

2022

PERAC COMPARATIVE ANALYSIS

SEPTEMBER 2023

2022 | A Comparative Analysis

OF INVESTMENT-RELATED EXPENSES FOR MA CONTRIBUTORY
RETIREMENT SYSTEMS AND INVESTMENT RETURNS FOR 1,
5, 10 AND 38-YEAR PERIODS ENDING DECEMBER 31, 2022

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Letter from Executive Director

John W. Parsons

“Studies such as this provide retirement board members, public officials and taxpayers with a critical tool with which to assess investment performance.”

This report represents a further installment in a series of reports focused on the costs associated with the investment of the assets of these systems and is consistent with PERAC's statutory responsibility to provide "statistical and other reports and information to the Governor and the General Court and the public."

The report details the management, custodian and consultant fees for each public pension system based on that system's 2022 Annual Statement of Financial Condition. Studies such as this provide retirement board members, public officials and taxpayers with a critical tool with which to assess investment performance. Using this report, board members are able to gauge their costs against those of their peers, public officials are able to analyze the management of the pension funds, and taxpayers can gain insight into the level of expenditure involved in this task. PERAC's effort in this area reflects its commitment to bring transparency to all aspects of retirement system management.

We are pleased to report that the average investment service provider fees for 2022 were 55 basis points or 0.55%. This is a drop from 58 basis points in the last report in 2018 and I commend retirement boards and investment vendors for their work and diligence towards these cost savings while striving to maximize investment returns for members and beneficiaries.

During 2022, a total of \$588.9 million was expended by the 103 public pension retirement boards for which we have data as they performed the vital task of investing

\$108.4 billion of system funds. The State and Teachers Fund spent \$357.3 million and local retirement boards incurred expenses of \$231.6 million.

The primary data source for the information published herein is the Schedule 7 filed by each retirement board as part of its 2022 Annual Statement of Financial Condition.

In assessing this material, it should be kept in mind that the level of cost, in and of itself, is neither a positive nor a negative. More important is whether the investment performance justifies the cost. In publishing this information PERAC makes no comment regarding any retirement board's asset allocation, investment strategy or manager/fund commitments.

On behalf of the Commission, I would like to thank the PERAC staff who prepared, reviewed and published this report, particularly, Sarita Yee and John Galvin for compiling the investment analysis. If you have any questions or comments, please contact Sarita at 617-591-8938 or sarita.yee@mass.gov or John at 617-591-8927 or john.p.galvin@mass.gov.

Sincerely,

John W. Parsons, Esq.
Executive Director



SEC

OFFICE of INVESTOR
EDUCATION and ADVOCACY

INVESTOR BULLETIN

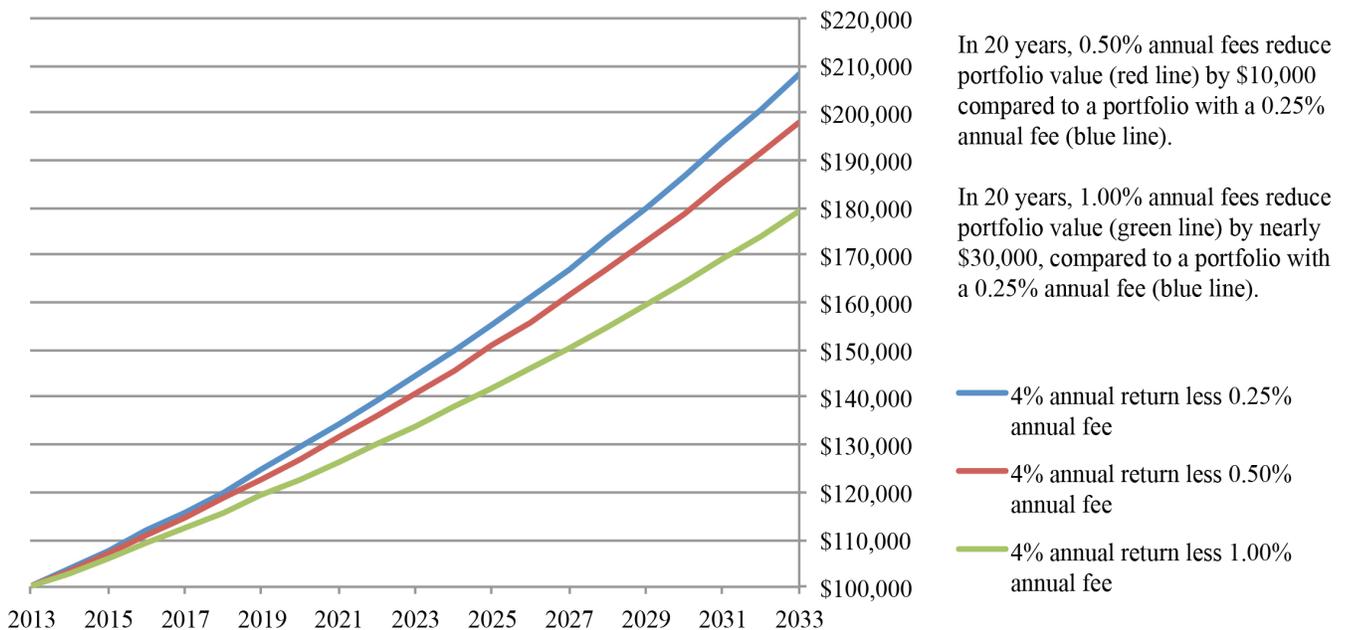
How Fees and Expenses Affect Your Investment Portfolio

The SEC's Office of Investor Education and Advocacy is issuing this bulletin to educate investors about how fees can impact the value of an investment portfolio.

As with anything you buy, there are fees and costs associated with investment products and services.

These fees may seem small, but over time they can have a major impact on your investment portfolio. The following chart shows an investment portfolio with a 4% annual return over 20 years when the investment either has an ongoing fee of 0.25%, 0.50% or 1%. Notice how the fees affect the investment portfolio over 20 years.

Portfolio Value From Investing \$100,000 Over 20 Years



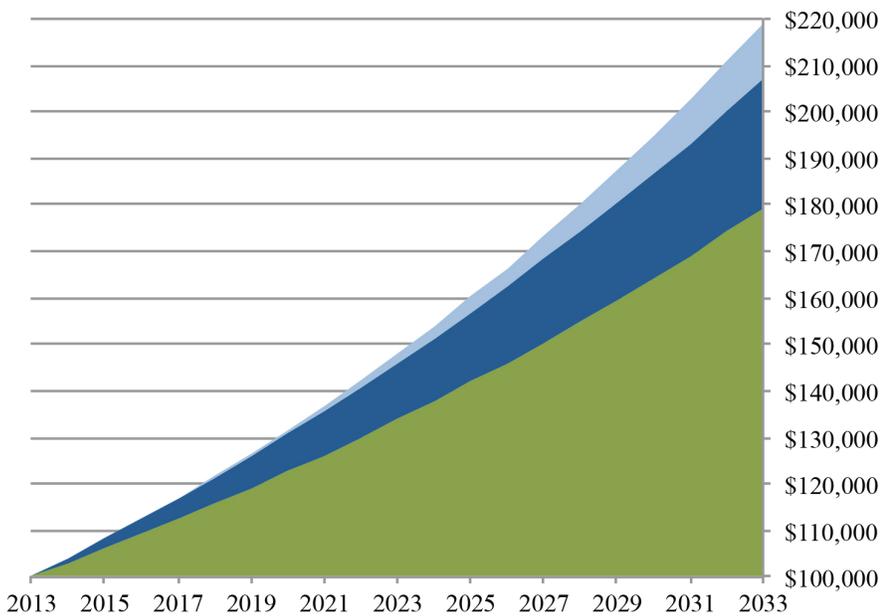
How do ongoing fees affect your investment portfolio?

Ongoing fees can also reduce the value of your investment portfolio. This is particularly true over time, because not only is your investment balance reduced by the fee, but you also lose any return you would have earned *on* that fee. ***Over time, even ongoing fees that are small can have a big impact on your investment portfolio.*** The chart above illustrates the effect of different ongoing fees on a

\$100,000 investment portfolio with a 4% annual return over 20 years.

The chart below illustrates the impact of a 1% ongoing fee on a \$100,000 investment portfolio that grows 4% annually over 20 years. As the investment portfolio grows over time, so does the total amount of fees you pay. Because of the fees you pay, you have a smaller amount invested that is earning a return.

Illustration of Ongoing Fees Over 20 Years



In 20 years, the total amount paid for a 1% annual fee adds up to almost \$28,000 for a \$100,000 initial investment.

In addition, if you were able to invest that \$28,000, you would have earned an additional \$12,000.

- additional return if the fees paid were invested
- total amount paid for the 1% annual fee
- 4% annual return less 1% annual fee

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1 | EXPLANATORY NOTES

This Expense Report is a helpful tool for retirement board members, public officials and taxpayers to analyze the costs associated with the management of the assets of the 104 public employee retirement systems in Massachusetts.* However, this tool must be used judiciously and in proper context. Investment strategies and asset allocation drive investment returns. Some strategies and allocations require the payment of greater fees than others. Expenses must be assessed in conjunction with investment performance. The primary data source for the information published herein is the Schedule 7 filed by each retirement board as part of its 2022 Annual Statement of Financial Condition.

Under Massachusetts law retirement boards may opt to invest assets through the Pension Reserves Investment Trust (PRIT). In some instances, the Report categorizes systems as either “PRIT” or “Non-PRIT.” “PRIT” systems are those that have invested all but a minimal amount of assets in the Pension Reserves Investment Trust. In short, either system’s assets have been fully transferred to PRIT and are managed by the Pension Reserves Investment Management Board (PRIM) or all assets with the exception of limited holdings in non-public asset classes have been transferred to PRIT. “Non-PRIT” systems include those that have no assets invested in PRIT or those in which the retirement board has invested in various segments of the PRIT Fund but retained responsibility for investing most of the system assets.

The Expense Ratio in this report has been expressed in percentage points (%). Another method of reporting fees is in Basis Points, otherwise referred to as bps or “bips.” Basis Points also describe the cost to the Boards for engaging the Investment Service Providers (ISP) for their services. For example, the average of ISP expenses for the year, across all Boards, was 0.55% or 55 bps. This may also be expressed as \$5,500 per \$1,000,000 invested.

*At publication time, data was available for 103 systems

2 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Alphabetical Order)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ADAMS	\$38,772,470.25	-10.81%	5.42%	6.13%	7.55%	\$198,553.96	0.51%	0.35%
AMESBURY	\$68,789,038.02	-10.59%	6.65%	8.24%	8.00%	\$341,598.80	0.50%	0.53%
ANDOVER	\$343,534,091.83	-8.37%	7.07%	8.51%	8.36%	\$1,250,331.33	0.36%	0.41%
ARLINGTON	\$198,983,993.07	-10.82%	6.52%	8.01%	8.26%	\$1,045,125.56	0.53%	0.54%
ATTLEBORO	\$180,896,676.63	-14.42%	6.63%	8.24%	8.72%	\$1,151,771.00	0.64%	0.59%
BARNSTABLE CTY	\$1,458,384,823.21	-10.86%	6.86%	8.40%	7.60%	\$7,592,845.40	0.52%	0.54%
BELMONT	\$148,923,833.81	-8.32%	6.37%	7.95%	9.07%	\$855,375.19	0.57%	0.68%
BERKSHIRE CTY	\$315,015,513.85	-10.92%	6.61%	8.23%	8.84%	\$1,634,173.88	0.52%	0.54%
BEVERLY	\$168,634,078.17	-10.91%	6.72%	8.34%	8.49%	\$874,163.72	0.52%	0.55%
BLUE HILLS REG	\$13,816,106.74	-10.85%	6.56%	8.20%	8.55%	\$42,797.38	0.31%	0.54%
BOSTON (CITY)	\$6,415,794,786.38	-10.55%	4.71%	6.71%	8.47%	\$40,211,648.56	0.63%	0.69%
BOSTON TEACHERS*	\$2,140,617,078.50	-10.70%	6.60%	8.21%	N/A	\$10,433,773.03	0.49%	0.52%
BRAINTREE	\$252,015,691.52	-10.62%	5.97%	7.25%	8.41%	\$1,712,598.14	0.68%	0.70%
BRISTOL CTY	\$837,138,740.69	-9.46%	6.36%	7.88%	8.66%	\$7,722,194.85	0.92%	0.99%
BROCKTON	\$740,113,506.09	-6.33%	6.04%	7.13%	8.46%	\$3,861,691.37	0.52%	0.74%
BROOKLINE	\$428,379,761.55	-9.75%	7.33%	8.01%	8.58%	\$2,534,980.50	0.59%	0.87%
CAMBRIDGE	\$1,632,691,513.53	-9.99%	6.08%	8.22%	9.00%	\$9,782,255.30	0.60%	0.72%
CHELSEA	\$248,630,296.61	-11.01%	6.67%	8.30%	7.97%	\$1,278,202.59	0.51%	0.54%
CHICOPEE	\$409,905,595.43	-10.04%	5.69%	7.88%	8.43%	\$2,637,616.44	0.64%	0.71%
CLINTON	\$68,569,477.41	-10.44%	7.01%	8.46%	7.81%	\$390,220.73	0.57%	0.62%
CONCORD	\$205,021,845.06	-11.27%	5.31%	7.53%	8.30%	\$1,186,634.30	0.58%	0.53%
DANVERS	\$132,794,076.78	-15.68%	4.22%	6.69%	7.68%	\$825,281.89	0.62%	0.72%
DEDHAM	\$175,321,833.93	-10.91%	6.75%	8.38%	9.29%	\$923,274.00	0.53%	0.54%
DUKES CTY	\$210,330,960.13	-13.86%	7.00%	9.02%	7.91%	\$1,266,526.06	0.60%	0.51%
EASTHAMPTON	\$69,148,885.28	-10.97%	6.71%	8.31%	8.23%	\$360,134.77	0.52%	0.54%
ESSEX REG	\$626,655,764.74	-10.80%	6.60%	8.34%	8.62%	\$3,213,083.36	0.51%	0.55%
EVERETT	\$242,493,164.37	-10.82%	6.77%	8.40%	8.40%	\$1,243,014.15	0.51%	0.53%
FAIRHAVEN	\$82,502,645.60	-10.87%	6.72%	8.30%	9.10%	\$429,049.16	0.52%	0.54%
FALL RIVER	\$336,567,624.67	-10.82%	6.54%	8.11%	8.28%	\$1,737,170.24	0.52%	0.55%
FALMOUTH	\$181,678,944.90	-8.49%	5.89%	8.09%	8.73%	\$1,181,772.75	0.65%	0.77%
FITCHBURG	\$157,280,156.69	-11.12%	6.62%	8.15%	7.68%	\$812,982.38	0.52%	0.54%
FRAMINGHAM	\$410,567,964.06	-10.65%	6.63%	8.26%	9.07%	\$2,103,808.20	0.51%	0.54%
FRANKLIN REG	\$178,621,370.95	-12.16%	6.36%	8.45%	8.28%	\$1,026,227.90	0.57%	0.58%
GARDNER	\$68,967,907.16	-11.04%	6.62%	8.27%	9.17%	\$361,361.31	0.52%	0.55%
GLOUCESTER	\$143,343,390.66	-10.78%	6.76%	8.34%	8.74%	\$735,776.81	0.51%	0.54%

* In 2010, Boston Teachers' assets were separated from Boston City assets and transferred into the PRIT Fund.

2 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Alphabetical Order)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
GREATER LAWRENCE	\$22,371,819.89	-17.25%	7.36%	8.99%	7.78%	\$96,348.64	0.43%	0.42%
GREENFIELD	\$90,230,668.07	-10.95%	6.79%	8.39%	8.44%	\$464,952.25	0.52%	0.54%
HAMPDEN CTY	\$475,967,067.01	-10.94%	6.47%	8.11%	8.47%	\$2,450,848.49	0.51%	0.54%
HAMPSHIRE CTY	\$427,393,599.25	-10.39%	6.46%	7.44%	8.18%	\$2,238,864.06	0.52%	0.63%
HAVERHILL	\$263,837,356.90	-9.75%	7.47%	8.49%	9.71%	\$1,799,392.67	0.68%	0.82%
HINGHAM	\$153,148,829.43	-10.94%	6.71%	7.85%	8.93%	\$821,476.09	0.54%	0.57%
HOLYOKE	\$370,242,310.31	-6.92%	7.64%	9.37%	9.32%	\$2,442,173.22	0.66%	0.72%
HULL	\$65,932,190.45	-10.70%	6.74%	8.33%	7.94%	\$331,418.03	0.50%	0.54%
LAWRENCE	\$303,523,397.98	-11.02%	6.66%	8.26%	7.82%	\$1,568,342.29	0.52%	0.54%
LEOMINSTER	\$258,279,861.91	-10.85%	6.22%	8.74%	8.48%	\$1,366,879.08	0.53%	0.62%
LEXINGTON	\$191,026,955.36	-14.47%	4.94%	7.16%	8.42%	\$851,081.12	0.45%	0.85%
LOWELL	\$482,626,052.86	-10.80%	6.50%	8.06%	8.87%	\$2,517,506.21	0.52%	0.54%
LYNN	\$488,616,244.77	-10.04%	6.69%	8.32%	8.01%	\$2,533,950.89	0.52%	0.54%
MALDEN	\$291,645,881.94	-16.68%	4.79%	6.98%	9.02%	\$817,083.00	0.28%	0.29%
MARBLEHEAD	\$115,529,072.50	-10.98%	6.67%	8.30%	9.03%	\$609,267.69	0.53%	0.55%
MARLBOROUGH	\$204,681,832.56	-12.42%	5.31%	6.73%	8.04%	\$932,348.33	0.46%	0.38%
MHFA	\$219,980,775.04	-8.46%	7.06%	7.30%	7.52%	\$1,176,462.36	0.53%	0.55%
MASSPORT	\$764,329,558.69	-13.96%	5.91%	7.57%	8.72%	\$3,220,808.28	0.42%	0.38%
MA TEACHERS' (MTRS)	\$34,712,144,660.68	-10.98%	6.74%	8.36%	9.24%	\$182,290,184.16	0.53%	0.55%
MWRA**	\$630,197,340.79	-11.64%	5.35%	6.97%	7.87%	\$4,509,339.14	0.72%	0.69%
MAYNARD	\$56,311,166.91	-12.16%	5.30%	7.98%	7.77%	\$357,017.27	0.63%	0.61%
MEDFORD	\$227,371,331.38	-10.45%	5.90%	6.62%	8.45%	\$1,444,683.71	0.64%	0.71%
MELROSE	\$107,045,691.37	-10.53%	6.37%	7.88%	8.25%	\$532,840.88	0.50%	0.51%
METHUEN	\$214,658,852.02	-10.81%	6.75%	8.58%	8.02%	\$1,111,159.86	0.52%	0.55%
MIDDLESEX CTY	\$1,878,438,939.78	-11.11%	6.50%	7.95%	8.28%	\$9,685,399.54	0.52%	0.53%
MILFORD	\$122,466,145.22	-10.68%	6.63%	8.23%	8.17%	\$625,881.14	0.51%	0.53%
MILTON	\$179,751,377.42	-10.97%	6.68%	8.29%	9.15%	\$919,978.47	0.51%	0.54%
MINUTEMAN REG	\$15,411,979.63	-10.84%	6.56%	8.07%	9.19%	\$79,951.28	0.52%	0.54%
MONTAGUE	\$53,976,547.09	-10.97%	6.66%	8.26%	8.94%	\$282,787.75	0.52%	0.54%
NATICK***	\$199,814,796.60							0.70%
NEEDHAM	\$213,890,130.05	-10.82%	6.65%	8.22%	9.37%	\$1,091,983.79	0.51%	0.53%
NEW BEDFORD	\$416,178,903.61	-11.43%	6.54%	8.32%	8.07%	\$2,215,999.75	0.53%	0.78%
NEWBURYPORT	\$109,582,829.12	-10.85%	6.73%	8.21%	8.17%	\$570,896.23	0.52%	0.54%
NEWTON	\$473,801,602.78	-10.44%	6.58%	8.15%	8.50%	\$2,328,215.66	0.49%	0.52%
NORFOLK CTY	\$1,261,554,428.73	-10.98%	5.77%	7.53%	8.36%	\$8,633,619.65	0.68%	0.78%

** Based on 37-year return.

*** Market Value based on 12/31/22 custodian report. Complete information not available as of publication date.

2 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Alphabetical Order)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
NORTH ADAMS	\$73,599,438.66	-17.35%	4.92%	7.40%	9.01%	\$296,592.72	0.40%	0.42%
NORTH ATTLEBORO	\$140,310,683.61	-14.59%	5.99%	8.25%	8.42%	\$724,693.25	0.52%	0.57%
NORTHAMPTON	\$145,380,380.62	-16.76%	4.78%	7.37%	8.84%	\$456,990.79	0.31%	0.33%
NORTHBRIDGE	\$47,618,761.96	-10.90%	6.79%	8.37%	9.15%	\$249,688.25	0.52%	0.55%
NORWOOD	\$209,521,652.87	-4.61%	8.64%	9.24%	9.19%	\$1,430,752.04	0.68%	0.71%
PEABODY	\$183,649,752.17	-10.88%	6.72%	8.32%	8.53%	\$961,903.15	0.52%	0.55%
PITTSFIELD	\$174,968,749.05	-10.80%	6.41%	8.07%	8.11%	\$877,263.03	0.50%	0.52%
PLYMOUTH	\$228,661,175.54	-10.55%	6.61%	8.59%	8.68%	\$1,538,909.86	0.67%	0.75%
PLYMOUTH CTY	\$1,313,590,415.27	-6.68%	6.67%	8.02%	8.91%	\$9,636,956.56	0.73%	0.90%
QUINCY	\$793,936,228.22	-9.60%	5.97%	7.02%	8.00%	\$4,868,208.00	0.61%	0.67%
READING	\$175,226,543.71	-10.26%	6.79%	8.35%	9.08%	\$1,017,963.56	0.58%	0.51%
REVERE	\$221,782,649.47	-10.93%	6.60%	8.19%	8.30%	\$1,133,869.42	0.51%	0.54%
SALEM	\$247,002,183.03	-10.41%	6.73%	8.17%	8.09%	\$1,253,711.01	0.51%	0.53%
SAUGUS	\$139,108,403.04	-9.86%	6.76%	8.34%	9.03%	\$856,764.47	0.62%	0.54%
SHREWSBURY	\$155,351,770.40	-10.40%	7.01%	8.91%	9.00%	\$933,277.59	0.60%	0.43%
SOMERVILLE	\$343,528,786.00	-22.06%	7.41%	8.62%	8.85%	\$1,574,490.26	0.46%	0.49%
SOUTHBRIDGE	\$74,936,401.67	-10.88%	6.66%	8.24%	8.03%	\$379,219.66	0.51%	0.54%
SPRINGFIELD	\$509,247,720.57	-10.55%	6.89%	8.52%	8.36%	\$2,568,130.86	0.50%	0.53%
STATE	\$33,192,580,321.71	-10.97%	6.75%	8.37%	9.23%	\$175,052,824.57	0.53%	0.55%
STONEHAM	\$116,465,455.13	-7.71%	5.70%	7.88%	8.57%	\$800,773.09	0.69%	0.64%
SWAMPSCOTT	\$78,893,901.29	-9.58%	6.88%	8.60%	8.91%	\$465,207.89	0.59%	0.56%
TAUNTON	\$376,880,964.28	-13.11%	5.93%	8.00%	9.20%	\$1,776,032.59	0.47%	0.56%
WAKEFIELD	\$153,416,109.97	-10.83%	6.71%	8.34%	9.39%	\$794,281.58	0.52%	0.55%
WALTHAM	\$301,248,928.24	-12.16%	5.72%	7.83%	8.41%	\$1,748,827.90	0.58%	0.54%
WATERTOWN	\$240,567,455.29	-11.19%	6.01%	7.82%	8.14%	\$1,703,811.55	0.71%	0.70%
WEBSTER	\$53,680,524.37	-9.46%	5.25%	7.53%	7.91%	\$337,909.66	0.63%	0.81%
WELLESLEY	\$256,590,416.07	-10.87%	6.71%	8.34%	9.64%	\$1,320,160.84	0.51%	0.54%
WEST SPRINGFIELD	\$135,017,277.05	-16.61%	4.72%	7.25%	7.81%	\$422,209.86	0.31%	0.32%
WESTFIELD	\$289,213,434.97	-7.21%	6.76%	9.09%	8.72%	\$1,854,990.24	0.64%	0.71%
WEYMOUTH	\$239,838,566.01	-12.58%	6.16%	7.93%	9.44%	\$1,818,183.22	0.76%	0.74%
WINCHESTER	\$156,060,427.26	-10.73%	6.61%	7.59%	8.77%	\$806,219.12	0.52%	0.49%
WINTHROP	\$93,894,489.93	-10.78%	6.76%	8.28%	8.55%	\$481,052.42	0.51%	0.54%
WOBURN	\$173,426,010.25	-10.98%	6.54%	8.39%	9.14%	\$950,424.18	0.55%	0.81%
WORCESTER	\$1,216,009,611.84	-8.47%	7.16%	7.74%	8.70%	\$7,002,117.07	0.58%	0.56%
WORCESTER REG	\$965,763,328.40	-11.00%	6.64%	8.21%	8.13%	\$5,006,118.40	0.52%	0.54%

3 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By 2022 Expense Ratio)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
BRISTOL CTY	\$837,138,740.69	-9.46%	6.36%	7.88%	8.66%	\$7,722,194.85	0.92%	0.99%
WEYMOUTH	\$239,838,566.01	-12.58%	6.16%	7.93%	9.44%	\$1,818,183.22	0.76%	0.74%
PLYMOUTH CTY	\$1,313,590,415.27	-6.68%	6.67%	8.02%	8.91%	\$9,636,956.56	0.73%	0.90%
MWRA**	\$630,197,340.79	-11.64%	5.35%	6.97%	7.87%	\$4,509,339.14	0.72%	0.69%
WATERTOWN	\$240,567,455.29	-11.19%	6.01%	7.82%	8.14%	\$1,703,811.55	0.71%	0.70%
STONEHAM	\$116,465,455.13	-7.71%	5.70%	7.88%	8.57%	\$800,773.09	0.69%	0.64%
BRAINTREE	\$252,015,691.52	-10.62%	5.97%	7.25%	8.41%	\$1,712,598.14	0.68%	0.70%
HAVERHILL	\$263,837,356.90	-9.75%	7.47%	8.49%	9.71%	\$1,799,392.67	0.68%	0.82%
NORFOLK CTY	\$1,261,554,428.73	-10.98%	5.77%	7.53%	8.36%	\$8,633,619.65	0.68%	0.78%
NORWOOD	\$209,521,652.87	-4.61%	8.64%	9.24%	9.19%	\$1,430,752.04	0.68%	0.71%
PLYMOUTH	\$228,661,175.54	-10.55%	6.61%	8.59%	8.68%	\$1,538,909.86	0.67%	0.75%
HOLYOKE	\$370,242,310.31	-6.92%	7.64%	9.37%	9.32%	\$2,442,173.22	0.66%	0.72%
FALMOUTH	\$181,678,944.90	-8.49%	5.89%	8.09%	8.73%	\$1,181,772.75	0.65%	0.77%
ATTLEBORO	\$180,896,676.63	-14.42%	6.63%	8.24%	8.72%	\$1,151,771.00	0.64%	0.59%
CHICOPEE	\$409,905,595.43	-10.04%	5.69%	7.88%	8.43%	\$2,637,616.44	0.64%	0.71%
MEDFORD	\$227,371,331.38	-10.45%	5.90%	6.62%	8.45%	\$1,444,683.71	0.64%	0.71%
WESTFIELD	\$289,213,434.97	-7.21%	6.76%	9.09%	8.72%	\$1,854,990.24	0.64%	0.71%
BOSTON (CITY)	\$6,415,794,786.38	-10.55%	4.71%	6.71%	8.47%	\$40,211,648.56	0.63%	0.69%
MAYNARD	\$56,311,166.91	-12.16%	5.30%	7.98%	7.77%	\$357,017.27	0.63%	0.61%
WEBSTER	\$53,680,524.37	-9.46%	5.25%	7.53%	7.91%	\$337,909.66	0.63%	0.81%
DANVERS	\$132,794,076.78	-15.68%	4.22%	6.69%	7.68%	\$825,281.89	0.62%	0.72%
SAUGUS	\$139,108,403.04	-9.86%	6.76%	8.34%	9.03%	\$856,764.47	0.62%	0.54%
QUINCY	\$793,936,228.22	-9.60%	5.97%	7.02%	8.00%	\$4,868,208.00	0.61%	0.67%
CAMBRIDGE	\$1,632,691,513.53	-9.99%	6.08%	8.22%	9.00%	\$9,782,255.30	0.60%	0.72%
DUKES CTY	\$210,330,960.13	-13.86%	7.00%	9.02%	7.91%	\$1,266,526.06	0.60%	0.51%
SHREWSBURY	\$155,351,770.40	-10.40%	7.01%	8.91%	9.00%	\$933,277.59	0.60%	0.43%
BROOKLINE	\$428,379,761.55	-9.75%	7.33%	8.01%	8.58%	\$2,534,980.50	0.59%	0.87%
SWAMPSCOTT	\$78,893,901.29	-9.58%	6.88%	8.60%	8.91%	\$465,207.89	0.59%	0.56%
CONCORD	\$205,021,845.06	-11.27%	5.31%	7.53%	8.30%	\$1,186,634.30	0.58%	0.53%
READING	\$175,226,543.71	-10.26%	6.79%	8.35%	9.08%	\$1,017,963.56	0.58%	0.51%
WALTHAM	\$301,248,928.24	-12.16%	5.72%	7.83%	8.41%	\$1,748,827.90	0.58%	0.54%
WORCESTER	\$1,216,009,611.84	-8.47%	7.16%	7.74%	8.70%	\$7,002,117.07	0.58%	0.56%
BELMONT	\$148,923,833.81	-8.32%	6.37%	7.95%	9.07%	\$855,375.19	0.57%	0.68%
CLINTON	\$68,569,477.41	-10.44%	7.01%	8.46%	7.81%	\$390,220.73	0.57%	0.62%
FRANKLIN REG	\$178,621,370.95	-12.16%	6.36%	8.45%	8.28%	\$1,026,227.90	0.57%	0.58%

** Based on 37-year return.

3 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By 2022 Expense Ratio)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
WOBURN	\$173,426,010.25	-10.98%	6.54%	8.39%	9.14%	\$950,424.18	0.55%	0.81%
HINGHAM	\$153,148,829.43	-10.94%	6.71%	7.85%	8.93%	\$821,476.09	0.54%	0.57%
ARLINGTON	\$198,983,993.07	-10.82%	6.52%	8.01%	8.26%	\$1,045,125.56	0.53%	0.54%
DEDHAM	\$175,321,833.93	-10.91%	6.75%	8.38%	9.29%	\$923,274.00	0.53%	0.54%
LEOMINSTER	\$258,279,861.91	-10.85%	6.22%	8.74%	8.48%	\$1,366,879.08	0.53%	0.62%
MARBLEHEAD	\$115,529,072.50	-10.98%	6.67%	8.30%	9.03%	\$609,267.69	0.53%	0.55%
MHFA	\$219,980,775.04	-8.46%	7.06%	7.30%	7.52%	\$1,176,462.36	0.53%	0.55%
MA TEACHERS' (MTRS)	\$34,712,144,660.68	-10.98%	6.74%	8.36%	9.24%	\$182,290,184.16	0.53%	0.55%
NEW BEDFORD	\$416,178,903.61	-11.43%	6.54%	8.32%	8.07%	\$2,215,999.75	0.53%	0.78%
STATE	\$33,192,580,321.71	-10.97%	6.75%	8.37%	9.23%	\$175,052,824.57	0.53%	0.55%
BARNSTABLE CTY	\$1,458,384,823.21	-10.86%	6.86%	8.40%	7.60%	\$7,592,845.40	0.52%	0.54%
BERKSHIRE CTY	\$315,015,513.85	-10.92%	6.61%	8.23%	8.84%	\$1,634,173.88	0.52%	0.54%
BEVERLY	\$168,634,078.17	-10.91%	6.72%	8.34%	8.49%	\$874,163.72	0.52%	0.55%
BROCKTON	\$740,113,506.09	-6.33%	6.04%	7.13%	8.46%	\$3,861,691.37	0.52%	0.74%
EASTHAMPTON	\$69,148,885.28	-10.97%	6.71%	8.31%	8.23%	\$360,134.77	0.52%	0.54%
FAIRHAVEN	\$82,502,645.60	-10.87%	6.72%	8.30%	9.10%	\$429,049.16	0.52%	0.54%
FALL RIVER	\$336,567,624.67	-10.82%	6.54%	8.11%	8.28%	\$1,737,170.24	0.52%	0.55%
FITCHBURG	\$157,280,156.69	-11.12%	6.62%	8.15%	7.68%	\$812,982.38	0.52%	0.54%
GARDNER	\$68,967,907.16	-11.04%	6.62%	8.27%	9.17%	\$361,361.31	0.52%	0.55%
GREENFIELD	\$90,230,668.07	-10.95%	6.79%	8.39%	8.44%	\$464,952.25	0.52%	0.54%
HAMPSHIRE CTY	\$427,393,599.25	-10.39%	6.46%	7.44%	8.18%	\$2,238,864.06	0.52%	0.63%
LAWRENCE	\$303,523,397.98	-11.02%	6.66%	8.26%	7.82%	\$1,568,342.29	0.52%	0.54%
LOWELL	\$482,626,052.86	-10.80%	6.50%	8.06%	8.87%	\$2,517,506.21	0.52%	0.54%
LYNN	\$488,616,244.77	-10.04%	6.69%	8.32%	8.01%	\$2,533,950.89	0.52%	0.54%
METHUEN	\$214,658,852.02	-10.81%	6.75%	8.58%	8.02%	\$1,111,159.86	0.52%	0.55%
MIDDLESEX CTY	\$1,878,438,939.78	-11.11%	6.50%	7.95%	8.28%	\$9,685,399.54	0.52%	0.53%
MINUTEMAN REG	\$15,411,979.63	-10.84%	6.56%	8.07%	9.19%	\$79,951.28	0.52%	0.54%
MONTAGUE	\$53,976,547.09	-10.97%	6.66%	8.26%	8.94%	\$282,787.75	0.52%	0.54%
NEWBURYPORT	\$109,582,829.12	-10.85%	6.73%	8.21%	8.17%	\$570,896.23	0.52%	0.54%
NORTH ATTLEBORO	\$140,310,683.61	-14.59%	5.99%	8.25%	8.42%	\$724,693.25	0.52%	0.57%
NORTHBRIDGE	\$47,618,761.96	-10.90%	6.79%	8.37%	9.15%	\$249,688.25	0.52%	0.55%
PEABODY	\$183,649,752.17	-10.88%	6.72%	8.32%	8.53%	\$961,903.15	0.52%	0.55%
WAKEFIELD	\$153,416,109.97	-10.83%	6.71%	8.34%	9.39%	\$794,281.58	0.52%	0.55%
WINCHESTER	\$156,060,427.26	-10.73%	6.61%	7.59%	8.77%	\$806,219.12	0.52%	0.49%
WORCESTER REG	\$965,763,328.40	-11.00%	6.64%	8.21%	8.13%	\$5,006,118.40	0.52%	0.54%

3 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By 2022 Expense Ratio)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ADAMS	\$38,772,470.25	-10.81%	5.42%	6.13%	7.55%	\$198,553.96	0.51%	0.35%
CHELSEA	\$248,630,296.61	-11.01%	6.67%	8.30%	7.97%	\$1,278,202.59	0.51%	0.54%
ESSEX REG	\$626,655,764.74	-10.80%	6.60%	8.34%	8.62%	\$3,213,083.36	0.51%	0.55%
EVERETT	\$242,493,164.37	-10.82%	6.77%	8.40%	8.40%	\$1,243,014.15	0.51%	0.53%
FRAMINGHAM	\$410,567,964.06	-10.65%	6.63%	8.26%	9.07%	\$2,103,808.20	0.51%	0.54%
GLOUCESTER	\$143,343,390.66	-10.78%	6.76%	8.34%	8.74%	\$735,776.81	0.51%	0.54%
HAMPDEN CTY	\$475,967,067.01	-10.94%	6.47%	8.11%	8.47%	\$2,450,848.49	0.51%	0.54%
MILFORD	\$122,466,145.22	-10.68%	6.63%	8.23%	8.17%	\$625,881.14	0.51%	0.53%
MILTON	\$179,751,377.42	-10.97%	6.68%	8.29%	9.15%	\$919,978.47	0.51%	0.54%
NEEDHAM	\$213,890,130.05	-10.82%	6.65%	8.22%	9.37%	\$1,091,983.79	0.51%	0.53%
REVERE	\$221,782,649.47	-10.93%	6.60%	8.19%	8.30%	\$1,133,869.42	0.51%	0.54%
SALEM	\$247,002,183.03	-10.41%	6.73%	8.17%	8.09%	\$1,253,711.01	0.51%	0.53%
SOUTHBRIDGE	\$74,936,401.67	-10.88%	6.66%	8.24%	8.03%	\$379,219.66	0.51%	0.54%
WELLESLEY	\$256,590,416.07	-10.87%	6.71%	8.34%	9.64%	\$1,320,160.84	0.51%	0.54%
WINTHROP	\$93,894,489.93	-10.78%	6.76%	8.28%	8.55%	\$481,052.42	0.51%	0.54%
AMESBURY	\$68,789,038.02	-10.59%	6.65%	8.24%	8.00%	\$341,598.80	0.50%	0.53%
HULL	\$65,932,190.45	-10.70%	6.74%	8.33%	7.94%	\$331,418.03	0.50%	0.54%
MELROSE	\$107,045,691.37	-10.53%	6.37%	7.88%	8.25%	\$532,840.88	0.50%	0.51%
PITTSFIELD	\$174,968,749.05	-10.80%	6.41%	8.07%	8.11%	\$877,263.03	0.50%	0.52%
SPRINGFIELD	\$509,247,720.57	-10.55%	6.89%	8.52%	8.36%	\$2,568,130.86	0.50%	0.53%
BOSTON (TEACHERS)*	\$2,140,617,078.50	-10.70%	6.60%	8.21%	N/A	\$10,433,773.03	0.49%	0.52%
NEWTON	\$473,801,602.78	-10.44%	6.58%	8.15%	8.50%	\$2,328,215.66	0.49%	0.52%
TAUNTON	\$376,880,964.28	-13.11%	5.93%	8.00%	9.20%	\$1,776,032.59	0.47%	0.56%
MARLBOROUGH	\$204,681,832.56	-12.42%	5.31%	6.73%	8.04%	\$932,348.33	0.46%	0.38%
SOMERVILLE	\$343,528,786.00	-22.06%	7.41%	8.62%	8.85%	\$1,574,490.26	0.46%	0.49%
LEXINGTON	\$191,026,955.36	-14.47%	4.94%	7.16%	8.42%	\$851,081.12	0.45%	0.85%
GREATER LAWRENCE	\$22,371,819.89	-17.25%	7.36%	8.99%	7.78%	\$96,348.64	0.43%	0.42%
MASSPORT	\$764,329,558.69	-13.96%	5.91%	7.57%	8.72%	\$3,220,808.28	0.42%	0.38%
NORTH ADAMS	\$73,599,438.66	-17.35%	4.92%	7.40%	9.01%	\$296,592.72	0.40%	0.42%
ANDOVER	\$343,534,091.83	-8.37%	7.07%	8.51%	8.36%	\$1,250,331.33	0.36%	0.41%
BLUE HILLS REG	\$13,816,106.74	-10.85%	6.56%	8.20%	8.55%	\$42,797.38	0.31%	0.54%
NORTHAMPTON	\$145,380,380.62	-16.76%	4.78%	7.37%	8.84%	\$456,990.79	0.31%	0.33%
WEST SPRINGFIELD	\$135,017,277.05	-16.61%	4.72%	7.25%	7.81%	\$422,209.86	0.31%	0.32%
MALDEN	\$291,645,881.94	-16.68%	4.79%	6.98%	9.02%	\$817,083.00	0.28%	0.29%
NATICK***	\$199,814,796.60							0.70%

* In 2010, Boston Teachers' assets were separated from Boston City assets and transferred into the PRIT Fund.

*** Market Value based on 12/31/22 custodian report. Complete information not available as of publication date.

4 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By Asset Size)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ASSETS > \$500 MILLION								
MA TEACHERS' (MTRS)	\$34,712,144,660.68	-10.98%	6.74%	8.36%	9.24%	\$182,290,184.16	0.53%	0.55%
STATE	\$33,192,580,321.71	-10.97%	6.75%	8.37%	9.23%	\$175,052,824.57	0.53%	0.55%
BOSTON (CITY)	\$6,415,794,786.38	-10.55%	4.71%	6.71%	8.47%	\$40,211,648.56	0.63%	0.69%
BOSTON (TEACHERS)*	\$2,140,617,078.50	-10.70%	6.60%	8.21%	N/A	\$10,433,773.03	0.49%	0.52%
MIDDLESEX CTY	\$1,878,438,939.78	-11.11%	6.50%	7.95%	8.28%	\$9,685,399.54	0.52%	0.53%
CAMBRIDGE	\$1,632,691,513.53	-9.99%	6.08%	8.22%	9.00%	\$9,782,255.30	0.60%	0.72%
BARNSTABLE CTY	\$1,458,384,823.21	-10.86%	6.86%	8.40%	7.60%	\$7,592,845.40	0.52%	0.54%
PLYMOUTH CTY	\$1,313,590,415.27	-6.68%	6.67%	8.02%	8.91%	\$9,636,956.56	0.73%	0.90%
NORFOLK CTY	\$1,261,554,428.73	-10.98%	5.77%	7.53%	8.36%	\$8,633,619.65	0.68%	0.78%
WORCESTER	\$1,216,009,611.84	-8.47%	7.16%	7.74%	8.70%	\$7,002,117.07	0.58%	0.56%
WORCESTER REG	\$965,763,328.40	-11.00%	6.64%	8.21%	8.13%	\$5,006,118.40	0.52%	0.54%
BRISTOL CTY	\$837,138,740.69	-9.46%	6.36%	7.88%	8.66%	\$7,722,194.85	0.92%	0.99%
QUINCY	\$793,936,228.22	-9.60%	5.97%	7.02%	8.00%	\$4,868,208.00	0.61%	0.67%
MASSPORT	\$764,329,558.69	-13.96%	5.91%	7.57%	8.72%	\$3,220,808.28	0.42%	0.38%
BROCKTON	\$740,113,506.09	-6.33%	6.04%	7.13%	8.46%	\$3,861,691.37	0.52%	0.74%
MWRA**	\$630,197,340.79	-11.64%	5.35%	6.97%	7.87%	\$4,509,339.14	0.72%	0.69%
ESSEX REG	\$626,655,764.74	-10.80%	6.60%	8.34%	8.62%	\$3,213,083.36	0.51%	0.55%
SPRINGFIELD	\$509,247,720.57	-10.55%	6.89%	8.52%	8.36%	\$2,568,130.86	0.50%	0.53%
ASSETS \$250 - \$500 MILLION								
LYNN	\$488,616,244.77	-10.04%	6.69%	8.32%	8.01%	\$2,533,950.89	0.52%	0.54%
LOWELL	\$482,626,052.86	-10.80%	6.50%	8.06%	8.87%	\$2,517,506.21	0.52%	0.54%
HAMPDEN CTY	\$475,967,067.01	-10.94%	6.47%	8.11%	8.47%	\$2,450,848.49	0.51%	0.54%
NEWTON	\$473,801,602.78	-10.44%	6.58%	8.15%	8.50%	\$2,328,215.66	0.49%	0.52%
BROOKLINE	\$428,379,761.55	-9.75%	7.33%	8.01%	8.58%	\$2,534,980.50	0.59%	0.87%
HAMPSHIRE CTY	\$427,393,599.25	-10.39%	6.46%	7.44%	8.18%	\$2,238,864.06	0.52%	0.63%
NEW BEDFORD	\$416,178,903.61	-11.43%	6.54%	8.32%	8.07%	\$2,215,999.75	0.53%	0.78%
FRAMINGHAM	\$410,567,964.06	-10.65%	6.63%	8.26%	9.07%	\$2,103,808.20	0.51%	0.54%
CHICOPEE	\$409,905,595.43	-10.04%	5.69%	7.88%	8.43%	\$2,637,616.44	0.64%	0.71%
TAUNTON	\$376,880,964.28	-13.11%	5.93%	8.00%	9.20%	\$1,776,032.59	0.47%	0.56%
HOLYOKE	\$370,242,310.31	-6.92%	7.64%	9.37%	9.32%	\$2,442,173.22	0.66%	0.72%
ANDOVER	\$343,534,091.83	-8.37%	7.07%	8.51%	8.36%	\$1,250,331.33	0.36%	0.41%
SOMERVILLE	\$343,528,786.00	-22.06%	7.41%	8.62%	8.85%	\$1,574,490.26	0.46%	0.49%
FALL RIVER	\$336,567,624.67	-10.82%	6.54%	8.11%	8.28%	\$1,737,170.24	0.52%	0.55%

* In 2010, Boston Teachers' assets were separated from Boston City assets and transferred into the PRIT Fund.

** Based on 37-year return.

4 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By Asset Size)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ASSETS \$250 - \$500 MILLION (Continued)								
BERKSHIRE CTY	\$315,015,513.85	-10.92%	6.61%	8.23%	8.84%	\$1,634,173.88	0.52%	0.54%
LAWRENCE	\$303,523,397.98	-11.02%	6.66%	8.26%	7.82%	\$1,568,342.29	0.52%	0.54%
WALTHAM	\$301,248,928.24	-12.16%	5.72%	7.83%	8.41%	\$1,748,827.90	0.58%	0.54%
MALDEN	\$291,645,881.94	-16.68%	4.79%	6.98%	9.02%	\$817,083.00	0.28%	0.29%
WESTFIELD	\$289,213,434.97	-7.21%	6.76%	9.09%	8.72%	\$1,854,990.24	0.64%	0.71%
HAVERHILL	\$263,837,356.90	-9.75%	7.47%	8.49%	9.71%	\$1,799,392.67	0.68%	0.82%
LEOMINSTER	\$258,279,861.91	-10.85%	6.22%	8.74%	8.48%	\$1,366,879.08	0.53%	0.62%
WELLESLEY	\$256,590,416.07	-10.87%	6.71%	8.34%	9.64%	\$1,320,160.84	0.51%	0.54%
BRAINTREE	\$252,015,691.52	-10.62%	5.97%	7.25%	8.41%	\$1,712,598.14	0.68%	0.70%
ASSETS \$100 MILLION - \$250 MILLION								
CHELSEA	\$248,630,296.61	-11.01%	6.67%	8.30%	7.97%	\$1,278,202.59	0.51%	0.54%
SALEM	\$247,002,183.03	-10.41%	6.73%	8.17%	8.09%	\$1,253,711.01	0.51%	0.53%
EVERETT	\$242,493,164.37	-10.82%	6.77%	8.40%	8.40%	\$1,243,014.15	0.51%	0.53%
WATERTOWN	\$240,567,455.29	-11.19%	6.01%	7.82%	8.14%	\$1,703,811.55	0.71%	0.70%
WEYMOUTH	\$239,838,566.01	-12.58%	6.16%	7.93%	9.44%	\$1,818,183.22	0.76%	0.74%
PLYMOUTH	\$228,661,175.54	-10.55%	6.61%	8.59%	8.68%	\$1,538,909.86	0.67%	0.75%
MEDFORD	\$227,371,331.38	-10.45%	5.90%	6.62%	8.45%	\$1,444,683.71	0.64%	0.71%
REVERE	\$221,782,649.47	-10.93%	6.60%	8.19%	8.30%	\$1,133,869.42	0.51%	0.54%
MHFA	\$219,980,775.04	-8.46%	7.06%	7.30%	7.52%	\$1,176,462.36	0.53%	0.55%
METHUEN	\$214,658,852.02	-10.81%	6.75%	8.58%	8.02%	\$1,111,159.86	0.52%	0.55%
NEEDHAM	\$213,890,130.05	-10.82%	6.65%	8.22%	9.37%	\$1,091,983.79	0.51%	0.53%
DUKES CTY	\$210,330,960.13	-13.86%	7.00%	9.02%	7.91%	\$1,266,526.06	0.60%	0.51%
NORWOOD	\$209,521,652.87	-4.61%	8.64%	9.24%	9.19%	\$1,430,752.04	0.68%	0.71%
CONCORD	\$205,021,845.06	-11.27%	5.31%	7.53%	8.30%	\$1,186,634.30	0.58%	0.53%
MARLBOROUGH	\$204,681,832.56	-12.42%	5.31%	6.73%	8.04%	\$932,348.33	0.46%	0.38%
NATICK***	\$199,814,796.60							0.70%
ARLINGTON	\$198,983,993.07	-10.82%	6.52%	8.01%	8.26%	\$1,045,125.56	0.53%	0.54%
LEXINGTON	\$191,026,955.36	-14.47%	4.94%	7.16%	8.42%	\$851,081.12	0.45%	0.85%
PEABODY	\$183,649,752.17	-10.88%	6.72%	8.32%	8.53%	\$961,903.15	0.52%	0.55%
FALMOUTH	\$181,678,944.90	-8.49%	5.89%	8.09%	8.73%	\$1,181,772.75	0.65%	0.77%
ATTLEBORO	\$180,896,676.63	-14.42%	6.63%	8.24%	8.72%	\$1,151,771.00	0.64%	0.59%
MILTON	\$179,751,377.42	-10.97%	6.68%	8.29%	9.15%	\$919,978.47	0.51%	0.54%
FRANKLIN REG	\$178,621,370.95	-12.16%	6.36%	8.45%	8.28%	\$1,026,227.90	0.57%	0.58%

*** Market Value based on 12/31/22 custodian report. Complete information not available as of publication date.

4 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By Asset Size)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ASSETS \$100 MILLION - \$250 MILLION (Continued)								
DEDHAM	\$175,321,833.93	-10.91%	6.75%	8.38%	9.29%	\$923,274.00	0.53%	0.54%
READING	\$175,226,543.71	-10.26%	6.79%	8.35%	9.08%	\$1,017,963.56	0.58%	0.51%
PITTSFIELD	\$174,968,749.05	-10.80%	6.41%	8.07%	8.11%	\$877,263.03	0.50%	0.52%
WOBURN	\$173,426,010.25	-10.98%	6.54%	8.39%	9.14%	\$950,424.18	0.55%	0.81%
BEVERLY	\$168,634,078.17	-10.91%	6.72%	8.34%	8.49%	\$874,163.72	0.52%	0.55%
FITCHBURG	\$157,280,156.69	-11.12%	6.62%	8.15%	7.68%	\$812,982.38	0.52%	0.54%
WINCHESTER	\$156,060,427.26	-10.73%	6.61%	7.59%	8.77%	\$806,219.12	0.52%	0.49%
SHREWSBURY	\$155,351,770.40	-10.40%	7.01%	8.91%	9.00%	\$933,277.59	0.60%	0.43%
WAKEFIELD	\$153,416,109.97	-10.83%	6.71%	8.34%	9.39%	\$794,281.58	0.52%	0.55%
HINGHAM	\$153,148,829.43	-10.94%	6.71%	7.85%	8.93%	\$821,476.09	0.54%	0.57%
BELMONT	\$148,923,833.81	-8.32%	6.37%	7.95%	9.07%	\$855,375.19	0.57%	0.68%
NORTHAMPTON	\$145,380,380.62	-16.76%	4.78%	7.37%	8.84%	\$456,990.79	0.31%	0.33%
GLOUCESTER	\$143,343,390.66	-10.78%	6.76%	8.34%	8.74%	\$735,776.81	0.51%	0.54%
NORTH ATTLEBORO	\$140,310,683.61	-14.59%	5.99%	8.25%	8.42%	\$724,693.25	0.52%	0.57%
SAUGUS	\$139,108,403.04	-9.86%	6.76%	8.34%	9.03%	\$856,764.47	0.62%	0.54%
WEST SPRINGFIELD	\$135,017,277.05	-16.61%	4.72%	7.25%	7.81%	\$422,209.86	0.31%	0.32%
DANVERS	\$132,794,076.78	-15.68%	4.22%	6.69%	7.68%	\$825,281.89	0.62%	0.72%
MILFORD	\$122,466,145.22	-10.68%	6.63%	8.23%	8.17%	\$625,881.14	0.51%	0.53%
STONEHAM	\$116,465,455.13	-7.71%	5.70%	7.88%	8.57%	\$800,773.09	0.69%	0.64%
MARBLEHEAD	\$115,529,072.50	-10.98%	6.67%	8.30%	9.03%	\$609,267.69	0.53%	0.55%
NEWBURYPORT	\$109,582,829.12	-10.85%	6.73%	8.21%	8.17%	\$570,896.23	0.52%	0.54%
MELROSE	\$107,045,691.37	-10.53%	6.37%	7.88%	8.25%	\$532,840.88	0.50%	0.51%

4 | INVESTMENT EXPENSE ANALYSIS: All Retirement Systems (Ranked By Asset Size)

RETIREMENT SYSTEM	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ASSETS < \$100 MILLION								
WINTHROP	\$93,894,489.93	-10.78%	6.76%	8.28%	8.55%	\$481,052.42	0.51%	0.54%
GREENFIELD	\$90,230,668.07	-10.95%	6.79%	8.39%	8.44%	\$464,952.25	0.52%	0.54%
FAIRHAVEN	\$82,502,645.60	-10.87%	6.72%	8.30%	9.10%	\$429,049.16	0.52%	0.54%
SWAMPSCOTT	\$78,893,901.29	-9.58%	6.88%	8.60%	8.91%	\$465,207.89	0.59%	0.56%
SOUTHBRIDGE	\$74,936,401.67	-10.88%	6.66%	8.24%	8.03%	\$379,219.66	0.51%	0.54%
NORTH ADAMS	\$73,599,438.66	-17.35%	4.92%	7.40%	9.01%	\$296,592.72	0.40%	0.42%
EASTHAMPTON	\$69,148,885.28	-10.97%	6.71%	8.31%	8.23%	\$360,134.77	0.52%	0.54%
GARDNER	\$68,967,907.16	-11.04%	6.62%	8.27%	9.17%	\$361,361.31	0.52%	0.55%
AMESBURY	\$68,789,038.02	-10.59%	6.65%	8.24%	8.00%	\$341,598.80	0.50%	0.53%
CLINTON	\$68,569,477.41	-10.44%	7.01%	8.46%	7.81%	\$390,220.73	0.57%	0.62%
HULL	\$65,932,190.45	-10.70%	6.74%	8.33%	7.94%	\$331,418.03	0.50%	0.54%
MAYNARD	\$56,311,166.91	-12.16%	5.30%	7.98%	7.77%	\$357,017.27	0.63%	0.61%
MONTAGUE	\$53,976,547.09	-10.97%	6.66%	8.26%	8.94%	\$282,787.75	0.52%	0.54%
WEBSTER	\$53,680,524.37	-9.46%	5.25%	7.53%	7.91%	\$337,909.66	0.63%	0.81%
NORTHBRIDGE	\$47,618,761.96	-10.90%	6.79%	8.37%	9.15%	\$249,688.25	0.52%	0.55%
ADAMS	\$38,772,470.25	-10.81%	5.42%	6.13%	7.55%	\$198,553.96	0.51%	0.35%
GREATER LAWRENCE	\$22,371,819.89	-17.25%	7.36%	8.99%	7.78%	\$96,348.64	0.43%	0.42%
MINUTEMAN REG	\$15,411,979.63	-10.84%	6.56%	8.07%	9.19%	\$79,951.28	0.52%	0.54%
BLUE HILLS REG	\$13,816,106.74	-10.85%	6.56%	8.20%	8.55%	\$42,797.38	0.31%	0.54%

5 | INVESTMENT EXPENSE ANALYSIS: PRIT / Non-PRIT

PRIT ONLY								
PRIT RETIREMENT BOARDS	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ADAMS	\$38,772,470.25	-10.81%	5.42%	6.13%	7.55%	\$198,553.96	0.51%	0.35%
AMESBURY	\$68,789,038.02	-10.59%	6.65%	8.24%	8.00%	\$341,598.80	0.50%	0.53%
BARNSTABLE CTY	\$1,458,384,823.21	-10.86%	6.86%	8.40%	7.60%	\$7,592,845.40	0.52%	0.54%
BERKSHIRE CTY	\$315,015,513.85	-10.92%	6.61%	8.23%	8.84%	\$1,634,173.88	0.52%	0.54%
BEVERLY	\$168,634,078.17	-10.91%	6.72%	8.34%	8.49%	\$874,163.72	0.52%	0.55%
BLUE HILLS REG	\$13,816,106.74	-10.85%	6.56%	8.20%	8.55%	\$42,797.38	0.31%	0.54%
BOSTON (TEACHERS)*	\$2,140,617,078.50	-10.70%	6.60%	8.21%	N/A	\$10,433,773.03	0.49%	0.52%
CHELSEA	\$248,630,296.61	-11.01%	6.67%	8.30%	7.97%	\$1,278,202.59	0.51%	0.54%
CLINTON	\$68,569,477.41	-10.44%	7.01%	8.46%	7.81%	\$390,220.73	0.57%	0.62%
DEDHAM	\$175,321,833.93	-10.91%	6.75%	8.38%	9.29%	\$923,274.00	0.53%	0.54%
EASTHAMPTON	\$69,148,885.28	-10.97%	6.71%	8.31%	8.23%	\$360,134.77	0.52%	0.54%
EVERETT	\$242,493,164.37	-10.82%	6.77%	8.40%	8.40%	\$1,243,014.15	0.51%	0.53%
FAIRHAVEN	\$82,502,645.60	-10.87%	6.72%	8.30%	9.10%	\$429,049.16	0.52%	0.54%
FITCHBURG	\$157,280,156.69	-11.12%	6.62%	8.15%	7.68%	\$812,982.38	0.52%	0.54%
FRAMINGHAM	\$410,567,964.06	-10.65%	6.63%	8.26%	9.07%	\$2,103,808.20	0.51%	0.54%
GARDNER	\$68,967,907.16	-11.04%	6.62%	8.27%	9.17%	\$361,361.31	0.52%	0.55%
GLOUCESTER	\$143,343,390.66	-10.78%	6.76%	8.34%	8.74%	\$735,776.81	0.51%	0.54%
GREENFIELD	\$90,230,668.07	-10.95%	6.79%	8.39%	8.44%	\$464,952.25	0.52%	0.54%
HAMPDEN CTY	\$475,967,067.01	-10.94%	6.47%	8.11%	8.47%	\$2,450,848.49	0.51%	0.54%
HINGHAM	\$153,148,829.43	-10.94%	6.71%	7.85%	8.93%	\$821,476.09	0.54%	0.57%
HULL	\$65,932,190.45	-10.70%	6.74%	8.33%	7.94%	\$331,418.03	0.50%	0.54%
LAWRENCE	\$303,523,397.98	-11.02%	6.66%	8.26%	7.82%	\$1,568,342.29	0.52%	0.54%
LEOMINSTER	\$258,279,861.91	-10.85%	6.22%	8.74%	8.48%	\$1,366,879.08	0.53%	0.62%
MA TEACHERS' (MTRS)	\$34,712,144,660.68	-10.98%	6.74%	8.36%	9.24%	\$182,290,184.16	0.53%	0.55%

* In 2010, Boston Teachers' assets were separated from Boston City assets and transferred into the PRIT Fund.

5 | INVESTMENT EXPENSE ANALYSIS: PRIT / Non-PRIT

PRIT ONLY (Continued)								
PRIT RETIREMENT BOARDS	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
MARBLEHEAD	\$115,529,072.50	-10.98%	6.67%	8.30%	9.03%	\$609,267.69	0.53%	0.55%
MELROSE	\$107,045,691.37	-10.53%	6.37%	7.88%	8.25%	\$532,840.88	0.50%	0.51%
MIDDLESEX CTY	\$1,878,438,939.78	-11.11%	6.50%	7.95%	8.28%	\$9,685,399.54	0.52%	0.53%
MILFORD	\$122,466,145.22	-10.68%	6.63%	8.23%	8.17%	\$625,881.14	0.51%	0.53%
MILTON	\$179,751,377.42	-10.97%	6.68%	8.29%	9.15%	\$919,978.47	0.51%	0.54%
MINUTEMAN REG	\$15,411,979.63	-10.84%	6.56%	8.07%	9.19%	\$79,951.28	0.52%	0.54%
MONTAGUE	\$53,976,547.09	-10.97%	6.66%	8.26%	8.94%	\$282,787.75	0.52%	0.54%
NEEDHAM	\$213,890,130.05	-10.82%	6.65%	8.22%	9.37%	\$1,091,983.79	0.51%	0.53%
NEWBURYPORT	\$109,582,829.12	-10.85%	6.73%	8.21%	8.17%	\$570,896.23	0.52%	0.54%
NEWTON	\$473,801,602.78	-10.44%	6.58%	8.15%	8.50%	\$2,328,215.66	0.49%	0.52%
NORTHBRIDGE	\$47,618,761.96	-10.90%	6.79%	8.37%	9.15%	\$249,688.25	0.52%	0.55%
PEABODY	\$183,649,752.17	-10.88%	6.72%	8.32%	8.53%	\$961,903.15	0.52%	0.55%
READING	\$175,226,543.71	-10.26%	6.79%	8.35%	9.08%	\$1,017,963.56	0.58%	0.51%
REVERE	\$221,782,649.47	-10.93%	6.60%	8.19%	8.30%	\$1,133,869.42	0.51%	0.54%
SALEM	\$247,002,183.03	-10.41%	6.73%	8.17%	8.09%	\$1,253,711.01	0.51%	0.53%
SOUTHBRIDGE	\$74,936,401.67	-10.88%	6.66%	8.24%	8.03%	\$379,219.66	0.51%	0.54%
SPRINGFIELD	\$509,247,720.57	-10.55%	6.89%	8.52%	8.36%	\$2,568,130.86	0.50%	0.53%
STATE	\$33,192,580,321.71	-10.97%	6.75%	8.37%	9.23%	\$175,052,824.57	0.53%	0.55%
WAKEFIELD	\$153,416,109.97	-10.83%	6.71%	8.34%	9.39%	\$794,281.58	0.52%	0.55%
WEBSTER	\$53,680,524.37	-9.46%	5.25%	7.53%	7.91%	\$337,909.66	0.63%	0.81%
WELLESLEY	\$256,590,416.07	-10.87%	6.71%	8.34%	9.64%	\$1,320,160.84	0.51%	0.54%
WINCHESTER	\$156,060,427.26	-10.73%	6.61%	7.59%	8.77%	\$806,219.12	0.52%	0.49%
WINTHROP	\$93,894,489.93	-10.78%	6.76%	8.28%	8.55%	\$481,052.42	0.51%	0.54%
WORCESTER REG	\$965,763,328.40	-11.00%	6.64%	8.21%	8.13%	\$5,006,118.40	0.52%	0.54%

5 | INVESTMENT EXPENSE ANALYSIS: PRIT / Non-PRIT

NON-PRIT								
NON-PRIT RETIREMENT BOARDS	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
ANDOVER	\$343,534,091.83	-8.37%	7.07%	8.51%	8.36%	\$1,250,331.33	0.36%	0.41%
ARLINGTON	\$198,983,993.07	-10.82%	6.52%	8.01%	8.26%	\$1,045,125.56	0.53%	0.54%
ATTLEBORO	\$180,896,676.63	-14.42%	6.63%	8.24%	8.72%	\$1,151,771.00	0.64%	0.59%
BELMONT	\$148,923,833.81	-8.32%	6.37%	7.95%	9.07%	\$855,375.19	0.57%	0.68%
BOSTON (CITY)	\$6,415,794,786.38	-10.55%	4.71%	6.71%	8.47%	\$40,211,648.56	0.63%	0.69%
BRAINTREE	\$252,015,691.52	-10.62%	5.97%	7.25%	8.41%	\$1,712,598.14	0.68%	0.70%
BRISTOL CTY	\$837,138,740.69	-9.46%	6.36%	7.88%	8.66%	\$7,722,194.85	0.92%	0.99%
BROCKTON	\$740,113,506.09	-6.33%	6.04%	7.13%	8.46%	\$3,861,691.37	0.52%	0.74%
BROOKLINE	\$428,379,761.55	-9.75%	7.33%	8.01%	8.58%	\$2,534,980.50	0.59%	0.87%
CAMBRIDGE	\$1,632,691,513.53	-9.99%	6.08%	8.22%	9.00%	\$9,782,255.30	0.60%	0.72%
CHICOPEE	\$409,905,595.43	-10.04%	5.69%	7.88%	8.43%	\$2,637,616.44	0.64%	0.71%
CONCORD	\$205,021,845.06	-11.27%	5.31%	7.53%	8.30%	\$1,186,634.30	0.58%	0.53%
DANVERS	\$132,794,076.78	-15.68%	4.22%	6.69%	7.68%	\$825,281.89	0.62%	0.72%
DUKES CTY	\$210,330,960.13	-13.86%	7.00%	9.02%	7.91%	\$1,266,526.06	0.60%	0.51%
ESSEX REG	\$626,655,764.74	-10.80%	6.60%	8.34%	8.62%	\$3,213,083.36	0.51%	0.55%
FALL RIVER	\$336,567,624.67	-10.82%	6.54%	8.11%	8.28%	\$1,737,170.24	0.52%	0.55%
FALMOUTH	\$181,678,944.90	-8.49%	5.89%	8.09%	8.73%	\$1,181,772.75	0.65%	0.77%
FRANKLIN REG	\$178,621,370.95	-12.16%	6.36%	8.45%	8.28%	\$1,026,227.90	0.57%	0.58%
GREATER LAWRENCE	\$22,371,819.89	-17.25%	7.36%	8.99%	7.78%	\$96,348.64	0.43%	0.42%
HAMPSHIRE CTY	\$427,393,599.25	-10.39%	6.46%	7.44%	8.18%	\$2,238,864.06	0.52%	0.63%
HAVERHILL	\$263,837,356.90	-9.75%	7.47%	8.49%	9.71%	\$1,799,392.67	0.68%	0.82%
HOLYOKE	\$370,242,310.31	-6.92%	7.64%	9.37%	9.32%	\$2,442,173.22	0.66%	0.72%
LEXINGTON	\$191,026,955.36	-14.47%	4.94%	7.16%	8.42%	\$851,081.12	0.45%	0.85%
LOWELL	\$482,626,052.86	-10.80%	6.50%	8.06%	8.87%	\$2,517,506.21	0.52%	0.54%
LYNN	\$488,616,244.77	-10.04%	6.69%	8.32%	8.01%	\$2,533,950.89	0.52%	0.54%
MALDEN	\$291,645,881.94	-16.68%	4.79%	6.98%	9.02%	\$817,083.00	0.28%	0.29%
MARLBOROUGH	\$204,681,832.56	-12.42%	5.31%	6.73%	8.04%	\$932,348.33	0.46%	0.38%
MASSPORT	\$764,329,558.69	-13.96%	5.91%	7.57%	8.72%	\$3,220,808.28	0.42%	0.38%
MAYNARD	\$56,311,166.91	-12.16%	5.30%	7.98%	7.77%	\$357,017.27	0.63%	0.61%

5 | INVESTMENT EXPENSE ANALYSIS: PRIT / Non-PRIT

NON-PRIT (Continued)								
NON-PRIT RETIREMENT BOARDS	MARKET VALUE (12/31/22)	2022 RETURN	5-Year RETURN	10-Year RETURN	38-Year RETURN	2022 INVESTMENT RELATED FEES	2022 EXPENSE RATIO (%)	2018 EXPENSE RATIO (%)
MEDFORD	\$227,371,331.38	-10.45%	5.90%	6.62%	8.45%	\$1,444,683.71	0.64%	0.71%
METHUEN	\$214,658,852.02	-10.81%	6.75%	8.58%	8.02%	\$1,111,159.86	0.52%	0.55%
MHFA	\$219,980,775.04	-8.46%	7.06%	7.30%	7.52%	\$1,176,462.36	0.53%	0.55%
MWRA**	\$630,197,340.79	-11.64%	5.35%	6.97%	7.87%	\$4,509,339.14	0.72%	0.69%
NATICK***	\$199,814,796.60							0.70%
NEW BEDFORD	\$416,178,903.61	-11.43%	6.54%	8.32%	8.07%	\$2,215,999.75	0.53%	0.78%
NORFOLK CTY	\$1,261,554,428.73	-10.98%	5.77%	7.53%	8.36%	\$8,633,619.65	0.68%	0.78%
NORTH ADAMS	\$73,599,438.66	-17.35%	4.92%	7.40%	9.01%	\$296,592.72	0.40%	0.42%
NORTH ATTLEBORO	\$140,310,683.61	-14.59%	5.99%	8.25%	8.42%	\$724,693.25	0.52%	0.57%
NORTHAMPTON	\$145,380,380.62	-16.76%	4.78%	7.37%	8.84%	\$456,990.79	0.31%	0.33%
NORWOOD	\$209,521,652.87	-4.61%	8.64%	9.24%	9.19%	\$1,430,752.04	0.68%	0.71%
PITTSFIELD	\$174,968,749.05	-10.80%	6.41%	8.07%	8.11%	\$877,263.03	0.50%	0.52%
PLYMOUTH	\$228,661,175.54	-10.55%	6.61%	8.59%	8.68%	\$1,538,909.86	0.67%	0.75%
PLYMOUTH CTY	\$1,313,590,415.27	-6.68%	6.67%	8.02%	8.91%	\$9,636,956.56	0.73%	0.90%
QUINCY	\$793,936,228.22	-9.60%	5.97%	7.02%	8.00%	\$4,868,208.00	0.61%	0.67%
SAUGUS	\$139,108,403.04	-9.86%	6.76%	8.34%	9.03%	\$856,764.47	0.62%	0.54%
SHREWSBURY	\$155,351,770.40	-10.40%	7.01%	8.91%	9.00%	\$933,277.59	0.60%	0.43%
SOMERVILLE	\$343,528,786.00	-22.06%	7.41%	8.62%	8.85%	\$1,574,490.26	0.46%	0.49%
STONEHAM	\$116,465,455.13	-7.71%	5.70%	7.88%	8.57%	\$800,773.09	0.69%	0.64%
SWAMPSCOTT	\$78,893,901.29	-9.58%	6.88%	8.60%	8.91%	\$465,207.89	0.59%	0.56%
TAUNTON	\$376,880,964.28	-13.11%	5.93%	8.00%	9.20%	\$1,776,032.59	0.47%	0.56%
WALTHAM	\$301,248,928.24	-12.16%	5.72%	7.83%	8.41%	\$1,748,827.90	0.58%	0.54%
WATERTOWN	\$240,567,455.29	-11.19%	6.01%	7.82%	8.14%	\$1,703,811.55	0.71%	0.70%
WEST SPRINGFIELD	\$135,017,277.05	-16.61%	4.72%	7.25%	7.81%	\$422,209.86	0.31%	0.32%
WESTFIELD	\$289,213,434.97	-7.21%	6.76%	9.09%	8.72%	\$1,854,990.24	0.64%	0.71%
WEYMOUTH	\$239,838,566.01	-12.58%	6.16%	7.93%	9.44%	\$1,818,183.22	0.76%	0.74%
WOBURN	\$173,426,010.25	-10.98%	6.54%	8.39%	9.14%	\$950,424.18	0.55%	0.81%
WORCESTER	\$1,216,009,611.84	-8.47%	7.16%	7.74%	8.70%	\$7,002,117.07	0.58%	0.56%

** Based on 37-year return.

*** Market Value based on 12/31/22 custodian report. Complete information not available as of publication date.

NOTES

NOTES

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