



October 28, 2020

Bristol County Retirement Board
645 County Street
Taunton, MA 02780

To the Bristol County Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2020 actuarial valuation of the Bristol County Retirement System. The valuation and report were prepared using generally accepted actuarial principles and practices. 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 system except where noted in the text.

Stone Consulting, Inc. is completely independent of Bristol County and the Bristol County Retirement System. This includes any of its officers and key personnel. Neither we or anyone else closely associated with us has any relationship with Bristol County or the Bristol County Retirement System that would impair our independence, other than this or related assignments.

We are pleased to present the results of this valuation. If the Retirement Board has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in inaccurate or misleading understanding of the results. The use of these results may not be appropriate for all circumstances.

We, Lawrence Stone and Colin Edgar, are consultants for Stone Consulting, Inc. Lawrence Stone is a member of the American Academy of Actuaries, and Colin Edgar is an Associate of the Society of Actuaries; we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.
Actuaries for the Plan

Lawrence B. Stone
Member, American Academy of Actuaries

Colin Edgar
Associate of the Society of Actuaries

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Report Summary

This report presents the results of the actuarial valuation of the Bristol County Retirement System as of January 1, 2020. The valuation was performed at the request of the Retirement Board for the purpose of determining the contribution requirements for Fiscal Year 2022 and beyond.

Summary of Results and Experience

■ Experience and Funding Schedule

The contribution is set to increase by 8.00% in the first year, equal to the projected FY2022 contribution from the prior valuation. This is followed by 5.00% increases for the remaining years, with the exception of the final year, when it decreases by 6.34%. The funding schedule finishes in FY2034, compared to the planned funding schedule from the 2018 valuation, which finished in FY2028.

The primary source of the change is a set of updates to assumptions, which reduced the funding ratio (based on Actuarial Value of Assets) from 68% to 60%.

■ Assumptions/methodology:

Assumption changes increased the liability by \$93.6 million, including a reduction of the discount rate from 7.75% to 7.50%. Assumptions and valuation methodology are discussed in Appendix A, on page 16.

Contribution requirements are based on the financial condition of the system as of December 31, 2019, as well as actuarial liability results, which are based on:

- The benefit provisions of M.G.L. Chapter 32 and related statutes;
- The demographics of members in the system (i.e., active and inactive participants, retirees and beneficiaries as of January 1, 2020);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

Format of the Report

- The funding schedule is shown on page 3, followed by an explanation of the actuarial results, and the funding schedule components.
- Full actuarial valuation results are shown on page 15, with prior results included for comparison. The Bristol County Retirement Board conducted their previous actuarial valuation effective January 1, 2018.

Development of Funding Schedule

The funding contribution consists of three parts:

- Net Normal Cost: this is the amount of liability generated by active employees earning another year of service, and includes administrative expense.
- Amortization: this is the amount of the Unfunded Liability that will be paid off by this contribution.
- Net 3(8)(c) Payments: these are benefit payments made related to service that a retiree has earned with a different retirement system than they retired from.

The appropriation for Fiscal 2022 is as follows:

Net Employer Normal Cost for Fiscal 2022 (including admin. expenses)	\$ 6,468,605
Net 3(8)(c) Payments	791,349
Amortization	42,087,531
Timing Adjustment*	<u>0</u>
Total Appropriation required for Fiscal 2022	\$ 49,347,485

* Contributions are assumed to be made at the beginning of the fiscal year, to provide a consistent basis for comparison. Individual employers may choose to contribute on a semi-annual basis; both July 1st and semiannual contribution amounts are provided on page 27, where the contribution is broken out by employer.

NOTE: for all tables in this report, totals may not sum due to rounding.

- The schedule's length is thirteen (13) years which is a six-year extension compared to the 7 years remaining from the schedule in the January 1, 2018 valuation. The maximum funding schedule length allowed by Section 22F of Chapter 32 of the Massachusetts General Laws is nineteen years to Fiscal 2040.
- Bristol County's funding schedule was developed by setting the contribution to increase by 8.00% in the first year and 5.00% for the remainder of the schedule, except for the final year, when it decreases by 6.34%

The schedule is shown on the following page.

BRISTOL COUNTY CONTRIBUTORY RETIREMENT SYSTEM

FUNDING SCHEDULE

Fiscal Year	Normal Cost	Unfunded Liability*	Funding Amortization of UAAL	Net 3(8)(c) Payments	Schedule Contribution**	% Change
2022	6,468,605	497,859,075	42,087,531	791,349	49,347,485	8.00%
2023	6,662,663	489,954,410	44,360,847	791,349	51,814,860	5.00%
2024	6,862,543	468,785,316	46,751,711	791,349	54,405,603	5.00%
2025	7,068,419	453,686,126	49,266,114	791,349	57,125,883	5.00%
2026	7,280,472	425,899,222	51,910,356	791,349	59,982,177	5.00%
2027	7,498,886	402,038,031	54,691,051	791,349	62,981,286	5.00%
2028	7,723,853	373,398,004	57,615,148	791,349	66,130,350	5.00%
2029	7,955,568	339,466,570	60,689,950	791,349	69,436,867	5.00%
2030	8,194,235	299,684,866	63,923,127	791,349	72,908,711	5.00%
2031	8,440,062	253,443,870	67,322,735	791,349	76,554,146	5.00%
2032	8,693,264	200,080,220	70,897,241	791,349	80,381,854	5.00%
2033	8,954,062	138,871,703	74,655,535	791,349	84,400,946	5.00%
2034	9,222,684	69,032,381	69,032,381	791,349	79,046,414	-6.34%
2035	9,499,365	-	-	791,349	10,290,713	-86.98%

Amortization of Unfunded Liability as of July 1, 2020

* Includes recognition of the following asset gains/(losses) in Fiscal 2024 and 2026:

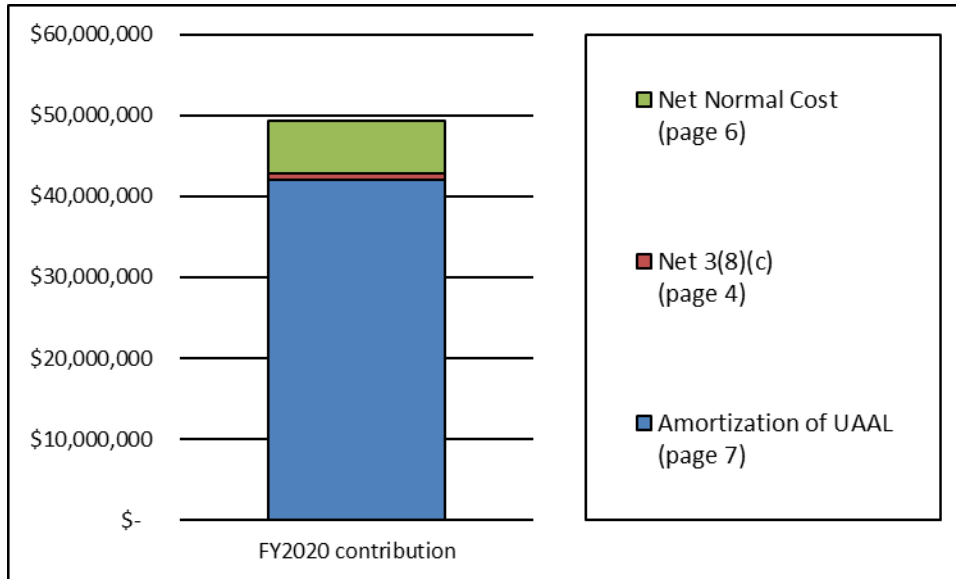
2024	\$	10,227,764
2026	\$	8,852,290

** Contribution is set to be the amount resulting from a 8% increase on the prior year's contribution, with 5% increases thereafter. The contribution in FY2034 decreases by -6.34%.

Components of Funding Appropriation

The funding objective of the plan is to fully fund the system while attempting to maintain a stable contribution amount for the upcoming fiscal year that is consistent with prior funding schedules or if employer finances allow it, to increase the contribution amount. This funding objective is being met.

The following pages discuss the components that make up the contribution, and how they are calculated from the actuarial results.



Net 3(8)(c) Payments

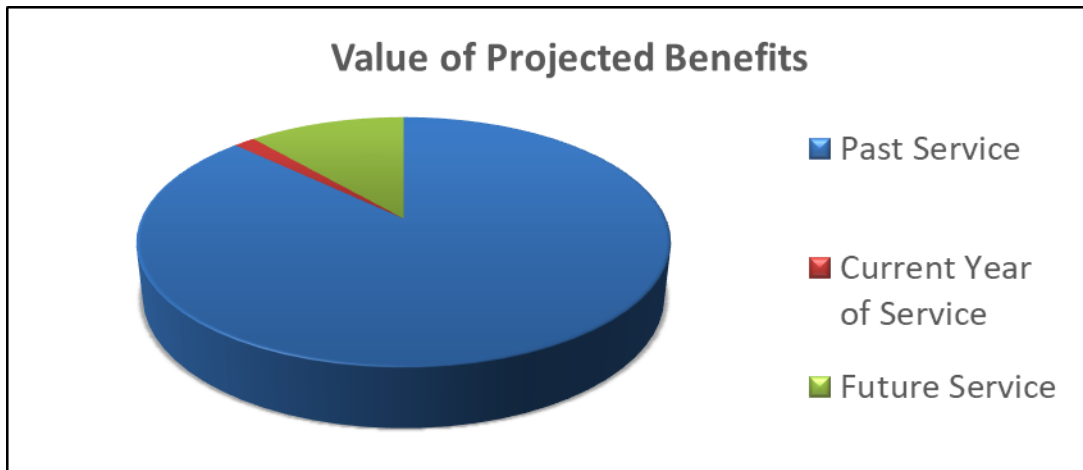
- 3(8)(c) payments are benefits which the Bristol County Retirement System pays to or receives from other retirement boards for service that a retiree had with a different retirement system.
- The net amount is equal to what Bristol County pays out, less what Bristol County receives from other systems, based on the most recent PERAC annual statement:

3(8)(c) payments made to other systems	\$	2,599,601
3(8)(c) payments received from other systems		<u>(1,808,252)</u>
Net payments in funding schedule	\$	791,349

- For the funding schedule, the amount of net payments is assumed to remain level in future years.

Development of Actuarial Results

Actuarial liabilities are calculated based on benefits that members are projected to receive in the future. The value of projected benefits is divided between past service, future service, and the current year of service.



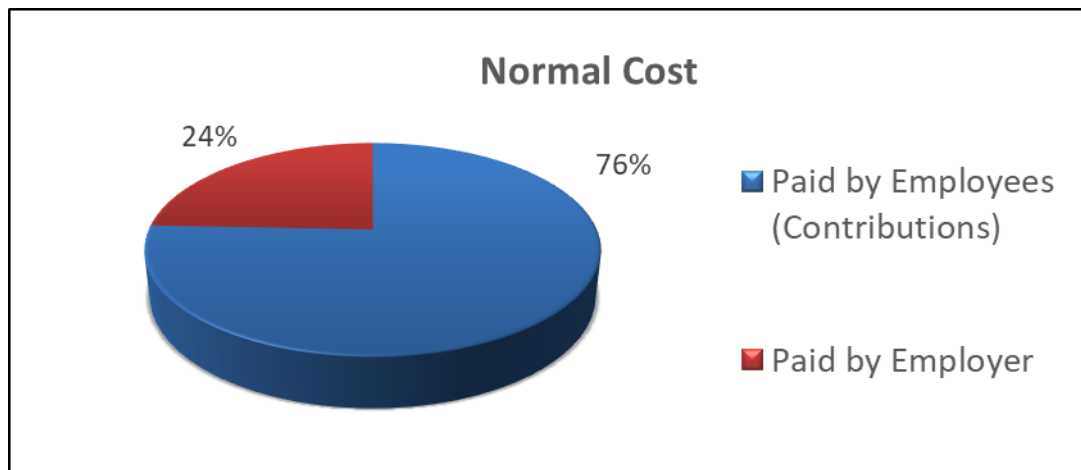
The actuarial funding method (in this case, entry age normal), assigns values to each of these periods of service.

- Past service: The Actuarial Accrued Liability (AAL), is the portion of the benefit value that is associated with past service; this can be thought of as the “price” of benefits already earned by members of the system.
- Current year: The “price” of benefits being earned during the current year is referred to as the Normal Cost (NC). This includes only the actives, as neither inactives nor retirees are earning any additional service.
- Future service: The amount for future service is not included in the liability, as those years of service have not yet been earned.

For retirees, the “past service” amount accounts for the entire value of their benefits; they have completed their careers, and will earn no more service during the current year or any future years.

Net Normal Cost

The entire Normal Cost is not borne by the System; a significant portion is paid by employee contributions. The portion of the Normal Cost not covered by employee contributions is the amount that must be paid through funding appropriations; this is the Net Normal Cost.



The Net Normal Cost as seen in the funding schedule is calculated by adjusting for timing, and adding in the administrative expense. The calculation is shown below, and compared to the covered payroll:

	January 1, 2020	% of Payroll*
Gross Normal Cost (GNC)	\$ 21,395,972	12.3%
Employees Contribution	<u>16,181,305</u>	9.3%
Net Normal Cost (NNC)	\$ 5,214,667	3.0%
Adjustment to beginning of Fiscal Year 2022**	236,411	
Administrative Expense	<u>1,017,527</u>	0.6%
Adjusted Net Normal Cost With Admin. Expense	\$ 6,468,605	

* Payroll paid in 2019 for employees as of January 1, 2020 is \$173,666,601. Payroll for new hires in 2019 was annualized.

** The NNC is adjusted from January 1, 2020 to Fiscal 2022 by rolling it forward with a payroll increase factor of 3.00%.

Unfunded Liability

The Unfunded Actuarial Accrued Liability (UAAL) is the portion of the AAL that is not covered by the value of the plan assets.

This is adjusted from the date of the valuation to the date of the contribution (July 1, 2021) to produce the Unfunded Liability seen in Fiscal Year 2022 in the funding schedule.

The liability results were as follows:

	January 1, 2020
Actuarial Accrued Liability	
a. Active Members	\$ 468,167,622
b. Inactive Members	8,633,268
c. Retired Members and Beneficiaries	<u>731,107,133</u>
d. Total	\$ 1,207,908,023
Unfunded Actuarial Accrued Liability	
a. Actuarial Accrued Liability	\$ 1,207,908,023
b. Less Actuarial Value of Assets	<u>725,798,232</u>
c. Unfunded Actuarial Accrued Liability	\$ 482,109,791
d. Adjustment to FY2022	<u>15,749,284</u>
e. Unfunded Actuarial Accrued Liability as of FY2022	\$ 497,859,075

In developing the funding schedule, we used a “fresh start” approach in which the UAAL (not counting Early Retirement Incentives) is amortized from scratch instead of maintaining the existing amortization amount and separately amortizing gains and losses. This can result in a schedule in which the changes in contribution amounts from year to year are more consistent.

The UAAL and funding ratio are measures of the plan’s funded status, which reflect the plan’s position as of January 1, 2020. We believe these measures, by themselves, are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan’s benefit obligations. However, we believe these measures, in conjunction with the plan’s funding schedule and unrecognized gains/losses, are appropriate for assessing the amount of future contributions.

Active Liability by Decrement

An active member can incur liabilities for the Retirement System in one of four ways:

- They can retire (if eligible),
- They can become disabled and collect a disability benefit,
- They can die, or
- They can terminate service, either withdrawing or retaining their Annuity Savings Fund balance

Active members have a portion of their liability associated with each of these four outcomes. The Accrued Liability for active members is divided as follows:

Active Actuarial Accrued Liability	
Superannuation Retirement	\$ 424,280,386
Death	11,406,884
Disability	27,579,587
Withdrawal	<u>4,900,765</u>
TOTAL	\$ 468,167,622

Demographic Results

Actives	
a. Number	3,319
b. Annual Compensation	\$173,666,601
c. Average Annual Compensation	\$52,325
d. Average Attained Age	47.9
e. Average Past Service	11.5
Retired, Disabled and Beneficiaries	
a. Number	2,646
b. Total Benefits (excluding State COLA)	\$69,802,050
c. Average Benefits	\$26,380
d. Average Age	72.4
Inactives	
a. Number	678

- Total compensation changed by 5.6% over the prior valuation
 - Average annual compensation changed by 2.5%
 - Salary loss of \$7.3 million compared to projected experience

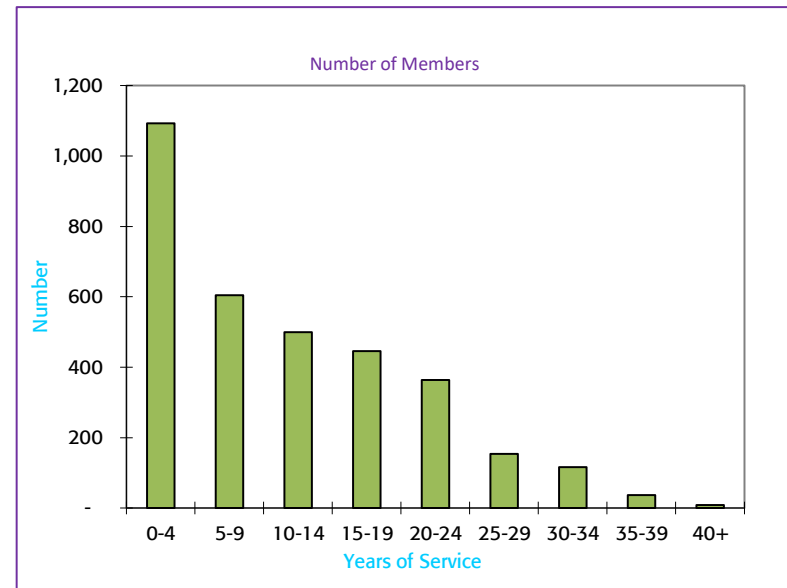
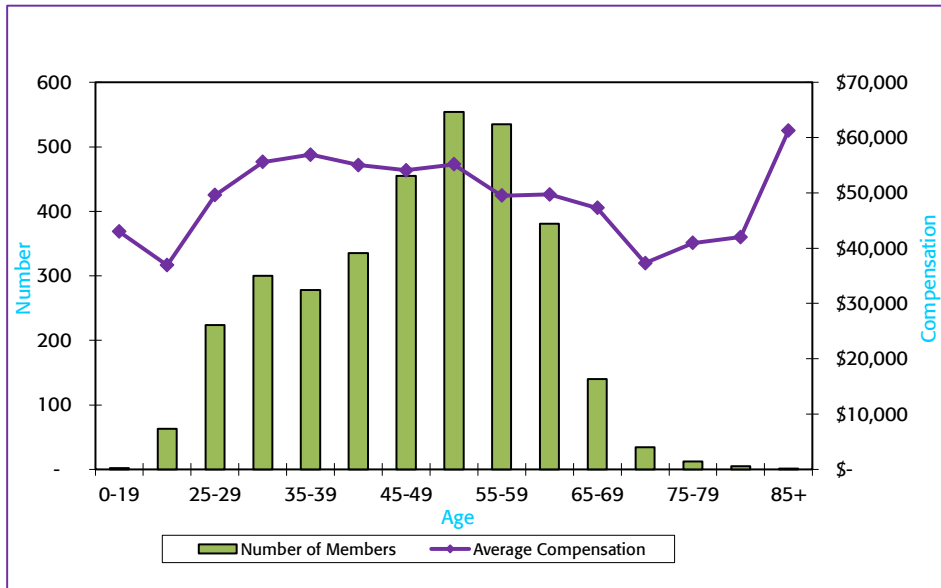
History of Demographic Statistics

Valuation Year	Actives	Average Age	Average Past Service	Average Ann'l Pay
2020	3,319	47.9	11.5	\$52,325
2018	3,220	48.1	11.9	\$51,074
2016	3,193	N/A	N/A	\$47,732
2014	3,119	N/A	N/A	\$45,488
2012	3,246	N/A	N/A	\$42,277
2010	3,334	N/A	N/A	\$40,925

Distribution of Plan Members as of January 1, 2020

ACTIVE MEMBERS

AGE	0-4 Years	5-9 Years	10-14 Years	15-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40 + Years	Total	Total Compensation	Average Compensation
0-19	2	-	-	-	-	-	-	-	-	2	\$ 85,966	\$ 42,983
20-24	63	-	-	-	-	-	-	-	-	63	\$ 2,325,382	\$ 36,911
25-29	201	22	1	-	-	-	-	-	-	224	\$ 11,108,843	\$ 49,593
30-34	176	109	15	-	-	-	-	-	-	300	\$ 16,676,672	\$ 55,589
35-39	109	83	73	13	-	-	-	-	-	278	\$ 15,814,828	\$ 56,888
40-44	115	66	61	62	31	-	-	-	-	335	\$ 18,427,004	\$ 55,006
45-49	139	75	69	71	77	21	3	-	-	455	\$ 24,615,301	\$ 54,100
50-54	129	98	85	75	79	53	33	2	-	554	\$ 30,552,061	\$ 55,148
55-59	86	84	103	112	65	35	37	13	-	535	\$ 26,474,751	\$ 49,486
60-64	43	45	68	75	79	26	24	17	4	381	\$ 18,939,410	\$ 49,710
65-69	22	17	18	29	25	11	13	2	3	140	\$ 6,616,199	\$ 47,259
70-74	6	4	2	6	5	5	5	1	-	34	\$ 1,267,830	\$ 37,289
75-79	1	1	3	2	2	1	1	-	1	12	\$ 491,014	\$ 40,918
80-84	1	-	1	-	-	2	-	1	-	5	\$ 210,085	\$ 42,017
85+	-	-	-	-	-	-	-	-	1	1	\$ 61,256	\$ 61,256
TOTAL	1,093	604	499	445	363	154	116	36	9	3,319	\$ 173,666,601	\$ 52,325



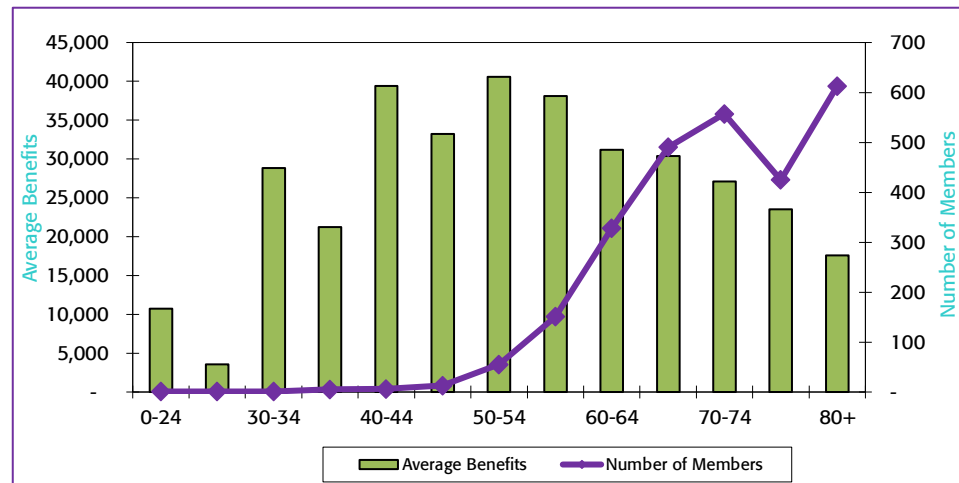
Distribution of Plan Members as of January 1, 2020

RETIRED MEMBERS

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
0-24	1	10,741	10,741
25-29	1	3,561	3,561
30-34	-	-	-
35-39	3	18,405	55,215
40-44	2	31,737	63,474
45-49	5	25,976	129,882
50-54	24	34,829	835,903
55-59	114	37,444	4,268,666
60-64	285	30,221	8,613,121
65-69	445	29,245	13,014,240
70-74	517	26,589	13,746,713
75-79	398	22,766	9,061,023
80+	589	16,957	9,987,855
TOTAL	2,384	\$ 25,080	\$ 59,790,392

Disabled Members			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	1	28,823	28,823
35-39	2	25,506	51,012
40-44	4	43,282	173,130
45-49	8	37,733	301,864
50-54	31	45,072	1,397,221
55-59	37	40,211	1,487,796
60-64	43	37,421	1,609,116
65-69	45	41,607	1,872,309
70-74	40	34,097	1,363,872
75-79	27	34,722	937,485
80+	24	32,876	789,030
TOTAL	262	\$ 38,212	\$ 10,011,658

Total			
Age	Number	Average Benefit	Total Benefit
0-24	1	10,741	10,741
25-29	1	3,561	3,561
30-34	1	28,823	28,823
35-39	5	21,245	106,226
40-44	6	39,434	236,603
45-49	13	33,211	431,746
50-54	55	40,602	2,233,124
55-59	151	38,122	5,756,463
60-64	328	31,165	10,222,237
65-69	490	30,381	14,886,549
70-74	557	27,129	15,110,585
75-79	425	23,526	9,998,508
80+	613	17,581	10,776,885
TOTAL	2,646	\$ 26,380	\$ 69,802,050



Benefits shown are net of State reimbursed COLA.

Assets

	Cash	\$	9,617,937.63
	Fixed Income Securities		54,713,509.94
	Equities		119,062,463.60
	Pooled Domestic Equity Funds		33,238,755.25
	Pooled International Equity Funds		180,162,604.05
	Pooled Domestic Fixed Income Funds		41,655,320.25
	Pooled International Fixed Income Funds		72,098,237.48
	Pooled Alternative Investments		107,779,383.81
	Pooled Real Estate Funds		76,692,209.21
	Hedge Funds		<u>50,920,366.21</u>
A	Sub-Total:	\$	745,940,787.43
	Interest Due and Accrued	\$	326,610.10
	Prepaid Expenses		7,888.30
	Accounts Receivable		2,860,759.59
	Buildings		253,900.00
	Accumulated Depreciation - Buildings		(151,249.67)
	Accounts Payable		<u>(4,360,410.63)</u>
B	Sub-Total:	\$	(1,062,502.31)
	Market Value of Assets [(A) + (B)]	\$	744,878,285.12

- The asset allocation is approximately 24% fixed income, cash, receivables and payables and 76% equities, alternative investments, hedge funds and similar types of investments.
- Annual return in calendar 2018-2019: 6.3% vs. a 7.75% assumption.
 - \$16,411,805 net actuarial asset loss in Calendar Years 2018 through 2019

Actuarial Value of Assets

For its Actuarial Value of Assets (AVA), Bristol County uses a five-year asset smoothing method which recognizes gains and losses over a five-year period. For example, for a gain in 2018, 20% would be recognized in 2019, another 20% in 2020, 2021, and 2022, and the final 20% in 2023.

The AVA is \$725.8 million, \$19.1 million lower than the MVA. The calculation of the smoothed asset value is shown on the following page. The benefit of using an asset smoothing method is that it results in a more stable measure of the financial condition of the Plan.

Five-Year Asset Smoothing

1. Market value of assets including receivable/payable as of 01/01/2020 \$ 744,878,285

2. Phase-in of asset gains and losses

	Plan Year (1)	Original Amount (2)	Percent Unrecognized (3)	Amount Unrecognized (2) x (3)
a.	2019	\$60,673,253	80%	\$48,538,602
b.	2018	(\$77,085,058)	60%	(\$46,251,035)
c.	2017	\$46,887,361	40%	\$18,754,944
d.	2016	(\$9,812,294)	20%	(\$1,962,459)
e.	2015	(\$49,166,968)	0%	\$0
f.	2014	(\$17,603,266)	0%	\$0
g.	Total	(\$46,106,972)		\$19,080,053

3. Valuation assets without corridor as of 01/01/2020 \$ 725,798,232
(1. - 2.g.)

4. Corridor Check

a. 80% of Market Value \$ 595,902,628
b. 120% of Market Value \$ 893,853,942

5. Valuation assets with corridor as of 01/01/2020 \$ 725,798,232
(3. within Corridor)

6. Calculation of return on valuation assets

a. Valuation assets as of 01/01/2018 \$ 672,172,677
b. ER contribs + EE contribs - Ben Pymts - Expenses \$ (21,213,663)
c. Actual return on valuation assets \$ 74,839,218
5. - (6.a. + 6.b.)
d. Weighted value of valuation assets \$ 661,341,679
e. Return on valuation assets 11.32%
(6.c. / 6.d.)
f. Annualized return on assets 5.51%

Risk

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as:

- Plan experience differing from that anticipated by the economic or demographic assumptions,
- Changes in economic or demographic assumptions,
- Increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status,
- Changes in plan provisions or applicable law.

As part of the valuation, we have not performed an analysis of the potential range of future measurements. GASB Statement 67 and 68 reports for the Bristol County Retirement System contain alternate results to measure the impact of increases or decreases in the discount rate.

Maturity

One important concern is the maturity of the system. Systems with a greater portion of their liability stemming from current retirees whose benefits already being paid are likely to experience greater impact from short-term asset experience, as high payouts in the near future leave less of the current assets will be available to benefit from investment returns further in the future.

Between actives and retirees, retirees account for 44% of the population, and 61% of the liability.

Comparative Results

	January 1, 2020	January 1, 2018	Percentage Change
Funding			
Contribution for Fiscal 2022	\$49,347,485	\$49,347,485	0.0%
Members			
■ Actives			
a. Number	3,319	3,220	3.1%
b. Annual Compensation	\$173,666,601	\$164,456,820	5.6%
c. Average Annual Compensation	\$52,325	\$51,074	2.5%
d. Average Attained Age	47.9	48.1	-0.4%
e. Average Past Service	11.5	11.9	-3.1%
■ Retired, Disabled and Beneficiaries			
a. Number	2,646	2,500	5.8%
b. Total Benefits*	\$69,802,050	\$60,954,073	14.5%
c. Average Benefits*	\$26,380	\$24,382	8.2%
d. Average Age	72.4	72.3	0.2%
■ Inactives			
a. Number	678	772	-12.2%
Normal Cost			
a. Total Normal Cost as of January 1, 2020	\$ 21,395,972	\$ 16,890,208	26.7%
b. Less Expected Members' Contributions	<u>16,181,305</u>	<u>14,447,101</u>	12.0%
c. Normal Cost to be funded by the Municipality	\$ 5,214,667	\$ 2,443,107	113.4%
d. Adjustment to July 1, 2021	236,411	149,944	57.7%
e. Administrative Expense Assumption	<u>1,017,527</u>	<u>1,500,000</u>	-32.2%
f. Normal Cost Adjusted to July 1, 2021	\$ 6,468,605	\$ 4,093,051	58.0%
Actuarial Accrued Liability			
a. Active Members	\$ 468,167,622	\$ 395,317,143	18.4%
b. Inactive Members	8,633,268	9,052,044	-4.6%
c. Retired Members and Beneficiaries	<u>731,107,133</u>	<u>588,286,320</u>	24.3%
d. Total	\$1,207,908,023	\$ 992,655,507	21.7%
Unfunded Actuarial Accrued Liability			
a. Actuarial Accrued Liability	\$1,207,908,023	\$ 992,655,507	21.7%
b. Less Actuarial Value of Assets	<u>725,798,232</u>	<u>672,172,677</u>	8.0%
c. Unfunded Actuarial Accrued Liability (UAAL)	\$ 482,109,791	\$ 320,482,830	50.4%
d. Adjustment to FY2022	<u>15,749,284</u>	N/A	
e. UAAL as of FY2022	\$ 497,859,075	N/A	

* Excluding State reimbursed COLA

APPENDICES

Appendix A – Actuarial Methods and Assumptions

All assumptions and methodologies were either set by statute or selected by the Bristol County Retirement Board in conjunction with guidance provided by Stone Consulting, Inc.

Stone Consulting, Inc. was furnished member and financial data by the Bristol County Retirement System's administrative staff. Although examined under broad parameters for reasonableness, the data was not audited by the actuary. With the assistance of the staff of the Bristol County Retirement Board, we were able to develop a database sufficient for valuation purposes.

ASSUMPTION AND METHODOLOGY CHANGES SINCE PRIOR VALUATION

Three assumption were changed from the prior valuation:

- Mortality assumption
- Retirement/Disability/Withdrawal assumptions
- Discount rate assumption

These three assumptions are described in greater detail on the following pages; all other assumptions and methods were maintained from the prior valuation.

ACTUARIAL METHODS

Actuarial Cost Method

The Entry Age Normal Actuarial Cost Method has been used in this valuation. Under this method, the normal cost is the amount calculated as the level percentage of compensation necessary to fully fund the prospective benefits from each member's entry age to retirement age.

The actuarial accrued liability represents the theoretical accumulation of all prior years' normal costs for the plan members as if the program had always been in effect. The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over plan assets. The use of the Entry Age Normal actuarial funding method is consistent with the requirements of Chapter 32 of the Massachusetts General Laws.

Asset Valuation Method

Market Value of Assets, adjusted for payables and receivables, adjusted to phase in investment gains compared to the expected market value and losses evenly over four years (shown on page 13). The asset valuation method adjusts the results to no less than 80% and no more than 120% of the market value of assets adjusted for payables and receivables.

Fiscal Year Adjustment

The actuarial results are adjusted by the valuation interest rate and salary scale to the beginning of Fiscal Year 2022. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

Actuarial Methods and Assumptions (Continued)

ACTUARIAL ASSUMPTIONS

Valuation Date

January 1, 2020.

Investment Return

7.50% per year net of investment expenses. The investment return assumption is a long-term assumption and is based on capital market expectations by asset class, historical returns, and professional judgement.

The prior valuation used an assumption of 7.75%; this change increased the liability by \$31.0 million.

Regular Interest Rate Credited to Annuity Savings Account

2% per year.

Cost-of-Living Increases

A 3% COLA on the first \$18,000 of a member's retirement allowance is assumed to be granted every year.

Salary Increases

Employees are assumed to receive the following pay increases by year of service:

- Years 0-1: 5.50%
- Year 2: 4.00%
- Years 3-4: 3.50%
- Years 5-7: 3.00%
- Years 8+: 2.75%

Total payroll is assumed to increase at 3.00% per year. The salary increase assumption reflects prior experience, current expectations, and professional judgement.

Credited Service

All service is assumed to be due to employment with the municipality.

Actuarial Methods and Assumptions (Continued)

Net 3(8)(c)

Net 3(8)(c) payments are assumed to be the same level as the past calendar year for all future years.

Contribution Timing

Contributions are assumed to be made at the beginning of the fiscal year. Amounts for both annual and semiannual payments are available in the breakouts on page 27.

In-Service Disability and Death

Both Disability and In-Service Death are assumed to be 35% ordinary and 65% accidental for Group 1 and 2, and 5% ordinary and 95% accidental for Group 4.

Mortality

RP-2014 table adjusted to 2006 and projected generationally with MP-2019 (sex-distinct). During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used.

Mortality for disabled retirees follows the same table as non-disabled retirees, set forward 2 years. Death is assumed to be due to the same cause as the disability 40% of the time.

The prior valuation used the following:

Group	Mortality table (all fully generational)
Pre-retirement, and beneficiaries	RP-2014 Blue Collar Mortality with Scale MP-2014
Group 1 and 2 retirees	RP-2014 Blue Collar Mortality Table, set forward 5 years for males, 3 years for females
Group 4 retirees	RP-2014 Blue Collar Mortality Table set forward 3 years for males, 6 years for females
Group 1 and 2 disabled	RP-2000 Mortality Table set forward six years
Group 4 disabled	RP-2000 Mortality Table set forward two years

The net effect of the change increased the liability by \$69.0 million.

Retirement, Disability, and Withdrawal

The next three sets of rates shown are based on a study by PERAC; these represent a change from the 2018 valuation, which used rates based on an experience study by Sherman Actuarial Services. The net effect of the change reduced the liability by \$6.4 million.

Withdrawal Prior to Retirement

The rates shown at the following sample ages illustrate the withdrawal assumption. Withdrawal rates are set to zero if the retirement rate at that age is nonzero.

Rate of Withdrawal

Service	Group 1 and 2	Group 4
0	15%	1.5%
1	12%	1.5%
2	10%	1.5%
3	9%	1.5%
4	8%	1.5%
5	7.6%	1.5%
10	5.4%	1.5%
15	3.3%	0.0%
20	2.0%	0.0%
25	1.0%	0.0%
30+	0.0%	0.0%

Disability Prior to Retirement

The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability:

Rate of Disability

Age	Group 1 and 2	Group 4
20	0.01%	0.10%
25	0.02%	0.20%
30	0.03%	0.30%
35	0.06%	0.30%
40	0.10%	0.30%
45	0.15%	1.00%
50	0.19%	1.25%
55	0.24%	1.20%
60	0.28%	0.85%

Actuarial Methods and Assumptions (Continued)

Rates of Retirement

The rates shown at the following ages illustrate the assumption regarding the incidence of retirement, once the member has achieved 10 years of service:

Age	Group 1 & 2 Male	Group 1 & 2 Female	Group 4	Hired after 4/1/2012		
				Group 1 & 2 Male	Group 1 & 2 Female	Group 4
50	1%	1.5%	2%	0%	0%	0%
51	1%	1.5%	2%	0%	0%	0%
52	1%	2.0%	2%	0%	0%	0%
53	1%	2.5%	2%	0%	0%	0%
54	2%	2.5%	7.5%	0%	0%	0%
55	2%	5.5%	15%	0%	0%	10%
56	2.5%	6.5%	10%	0%	0%	7%
57	2.5%	6.5%	10%	0%	0%	20%
58	5%	6.5%	10%	0%	0%	10%
59	6.5%	6.5%	15%	0%	0%	15%
60	12%	5%	20%	25%	30%	20%
61	20%	13%	20%	20%	13%	20%
62	30%	15%	25%	30%	15%	25%
63	25%	12.5%	25%	25%	12.5%	25%
64	22%	18%	30%	22%	18%	30%
65	40%	15%	100%	40%	15%	100%
66	25%	20%	N/A	25%	20%	N/A
67	25%	20%	N/A	25%	20%	N/A
68	30%	25%	N/A	30%	25%	N/A
69	30%	20%	N/A	30%	20%	N/A
70	100%	100%	N/A	100%	100%	N/A

Family Composition

Members assumed married with 2 dependent children – one male and one female both age 15; age difference between member and spouse assumed to be 3 years (the male being the older).

Administrative Expenses

Estimated budgeted amount of \$1,017,527 for the Fiscal Year 2022 is added to the Normal Cost. The administrative expense does not include investment manager and custodial fees. These fees are considered part of the discount rate assumption that is net of fees.

Appendix B – Summary of Principal Provisions

1. PARTICIPANT

Participation is mandatory for all full-time employees whose employment commences before age 65. There are three classes of members in the retirement system:

- Group 1: general employees
- Group 2: employees in specified hazardous occupations (e.g., electricians)
- Group 4: police and firefighters

2. MEMBER CONTRIBUTIONS

Member contributions vary depending upon date hired as follows:

Date of Hire	Member Contribution Rate
Prior to 1975	5% of Pay
1975 – 1983	7% of Pay
1984 – June 30, 1996	8% of Pay
After June 30, 1996	9% of Pay

Members hired after 1978 contribute an additional 2% of pay over \$30,000.

3. PAY

a. Pay

Gross regular compensation excluding bonuses, overtime, severance pay, unused sick pay, and other similar compensation.

b. Average Pay

The average of pay during the three consecutive years that produce the highest average or, if greater, during the last three years (whether or not consecutive) preceding retirement. For members hired after April 1, 2012, five-year averages will be used.

4. CREDITED SERVICE

Period during which an employee contributes to the retirement system plus certain periods of military service and “purchased” service.

Summary of Principal Provisions (Continued)

5. SERVICE RETIREMENT

a. Eligibility

Hired prior to April 2, 2012:

- Attainment of age 55 and completion of ten years of credited service,
- or at any age with completion of 20 years of service.
- If hired prior to 1978 or a member of Group 4, the completion of ten years of service is not required.

Hired after April 1, 2012:

- Group 1 – Age 60 and Completion of 10 years of credited service;
- Group 2 – Age 55 and completion of 10 years of service;
- Group 4 – Age 55.

b. Retirement Allowance

Determined as the product of the member's benefit percentage, average pay and credited service, where the benefit percentage is shown below (maximum allowance of 80% of average pay):

Benefit Percentage	Group 1	Group 2	Group 4
2.5%	65+	60+	55+
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	N/A	49
1.8	58	N/A	48
1.7	57	N/A	47
1.6	56	N/A	46
1.5	55	N/A	45
Hired after April 1, 2012*			
2.5%	67+	62+	57+
2.35	66	61	56
2.20	65	60	55
2.05	64	59	54
1.90	63	58	53
1.75	62	57	52
1.60	61	56	51
1.45	60	55	50

*Reduction is .125% for each year early instead of .15% per year for employees with over 30 years of service.

In addition, veterans receive an additional \$15 per year for each year of credited service up to 20 years

Summary of Principal Provisions (Continued)

6. DEFERRED VESTED RETIREMENT

a. Eligibility

Completion of 10 years of credited service (for elected and appointed members, 6 years in the event of involuntary termination).

b. Retirement Allowance

Determined in the same manner as "Service Retirement" section above with the member eligible to start collecting a benefit at age 55, (or age 57 for post-April 1, 2012 hires) or defer until later at his or her discretion. If a member chooses, his or her contributions with interest may be withdrawn. The amount of interest he or she will receive depends on length of service and whether or not the termination of employment was voluntary.

7. ORDINARY DISABILITY RETIREMENT

a. Eligibility

Non-job related disability after completion of 10 years of credited service.

b. Retirement Allowance

Determined in the same manner as "Service Retirement" section and calculated as if the member had attained age 55 (or age 57 for those hired after April 1, 2012), if younger. Veterans receive 50% of pay (during final year) plus an annuity based on accumulated member contributions with interest.

8. ACCIDENTAL DISABILITY RETIREMENT

a. Eligibility

Disabled as a result of an accident in the performance of duties. No age or service requirement.

b. Retirement Allowance

72% of pay plus an annuity based on accumulated member contributions with interest. Also, a dependent's allowance per year for each child. Total allowance not to exceed 100% of pay (75% for members hired after 1987).

Summary of Principal Provisions (Continued)

9. NON-OCCUPATIONAL DEATH

a. Eligibility

Dies while in active service, but not due to occupational injury. 2 years of service.

b. Retirement Allowance

Benefit as if Option C had been elected (see below) and member had attained age 55 (or age 57 for those hired after April 1, 2012) if younger.

Minimum monthly benefits provided as follows:

- spouse - \$500,
- first child - \$120,
- each additional child - \$90

10. OCCUPATIONAL DEATH

a. Eligibility

Dies as a result of an occupational injury.

b. Benefit Amount

72% of pay plus refund of annuity savings fund balance. In the case of an accidental disability retiree who dies of the same cause, the beneficiary receives 72% of the last 12 months salary or the current pension amount, whichever is greater.

11. COST-OF-LIVING INCREASES

An increase of up to 3% applied to the first \$18,000 of annual benefit. Funded by the Employer from Fiscal Year 1999. Percentage increase is voted on each year by the Retirement Board. Cost-of-living increases granted during Fiscal Year 1982 through Fiscal 1998 are reimbursed by the Commonwealth.

12. OPTIONAL FORMS OF PAYMENT

- Option A: Allowance payable monthly for the life of the member.
- Option B: Allowance payable monthly for the life of the member with a guarantee of remaining member contributions with interest.
- Option C: Allowance payable monthly for the life of the member with 66-2/3% continuing to the member's beneficiary upon the member's death. If the beneficiary predeceases the member, the allowance amount "pops up" to the non-reduced amount.

Appendix C – Glossary of Terms

- **Actuarial Accrued Liability**
The portion of the Present Value of Benefits that is attributable to past service.
- **Actuarial Value of Assets**
The value of assets based on the asset valuation method shown in the Actuarial Methods and Assumptions section of this report.
- **Actuarial Assumptions**
Estimates are made as to the occurrence of certain events that determine the level of benefits to be paid and how long they will be provided. The more important actuarial assumptions include the investment return on assets, salary increases and the rates of turnover, disability, retirement and mortality.
- **Actuarial Cost Method**
The procedure that is used to allocate the present value of benefits between the liability that is attributable to past service (Actuarial Accrued Liability) and that attributable to future service.
- **Funding Ratio**
The percentage of the accrued liability that is covered by the Actuarial Value of Assets.
- **GASB**
Government Accounting Standards Board (issues guidance for disclosure of retirement system liabilities).
- **Normal Cost**
The portion of the Present Value of Benefits that is attributable to benefits to be earned in the coming year.
- **PERAC**
Public Employee Retirement Administration Commission, a division of the State government which has regulatory authority over the administration of the retirement system.
- **Present Value of Benefits**
Represents the dollar value today of all benefits expected to be earned by current members if all actuarial assumptions are exactly realized.
- **PRIT**
Pension Reserves Investment Trust Fund is the state controlled and administered fund for the investment of assets for members of the retirement system.
- **Unfunded Actuarial Accrued Liability**
That portion of the Actuarial Accrued Liability not covered by System Assets.

■ Bristol County Retirement Board
Actuarial Valuation as of January 1, 2020

PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2020

The normal cost for employees on that date was:	\$16,181,305	9.3% of payroll
The normal cost for the employer was:	\$5,214,667	3.0% of payroll

The actuarial liability for active members was:	\$468,167,622
The actuarial liability for retired members was (includes inactives):	\$739,740,401
Total actuarial accrued liability:	\$1,207,908,023
System assets as of that date (\$744,878,285.12 Market Value):	\$725,798,232
Unfunded actuarial accrued liability:	\$482,109,791

The ratio of system's assets to total actuarial liability was:	60%
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As of that date the total covered employee payroll was:	\$173,666,601
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The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	7.50% per annum
Rate of Salary Increase:	Select and ultimate (2.75% ultimate rate)

SCHEDULE OF FUNDING PROGRESS (Dollars in \$000's)

Actuarial Valuation Date	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 % of Covered Payroll ((b-a)/c)
1/1/2020	\$725,798	\$1,207,908	\$482,110	60%	\$173,667	278%
1/1/2018	\$672,173	\$992,656	\$320,483	68%	\$164,457	195%
1/1/2016	\$596,532	\$908,025	\$311,493	66%	\$152,407	204%
1/1/2014	\$516,076	\$840,302	\$324,226	61%	\$141,877	229%
1/1/2012	\$460,573	\$776,734	\$316,161	59%	\$137,231	230%

Breakout of FY2022 and FY2023 Appropriation

Unit Name	FY2022 Appropriation		FY2023 Appropriation	
	July 1st	Semiannual	July 1st	Semiannual
County of Bristol	\$ 1,680,234	\$ 1,761,554	\$ 1,694,908	\$ 1,778,493
Town of Acushnet	\$ 1,513,001	\$ 1,540,354	\$ 1,604,427	\$ 1,633,432
Acushnet Housing Authority	\$ 21,503	\$ 21,891	\$ 22,865	\$ 23,278
Town of Berkley	\$ 720,691	\$ 733,720	\$ 763,530	\$ 777,334
Town of Dartmouth	\$ 5,854,418	\$ 5,960,255	\$ 6,063,785	\$ 6,173,408
Dartmouth Housing Authority	\$ 89,194	\$ 90,807	\$ 95,022	\$ 96,740
Dartmouth Fire District #3	\$ 144,732	\$ 147,348	\$ 152,537	\$ 155,295
Dartmouth Fire District #2	\$ 45,242	\$ 46,060	\$ 47,383	\$ 48,240
Dartmouth Fire District #1	\$ 78,497	\$ 79,916	\$ 83,508	\$ 85,018
Town of Dighton	\$ 890,368	\$ 906,464	\$ 897,957	\$ 914,190
Dighton Housing Authority	\$ 14,361	\$ 14,621	\$ 15,439	\$ 15,718
Dighton-Rehoboth Regional School District	\$ 1,026,837	\$ 1,045,401	\$ 1,088,581	\$ 1,108,260
Dighton Water District	\$ 124,067	\$ 126,310	\$ 132,559	\$ 134,955
North Dighton Fire District	\$ -	\$ -	\$ -	\$ -
Town of Easton	\$ 5,100,875	\$ 5,193,090	\$ 5,415,128	\$ 5,513,024
Easton Housing Authority	\$ 95,417	\$ 97,142	\$ 101,504	\$ 103,339
Town of Freetown	\$ 1,298,085	\$ 1,321,552	\$ 1,339,930	\$ 1,364,153
Freetown-Lakeville Regional School District	\$ 927,895	\$ 944,669	\$ 984,380	\$ 1,002,176
Town of Mansfield	\$ 5,962,491	\$ 6,070,282	\$ 6,258,275	\$ 6,371,413
Mansfield Housing	\$ 76,324	\$ 77,704	\$ 80,863	\$ 82,325
Bristol County Mosquito Control	\$ 167,117	\$ 170,138	\$ 177,984	\$ 181,202
Town of Norton	\$ 3,365,604	\$ 3,426,448	\$ 3,571,602	\$ 3,636,170
Norton Housing Authority	\$ 46,081	\$ 46,914	\$ 49,055	\$ 49,942
Town of Raynham	\$ 2,439,137	\$ 2,483,232	\$ 2,588,360	\$ 2,635,153
Raynham Housing Authority	\$ 54,652	\$ 55,640	\$ 58,196	\$ 59,248
Raynham Water District	\$ 142,697	\$ 145,277	\$ 152,993	\$ 155,759
Town of Rehoboth	\$ 1,214,982	\$ 1,236,946	\$ 1,285,833	\$ 1,309,078
Town of Seekonk	\$ 3,365,427	\$ 3,426,268	\$ 3,471,949	\$ 3,534,715
Seekonk Housing Authority	\$ 32,486	\$ 33,073	\$ 34,374	\$ 34,995
Seekonk Water District	\$ 110,687	\$ 112,688	\$ 117,771	\$ 119,900
Town of Somerset	\$ 3,855,206	\$ 3,924,901	\$ 4,093,351	\$ 4,167,351
Somerset Housing Authority	\$ 70,420	\$ 71,693	\$ 75,009	\$ 76,366
Town of Swansea	\$ 2,404,015	\$ 2,447,475	\$ 2,549,743	\$ 2,595,837
Swansea Housing Authority	\$ 37,433	\$ 38,109	\$ 39,550	\$ 40,265
Swansea Water District	\$ 130,965	\$ 133,332	\$ 139,644	\$ 142,169
Town of Westport	\$ 3,060,550	\$ 3,115,879	\$ 3,246,146	\$ 3,304,830
Westport Housing Authority	\$ 13,926	\$ 14,178	\$ 14,764	\$ 15,031
Somerset Berkley Schools	\$ 336,663	\$ 342,749	\$ 357,665	\$ 364,131
SE MA Regional Emergency Comm District	\$ 2,795	\$ 2,846	\$ 3,713	\$ 3,780
North Raynham Water District	\$ 14,388	\$ 14,648	\$ 15,968	\$ 16,257
Subtotal	\$ 46,529,462	\$ 47,421,576	\$ 48,886,252	\$ 49,822,971
Sheriff's Unfunded Liability	\$ 2,818,023	N/A	\$ 2,928,608	N/A
TOTAL	\$ 49,347,485	\$ 50,239,599	\$ 51,814,860	\$ 52,751,579