philip Brown, Esq. to appear and present together on a panel at the PERAC's 2023 Emerging Issues Forum. The presentation was well received and garnered positive feedback.

The Fund works to attain the goal of sustaining and preserving a financially sound pension fund for its membership. The Fund provides the annual ACFR report and monthly financial reports on the Fund's website regularly. The Investment Compliance Working Group (ICWG) meets at least annually to continuously review and improve Finance Department policies and procedures. In 2023, an asset liability modeling study was conducted to consider alternatives to the current Policy asset

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mix with the objective of identifying potential opportunities for improved Fund financial results. On February 16, 2024, the Board approved a new asset allocation mix that will go into effect on April 1, 2024.

As we completed the final year of the 2020 – 2023 Strategic Plan and celebrate our 75th Anniversary, the Retirement Fund management and Board determined that the time was right to give a fresh look at the status and operations of the Retirement Fund and identify areas where we can and should develop new and/or added capabilities in benefits administration, operations, and finance. The development team is mindful that changes and challenges in financial technology, cybersecurity and data protection occur more rapidly than ever. The MBTA Retirement Fund Strategic Plan for 2024-2027 has been developed and is in the process of being refined and approved by the Board. We look forward to sharing our updated goals to continue to provide responsible and efficient stewardship to deliver promised retirement benefits, while promoting retirement security for members and retirees.

Investment Policy Overview

The Fund's portfolio is broadly diversified, holding investments ranging from publicly traded stocks and bonds to privately held partnerships. The scale and scope of these investments makes oversight of these assets highly complex and requires an investment policy. The Retirement Board of the Fund adopts an Investment Policy Statement (IPS) which establishes investment objectives and policy, obtains expert advice and assistance, and oversees the employment of qualified and competent investment staff. In addition, the IPS is designed to obtain optimal risk-adjusted returns and ensure that investments are made for the exclusive benefits of the Members of the Fund. The Board also monitors the actions of staff, consultants, and advisors to ensure compliance with its policies. In 2023, the Fund convened its Investment Compliance Working Group for their annual review of the IPS, Investment Selection Process, Investment Management Compliance Policies and Financial Reporting. The ICWG did not recommend any formal changes to these policies in 2023. However, it anticipates edits in 2024 to reflect the PRIM Investment mandate in the new Pension Agreement. The current Investment Policy Statement has been in effect since July 2020. The Board's primary goal is to maintain a financially sound pension fund to provide financial security for its Members.

MBTA Retirement Fund Performance

Following a difficult year in 2022, 2023 provided a highly desired come-back. Regardless of market conditions, the Board and management are always focused on long-term performance. As of December 31, 2023, the total Fund return gross of fees was 9.34% and the annualized three, five and ten-year returns were 2.73%, 8.14% and 6.53%, respectively. For more detailed information regarding the Fund's investment policies, guidelines and results please see the Investment Section of this report, starting on page 70.

Year Ended December 31, 2023:

- The Fund's total gross return is 9.34% compared to the total policy benchmark 11.02%.
- The Fund's inception to date gross return is 8.98%.
- The return equates to an investment gain of $142.7 million.

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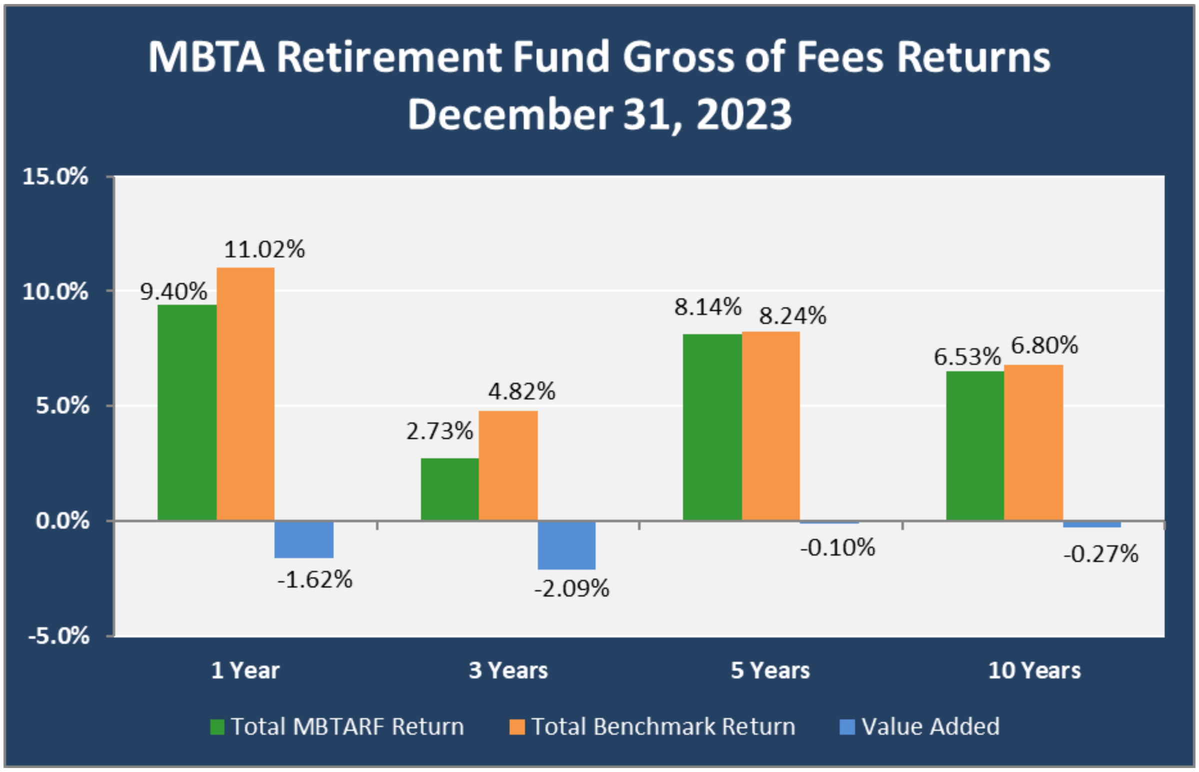
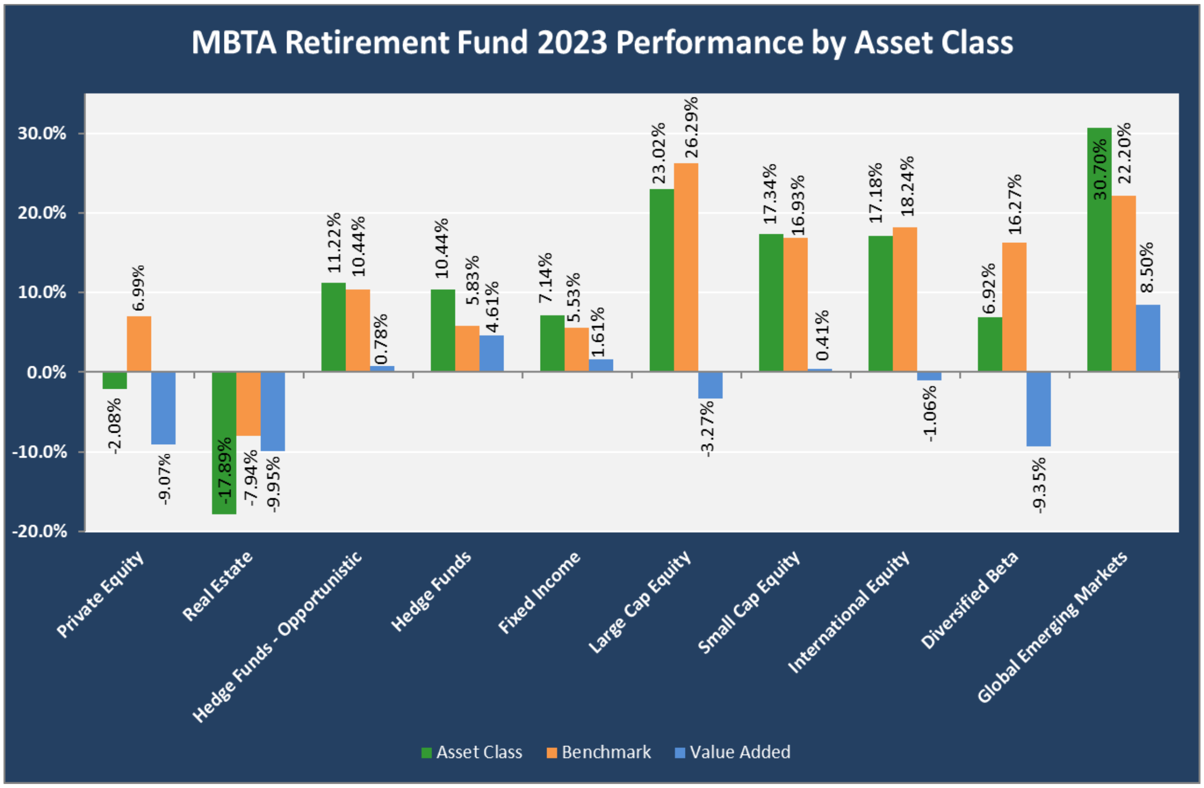
- Net total outflows to pay benefits for the calendar year were approximately $247.2 million.
- The 1, 5- year gross return and since inception return outperformed the actuarial rate of return of 7.25%.




MBTA Retirement Fund 2023 Performance by Asset Class
30.0%
20.0%
10.0%
0.0%
-10.0%
-20.0%
-2.08%
6.99%
-9.07%
-17.89%
-7.94%
-9.95%
11.22%
10.44%
0.78%
10.44%
5.83%
4.61%
7.14%
5.53%
1.61%
23.02%
26.29%
-3.27%
17.34%
16.93%
0.41%
17.18%
18.24%
-1.06%
6.92%
16.27%
-9.35%
30.70%
22.20%
8.50%
Private Equity
Real Estate
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Hedge Funds
Fixed Income
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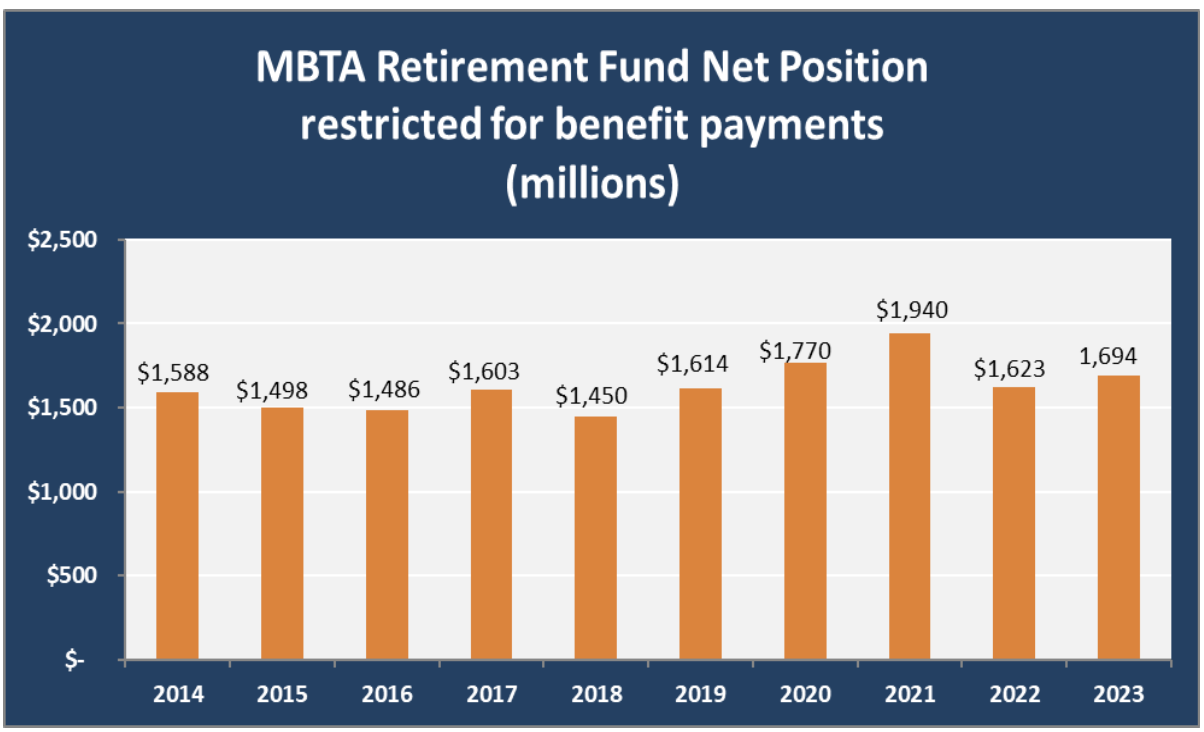
Small Cap Equity
International Equity
Diversified Beta
Global Emerging Markets
Asset Class
Benchmark
Value Added


MBTA Retirement Fund Net Position restricted for benefit payments (millions)
$2,500
$2,000
$1,500
$1,000
$500
$-
$1,588
$1,498
$1,486
$1,603
$1,450
$1,614
$1,770
$1,940
$1,623
1,694
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

(Continued)

Management's Discussion and Analysis

The Management's Discussion and Analysis (MD&A), beginning on page 30, provides an overview and analysis of the Fund's basic financial statements. This letter of transmittal is intended to complement the MD&A, and should be read in conjunction with the MD&A.

Markets and Outlook

While many investors began 2023 with fears of inflation and the possibility of a recession, the U.S. Economy closed the year with strong growth. The labor market recorded consistent job growth and low unemployment. The Federal Reserve increased rates four times over the year but at their December meeting, the expectation was that no additional increases were expected, and lower rates may be in the near future.

Early in the year, saw a regional bank crisis as Silicon Valley Bank filed for Chapter 11 bankruptcy in March 2023. Despite the market volatility immediately following the bankruptcy, market sentiment remained optimistic. Inflation stayed elevated as the Fed's interest rate hikes were working to slow the economy. The U.S. fixed income market rebounded in 2023 due to a sharp drop in yields toward the end of the year. The Fund's fixed income portfolio returned 7.14% in 2023 outperforming the Bloomberg Aggregate that returned 5.53%. The high-yield sector drove positive performance in the sector due to its narrowing spread.

Throughout the year, but particularly in the fourth quarter, the United States real estate market faced many challenges. The fourth quarter saw a drastic drop in transaction volume compared to 2022 due to higher interest rates, and tight lending conditions. Outside the U.S., the MSCI Emerging Markets index, MSCI EAFE and the MSCI All Country World Index (ACWI) returned 7.93%, 10.42%, and 11% respectively in the fourth quarter. Going into 2024, discussions remain whether the economy will continue to avoid a recession if inflation will moderate and if/when the Fed will cut rates. The Fund's investment portfolio is broadly diversified, and we expect strong performance over the long term.

Asset Allocation/Investments

The Fund is responsible for implementing an asset allocation with an appropriate balance of risk and return, it is a critical component for formulating investment strategies. Asset-liability modeling (ALM) is conducted in three to five-year intervals. The last ALM Study was completed in November 2023. The project's purpose is to consider alternatives to the current asset mix with the objective of identifying potential opportunities for improved Fund financial results. This approach allows for sufficient flexibility to capture investment opportunities as they may occur yet provide parameters to ensure prudence and care while managing the Fund's assets. The Board approved an asset allocation in February 2020, and it is in effect through March 31, 2024. On February 16, 2024, the Board approved an updated asset allocation that went into effect on April 1, 2024. The new asset allocation will be reflected in the 2024 ACFR. The Board's primary goal is to maintain a financially sound pension fund to provide financial security for its Members.

The applicable asset allocation for the year 2023 (below) is the result of an asset-liability study conducted by the Fund's actuary, Buck Global, LLC, and investment advisor, Segal Marco Advisors. At year end the Fund's actual asset allocation was within approved target ranges.

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Asset Class	Target (%)	Minimum Exposure (%)	Maximum Exposure (%)
Equities	43	38	48
Domestic Large Cap	17	12	22
Domestic Small Cap	7	4	10
International Equity (unhedged)	9	5	13
International Small Cap	2	0	4
Global / Emerging Markets	8	4	12
Fixed Income	23	20	30
Core Fixed Income	8	4	12
Inflation Linked Securities	3	0	5
Mortgages	3	0	5
Global & Multi Sector	6	3	9
Bank Loans	3	0	5
Cash	2	0	3
Alternative Investments	32	20	39
Private Equity	8	4	12
Private Credit	2	0	4
Real Estate	9	5	12
Fund of Hedge Funds	5	2	8
Fund of Hedge Funds - Opportunistic	2	0	4
Risk Parity	6	3	9

The changes to the Pension Agreement require the Fund to use its best efforts, subject to the Trustees' exercising their fiduciary and investment obligations, to transfer 50% of the market value of the Fund's portfolio assets as of April 30, 2023, to the Pension Reserves Investment Trust (PRIT) within five years of March 31, 2023 (the "PRIT Directive"). The Board of Trustees and Fund Management are responsible for continually reviewing investment manager performance to ensure the Fund is utilizing the best investment managers possible.

Some 2024 Investment Highlights include:

- As of publication, the Fund has committed $334 million or 40% of the PRIT investment mandate in various segmentation programs available.
- In February 2023, the Board of Trustees voted to invest $15 million in Hamilton Lane Strategic Opportunities Fund VIII.
- After a period on the Watch List due to underperformance, in May 2023, PanAgora, a diversified beta manager, was terminated. All funds were received in June 2023 except for a 10% audit holdback, which was ultimately distributed to the Fund in April 2024.
- As the result of a private credit search, the Board approved $5 million dollar allocations to both Ironsides Opportunities Fund II and Venture Lending and Leasing Fund XI in June 2023.
- In November 2023, the Board voted to terminate Sands Capital Management and reallocate the Funds to PRIM Emerging Markets Equity Segmentation (15%), SSGA Russell 1000 Index (60%), and SSGA MSCI EAFE Index (25%).

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- During the annual review of private equity, in December 2023, the Trustees committed $12.5 million to the PRIM Private Equity Vintage Year 2024 Segmentation Program (PEVY 2024). In addition to allocating to PEVY 2024, the Board also committed $7.5 million to a new private equity fund with a long-standing investment manager, New Mountain Partners VII.

Administration

The Board of Trustees of the Retirement Fund is the highest authority within the organizational structure. As of December 31, 2023, the date of the Fund's most recent actuarial valuation, the Fund's membership included 5,805 members in active status, 6,800, retirees and beneficiaries receiving benefits and 3 terminated vested members who are not yet receiving benefits. Our pension management software enables the Fund to efficiently track demographics for both active and retired Members as well as facilitate benefit payments via an automated process. In addition, the Fund offers an employee self-service platform for active and retired Members which offers remote access to their personal retirement information. I encourage you to visit the portal at: www.pensiontechnologygroup.com/mbta

Benefits

After seven months of intense bargaining between the negotiating parties to the Pension Agreement, Local 589, Amalgamated Transit Union, AFL-CIO (Union) and the Massachusetts Bay Transportation Authority (Authority), I am pleased to announce that on March 31, 2023, the Union and the Authority reached an agreement and entered into a Memorandum of Understanding (MOU) that resulted in important changes to the Pension Agreement. These changes supersede the interest arbitration award of August 26, 2022, which has been vacated in full and is of no further effect. The term of the new Pension Agreement runs from June 30, 2018, through June 30, 2028.

Membership

Membership in the Fund is available to most MBTA employees except for MBTA Police Officers. Employees who are or may become members of the Union are included in the membership of the Fund. Employees who are not members of the Union but who are on the regular payroll of the Authority and Members of the Fund on the date of the execution of the Fund's Pension Agreement are also included in the membership of the Fund.

The new Pension Agreement created a two-tier pension benefit structure. Employees who are or become Members of the Fund on or before June 30, 2023, are in the Group A Plan unless a Member (i) elected to join the Group B Plan by providing written notification to the Fund between July 1, 2023, and March 29, 2024, and (ii) accumulates at least 24 months of creditable service after such election. Employees who are or become Members of the Fund on or after July 1, 2023, are automatically in the Group B Plan.

The retirement age for Group A Plan Members remains unchanged; those whose hire date is on or after December 6, 2012, will be required to complete at least twenty-five (25) years of creditable service and attain age 55 to be eligible for an early normal retirement allowance. For those members whose date of hire is prior to December 6, 2012, completion of at least twenty-three (23) years of creditable service is required to receive compensation under an early normal allowance.

(Continued)

Pension benefits for new hires, Group B, defined as those employees who become Members of the Fund on or after July 1, 2023, have adopted a sliding scale determined by the Member's age at the time of retirement beginning at a rate of 1.75% at 55 years of age progressing to a rate of 2.46% at 61 years of age. Members, however, are fully vested after the Member accrues 10 years of creditable service.

Contributions

Benefits paid to Members are financed by employer contributions, employee contributions and earnings on investments made by the Fund. Per the updated Pension Agreement, Active Members' individual contributions are increased by 1.25% over the actuarial annual required contribution rate beginning with the first full pay period after July 1, 2023. Effective July 1, 2023, the valuation report calculated a Members rate of 9.0989%, and therefore Members were required to contribute at a rate of 10.3489% of their pensionable salary while the Authority contribution rate is 25.9511%. The increase to the members rate was negotiated in the Pension Agreement to pay down the MBTA Retirement Fund's unfunded accrued liability and ultimately provide a more stable financial future for the retirees.

The Active Members calculated contribution rate will remain at 9.0989% beginning on July 1, 2024, resulting in a stable paid contribution rate of 10.3489%. Per the Pension Agreement, the Authority contributions will be maintained at a minimum floor of 25.8161% of payroll, paying increased amounts if prescribed by the actuarial annual required contribution rate until the unfunded amount of the plan is less than 20%, as determined by the MBTARF's actuary. Authority matching contributions will remain consistent at 25.9511% beginning July 1, 2024.

Funding

In setting contribution rates, the Board's principal objective is to set rates so the unfunded actuarial accrued liability (UAAL) will be amortized over a reasonable period from the most recent valuation date and set rates, so they remain relatively level over time. An actuarial valuation is performed annually. Every year the Actuary reviews the assumptions used in the Valuation. In the Spring of 2023, an Experience Study was conducted, and Buck proposed updated assumptions for mortality tables, salary increases, termination rates and retirement rates. All assumptions were approved by the MBTA Retirement Board in April 2023 for use in the 2022 Valuation Report. Buck did not recommend any changes to assumptions for the 2023 Valuation Report. The investment return assumption of 7.25% and the inflation assumption of 2.75% remain the same. The mortality table, Pri-2012 Blue Collar, continues to be recommended as the best fit based on the makeup of the plan participants.

The most recent actuarial valuation report, dated December 31, 2023, calculated the Fund's unfunded actuarial pension liability at $1,459,032,710. As of December 31, 2023, the funded ratio is 55.83%. The adoption of the most recent asset allocation continues to support a 7.25% discount rate. However, the Board of Trustees are mindful of monitoring this rate to help facilitate financial solvency. In addition, the investment managers' performance is reviewed monthly and, if needed, adjustments to the portfolio are made to help increase and limit decreases to the Fund's overall return.

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The actuarial firm, Buck Global, LLC, completed the actuarial reviews and valuations. For more information on the actuarial assumptions of the Fund as part of the December 31, 2023, valuation, please see the Summary of Actuarial Assumptions and Methods found in the Actuarial Section of the ACFR, starting on page 115.

Membership Communications

The MBTA Retirement Fund continues its focus on member communication through Milestones and posting pertinent information to our website at www.mbtarf.com. We place a special emphasis on providing quality customer service to which we encourage feedback and welcome new ideas.

Awards

The Government Finance Officers Association (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the Fund for its annual comprehensive financial report for the fiscal year that ended December 31, 2022. To be awarded a Certificate of Achievement, the Fund must publish an easily readable and efficiently organized ACFR, the contents of which conform to program standards. This report must satisfy both generally accepted accounting principles and applicable legal requirements. The Fund has received this prestigious award for the last seven years.

A Certificate of Achievement is valid for a period of one year only. We believe our current ACFR continues to meet the Certificate of Achievement Program's requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

Acknowledgements

The compilation of the ACFR reflects the combined efforts of the Fund's staff, Actuary, and Investment Advisor. Our goal is to present a thorough and accurate report that is easy for our members to read and understand. It is intended to provide complete and reliable information as a basis for making management decisions.

Particularly on the Fund's 75th Anniversary, I would like to take this opportunity to express my appreciation to the Board of Trustees, Staff, Investment Advisor, Actuary, and to the many members who are working diligently to ensure the continued success of the Fund. We recognize and appreciate the dedication of our Board of Trustees who voluntarily provide their expertise and oversight to protect the financial future of our membership.

Yours respectfully,

John P. Barry
Interim - Executive Director / Chief Financial Officer

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

MBTA Retirement Fund
Massachusetts

For its Annual Comprehensive Financial Report
For the Fiscal Year Ended December 31,

2022

Christopher P. Morrill

Executive Director/CEO

MBTA Retirement Fund Board Trustees

Effective January 1, 2023

Advisory Committees to the MBTA Retirement Fund Board

Audit and Actuary Committee

James Evers
Board Member

James Bradley
Board Member

Mary Ann O'Hara
Board Member

Paul Todisco
Board Member

Organizational Chart

Effective January 1, 2023

MBTA Retirement Fund Board

Elected

James Evers, Interim-Chair
James Bradley
Timothy Long

Appointed

Mary Ann O'Hara
Chanda Smart
Paul Todisco

Jacquelyn Carey, Interim - Board Secretary

Interim-Executive Director
John P. Barry

Fund Staff/Counsel

Administrative
Maura Corso

Margaret Lane

- Executive Support
- Maintain Documentation
- Correspondence
- Customer Service

Finance
Jacquelyn Carey

Joseph D'Angelo
Michael Barrio

- Accounting / Reporting
- Monitoring Investments
- Payroll / Contributions
- Investment Compliance

Benefits
Dominique Sye

Sagine Gay
Siobhan Keeney

- Benefits Calculations
- Member Services
- Records Management
- Disability Requirements

Counsel
Holland & Knight

- Legal Advice
- Compliance
- Fiduciary Guidance

Info Technology
Robert Biga

- Information Governance
- Technology Oversight
- Cyber Risk Management

Contractors/Service Providers

Consulting
Segal-Marco

- Asset Allocation
- Monitor Performance
- Investment Policy
- Performance Reporting

Investment Managers

- Equity & Fixed Income
- Alternative Investments
- Diversified Beta

Custodian Bank
State Street

- Safekeeping
- Asset Valuations
- Benefit Payments
- Compliance Reporting

Actuary
Buck

- Actuarial Assumptions
- Project Financial Needs
- Earnings Assumptions
- Funded Status

Auditors
KPMG

- Audits
- Independent Testing

Please refer to the Investment Section, page 109 for the Summary Schedule of Broker Commission and Fees and page 110 for the Schedule of Direct Management Fees.

Historical MBTA Retirement Fund Board Members

	Period of Service From	To
(A) Harold Ulrich **	08/48	01/49
(E) Irving F. Murray	08/48	08/49
(E) William A. Roche	08/49	07/56
(A) Thomas A. Dunbar **	08/48	01/59
(A) Charles A. McCarron **	08/48	05/60
(E) Thomas P. Dillon	08/48	03/61
(A) Ernest M. Flint	01/49	01/50
(E) Bartholomew P. Saunders	08/49	08/52
(A) Arthur V. Grimes	07/50	06/52
(A) Augustine Airola	06/52	04/53
(E) James J. Casey	08/52	08/64
(A) Harold Ulrich	04/53	04/57
(E) Michael J. Gormley	07/56	12/63
(A) William V. Ward **	08/57	08/64
(A) John J. Sullivan	01/59	07/59
(A) Willis B. Downey **	06/59	08/62
(A) William E. Ryan	06/60	02/72
(E) Edward S. Russell	03/61	01/62
(E) Matthew F. Ryan	01/62	12/69
(A) Edward F. McLaughlin, Jr.	08/62	03/70
(E) Walter H. Doyle	12/63	12/69
(E) Thomas F. Holland, Jr.	08/64	08/70
(A) Philip Kramer **	08/64	04/68
(A) Richard D. Buck **	04/68	07/79
(E) John J. Sugrue	12/69	12/71
(E) Albert F. Kelley	12/69	12/75
(A) Joseph C. Kelly	03/70	07/70
(A) John R. Launie	07/70	05/83
(E) Albert J. Fitzpatrick	08/70	07/80
(E) Patrick C. Quill	12/71	12/75
(A) Joseph H. Elcock	02/72	07/79
(E) John J. Sugrue	01/76	07/76
(E) Redmond R. Condon	01/76	02/78
(E) Joseph D. Fleming, Jr.	07/76	12/77
(E) Donald R. Abbott	12/77	08/79
(E) James J. Slattery	02/78	08/79
(A) Walter J. Ryan **	07/79	05/83
(A) Richard L. Taylor	07/79	05/83
(E) George P. Adams	08/79	11/79
(E) Richard J. Guiney	08/79	11/79
(E) John J. Gallahue, Jr.	11/79	01/83
(E) John J. O'Leary	03/80	01/93
(E) James T. Norton	07/80	10/90
(E) Paul M. Connolly	01/83	12/86

	Period of Service From	To
(A) Paul E. Means	05/83	01/84
(A) William F. Irvin **	05/83	04/91
(A) James E. Smith, Esq.	05/83	04/91
(A) Melissa A. Tillman	01/84	04/91
(E) Anthony B. Romano **	12/86	02/92
(E) John J. Connolly **	10/90	08/94
(A) Domenic M. Bozzotto	04/91	02/97
(A) Toye L. Brown, Ph.D.	04/91	10/93
(A) James A. Radley	04/91	11/92
(E) James W. Duchaney	02/92	01/93
(A) Michael P. Hogan	11/92	12/93
(E) Richard M. Murphy	01/93	08/96
(E) Edward F. Sheckleton **	01/93	12/01
(A) Oliver C. Mitchell, Jr.	10/93	05/98
(A) Albert Shaw	12/93	10/95
(E) Paul V. Buckley	08/94	04/98
(A) Boyce W. Slayman	10/95	03/00
(E) James E. Lydon	10/96	12/01
(A) Janice Loux**	10/97	03/15
(E) William A. Irvin	04/98	12/05
(A) William A. Mitchell, Jr.	12/98	10/00
(A) Joseph M. Trolla	08/00	10/08
(A) Hon. Baron H. Martin	11/00	10/04
(E) Stephan G. MacDougall	01/02	12/10
(E) John P. Barry	01/02	04/06
(A) Jonathan R. Davis	10/04	05/15
(E) James M. O'Connell	09/07	06/15
(E) Michael F. Mastrocola	07/06	01/12
(A) Darnell L. Williams	01/09	05/15
(E) John J. Lee	01/11	12/13
(E) James M. Evers **	04/12	Present
(E) James M. O'Brien	01/14	12/19
(A) Steven Grossman	06/15	12/19
(A) Betsy Taylor	06/15	04/23
(A) Michael J. Heffernan	06/15	09/17
(E) Craig S. Hughes	07/15	04/23
(A) Steven Kadish	10/17	09/18
(A) Michael Abramo	03/19	04/21
(E) James Bradley	01/20	Present
(A) Mary Ann O'Hara	01/22	Present
(A) Paul Todisco	06/22	Present
(E) Timothy Long	05/23	Present
(A) Chanda Smart	08/23	Present

(E) Employee Representative (A) Authority Representative ** Chairperson

Historical Executive Directors of the MBTA Retirement Fund

Name	Period of Service From	To	Name	Period of Service From	To
John H. Moran	01/48	11/51	Karl E. White	04/02	06/06
Michael J. Powell	11/51	12/82	Michael H. Mulhern	07/06	08/16
John J. "Jack" Gallahue, Jr.	01/83	03/02	John P. Barry - Interim	08/16	Present

1 Prior to 1968 the Executive Director position was referred to as Treasurer

Historical MBTA Retirement Fund Alternate Board Members

Name	Period of Service From	To
(A) Joseph Gannon	08/48	01/49
(A) Richard A. Sullivan	08/48	01/49
(A) Ernie B. Myott	08/48	08/64
(E) Philip E. Doyle	08/48	12/49
(E) John C. Carey	08/48	08/54
(E) Joseph P. Fahey	08/48	04/54
(A) Edward Dana	01/49	02/51
(A) Edward R. Kelly	01/49	07/50
(E) Thomas Freeman	12/49	08/52
(A) Ernest M. Flint	07/50	10/52
(E) Thomas F. Holland, Jr.	08/52	08/64
(A) John J. Sullivan	10/52	01/59
(A) Horace Schmerhorn	04/53	04/56
(E) Edward S. Russell	04/54	03/61
(E) Michael J. Gormley	04/54	07/56
(A) Robert H. Ryan	05/56	08/57
(E) Joseph P. Fahey	07/56	01/58
(A) John J. Graham	08/57	08/64
(E) Thomas J. Rush	01/58	12/69
(A) William J. Fitzsimons	01/59	07/70
(E) Richard R. Rodwell	03/61	01/62
(E) Walter H. Doyle	01/62	12/63
(E) Paul F. Halloran	12/63	12/69
(E) Albert J. Fitzpatrick	08/64	08/70
(A) Frederick J. Sheehan	08/64	03/67
(A) George L. Anderson	08/64	04/68
(A) Vincent M. Banks	03/67	01/74
(A) Forrest I. Neal, Jr.	04/68	01/78
(E) Patrick C. Quill	12/69	12/71
(E) Dennis F. Guiney	12/69	12/73
(A) Joseph A. Emerson	07/70	01/74
(E) Charles H. Ward	08/70	02/77
(E) Paul F. Sullivan	12/71	12/73
(E) Charles F. Cole, Jr.	12/73	12/75
(E) Edward J. Doherty	12/73	12/75
(A) Daniel F. Dullea	01/74	02/76
(A) Francis A. Sullivan	01/74	07/79
(E) Joseph A. Dineen	01/76	12/77
(E) Joseph D. Fleming, Jr.	01/76	07/76
(E) James T. Norton	03/77	07/80
(E) Redmond R. Condon	02/78	01/84
(E) George P. Adams	02/78	08/79
(A) Troy Y. Murray	10/78	07/79
(A) Guido R. Perera, Jr.	10/78	7/79
(A) Paul E. Means	7/79	5/83
(A) John J. McCarthy	7/79	5/83
(A) Guy F. DeBenedetto	7/79	8/81
(E) Frederick W. Burt III	12/79	3/83
(E) Charles E. Smyth	7/80	10/90
(E) Donald J. Quinlan	3/83	7/85
(E) Anthony B. Romano	1/84	12/86
(A) Melba F. Hamilton	5/84	4/91
(A) Judith H. Robbins	6/84	4/91
(E) Stanley V. Stearns	7/85	1/87
(E) Albert Mastrocola	1/87	10/97
(E) Edward F. Sheckleton	1/87	1/93
(E) Paul V. Buckley	10/90	8/94
(A) Michael P. Hogan	6/91	11/92
(A) Gregory C. Flynn, Esq.	10/91	3/92
(A) Arthur D. Shea	11/91	2/92
(A) Wesley G. Wallace, Jr.	2/92	3/94
(A) Esther R. Maletz, Esq.	3/92	3/94
(E) Robert F. Gosnell	1/93	3/96
(A) Carol A. Buckley	3/94	1/96
(A) Francis X. McDonough	3/94	8/96
(A) Clifford H. Straw	3/94	1/96
(E) Robert H. Stearns	8/94	4/98
(A) William A. Mitchell, Jr.	1/96	12/98
(E) Daniel K. Burton	4/96	9/96
(A) Sharna A. Small-Borsellino	4/96	5/00
(E) Francis X. Madden	10/96	1/99
(E) James M. O'Connell	4/98	12/05
(A) Philip Puccia	2/97	3/99
(E) James D. Wyllie	11/97	12/98
(E) Daniel K. Burton	1/99	1/00
(A) Willie J. Davis	12/98	7/00
(A) Michael Mulhern	4/99	4/02
(E) Torrie Austin	5/99	4/00
(E) James D. Wyllie	1/99	11/00
(E) James M. Evers	5/00	9/00
(A) Alice A. Fernandes	5/00	12/06
(A) Jonathan R. Davis	8/00	10/04
(E) Stephan G. MacDougall	10/00	11/00
(E) James M. Evers	11/00	12/01
(E) James Knox	8/01	12/01

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(E) James Crowley	01/02	03/03	(A) Gerald K. Kelley	06/12	Present
(E) Roy L. Chance	02/02	12/02	(E) Margaret C. LaPaglia	01/14	02/18
(A) Wesley G. Wallace, Jr.	05/02	10/06	(E) Lawrence C. Kelly	01/14	12/16
(E) Robert L. Callahan	03/03	02/06	(E) Timothy P. Long	07/15	04/23
(E) M. John Burr	03/03	12/03	(E) John D. Hunt	01/17	12/19
(E) John S. Murray	01/04	02/05	(E) Patrick Hogan	04/18	12/21
(A) Brian J. Donohue	10/04	05/09	(A) Paul Brandley	03/18	05/19
(E) James M. O'Brien	03/05	12/10	(A) Mary Ann O'Hara	12/19	12/21
(E) Michael F. Mastrocola	02/06	06/06	(A) Patrick Landers	01/22	07/23
(E) Daniel K. Burton	07/06	09/07	(E) Jose Cruz	01/22	Present
(A) Jeanne M. Morrison	10/06	03/15	(E) John Mersereau	01/22	Present
(E) Lawrence C. Kelly	02/10	04/11	(A) David Panagore	06/22	02/24
(E) Walter J. Novicki	01/11	12/11	(E) James Joyce	05/23	Present
(E) James M. O'Brien	05/11	12/13	(A) Thomas McGee	08/23	Present
(E) John A. Clancy	01/12	12/13			

(E) Employee Representative (A) Authority Representative

MBTA Retirement Fund Professional Services

KPMG LLP
Audit services

Segal Marco Advisors
Investment consulting services

Buck Global, LLC
Actuarial services

Holland & Knight
Legal Counsel

State Street Bank & Trust Company
Custodian

FINANCIAL SECTION

KPMG LLP
Two Financial Center
60 South Street
Boston, MA 02111

Independent Auditors' Report

The Retirement Board and Participants
Massachusetts Bay Transportation Authority Retirement Fund:

Opinion

We have audited the financial statements of the Massachusetts Bay Transportation Authority Retirement Fund (the Fund), as of and for the years ended December 31, 2023 and 2022 and the related notes to the financial statements, which collectively comprise the Fund's basic financial statements for the years then ended as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Fund as of December 31, 2023 and 2022, and the changes in its fiduciary net position for the years then ended in accordance with U.S. generally accepted accounting principles.

Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Fund and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with U.S. generally accepted accounting principles, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Fund's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditors' Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions,

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misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.
In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Fund’s internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Fund’s ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control related matters that we identified during the audit.

Required Supplementary Information

U.S. generally accepted accounting principles require that the management’s discussion and analysis, the schedule of changes in net pension liability and related ratios, the schedule of investment returns, and the schedule of contributions be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with GAAS, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management’s responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audits of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Fund’s basic financial statements. The schedule of administrative expenses and the schedule of investment expenses and payments of consultants are presented for purposes of additional analysis and are not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with GAAS.

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KPMG

In our opinion, the schedule of administrative expenses and the schedule of investment expenses and payments to consultants are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Other Information

Management is responsible for the other information included in the annual comprehensive financial report. The other information comprises the Introductory, Investment, Actuarial, Statistical, and the Frequently Asked Questions sections but does not include the basic financial statements and our auditors' report thereon. Our opinion on the basic financial statements does not cover the other information, and we do not express an opinion or any form of assurance thereon.
In connection with our audits of the basic financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the basic financial statements, or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

KPMG LLP

Boston, Massachusetts
June 24, 2024

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

This section presents Management's Discussion and Analysis (MD&A) of the Massachusetts Bay Transportation Authority Retirement Fund's (the Fund or MBTARF) financial activity and performance as of and for the years ended December 31, 2023 and 2022. The MD&A is unaudited and is intended to serve as an introduction to the Fund's basic financial statements, as well as to offer readers of the Fund's financial statements a narrative view and analysis of MBTARF's financial activities.

Financial Reporting Structure

The financial statements include the statements of fiduciary net position and changes in fiduciary net position. They present the financial position of the Fund as of December 31, 2023, and 2022 and its financial activities for the years then ended. The notes to the financial statements provide further information that is essential to a full understanding of the financial statements. The notes describe the significant accounting policies of the Fund and provide detailed disclosures on certain account balances. The required supplementary information includes the schedules of changes in net pension liability and related ratios, investment returns, contributions and related notes as prescribed by the Governmental Accounting Standards Board (GASB).

The Fund's financial statements are prepared on an accrual basis of accounting. This method of accounting requires recognizing and recording financial transactions when they occur and not just in conjunction with the inflows and outflows of cash.

The total assets managed by the Fund are held in the trust for the payment of pension and related benefits to its members. The Fund's Board of Trustees, in its fiduciary capacity, with assistance from its consultants established the Fund's investment policies and oversees their implementation.

Financial Highlights

Year ended December 31, 2023

The net position of the Fund increased $71.9 million, or 4.4%, from $1,622.5 million as of December 31, 2022 to $1,694.4 million as of December 31, 2023.

Net investment income increased $400.1 million, or 155.5%, from ($257.3) million for the year ended December 31, 2022 to $142.8 million for the year ended December 31, 2023. The Fund had a 9.40% rate of return for the year ended December 2023 compared to a (12.97%) rate of return for the year ended December 31, 2022. The returns identified in the MD&A are gross of fees.

The total contributions received during the year ended December 31, 2023 were $186.0 million compared to total contributions received during the year ended December 31, 2022 of $175.5 million.

Employer contributions during the year ended December 31, 2023 increased $5.2 million or 4.0% to $135.2 million from $130.0 million during the year ended December 31, 2022.

Member contributions were $50.7 million during the year ended December 2023, an increase of $5.2 million or 11.4% over year ended December 31, 2022 member contributions of $45.5 million.

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

Benefits paid during the year ended December 31, 2023 were $247.2 million, an increase of $20.9 million or 9.2% over year ended December 31, 2022 when benefits paid were $226.3 million. The increase in benefits is largely due to rising final average compensation, one time retro-active compensation payments and a cost-of-living adjustment to the membership as negotiated in the Pension Agreement which was effective in March 2023.

Year ended December 31, 2022

The net position of the Fund decreased $317.4 million, or (16.4%) from $1,939.9 million as of December 31, 2021 to $1,622.5 million as of December 31, 2022.

Net investment income decreased $489.7 million, or (210.7%), from $232.4 million for the year ended December 31, 2021 to ($257.3) million for the year ended December 31, 2022. The Fund had a (12.97%) rate of return for the year ended December 2022 compared to a 13.88% rate of return for the year ended December 31, 2021. The returns identified in the MD&A are gross of fees with the exception of hedge funds, which are net of fees.

The total contributions received during the year ended December 31, 2022 were $175.5 million compared to total contributions received during the year ended December 31, 2021 of $166.7 million.

Employer contributions during the year ended December 31, 2022 increased $6.5 million or 5.3% to $130.0 million from $123.5 million during the year ended December 31, 2021.

Member contributions were $45.5 million during the year ended December 2022, an increase of $2.3 million or 5.3% over year ended December 31, 2021 member contributions of $43.2 million.

Benefits paid during the year ended December 31, 2022 were $226.3 million an increase of 4.7 million or 2.1% over year ended December 31, 2021 when benefits paid were $221.6 million. The increase in benefits is largely due to rising final average compensation.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

Financial Analysis

The following schedules report the condensed comparative fiduciary net position and activities for the Fund as of and for the three years ended December 31, 2023, 2022 and 2021.

Condensed Comparative Fiduciary Net Position

(Dollar values expressed in millions)

		December 31		
		2023	2022	2021
Cash	$	1.6	1.2	1.3
Receivables		15.7	9.5	9.4
Investments		1,681.3	1,616.1	1,934.3
Cash collateral on securities lending		22.4	10.3	17.5
Right-of-use asset net of accumulated amort.		0.9	—	—
Total assets		1,721.9	1,637.1	1,962.5
Cash collateral on securities lending		22.4	10.3	17.5
Accounts payable and accrued expenses		2.5	2.4	2.3
Payable for investments purchased		1.5	1.9	2.8
Lease Liability		1.1	—	—
Total liabilities		27.5	14.6	22.6
Net position – restricted for pension benefits	$	1,694.4	1,622.5	1,939.9

Total assets at fair value were $1,721.9 million as of December 31, 2023, an increase of $84.8 million or 5.2%, over the year ended December 31, 2022, which were $1,637.1 million, which represented a decrease of $325.4 million or (16.6%) over the period ending December 31, 2021, where total assets were $1,962.5 million. At December 31, 2023, Investments totaled $1,681.3 million. This was an increase of $65.2 million from the period ending December 31, 2022, which had investments at fair value were $1,616.1 million, a decrease of ($318.2) million, or (16.5%), over the year ended December 31, 2021, which were valued at $1,934.3 million. This investment increase in 2023 is due to markets rebounding after a disappointing 2022, with the notable exception of private equity and real estate investments, which continued to show negative returns. Fixed income returns also rebounded in 2023, as peak inflation leveled off, and pricing pressures over the course of the year gradually receded, even as short-term rates remain elevated. The Federal Reserve raised interest rates four times in 2023 although the interest rates are projected to level or even reverse in 2024.

As of December 31, 2023 cash collateral on securities lending increased by $12.1 million or 117%, over the year ended December 31, 2022. The cash collateral on securities lending decreased by $7.2 million or (41.1%), between December 31, 2021, and December 31, 2022. 2023 receivables increased by $6.1 million, or 63.5%, over the prior calendar year. Between December 31, 2021 and December 31, 2022 receivables increased by $0.2 million, or 2.1%.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

GASB Statement No. 87 was implemented in 2023 and resulted in a right-of-use asset, net of accumulated amortization of $0.9 million for the year. This pronouncement was not reported in 2022 and 2021.

Total liabilities as of December 31, 2023 increased by $12.9 million, or 88.4% over the prior year, and decreased by $8.0 million, or (35.4)% during calendar year 2022. Cash collateral on securities lending increased by $12.1 million or (117%), over the year ended December 31, 2022. The cash collateral on securities lending decreased by $7.2 million or (41.1%), between December 31, 2021, and December 31, 2022. From December 31, 2022 through December 31, 2023, payable for investments purchased decreased by $0.4 million, or (21.1%). From December 31, 2021 through December 31, 2022, payable for investment purchased decreased by $0.9 million, or (32.1%). From December 31, 2021 through December 31, 2022, payable for investment purchased decreased by $0.9 million, or (32.1%). GASB Statement No. 87 was implemented in 2023 and resulted in a lease liability of $1.1 million. This statement was not reported in 2022 and 2021.

Condensed Comparative Statement of Changes in Fiduciary Net Position

(Dollar values expressed in millions)

		December 31		
		2023	2022	2021
Additions:				
Employer contributions	$	135.2	130.0	123.5
Member contributions		50.7	45.5	43.2
Income from investments		142.8	(257.3)	232.4
Total additions		328.7	(81.8)	399.1
Deductions:				
Retirement benefits		247.2	226.3	221.5
Refunds of contributions		5.0	4.8	3.2
Administrative expense		4.4	4.5	4.4
Total deductions		256.6	235.6	229.1
Total changes in fiduciary net position	$	72.1	(317.4)	170.0
Net position restricted for pension benefits				
Beginning of Year		1,622.5	1,939.9	1,769.9
Adjustment for adoption of GASB 87		(0.2)	0.0	0.0
End of year	$	1,694.4	1,622.5	1,939.9

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

Additions to Plan Fiduciary Position

For the calendar year ended December 31, 2023, employer contributions increased by $5.2 million and member contributions also increased by $5.2 million. For the calendar year ended December 31, 2022, employer contributions increased by $6.5 million and member contributions increased by $2.3 million. For the year ending 2023, from January through June the contributions rates (employee and employer) were 9.3339% and 26.6561% respectively. On July 1, 2023, the employee contribution rate changed from 9.3339% to 10.3489%. This also includes the provision from the Pension Agreement effective March 2023 that the members pay 125 basis points over the actuarial required contribution rate. The employer contribution rate was changed from 26.6561% to 25.9511%. The current rates were effective as of July 1, 2023, based on the 2022 actuarial report recommendation. The Board of Directors voted in 2021 and 2022 to make no change to the contribution rates. Contributions are required to provide benefits and meet administrative expenses and are made jointly by the Massachusetts Bay Transportation Authority (the Authority) and members. The member contribution percentage is negotiated periodically as part of the collective bargaining agreement.

There was a net investment gain in 2023 of $142.8 million compared to a net investment loss in 2022 of ($257.3) million. Comparatively the investment gain in 2021 was $232.4 million. The increase in 2023 is due to improved market conditions in both the equity and fixed income markets. The loss in 2022 was a result of a decrease in the fair value of the investment portfolio from a sharp decline in overall market performance.

Deductions from Fiduciary Net Position

Benefits paid increased by $20.9 million and $4.8 million, or 9.2% and 2.2%, over the years ended 2023 and 2022, respectively. These increases are primarily due to the rising final average compensation and lengthening life span. The additional increase in 2023 can also be attributed to a one-time retroactive cost of living adjustment to the retired members as negotiated in the Pension Agreement. Administrative expenses decreased from $4.5 million to $4.4 million, a decrease of $0.1 million or (2.2%) over year 2022 and increased $0.1 million, or 2.3% over year 2021.

Net Pension Liability (NPL)

The Fund retains an independent actuarial firm, Buck Global, LLC, to conduct annual actuarial valuations to monitor the net pension liability.

As of December 31, 2023, and 2022, the fiduciary net position as a percentage of the total pension liability was 51.29% and 51.23%, respectively.

Investment Performance 2023

The Fund began the calendar year 2023 with a net position of $1,622.5 million and ended the calendar year with a net position of $1,694.4 million, representing a 4.4% increase. The Fund invests strategically to achieve the actuarial rate of return, while controlling risk through diversification of asset class exposure. The primary determinant of long-term investment performance is the strategic asset allocation policy.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

Domestic equity 29.7%, international equity 15.8%, fixed income investments 23.3%, and cash equivalents 2.5% comprise approximately 71.3% of invested assets as of December 31, 2023. The remaining 28.7% of assets are invested in real estate 8.3%, and alternative investments 20.4%, which include private equity, absolute return, and diversified beta. These assets are expected to earn enhanced returns and manage risk through further diversification.

Investment performance results are measured by the relationship of the Fund's portfolio returns for equity and fixed income investment against widely accepted market indices. For the calendar year ended December 31, 2023, the MBTA Retirement Fund's total fund return was 9.4% compared to (13.0%) for the calendar year ended December 31, 2022. The 2023 increase in return is attributed to the return of positive gains experienced in most all asset classes after a down year in 2022. The only investment classes with significant negative returns were in real estate and private equity.

The domestic large cap equity returned 23.0% compared to the S&P 500 Index of 26.3%. The domestic small cap equity returned 17.3% compared to the Russell 2000 Growth Index of 18.7% and the Russell 2000 Value Index of 14.6%. The global equity and emerging markets returned 30.7% compared to MSCI All Country World Index of 22.2%. The international equity returned 17.2% compared to the MSCI EAFE Index of 18.2%. Fixed Income returned 7.1% compared to the Bloomberg Aggregate of 5.5%.

The total fund performance of 9.4% for calendar year 2023 trailed the total fund custom index (a blended composition of major market indices in proportion to the Fund's asset allocation) by 160 basis points, which returned 11.0%.

Additionally, for the year ended December 31, 2023, the real estate portfolio returned (17.9%) compared to the NCREIF Property Index of (7.9%). The hedge fund portfolio returned 10.4% compared to the CSFB/Tremont Hedge Fund Index of 5.8%. The opportunistic portfolio returned 11.2% compared to Bank of America/Merrill Lynch High Yield Benchmark return of 13.5%. The private equity portfolio returned (2.1%) compared to State Street's Private Equity benchmark return of 7.0%. The private credit portfolio returned 5.1% compared to State Street's Private Credit benchmark return of 10.2%. Diversified Beta returned 6.9% compared to the 60% MSCI World Eq / 40% Barclays Aggregate Bond return of 16.3%.

Investment Performance 2022

The Fund began the calendar year 2022 with a net position of $1,939.9 million and ended the calendar year with a net position of $1,622.5 million, representing a 16.4% decrease. The Fund invests strategically to achieve the actuarial rate of return, while controlling risk through diversification of asset class exposure. The primary determinant of long-term investment performance is the strategic asset allocation policy.

Domestic equity 24.6%, international equity 16.7%, fixed income investments 22.3%, and cash equivalents 3.5% comprise approximately 67.1% of invested assets as of December 31, 2022. The remaining 32.9% of assets are invested in real estate 10.7%, and alternative investments 22.2%, which include private equity, absolute return, and diversified beta. These assets are expected to earn enhanced returns and manage risk through further diversification.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information

Management's Discussion and Analysis

December 31, 2023 and 2022

(Unaudited)

Investment performance results are measured by the relationship of the Fund's portfolio returns for equity and fixed income investment against widely accepted market indices. For the calendar year ended December 31, 2022, the MBTA Retirement Fund's total fund return was (13.0%) compared to 13.9% for the calendar year ended December 31, 2021. The 2022 decrease in return is attributed to the decline in markets and reductions previous gains experienced in several core asset classes. Investment classes that drove the negative return were in the small cap growth equity, large cap growth equity, global equity and emerging markets and domestic fixed income.

The domestic large cap equity returned (15.8%) compared to the S&P 500 Index of (18.1%). The domestic small cap equity returned (22.3%) compared to the Russell 2000 Growth Index of (26.3%) and the Russell 2000 Value Index of (14.5%). The global equity and emerging markets returned (37.0%) compared to MSCI All Country World Index of (18.4%). The international equity returned (16.9%) compared to the MSCI EAFE Index of (14.5%). Fixed Income returned (10.3%) compared to the Bloomberg US Aggregate of (13.0%).

The total fund performance of (13.0%) for calendar year 2022 trailed by 465 basis points, the total fund custom index (a blended composition of major market indices in proportion to the Fund's asset allocation), which returned (8.3%).

Additionally, for the year ended December 31, 2022, the real estate portfolio returned 3.9% compared to the NCREIF Property Index of 5.5%. The hedge fund portfolio returned (2.5%) compared to the CSFB/Tremont Hedge Fund Index of 1.1%. The opportunistic portfolio returned (0.7%) compared to Bank of America/Merrill Lynch High Yield Benchmark return of (11.2%). The private equity portfolio returned (0.5%) compared to State Street's Private Equity benchmark return of (5.47%). The private credit portfolio returned 7.9% compared to State Street's Private Credit benchmark return of 3.0%. Diversified Beta returned (19.6%) compared to the 60% MSCI World Eq / 40% Barclays Aggregate Bond return of (15.9%).

Contacting the MBTA Retirement Fund

This financial report is designed to provide a general overview of the Fund's investment results and financial condition of the Fund for the years ended December 31, 2023 and 2022. Please contact the MBTA Retirement Fund Office by emailing invest@mbtarf.com or by phone to 617-316-3800 for additional financial information or questions related to this report.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Statements of Fiduciary Net Position

December 31, 2023 and 2022

	2023	2022
Assets:		
Investments, at fair value:		
Domestic:		
Cash and cash equivalents	$ 58,328,068	58,763,129
Fixed income	376,362,371	357,589,712
Common stock and equity funds	501,075,238	444,338,203
Real estate funds	139,792,010	173,477,871
Alternative investments and hedge funds	337,372,697	358,179,395
	1,412,930,384	1,392,348,310
International:		
Cash and cash equivalents	85,580	137,798
Fixed income	2,723,533	149,438
Common stock and equity funds	265,554,999	223,460,403
	268,364,111	223,747,639
Total investments	1,681,294,495	1,616,095,949
Cash and cash equivalents	1,578,779	1,204,250
Contribution receivable from Massachusetts Bay Transportation Authority	8,348,040	6,719,724
Cash collateral on securities lending, invested	22,392,120	10,255,356
Receivable for investments sold	7,401,551	2,902,212
Right-of-use asset, net of accumulated amortization	893,105	—
Total assets	1,721,908,090	1,637,177,491
Liabilities:		
Cash collateral on securities lending, due to borrowers	22,392,120	10,255,356
Accounts payable and accrued expenses	2,520,930	2,435,703
Payable for investments purchased	1,530,057	1,937,454
Lease liability	1,063,723	—
Total liabilities	27,506,830	14,628,513
Net position – restricted for pension benefits	$ 1,694,401,260	1,622,548,978

See accompanying notes to financial statements.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Statements of Changes in Fiduciary Net Position
For the years ended December 31, 2023 and 2022

	2023	2022
Additions:		
Contributions by Massachusetts Bay Transportation Authority	$ 135,226,433	129,973,295
Contributions by members	50,735,073	45,511,253
Total contributions	185,961,506	175,484,548
Investment income:		
Income from investments	28,142,135	27,388,603
Less investment expenses, other than from securities lending	(4,464,889)	(4,901,736)
Net appreciation (depreciation) in fair value of investments	118,978,961	(279,781,753)
Net investment gain (loss)	142,656,208	(257,294,886)
Securities lending activity:		
Securities lending income	902,101	365,533
Less borrower rebates and fees	(857,844)	(325,638)
Net income from securities lending activities	44,257	39,896
Total net investment income (loss)	142,700,464	(257,254,990)
Total additions	328,661,971	(81,770,442)
Deductions:		
Retirement benefits	247,184,648	226,290,777
Refunds of members' contributions	5,005,285	4,847,462
Administrative expenses	4,415,368	4,484,766
Total deductions	256,605,301	235,623,005
Change in fiduciary net position	72,056,670	(317,393,447)
Net position restricted for pension benefits:		
Beginning of year	1,622,548,978	1,939,942,425
Adjustment for adoption of GASB 87	(204,388)	—
End of year	$ 1,694,401,260	1,622,548,978

See accompanying notes to financial statements.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

(1) Description of the Fund

(a) General

The following description of the Massachusetts Bay Transportation Authority Retirement Fund (the Fund), a single employer defined benefit pension plan, provides only general information. Employees (members) should refer to the Pension Agreement for a more complete description of the Fund's provisions.

The Fund was established on January 1, 1948, under an agreement and declaration of trust (restated on November 17, 2023, July 19, 2019 and October 28, 1980) by and among the Massachusetts Bay Transportation Authority (the Authority), Local 589, Amalgamated Transit Union, Boston Carmen's Union, and AFL CIO (collectively, the Union). The Fund was established as a contributory defined benefit retirement plan in accordance with the Pension Agreement, effective July 1, 1970, adopted by the Authority and the Union for the purpose of receiving contributions and providing pension benefits for its members and qualified beneficiaries.

The general administration and responsibility for the operation of the Fund are vested in a seven-member Retirement Board. The Board consists of three members appointed by the Authority (at least one of whom must be a member of the Authority's Board of Directors), two members appointed by the Boston Carmen's Union, Local Union 589 of the Amalgamated Transit Union, AFL-CIO, one member elected by vote conducted by the Authority for a term of three years by members of the Fund who are not members of the Boston Carmen's Union, Local Union 589 of the Amalgamated Transit Union, AFL-CIO, and one member, who has no vote and is known as the honorary member, who is elected, for such period as the Retirement Board may determine, by the other six members of the Retirement Board.

(b) Membership

The Fund covers all employees of the Authority except the MBTA Police, who are covered separately, and certain executives who elect coverage under an alternate plan. At December 31, 2023 and 2022, Fund membership consisted of:

		2023	2022
Retired members or beneficiaries currently receiving benefits	$	6,773 (1)	6,759 (2)
Active members		5,805	5,555
Active members not presently earning service credit		444	307
Total membership	$	13,022	12,621

(1) Includes 6,625 retirees and beneficiaries and 148 individuals receiving payments under Qualified Domestic Relation Orders (QDROs)

(2) Includes 6,614 retirees and beneficiaries and 145 individuals receiving payments under Qualified Domestic Relation Orders (QDROs)

(c) Funding Policy

Contributions required to provide benefits and meet administrative expenses are made jointly by the Authority and members. The member contribution rate was increased from 9.339% to

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

10.3489% effective July 1, 2023 of pretax compensation. The Authority contribution rate decreased from 26.6561% to 25.9511% effective July 1, 2023. As of July 1, 2023, member contributions increased to 10.3489%, which is the negotiated 1.25% over the actuarial annual required contribution rate of 9.0989%. The Authority contribution rate was 25.9511% as determined by the 2022 Valuation of plan benefits and the executed Pension Agreement effective March 2023. As determined by the 2023 Valuation of plan benefits and the executed Pension Agreement the employer and employee rates as of July 1, 2024 will remain the same. The terms of the Fund's obligations are part of the Pension Agreement contained in the annual report of the Fund. Only parties to the Pension Agreement can amend the terms. The contributions by members and the Authority have been developed to provide normal contributions, interest on the unfunded accrued liability, and administrative expenses.

(d) Benefits

The Fund provides for retirement, disability and death benefits in accordance with the Pension Agreement, as amended.

On March 31, 2023, the parties to the Pension Agreement, Local 589, Amalgamated Transit Union, AFL-CIO (Union) and the Massachusetts Bay Transportation Authority (MBTA) reached agreement on a new Pension Agreement, which will run through June 30, 2028. The new Pension Agreement creates a two-tier benefit structure for new employees who become Members of the Fund after June 30, 2023 or existing employees who are otherwise eligible to switch into the new system. All other Members and retirees will remain subject to the preexisting benefit structure. Other changes to the Pension Agreement, which will be published to the Fund's website, include a COLA increase for eligible retired Members, contribution increases for active Members and the MBTA, changes in disability retirement calculations and the return of Member contributions, and Fund investments in the Pension Reserves Investment Trust (PRIT).

Summary of Changes from December 31, 2022 Valuation

- A one-time COLA increase was provided to select retirees and beneficiaries.
- The maximum pensionable earnings percentage was increased from 75% to 80%.
- A two-tier benefit structure consisting of the Group A Plan and the Group B Plan was adopted

(Continued)

**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND**

Notes to Financial Statements
December 31, 2023 and 2022

A summary of benefits is as follows:

(i) Normal Retirement Allowance for Group A Plan Members

Condition for Allowance

Any member may retire at age 65. A member may remain in service after the stated retirement date.

Amount of Allowance

The normal retirement allowance equals 2.46% of 3-year average annual compensation multiplied by the years of service, such allowance not to exceed 80% of such average annual compensation.

(ii) Normal Retirement Allowance for Group B Plan members

Condition for Allowance

Any member may retire beginning at age 55 with at least 10 years of creditable service.

Amount of Allowance

The normal retirement allowance equals the average of the Member's highest 3 years of pensionable earnings multiplied by the Age Multiplier multiplied by the years of service.

The Age Multiplier is determined using the following table:

Age at Retirement	Percentage
55	1.750%
56	1.875%
57	2.000%
58	2.125%
59	2.250%
60	2.375%
61+	2.460%

A Retired Member's retirement allowance cannot exceed 80% of the average of the Retired Member's highest 3 years of pensionable earnings.

(iii) Early Normal Retirement Allowance for Group A Plan members

Condition for Allowance

Any member hired prior December 6, 2012 and has completed at least 23 years of service may retire on an early normal retirement allowance.

Any member hired on or after December 6, 2012, and has attained age 55 and completed at least 25 years of service may retire on an early normal retirement allowance.

Amount of Allowance

The early normal retirement allowance is computed in the same manner as a normal retirement allowance on the basis of the compensation and service to the time of retirement.

(Continued)

**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND**

Notes to Financial Statements
December 31, 2023 and 2022

(iv) Early Reduced Retirement Allowance for Group A Plan members

Condition for Allowance

A member who has attained age 55 and has completed at least 20 years of service may be retired on an early reduced retirement allowance.

Amount of Allowance

The early reduced retirement allowance is an immediate allowance, commencing at the date of retirement, and is computed in the same manner as a normal retirement allowance on the basis of compensation and service to the time of early retirement, but reduced by ½ of 1% for each month of retirement prior to normal retirement date.

(v) Disability Retirement Allowance for Group A Plan members

Condition for Allowance

Any member who has completed 4 years of service in case of disablement due to an occupational accident or sickness, or who has completed 6 years of service in case of disablement due to any other cause, and who has become totally and permanently incapacitated, mentally or physically, for the further performance of duty may be retired.

Amount of Allowance

Upon disability retirement, a member receives an allowance commencing immediately, which is computed as a normal retirement allowance on the basis of the compensation and service to the time of disability retirement and is not less than 15% of the member's 3-year average annual compensation.

(vi) Disability Retirement Allowance for Group B Plan members

Condition for Allowance

Any member who has completed 4 years of service in case of disablement due to an occupational accident or sickness, or who has completed 6 years of service in case of disablement due to any other cause, and who has become totally and permanently incapacitated, mentally or physically, for the further performance of duty may be retired.

Amount of Allowance

Upon disability retirement, a member receives an allowance commencing immediately, which is computed as a normal retirement allowance on the basis of the compensation and service to the time of disability retirement and is not less than 15% of the member's 3-year average annual compensation. The Age Multiplier is based on the member retiring at the age of 55 or the member's age at the time of disability retirement (referenced on the Age Multiplier chart above) if the member is over the age of 55.

(vii) Vested Retirement Allowance for Group A Plan members

Condition for Allowance

Any member who has completed 10 years of service and does not receive a refund of his contributions with interest, in the event his employment terminates for reasons other than voluntary quit or discharge for cause.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

Amount of Allowance

The vested retirement allowance is a deferred allowance commencing on the member's normal retirement date and equal to the amount computed as a normal retirement allowance on the basis of the compensation and service to the time of termination.

(viii) Vested Retirement Allowance for Group B Plan members

Condition for Allowance

Any member shall have a fully vested deferred retirement allowance if the member has accrued 10 or more years of service and has not withdrawn their contributions from the Fund.

Amount of Allowance

The vested retirement allowance is computed as the average of the member's highest 3 years of pensionable earnings multiplied by 2.46% multiplied by the years of service; provided, however, that if a vested member retires prior to the age of 65, then the vested member's retirement allowance will be reduced for their entire retirement by 6% per year, or one-half percent each month, of retirement before age 65.

(ix) Survivor Benefit

Condition for Benefit

Upon the death of a member who has completed 10 years of service and who is survived by a spouse and/or dependent children designated to receive the deceased member's contributions with interest, a benefit may be elected by such survivor in lieu of the payment of the contributions with interest.

Amount of Benefit

If the deceased member had completed at least 10 but fewer than 23 years of service, the survivor's benefit, payable for life, is equal to the amount which would have become payable if the member had retired as of the date of his death and elected a 50% joint and survivor option in effect as of the date of death with the survivor as the designated person under the option. There is no reduction for early commencement.

If the deceased member had completed at least 23 years of service, the survivor's benefit, payable for life, is equal to the amount which would have become payable if the member had retired as of the date of his death and elected a 100% joint and survivor option in effect as of the date of death with the survivor as the designated person under the option. There is no reduction for early commencement.

(x) Accidental Death Benefit

Condition for Benefit

Upon the death of a member in service whose death results solely from an injury or injuries sustained in the performance of duty, and who is survived by a spouse designated to receive the deceased member's contribution with interest, an allowance shall be payable to said spouse.

Amount of Benefit

The accidental death benefit, payable for life, is equal to the amount which would have become payable to the member if the member had retired as of the date of his death on a disability

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

retirement allowance. If there should be insufficient creditable service, the surviving spouse receives the minimum allowance available under the disability retirement provision.

(xi) Return of Contributions

On Account of Termination of Service

In the event of a Group A Plan member's termination of employment for any reason other than death or retirement or a Group B Plan member's nonvested termination, he is paid the amount of his contributions, with interest. Group A Plan members may not elect to keep their contributions in the Fund. Group B Plan members may elect to keep their contributions in the Fund to maintain and resume creditable service in the event they become an employee again in the future.

On Account of Death Prior to Retirement

Upon the death of a member or retired member before his retirement allowance has become effective, the amount of his contributions, with interest, is paid to his beneficiary or estate, unless a survivor benefit is payable.

On Account of Death after Retirement

Upon the death of a retired member, or the survivor of a retired member and his designated beneficiary under an optional benefit, any excess of his contributions at retirement, with interest, over the sum of all retirement allowance payments made is paid to the member's beneficiary or to the survivor's estate.

Our valuation does not include return of contributions on account of death after retirement for current retirees due to negligible impact on the Fund's liabilities.

(xii) Optional Benefits in Lieu of Regular Benefits

At retirement, or on his normal retirement date if prior thereto, any member may elect to convert his allowance into an optional benefit of equivalent actuarial value permitted by the Rules and Regulations.

(xiii) Reinstatement of Creditable Service

If a member's service is interrupted by reason of resignation or dismissal, he has the opportunity upon the completion of 3 years of service after he has been rehired to repay to the Fund all amounts he has withdrawn together with an amount equal to their reasonable earnings. Upon such repayment, the member is to be credited with service for the periods before and after the interruption as though they had been a single period of service.

(2) Significant Accounting Policies

(a) Basis of Accounting

The financial statements have been prepared on the accrual basis of accounting in conformity with U.S. generally accepted accounting principles (GAAP), as promulgated by the Governmental Accounting Standards Board (GASB).

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

(b) Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the dates of the financial statements and the reported amounts of additions and deductions during the reporting periods. Actual results could differ from estimates.

(c) Cash and Cash Equivalents

Cash and cash equivalents generally consist of cash on deposit with banks and financial institutions and highly liquid short-term investments, which have original maturities of three months or less. The Fund maintains its cash deposits with financial institutions, which management considers being of high credit quality and, by policy, limits the allocation of funds to any single major financial institution to minimize the Fund's amount of credit exposure.

(d) Revenue Recognition

Contributions are recognized pursuant to the contractual requirements of the Pension Agreement. Investment income is recognized as it is earned. Net appreciation (depreciation) in the fair value of investments is recorded as an increase (decrease) to investment income based on the valuation of investments as of the date of the financial statements.

(e) Retirement Benefits and Refunds

Retirement benefits and refunds are recognized when they become due and payable.

(f) Investments

Investments are stated at fair value. Securities traded on national security exchanges are valued on the basis of the closing price as of the last business day of the reporting period. Securities traded in the over-the-counter market are normally valued at the mean of the closing bid and ask prices. Securities listed or traded on certain foreign exchanges whose operations are similar to the U.S. over-the-counter market are valued at the price within the limits of the latest available current bid and ask prices deemed best to reflect current value. Gains and losses on sales of investments are determined on the basis of average cost.

Investments in real estate represent the Fund's percent ownership in private real estate funds. The Fund's investments are valued based on estimates by the Fund's management as a result of their review of financial information of the underlying real estate investment assets and standards established by the real estate industry, generally using the net asset value of the underlying investment as a practical expedient.

Investments in alternative investments and hedge funds include the Fund's percent ownership in venture capital, leveraged buyouts, private placements, hedge fund-of-funds, and other investments where the structure, risk profile, and return potential differ from traditional equity and fixed income investments. These investments are included in the statement of fiduciary net position at estimated values determined in good faith by the Fund's management, generally using the net asset value of the underlying investment as a practical expedient.

Purchase and sales of investments are selected on a trade-date basis.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

(g) Derivatives

A derivative is an investment agreement or security with a value that depends on, or is derived from, the value of an underlying asset, reference rate, or financial index. The Fund has classified its investment in forward exchange contracts as investment in derivative instruments. A forward exchange contract is a commitment to purchase or sell a foreign currency at a future date at a negotiated forward rate. The Fund utilizes forward foreign exchange contracts to minimize the effect of fluctuating foreign currencies. Risk associated with such contracts includes movement in the value of a foreign currency relative to the U.S. dollar. Realized gain or loss on forward exchange contracts is the difference between the original contract and the closing value of such contract and is included in the statement of changes in fiduciary net position. At December 31, 2023 and 2022, the Fund held open forward exchange contracts of varying amounts and currencies. Unrealized gains and losses are not significant to the financial statements.

(h) Currency Translation

As a result of having assets and liabilities denominated in foreign currencies, the Fund is exposed to the effect of foreign exchange rate fluctuations. Assets and liabilities denominated in foreign currencies and commitments under forward foreign exchange contracts and currency options are translated into U.S. dollars at the mean of the quoted bid and ask prices of such currencies against the U.S. dollar. Changes in foreign exchanges are reflected directly in income. Purchases and sales of portfolio securities are translated at the rates of exchange prevailing when such securities were acquired or sold. Income and expenses are translated at rates of exchange prevailing when accrued. It is not practical to isolate that portion of the results of operations arising as a result of changes in the foreign exchange rates from the fluctuations arising from changes in the market price of securities during the period. Net realized gains on foreign currency transactions represent net foreign exchange gains from holding foreign currencies, currency gains or losses realized between the trade and settlement dates on security transactions, and the difference between the amounts of dividends, interest, and foreign taxes recorded on the Fund's books and the U.S. dollar equivalent amounts actually received or paid.

(i) Income Taxes

The Fund is considered a qualified governmental plan under Internal Revenue Code Section 414(d) and is generally exempt from federal and state income tax under the Internal Revenue Code Section 115.

(j) Leases (Lessee)

The Fund is a lessee for a noncancellable lease of space and recognizes a lease liability and an intangible right-to-use lease asset.

The Fund initially measured the lease liability at the present value of payments expected to be made during the lease term. Subsequently, the lease liability is reduced by the principal portion of lease payments made. The lease asset is initially measured as the initial amount of the lease liability. Subsequently, the lease asset is amortized into administration expense on a straight-line basis over the lease term.

The lease term expires in 2026. The discount rate used for the calculation of the lease liability is 2.50%. Interest Expense from this lease totaled $31,774 and $41,025 for the years ended December 31, 2023 and 2022, respectively.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

Future annual lease payments are as follows:

Year ending December 31:	Principal	Interest	Total
2024	$ 397,295	$ 22,084	$ 419,379
2025	415,552	11,943	427,495
2026	250,876	2,103	252,979
Total	$ 1,063,723	$ 36,130	$ 1,099,853

(k) Subscription Based Information Technology Agreements (SBITAs)

The Fund evaluated all subscription-based Information Technology platforms and determined that all subscription agreements are of a short term (less than 12 months) nature and would not require an adjustment to record a right-of-use asset or related liability as of December 31, 2023, in accordance with GASB 96.

GASB 96 provides an exception for short-term SBITAs. Short-term SBITAs have a maximum possible term under the SBITA contract of 12 months (or less), including any options to extend, regardless of their probability of being exercised. Any subscription payments for short-term SBITAs are recognized as outflows of resources as of December 31, 2023.

(l) Adoption of New Accounting Pronouncement

In 2023, the Fund implemented GASB Statement No. 87, *Leases*. This statement requires the recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this Statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset.

In 2023, the Fund implemented GASB No. 96, *Subscription Based Information Technology Agreements* (SBITAs). This statement establishes uniform accounting and financial reporting requirements for SBITAs. The Fund evaluated all subscription-based Information Technology platforms and determined that all subscription agreements are of a short term (less than 12 month) nature, and would not require an adjustment to record a right-of-use asset or related liability as of December 31, 2023, in accordance with GASB 96.

(3) Cash Deposits, Investments, and Securities Lending

The Fund, in accordance with the declaration of trust agreement, is authorized to make deposits into checking and savings accounts and to invest in any form or type of investment, financial instrument, or financial transaction deemed prudent in the informed opinion of the Retirement Board. State Street Bank & Trust Company serves as the master custodian for the Fund's assets.

For the years ended December 31, 2023 and 2022, the Fund's essential risk information about deposits and investments is presented on the following tables.

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(a) Custodial Credit Risk

Custodial credit risk is the risk that, in the event of failure of a depository financial institution, the Fund's deposits may not be returned. The Fund maintains its cash and cash equivalent deposits with various financial institutions, which management considers being of high quality. The Fund limits the allocation of its cash and cash equivalent deposits to any single financial institution to minimize the Fund's exposure. The Fund's Board has not adopted a formal custodial credit risk policy.

The Fund's cash and cash equivalent deposits that are not collateralized are subject to the Federal Deposit Insurance Corporation (FDIC) insurance limits. At December 31, 2023 and 2022, $0.00 and $804,225 of the Fund's cash and cash equivalents deposits were in excess of the FDIC insurance limit. The Fund held no un-collateralized cash or cash equivalents in excess of the FDIC insurance limit as of December 31, 2023.

Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the Fund and are held by either the depository financial institution or the depository financial institution's trust department or agent but not in the Fund's name.

All of the Fund's investments are held by the Fund's custodian in the Fund's name, except for investments in hedge funds, real estate and alternative investments, which by their nature are not required to be categorized.

(b) Investment Policy

The Fund's investment objective is to achieve consistent positive real returns and to maximize long-term total return within prudent levels of risk through a combination of income and capital appreciation. The Fund's goal is to meet or exceed the Fund's actuarial target rate of return in order to maintain and improve upon its funded status.

The Fund is currently invested in stocks (domestic and foreign), fixed income securities (domestic), real estate, private equity, private credit and hedge funds.

The following was the Board's adopted target asset allocation policy as of December 31, 2023 and 2022:

Asset class	2023	2022
Domestic equity	24 %	24 %
International large cap equity	9	9
International small cap equity	2	2
Global/emerging markets	8	8
Fixed income	23	23
Real estate	9	9
Private equity	8	8
Private credit	2	2
Hedge funds	5	5
Hedge funds – opportunistic	2	2
Risk parity/diversified beta	6	6
Cash	2	2
Total	100 %	100 %

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(c) Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. The following is a listing of the Fund's fixed income investments and related maturity schedule (in years) as of December 31, 2023 and 2022:

	2023				
Investment type	**Fair value**	**Less than 1**	**1-5**	**6-10**	**More than 10**
Agency debt	$ 2,762,771	—	614,074	1,267,305	881,392
U.S. Treasury notes & bonds	91,584,398	1,944,706	39,409,508	30,010,040	20,220,144
Domestic corporate	215,486,535	3,340,982	98,202,827	46,970,590	66,972,136
International corporate	2,723,533	—	355,318	1,850,538	517,677
Asset Backed:					
CMOs	9,460,199	134,407	57,133	231,639	9,037,020
Mortgage backed	33,251,264	—	—	522,529	32,728,735
Other	23,817,204	3,151	2,056,708	3,924,141	17,833,204
	$ 379,085,904	5,423,246	140,695,568	84,776,782	148,190,308

	2022				
Investment type	**Fair value**	**Less than 1**	**1-5**	**6-10**	**More than 10**
Agency debt	$ 2,536,775	368,340	586,350	586,718	995,367
U.S. Treasury notes & bonds	83,746,982	9,942,351	36,262,963	21,959,405	15,582,263
Domestic corporate	203,331,868	1,624,489	105,276,205	33,442,625	62,988,549
International corporate	149,438	—	149,438	—	—
Asset Backed:					
CMOs	10,407,771	—	194,230	273,082	9,940,459
Mortgage backed	32,383,692	—	—	648,757	31,734,935
Other	25,182,624	—	4,445,322	2,048,918	18,688,384
	$ 357,739,150	11,935,180	146,914,508	58,959,505	139,929,957

The Fund's guidelines limit its effective exposure to interest rate risk by benchmarking the separately managed fixed income investment accounts to an intermediate duration benchmark with a weighted average duration of four to five years. The Fund further constrains its actively managed fixed income portfolios to maintain a duration that shall not exceed 1.5 times the benchmark duration.

Fixed income managers are also expected to report risk statistics and give a description of portfolio characteristics, including quality, duration, allocation by security type, and yield to maturity.

The collateralized mortgage obligations (CMOs) held by the Fund at December 31, 2023 and 2022 are highly sensitive to changes in interest rates.

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(d) Credit Risk

Credit risk exists when there is a possibility the issuer or other counterparty to an investment may be unable to fulfill its obligations.

The Fund’s Board does not have a formal investment policy governing credit risk; each fixed income securities investment manager is given a specific set of guidelines to invest within based on the mandate for which it was hired. The Fund expects all investment managers to perform their fiduciary duties as prudent people would and conform to all state and federal statutes governing the investment of the funds. Managers are to adhere to the philosophy and style that was articulated to the Retirement Board at the time of hire. The fixed income investment managers have full discretion to invest in fixed income securities in order to exceed their strategy specific benchmarks.

The Fund’s fixed income investments as of December 31, 2023 and 2022 were rated by Standard and Poor’s and/or an equivalent national rating organization, and the ratings are presented below using the Standard & Poor’s rating scale:

	2023								
Investment type	Fair value	AAA	AA	A	BBB	BB	B	CCC**	Not Rated
Agency debt	$ 2,762,771	—	2,364,287	—	—	—	—	—	398,484
Domestic corporate	215,486,535	49,776,255	2,124,627	18,774,149	64,093,157	14,313,250	61,781,151	2,283,097	2,340,849
International	2,723,533	—	—	—	619,239	1,598,659	—	—	505,635
Asset backed:									
CMOs	9,460,199	1,372,727	221,431	246,240	—	71,362	—	—	7,548,439
Mortgage backed	33,251,264	—	—	—	—	—	—	—	33,251,264
Other	23,817,203	4,737,809	89,153	1,618,700	3,589,982	105,364	107,524	—	13,568,673
Total credit securities risk	287,501,506	55,886,791	4,799,498	20,639,089	68,302,378	16,088,634	61,888,675	2,283,097	57,613,344
U.S. government fixed income securities*	91,584,398								
Total fixed income securities	$ 379,085,904								

	2022								
Investment type	Fair value	AAA	AA	A	BBB	BB	B	CCC**	Not Rated
Agency debt	$ 2,536,775	—	2,536,775	—	—	—	—	—	—
Domestic corporate	203,331,868	47,420,833	1,395,366	19,227,985	64,966,295	12,754,464	53,960,675	1,313,337	2,292,913
International	149,438	—	—	—	102,960	—	—	46,478	—
Asset backed:									
CMOs	10,407,771	1,927,758	191,423	285,139	37,385	87,326	—	—	7,878,740
Mortgage backed	32,383,692	—	—	—	—	—	—	—	32,383,692
Other	25,182,624	5,561,507	685,085	3,241,367	3,187,235	—	131,506	—	12,375,924
Total credit securities risk	273,992,168	54,910,098	4,808,649	22,754,491	68,293,875	12,841,790	54,092,181	1,359,815	54,931,269
U.S. government fixed income securities*	83,746,982								
Total fixed income securities	$ 357,739,150								

* Obligations of the U.S. government or obligations explicitly guaranteed by the U.S. government are not considered to have credit risk.

** The rating associated with this investment grade can be between C to CCC.

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(e) Concentration Risk

Concentration of credit risk is the risk of loss that may be attributed to the magnitude of a government's investment in a single issuer. The Fund places a 5% limit on the individual exposure to any single issuer at the time of purchase. The Fund has no investments with the exception of commingled funds, at fair value, that exceed 5% of the Fund's total investments as of December 31, 2023 and 2022. The Fund does have investments in individual commingled funds and trusts that represent more than 5% of the Fund's assets, but in each case, these investments are in institutional commingled funds that are invested in diversified portfolios.

(f) Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or a deposit. The Fund's exposure to foreign currency risk is attributable to its investments in separately managed and commingled international equity mutual funds and trusts that are invested in diversified portfolios of international stocks that are denominated in foreign currencies. The Fund's combined policy target allocation to all non-U.S. securities is currently 19.0% of the Fund's total assets. Currency hedging is permitted for defensive purposes. Currency hedging shall be effected through the use of forward currency contracts, which are described more fully in note 2.

Risk of loss arises from changes in currency exchange rates. The Fund's exposure to foreign currency risk as of December 31, 2023 and 2022 are presented on the following tables:

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Currency		2023 Short-Term	Fixed Income	Equity	Total
Brazilian Real		—	748,564	—	748,564
Canadian Dollar		85,635	—	—	85,635
Euro		(55)	444,408	—	444,353
Indonesian Rupiah		—	505,635	—	505,635
Mexican Peso		0	507,249	—	507,249
South African Rand		—	517,677	—	517,677
International equity pooled funds (various currencies)		—	—	265,554,999	265,554,999
Total securities subject to foreign currency risk		85,580	2,723,533	265,554,999	268,364,111
United States dollars (securities held by international investment managers)		—	—	3,642,882	3,642,882
Total International Investment Securities	$	85,580	2,723,533	269,197,881	272,006,993

Currency		2022 Short-Term	Fixed Income	Equity	Total
Argentine peso	$	53,521	46,478	—	99,999
Canadian dollar		82,723	—	—	82,723
Euro currency		(105)	102,960	3,993,614	4,096,469
Indian rupee		0	—	6,462,030	6,462,030
Japanese yen		0	—	3,793,044	3,793,044
Norwegian krone		1,666	—	122,152	123,818
Pound sterling		(7)	—	2,486,758	2,486,751
Swiss franc		0	—	2,297,034	2,297,034
Thailand baht		—	—	948,820	948,820
International equity pooled funds (various currencies)		—	—	203,356,951	203,356,951
Total securities subject to foreign currency risk		137,798	149,438	223,460,403	223,747,639
United States dollars (securities held by international investment managers)		—	—	5,930,124	5,930,124
Total International Investment Securities	$	137,798	149,438	229,390,527	229,677,763

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(g) Securities Lending Transactions

The Fund participates in the State Street Bank and Trust Company securities lending program by lending securities to borrowers (subject to borrower limits and program guidelines) and earning additional income, which is included in net investment income in the statement of changes in fiduciary net position. The lending program loans domestic and international equities, real estate investment trusts and fixed income securities for collateral with a concurrent agreement to return the collateral for the same securities in the future.

The Fund did not incur any losses on loaned securities during the year ended December 31, 2023 and 2022. The securities are monitored and valued on a daily basis by the custodian to ensure that the loans are properly collateralized. The collateral value is required to be at least 102% of the fair value of loaned domestic investments and a collateral value of at least 105% of the fair value on loaned international investments. Collateral can consist of both cash and securities. Should the collateral percentage levels fall below the stated figures, the borrowers are required to provide additional collateral to proper levels. The indemnification that State Street Bank provides the Fund in regard to loan risk is that should a borrower default on returning a security from loan, the collateral held is used to buy the security to be returned to the Fund. Any shortfall of proceeds to purchase the securities is taken on by State Street Bank. Since loans are terminable at will, loan durations do not generally match the duration of the investments made with the cash collateral.

Loaned securities are included in the statement of fiduciary net position since the Fund maintains ownership. For loans collateralized by cash, the value of the collateral is recorded as a liability offsetting the cash collateral recorded as an asset. The cash collateral as of December 31, 2023 and 2022 was $22,392,120 and $10,255,356, respectively. For loans having collateral other than cash, the related collateral securities are not recorded as assets in the statement of fiduciary net position, and a corresponding liability is not recorded, since the Fund cannot pledge or sell the collateral securities, except in the event of a borrower's default.

At December 31, 2023 and 2022, the fair value of loaned securities outstanding, included in investments, was approximately $21,834,761 and $10,008,621 respectively.

(h) Commitments

At December 31, 2023 and 2022, the Fund had contractual commitments to provide approximately $107.9 million and $109.2 million, respectively, of additional funding for alternative investments and real estate.

(i) Money-Weighted Rate of Return

The annual money-weighted rate of return on the Fund's investments calculated as the internal rate of return on the pension fund net of investment expenses for the years ended December 31, 2023 and 2022 was 8.73% and (9.26%), respectively. A money weighted return expresses investment performance net of pension plan investment expense, adjusted for the changing amounts actually invested.

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(4) Fair Value Measurements

The Fund measures and records its investments using fair value measurement guidelines established by generally accepted accounting principles. The fair value gives the highest priority to unadjusted quoted prices in active markets for identical assets and liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). These levels of the fair value hierarchy are described below:

- Level 1 – Unadjusted quoted prices for identical assets or liabilities in active markets
- Level 2 – Observable inputs other than quoted prices in active markets for identical assets and liabilities. Level 2 inputs include the following:
  - Quoted prices for similar assets and liabilities in active markets
  - Quoted prices for identical or similar assets or liabilities in markets that are not active
  - Inputs other than quoted prices that are observable for the asset or liability, such as:
    1. Interest rates and yield curves observable at commonly quoted intervals
    2. Implied volatilities
    3. Credit spreads
- Level 3 – Unobservable inputs for the asset or liability (i.e., supported by little or no market activity). Level 3 inputs include management's assumptions.

The following tables' set forth by fair value hierarchy level, the Fund's assets carried at fair value December 31, 2023 and 2022:

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	Total at December 31, 2023	Fair value measurements using: Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Cash equivalents:				
Active cash	$ 6,113,532	6,113,532	—	—
International cash and equivalents	85,580	85,580	—	—
STIF-type instrument	41,975,528	41,975,528	—	—
Treasury bill	10,239,008	10,239,008	—	—
Total cash equivalents	58,413,648	58,413,648	—	—
U.S. equities:				
Common stock	184,279,529	184,279,529	—	—
Depository receipts	6,332,533	6,332,533	—	—
Mutual funds	307,404,392	307,404,392	—	—
Preferred stock	448,413	448,413	—	—
Real estate investment trust	2,610,371	2,610,371	—	—
Total U.S. equities	501,075,238	501,075,238	—	—
International equities - common stock	265,554,999	265,554,999	—	—
Fixed income:				
Agency debt	2,762,771	—	2,762,771	—
U.S. treasury notes and bonds	91,584,398	—	91,584,398	—
Domestic corporate	215,486,535	—	215,486,535	—
Asset backed:				
CMO	9,460,199	—	9,460,199	—
Mortgage-backed	33,251,264	—	33,251,264	—
Other asset backed	23,817,204	—	23,817,204	—
Total U.S. fixed income	376,362,371	—	376,362,371	—
International fixed income - bonds	2,723,533	—	2,723,533	—
Total investments by fair value level	1,204,129,789	825,043,885	379,085,904	—
Total investments measured at net asset value (NAV):				
Hedge fund of funds	155,617,354			
Private equity funds	181,755,342			
Private real estate funds	139,792,010			
Total investments measured at NAV	477,164,706			
Total investments	$ 1,681,294,495			

(Continued)

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		Fair value measurements using:		
	Total at December 31, 2022	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Cash equivalents:				
Active cash	$ 9,165,056	9,165,056	—	—
International cash and equivalents	137,798	137,798	—	—
STIF-type instrument	40,022,933	40,022,933	—	—
Treasury bill	9,575,140	9,575,140	—	—
Total cash equivalents	58,900,927	58,900,927	—	—
U.S. equities:				
Common stock	202,033,228	202,033,228	—	—
Depository receipts	10,686,069	10,686,069	—	—
Mutual funds	228,438,926	228,438,926	—	—
Preferred stock	805,793	805,793	—	—
Real estate investment trust	2,374,187	2,374,187	—	—
Total U.S. equities	444,338,203	444,338,203	—	—
International equities - common stock	223,460,403	223,460,403	—	—
Fixed income:				
Agency debt	2,536,775	—	2,536,775	—
U.S. treasury notes and bonds	83,746,982	—	83,746,982	—
Domestic corporate	203,331,868	—	203,331,868	—
Asset backed:				
CMO	10,407,771	—	10,407,771	—
Mortgage-backed	32,383,692	—	32,383,692	—
Other asset backed	25,182,624	—	25,182,624	—
Total U.S. fixed income	357,589,712	—	357,589,712	—
International fixed income - bonds	149,438	—	149,438	—
Total investments by fair value level	1,084,438,683	726,699,533	357,739,150	—
Total investments measured at net asset value (NAV):				
Hedge fund of funds	178,789,685			
Private equity funds	179,389,711			
Private real estate funds	173,477,871			
Total investments measured at NAV	531,657,266			
Total investments	$ 1,616,095,949			

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Commingled funds are typically structured as an investment vehicle created by the Investment Manager to execute a specific investment strategy. Some investment strategies are only pursued by commingled accounts. Mutual funds and/or other types of commingled investment vehicles, including, but not limited to, Alternative Investments, may provide lower costs and better diversification than can be obtained with a separate account that pursues the same investment objectives. The fair value of the hedge fund of funds, private equity funds and real estate funds are not rated funds. The fair values of these funds are based on net asset value calculated in accordance with the general partner's fair valuation policy as of the measurement date and are annually audited separately.

The following represents the significant investment strategies and terms on which the Fund may redeem investments for those investments measured at the NAV (or its equivalent) as a practical expedient:

	Fair Value December 31, 2023	Fair Value December 31, 2022	Total Unfunded Commitments as of December 31, 2023	Redemption Frequency if Currently Eligible	Redemption Notice Period
Hedge fund of funds					
Diversified beta[1]	$ 51,932,671	$ 90,623,911	$ -	monthly	15-30 days
Fund of hedge fund[2]	73,171,290	66,252,755	—	quarterly	30-90 days
Opportunistic hedge fund[3]	30,513,393	21,913,019	24,504,747	N/A	N/A
Private equity funds[4]	181,755,342	179,389,710	83,402,237	N/A	N/A
Private real estate funds					
Open-ended real estate funds[5]	125,872,993	155,439,203	—	quarterly	30 days - 1 year
Closed-end real esate funds[6]	13,919,017	18,038,668	—	N/A	N/A
Total Investments Measured at NAV	**$ 477,164,706**	**$ 531,657,266**	**$ 107,906,984**		

1 This category includes one diversified beta investment manager who utilizes a risk premium capture strategy that seeks to generate returns by investing in equity, bond and commodity markets using a risk-balanced investment process. The manager provides monthly liquidity with 15 - 30-day notification.

2 This category includes one fund of hedge fund managers; the manager provides quarterly liquidity with 30 - 90-day notice.

3 This category includes one opportunistic hedge fund manager who is not subject to redemption and is normally returned through distributions as a result of the liquidation of the underlying assets over a period of approximately three to seven years.

4 This type includes private equity funds that invest in nonmarketable securities of private companies, which ultimately may become public in the future and whose strategies include buyout, growth equity, venture, mezzanine debt, distressed debt, secondary fund of funds or special situations. Generally, each fund in this category may not be subject to redemption and is normally returned through distributions as a result of liquidation of the underlying assets over a weighted average period of approximately nine years.

5 This category includes six open-ended real estate funds that invest directly in real estate and real estate related assets, including retail, industrial, office, residential and hotels. Investments in this category can be redeemed quarterly upon 30 days to one-year notice.

6 This category includes funds that invest directly in real estate and real estate related assets,

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
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including retail, industrial, office, residential and hotels. Generally, investment in each fund in this category may not be subject to redemption and is normally returned through distributions as a result of the liquidation of the underlying assets over a weighted average period of approximately seven or more years.

(5) Related-Party Transactions

The Fund invests certain cash in a money market fund, the State Street Bank and Trust Company Short Term Investment Fund, which is sponsored by the Fund's custodial bank. The total value of the funds held at December 31, 2023 and 2022 was $41,975,528 and $40,022,933 respectively.

The Fund invests in the AFL-CIO Housing Investment Trust and the AFL-CIO Building Investment Trust, two for-profit investment programs of the AFL-CIO. The total value of AFL-CIO Housing Investment Trust at December 31, 2023 and 2022 was $48,705,743 and $46,312,964 respectively. The total value of AFL-CIO Building Investment Trust at December 31, 2023 and 2022 was $9,890,903 and $14,988,018, respectively.

(6) Net Pension Liability

The components of the net pension liabilities of the Fund as of December 31, 2023 and 2022 are shown as follows (amounts in thousands):

		2023	2022
Total pension liability	$	3,303,364	3,167,471
Plan fiduciary net position		(1,694,401)	(1,622,549)
Fund's net pension liability	$	1,608,963	1,544,922
Plan fiduciary net position as a percentage of total pension liability		51.29 %	51.23 %

Actuarial Assumptions

The total pension liability was determined by an actuarial valuation as of December 31, 2023 and 2022, using the following actuarial assumptions:

- As of December 31, 2023, a table of increases based on years of service, with rates of increase declining from 14% per year for the newly hired to 2.75% per year with 15 or more years of service
- Investment rate of return compounded annually in 2023 and 2022 of 7.25% per annum
- Inflation rate of 2.75%

The PRI-2012 Amount Weighted Blue Collar Mortality Tables with fully generational projection using Scale MP-2021 are used for all active participants. 101.1% of the PRI-2012 Amount Weighted Blue Collar Post Commencement Tables with fully generational projection using Scale MP-2021 are used for all retirees and beneficiaries preceding their related member's death. 98.3% of the PRI-2012 Amount Weighted Blue Collar Contingent Survivor Tables with fully generational projection using Scale MP-

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2021 are used for all beneficiaries following the death of their related member. The PRI-2012 Amount Weighted Total Dataset Disability Tables with fully generational projection using Scale MP-2021 are used for the period after disability retirement. Among pre-retirement deaths, 7.50% are assumed to qualify for accidental death benefits.

The actuarial assumptions used in the December 31, 2023 valuation were based on the results of an actuarial experience study for the period from January 1, 2018, through December 31, 2022. Actuarial valuations attempt to estimate costs associated with the pension fund based on a number of demographic, economic and retirement experience assumptions. Experience studies are required by statute to be conducted every five years to review experience in comparison to these assumptions and to provide recommended changes to assumptions.

The long-term expected rate of return on Fund investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension Fund investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of long-term arithmetic rates of return for each major asset class included in the Fund's target asset allocation as of December 31, 2023, are summarized in the following table:

	Target asset allocation		Long-term expected real rate of return	
Asset class	**2023**	**2022**	**2023**	**2022**
Equity				
US Large Cap	17 %	17 %	5.24 %	7.33 %
US Small Cap	7 %	7 %	8.13 %	7.91 %
Non-US Equity				
Global Equity	4 %	4 %	5.65 %	7.47 %
Emerging Markets Equity	4 %	4 %	8.62 %	9.54 %
Developed International Equity	11 %	11 %	7.10 %	7.19 %
Total Equity	43 %	43 %		
Fixed income				
Global Aggregate	8 %	8 %	2.19 %	1.74 %
Mortgage-Backed Securities	3 %	3 %	2.08 %	1.48 %
Global Multi Sector	6 %	6 %	1.18 %	1.08 %
US TIPS	3 %	3 %	2.22 %	1.98 %
Bank Loans	3 %	3 %	6.36 %	5.99 %
Total Fixed Income	23 %	23 %		
Alternatives				
Private Equity	8 %	8 %	8.59 %	12.92 %
Private Credit	2 %	2 %	6.56 %	5.91 %
Real Estate	9 %	9 %	3.87 %	5.17 %
Multi Asset Class	6 %	6 %	4.27 %	5.18 %
Hedge Funds FOF & Hedged Equity	7 %	7 %	4.13 %	4.12 %
Total Alternatives	32 %	32 %		
Cash	2 %	2 %	0.64 %	0.51 %

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

Nominal long-term expected rates of return for these asset classes are equal to the sum of the above expected long-term real rates and the expected long-term inflation rate of 2.36%.

(a) Discount Rate

The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed that contributions will continue to be made in accordance with the current funding policy. Based on these assumptions, the fiduciary net position was projected to be available to make all projected future benefit payments to current Fund members. The assumed discount rate has been determined in accordance with the method prescribed by GASB 67 and is based on an expected long-term rate of return on Fund assets of 7.25% and the S&P Municipal Bond 20 Year High Grade Rate Index, whose yield to maturity was 4.00% as of December 29, 2023. We believe these assumptions do not significantly from what we deem reasonable for the purposes of the measurements required by GASB 67.

(b) Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability as of December 31, 2023 and 2022, calculated using the discount rate of 7.25%, respectively, as well as what the Fund's net pension liability would be if it were calculated using a discount rate that is one percentage point lower 6.25% or one percentage point higher 8.25% than the current rate (amounts in thousands):

		1% Decrease (6.25%)	Current discount rate (7.25%)	1% Increase (8.25%)
2023 Net pension liability	$	1,941,656	1,608,963	1,325,603
2022 Net pension liability	$	1,862,112	1,544,922	1,274,657

(7) Subsequent Events

There have been no other subsequent events through June 17, 2024 the date that the Fund's financial statements were available to be issued, that require recognition or disclosure.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Notes to Financial Statements
December 31, 2023 and 2022

REQUIRED SUPPLEMENTARY INFORMATION

(Unaudited)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information
Schedule of Changes in Net Pension Liability and Related Ratios
(Unaudited)

	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability										
Service cost	62,188,799	55,162,629	55,417,684	52,008,968	47,942,711	46,101,006	31,850,127	31,896,560	37,305,333	34,500,540
Interest	225,168,408	220,640,668	217,508,956	214,772,564	214,112,586	207,497,686	204,779,603	195,768,057	191,392,028	184,667,178
Differences between expected and actual experience	65,179,233	66,601,348	1,811,509	(7,346,171)	(3,179,975)	11,599,381	44,627,096	90,067,566	31,325,149	48,560,391
Changes of assumptions	35,546,454	(45,499,300)	(3,389,843)	-	69,299,287	43,926,927	128,688,470	-	(6,762,751)	-
Benefit Payments	(252,189,933)	(231,138,239)	(224,767,671)	(225,422,340)	(223,864,973)	(221,710,054)	(212,814,757)	(197,561,539)	(188,906,232)	(184,130,187)
Net change in total pension liability	135,892,961	65,767,106	46,580,635	34,013,021	104,309,636	87,414,946	197,130,539	120,170,644	64,353,527	83,597,922
Total pension liability-beginning of year	3,167,471,121	3,101,704,015	3,055,123,380	3,021,110,359	2,916,800,723	2,829,385,777	2,632,255,238	2,512,084,594	2,447,731,057	2,364,133,135
Total pension liability-ending (a)	3,303,364,082	3,167,471,121	3,101,704,015	3,055,123,380	3,021,110,359	2,916,800,723	2,829,385,777	2,632,255,238	2,512,084,594	2,447,731,057
Change in fiduciary net position:										
Contributions - employer	135,226,433	129,973,295	123,493,762	116,285,928	103,263,763	92,013,124	83,382,882	77,239,279	73,373,672	70,603,285
Contributions - employee	50,735,073	45,511,253	43,224,002	40,774,027	36,366,108	32,606,337	29,775,344	27,791,543	26,510,946	25,318,224
Net investment (loss) income	142,700,464	(257,254,990)	232,417,541	228,670,823	253,730,990	(52,072,879)	221,690,618	86,782,343	4,711,246	73,543,477
Benefit payments	(252,189,933)	(231,138,239)	(224,767,671)	(225,422,340)	(223,864,973)	(221,710,054)	(212,814,757)	(197,561,539)	(188,906,232)	(184,130,187)
Administrative expenses	(4,619,755)	(4,484,766)	(4,366,485)	(4,511,375)	(5,046,775)	(4,317,624)	(4,463,775)	(6,493,777)	(5,808,086)	(4,052,664)
Net change in fiduciary net position	71,852,282	(317,393,447)	170,001,149	155,797,063	164,449,113	(153,481,096)	117,570,312	(12,242,151)	(90,118,454)	(18,717,865)
Fund fiduciary net position-beginning of year	1,622,548,978	1,939,942,425	1,769,941,276	1,614,144,213	1,449,695,100	1,603,176,196	1,485,605,884	1,497,848,035	1,587,966,489	1,606,684,354
Fund fiduciary net position - end of year (b)	1,694,401,260	1,622,548,978	1,939,942,425	1,769,941,276	1,614,144,213	1,449,695,100	1,603,176,196	1,485,605,884	1,497,848,035	1,587,966,489
Fund's net pension liability-ending (a)-(b)	1,608,962,822	1,544,922,143	1,161,761,590	1,285,182,104	1,406,966,146	1,467,105,623	1,226,209,581	1,146,649,354	1,014,236,559	859,764,568
Fund fiduciary net position as a percentage of the total pension liability	51.29%	51.23%	62.54%	57.93%	53.43%	49.70%	56.66%	56.44%	59.63%	64.88%
Covered payroll	560,824,908	496,467,531	458,857,189	460,921,559	436,828,077	425,862,201	428,830,122	446,740,427	443,237,899	417,957,007
Net pension liability as a percentage of covered payroll	286.89%	311.18%	253.19%	278.83%	322.09%	344.50%	285.94%	256.67%	228.82%	205.71%

See accompanying independent auditors' report.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information
Schedule of Changes in Net Pension Liability and Related Ratios
(Unaudited)

Change of Assumptions:

2023: No change of assumptions

2022: Assumption changes to the salary scale, mortality rates, termination rates, and retirement rates were made according to the experience study completed in 2023. This decreased the total pension liability by $45.5 million.

2021: Participants who have been receiving Workers' Compensation benefits for five or more years are assumed to never receive a Massachusetts Bay Transportation Authority Retirement Fund pension benefit. This decreased the actuarial accrued liability by $2.76 million.

Participants who are active, but did not contribute to the plan in 2021, are assumed to remain non-contributing to the remainder of their employment and to receive only a refund of their contributions to the Fund with interest. This decreased the actuarial accrued liability by $0.63 million.

2020: No change of assumptions.

2019: Discount rate decreased from 7.50% to 7.25% resulting in an increased net pension liability totaling $69.3 million.

2018: Salary scale decreased the net pension liability by $(59.6) million, mortality rates increased the net pension liability by $6.0 million, termination rates increased the net pension liability by $9.4 million, and retirement rates increased the net pension liability by $88.1 million, resulting in increased net pension liability totaling $43.9 million.

2017: Discount rate decreased from 7.75% to 7.50% resulting in an increased net pension liability totaling $128.7 million.

See accompanying independent auditor's report.

(Continued)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information
Schedule of Investment Returns
(Unaudited)

Annual money-weighted rate of return, net of investment expense

Year	Money-Weighted Rate of Return
2023	8.73 %
2022	(9.26)
2021	13.23
2020	14.22
2019	17.67
2018	(3.37)
2017	17.79
2016	5.88
2015	0.65
2014	4.80

See accompanying independent auditors' report.

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RETIREMENT FUND

Required Supplementary Information
Schedule of Contributions
(Unaudited)

Year	Actuarially determined contribution	Actual contribution in relation to actuarially determined contribution	Percentage of actuarially required contributions	Covered-payroll	Contribution as a percentage of covered-payroll
2023	$131,307,539	$131,307,539	100.00 %	$560,824,908	24.11 %
2022	126,389,486	129,973,295	102.84	496,467,531	26.18
2021	122,034,414	123,493,762	101.20	458,857,189	26.91
2020	116,285,928	116,285,928	100.00	460,921,559	25.23
2019	103,264,000	103,263,763	100.00	436,828,077	23.64
2018	92,013,000	92,013,124	100.00	425,862,201	21.61
2017	83,383,000	83,382,882	100.00	428,830,122	19.44
2016	77,239,000	77,239,279	100.00	446,740,427	17.29
2015	73,359,000	73,373,372	100.02	443,237,899	16.55
2014	77,594,000	70,603,285	90.99	417,957,007	16.89

See accompanying independent auditors' report.

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**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RETIREMENT FUND**

Notes to Required Supplementary Information

(Unaudited)

Actuarial Assumption and Methods Used to Determine Contribution Rates

- Actuarially determined contributions are calculated as of the December 31 preceding by six months the start of the fiscal year in which contributions are made. For example, the contribution calculated in the December 31, 2023 actuarial valuation are to be made during the period from July 1, 2024, to June 30, 2025.
- The methods and assumptions used to calculate the actuarially determined contribution in the December 31, 2023 actuarial valuation are shown in Section III. For funding purpose, an allowance of 1.00% of annual compensation of active members below normal retirement age is included in the total required contribution to cover expenses
- Salary – As of December 31, 2023, a table of increases based on years of service, with rates of increase declining from 14% per year for the newly hired to 2.75% per year with 15 or more years of service. As of December 31, 2022, a table of increases based on years of service, with rates of increase declining from 14% per year for the newly hired to 2.75% per year with 15 or more years of service.
- Actuarial cost method – Entry Age Normal, Level Percentage of Pay
- Amortization method – Closed period (specified below); installments increase at the rate of 4% per year
- Remaining amortization period – 15 years (2023 valuation), 16 years (2023 valuation)
- Asset Valuation method – Five-year phase-in smoothing method
- Investment rate of return – 7.25% net of pension plan investment expense.
- Retirement Age – Probabilities of retirement are based on table that reflects both age and service
- Mortality - The PRI-2012 Amount Weighted Blue Collar Mortality Tables with fully generational projection using Scale MP-2021 are used for all active participants. 101.1% of the PRI-2012 Amount Weighted Blue Collar Post Commencement Tables with fully generational projection using Scale MP-2021 are used for all retirees and beneficiaries preceding their related member's death. 98.3% of the PRI-2012 Amount Weighted Blue Collar Contingent Survivor Tables with fully generational projection using Scale MP-2021 are used for all beneficiaries following the death of their related member. The PRI-2012 Amount Weighted Total Dataset Disability Tables with fully generational projection using Scale MP-2021 are used for the period after disability retirement. Among pre-retirement deaths, 7.50% are assumed to qualify for accidental death benefits.

Schedule of Administrative Expenses

As of December 31,		2023	2022
Wages and Benefits			
Staff Salaries *	$	1,154,989	1,182,038
Retiree Payroll		128,695	328,326
Benefits		375,984	364,362
Total Personnel Services	**$**	**1,659,668**	**1,874,726**

*Interim Executive Director Salary = $196,000

Professional Services			
Actuarial	$	294,708	231,499
Audit		151,401	136,450
Legal Counsel		1,116,641	1,040,948
Disability Medical Exams		89,925	78,275
Total Professional Services	**$**	**1,652,675**	**1,487,172**
Communication			
Newsletter / Annual Report	$	29,317	12,030
Postage		6,446	2,980
Telephone*		0	12,636
Education and Training		41,567	46,806
Manager Meetings		6,158	4,990
Member Services		7,417	7,048
Total Communication	**$**	**90,904**	**86,490**
Miscellaneous			
General and Administrative	$	38,299	27,553
Business Insurance		248,268	234,745
Rent & GASB 87 Adoption		449,410	459,524
Technological Support		276,143	314,556
Total Miscellaneous	**$**	**1,012,120**	**1,036,378**
Total Administrative Expenses	**$**	**4,415,368**	**4,484,766**

See accompanying Independent Auditors' Report

*Telephone was merged with Technological Support in 2023 when Teams upgrade occurred.

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Schedule of Investment Expenses and Payments to Consultants

As of December 31,		2023	2022
Schedule of Investment Expenses			
Investment Management Fees	$	3,275,260	3,736,480
Investment Consultant Fees		344,000	344,000
Communications / Governmental Services		157,160	148,225
Custodial Fees		688,469	673,031
Total Investment Expenses	**$**	**4,464,889**	**4,901,736**
Schedule of Payments to Consultants*			
Independent Auditors	$	151,401	136,450
Actuary		294,708	231,499
Legal		1,116,641	1,040,948
Total Payments to Consultants	**$**	**1,562,750**	**1,408,897**

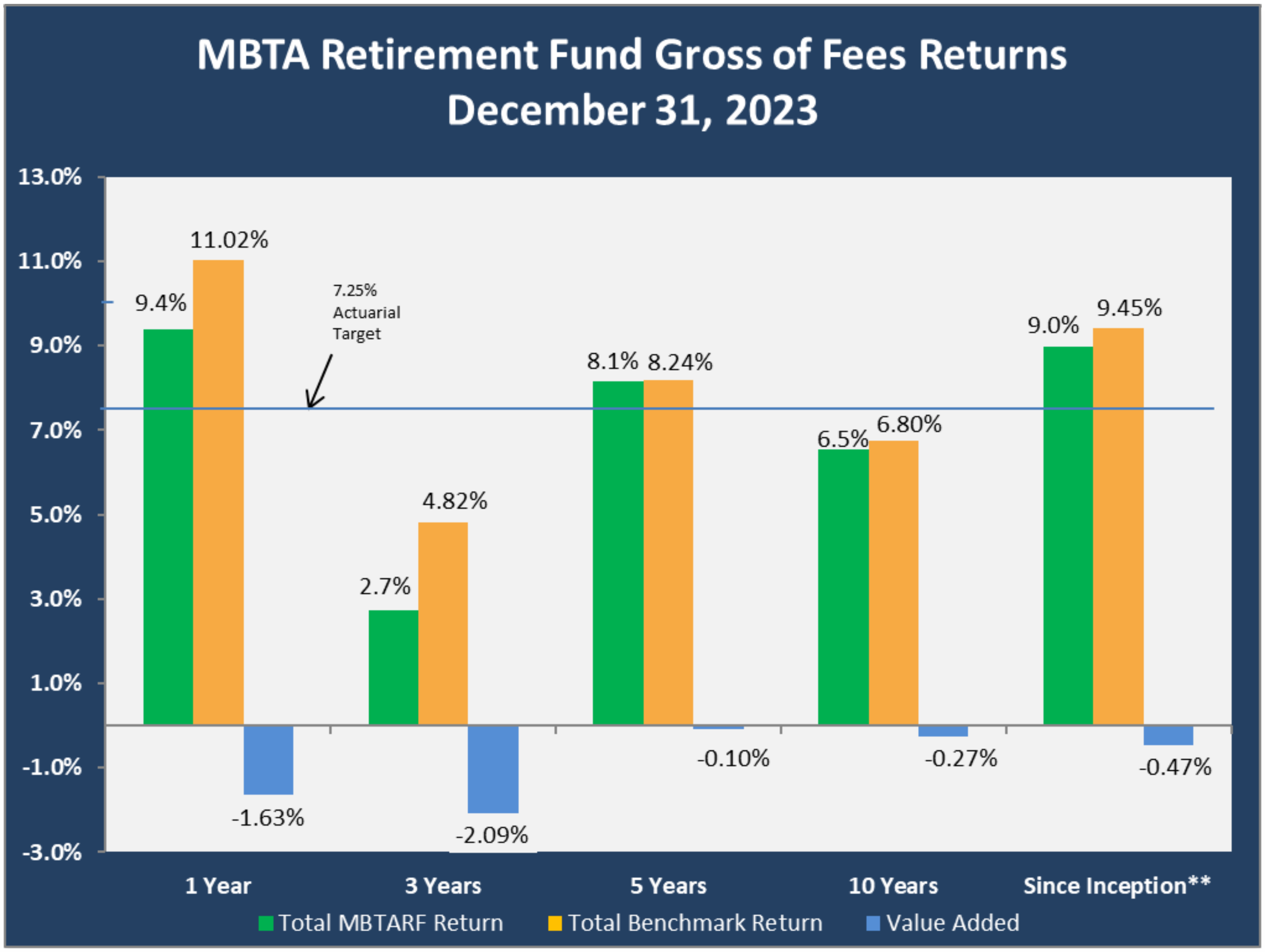
*These payments are presented for analytical purposes; each amount is already included in schedules of administrative or investment expenses

See accompanying Independent Auditors' Report

INVESTMENT SECTION

(Unaudited)

2023 Investment Results



** Performance inception date of January 1, 1982

Report on Investment Activity

The Massachusetts Bay Transportation Authority Retirement Fund (the "Fund" or "MBTARF") was created to provide retirement benefits for certain employees of the Massachusetts Bay Transportation Authority (the "Authority"). The Fund was established in 1948 pursuant to a Trust Agreement between local 589 ATU AFL-CIO (the "Union") and the Authority, that is governed by the terms of a separately negotiated Pension Agreement between the Authority and the Union. The MBTA Retirement Board is responsible for the general oversight of the MBTA Retirement Fund. The primary goal of the Fund's investment program is to meet or exceed the Fund's actuarial target rate of return in order to maintain and improve upon its funded status. The Board of the Fund seeks to maximize return on investments through a diverse group of investment managers with an acceptable level of risk.

The Investment Section was prepared by the MBTA Retirement Fund Finance Staff with assistance of the consultant, Segal Marco Advisors. The Fund's investment portfolios are presented at fair value, which is appropriate industry standard. The accompanying financial statements were prepared in accordance with U.S. generally accepted accounting principles (GAAP). The Fund adheres to the reporting requirements established by the Governmental Accounting Standards Board (GASB).

The investment performance information provided in this section of the Annual Comprehensive Financial Report was calculated by the Fund's custodian, State Street Bank & Trust Company, using a time-weighted rate of return based on the fair value of assets.

As of December 31, 2023, the Board employed 12 public markets investment managers, 16 private equity market managers, 5 private credit managers, 8 real estate managers, 1 hedge fund-of-funds manager, 1 opportunistic hedge fund manager and 1 risk parity/diversified beta managers. The Fund had approximately $1,711.7 million in assets under management as of December 31, 2023. Each investment manager operates within guidelines that are established by the Board and consultant and are outlined in a detailed investment management or partnership agreement.

The Investment Policy statement adopted by the Fund Board requires that the Board and the Executive Director review the asset allocation at least quarterly to determine if the asset allocation is consistent with the exposure ranges described. A change in the Fund's liability structure, funded status or long-term investment prospects may also trigger a revision of the asset allocation. The Interim-Executive Director will direct investment managers to transfer funds to rebalance the asset allocation as necessary and shall use appropriate judgment and care when rebalancing portfolios.

Current Allocation as of 12/31/2023

Asset Class	12/31/2023 Allocation (%)	Target (%)
Equities	**45.6**	**43**
US Large Cap	22.0	17
US Small Cap	7.8	7
International Equity (unhedged)	11.0	9
International Small Cap	2.1	2
Global / Emerging Markets	2.7	8
Fixed Income	**22.5**	**23**
Core Fixed Income	8.1	8
TIPS	3.1	3
Mortgages	2.9	3
Global & Multi Sector	5.5	6
Bank Loans	2.9	3
Cash*	3.5	2
Alternative Investments	**28.4**	**32**
Private Equity & Private Credit	10.8	10
Real Estate	8.3	9
Fund of Hedge Funds	4.4	5
Fund of Hedge Funds - Opportunistic	1.8	2
Risk Parity / Diversified Beta	3.1	6

*Investment manager's cash holdings are reported in cash and cash equivalents

The Year in Review – The World Markets

Fiscal Year 2023 Global Markets Overview

First Quarter 2023:

World equity markets were solidly positive with US, developed international, and emerging market equities at +7.5%, +8.5%, and +4.0%, respectively, and rising stocks were fueled by recession fears moderating; globally, the financial sector was able to weather the turbulence caused by the failure of Silicon Valley Bank (SVB) and the acquisition of Credit Suisse by UBS this quarter. Emerging market equities had a brief period of renewed optimism as China's economy re-opened (following lifted COVID restrictions in December 2022), however they ultimately lagged developed markets as US/China tensions escalate. The re-opening of China's economy also resulted in a growth of China's GDP at +2.2%. Meanwhile, Japan's GDP was flat as private consumption grew less than anticipated. Eurozone GDP rose +0.1% quarter over quarter, falling slightly short of market expectations at +0.2%: economic performance was hit by high inflation and the fastest pace of rate increases by the European Central Bank in 20 years. The ECB increased rates twice during the quarter by 50 basis points each time, coming as inflation remains a concern. While the most aggressive rate hikes occurred in Europe, yields rose in most developed markets. All in all, global banking developments impacted the speed of rate increases by the global central banks. Following the trend of fourth quarter 2022, the U.S. dollar depreciated relative to the yen, British pound, and Euro. U.S. large cap and emerging market valuations remain above their long-term median, while U.S. small cap continue to appear undervalued. With the exception of Real Estate, all international sectors generated positive returns, but emerging market sectors had mixed results. The yield curve was further inverted, as yield rose on short-term maturities but declined with intermediate to long-term maturities.

The U.S. GDP rose +1.1% this quarter, which despite being positive, shows a slowdown from previous quarters. As inflation has stayed elevated, the Federal Reserve's interest rate hikes (25 bps in both February and March) are likely working to slow the economy. The economy has stayed out of recession territory with positive exports and consumer spending, however, challenges such as high inflation, continued fallout from the global banking situation, and geopolitical uncertainty remain. The unemployment rate in December 2022 (3.5%) beat market expectations once again as the government added 47k jobs, whereas the nonfarm payrolls rising 236,000 in March were slightly below expectations. While it may be a sign of a somewhat cooler economy, the job market remains relatively strong, which makes the Federal Reserve's rate hike decisions more challenging going forward. Confidence declined slightly: consumer spending was slowed amid the backdrop of interest rate hikes, growing recession fears, inflation, and

(Continued)

assessments of personal finances worsening due to higher expenses. The effect on the consumer due to higher interest rates and inflation is also reflected in retail sales: falling -1% in March after having risen in January. Information Technology (+21.8%) and Telecom (+20.5%) have dominated the U.S. sectors as large constitutes such as Meta, Apple, and Alphabet continue to produce outsized returns. The fall of SVB created turbulence in the financial sector (-5.6%), while Energy (-4.7%) pulled back from its significant outperformance in 2022.

Second Quarter 2023:

As investor sentiment rose, U.S. (+8.7%), developed international (+3.0%), and emerging market equities (+0.9%) all posted positive returns. Emerging market performance was hindered by continued tensions between the U.S. and China, again resulting in lower returns than developed markets. China suffered a poorer than expected recovery (GDP growth +6.3% compared to the forecasted +7.3%) and the Shanghai Composite Index is only marginally positive year-to-date; however, Korea and Taiwan outperformed overall as technology was strong for the quarter due to the positive sentiment behind artificial intelligence. Japan reported a second straight quarter of economic growth with a rise in GDP of 0.7%, as private consumption rose after strict border controls were lifted; the country produced the highest returns (+6.4%) for the developed international markets as expectations of governance reforms and structural shifts in the economy boosted investor sentiment. The Nikkei 225 Index exceeded 33,700 yen in June, its highest level in 33 years. European markets were able to contribute positive returns (+2.7%) despite late-quarter worries about the EU economy and the continuing pace of the European Central Bank's rate hikes (twice this quarter, 25 basis points each time). However, Eurozone GDP only inched up +0.1% quarter over quarter, the weakest GDP expansion rate since first quarter 2021 – high inflation and increasing rates hit economic performance this quarter. Inflation was also the main driving force behind the speed of rate increases by the global central banks: in addition to the rate hikes by the ECB, the Federal Reserve hikes rates in May by 25 basis points, but then in June announced it would pause interest rate increases after ten consecutive rate hikes. The U.S. policy rate is the highest relative to Eurozone, the United Kingdom, and Japan – therefore, the U.S. dollar again depreciated relative to the Euro, British pound, and yen.

U.S. large cap and emerging market valuations remain above their long-term median, whereas small cap appears cheap relative to the last 20 years. As smaller companies are more dependent on financing, regional banks and higher interest rates continued to hinder their performance. U.S. GDP rose +2.4%, as recession fears come to an end. Consumer spending has pulled back from its high but is still relatively robust. The unemployment rate fluctuated between 3.4% and 3.7%; nonfarm payrolls rose 209,000 in June, showing that the labor market remains strong despite several Federal Reserve rate hikes aimed at slowing the economy to reduce

(Continued)

inflation. Inflation showed signs of slowing, so the Federal Reserve paused interest rate hikes in June. Confidence rose slightly as consumers had a more favorable outlook regarding moderated inflation and paused rate hikes. Growth continued to significantly outperform value, driven by continued enthusiasm for artificial intelligence resulting in positive IT gains (+17.2%).

Third Quarter 2023:

All global equity markets posted negative returns, as the forecast of sustained higher interest rates by the U.S. Federal Reserve withered positive momentum to start the quarter. The U.K. and Japan showed resilience, but not enough to combat the economic worry over higher interest rates in Europe and concerns from China in Asia: the Eurozone growth rate contracted for the second consecutive quarter amid a variety of weakening factors, and Japanese equities were down but relative performance was supported by the weakening yen and strong domestic demand. Energy posted the highest positive return for all global markets, given the recent surge in oil prices. In the emerging markets, most sectors were negative this quarter, but less volatile than counterparts in the developed markets. China again underperformed, as economic issues persisted with property sector issues. The country's GDP grew by +4.9% this quarter due to increased inflation and continuing to face a variety of weakening factors like Europe. The OECD predicts the global economy to grow by 3% in 2023 before slowing a bit to 2.7% in 2024, as headline inflation moderates given higher interest rates. Global unemployment rates have remained steady post-pandemic, with the U.S. unemployment rate ticking minimally higher but remaining near historic lows, the Eurozone rate trending downwards despite regional differences and slightly higher labor force participation, and Japan maintaining the lowest rate among G7 countries largely due to its aging population demographics.

U.S. GDP grew +4.9%, a higher-than-expected rate that was driven by strong consumer spending. Quarterly growth was solidly positive despite persisting recession fears, as the pause in Federal Reserve interest rate hikes led to less robust economic growth. Challenges are still being faced, such as sustained higher interest rates, multiple geopolitical issues, and moderating inflation, however, there is no shortage of economic resilience, including a solid labor market and strong consumer spending. Confidence decreased this quarter due to rising prices. The U.S. dollar strengthened broadly over the third quarter against most G10 currencies, excluding the Norwegian Krone. Investor optimism from the beginning of the quarter dwindled as the realization over sustained higher interest rates to battle inflation settled, resulting in all U.S. equities reporting negative returns for the quarter.

(Continued)

Fourth Quarter 2023:

All global markets posted positive returns (+11.7%, +10.4%, and +7.9% for U.S., Developed International, and Emerging Markets, respectively) as investor sentiment improved globally due to potential interest rate cuts for 2024 signaled by the U.S. Federal Reserve. However, this quarter, global central banks kept interest rates at record highs in anticipation of inflation resurgence. The OECD estimates the global economy grew by a lower than expected 1.6% in 2023 compared to 2.9% in 2022; growth should remain tame in 2024, as headline inflation moderates given the higher interest rates. Europe and Japan produced the highest returns for developed international markets at +11.1% and +8.2% respectively, driven by increasing market expectations. Europe was uplifted by softer inflation numbers in addition to the increasing market expectations, while Japan's returns resulted in one of its strongest years in recent memory. Eurozone growth rate stabilized amid weakening factors, resulting in annual GDP growth at +0.5%. All sectors in developed international equities were positive, with the strongest performers being IT (+21.3%) and Materials (+17.1%). Asian market growth was led by technology stocks. In emerging markets, lack of economic stimulus and the ongoing real estate crisis in China continued to hinder performance across the asset class, delivering lower returns despite Latin America's strong performance of +17.6%. The lag also comes as China continues to detract from the index. However, China's quarterly growth matched the government's targeted total year GDP growth of +5.2%, even with the ongoing real estate crisis sentiment on weaker economic growth, and uncertainty in stimulus measures. Turkey placed the worst performing index as inflation persists over 60%.

U.S. GDP expanded at a higher-than-expected annualized growth rate of 3.3% this quarter, driven by strong consumer spending. This growth, while solidly positive, comes as recession fears persists and the economy is still facing numerous challenges such as sustained higher interest rates (hikes were aimed at cooling inflation), multiple geopolitical issues, and moderating inflation. Strength of consumer demand means the Fed may have more work to do in terms of holding steady the already high interest rates as it seeks to reign in a strong economy. A surge in confidence amid expectations of imminent rate cuts by the Federal Reserve and restored optimism for next year resulted in a rise in the consumer confidence index in December. The unemployment rate held steady at 3.7% – remaining near historical lows – and the average hourly earnings over the past 12 months increased by 4.1%. Energy posted the only negative return at -6.9% as crude oil prices weakened.

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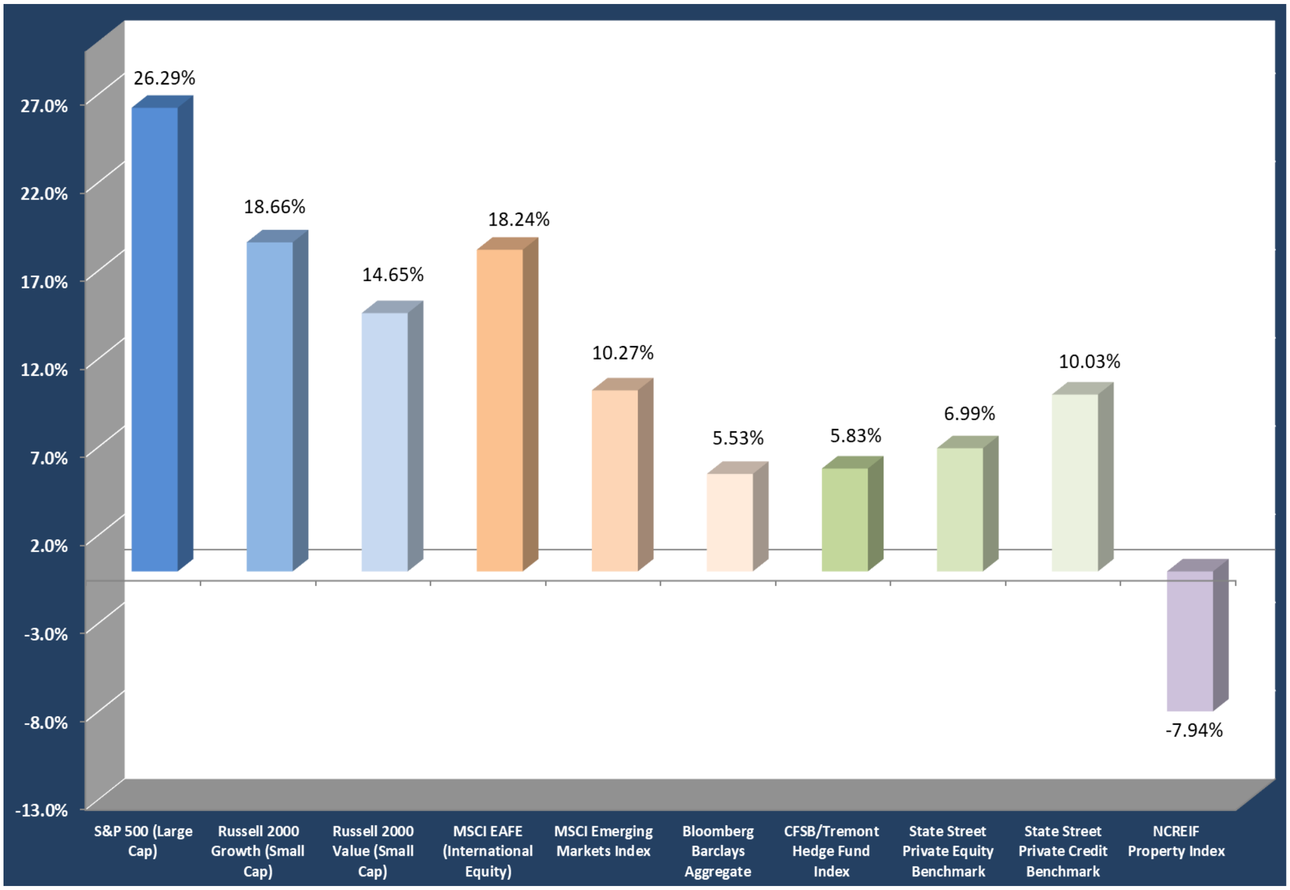
Fiscal Year 2023 Market Indices Returns



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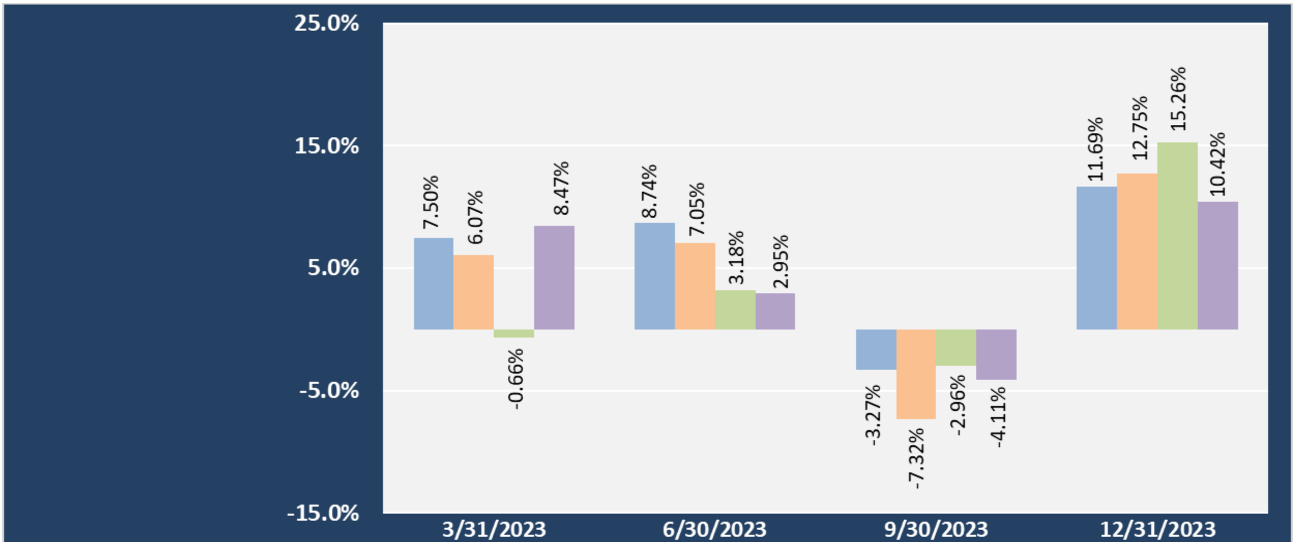
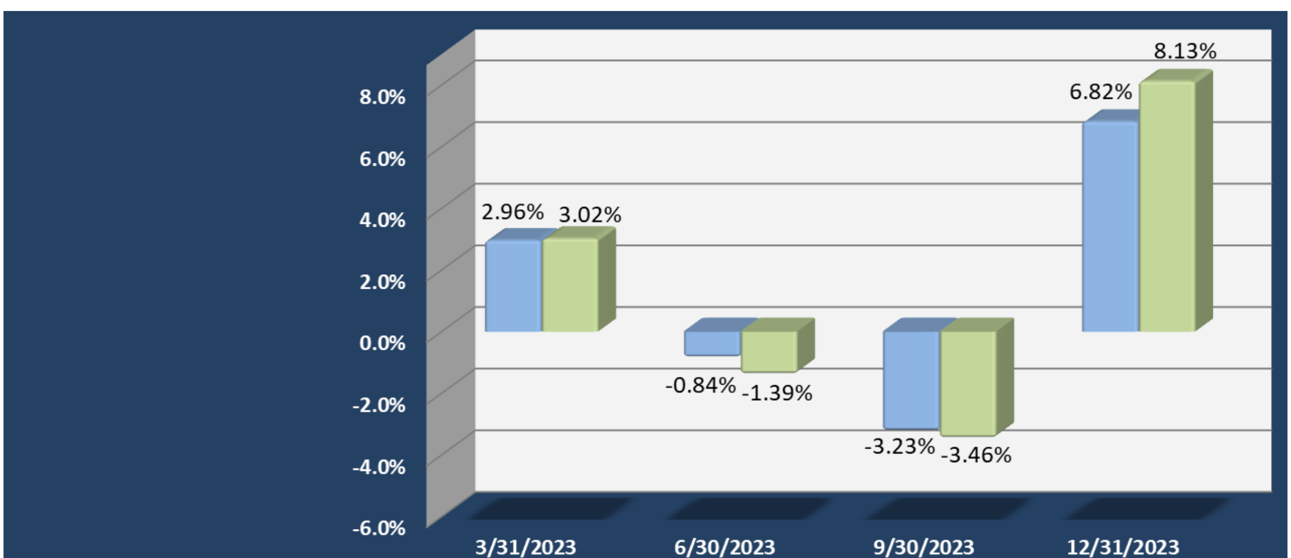
Fiscal Year 2023 Equity Indices by Quarter



	3/31/2023 1st Qtr	6/30/2023 2nd Qtr	9/30/2023 3rd Qtr	12/31/2023 4th Qtr
S&P 500 (Large Cap)	7.50%	8.74%	-3.27%	11.69%
Russell 2000 Growth (Small Cap)	6.07%	7.05%	-7.32%	12.75%
Russell 2000 Value (Small Cap)	-0.66%	3.18%	-2.96%	15.26%
MSCI EAFE (International Equity)	8.47%	2.95%	-4.11%	10.42%

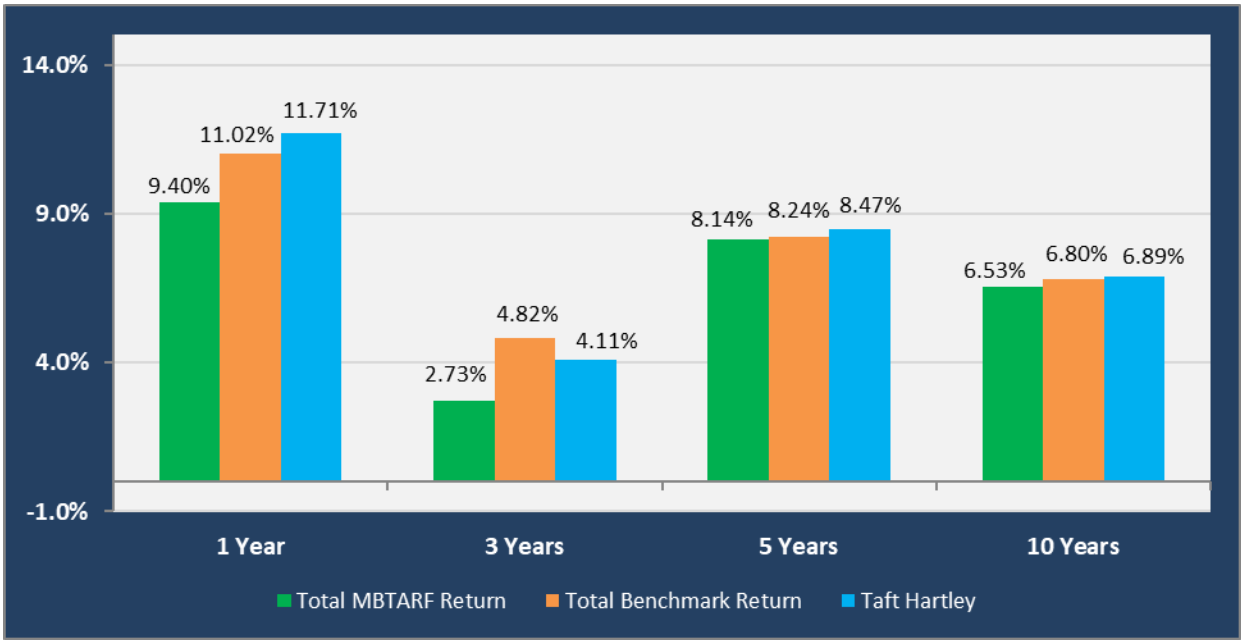
Fiscal Year 2023 Fixed Income Indices by Quarter



	3/31/2023 1st Qtr	6/30/2023 2nd Qtr	9/30/2023 3rd Qtr	12/31/2023 4th Qtr
Bloomberg Barclays Aggregate	2.96%	-0.84%	-3.23%	6.82%
Bloomberg Multiverse Index (Global)	3.02%	-1.39%	-3.46%	8.13%

MBTARF Core Performance: Fiscal Year 2023

Returns are calculated based on a time-weighted rate of return methodology. The chart below depicts the Fund's returns (gross of fees) and benchmarks for the periods ended December 31, 2023:



During fiscal year 2023, the Fund returned 9.40%, underperforming the Policy Benchmark of 11.02% by 162 basis points. The MBTARF began fiscal year 2023 with a net position of $1,622.5 million and ended with a net position of $1,694.4 million. On a gross basis, the Fund increased by $71.9 million. Additionally, $247.2 million in net retirement benefits were dispersed to members of the Fund.

The quarterly returns of the Fund in fiscal year 2023 were as follows:

	MBTARF Return	Policy Benchmark Return
1st Quarter	3.78%	3.57%
2nd Quarter	1.60%	2.62%
3rd Quarter	-2.71%	-1.97%
4th Quarter	6.64%	6.55%

(Continued)

Following a difficult 2022, the markets rebounded in 2023 as nearly all asset classes produced positive returns. In an effort to moderate inflation and suppress fears of a recession, the U.S. Federal Reserve raised rates four times in 2023. The U.S. economy closed the year with strong growth and low unemployment.

Equities had a strong 2023, generating returns ranging from 18.24% for the EAFE index of non-U.S. developed markets stocks to 26.29% and 16.93% for the S&P 500 Index of Large Cap U.S. stocks and Russell 2000 Index of Small Cap U.S. stocks, respectively. Fixed income was also a positive contributor to 2023 returns, as core bond index returns ranged from 13.45% for the Bloomberg U.S. Corporate High Yield index to 5.53% for the Bloomberg Barclays Aggregate Index. Diversified hedge funds also contributed, reporting a gain of 5.83% for the year based on the CFSB/Tremont Hedge Fund Index. Real estate was an outlier in 2023, as the NECREIF Property Index detracted (7.94%).

Although, The MBTA Retirement Fund generated a gross positive return of 9.40% in 2023 it ranked in the 81st percentile of the All-Public Plans greater than $1 Billion Gross Return Universe. The Fund outperformed its long-term investment objective of 7.25%. for the one-year, five-year and since inception periods. The annualized return since inception is 8.98%. The Fund's gross annualized return over the five-year period ended December 2023 was 8.14% and ranked in the top 74% of the All-Public Plans greater than $1 Billion Gross Return Universe. The gross returns for the three and ten-year periods ended December 2023 were 2.73% and 6.53% and ranked in the 89th and 66th percentiles, respectively.

In the 2023 Pension Agreement, the negotiating parties agreed to the PRIT Directive, which instructs the Retirement Board to vote, as soon as practicable, to transfer 50% of the market value of all Fund assets as of April 30, 2023, to the Massachusetts Pension Reserves Investment Trust (PRIT). Subject to the Trustee's meeting their existing fiduciary duties and obligations, the Trustees will use best efforts to effectuate such transfer of increased Fund assets to PRIT within five years of March 31, 2023. The MBTA Retirement Board authorized the following actions in 2023, among others, to position the Fund for long-term risk-adjusted returns, while addressing the Fund's policy framework and cost effectiveness:

- Committed $15 million in the opportunistic asset class to Hamilton Lane Strategic Opportunities Fund VIII.
- After a period on the Watch List due to underperformance, in May 2023, PanAgora, a diversified beta manager, was terminated.
- In June 2023, allocated $5 million dollars to two private credit managers, Ironsides Opportunities Fund II and Venture Lending and Leasing Fund XI.

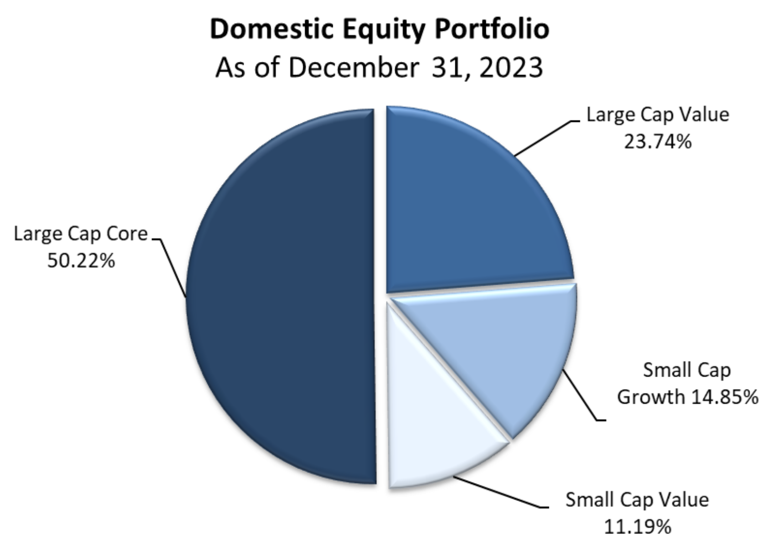
(Continued)

- Terminated global growth manager, Sands Capital Management and reallocate the Funds to PRIM Emerging Markets Equity Segmentation (15%), SSGA Russell 1000 Index (60%), and SSGA MSCI EAFE Index (25%).
- Committed $12.5 million to the PRIM Private Equity Vintage Year 2024 Segmentation Program (PEVY 2024).
- Committed $7.5 million to a new private equity fund with a long-standing investment manager, New Mountain Partners VII.

Investment Summary by Type

Domestic Equity Portfolio

As of December 31, 2023, the domestic equity portfolio had approximately $500.6 million in net positions, which represented 29.78% of the Fund portfolio. Approximately 74% of the domestic equity portfolio is invested in a large capitalization equity strategy (large cap) with the remaining 26% in a small capitalization equity strategy (small cap). The Fund's domestic equity portfolio is actively managed in an attempt to outperform a diverse set of indices. Each investment manager's performance is measured against an assigned index based on the stated investment strategy.



On a three, five and ten-year basis through December 31, 2023, the domestic equity portfolio has returned 7.81%, 14.20% and 10.28% compared to the S&P 500 benchmark, which returned 10.00%, 15.69% and 12.03% respectively.

Style - The Board intends to manage risk and diversify the Fund's portfolio through the selection of money managers with different investment styles and complementary characteristics within each asset class.

Portfolio Risks – Although the performance of equity securities has historically exceeded that of other market assets over an extended period of time, these assets, as all investments, carry the risk of loss of principal and are subject to changing market conditions. The value of equities is not only determined by external market factors, but by the performance of the firms for which these assets legally represent.

(Continued)

Portfolio Returns - During the fiscal year, the domestic equity portfolio produced a return of 21.25% compared to the S&P 500 benchmark 26.29%. Large cap equity managers returned 23.02%, underperforming the benchmark by 3.27%; and small cap equity returned 17.34%, slightly outperforming the Russell 2000 Index by 0.41%. The Fund had one large cap core indexed manager and one small cap value indexed manager. The two active large cap value managers outperformed their benchmark in 2023. The two small cap growth managers, RBC Global Asset Management and Alliance Capital nearly met their benchmark in 2023.

The top ten holdings in the domestic equity portfolio on December 31, 2023, are illustrated below. A complete listing of holdings is available upon request.

Shares	Stock	Fair Value ($000's)	% of fair value
7,404	MICROSOFT CORP	$ 2,784	0.56 %
4,300	ADOBE INC	2,565	0.51
14,608	JPMORGAN CHASE + CO	2,485	0.50
5,200	PARKER HANNIFIN CORP	2,396	0.48
15,300	LENNAR CORP A	2,280	0.46
4,100	MARTIN MARIETTA MATERIALS	2,046	0.41
5,669	BERKSHIRE HATHAWAY INC CL B	2,022	0.40
12,785	WALMART INC	2,016	0.40
5,300	ANSYS INC	1,923	0.38
4,900	AMERIPRISE FINANCIAL INC	1,861	0.37
	Total Top Ten	**$ 22,378**	**4.47%**

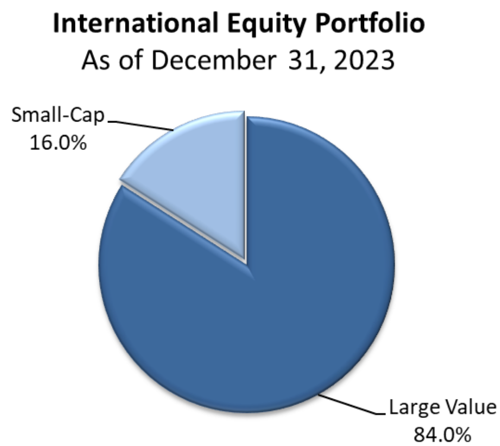
(Continued)

The MBTA Retirement Fund's domestic equity managers on December 31, 2023 are presented in the following table:

Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
Alliance Bernstein	Small Cap Growth	$ 29,102,594
Aristotle Capital Management	Large Cap Value	60,732,796
Boston Partners	Large Cap Value	58,126,411
RBC Global Asset Management	Small Cap Growth	45,260,631
State Street Global Advisors	Small Cap Value	56,024,184
State Street Global Advisors	Large Cap Core	251,380,208
Total Portfolio Fair Value:		**$ 500,626,825**

International Equity Portfolio

As of December 31, 2023, the international equity portfolio had approximately $219.6 million in net positions, representing 13.06% of the Fund portfolio. Two of the three international equity managers are benchmarked against the MSCI EAFE index, which includes the developed markets of Europe, Australia and the Far East. The third international equity manager is benchmarked against the MSCI World Ex US Small Cap index.



The primary strategy is to invest in international equity funds to achieve consistent, positive real returns and to maximize long-term total return within prudent levels of risk through a combination of income and capital appreciation.

Style – The Board intends for a group of managers employing various strategies to invest assets in a well-diversified portfolio of Non-U.S. developed market equity securities. This group consists of a broad range of styles and approaches including: core international products, top-down country selectors, bottom-up security selectors, capitalization ranges, growth and value-oriented products and products using various mixtures of these strategies. Certain investment managers may have a guideline limiting exposure to emerging markets.

Portfolio Risks – International assets are subject to additional risks such as changes in foreign currency exchange markets and the environment in which the trading of these securities and associated financial reporting are governed. Differences between reporting standards across jurisdictions also adds to the complexity of these markets.

Portfolio Returns - During the fiscal year, international equity returned 17.18%, underperforming the MSCI EAFE by 106 basis points. Morgan Stanley was the only international equity manager to underperform their individual benchmark in 2023, missing the mark by 145 basis points.

(Continued)

On a three, five and ten-year basis through December 31, 2023, the international equity portfolio has returned 1.94%, 7.71% and 4.23% compared to the MSCI EAFE benchmark, which returned 4.02%, 8.16% and 4.28% respectively.

Due to the 2023 termination of Sands Capital, the top ten holdings in the international equity portfolio on December 31, 2023 are no longer presented. The only holdings in this portfolio are commingled fund managers as presented in the following table:

	Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
EatonVance Investment Managers	Eaton Vance International Small Cap	Small Cap	$ 35,023,099
Morgan Stanley	Morgan Stanley Investment Management	Large Value	102,942,935
SSgA State Street Global Advisors	SSGA - MSCI EAFE Index	Large Value	81,604,845
	Total Portfolio Fair Value:		**$ 219,570,879**

Global Equity and Emerging Market Portfolio

As of December 31, 2023, the global equity and emerging markets portfolio had approximately $46 million, or 2.74%, of the MBTA Retirement Fund's assets. In 2023, the Board of Directors, terminated global growth manager, Sands Capital Management and reallocate the Funds to PRIM Emerging Markets Equity Segmentation (15%), SSGA Russell 1000 Index (60%), and SSGA MSCI EAFE Index (25%). The Fund measures the remaining PRIM Emerging Market portfolio against the MSCI Emerging Markets Index which captures large and mid-cap representation across 26 emerging markets countries.

Portfolio Composition – PRIM's primary strategy for this portfolio is investing in companies in developing countries, including, but not limited to, China, Brazil, Russia, South Korea, Taiwan, and India. These countries typically have less efficient securities markets, and thus there is opportunity for returns above benchmarks.

Portfolio Risks – In addition to providing the potential for higher expected returns, emerging markets generally expose investors to higher expected risks, due to their susceptibility to more volatile economic conditions, potential political instability and, in some cases, an absence of a mature system of corporate governance. These investments also carry all the risks associated with domestic and developed market investments.

Portfolio Returns - During the fiscal year, the Global Equity and Emerging Markets portfolio returned 30.7%. Although Sands Global Growth was terminated in November 2023, they contributed significantly to the overall 2023 total gross return for this asset class. Through November 2023, Sands YTD return was 24.0%. The manager was ultimately terminated due to their return volatility, which was demonstrated by their 2022 YTD return of (43.03%) and was the largest driver of negative performance in 2022. On a three, five and ten-year basis through December 31, 2023, the global equity and emerging market portfolio has returned (3.68%), 12.16% and 10.32% compared to the MSCI All Country World Index, which returned 1.55%, 7.08% and 3.83% respectively.

(Continued)

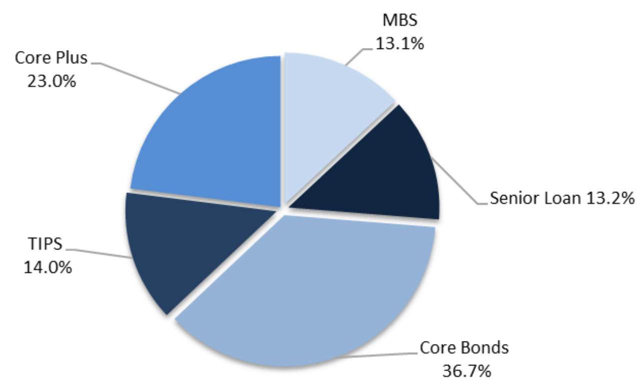
Due to the 2023 termination of Sands Capital, the top ten holdings for the global equity and emerging market portfolio on December 31, 2023 are no longer presented. The only holding in this portfolio is a commingled fund manager which is presented in the following table:

	Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
	Pension Reserves Investment Management	Emerging	$ 45,984,120
	Total Portfolio Fair Value:		**$ 45,984,120**

Fixed Income Portfolio

As of December 31, 2023, the fixed income portfolio had approximately $372.6 million in net positions, which represented 22.16% of the MBTARF portfolio. The Fund's fixed income portfolio is benchmarked against the Barclays Aggregate Bond Index, BC GOV/Credit, BC MBS, S&P/LSTA Leveraged Loan and BC U.S. TIPS.

Fixed Income Portfolio
As of December 31, 2023



Styles - Fixed income managers serve in a specialist role managing debt securities. Domestic core fixed income managers' investments may include (i) U.S. dollar denominated obligations of the United States Government and its Agencies and instrumentalities, as well as U.S. corporations, (ii) mortgage-backed securities including CMOs and commercial mortgage backed securities ("CMBS"), (iii) Asset Backed Securities("ABSs"), (iv) registered 144A securities if applicable, (v) municipal bonds, (vi) short term securities, (vii) securities of foreign companies or foreign countries (sovereigns or supranational) denominated in U.S. dollars, trading in the U.S. markets and capable of settlement in U.S. markets (Yankee bonds) and (viii) dollar denominated obligations of U.S. companies trading outside the U.S. ("Eurobonds").

Portfolio Risk - Risk in bond investments is primarily driven by changing interest rates which cause the value of these investments to fluctuate. The action of the Federal Reserve Bank of the United States through its monetary policy and through the monetary policy of other such institutions significantly affects interest rates. The risk of default is also associated with these investments and is measured by established credit rating firms. Default risks are subject to change.

Portfolio Returns - During the fiscal year, fixed income portfolio returned 7.14% outperforming the Bloomberg Aggregate Bond Index benchmark by 1.61%.

(Continued)

On a three, five and ten-year basis through December 31, 2023, the fixed income portfolio has returned (1.02%), 2.25% and 2.53% compared to the Bloomberg Aggregate Bond Index, which returned (3.31%), 1.1% and 1.81% respectively.

The top ten holdings in the fixed income portfolio on December 31, 2023 are illustrated below. A complete listing of holdings is available upon request.

Shares	Stock		Market Value ($000's)	% of fair value
7,230,000	US TREASURY N/B Due 08/15/2043	Rating NR	$ 7,380	1.98 %
4,200,000	US TREASURY N/B Due 05/15/2053	Rating NR	3,883	1.04
4,065,494	TSY INFL IX N/B Due 01/15/2033	Rating NR	3,846	1.03
3,259,188	TSY INFL IX N/B Due 01/15/2026	Rating NR	3,144	0.84
3,142,000	US TREASURY N/B Due 08/15/2033	Rating NR	3,138	0.84
3,258,269	TSY INFL IX N/B Due 01/15/2029	Rating NR	3,118	0.84
3,258,125	TSY INFL IX N/B Due 01/15/2027	Rating NR	3,096	0.83
3,093,049	TSY INFL IX N/B Due 07/15/2025	Rating NR	2,997	0.80
3,042,000	US TREASURY N/B Due 01/31/2028	Rating NR	2,994	0.80
2,918,439	TSY INFL IX N/B Due 07/15/2028	Rating NR	2,793	0.75
	Total Top Ten		**$ 36,389**	**9.75 %**

(Continued)

The MBTA Retirement Fund's fixed income managers on December 31, 2023 are presented in the following table:

Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
AFL-CIO Housing	MBS	$ 48,705,744
Eaton Vance	Senior Loan	49,154,569
Income Research & Management	Core Bonds	136,720,168
IRM TIPS	TIPS	52,223,874
Loomis, Sayles & Company	Core Plus	85,792,015
Total Portfolio Fair Value:		**$ 372,596,370**

Real Estate Portfolio

As of December 31, 2023, the MBTA Retirement Fund had $139.8 million invested in real estate. The equity real estate program is comprised primarily of two separate but complementary investment strategies – core and specialty. Core investments include property types in multi-family housing, retail, industrial and office buildings. These assets are characterized by stable and increasing income levels and are in major metropolitan areas which exhibit reasonable economic diversification. Specialty investments include property types in hotels, assisted-living and congregate care facilities. Specialty strategies enhance returns of assets capable of, but not currently, exhibiting core type characteristics.

Objective - The MBTA Retirement Fund's allocation to real estate equity is intended to enhance the return, risk and portfolio diversification characteristics of the Fund's total portfolio. It is anticipated that investments in equity real estate will, over a full market cycle, produce an income return that is in excess of the yield of an investment grade, core fixed income investment combined with some level of equity appreciation. In addition, it is expected that equity real estate will exhibit a lower correlation with traditional equity and fixed income securities.

Portfolio Risk - Real estate investments expose investors to risks. which include:

- Market risks that may be exacerbated by real estate's sensitivity to economic conditions and/or by the investment manager's utilization of leverage.
- Lower liquidity, especially for closed end, limited partnership and direct investments.
- Operational and credit risks that are higher than those of traditional investments.
- Valuation and appraisal lag which can be exacerbated in times of rapid price changes in the commercial real estate market.

Leverage – Leverage may be utilized at the discretion of the underlying real estate managers in a constrained manner, consistent with the commingled fund documents, in order to enhance

(Continued)

yields of the various investments and/or facilitate the diversification of the portfolio. The total level of debt for any single commingled fund investment is not expected to exceed 70% of the value of that fund. However, as a general guideline, the Fund's composite real estate portfolio shall never be more than 50% levered on an aggregate basis at any time.

Real Estate Investment Strategies - Private real estate equity strategies include core, core plus, value-added and opportunistic approaches. Core diversified funds have lower risk due to their limited use of leverage and broad diversification across multiple property types, geographic regions and income generating assets (most properties in core portfolios are fully leased and generating income). Further out on the risk and return continuum, core plus, value-added and opportunistic funds have lower occupancy rates, utilize more leverage and include properties in the development and/or pre-development stage. Due to their higher risk, these strategies are expected to generate returns that exceed that of core real estate.

Open-ended and closed-end real estate investments are diversified by vintage year, investment manager, geographic region, property type and investment strategy. With respect to vintage year diversification, closed end funds are diversified due to the fact that they are designed to invest over specific, finite time periods, while open-end funds are diversified by definition (i.e. by virtue of always being open and investing in all time periods).

Investment Strategy Allocations - Of the MBTA Retirement Fund's three active closed-end real estate funds, there are no funds are in the investing stage of their lifecycle; two funds accounting for $13.2 million in fair value are in the harvesting stage, while one fund accounting for approximately $750 thousand in fair value is liquidating its underlying investments.

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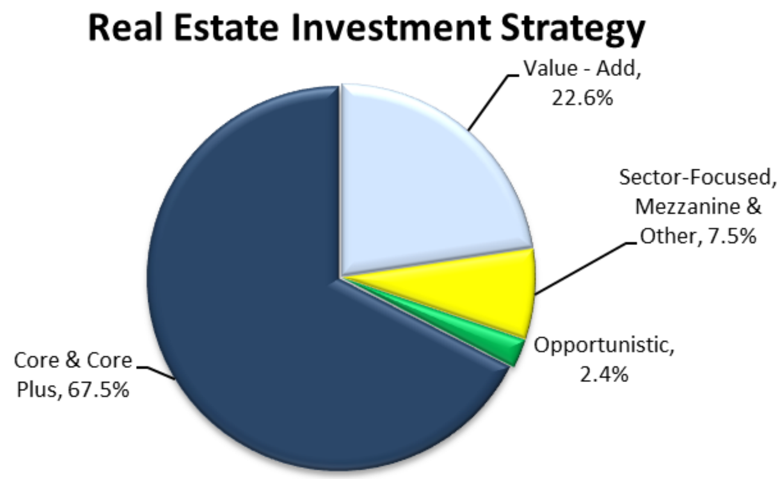
The MBTA Retirement Fund's investment strategy is diversified across closed and open-end funds as follows:



Portfolio Returns – The MBTARF real estate portfolio returned (17.89%) during the year. The 3, 5 and 10-year returns for the real estate portfolio are 0.44%, 1.70% and 6.82%, respectively. The NCREIF Benchmark returned (7.94%) during the fiscal year. The benchmark's 3, 5, and 10-year returns are 4.57%, 4.33% and 6.80%, respectively.

The MBTARF real estate portfolio received $3.6 million in distributions during the year-ending December 31, 2023, compared to the $14.2 million in distributions received during 2022. The Fund submitted a full redemption to MEPT in 2022 and received partial redemption payments in 2023 totaling approximately $840 thousand. The MBTARF's real estate managers did not call any capital during 2023, compared to $0.7 million of capital called during 2022. The decrease in investing with open-ended managers and no new allocations to closed-end funds, both contributed to the low capital called figure for 2023. The net cash flow from the MBTARF's real estate portfolio for the year ended December 31, 2023 was an inflow of $3.6 million, compared to a net inflow of $13.5 million for 2022.

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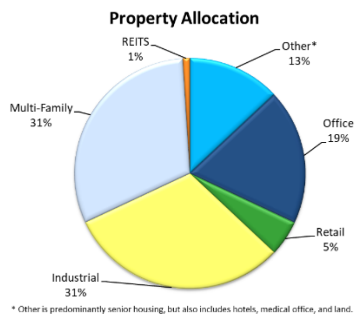
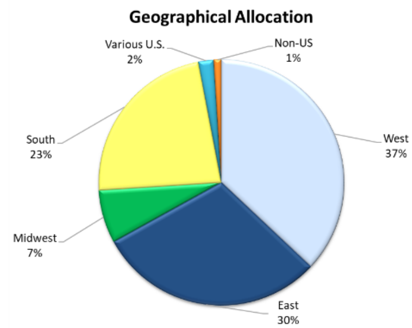
Geographic Diversification

The following charts illustrate the property type and geographic diversification of the closed end real estate portfolio:





The MBTA Retirement Fund Real Estate managers on December 31, 2023 are presented in the following table:

	Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
AFL-CIO BUILDING INVESTMENT TRUST	AFL CIO BLDG INVST TR	Open Ended	$ 9,890,903
INTERCONTINENTAL REAL ESTATE CORPORATION	INTERCONTINENAL REAL ESTATE CORP	Open Ended	12,120,721
J.P.Morgan Asset Management	JP MORGAN ASSET MANAGEMENT	Open Ended	31,658,459
BentallGreenOak Residential Services	BENTALL GREEN OAK	Open Ended	40,170,488
PENSION RESERVES INVESTMENT MANAGEMENT BOARD	PRIM REAL ESTATE SEGMENTATION	Open Ended	17,298,979
Prudential Real Estate Investors	PRUDENTIAL REAL ESTATE INVESTORS	Sector Focused	10,527,500
SIGULER GUFF	SIGULER GUFF & COMPANY	Opportunistic	3,391,518
TA REALTY	TA REALTY CORE PROPERTY FUND	Open Ended	14,733,442
	Total Portfolio Fair Value:		**$ 139,792,010**

Risk Parity / Diversified Beta Portfolio:

As of December 31, 2023, the MBTA Retirement Fund had $51.9 million invested in the risk parity portfolio, representing 3.09% of the total Fund. The Risk Parity manager utilizes a risk premium capture strategy that seeks to generate returns by investing in equity, bond and commodity markets using a risk-balanced investment process. Specifically, the managers select the appropriate assets for the strategy, allocate them based on their proprietary risk management and portfolio construction techniques, and then applies an active position process to improve expected returns.

The MBTA Retirement Fund invests in Risk Parity / Diversified Beta products because it provides the Fund with diversification and attractive returns. Additionally, the strategy provides daily liquidity, no lock-up, high capacity and high transparency, all of which are attractive qualities for the Fund.

Portfolio Risks - Investments in Risk Parity / Diversified Beta are subject to various risks, including derivatives and leverage risk. Risk Parity managers may invest a substantial portion of their assets in “derivatives” because their value “derives” from the value of an underlying asset, reference rate or index, the value of which may rise or fall more rapidly than other investments. The strategy invests principally in exchange-traded futures across a diverse mix of assets including equities, bonds and commodities. For some derivatives, it is possible to lose more than the amount invested in the derivative. If the portfolio uses derivatives to “hedge” a portfolio risk, it is possible that the hedge may not succeed and may result in unexpected changes in the value of the rest of the portfolio. Over the counter derivatives are also subject to counterparty risk, which is the risk that the other party to the contract will not fulfill its contractual obligation to complete the transaction with the Fund. The implementation of a risk parity strategy requires the use of leverage to increase the risk of the government bond allocation in the strategy so that it can be balanced against the portfolio’s exposure to stocks and commodities.

(Continued)

The use of derivatives facilitates the ability to create the desired exposure of leverage in the portfolio. Leverage may cause the portfolio to be more volatile than if the portfolio had not been leveraged because it can exaggerate the effect of any increase or decrease in the value of securities held by the portfolio.

Portfolio Returns - For the calendar year 2023, the Risk Parity / Diversified Beta portfolio returned 6.92% underperforming the asset class benchmark (60% MSCI World Equity / 40% Barclays Aggregate Bond Index) by 9.35%.

On a three, five and ten-year basis through December 31, 2023, the Risk Parity / Diversified Beta portfolio has returned (-1.88%), 4.72% and 4.40% compared to its benchmark, which returned 3.11%, 8.31% and 6.08% respectively. In May 2023, the Board voted to terminate risk parity manager, PanAgora. The manager's long-term underperformance, along with potential future asset allocation changes for the Fund, and the Fund's review of PanAgora's proposed changes to the PPM all led to the Board's decision for a full liquidation from this manager.

The MBTA Retirement Fund's Risk Parity / Diversified Beta manager on December 31, 2023 is presented in the following table:

	Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
Invesco	Invesco	Diversified Beta	$ 51,932,671
	Total Portfolio Fair Value:		**$ 51,932,671**

Fund of Hedge Fund Portfolio

As of December 31, 2023, the MBTARF's fund of hedge fund portfolio held $73.2 million in net positions, which represented 4.35% of the total MBTARF portfolio. The objective of the MBTARF's hedge fund program is to reduce the volatility of the total fund while attempting to maximize returns in a variety of market conditions. As a group of strategies, hedge funds represent a broad set of investment styles, mandates and products that focus primarily on the liquid equity, fixed income and derivatives markets. This may also include allocations to non-traditional investments, including illiquid securities and investments. There are two primary methods for investing in hedge funds, funds of hedge funds and single manager funds. The MBTARF primarily utilizes funds of hedge funds in an effort to significantly reduce risk through diversification.

Portfolio Risks - Hedge Funds are subject to various risks inherent in this strategy. Fluctuations in the markets can create market risk and credit risk is due to the fixed income nature of hedge fund strategies. As the MBTARF is invested in fund of fund strategies, liquidity risk is present as managers unwind from underlying positions. Investing in hedge funds exposes operational risks in executing strategies and valuations of positions. The Fund monitors risk by enforcing the investment managers to provide exceptional levels of transparency.

Portfolio Returns - The MBTARF's fund of hedge fund portfolio returned 10.44% for the fiscal year. The MBTARF uses the CSFB/Tremont Hedge Fund Index as a benchmark for hedge fund performance. The benchmark returned 5.83% in the 2023 fiscal year. On a 3, 5 and 10-year basis, the MBTARF hedge fund portfolio returned 5.18%, 7.01% and 2.61%, respectively. The benchmark returned 5.00%, 6.12% and 3.87%, respectively, over the same 3, 5 and 10-year periods.

(Continued)

The MBTARF hedge fund portfolio has one active fund of hedge fund investment manager as of December 31, 2023.

Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
Pension Reserves Investment Management	Fund of Funds	$ 73,171,290
Total Portfolio Fair Value:		**$ 73,171,290**

Fund of Hedge Fund - Opportunistic Portfolio

As of December 31, 2023, the MBTARF's fund of hedge fund - opportunistic portfolio held $30.5 million in net positions, which represented 1.81% of the total MBTARF portfolio. While descriptions vary across investors, opportunistic investments generally encompass non-traditional investment strategies that seek to generate risk-adjusted returns by taking advantage of temporary market inefficiencies or dislocations arising from evolving market conditions, regulatory changes and other factors. Opportunistic investments generally do not fit into other asset class or strategy descriptions and may be viewed as tactical and time constrained. As compared to multi-strategy hedge funds, opportunistic investments generally exhibit higher expected returns, greater market risk, less liquidity and a higher level of concentration. Opportunistic managers may invest across asset classes (e.g. equity, debt, alternatives) and offer funds in different vehicles. Opportunistic investments may also come in the form of hedge funds or long-only investment strategies.

Portfolio Risks – Opportunistic Hedge Funds are subject to various risks inherent in this strategy. Depending on what form they take, opportunistic investments may expose an investor to a range of risks. These include:

- Market risks that impact the underlying value of investments held in underlying equity, fixed income and alternative investments.
- Market risks may include equity, interest rate or currency exchange rate risk and may be impacted by macroeconomic factors such as inflation expectation.
- Credit risk attributable to fixed income securities or private debt investments.
- Liquidity risks, especially for closed-end, limited partnership and direct investments.
- Operational risks related to valuation processes, transaction processing, compliance, financial reporting and service providers.

(Continued)

Portfolio Returns - The MBTARF's opportunistic fund of hedge fund portfolio returned 11.22% for fiscal year 2023. The 3 and 5-year returns for the opportunistic fund of hedge fund portfolio is 6.66% and 9.48% respectively. The MBTARF uses the Bank of America/Merrill Lynch High Yield Index as a benchmark for performance, which returned 13.46% in 2023, and returned 2.00% and 5.21% for the 3 and 5-year periods. The first full year the MBTA Retirement Fund began investing in this asset class was 2018, due to this, the 10-year returns are not yet available.

The MBTARF opportunistic hedge fund of fund portfolio held three active investments with one manager as of December 31, 2023. The manager is presented in the following table:

	Manager	Investment Mandate	Portfolio Fair Value @ 12-31-2023
Hamilton Lane	Hamilton Lane	Fund of Funds - Opportunistic	$ 30,513,394
	Total Portfolio Fair Value:		**$ 30,513,394**

Private Equity Portfolio

As of December 31, 2023, the private equity portfolio had approximately $150.4 million in net positions, which represented 8.94% of the MBTARF portfolio. The private equity portfolio is used to increase the expected long-term return of the MBTARF portfolio, while generating cash flow and providing diversification. The private equity portfolio is diversified among sub-classes, which include venture capital, growth equity, buyouts, secondary strategies, distressed, energy and special situations. The MBTARF private equity portfolio is benchmarked to a State Street Customized Benchmark, which takes into account the portfolio's allocations to the various private equity sub-classes.

Portfolio Risks - Private equity does not lend itself to traditional quantitative measures of risk. Rather, risk is measured through a combination of quantitative and qualitative constraints. These risks include, but are not limited to, the following:

- ***Liquidity risk***: Private equity investments are illiquid and typically have expected holding periods of 10-12 years. Investments are typically held until maturity and selling prior to maturity results in a discount to fair value. Liquidity risk is managed by minimizing the possibility of forced sales that may arise from exceeding maximum exposure limits or lowering asset allocation exposure limits.
- ***Vintage risk***: Vintage reflects the year of the first capital draw from a fund. Vintage risk refers to the variability of private equity commitments over time and is minimized by pacing investments to provide vintage year diversification.
- ***Manager risk***: Manager risk consists of two elements - the exposure within an investment vehicle, and the number of managers in the private equity program. The exposure to a specific manager within an investment vehicle is controlled by limiting the commitment size to a specific investment vehicle. The optimum number of managers in the portfolio varies with time.
- ***Firm risk***: Firm risk is the exposure to a private equity firm and is controlled by limiting the maximum commitment to funds actively managed by a firm and its affiliates.

(Continued)

- ***Currency risk***: Currency risk is the risk that investments held in a foreign currency will change in value as a result of changes in the currency exchange rates. The private equity program accepts the currency risks consistent with the geographic constraints of the investment opportunity. Private equity investments generally do not hedge currency risk and the private equity program does not implement currency hedges.
- ***Industry risk***: Typically, private equity funds are permitted to invest in a wide variety of industries with limited controls. Industry risk is controlled primarily through appropriate diversification across strategies and sub-strategies.
- ***Geographic risk***: Geographic risk is controlled through a long-term, international target exposure. Global opportunities generally indicate geographic limits and exposure will be attributed and monitored accordingly.
- ***Leverage risk***: Private equity managers invest capital throughout the capital structure of portfolio companies. The capital markets control the maximum leverage available to the private equity managers. Investors control leverage exposure through portfolio construction and private equity fund selection.

Portfolio Returns - The MBTARF's private equity portfolio returned (2.08%) during the fiscal year. The 3, 5 and 10-year returns for the private equity portfolio are 8.67%, 13.17% and 8.74%, respectively. The MBTARF's State Street Private Equity Benchmark returned 6.99% during the fiscal year. The benchmark's 3, 5 and 10-year returns are 11.48%, 14.64% and 12.39%, respectively. In April 2020, per the asset allocation, private credit was separated from the private equity portfolio. Due to this, the 5 and 10-year returns include both private equity and private credit funds while the 1 and 3-year return reflects only private equity.

The MBTARF private equity portfolio received $15.8 million in distributions during the fiscal year 2023, compared to $16.4 million in the 2022 fiscal year. The private equity portfolio managers called $22.8 million of capital during the fiscal year 2023, compared to $17.8 million called in the 2022 fiscal year. The net cash flow from the private equity portfolio was an outflow of $7 million in fiscal year 2023, compared to an outflow of $1.4 million in fiscal year 2022.

(Continued)

The MBTA Retirement Fund's active private equity investment managers are reported in the summary below:

Manager	Investment Mandate	Portfolio Fair Value 12-31-2022	Manager	Investment Mandate	Portfolio Fair Value 12-31-2022
EUROPEAN STRATEGIC PARTNERS II	Buyout	33,406	PRIT PEVY 2020 VINTAGE	Secondary Fund of Funds	22,801,598
EUROPEAN STRATEGIC PARTNERS 2006B	Buyout	594,700	PRIT PEVY 2021 VINTAGE	Secondary Fund of Funds	14,388,127
EUROPEAN STRATEGIC PARTNERS 2008A	Buyout	39,440	PRIT PEVY 2022 VINTAGE	Secondary Fund of Funds	2,724,318
GROSVENOR OPPOR CREDIT III	Special Situations	195,216	PRIT PEVY 2023 VINTAGE	Secondary Fund of Funds	920,363
LEXINGTON CAPITAL PARTNERS VIB	Secondary Fund of Funds	52,854	LAVIEN (aka Quadrangle Capital Partners II)	Buyout	106,279
LEXINGTON CAPITAL PARTNERS VII	Secondary Fund of Funds	1,018,325	SCP PARTNERS II	Venture	594,036
LEXINGTON CAPITAL PARTNERS VIII	Secondary Fund of Funds	5,853,722	SIGULER GUFF BRIC OPPN FDII	Buyout	429,343
LEXINGTON CAPITAL PARTNERS IX	Secondary Fund of Funds	10,128,737	SL CAPITAL ESF I	Buyout	2,103,654
LEXINGTON CAPITAL PARTNERS X	Secondary Fund of Funds	3,634,754	SL CAPITAL SOF II	Secondary Fund of Funds	34,674
LEXINGTON MIDDLE MARKET II	Secondary Fund of Funds	1,402,364	STERLING CAPITAL PARTNERS	Growth Equity	112,320
LEXINGTON MIDDLE MARKET III	Secondary Fund of Funds	4,675,998	STERLING CAPITAL PARTNERS II	Growth Equity	155,119
LEXINGTON MIDDLE MARKET	Secondary Fund of Funds	13,660	STERLING CAPITAL PARTNERS III	Growth Equity	23,726
LEXINGTON MIDDLE MARKET IV	Secondary Fund of Funds	9,138,171	STERLING CAPITAL PARTNERS IV	Growth Equity	813,784
NEW MOUNTAIN PARTNERS III	Buyout	198,038	SVB STRATEGIC INVESTORS VIII	Venture	10,755,695
NEW MOUNTAIN PARTNERS IV	Buyout	1,304,630	SVB CAPITAL PARTNERS II	Venture	246,154
NEW MOUNTAIN PARTNERS V	Buyout	12,140,493	SVB CAPITAL PARTNERS III	Venture	4,232,399
NEW MOUNTAIN PARTNERS VI	Buyout	7,231,780	SVB STRATEGIC INVESTORS III	Venture	2,227,438
OPUS CAPITAL VENTURE PARTNERS V	Venture	2,839,531	TOP TIER VENTURE VELOCITY FUND	Secondary Fund of Funds	2,504,820
PHAROS CAPITAL PARTNERS	Growth Equity	1,154,280	TOP TIER VENTURE VELOCITY FUND IV	Secondary Fund of Funds	4,595,428
PHAROS CAPITAL PARTNERS II	Growth Equity	6,024,560	WELLINGTON PARTNERS II	Venture	837,009
PHAROS CAPITAL PARTNERS III	Growth Equity	4,089,678	WLR RECOVERY FUND V	Special Situations	1,313,544
			Z CAPITAL SPECIAL SIT. FD II	Special Situations	6,693,669
			Total Portfolio Fair Value		**$ 150,377,834**

Private Credit Portfolio

As of December 31, 2023, the private credit portfolio had approximately $31.4 million in net positions, which represented 1.87% of the MBTARF portfolio. The private credit portfolio is used to increase the expected long-term return of the MBTARF portfolio, while generating cash flow and providing diversification. Private credit is a way for businesses to raise capital, where an investor lends money in exchange for interest payments. The investor can impose covenants, warrants and/or collateralization to secure the loan. As a comparison, private equity is when the investor owns all or part of the company.

In April 2020, per the asset allocation, the Fund separated performance and reporting for the private credit strategy from the private equity portfolio. As of December 31, 2023, the MBTA Retirement Fund's private credit strategy has 12 limited partnerships. The MBTARF private credit portfolio is benchmarked to a State Street Private Credit Benchmark.

Portfolio Risks - Private credit does not lend itself to traditional quantitative measures of risk. Rather, risk is measured through a combination of quantitative and qualitative constraints. These risks include, but are not limited to, the nonpayment of scheduled interest and principal payments on a debt investment. If a borrower fails to make a payment, or default, this may affect the overall return to the lender. Private credit investments are generally illiquid and require longer investment horizons. The typical lifespan of an MBTARF investment in private credit can range between 8-12 years.

Portfolio Returns - The MBTARF's active private credit portfolio returned 5.12% during the fiscal year and 20.99% for the three-year period ending December 31, 2023. The MBTARF's State Street PEI Mezzanine - Special Situations Benchmark returned 10.03% during the fiscal year and 12.44% for three-year period. The MBTARF began separating out private credit from private equity in 2021, due to this, the 5 and 10-year returns are not yet available.

(Continued)

The MBTARF private credit portfolio received $4.5 million in distributions during the fiscal year 2023, compared to $3.1 million received in 2022. The private credit portfolio managers called $6.8 million of capital during the fiscal year 2023, compared to $8.4 million called in 2022. The net cash flow from the private credit portfolio was an outflow of $2.4 million in fiscal year 2023, compared to an outflow of $5.3 million in 2022. The main driver of the 2023 cash flow was the funding of Neuberger Berman, along with the new investments in Ironsides Opportunities Fund II and WTI X.

The MBTA Retirement Fund's active private credit investment managers are reported in the summary below:

Manager	Investment Mandate	Portfolio Fair Value 12-31-2023
CRESCENT MEZZ PARTNERS VIIB	Mezzanine	$ 2,842,164
IRONSIDES OPP FUND II	Mezzanine	1,528,557
NEUBERGER BERMAN FUND IV	Mezzanine	6,271,973
OAKTREE MEZZANINE FUND - CLASS A	Mezzanine	1,010
OAKTREE MEZZANINE FUND - CLASS B	Mezzanine	4,686
VENTURE LENDING + LEASING IV	Mezzanine	43,050
VENTURE LENDING + LEASING IX	Mezzanine	6,409,050
VENTURE LENDING + LEASING V	Mezzanine	207,450
VENTURE LENDING + LEASING VI	Mezzanine	1,526,104
VENTURE LENDING + LEASING VII	Mezzanine	2,856,225
VENTURE LENDING + LEASING VIII	Mezzanine	3,563,207
WTI FUND X	Mezzanine	6,124,034
Total Portfolio Fair Value		**$ 31,377,510**

SCHEDULE OF TIME-WEIGHTED RETURNS BY ASSET CLASS*

For the Period Ended December 31, 2023

	Annualized Returns		Annual Returns				
Portfolio	3 - Year	5 - Year	2023	2022	2021	2020	2019
Total Fund	2.73	8.14	9.40	(12.97)	13.88	15.26	18.36
Policy Benchmark	4.82	8.24	11.02	(8.32)	13.52	10.64	16.29
Taft Hartley - Median	4.11	8.47	11.71	(11.00)	14.60	11.50	18.10
Domestic Equity Large Cap Composite	9.62	15.06	23.02	(15.80)	27.17	17.27	30.55
S&P 500 Index	10.00	15.69	26.29	(18.11)	28.71	18.40	31.49
Domestic Equity Small Cap Composite	3.79	12.20	17.34	(22.31)	22.63	23.15	29.15
Russell 2000 Growth Index	(3.50)	9.22	18.66	(26.36)	2.84	34.63	28.48
Russell 2000 Value Index	7.94	10.00	14.65	(14.48)	28.27	4.63	22.39
Global Emerging Markets Composite	(3.68)	12.16	30.70	(36.96)	8.47	49.72	31.95
MSCI ALL Country World	1.55	7.08	15.62	(18.36)	18.54	16.26	26.60
International Equity Composite	1.94	7.71	17.18	(16.90)	8.77	11.32	22.93
MSCI EAFE	4.02	8.16	18.24	(14.45)	11.26	7.82	22.02
Fixed Income Composite	(1.02)	2.25	7.14	(10.26)	0.86	7.66	7.08
Bloomberg Aggregate	(3.31)	1.10	5.53	(13.01)	(1.54)	7.51	8.72
Diversified Beta	(1.88)	4.72	6.92	(19.55)	9.82	12.30	18.73
60% MSCI World Eq / 40% BC Agg Bond	3.11	8.31	16.27	(15.85)	12.05	13.31	20.01
Hedge Funds	5.18	7.01	10.44	(2.51)	8.06	4.76	15.12
CSFB/Tremont Hedge Fund Index	5.00	6.12	5.83	1.06	8.23	6.36	9.31
Hedge Funds - Opportunistic	6.66	9.48	11.22	(0.68)	9.85	11.47	16.25
Bank of America/Merrill Lynch HY Index	2.00	5.21	13.46	(11.22)	5.36	6.17	14.41
Private Equity Composite	8.67	13.17	(2.08)	(0.53)	31.74	31.10	13.68
State Street Private Equity Benchmark	11.48	14.64	6.99	(5.47)	49.22	9.27	12.38
Private Credit Composite	20.99	-	5.12	7.86	56.20	-	-
State Street Private Credit Benchmark	12.44	-	10.03	3.00	25.30	-	-
Real Estate Composite	0.44	1.70	(17.89)	3.85	18.83	1.19	6.11
NCREIF Property Index	4.57	4.33	(7.94)	5.53	17.70	1.60	6.42

Policy Benchmark:

17% S&P 500	6% BBG Barclays Multiuniverse
7% Russell 2000	3% BBG Barclays MBS
9% MSCI EAFE	8% State Street PE Index
2% MSCI World EX US Small Cap	2% State Street Private Credit
4% MSCI AC World Index Net	7% 91 T-Bill One Month Lag Plus 300BP
4% MSCI Emerging Markets Index	9% NCREIF Property Index quarter lag
3% BBG Barclays US TIPS 1-10 year	6% 91 T-Bill Pluss 300BP
8% BBG Barclays Aggregate	2% ICE BoFA US 3-Month T-Bill
3% S&P/LSTA	

* All return information is gross of fees. Returns are calculated on a time-weighted rate of return methodology.

Investment Summary at Fair Value

As of December 31, 2023

	Fair Value	% of Fair Value
Short-Term:		
Cash and cash equivalents*	$ 58,413,648	3.47 %
Fixed Income:		
U.S. Agencies	2,762,771	0.16
US Treasury	91,584,398	5.45
Domestic fixed income	215,486,535	12.82
International fixed income	2,723,533	0.16
Asset Backed	66,528,666	3.96
Equity:		
Domestic equity securities	501,075,238	29.90
International equity securities	265,554,999	15.89
Real Estate	139,792,010	8.13
Private Equity & Private Credit	181,755,342	10.81
Risk Parity	51,932,671	3.09
Hedge Funds	73,171,290	4.35
Hedge Funds - Opportunistic	30,513,394	1.81
Total Investments	$ 1,681,294,495	100.00 %

*Investment manager's cash holdings are reported in cash and cash equivalents

SUMMARY SCHEDULE OF BROKER COMMISSION

(Top 25 Brokers and Cumulative Fees Paid to Others)

Year Ended December 31, 2023

Brokerage Firm	Shares/Par Value	Fees Paid	% Total	Average $ per share
MORGAN STANLEY CO INCORPORATED	17,766,831	$13,276	14.61%	0.0007
J P MORGAN SECURITIES INC	123,898	12,711	13.99%	0.1026
BOFA SECURITIES, INC.	941,507	6,648	7.32%	0.0071
GOLDMAN SACHS + CO LLC	3,984,057,976	5,905	6.50%	0.0000
MACQUARIESECURITIES (INDIA) PVT LTD	233,225	5,626	6.19%	0.0241
STATE STREET BANK AND TRUST COMPANY	455,219	4,552	5.01%	0.0100
CITIBANK N.A.	21,743	3,091	3.40%	0.1422
JEFFERIESLLC	1,421,144	2,934	3.23%	0.0021
RBC CAPITAL MARKETS LLC	106,037	2,880	3.17%	0.0272
WILLIAM BLAIR & COMPANY L.L.C	84,465	2,258	2.49%	0.0267
J.P. MORGAN SECURITIES LLC	17,323,293	2,099	2.31%	0.0001
CITIBANK INTERNATIONAL PLC	3,256	1,944	2.14%	0.5969
UBS AG	67,248	1,930	2.12%	0.0287
NATIONAL FINANCIAL SERVICES CORPORATION	151,215	1,922	2.12%	0.0127
BOFA SECURITIES, INC	64,934	1,718	1.89%	0.0265
BARCLAYS CAPITAL INC./LE	80,625	1,550	1.71%	0.0192
UBS SECURITIES LLC	706,373	1,454	1.60%	0.0021
CREDIT SUISSE SECURITIES (USA) LLC	1,293,318	1,180	1.30%	0.0009
PERSHING LLC	7,720,441	1,145	1.26%	0.0001
BARCLAYS CAPITAL	50,746	1,105	1.22%	0.0218
NATIONAL FINANCIAL SERVICES LLC	38,951	1,052	1.16%	0.0270
STOCK DISTRIBUTION	34,964	874	0.96%	0.0250
ITAU CORRETORA VALOR	24,072	874	0.96%	0.0363
LIQUIDNETEUROPE LIMITED	73,882	788	0.87%	0.0107
LIQUIDNETINC	25,251	678	0.75%	0.0269
OTHER	1,911,122,475	10,655	11.73%	0.0000
TOTAL	**5,943,993,090**	**$ 90,844**	**100%**	**0.0000**

The Fund Board has a commission recapture agreement with Capital Institutional Services, Inc. For the year ended December 31, 2023, the Fund earned approximately $2,740 from the commission recapture program.

SCHEDULE OF DIRECT MANAGEMENT FEES

Year Ended December 31, 2023

Investment Management Fees by Asset Class:	**AUM ($000s)**	**Fees ($000s)**
Domestic Equity	$ 500,627	$ 1,317
International Equity	219,571	573
Global Equity	45,984	492
Fixed Income	372,596	670
Risk Parity / Diversified Beta	51,933	187
Alternative Asset Classes	424,358	36
Total Investment Management Fees		**$ 3,275**
Investment Advisory (Consulting) Fees		$ 344
Communications and Governmental Services		157
Custodian Fees		688
Total Other Fees		**$ 1,189**
Total Direct Management Fees charged to MBTARF		**$ 4,464**

INVESTMENT POLICY STATEMENT

The following are significant fundamentals of the Fund's Investment Policy Statement. The policy delineates the objectives and policies that have been established by the Board to provide a framework for the on-going management of the Fund. It is designed to clearly communicate the directives of the Board to all interested parties. The Policy shall be revised from time to time, as deemed necessary, and will be reviewed annually to ensure its relevance to the Fund's current needs. Any resulting material changes will be communicated to all affected parties. The Policy will apply to the Fund on an aggregate basis.

The purpose of this Investment Policy Statement ("IPS") is to enumerate for stakeholders clear and concise guidelines by which the Retirement Board administers the Fund. This IPS is designed to allow sufficient flexibility to capture investment opportunities while providing guidance to facilitate compliance with the governing documents of the Fund and Massachusetts law. The Retirement Board periodically reviews this IPS to ensure that it conforms with the best practices applicable to the Fund.

In fulfilling the mission of the Trust, the objective of the Retirement Board is to ensure the availability of sufficient assets to pay benefits by achieving the highest level of investment performance compatible with acceptable levels of risk in a cost-effective manner and prudent investment practices. Specifically, in order to maintain if not improve upon its funded status, the Retirement Board seeks to meet or exceed the actuarial target rate of return. Maintaining, if not exceeding, the Assumed Rate of Return should have the benefit of stabilizing employer and employee contributions to the Fund. The Fund shall have a risk tolerance consistent with that of other funds created for similar purposes, and the assets of the Fund shall be invested accordingly. The Fund has adopted a Risk Management Framework. As a mature defined benefit plan, the Fund will have a negative cash flow as more participants retire, which, in turn, impacts the Fund's tolerance for market volatility.

The Fund's investment program is based on the precepts of the generally accepted capital markets theory followed by institutional investors who, by definition, are long-term-oriented investors with goals and objectives that are similar to the Fund. This philosophy holds that:

- Increasing risk is rewarded with compensating returns over time and therefore, prudent risk-taking is justifiable for long-term investors.
- Risk can be mitigated through diversification of asset class exposure, implementation strategies and individual security holdings.

(Continued)

- Diversification benefits shall be measured by examining the correlation between asset classes, implementation strategies and manager styles, with a goal of maximizing diversification and limiting concentration and overlap in asset classes and strategies that are more highly correlated.
- The primary determinant of long-term investment performance is the strategic or long-term asset allocation strategy.

Rate of Return Assumption

The Retirement Board will, with the assistance of the Actuary and Investment Advisor, establish and annually review the Assumed Rate of Return and may adopt changes over a market cycle, or more frequently if warranted. The current Assumed Rate of Return is 7.25% annually, net of all fees and operating expenses.

Relative Return Objectives

The Fund shall seek to achieve a rate of return that ranks in the top half of the appropriate peer fund universes given a comparable level of risk and to achieve a long-term rate of return on investments that is equal to or exceeds both the Asset Allocation Index Return and the Policy Index Return. Given its investment philosophy, the Retirement Board recognizes that the return targets may not be achieved in any single year; the Retirement Board will measure the performance of the Fund over an appropriate longer-term horizon.

Current Asset Allocation Targets & Ranges

Asset allocation herein refers to the establishment of relative percentage allocation guidelines for the investment of assets in equities, fixed income, alternative investments, cash equivalents and other general forms of investment, but not to individual security selection. This single decision is the most important consideration for the Board. In terms of direct impact on the Fund’s performance, the Fund’s policy asset mix choice outweighs all other decisions. As a practical matter, the Board understands that while important, portfolio structure decisions and active management strategies involving stock and bond selection, sector weighting or market timing have been shown to contribute less than long-term asset allocation decisions.

It is generally recognized that asset allocation decisions may account for up to 90% of the investment return for a large pool of assets; in terms of direct impact on the Fund’s performance, the Fund’s policy asset mix choice outweighs all other decisions. The Retirement Board shall manage the Fund to achieve the Assumed Rate of Return while adhering to fiduciary obligations and ensuring liquidity sufficient to pay benefits.

(Continued)

Factors to be considered include:

(1) the Fund's assumed rate of return,
(2) the risk tolerance of the Board,
(3) the Fund's liquidity requirements,
(4) Funded status,
(5) the Fund's liability structure and other characteristics unique to the fund. Following an asset allocation review which considered the impact of a range of asset allocation policies on the Fund.

The Board will review the asset allocation targets at least annually and may adopt changes over a three to five-year time horizon or, more frequently, if significant changes occur within the economic or capital market environments. A change in the Fund's liability structure, funded status or long-term investment prospects may also trigger a revision of the asset allocation.

The Fund may have the opportunity to invest in PRIT. If the Fund invests with a PRIT Segmentation Program, the Investment Advisor will, at the time of the investment is being considered by the Retirement Board, suggest to the Retirement Board allocations to the Fund's asset (sub)classes (if necessary), recognizing that a PRIT Segmentation Account may not fit uniformly into the Fund's asset allocation rubric; this assignment will impact the IM Benchmark(s) applicable to the PRIT Segmentation Account.

Performance Benchmarks

Total Fund Return: The Total Fund Return shall be compared against other corporate, jointly trusteed and public pension plans of similar size and circumstances, as identified by the Investment Advisor. The Total Fund Return objective is to meet or exceed the Allocation Index Return and the Policy Index Return, which are each described below.

Allocation Index: The Allocation Index Return shall measure the success of the Fund's current allocation. It shall be calculated by using index rates of return for each asset class invested in by the Fund multiplied by the actual percent allocated to each asset class. The difference between the Allocation Index Return and the Total Fund Return measures the effect of active management. If the Total Fund Return is greater than the Allocation Index Return, then active management has in aggregate added value.

Policy Index: The Policy Index Return shall measure the success of the Fund's target asset allocation. It shall be calculated by using index rates of return for each asset class invested in by the Fund multiplied by the percent targeted to each asset class. The difference between the Allocation Index Return and the Policy Index Return measures the effects of deviating from the target allocation.

(Continued)

If the Allocation Index Return is greater than the Policy Index Return, then deviating from the target allocation has added value. If the Allocation Index Return is less than the Policy Index Return, then deviating from the target allocation has not added value.

Manager Benchmarks: The Investment Managers shall be compared to a combination of passively managed index returns matching the managers' specific investment styles, as well as the median manager in their appropriate peer group universe.

Rebalancing

The actual asset allocation mix will deviate from the targets due to market movements, cash flows, and manager performance. The Retirement Board and Executive Director with the assistance of the Investment Advisor will review asset allocation at least quarterly to determine compliance with the targets and rebalance as warranted. The Executive Director shall report material rebalancing activity to the Retirement Board.

ACTUARIAL SECTION

(Unaudited)

Buck Global, LLC has performed a December 31, 2023 actuarial valuation of the MBTA Retirement Fund. This valuation and report was prepared using Generally Accepted Actuarial Principles and practices and meets the parameters set by the Governmental Accounting Standards Board (GASB). To the best of our knowledge, this report is complete and accurate, and the assumptions used represent our best estimate of anticipated experience of the Fund.

Buck Global, LLC has prepared and included, as part of this report, all of the supporting schedules in the Actuarial Section of the Annual Comprehensive Financial Report (ACFR).

BUCK

500 Plaza Drive
Secaucus, NJ 07096

May 20, 2024

Retirement Board
Massachusetts Bay Transportation Authority Retirement Fund
One Washington Mall, Fourth Floor
Boston, MA 02108

Dear Board Members:

The Pension Agreement covering the Massachusetts Bay Transportation Authority Retirement Fund provides that the actuary make annual actuarial valuations of the Fund and certify rates of contribution to the Retirement Board. The most recent actuarial valuation of the Fund was prepared as of December 31, 2023.

This valuation reflects the funding policy adopted by the Board effective December 31, 2009. The actuarial cost method used is the entry age normal cost method. The amortization of the unfunded liability is made in installments increasing at the rate of four percent per year over a closed 30-year period beginning December 31, 2009.

This valuation is based on assumptions adopted by the Retirement Board, in April 2023 and effective with the actuarial valuation of December 31, 2022, on the basis of an experience study covering the period January 1, 2018, through December 31, 2022. Significant assumptions revised on the basis of the experience study include mortality, salary increase rates, termination rates, and retirement rates. We believe that these assumptions are reasonable. The assumptions and methods used for funding purposes satisfy the requirements of all applicable Actuarial Standards of Practice. The same actuarial assumptions are used for financial reporting by and for the Fund under GASB Statements 67 and 68.

We performed the valuation using participant data and plan asset data supplied by the Authority and Retirement Fund. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The accuracy of the results of the valuation is dependent on the accuracy of the data.

The following exhibits from the valuation report were incorporated in the Actuarial Section of the Annual Comprehensive Financial Report (ACFR):

1. Summary of Principal Results
2. Number and annual retirement allowances of retired members, disabled members and beneficiaries as of December 31, 2023
3. Schedule of Funding Progress
4. Outline of Actuarial Assumptions and Methods
5. Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes

(Continued)

6. Number and Annual Compensation of Active Members Distributed by Fifth Age and Service as of December 31, 2023
7. Number and Annual Retirement Allowances Distributed by Age as of December 31, 2023

The following exhibits were separately prepared by Buck for use in the ACFR:

1. Schedule of Retired Members and Beneficiaries Added To and Removed From Rolls
2. Solvency Test

Actuarial Standard of Practice No. 56 ("ASOP 56") provides guidance to actuaries when performing actuarial services that involve designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the Fund using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits in the valuation report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. Extra checking and review are completed if significant changes are made to the internal model. Significant modifications to the internal model that apply to multiple clients are generally developed, checked, and reviewed by various experts within the company who are familiar with the details of the required changes.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of the valuation. However, in accordance with the requirements of Actuarial Standard of Practice No. 51 ("ASOP 51"), a risk assessment is provided in Section X of the valuation report.

Where presented, the "funded ratio" and "unfunded accrued liability" are generally measured using the actuarial value of assets basis. It should be noted that recomputation of these measurements using the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but does not provide a basis for the assessment of the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

(Continued)

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the Academy to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Buck Global, LLC (Buck)

David L. Driscoll

David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

Section II - Summary of Principal Results

1. The principal results of the current and preceding years' valuations are summarized below:

Valuation Date	December 31, 2022	December 31, 2023
Number of active members	5,555	5,805
Annual compensation of all members	$ 496,467,531	$ 560,824,908
Annual compensation of active members below normal retirement age	$ 492,169,885	$ 555,382,730
Average age (years)	48.42	48.24
Average service (years)	10.86	10.52
Average compensation	$ 89,373	$ 96,611
Number of active members not accumulating creditable service	307	444
Number of retired members, beneficiaries and disabled members	6,783[1]	6,800[2]
Annual retirement allowances	$ 232,067,261[3]	$ 238,078,036[4]
Assets for funding purposes	$ 1,799,924,778	$ 1,844,331,372
Unfunded accrued liability	$ 1,367,546,343	$ 1,459,032,710
Contribution rates required:		
Normal	12.6400%	12.8500%
Accrued liability	21.4100%	21.2000%
Expenses	1.0000%	1.0000%
Total required rate	35.0500%	35.0500%
Member excess rate	0.0000%	0.0000%
Actual contribution rate during following fiscal year	35.0500%	35.0500%

2. Valuation results as of December 31, 2023, are given in Section VI, and contribution levels are set forth in Section VII.
3. Schedule B of this report outlines the actuarial assumptions and methods used in the valuation. The actuarial assumptions were selected on the basis of an experience study covering the five-year period ending December 31, 2022. The Retirement Board voted to adopt these assumptions in April 2023.
4. Schedule C of this report presents a summary of the main provisions of the Fund, as interpreted in preparing the actuarial valuation.

[1] Includes 6,614 retirees and beneficiaries, 24 individuals receiving worker's compensation for over 5 years, and 145 individuals receiving payments under QDROs.
[2] Includes 6,625 retirees and beneficiaries, 27 individuals receiving worker's compensation for over 5 years, and 148 individuals receiving payments under QDROs.
[3] Excludes 24 individuals receiving worker's compensation for over 5 years.
[4] Excludes 27 individuals receiving worker's compensation for over 5 years.

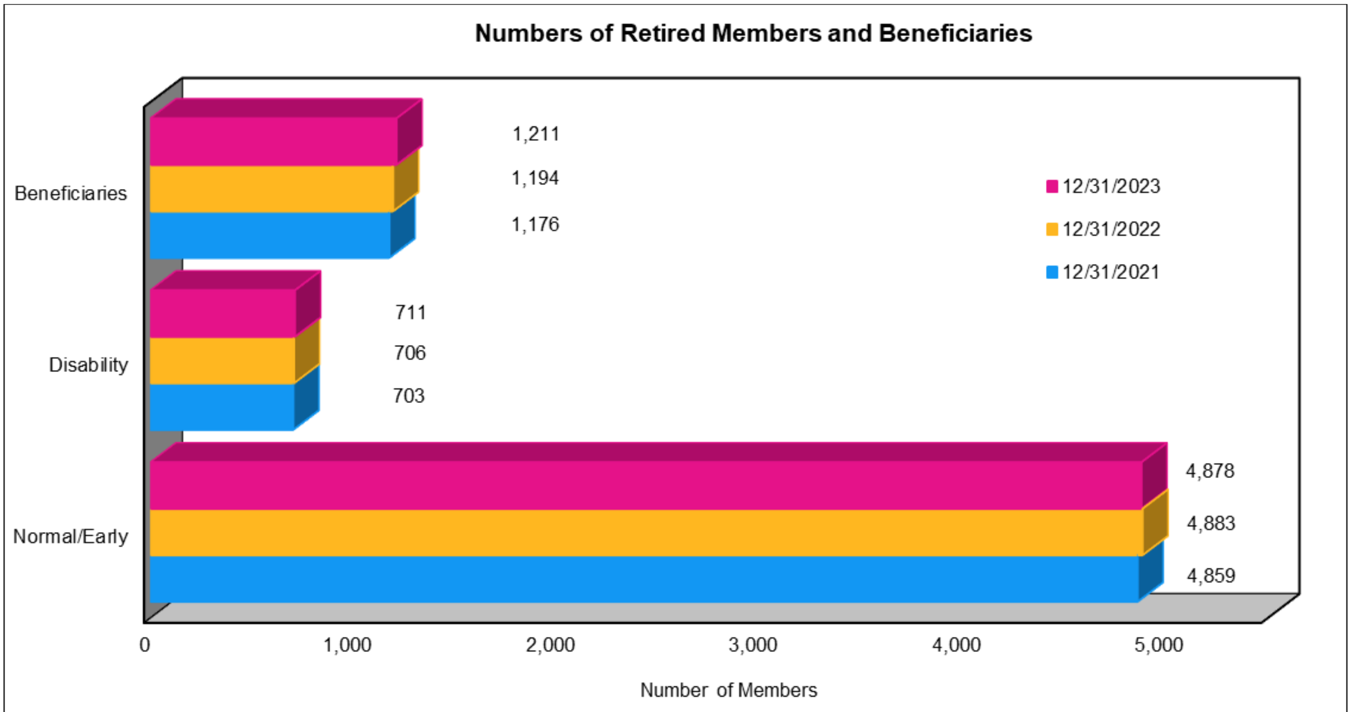
Section III - Membership Data

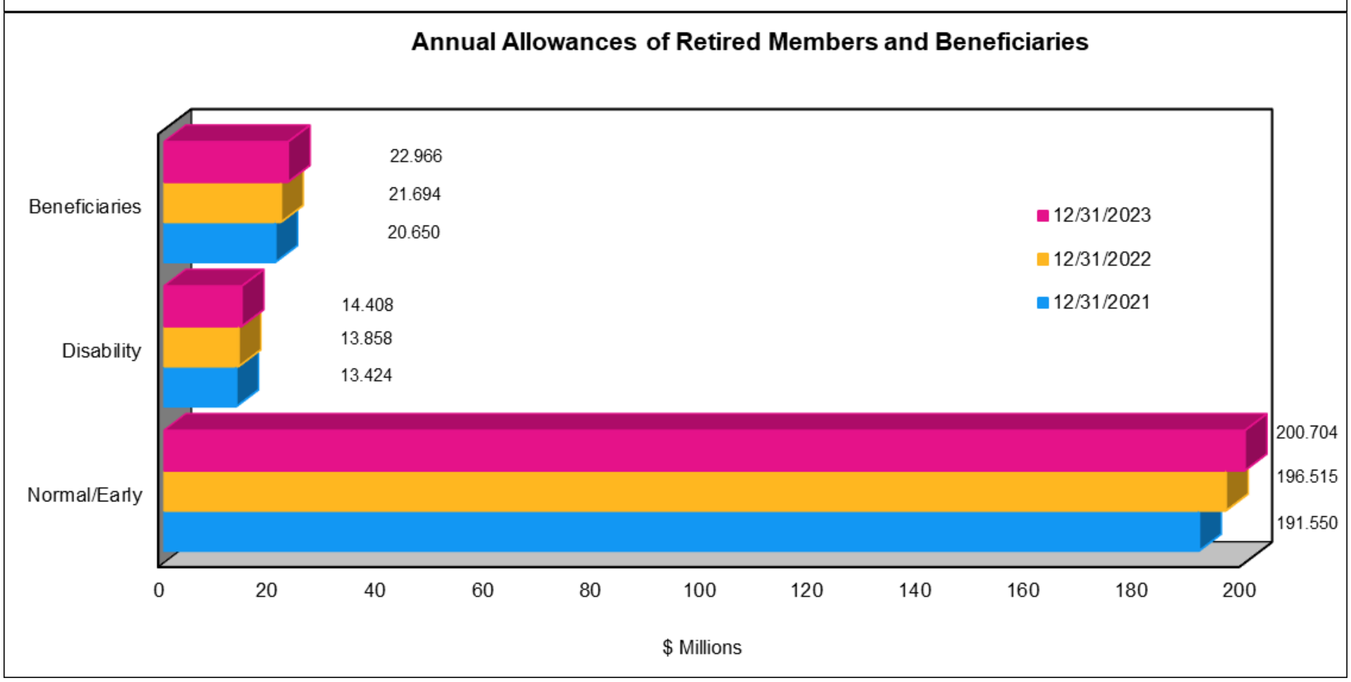
1. Employee data were furnished by the Authority and Retirement Fund.
2. Table 1 of Schedule D shows the number and annual compensation of active members, while Table 2 of Schedule D shows the number and annual retirement allowances of retired members, disabled members and beneficiaries.
3. The following table summarizes the number and annual retirement allowances of retired members, disabled members and beneficiaries as of December 31, 2023:

Category	Number	Annual Retirement Allowances
Benefits to Members Retired on Normal, Early Normal and Reduced Early Retirement Allowances	4,878	$ 200,703,565
Benefits to Members Retired on Disability Retirement Allowances	711[1]	14,408,229[2]
Benefits to Beneficiaries of Deceased Members[3]	1,211	22,966,242
Total	6,800	$ 238,078,036

[1] Includes 27 individuals receiving worker's compensation for over 5 years.
[2] Excludes 27 individuals receiving worker's compensation for over 5 years.
[3] Includes 148 individuals receiving payments under QDROs.

Section III - Membership Data (continued)[1]





[1] Disability counts include individuals receiving worker's compensation for over 5 years, and disability allowances exclude individuals receiving worker's compensation for over 5 years.

Section IV - Assets

1. Asset information was obtained from the Retirement Fund office.
2. The market value of the Fund's net assets available for benefits as of December 31, 2023, amounted to $1,694,401,260.
3. The asset valuation method is a five-year phase-in smoothing method under which the value of assets for actuarial purposes equals market value adjusted for a five-year phase-in of the differences between actual and assumed investment return. The value of assets for actuarial purposes may not differ from the market value of assets by more than 20%. The smoothing method used to calculate the value of assets for actuarial purposes was restarted as of December 31, 2013, coincident with the change to the present method.
4. The calculation of the actuarial value of assets as of December 31, 2023, is presented below:

Market value as of December 31, 2023					1,694,401,260	(A)
Adjustment to recognize asset gains (losses) over 5 years:						
Year Ending	Asset gain (loss)	X	Adjustment factor	=	Adjustment	
12/31/2023	27,626,501		0.80		22,101,201	
12/31/2022	(395,720,797)		0.60		(237,432,478)	
12/31/2021	106,359,393		0.40		42,543,757	
12/31/2020	114,287,041		0.20		22,857,408	
Total					(149,930,112)	(B)
Actuarial value of assets, as of December 31, 2023					1,844,331,372	
Asset gain during fiscal year ending December 31, 2023						
Actual return on market value and cash flow						
Income from investments and securities lending					28,186,392	
Net appreciation					118,978,961	
Total					147,165,353	(C)
Expected 7.25% return on market value and cash flow					119,538,852	(D)
Asset gain (loss) (C) – (D)					27,626,501	

The assets for valuation purposes are 113.70% of market value.

5. As of December 31, 2007, members' excess contributions (as discussed in Section V) had been fully depleted to cover the cost of the one-time cost-of-living increases negotiated in collective bargaining related to the benefits provided under the Fund. The actuarial asset value derived above thus requires no additional adjustment for members' excess contributions.

Section V – Member Excess Contributions

1. Effective July 1, 1998, in lieu of a reduction in the 4% contribution rate, members continued to make contributions equal to 4% of covered payroll.
2. To the extent that 4.00% exceeds the actuarially determined member required contribution rate, the excess is characterized as member excess contributions. These amounts are to be accumulated within the Retirement Fund and used to provide additional benefits.
3. The member excess rates developed in prior years are as follows:

Period	Excess Rate	Period	Excess Rate
July 1, 2009 – June 30, 2010	0.00000%	July 1, 2016 – June 30, 2017	0.00000%
July 1, 2010 – June 30, 2011	0.00000%	July 1, 2017 – June 30, 2018	0.00000%
July 1, 2011 – June 30, 2012	0.00000%	July 1, 2018 – June 30, 2019	0.00000%
July 1, 2012 – June 30, 2013	0.00000%	July 1, 2019 – June 30, 2020	0.00000%
July 1, 2013 – June 30, 2014	0.00000%	July 1, 2020 – June 30, 2021	0.00000%
July 1, 2014 – June 30, 2015	0.00000%	July 1, 2021 – June 30, 2022	0.00000%
July 1, 2015 – June 30, 2016	0.00000%	July 1, 2022 – June 30, 2023	0.00000%

4. As of December 31, 2007, members' excess contributions accumulated in prior years had been fully depleted.
5. The member excess rate for the period July 1, 2023 - June 30, 2024 is derived as follows:
   a. Effective prior member excess rate (December 31, 2022) -4.7539%
   b. Decrease in total required contribution rate from prior valuation (see Section VII) 0.00%
   c. Current member excess rate (July 1, 2023) ((a.) + 25% of (b.)) -4.7539%
6. The accumulated value of the excess contributions as of December 31, 2023 is $0.

Section VI – Comments on Valuation

1. Schedule A of this report presents the results of the valuation as of December 31, 2023.

2. The total entry age normal accrued liability on account of benefits expected to be paid to present retired members, former members, beneficiaries, active and inactive members is $3,303,364,082**.** Of this amount, $2,177,011,957 is on account of retired members and beneficiaries, $1,117,559,831 is on account of present active members and $8,792,294 is on account of active members not accumulating creditable service.

3. The value of Fund assets to be used in developing required contributions to the Fund is $1,844,331,372, including required contributions made by active members. When $1,844,331,372 is subtracted from $3,303,364,082, there remains $1,459,032,710, which represents the unfunded actuarial accrued liability of the Fund.

4. Amortization of the unfunded liability over the remaining 16 years in the amortization period as of December 31, 2023, in annual installments rising at the rate of 4% per year produces an amortization installment of $117,764,096 as of December 31, 2023. This amounts to 21.20% of the value of annual compensation of active members below normal retirement age on that date.

5. The total entry age normal cost at December 31, 2023, is $71,380,694, or 12.85% of the annual compensation of active members below normal retirement age on that date.

6. In addition to the amounts needed to cover amortization of the unfunded liability and normal cost, an allowance of 1.00% of annual compensation of active members below normal retirement age is included in the total required contribution to cover expected administrative expenses. Under the current funding policy of fully covering the actuarially determined contribution, and assuming there are no future experience gains or losses, future expected Fund contributions are expected to remain relatively level as a percent of payroll for 16 years and remain relatively level as a percent of payroll thereafter at the normal cost rate, and the funded status is expected to increase to 100% after 16 years.

7. During 2023, the unfunded actuarial accrued liability increased $91.5 million, from $1,367.5 million to $1,459.0 million. The expected unfunded actuarial accrued liability at December 31, 2023, was $1,340.7 million. The $118.3 million difference consists of a $17.5 million loss in 2023 of returns on the actuarial value of assets and $100.9 million in increased accrued liability due to unfavorable demographic experience, the new Pension Agreement changes, and contribution rate changes. Additional detail is provided in Section IX.

8. The total contribution rate is compliant with the definition of a reasonable actuarially determined contribution under ASOP 4. When determining the smoothing period for the actuarial value of assets and the amortization period for the unfunded actuarial accrued liability, the following items were considered: (i) the balance among benefit security, intergenerational equity, and stability of actuarially determined contributions, (ii) the timing and duration of expected benefit payments, and (iii) the nature and frequency of plan amendments. Plan amendments are amortized over periods appropriate for the nature of the change or are funded at the time of the change based on decisions by the plan sponsor.

Section VII – Contributions to the Fund

1. Effective December 31, 2009, the contributions by members and the Authority are to provide normal contributions, amortization of the unfunded accrued liability and administrative expenses. It is assumed that investment earnings will be sufficient to cover fiduciary and investment expenses and, in addition, provide the yield assumed for actuarial purposes.
2. The valuation indicates that 12.85% of compensation is required to cover normal cost and 21.20% of compensation is required to cover amortization of the unfunded accrued liability. Adding 1.00% of compensation for anticipated administrative expenses, excluding fiduciary and other investment expenses, results in a total contribution rate of 35.05% of compensation to be paid by the Authority and the members of the Retirement Fund from July 1, 2024, through June 30, 2025.
3. This rate is the same as the 35.05% rate developed in the December 31, 2022, valuation. This results in identical rates payable during the year beginning July 1, 2024:

Authority	25.9511%
Members' required	9.0989%[1]
Subtotal (Section II)	35.0500%
Members' excess (Section V)	0.0000%
Total	35.0500%

[1] The actual rate in effect as of July 1, 2024, will be 125 basis points higher, as specified in the new Pension Agreement. The actual rate is 10.3489%.

Section VIII – Statement No. 25 of the Governmental Accounting Standards Board

Statement No. 25 of the Governmental Accounting Standards Board has been superseded by Statement No. 67. Required reporting for the Retirement Fund under Statement No. 67 will be covered in a separate report. The information below is shown nonetheless for informational purposes.

Schedule of Funding Progress (,000's)[1]

Year Ending December 31	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage Covered Payroll ((b-a)/c)
2023	1,844,331	3,303,364	1,459,033	55.83%	555,383	262.71%
2022	1,799,925	3,167,471	1,367,546	56.83%	492,170	277.86%
2021	1,760,644	3,101,704	1,341,060	56.76%	454,985	294.75%
2020	1,636,054	3,055,123	1,419,069	53.55%	456,930	310.57%
2019	1,561,193	3,021,110	1,459,918	51.68%	433,577	336.72%
2018	1,559,453	2,916,800	1,357,348	53.46%	423,075	320.83%
2017	1,599,505	2,829,386	1,229,881	56.53%	425,658	288.94%
2016	1,607,560	2,694,556	1,086,996	59.66%	444,455	244.57%
2015	1,630,411	2,572,084	941,673	63.39%	440,502	213.77%
2014	1,632,175	2,447,731	815,556	66.68%	415,146	196.45%

[1] Some numbers in the table do not add up due to rounding.

Section IX – Experience

Records are maintained in which the actual experience of active and retired members is compared to that expected on the basis of the tables adopted by the Retirement Board. In this way, deviations in the experience from that anticipated will be noted and any adjustments believed necessary will be brought to the attention of the Retirement Board in future experience studies.

During the last year, the total unfunded actuarial accrued liability (UAL) was expected to decrease from $1,367,546,343 to $1,340,688,329. The actual UAL at the end of the year was $1,459,032,710. The chart below reconciles the expected to actual UAL. The primary sources of changes were a $65,237,376 increase in the accrued liability resulting from unfavorable demographic experience in 2023, a $35,546,454 increase in the accrued liability resulting from the new Pension Agreement, and returns on assets measured at actual value that were $17,458,745 below expected levels in 2023.

The sources of the (Gains)/Losses are shown below:

Actual UAL as of December 31, 2022		$ 1,367,546,343
Expected UAL (Prior to Changes) as of December 31, 2023		$ 1,340,688,329
Salary Increases	$ 36,050,923	
New Participants	66,795	
Active – Retirements	3,659,034	
Active – Terminations	(1,777,318)	
Active – Mortality	452,824	
Active – Disabilities	(1,077,583)	
Retiree Mortality	5,319,267	
Other (Data Corrections, etc.)	22,543,434	
Liability (Gain)/Loss – Demographic Experience		$ 65,237,376
Change in Accrued Liability Due to Contribution Rate Changes		$ 101,806
Change in Accrued Liability Due to New Pension Agreement		$ 35,546,454
Change in Accrued Liability Due to Assumption Changes		$ 0
Total of Liability (Gain)/Loss and effects of new Pension Agreement, changes in assumptions, and changes in Contribution rates		$ 100,885,636
Investment (Gain)/Loss		$ 17,458,745
Total Change in UAL		$ 118,344,381
Actual UAL as of December 31, 2023		$ 1,459,032,710

Section X – Risk Information

Actuarial Standard of Practice No. 51 ("ASOP 51") Disclosures

Funding future retirement benefits before they become due requires assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities and the corresponding funded status of the Fund. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the Fund. Understanding the risks to the funding of the Fund is important.

Actuarial Standard of Practice No. 51 ("ASOP 51") requires certain disclosures of potential risks to the Fund and the provision of useful information for intended users of actuarial reports who determine Fund contributions or evaluate the adequacy of specified contribution levels to support benefit provisions. While its status as a governmental pension plan (as defined in the Internal Revenue Code) exempts it from the funding provisions of ERISA, the Massachusetts Bay Transportation Authority Retirement Fund uses the information presented to assist in making decisions regarding contribution levels.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgment and educated decisions. Future measurements may deviate in ways that produce positive or negative financial effects on the Fund.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the Fund's future financial condition.

- Investment risk – the risk that assets will not earn the expected rate of return
- Interest rate risk – the risk that the general level of interest rates will increase or decrease significantly from current levels
- Asset liability mismatch - Potential that changes in asset values are not matched by changes in the value of liabilities
- Longevity and other demographic risk – the risk that mortality or other demographic experience will be different from expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the Fund. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the sponsor of a pension plan to make contributions to the plan. In addition, this valuation report in not intended to provide investment advice or guidance on managing or reducing risk. Buck welcomes the opportunity to assist with such matters as part of a separate project or projects utilizing the appropriate staff and resources for those objectives.

Section X – Risk Information (continued)

Investment Risk

Retirement Fund costs are sensitive to the market return on assets. Returns below those assumed with increase costs. The Fund uses an actuarial value of assets that smooths gains and losses on market returns over a 5-year period to help control some of the volatility in costs due to investment risk.

The Fund invests in a diversified portfolio of assets with the objective of maximizing investment returns at a reasonable level of risk. Actuarial Standard of Practice No. 4 (ASOP 4) requires the actuary to disclosure a Low-Default-Risk Obligation Measure (LDROM) of the plan's liability and provide commentary to help the intended users of this report understand the significance of the LDROM with respect to funded status, contributions, and participant benefit security.

The LDROM is based on discount rates derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future. The LDROM shown here represents what the Fund's liability would be if it invested its assets solely in a portfolio of high-quality bonds whose cash flows approximately match future benefit payments. Consequently, the difference between the LDROM and the actuarial accrued liability represents the taxpayer savings from investing in a diversified portfolio of assets versus only investing in high-quality bonds. Furthermore, this difference also represents the cost of reducing investment risk.

As of December 31, 2023, the LDROM is $4.1 billion based on an interest rate of 5.19%. The interest rate used for the LDROM was determined by calculating a single equivalent discount rate using projected benefit payments and the Buck Above Median Yield Curve as of December 29, 2023. Please note that the interest rate used for the LDROM is based on bond yields as of the measurement date and will therefore vary for different measurement dates. All other assumptions are the same as those used for funding purposes as shown in this report.

Actuaries play a role in helping to determine funding methods and policies that can achieve affordable and appropriate contributions and risk management. The funded status based on the actuarial accrued liability, as well as the actuarially determined contributions, are calculated using the expected return on assets, which reflects the actual investment portfolio. Since the assets are not invested solely in an all-bond portfolio, the LDROM does not indicate the Fund's funded status or progress, nor does it provide information on necessary plan contributions.

Regarding participant benefit security, if the Fund were to be funded on an LDROM basis, participant benefits currently accrued as of the measurement date might be considered more secure, since the investment risk would be significantly reduced. However, the fact that assets are invested in a diversified portfolio does not mean that the participants' benefits are not secure. The security of participant benefits relies on a combination of the assets in the plan, the investment returns generated from those assets, and the promise of future contributions from the plan sponsor. Reducing investment risk by investing solely in bonds may significantly increase the actuarially determined contributions, and thereby increase contributions risk by decreasing the ability of the plan sponsor to make necessary contributions to fund the benefits. Unnecessarily high contribution requirements in the near term may not be affordable and could imperil plan sustainability and benefit security. Participant benefits will remain secure if reasonable and appropriate contributions with managed risk are calculated and paid.

Section X – Risk Information (continued)

Assessment of Risks

- Investment return: Lower assets mean higher unfunded liability and larger contribution amounts. For example, if returns on assets at market value were an additional 1% lower than actual, this would reduce the actuarial value of assets by approximately $3.2 million, which would increase the 2023 Authority contribution rate by 0.0375% and the member contribution rate by 0.0125%.
- Interest rate risk: Actuarial liabilities contained in this report are based on the assumption that interest rates will remain at current levels throughout the forecast period. These interest rates are used to discount future expected benefit payments to determine the Fund liability. As interest rates increase, the discounted value of future benefit payments will decrease; similarly, as interest rates decrease, the discounted value of future benefit payments will increase. The duration of the Fund's liability is approximately nine years, which means that every 100-basis point change in interest rates will result in roughly a 9% change in Fund liability.
- Asset liability mismatch: Unless assets are explicitly structured to mimic the characteristics of Fund liabilities, there is a risk that economic scenarios that affect interest rates will have a larger impact on liability than on assets. This is because Fund liability is the discounted value of benefit payments that extend way out into future years, i.e., have a long duration. Fund investments, on the other hand, typically have a shorter duration with respect to interest rate changes, often holding fixed income securities with lower durations than Fund liabilities, and typically maintaining some monies in equity investments that are not as directly sensitive to interest rate changes.
- Longevity and other demographic risk: The Fund is subject to longevity risk, the risk that participants will live longer (or shorter) than expected. The most recent experience study showed that actual mortality experience had tracked closely to the current mortality assumption as determined by the experience study completed in 2023.

In addition, the Fund is subject to risks associated with assumptions with respect to active and deferred vested participants (for example, salary increases, termination prior to retirement, retirement, and optional form election). The current assumptions for these decrements are based on the experience study completed in 2023. Changes in future liabilities will result to the extent actual experience differs from these assumptions. In particular, higher than expected salary increases (including base pay plus short-term incentives) would increase actuarial liabilities. Further, due to the subsidized early retirement reductions for certain groups, retirements earlier than expected could increase liabilities.

Section X – Risk Information (continued)

Historical Results

The following table shows selected historical values of key valuation measures. These items illustrate how actual volatility has impacted the Fund in recent years and gives additional context to the risks described above. Further information can be found in the actuarial valuation reports for each year.

	12/31/2019	12/31/2020	12/31/2021	12/31/2022	12/31/2023
Actuarial Value of Assets (AVA)	$1.56B	$1.64B	$1.76B	$1.80B	$1.84B
Asset Return on MV in Prior Year	17.67%	14.22%	13.23%	(9.26)%	9.36%
Investment gain/(loss) on AVA	$(28M)	$33M	$66M	$(31M)	$(17M)
Actuarial Accrued Liability	$3.02B	$3.06B	$3.10B	$3.17B	$3.30B
The ratio of retired life* actuarial accrued liability to total actuarial accrued liability	71%	69%	69%	68%	66%
The ratio of benefit payments to actuarial value of assets	14%	14%	13%	13%	14%
The ratio of actuarial value of assets to participant payroll	357%	355%	384%	363%	329%
Normal cost	$52M	$55M	$55M	$62M	$71M
Discount rate	7.25%	7.25%	7.25%	7.25%	7.25%
Non-Investment gain/(loss)	$4M	$8M	$1M	$(67M)	$(65M)
Funding Policy contribution	$156M	$161M	$159M	$172M	$195M

* Retired members, former members and beneficiaries

Commentary on Fund Maturity Measures

The ratio of retired life actuarial accrued liability to total actuarial accrued liability

A mature pension plan will often have a ratio above 60 - 65 percent. A higher percentage will generally indicate an increased need for asset / liability matching due to inability to accept volatility in future returns.

The ratio of benefit payments to actuarial value of assets

Higher benefit payments as a percentage of assets means the fund may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not garner the same returns as less liquid assets and therefore increase the investment risk. However, there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored for continual upward trend with greater magnitude.

The ratio of actuarial value of assets to participant payroll

Plans that have higher asset-to-payroll ratios experience *more* volatile employer contributions (as a percentage of payroll) due to investment return. For example, if lower than expected asset return increases the unfunded liability of two pension plans by the same percentage, the plan with the higher assets-to-payroll ratio may experience higher contribution volatility than a plan with the lower asset-to-payroll ratio.

Section XI – Alternative Scenarios

What if Active Headcount Remained at its 12/31/2016 Level?

		12/31/2023 Valuation (A)	12/31/2016 Level (B)
1.	Normal Cost Rate	12.85%	12.85%
2.	Expenses	1.00%	1.00%
3.	Amortization	$117,764,096	$117,764,096
4.	Active Employees 12/31/2023	NA	5,805
5.	Active Employees 12/31/2016	NA	5,786
6.	New Entrant Salary	NA	$79,000
7.	Payroll (7.A+6.x(5.-4. , not less than 0))	$555,382,730	$555,382,730[1]
8.	Accrued Liability Amortization Rate (3./7.)	21.20%	21.20%
9.	Total Contribution (1.+ 2.+ 8.)	35.05%	35.05%
10.	Member Contribution	9.0989%	9.0989%

- Since active membership has now surpassed what it was from the 12/31/2016 valuation, the active headcount does not impact the results of the valuation.

[1] Active Headcount as of 12/31/2023 is greater than the Active Headcount as of 12/31/2016, resulting in no difference in the calculations between scenarios (A) and (B).

Section XI – Alternative Scenarios (continued)

Contribution as a % of Pay Under Alternative Funding Policies

The current funding policy contribution rates were determined by amortizing the unfunded liability over a 16-year period ending in 2040 in installments escalating at the rate of 4% per year. The table below presents calculations of what the contribution rates developed in this valuation would be if the Fund were to change its current funding policy with respect to the amortization of the unfunded liability.

Amort. (years)	**Escalator % per year**									
	0%		1%		2%		3%		4%	
	Authority	Member	Authority	Member	Authority	Member	Authority	Member	Authority	Member
9	39.56%	13.64%	38.54%	13.29%	37.53%	12.96%	36.56%	12.63%	35.61%	12.32%
10	37.46%	12.93%	36.39%	12.58%	35.36%	12.24%	34.37%	11.90%	33.40%	11.58%
11	35.74%	12.36%	34.65%	12.00%	33.59%	11.65%	32.57%	11.31%	31.58%	10.98%
12	34.32%	11.89%	33.21%	11.52%	32.13%	11.16%	31.08%	10.81%	30.08%	10.47%
13	33.14%	11.49%	32.00%	11.11%	30.89%	10.75%	29.83%	10.39%	28.81%	10.05%
14	32.13%	11.16%	30.97%	10.77%	29.84%	10.40%	28.76%	10.03%	27.71%	9.69%
15	31.27%	10.87%	30.08%	10.48%	28.94%	10.09%	27.83%	9.73%	26.78%	9.37%
16	30.53%	10.62%	29.31%	10.22%	28.15%	9.83%	27.02%	9.46%	25.95%	9.10%

- The "Years" on the left side denote the years over which the unfunded liability is amortized
- Dollar amounts shown are expressed in $millions
- Percentages of payroll shown represent total contributions developed as a % of pay
- The red circle represents current funding policy

Section XI – Alternative Scenarios (continued)

2023 Amortization under Alternative Funding Policies

The table below presents calculations of what the contribution for amortization of the unfunded liability developed in this valuation would be if the Fund were to change its current funding policy with respect to the amortization of the unfunded liability

Amort. (years)	Escalator % per year 0%	1%	2%	3%	4%
9	$218.55	$210.92	$203.50	$196.29	$189.28
10	$202.91	$195.06	$187.43	$180.04	$172.86
11	$190.23	$182.16	$174.34	$166.77	$159.45
12	$179.75	$171.48	$163.48	$155.75	$148.30
13	$170.97	$162.51	$154.34	$146.46	$138.88
14	$163.52	$154.88	$146.54	$138.52	$130.82
15	$157.14	$148.32	$139.83	$131.67	$123.85
16	$151.62	$142.63	$133.99	$125.70	$117.76

- The “Years” on the left side denote the years over which the unfunded liability is amortized
- Dollar amounts shown are expressed in $ millions
- Percentages of payroll shown represent total contributions developed as a % of pay
- The red circle represents current funding policy

Schedule A – Results of the Valuation as of December 31, 2023

1.	Present Value of Future Benefits	
	(a) Present value of prospective benefits to retired members, former members and beneficiaries	$ 2,177,011,958
	(b) Present value of prospective retirement allowances on account of present active members	1,742,179,700
	(c) Present value of prospective retirement allowances or return of members' contributions for members not accumulating creditable service	8,792,294
	(d) Total actuarial liabilities	$ 3,927,983,952
2.	Assets of the Fund for purposes of development of contributions	$ 1,844,331,372
3.	Present value of future contributions to the fund (1(d)-2)	$ 2,083,652,580
4.	Present value of future normal contributions to the Fund[1]	$ 624,619,870
5.	Unfunded accrued liability (3) - (4)	$ 1,459,032,710

[1] Includes future contributions of members at the rate developed in Section VII.

Schedule B – Outline of Actuarial Assumptions and Methods

In 2023, an experience study was conducted based on the experience from January 1, 2018 to December 31, 2022. Based on the experience study, Buck proposed assumptions for mortality tables, salary increases, termination rates, and retirement rates. All proposed assumptions were approved by the Retirement Board in April 2023.

Data
The rate of pay was used for the 2023 valuation (projected 2024 pensionable earnings). Starting with the 2021 valuation, participants who have been receiving Workers' Compensation benefits for 5 or more years are assumed to never commence their Massachusetts Bay Transportation Authority Retirement Fund pension benefit, but are assumed to receive a refund of their contributions to the Fund with interest. In addition, participants who are active but did not contribute to the plan in 2023, are assumed to remain non-contributing for the remainder of their employment.

Interest rate for funding purposes
7.25% per annum, compounded annually, in addition to fiduciary and investment management expenses.

Separations from active service
Representative values of the assumed rates of withdrawal and reduced early retirement and disability are as follows:

	Withdrawal[1]					
Age/Service	0	1	2	3	4	5+
25	6.59%	6.31%	6.62%	4.62%	4.16%	5.73%
30	6.59%	6.31%	6.62%	4.62%	4.16%	6.25%
35	6.59%	6.31%	6.62%	4.62%	4.16%	3.17%
40	6.59%	6.31%	6.62%	4.62%	4.16%	2.73%
45	6.59%	6.31%	6.62%	4.62%	4.16%	2.19%
50	6.59%	6.31%	6.62%	4.62%	4.16%	1.68%
55	6.59%	6.31%	6.62%	4.62%	4.16%	2.33%
60	6.59%	6.31%	6.62%	4.62%	4.16%	2.72%
>64	6.59%	6.31%	6.62%	4.62%	4.16%	3.65%

Age	Disability Male[2]	Disability – Female[2]
20	0.07%	0.11%
25	0.08%	0.12%
30	0.10%	0.15%
35	0.13%	0.20%
40	0.17%	0.26%
45	0.15%	0.38%
50	0.25%	0.44%
55	0.46%	0.80%
60	0.90%	1.58%
64	1.68%	2.94%

[1] 100% of future terminated members not eligible for a retirement allowance are assumed to receive a refund of their accumulated employee contributions.

[2] 50% of disabled employees are assumed to qualify for occupational disability benefits.

Schedule B – Outline of Actuarial Assumptions and Methods (continued)

Unreduced retirement rates

Representative rates of unreduced early normal retirement allowances are as follows:

	Unreduced Retirement		
Age	In the year attaining eligibility	In years after first eligibility	Reduced Retirement
42	39.0%	5.8%	N/A
43	42.0%	5.8%	N/A
44	27.1%	32.3%	N/A
45	30.0%	24.3%	N/A
46	28.7%	17.3%	N/A
47	36.5%	18.1%	N/A
48	24.9%	14.1%	N/A
49	30.2%	15.9%	N/A
50	33.3%	14.7%	N/A
51	37.0%	21.2%	N/A
52	31.7%	15.6%	N/A
53	35.0%	17.0%	N/A
54	28.3%	15.4%	N/A
55	28.6%	15.3%	3.4%
56	30.5%	14.6%	3.7%
57	33.3%	14.8%	4.6%
58	26.7%	23.2%	4.3%
59	31.2%	23.2%	3.8%
60	25.6%	22.3%	5.3%
61	35.5%	20.6%	5.2%
62	40.0%	26.0%	9.7%
63	59.3%	27.8%	11.7%
64	52.9%	18.8%	15.8%
65	30.9%	30.4%	N/A
66	30.9%	27.8%	N/A
67	30.9%	23.9%	N/A
68	30.9%	20.6%	N/A
69	30.9%	26.6%	N/A
70+	100.0%	100.0%	N/A

Vested Group B plan members who terminate before retirement eligibility are assumed to retire at age 65.

Schedule B – Outline of Actuarial Assumptions and Methods (continued)

Inflation:

2.75% per year.

Salary increases

Service	Salary Increase %
0	14.00%
1	13.00%
2	12.00%
3	11.00%
4	10.00%
5-9	4.00%
10-14	3.00%
15+	2.75%

Deaths before and after retirement

The PRI-2012 Amount Weighted Blue Collar Mortality Tables with fully generational projection using Scale MP-2021 are used for all active participants. 101.1% of the PRI-2012 Amount Weighted Blue Collar Post Commencement Tables with fully generational projection using Scale MP-2021 are used for all retirees and beneficiaries preceding their related member's death. 98.3% of the PRI-2012 Amount Weighted Blue Collar Contingent Survivor Tables with fully generational projection using Scale MP-2021 are used for all beneficiaries following the death of their related member. The PRI-2012 Amount Weighted Total Dataset Disability Tables with fully generational projection using Scale MP-2021 are used for the period after disability retirement. Among pre-retirement deaths, 7.50% are assumed to qualify for accidental death benefits.

Normal retirement

Age 65.

Percent married

90% of male members and 50% of female members under age 55 or who have less than 23 years of service are assumed to be married. 100% of employees age 55 and older or who have 23 or more years of service are assumed to be married. In each case, the female is assumed to be three years younger than the male.

Schedule B – Outline of Actuarial Assumptions and Methods (continued)

Pension options

50% of male members elect a 75% joint and survivor benefit and 10% of female members elect a 50% joint and survivor benefit. All others elect a life annuity.

Fiduciary and investment management expenses

Paid from investment earnings of the Fund.

Loading or contingency reserves

None.

Valuation method

Prior to December 31, 2009, projected benefit method with entry age normal cost and open-end accrued liability. On and after December 31, 2009, individual entry age normal method.

Asset valuation method

A five-year phase-in smoothing method is used, under which the value of assets for actuarial purposes equals market value less a five-year phase-in of the differences between actual and assumed investment return. The value of assets for actuarial purposes may not differ from the market value of assets by more than 20%.

Effective December 31, 2013, the actuarial asset method was changed from a five-year moving average of market values to a five-year phase-in smoothing method, with the smoothing restarted as of December 31, 2013.

Prior to December 31, 2013, a five-year moving average of market values method was used to compute the actuarial value of assets.

Administrative expenses

Administrative expenses are estimated to be 1.0% of covered payroll per year.

Summary of Changes from December 31, 2022 Valuation

None.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes

The Massachusetts Bay Transportation Authority Retirement Fund became effective as of January 1, 1948. The following summary describes the current main membership, benefit, and contribution provisions of the Fund as interpreted for the valuation.

1 - Definitions

“Compensation” means the full regular remuneration paid to an employee, excluding any overtime pay. “Service” creditable under the Fund means all service rendered by a member prior to his normal retirement date since he last became a member for which contributions are made by the member and by the Authority. “Union” means Boston Carmen’s Union, Local Division 589 of the Amalgamated Transit Union, AFL-CIO.

2 - Membership

Each employee, including employees on a part-time basis, who is or who may become a member of the Union or any union recognized by the Authority for collective bargaining purposes is included in the membership of the Fund. Any employee who is not a member of the Union but who is in a group which was authorized to participate in the Fund is included in the membership.

3 - Benefits

Normal Retirement Allowance for Group A Plan members

Condition for Allowance

Any member may retire at age 65. A member may remain in service after the stated retirement date.

Amount of Allowance

The normal retirement allowance equals 2.46% of 3-year average annual compensation multiplied by the years of service, such allowance not to exceed 80% of such average annual compensation.

Normal Retirement Allowance for Group B Plan members

Condition for Allowance

Any member may retire beginning at age 55 with at least 10 years of creditable service.

Amount of Allowance

The normal retirement allowance equals the average of the Member’s highest 3 years of pensionable earnings multiplied by the Age Multiplier multiplied by the years of service.

The Age Multiplier is determined using the following table:

Age at Retirement	Percentage
55	1.750%
56	1.875%
57	2.000%
58	2.125%
59	2.250%
60	2.375%
61+	2.460%

A Retired Member’s retirement allowance cannot exceed 80% of the average of the Retired Member’s highest 3 years of pensionable earnings.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes (continued)

Early Normal Retirement Allowance for Group A Plan members

Condition for Allowance

Any member hired prior December 6, 2012 and has completed at least 23 years of service may retire on an early normal retirement allowance.

Any member hired on or after December 6, 2012, has attained age 55 and completed at least 25 years of service may retire on an early normal retirement allowance.

Amount of Allowance

The early normal retirement allowance is computed in the same manner as a normal retirement allowance on the basis of the compensation and service to the time of retirement.

Early Reduced Retirement Allowance for Group A Plan members

Condition for Allowance

A member who has attained age 55 and has completed at least 20 years of service may be retired on an early reduced retirement allowance.

Amount of Allowance

The early reduced retirement allowance is an immediate allowance, commencing at the date of retirement, and is computed in the same manner as a normal retirement allowance on the basis of compensation and service to the time of early retirement, but reduced by ½ of 1% for each month of retirement prior to normal retirement date.

Disability Retirement Allowance for Group A Plan members

Condition for Allowance

Any member who has completed 4 years of service in case of disablement due to an occupational accident or sickness, or who has completed 6 years of service in case of disablement due to any other cause, and who has become totally and permanently incapacitated, mentally or physically, for the further performance of duty may be retired.

Amount of Allowance

Upon disability retirement, a member receives an allowance commencing immediately, which is computed as a normal retirement allowance on the basis of the compensation and service to the time of disability retirement and is not less than 15% of the member's 3-year average annual compensation.

Disability Retirement Allowance for Group B Plan members

Condition for Allowance

Any member who has completed 4 years of service in case of disablement due to an occupational accident or sickness, or who has completed 6 years of service in case of disablement due to any other cause, and who has become totally and permanently incapacitated, mentally or physically, for the further performance of duty may be retired.

Amount of Allowance

Upon disability retirement, a member receives an allowance commencing immediately, which is computed as a normal retirement allowance on the basis of the compensation and service to the time of disability retirement and is not less than 15% of the member's 3-year average annual compensation. The Age Multiplier is based on the member retiring at the age of 55 or the member's age at the time of disability retirement (referenced on the Age Multiplier chart above) if the member is over the age of 55.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes (continued)

Vested Retirement Allowance for Group A Plan members

Condition for Allowance

Any member who has completed 10 years of service and does not receive a refund of his contributions with interest, in the event his employment terminates for reasons other than voluntary quit or discharge for cause.

Amount of Allowance

The vested retirement allowance is a deferred allowance commencing on the member's normal retirement date and equal to the amount computed as a normal retirement allowance on the basis of the compensation and service to the time of termination.

Vested Retirement Allowance for Group B Plan members

Condition for Allowance

Any member shall have a fully vested deferred retirement allowance if the member has accrued 10 or more years of service and has not withdrawn their contributions from the Fund.

Amount of Allowance

The vested retirement allowance is computed as the average of the member's highest 3 years of pensionable earnings multiplied by 2.46% multiplied by the years of service; provided, however, that if a vested member retires prior to the age of 65, then the vested member's retirement allowance will be reduced for their entire retirement by 6% per year, or one-half percent each month, of retirement before age 65.

Survivor Benefit

Condition for Benefit

Upon the death of a member who has completed 10 years of service and who is survived by a spouse and/or dependent children designated to receive the deceased member's contributions with interest, a benefit may be elected by such survivor in lieu of the payment of the contributions with interest.

Amount of Benefit

If the deceased member had completed at least 10 but fewer than 23 years of service, the survivor's benefit, payable for life, is equal to the amount which would have become payable if the member had retired as of the date of his death and elected a 50% joint and survivor option in effect as of the date of death with the survivor as the designated person under the option. There is no reduction for early commencement.

If the deceased member had completed at least 23 years of service, the survivor's benefit, payable for life, is equal to the amount which would have become payable if the member had retired as of the date of his death and elected a 100% joint and survivor option in effect as of the date of death with the survivor as the designated person under the option. There is no reduction for early commencement.

Accidental Death Benefit

Condition for Benefit

Upon the death of a member in service whose death results solely from an injury or injuries sustained in the performance of duty, and who is survived by a spouse designated to receive the deceased member's contribution with interest, an allowance shall be payable to said spouse.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes (continued)

Amount of Benefit

The accidental death benefit, payable for life, is equal to the amount which would have become payable to the member if the member had retired as of the date of his death on a disability retirement allowance. If there should be insufficient creditable service, the surviving spouse receives the minimum allowance available under the disability retirement provision.

Return of Contributions

On Account of Termination of Service

In the event of a Group A Plan member's termination of employment for any reason other than death or retirement or a Group B Plan member's nonvested termination, he is paid the amount of his contributions, with interest. Group A Plan members may not elect to keep their contributions in the Fund. Group B Plan members may elect to keep their contributions in the Fund to maintain and resume creditable service in the event they become an employee again in the future.

On Account of Death Prior to Retirement

Upon the death of a member or retired member before his retirement allowance has become effective, the amount of his contributions, with interest, is paid to his beneficiary or estate, unless a survivor benefit is payable.

On Account of Death after Retirement

Upon the death of a retired member, or the survivor of a retired member and his designated beneficiary under an optional benefit, any excess of his contributions at retirement, with interest, over the sum of all retirement allowance payments made is paid to the member's beneficiary or to the survivor's estate.

Our valuation does not include return of contributions on account of death after retirement for current retirees due to negligible impact on the Fund's liabilities.

Optional Benefits in Lieu of Regular Benefits

At retirement, or on his normal retirement date if prior thereto, any member may elect to convert his allowance into an optional benefit of equivalent actuarial value permitted by the Rules and Regulations.

Reinstatement of Creditable Service

If a member's service is interrupted by reason of resignation or dismissal, he has the opportunity upon the completion of 3 years of service after he has been rehired to repay to the Fund all amounts he has withdrawn together with an amount equal to their reasonable earnings. Upon such repayment, the member is to be credited with service for the periods before and after the interruption as though they had been a single period of service.

4 - Contributions

Contributions required to provide benefits and meet administrative expenses are made jointly by the Authority and members. The member contribution rate was increased from 5.1489% to 5.4989% effective August 11, 2012, to 5.5589% effective July 1, 2013, to 5.7989% effective July 1, 2014, to 5.7914% effective July 1, 2015, to 6.4614% effective July 1, 2016, to 7.1189% effective July 1, 2017, to 8.0089% effective July 1, 2018, to 8.8239% effective July 1, 2019, to 9.3339% effective July 1, 2020, to 9.1239% effective July 1, 2021, to 9.0539% effective July 1, 2022, to 9.0989% effective July 1, 2023, and to 9.0989% effective July 1, 2024. Member contributions are "picked up" by the Authority pursuant to Section 414(h)(2) of the Internal Revenue Code.

Summary of Changes from December 31, 2022 Valuation

- A one-time COLA increase was provided to select retirees and beneficiaries.
- The maximum pensionable earnings percentage was increased from 75% to 80%.
- A two-tier benefit structure consisting of the Group A Plan and the Group B Plan was adopted.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes (continued)

Amount of Benefit

The accidental death benefit, payable for life, is equal to the amount which would have become payable to the member if the member had retired as of the date of his death on a disability retirement allowance. If there should be insufficient creditable service, the surviving spouse receives the minimum allowance available under the disability retirement provision.

Return of Contributions

On Account of Termination of Service

In the event of a member's termination of employment for any reason other than death or retirement, he is paid the amount of his contributions, with interest.

On Account of Death Prior to Retirement

Upon the death of a member or retired member before his retirement allowance has become effective, the amount of his contributions, with interest, is paid to his beneficiary or estate, unless a survivor benefit is payable.

On Account of Death after Retirement

Upon the death of a retired member, or the survivor of a retired member and his designated beneficiary under an optional benefit, any excess of his contributions at retirement, with interest, over the sum of all retirement allowance payments made is paid to the member's beneficiary or to the survivor's estate.

Our valuation does not include return of contributions on account of death after retirement for current retirees due to negligible impact on the Fund's liabilities.

Optional Benefits in Lieu of Regular Benefits

At retirement, or on his normal retirement date if prior thereto, any member may elect to convert his allowance into an optional benefit of equivalent actuarial value permitted by the Rules and Regulations.

Reinstatement of Creditable Service

If a member's service is interrupted by reason of resignation or dismissal, he has the opportunity upon the completion of 3 years of service after he has been rehired to repay to the Fund all amounts he has withdrawn together with an amount equal to their reasonable earnings. Upon such repayment, the member is to be credited with service for the periods before and after the interruption as though they had been a single period of service.

4 - Contributions

Contributions required to provide benefits and meet administrative expenses are made jointly by the Authority and members. The member contribution rate was increased from 5.1489% to 5.4989% effective August 11, 2012, to 5.5589% effective July 1, 2013, to 5.7989% effective July 1, 2014, to 5.7914% effective July 1, 2015, to 6.4614% effective July 1, 2016, to 7.1189% effective July 1, 2017, to 8.0089% effective July 1, 2018, to 8.8239% effective July 1, 2019, to 9.3339% effective July 1, 2020, to 9.1239% effective July 1, 2021, to 9.0539% effective July 1, 2022, and to 9.0989% effective July 1, 2023. Member contributions are "picked up" by the Authority pursuant to Section 414(h)(2) of the Internal Revenue Code.

Schedule D – Tables of Employee Data

Table 1 – The Number and Annual Compensation of Active Members Distributed by Fifth Age and Service as of December 31, 2023[1]

Attained Age	Completed Years of Service: 0 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 & up		Total	
	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
Under 25	51	$ 3,681,787	0	$ 0	0	$ 0	0	$ 0	0	$ 0	0	$ 0	0	$ 0	0	$ 0	0	$ 0	51	$ 3,681,787
25 to 29	181	14,693,078	11	1,123,782	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	15,816,861
30 to 34	309	27,148,339	116	11,354,709	28	2,803,091	1	74,797	0	0	0	0	0	0	0	0	0	0	454	41,380,936
35 to 39	325	28,528,269	211	20,906,380	128	13,309,121	70	7,488,333	1	111,363	0	0	0	0	0	0	0	0	735	70,343,466
40 to 44	283	24,649,922	232	22,469,450	123	12,427,501	163	16,952,799	47	5,088,699	0	0	0	0	0	0	0	0	848	81,588,370
45 to 49	268	23,133,614	210	19,898,877	124	12,603,427	172	17,938,027	91	9,417,928	16	1,646,713	0	0	0	0	0	0	881	84,638,586
50 to 54	204	17,730,407	209	20,534,530	139	14,354,038	174	17,481,693	125	12,466,012	23	2,405,425	3	286,894	0	0	0	0	877	85,258,999
55 to 59	161	14,219,862	149	14,935,636	149	15,384,741	207	21,487,895	148	14,879,384	41	4,040,346	20	2,018,066	11	1,057,846	0	0	886	88,023,775
60 to 64	63	5,924,164	94	9,603,630	129	13,577,549	185	19,262,765	123	12,724,774	25	2,386,488	10	1,007,240	15	1,531,130	2	179,150	646	66,196,892
65 to 69	15	1,764,589	30	3,165,115	42	4,314,016	49	4,862,853	26	2,460,361	11	1,175,990	4	433,888	7	695,864	1	118,997	185	18,991,673
70 & up	6	573,468	8	821,392	9	950,073	11	1,033,573	10	937,498	4	363,189	2	224,370	0	0	0	0	50	4,903,563
Total	1,866	$ 162,047,500	1,270	$ 124,813,501	871	$ 89,723,558	1,032	$ 106,582,733	571	$ 58,086,020	120	$ 12,018,151	39	$ 3,970,458	33	$ 3,284,840	3	$ 298,147	5,805	$ 560,824,908

[1] Minor differences between the sums of values shown and the totals shown may arise due to rounding.

Schedule D – Tables of Employee Data (continued)

Table 2 – The Number and Annual Retirement Allowances Distributed by Age as of December 31, 2023[1]

	Service Retirements		Disabled Members		Beneficiaries	
Age	Number	Amount	Number	Amount	Number	Amount
<50	33	$ 1,877,633	27	$ 545,435	22	$ 235,175
50	14	776,137	7	150,329	6	138,096
51	21	1,084,047	5	111,970	5	54,262
52	32	1,701,347	10	240,455	10	174,419
53	35	2,011,397	5	86,030	7	96,536
54	41	2,153,547	6	78,386	5	116,174
55	59	3,171,442	13	346,359	4	64,143
56	66	3,399,690	19	396,005	8	128,839
57	76	3,958,693	16	385,189	13	214,182
58	97	5,120,389	14	307,140	11	189,694
59	106	5,514,142	21	516,352	10	107,757
60	125	6,604,274	20	476,583	17	266,103
61	108	5,396,291	26	649,918	20	324,289
62	107	5,474,535	25	585,345	18	318,246
63	131	6,422,992	31	717,951	14	280,635
64	142	7,074,453	39	779,094	17	254,234
65	193	8,927,665	36	858,693	26	393,411
66	171	7,585,061	27	637,275	21	568,970
67	198	8,719,187	18	392,011	33	579,434
68	197	8,566,499	32	694,525	40	731,637
69	187	7,853,909	38	743,980	26	602,533
70	192	7,988,906	21	421,627	27	476,820
71	212	8,818,110	20	357,741	30	688,261
72	183	7,156,342	12	277,643	30	531,090
73	181	6,820,891	26	485,882	26	678,738
74	193	7,514,607	23	425,794	32	775,624
75	203	7,541,423	17	320,253	46	1,020,065
76	192	6,792,080	19	450,811	41	980,993
77	175	6,274,861	14	252,866	54	1,077,636
78	151	5,270,075	13	303,229	45	985,843
79	168	5,794,992	16	286,043	47	1,009,270
80	148	4,890,099	20	269,430	54	1,091,374
81	129	4,355,571	13	255,044	50	945,972
82	111	3,519,605	10	195,017	46	828,757
83	94	2,815,916	7	124,993	40	746,795
84	73	2,402,506	4	55,500	35	703,742
85	65	1,984,406	6	104,629	37	643,008
>85	269	7,369,844	8	122,702	238	3,943,486
Total	4,878	$200,703,565	684	$ 14,408,229	1,211	$ 22,966,242
No Option	3,145	130,619,176	566	12,204,028	1,211	22,966,242
Survivor Option	33	1,586,352	2	40,374	0	0
Pop-Up Option	1,700	68,498,037	116	2,163,827	0	0
Total	4,878	$200,703,565	684	$ 14,408,229	1,211	$ 22,966,242

[1] Minor differences between the sums of values shown and the totals shown may arise due to rounding. Disabled members' counts and allowances exclude 27 individuals receiving worker's compensation for over 5 years.

Schedule D – Tables of Employee Data (continued)

Table 3 – Reconciliation of Participant Data

	Actives	Retirees	Beneficiaries	Disabled[15]	Actives, not accruing service	Total
Participants as of December 31, 2022	5,555	4,883	1,194	706	307	12,645
Changes due to:						
Termination						
Due Contributions	(125)				125	0
Received Contributions	(59)				(49)	(108)
Retirements	(150)	152			(2)	0
Disability	(30)			33	(3)	0
Deaths						
With Survivor	(2)	(68)		(6)	(1)	(77)
Without Survivor	(1)	(91)	(60)	(22)		(174)
New Entrants	603		79		53	735
Rehires	12			(1)	(3)	8
Benefits Expired			(2)			(2)
Began contributing	8				(8)	0
Stopped contributing	(6)				6	0
Escheatment					(27)	(27)
Data Corrections		2		1	46	49
Total Changes	250	(5)	17	5	137	404
Participants as of December 31, 2023	5,805	4,878	1,211	711	444	13,049

[15] Includes 24 individuals on December 31, 2022 and 27 individuals on December 31, 2023 receiving worker's compensation for over 5 year.

Solvency Test

As of December 31, 2023

The MBTA Retirement Fund's funding objective is to meet long-term benefit promises through contributions that remain approximately level from year-to-year as a percent of member payroll. If the contributions to the Fund are level in concept and soundly executed, the Fund will pay all promised benefits when due - - the ultimate test of financial soundness.

A solvency test is one means of checking a fund's progress under its funding program. In a solvency test, the fund's present assets (cash and investments) are compared with:

1. Active member contributions on deposit;
2. The liabilities for future benefits to present retired lives;
3. The liabilities for service already rendered by active and inactive members.

In a Fund that has been following the discipline of level percent-of-payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the Fund. Buck prepared the following Solvency Schedule:

Valuation Date	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active/Inactive Members (Employer Financed)	Actuarial Value of Assets	Portion of AAL Covered by Assets (1)	(2)	(3)
12/31/2023	$ 380,681,213	$ 2,177,011,957	$ 745,670,912	$ 1,844,331,372	100%	67%	0%
12/31/2022	347,358,589	2,143,395,353	610,950,073	1,799,924,778	100%	68%	0%
12/31/2021	325,347,277	2,129,569,570	646,787,168	1,760,643,571	100%	67%	0%
12/31/2020	298,648,242	2,109,955,052	646,520,086	1,636,054,386	100%	63%	0%
12/31/2019	266,634,347	2,129,210,443	625,265,569	1,561,192,531	100%	61%	0%
12/31/2018	240,849,945	2,092,861,364	583,089,414	1,559,452,659	100%	63%	0%
12/31/2017	221,627,390	2,057,542,739	550,215,648	1,599,505,237	100%	67%	0%
12/31/2016	219,497,282	1,918,980,542	556,078,499	1,607,560,108	100%	72%	0%
12/31/2015	219,752,752	1,774,425,407	577,905,849	1,630,411,191	100%	79%	0%
12/31/2014	211,433,306	1,682,557,007	553,740,744	1,632,174,762	100%	84%	0%

Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

As of December 31, 2023

Schedule prepared by Buck

Valuation Date	Added to Rolls		Removed from Rolls		Rolls - End of Year		% Increase in Annual Allowances	Average Annual Allowances
	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances		
12/31/2023	184	$ 8,310,204	170	$ 2,299,429	6,773	$ 238,078,036	2.38%	$ 35,151
12/31/2022	233	11,543,586	187	5,100,217	6,759	232,067,261	2.16%	34,335
12/31/2021	205	8,555,618	202	5,039,468	6,713	225,623,892	1.54%	33,610
12/31/2020	144	5,343,426	247	5,787,592	6,710	222,107,742	1.33%	33,101
12/31/2019	148	6,101,838	176	4,806,046	6,813	222,551,908	1.00%	32,666
12/31/2018	209	8,408,514	191	4,618,807	6,841	221,256,116	1.47%	32,343
12/31/2017	310	14,541,060	171	4,108,386	6,823	217,466,409	2.90%	31,873
12/31/2016	370	18,053,040	158	3,735,177	6,684	207,033,735	4.02%	30,975
12/31/2015	270	11,550,600	205	4,661,828	6,472	192,715,872	2.67%	29,777
12/31/2014	123	5,191,092	87	360,332	6,407	185,827,100	2.09%	29,004

Schedule of Active Member Valuation Data

Valuation Date	Number	Annual Payroll	Average Annual Pay	% Increase In Average Pay
2023	5,805	$ 560,824,908	$ 96,611	8.1%
2022	5,555	496,467,531	89,373	6.9%
2021	5,486	458,857,189	83,641	3.0%
2020	5,674	460,921,559	81,234	2.4%
2019	5,507	436,828,077	79,322	0.4%
2018	5,392	425,862,201	78,980	-0.8%
2017	5,386	428,830,122	79,619	3.1%
2016	5,786	446,740,427	77,211	2.5%
2015	5,885	443,237,899	75,317	4.5%
2014	5,798	417,957,007	72,086	8.2%

STATISTICAL SECTION

(Unaudited)

Objectives

The objectives of the Statistical Section are to provide additional historical perspective, context and detail to assist readers in using the information in the Financial Statements, Notes to the Financial Statements and Required Supplementary Information in order to understand and assess the Plan's economic condition.

Financial Trends

The Schedule of Changes in Net Position presented on page 153 contains historical information related to the Fund's revenues, expenses, changes in net position and net position available for benefits. The Schedule of Additions by Source on page 153 provides employer and employee contribution rates and historical investment income information. The schedules of deductions and benefits by type on page 154 provide a history of annual benefit, withdrawal and operating expense trends.

Demographic and Economic Information

The schedule of Distribution of Plan Members shown on page 155 provides relevant details about the composition of the Fund's active membership including concentration of members within various age groups.

Operating Information

The Schedule of Average Benefit Payments on page 156 presents average monthly benefits and average final salary information by years of credited service for new benefit recipients within specified plan years. The Schedule of Benefit Recipients by Type and Option on page 157 illustrates the number of participants and total benefit payments by type and option.

Statistical data is provided from both the Fund's internal resources and from the Fund's Actuary, Buck Global, LLC.

Financial Trends (2014 – 2023 for all reports)

Schedule of Changes in Net Position

Year Ended Dec 31	Net Position Beginning of Year	Additions	Deductions	Increase (Decrease) in net Position	Adjustment for adoption of GASB 67	Net Position End of Year
2023	$ 1,622,548,978	$ 328,661,971	$ 256,605,301	72,056,670	(204,388)	1,694,401,260
2022	1,939,942,425	(81,770,442)	235,623,005	(317,393,447)	-	1,622,548,978
2021	1,769,941,276	399,135,305	229,134,156	170,001,149	-	1,939,942,425
2020	1,614,144,213	385,730,778	229,933,715	155,797,063	-	1,769,941,276
2019	1,449,695,100	393,360,861	228,911,748	164,449,113	-	1,614,144,213
2018	1,603,176,196	72,546,582	226,027,678	(153,481,096)	-	1,449,695,100
2017	1,485,605,884	334,848,844	217,278,532	117,570,312	-	1,603,176,196
2016	1,497,848,035	191,813,165	204,055,316	(12,242,151)	-	1,485,605,884
2015	1,587,966,489	104,595,864	194,714,318	(90,118,454)	-	1,497,848,035
2014	1,606,684,354	169,464,986	188,182,851	(18,717,865)	-	1,587,966,489

Schedule of Additions by Source

Year Ended Dec 31	Employee Contributions	Employer Contributions	Employer Contributions as % of Covered Payroll	Investment Income (a)	Total
2023	$ 50,735,073	$ 135,226,433	24.11%	$ 142,700,464	$ 328,661,971
2022	45,511,253	129,973,295	26.18	(257,254,989)	(81,770,441)
2021	43,224,002	123,493,762	26.91	232,417,541	399,135,304
2020	40,774,027	116,285,928	25.45	228,670,823	385,730,778
2019	36,366,108	103,263,763	23.82	253,730,990	393,360,861
2018	32,606,337	92,013,124	21.61	(52,072,879)	72,546,582
2017	29,775,344	83,382,882	19.44	221,690,618	334,848,844
2016	27,791,543	77,239,279	17.38	86,782,343	191,813,165
2015	26,510,946	73,373,672	16.66	4,711,246	104,595,864
2014	25,318,224	70,603,285	17.00	73,543,477	169,464,986

Contributions were made in accordance with actuarially determined contribution requirements
(a) Net of investment expenses

Schedule of Deductions by Type

Year Ended Dec 31	Benefits	Operating Expenses	Withdrawals	Total
2023	$ 247,184,648	$ 4,415,368	$ 5,005,285	$ 256,605,301
2022	226,290,777	4,484,766	4,847,462	235,623,005
2021	221,589,832	4,366,485	3,177,839	229,134,156
2020	221,447,685	4,511,375	3,974,655	229,933,715
2019	220,553,916	5,046,775	3,311,057	228,911,748
2018	218,385,648	4,317,624	3,324,406	226,027,678
2017	208,999,450	4,463,775	3,815,307	217,278,532
2016	195,707,470	6,493,777	1,854,069	204,055,316
2015	187,148,675	5,808,086	1,757,557	194,714,318
2014	182,499,776	4,052,664	1,630,411	188,182,851

Schedule of Benefit Deduction by Type

Year Ended Dec 31	Service	Disability	Beneficiary	Total
2023	$ 208,779,080	$ 16,172,101	$ 22,233,467	$ 247,184,648
2022	191,860,901	14,600,088	19,829,789	226,290,778
2021	188,377,526	14,081,012	19,131,295	221,589,832
2020	188,613,828	13,697,233	19,136,624	221,447,685
2019	189,884,938	13,715,736	16,953,242	220,553,916
2018	188,529,051	13,331,294	16,525,303	218,385,648
2017	179,572,258	12,873,203	16,553,989	208,999,450
2016	165,645,608	13,811,300	16,250,562	195,707,470
2015	158,790,759	12,294,604	16,063,312	187,148,675
2014	153,390,245	10,892,495	18,217,036	182,499,776

Demographic and Economic Information (As of 12/31/23)

Distribution of Fund Members as of December 31, 2023 - Active Members

	Years of Service										Total	Average
Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total	Compensation	Compensation
under 25	51	-	-	-	-	-	-	-	-	51	3,681,787	72,192
25-29	181	11	-	-	-	-	-	-	-	192	15,816,861	82,379
30-34	309	116	28	1	-	-	-	-	-	454	41,380,936	91,147
35-39	325	211	128	70	1	-	-	-	-	735	70,343,466	95,705
40-44	283	232	123	163	47	-	-	-	-	848	81,588,370	96,213
45-49	268	210	124	172	91	16	-	-	-	881	84,638,586	96,071
50-54	204	209	139	174	125	23	3	-	-	877	85,258,999	97,217
55-59	161	149	149	207	148	41	20	11	-	886	88,023,775	99,350
60-64	63	94	129	185	123	25	10	15	2	646	66,196,892	102,472
65-69	15	30	42	49	26	11	4	7	1	185	18,991,673	102,658
70+	6	8	9	11	10	4	2	-	-	50	4,903,563	98,071
Total	**1,866**	**1,270**	**871**	**1,032**	**571**	**120**	**39**	**33**	**3**	**5,805**	**560,824,908**	96,611

Operating Information

Schedule of Average Benefit Payments - New Benefit Recipients (2014 – 2023)

Years of Service	0-4	5-9	10-14	15-19	20-24	25-29	30+	Total
2014								
Average Monthly Benefit	$ -	$ 944	$ 1,565	$ 2,371	$ 3,455	$ 4,103	$ 4,429	**$ 3,517**
Average Final Average Salary	-	60,088	69,079	71,012	80,485	81,816	80,201	**79,223**
Number of Retired Members	-	1	10	7	55	37	13	**123**
2015								
Average Monthly Benefit	$ 813	$ 951	$ 1,760	$ 2,346	$ 3,720	$ 4,582	$ 4,988	**$ 3,565**
Average Final Average Salary	143,040	77,667	74,294	76,590	86,810	87,865	88,188	**85,090**
Number of Retired Members	2	18	27	24	98	70	31	**270**
2016								
Average Monthly Benefit	$ 2,754	$ 1,294	$ 1,871	$ 2,708	$ 4,012	$ 4,430	$ 5,222	**$ 4,066**
Average Final Average Salary	91,458	82,418	81,622	80,316	85,125	78,969	81,558	**81,761**
Number of Retired Members	2	15	24	19	111	128	71	**370**
2017								
Average Monthly Benefit	$ -	$ 1,145	$ 1,703	$ 2,572	$ 3,805	$ 4,776	$ 5,145	**$ 3,972**
Average Final Average Salary	-	87,848	76,222	78,592	83,192	84,360	83,286	**82,327**
Number of Retired Members	-	7	41	38	52	107	65	**310**
2018								
Average Monthly Benefit	$ 535	$ 1,183	$ 1,718	$ 2,392	$ 3,766	$ 4,767	$ 4,939	**$ 3,445**
Average Final Average Salary	47,133	67,758	67,861	61,879	81,109	87,896	84,979	**77,016**
Number of Retired Members	2	6	37	32	55	48	24	**204**
2019								
Average Monthly Benefit	$ -	$ 1,488	$ 1,821	$ 2,495	$ 3,728	$ 4,904	$ 5,299	**$ 3,345**
Average Final Average Salary	-	68,561	71,079	73,257	80,413	91,264	93,985	**79,622**
Number of Retired Members	-	13	25	25	50	20	17	**150**
2020								
Average Monthly Benefit	$ 655	$ 1,096	$ 1,820	$ 2,832	$ 3,849	$ 4,967	$ 5,073	**$ 3,428**
Average Final Average Salary	74,475	60,381	63,869	72,394	79,997	89,472	77,950	**76,585**
Number of Retired Members	2	9	17	26	53	22	8	**137**
2021								
Average Monthly Benefit	$ 1,027	$ 1,660	$ 1,875	$ 2,872	$ 4,099	$ 4,952	$ 5,654	**$ 3,592**
Average Final Average Salary	98,776	81,957	63,701	75,170	87,159	82,954	99,055	**82,055**
Number of Retired Members	1	15	23	39	82	21	14	**195**
2022								
Average Monthly Benefit	$ 1,189	$ 1,400	$ 2,348	$ 3,108	$ 4,392	$ 5,706	$ 5,561	**$ 4,099**
Average Final Average Salary	101,055	71,338	85,686	84,607	93,017	93,340	93,132	**90,143**
Number of Retired Members	4	10	35	31	92	49	17	**238**
2023								
Average Monthly Benefit	$ 446	$ 1,093	$ 2,391	$ 2,835	$ 4,212	$ 4,898	$ 5,988	**$ 3,752**
Average Final Average Salary	112,858	74,075	92,677	67,220	89,336	93,872	96,317	**86,320**
Number of Retired Members	3	11	24	36	76	20	21	**191**

Schedule of Benefit Recipients by Type and Option

December 31, 2023

		Type of Retirement*									Option Selected**					
	Total	I	II	III	IV	V	VI	VII	VIII	IX	A	B	C	D	E	Grand Total
$0-$500	192	26	3	0	63	6	1	67	0	26	138	20	8	0	26	192
$500-$1,000	396	45	1	1	108	4	17	173	0	47	301	42	6	0	47	396
$1,000-$1,500	540	82	12	13	140	4	20	234	2	33	418	61	28	0	33	540
$1,500-$2,000	683	139	97	32	153	2	4	203	24	29	472	147	32	3	29	683
$2,000-$2,500	918	161	413	47	129	3	1	142	13	9	614	238	55	2	9	918
$2,500-$3,000	983	148	642	20	66	2	1	97	6	1	605	294	76	7	1	983
$3,000-$3,500	879	96	681	20	31	0	4	46	0	1	533	281	58	6	1	879
$3,500-$4,000	738	68	621	12	19	0	2	16	0	0	403	257	70	8	0	738
Over $4,000	1470	165	1283	4	1	0	2	15	0	0	860	453	144	13	0	1470
Total	**6799**	**930**	**3753**	**149**	**710**	**21**	**52**	**993**	**45**	**146**	**4344**	**1793**	**477**	**39**	**146**	**6799**

*Type of Retirement
I Normal
II Early Normal
III Early Reduced
IV Disability
V Special Disability
VI Special Survivor
VII Optionee
VIII Special early Reduced
IX QDRO

** Option Selected
A Lifetime Annuity
B Joint Annuinty Pop-up
C Joint Annuity
D Term Certain
E QDRO

FREQUENTLY ASKED QUESTIONS

(Unaudited)

Questions & Answers

The MBTA Retirement Fund is providing the below answers to frequently asked questions to assist you with understanding your retirement benefits under the Pension Agreement. These are being provided for informational purposes only. In the event of any conflict between these answers to frequently asked questions and the Pension Agreement, the Pension Agreement will control.

Q *Who is eligible to become a member of the Retirement Fund?*

A Any person regularly employed by the MBTA is eligible to become a member of the Retirement Fund.

Q *How does an employee contribute to the Retirement Fund?*

A Retirement contributions are deducted from the regular earnings (excluding overtime).

Q *Are the matching contributions made by the Authority applied to the member's balance in the Fund?*

A No. The Authority's contributions are not applied to the member's balance in the Fund. These contributions become an irrevocable asset of the Fund used for the benefit of its members.

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Q *What is the rate of interest earned by the member on his/her contributions? Does the member continue to earn interest after his/her employment with the Authority is terminated by reason of retirement, resignation, or discharge?*

A Interest earned on contributions made on or after July 1, 1967, are compounded annually at a rate of three percent (3%). Note: This rate is set by the Pension Agreement and does not reflect the earnings of the Fund. No. A member stops earning interest on his/her contributions as of the last day of the month prior to his/her separation from the Authority's service.

Q *What is creditable service?*

A Creditable service is the total of membership service and prior service. Prior service is service rendered to the MBTA before January 1, 1948. Membership service is the period of service rendered to the MBTA starting January 1, 1948, for which a member made contributions to the Fund, with exceptions as follows:

1. The period of time an employee is not working at the MBTA due to an injury on the job and is being paid workers' compensation.
2. The period of time spent in the military service by an employee who was a member of the Fund before leaving for military service, for which a maximum credit of 4 years is allowed, if such time occurs during a period of national emergency or such military service is compulsory.

Q *How do part-time employees accrue creditable service?*

A For the purpose of determining the amount of retirement benefit, creditable service for part-time employees of the MBTA accrues at the rate of one month of creditable service, or fraction thereof, for each 173 pay hours received.

Q *Under what circumstances is the spouse of a member required to sign a spousal consent form?*

A When a member submits their application, a spousal consent is required when the member elects to receive his/her benefit in the following manner:

- No optional benefit for spouse
- $33^{1/3}$% with no pop-up
- 25% with no pop-up
- 50% with pop-up
- $33^{1/3}$% with pop-up

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- 25% with pop-up
- 5, 10 or 15-year term certain benefits

Q *Are retirement contributions deducted from Workers' Compensation payments? Does the time out on Workers' Compensation count as creditable membership service?*

A No. There are no retirement contributions deducted from Workers' Compensation payments. As a result, it may exclude that year as a high year in calculating the high 3-year average. Yes. When a member is out of work from the MBTA and receiving Workers' Compensation payments, the time out on Worker's Compensation counts as creditable membership service.

Q *Workers' Compensation Offset: Does my receipt of Workers' Compensation payments affect my disability retirement benefit?*

A Possibly. If the payments that you receive under Workers' Compensation are based on the same injury that qualified you for disability retirement, your pension benefit will be offset against your Workers' Compensation for that same injury.

This means that your pension benefit will be directly reduced by the amount of the Workers' Compensation benefit that you receive.

Workers' Compensation payments that are based on an injury different from the injury that qualified you for a disability pension will not affect your disability retirement benefit.

Q *Is the employment date with the Authority the same as the membership date in the Fund?*

A No. Membership in the Fund begins when contributions are made to the Fund and is usually a short time after the employment date, typically 90 working days after being employed.

Q *Who is the Group A Plan?*

A Employees who became members of the Fund on or before June 30, 2023 are enrolled in Group A unless they elected to join Group B prior to the March 29, 2024 deadline and then accumulates at least 24 months of creditable service after such election.

Q *Who is in the Group B Plan?*

A Those who are or become members of the Fund on or after July 1, 2023, are automatically enrolled in the Group B Plan and may not elect to join Group A.

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Employees enrolled in the Group A Plan that elected to join the Group B Plan prior to the March 29, 2024, deadline are enrolled in Group B once they have accrued 24 months of creditable service from the date of their election to join Group B.

Q *When can a member retire?*

A **Group A Plan:** A member can retire at age 65 or older on a Normal Retirement.

For a member hired before December 6th, 2012, an Early Normal Retirement is available with 23 years of creditable service.

A member hired on or after December 6th, 2012, an Early Normal Retirement is available if the member is age 55 or older and has at least 25 years of creditable service.

An Early Reduced Retirement is available if the member is age 55 or older and has at least 20 years of creditable service; however, the retirement allowance will be reduced by 1/2 of 1% for each month between the age at retirement and age 65.

The plan provides for a Disability Retirement after 4 years of creditable service for an occupational disability or after 6 years for a non-occupational disability.

Group B Plan: A member can retire at age 55 with at least 10 years of creditable service on a Normal Retirement.

A Group B member who accrues at least 10 years of credible service prior to obtaining 55 years of age may leave the employ of the MBTA and elect to begin receiving a vested retirement allowance anytime between the ages of 55-65. Vested retirement allowances are reduced based upon the number of months a member begins collecting their benefit prior to obtaining age 65.

The plan provides for a Disability Retirement after 4 years of creditable service for an occupational disability or after 6 years for a non-occupational disability.

Q *How is a member's normal retirement allowance (non-disability and non-vesting) determined?*

A **Group A Plan:** The retirement allowance is determined by using the following formula: The average of the member's highest three years of pensionable earnings, multiplied by 2.46%, multiplied by years and months of creditable membership service.

Group B Plan: The retirement allowance is determined by using the following formula: The average of the member's highest three years of pensionable earnings, multiplied by the age multiplier based upon the member's age at retirement (see Pension Agreement Article IV), multiplied by the member's years and months of creditable service.

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Q *What is the date shown on the monthly retirement checks and when are they mailed to the retirees?*

A The monthly retirement checks are dated for the last business day of the month. The checks are mailed 4 or 5 days before the end of the month in order for them to arrive at the retiree's home by the last day of the month.

Q *If a member leaves the employment of the MBTA, what happens to the contributions made on the employee's behalf (Authority's Contributions) to the Fund?*

A Those contributions, once made, become an irrevocable asset of the Pension Fund and can only be used for the exclusive benefit of the retired members and their beneficiaries.

Q *If a retirement benefit is sent direct deposit (ACH – wire transfer) to a bank or credit union, when is the benefit deposited into the retiree's account and when are the funds available?*

A The benefit is wired to the retiree's bank or credit union on the last business day of the month. The availability date of these funds is determined by the member's banking institution.

Q *Does a member have a decision to make on how the pension will be paid?*

A Yes. A member can take the maximum retirement allowance payable and will get a check every month for life in that amount, subject to adjustments from time to time. If a member takes the maximum retirement allowance payable, the member will recover the money contributed to the Fund in three years or less, and after the member dies, no further payments will be made from this Fund. A member can elect to take retirement payments under an option. Options give the retiree a lesser amount for life with the provision that upon their death the person designated as beneficiary will receive a retirement allowance. An example would be the 100% option. Instead of taking the maximum retirement allowance payable, the member elects to take a reduced amount for life and upon the members death, the designated beneficiary will receive 100% of the allowance the member was receiving for life. The amount of reduction from the maximum is determined by option factors which are based on the member's and designated beneficiary's age and life expectancy. There are several types of options available.

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Q *Once a member has retired and elected either the maximum benefit or elected an option, can this election be changed?*

A No. An option elected by a member can only be changed prior to the effective date of retirement.

Q *How does unused sick leave affect the retirement allowance?*

A At retirement, a member's unused sick leave is converted to creditable membership service, which when multiplied by 2.46% of the average of the three (3) best years, increases the retirement allowance. For example, an unused sick balance of 150 days converts to 7 months of creditable membership service. However, unused sick leave cannot be used to determine service eligibility for retirement.

Q *In the event a retiree is divorced or widowed, can he/she drop the option elected or change it in favor of a new spouse?*

A No. In the event a retiree is divorced or widowed from his/her spouse, the option elected cannot be dropped or transferred in favor of a new spouse after the effective date of retirement.

Q *Can a member buy any service for which credit is not being received?*

A No. A member can only get credited for the time in which both the member and the Authority make contributions.

Q *Who can an active or retired member contact with specific questions concerning health and life insurance benefits?*

A Active and retired members of the MBTA may contact the Benefits Department with specific questions about health and life insurance benefits. The telephone number is (617) 222-3244. Written inquiries should be sent to the MBTA Benefits Department, 10 Park Plaza, 2nd Floor, Boston, MA 02116.

Q *Can a member withdraw any money from the Fund and pay it back at a later date with interest?*

A No. A member cannot withdraw any contributions from the Fund. The only way a member can obtain money from the Fund is either by resigning or retiring.

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Q *Can I receive creditable service in the MBTA Retirement Fund for service with any other Federal, State, or local government agency?*

A No. Since the MBTA Retirement Fund is a private system, no credit can be given for service other than with the MBTA.

Q *If the surviving spouse is eligible to receive a monthly benefit, how soon does he/she begin receiving the benefit? Does he/she have to wait until the member would have reached age 65?*

A The surviving spouse is eligible to receive the benefit the first month following the member's death. He/She does not have to wait until the member would have reached age 65.

Example: Member passes away June 15th. The surviving spouse is eligible for benefit starting July 1st.

Q *How are changes made to the Pension Agreement?*

A All changes to the Pension Agreement are negotiated between Local #589 and the Authority.

Q *If I leave the employ of the Authority and return at a later date, am I eligible to "Buy Back" my prior service?*

A Yes. A former member of the Fund who is re-employed by the Authority is eligible, after a 3-year waiting period, to request the Retirement Board to restore his/her previous service by the repayment of the withdrawn funds, plus interest. "Bridging the Gap" restores to the member the creditable service he/she built up during the previous period of employment. There is no credit given for the period between the date the member left the employ of the Authority and the date he/she was re-employed. That gap will always remain. Therefore, any member of the Fund who terminated his/her employment with the Authority and was re-employed should contact the Retirement Board to determine the amount necessary to "Buy Back" the previous service.

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Q *How does a member qualify for a benefit under the Vesting Provision of the Fund?*

A **Group A Plan:** Under the Vesting Provision of the Fund, a member who has at least 10 years of creditable membership service may qualify for a benefit provided that his/her employment with the MBTA ended through no fault of their own. If a member resigns or is discharged for cause, he/she is not eligible for a retirement benefit under this provision.

Group B Plan: A Member qualifies for a vested deferred retirement allowance if the member accrues at least 10 years of credible service, the member's employment with the MBTA is terminated for any reason prior to becoming eligible for an immediate retirement allowance per Article IV (2), and the member has not withdrawn their contributions from the Fund.

Q *When is a member eligible to receive a vested retirement benefit?*

A **Group A Plan:** A member is eligible to receive a vested retirement benefit the first of the month following the member's 65th birthday provided that (i) such member has 10 years of creditable membership service in the Fund, and (ii) such member's employment did not end voluntarily or by termination (e.g. was permanently laid off).

Group B Plan: A member that has 10 years of creditable membership service (and was not eligible for a retirement allowance set out in Pension Agreement Article IV, Section 2) may begin collecting their vested allowance between the ages of 55-65 provided that such allowance will be reduced by one half of one percent (0.50%) for each month prior to their 65^{th} birthday. All vested retirement allowances are calculated using the 2.46% multiplier.

Q *Can taxes be withheld from a retiree's pension benefit?*

A Federal tax can be withheld and deducted from a retiree's pension benefit each month. The amount of federal tax withheld from a retiree's pension allowance can be changed at any time by filing a new W-4P form with the Retirement Fund. The pension allowance is not taxable in the state of Massachusetts. Retirees and payees residing in states other than Massachusetts should consult their tax professional for advice regarding the state tax status of a retiree's pension benefit.

Q *If a member has a question concerning the Fund or would like to obtain an estimate of his/her retirement benefit, whom should he/she contact for the correct answer?*

A All questions should be directed to the MBTA Retirement Fund at One Washington Mall, Boston, MA 02108 617-316-3800 or 800-810-6228.

MBTA Retirement Fund

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