

**PLYMOUTH COUNTY
CONTRIBUTORY RETIREMENT SYSTEM**

December 31, 2017 Actuarial Valuation Report

GASB 67 & 68

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Introduction

This report presents the Governmental Accounting Standards Statements 67 & 68 based on the findings of an actuarial valuation as of January 1, 2017, of the Plymouth County Contributory Retirement System, rolled forward to December 31, 2017.

The actuarial valuation is based on:

- Provisions of Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2017.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Plymouth County Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board
- Assets as of December 31, 2017

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2017.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

GASB Statements No. 67 and No. 68

Effective for periods beginning after June 15, 2013, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 67 and 68. These statements, which amend GASB Statements No. 25 and No. 27, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP).

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

The statement requires the system to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position. The statement of fiduciary net position presents the following items as of the end of the plan’s reporting period, as applicable:

- Assets
 - Deferred outflows of resources (consumption of net assets by the employers that is applicable to a future reporting period)
- Liabilities
 - Deferred inflows of resources (acquisition of net assets by the employers that is applicable to a future reporting period)
- Fiduciary net position (Assets + Deferred outflows – Liabilities – Deferred inflows)

The system is considered a cost-sharing multiple-employer pension plan since pension obligations exist for employees of more than one employer and plan assets can be used to pay the benefits of the employees of any employer.

This report does not include all items required under GASB Statements No. 67 and No. 68. Rather, it provides all items required that are not readily available from other sources such as the Annual Statement of the Financial Condition prepared by the Board, Chapter 32 of the Massachusetts General Laws and investment reports prepared by the plan’s investment consultant.

Discount Rate

The discount rate, and all other actuarial assumptions, are the as those described in Exhibit 5. The discount rate was selected based on a projection of employer and employee contributions, benefit payments, expenses and the long term expected rate of return on trust assets. Under Chapter 32 of the Massachusetts Laws, employers are required to make the necessary contributions to the trust such that the plan reaches a full funding status by 2040. In addition, Chapter 32 also gives the Retirement Board the right to go directly to the Assessors of the community and add an additional property tax to bills for amounts not paid by employer.

Based on these laws and assumptions, the pensions plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

The Board selected 8.00% as the long term expectation of investment returns. The average return for the 33 years ending as of December 31, 2017 was 9.25%. The average return for the past 5 years ending December 31, 2017 was 9.37%.

Net Position Restricted for Pensions

The Net Position Restricted for Pensions as of December 31, 2017 is \$1,018,385,952. The 2016 Annual Statement of the Financial Condition contains the values for previous years and the changes in Net Position Restricted for Pensions. Investments are reported at fair value.

December 31, 2016 Net Position	884,718,724
Employer Contributions	70,440,945
Employee Contributions	28,217,225
Other Payments	2,530,594
Benefit Payments	(110,807,538)
Expenses	(1,988,934)
Investment Income	<u>145,274,936</u>
December 31, 2017 Net Position	1,018,385,952

Pension Liability as of December 31, 2017

The following presents the changes in the pension liability during 2016.

December 31, 2016 Liability	1,520,090,445
Service Cost	26,807,632
Interest on Liability and Service Cost	119,404,813
Change in Plan Provisions	0
Experience (Gain) and Loss	0
Change in Assumptions	0
Benefit Payments	(110,807,538)
Other	<u>0</u>
December 31, 2017 Liability	1,555,495,352

Net Pension Liability as of December 31, 2017

The following presents the net pension liability of the system calculated using the discount rate of 8.00%, as well as what the system’s net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (7.00%) or 1-percentage-point higher (9.00%) than the current rate:

	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Total Pension Liability	1,716,195,801	1,555,495,352	1,418,361,350
Plan Fiduciary Net Position	<u>1,018,385,952</u>	<u>1,018,385,952</u>	<u>1,018,385,952</u>
Net Pension Liability	697,809,849	537,109,400	399,975,398

The Plan Fiduciary Net Position as a percentage of the Total Pension Liability is 65.5%.

		1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
County of Plymouth	1	44,677,973	34,388,966	25,608,825
Hospital	2	3,202,249	2,464,795	1,835,487
Abington	3	24,566,396	18,908,936	14,081,134
Bridgewater	4	32,702,161	25,171,095	18,744,447
Bridgewater Housing	5	1,182,090	909,863	677,558
Bridgewater/Raynham				
Regional School	6	16,113,127	12,402,393	9,235,832
Carver	7	19,706,150	15,167,969	11,295,305
Carver/Marion/Wareham				
Regional Refuse	8	833,185	641,309	477,571
Duxbury	9	33,733,524	25,964,943	19,335,611
Duxbury Housing	10	380,306	292,725	217,987
East Bridgewater	11	24,049,319	18,510,938	13,784,752
East Bridgewater Housing	12	405,428	312,061	232,386
Halifax	13	11,190,079	8,613,086	6,414,005
Hanover	14	30,402,877	23,401,319	17,426,528
Hanson	15	14,545,149	11,195,508	8,337,087
Kingston	16	21,008,961	16,170,753	12,042,059
Kingston Housing	17	48,149	37,061	27,598
Lakeville	18	9,756,080	7,509,327	5,592,056
Marion	19	9,640,243	7,420,166	5,525,660
Marshfield	20	54,870,184	42,233,986	31,450,865
Marshfield Housing	21	337,740	259,961	193,588
Mattapoisett	22	10,925,609	8,409,522	6,262,415
Middleborough	23	61,353,535	47,224,270	35,167,037
Middleborough Housing	24	1,591,006	1,224,609	911,944
Norwell	25	23,966,977	18,447,559	13,737,555
Norwell Housing	26	263,772	203,027	151,191
Old Rochester Regional				
School	27	6,045,825	4,653,516	3,465,387
Onset Fire District	28	2,458,384	1,892,236	1,409,113
Pembroke	29	31,062,308	23,908,888	17,804,505
Plymouth County Mosquito				
Control	30	2,018,764	1,553,857	1,157,129
Plympton	31	4,920,955	3,787,695	2,820,627
Rochester	32	6,853,191	5,274,951	3,928,158
Rockland	33	37,139,534	28,586,574	21,287,891
Scituate	34	44,878,245	34,543,117	25,723,618
Scituate Housing	35	1,636,364	1,259,522	937,942
Silver Lake Regional School	36	6,671,760	5,135,303	3,824,165
South Shore Regional				
School	38	3,386,471	2,606,592	1,941,081
Wareham	39	36,905,070	28,406,105	21,153,499

	<u>Unit</u>	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Wareham Fire District	40	7,089,748	5,457,032	4,063,750
Wareham Housing	41	361,466	278,223	207,187
West Bridgewater	42	18,355,190	14,128,126	10,520,953
Whitman	43	18,609,891	14,324,171	10,666,944
Whitman/Hanson Regional School	44	11,051,215	8,506,202	6,334,410
Whitman Housing	45	995,077	765,918	570,365
Abington Housing	46	348,207	268,018	199,588
Pembroke Housing	47	1,138,826	876,563	652,760
Hanson Housing	48	435,433	335,156	249,585
Rockland Housing	49	735,492	566,113	421,574
Halifax Housing	50	369,141	284,131	211,587
Mattapoisett Housing	51	192,596	148,242	110,393
Acushnet/Rochester/Marion Health District	53	194,689	149,854	111,593
West Bridgewater Housing	54	107,463	82,715	61,596
South Shore Tri Town Development	55	829,696	638,623	475,571
Carver Housing	56	182,826	140,723	104,794
Retirement Staff	59	<u>1,383,757</u>	<u>1,065,088</u>	<u>793,151</u>
Total		697,809,849	537,109,400	399,975,398

Employer Contributions during 2017

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
County of Plymouth	1	4,510,156	0.064026
Hospital	2	323,253	0.004589
Abington	3	2,479,907	0.035205
Bridgewater	4	3,301,134	0.046864
Bridgewater Housing	5	119,309	0.001694
Bridgewater/Raynham			
Regional School	6	1,626,551	0.023091
Carver	7	1,989,254	0.028240
Carver/Marion/Wareham			
Regional Refuse	8	84,098	0.001194
Duxbury	9	3,405,229	0.048342
Duxbury Housing	10	38,415	0.000545
East Bridgewater	11	2,427,677	0.034464
East Bridgewater Housing	12	40,902	0.000581
Halifax	13	1,129,620	0.016036
Hanover	14	3,069,053	0.043569
Hanson	15	1,468,264	0.020844
Kingston	16	2,120,777	0.030107
Kingston Housing	17	4,889	0.000069
Lakeville	18	984,828	0.013981
Marion	19	973,158	0.013815
Marshfield	20	5,538,881	0.078632
Marshfield Housing	21	34,076	0.000484
Mattapoisett	22	1,102,860	0.015657
Middleborough	23	6,193,391	0.087923
Middleborough Housing	24	160,595	0.002280
Norwell	25	2,419,382	0.034346
Norwell Housing	26	26,641	0.000378
Old Rochester Regional			
School	27	610,322	0.008664
Onset Fire District	28	248,134	0.003523
Pembroke	29	3,135,629	0.044514
Plymouth County Mosquito			
Control	30	203,766	0.002893
Plympton	31	496,716	0.007052
Rochester	32	691,796	0.009821
Rockland	33	3,749,072	0.053223
Scituate	34	4,530,275	0.064313
Scituate Housing	35	165,163	0.002345
Silver Lake Regional School	36	673,517	0.009561
South Shore Regional			
School	38	341,872	0.004853
Wareham	39	3,725,405	0.052887

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
Wareham Fire District	40	715,653	0.010160
Wareham Housing	41	36,511	0.000518
West Bridgewater	42	1,852,901	0.026304
Whitman	43	1,878,591	0.026669
Whitman/Hanson Regional School	44	1,115,553	0.015837
Whitman Housing	45	100,435	0.001426
Abington Housing	46	35,155	0.000499
Pembroke Housing	47	114,973	0.001632
Hanson Housing	48	43,931	0.000624
Rockland Housing	49	74,213	0.001054
Halifax Housing	50	37,276	0.000529
Mattapoisett Housing	51	19,423	0.000276
Acushnet/Rochester/Marion Health District	53	19,663	0.000279
West Bridgewater Housing	54	10,876	0.000154
South Shore Tri Town Development	55	83,720	0.001189
Carver Housing	56	18,444	0.000262
Retirement Staff	59	<u>139,663</u>	<u>0.001983</u>
		70,440,945	100.0000%

Pension Expense for 2017

Service Cost	26,807,632
Interest	119,404,813
Difference in Experience - Amortization	4,846,385
Change in Assumptions - Amortization	(5,294,734)
Changes in Plan Provisions	0
Employee Contributions	(28,217,225)
Projected Earnings	(70,322,122)
Administration Expense	1,988,934
Other Changes in Fiduciary Net Position	0
Asset (Gain) / Loss Amortization	<u>7,117,588</u>
Total Expense	56,331,271

Schedules of Required Supplementary Information

	<u>2017</u>
Total Pension Liability – Beginning	1,520,090,445
Total Pension Liability – Ending (a)	1,555,495,352
Plan Fiduciary Net Position – Beginning	884,718,724
Plan Fiduciary Net Position – Ending (b)	1,018,385,952
Net Pension Liability – Ending (a) – (b)	537,109,400
Plan Fiduciary Net Positions as a percentage of the Total Pension Liability	65.5%
Covered-employee payroll	275,630,362
Net Pension Liability as a percentage of Covered-employee Payroll	194.9%

Schedule of Net Position Restricted for Pensions Amortization Recognition

Below is the schedule of amortization adjustments to the Pension Expense for the coming years. A positive number indicates that the actual return was less than the expected return and will be added to the Pension Expense.

Assets

<u>Year</u>	<u>(Gain)/</u> <u>Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
2017	(74,952,814)	5	(14,990,563)	(14,990,563)	(14,990,563)	(14,990,563)	(14,990,562)
2016	8,756,807	5	1,751,361	1,751,361	1,751,361	1,751,363	0
2015	68,091,068	5	13,618,039	13,618,039	13,618,040	0	0
2014	33,693,756	5	6,738,751	6,738,752	0	0	0

Experience

<u>Year</u>	<u>(Gain)/</u> <u>Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
2016	21,421,023	4.42	4,846,385	4,846,385	4,846,385	4,846,385	2,035,483

Assumptions

<u>Year</u>	<u>(Gain) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
2016	(23,402,726)	4.42	(5,294,734)	(5,294,734)	(5,294,734)	(5,294,734)	(2,223,790)

Reconciliation of Net Pension Liability for 2017

NPL Beginning	635,371,721
Expense	56,331,291
Contribution	(70,440,945)
Deferred Outflows	(18,016,575)
Deferred Inflows	(63,605,494)
Revenue	<u>(2,530,598)</u>
NPL Ending	537,109,400

	<u>County of Plymouth</u>	<u>Hospital</u>	<u>Abington</u>	<u>Bridgewater</u>	<u>Bridgewater Housing</u>	<u>Bridgewater/ Raynham Regional School</u>
Net Pension Liability	34,388,966	2,464,795	18,908,936	25,171,095	909,863	12,402,393
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	750,914	53,821	412,893	549,633	19,868	270,817
Net Asset Loss	2,511,671	180,021	1,381,054	1,838,424	66,454	905,835
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	11,524,984	0	0	70,562	334,787	268,578
Total Deferred Outflows	14,787,569	233,842	1,793,947	2,458,619	421,109	1,445,230
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	3,839,143	275,167	2,110,971	2,810,071	101,576	1,384,588
Changes in Assumptions	820,382	58,801	451,091	600,480	21,705	295,872
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	2,267,376	640,823	632,501	1,079,530	0	313,057
Total Deferred Inflows	6,926,901	974,790	3,194,563	4,490,081	123,281	1,993,517
Pension Expense						
Proportionate share of plan Pension Expense	3,606,666	258,504	1,983,142	2,639,909	95,425	1,300,745
Net Amortization from changes in Share Proportions	3,631,703	(278,182)	(248,593)	(387,893)	128,953	(10,662)
Total Employer Pension Expense	7,238,369	(19,678)	1,734,549	2,252,016	224,378	1,290,083
Revenue	162,024	11,613	89,090	118,594	4,287	58,434

	<u>Carver</u>	<u>Carver/Marion/ Wareham Regional</u>	<u>Duxbury</u>	<u>Duxbury Housing</u>	<u>East Bridgewater</u>	<u>East Bridgewater Housing</u>
Net Pension Liability	15,167,969	641,309	25,964,943	292,725	18,510,938	312,061
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	331,206	14,004	566,967	6,391	404,203	6,815
Net Asset Loss	1,107,824	46,839	1,896,404	21,379	1,351,985	22,793
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	588,639	206,159	523,210	94,733	86,888	46,365
Total Deferred Outflows	2,027,669	267,002	2,986,581	122,503	1,843,076	75,973
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	1,693,334	71,595	2,898,695	32,679	2,066,539	34,838
Changes in Assumptions	361,846	15,299	619,418	6,984	441,597	7,444
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	440,451	17,823	1,364,686	16,811	386,983	417
Total Deferred Inflows	2,495,631	104,717	4,882,799	56,475	2,895,119	42,699
Pension Expense						
Proportionate share of plan Pension Expense	1,590,795	67,260	2,723,166	30,701	1,941,401	32,728
Net Amortization from changes in Share Proportions	74,889	70,519	(307,913)	28,618	(122,914)	19,192
Total Employer Pension Expense	1,665,684	137,779	2,415,253	59,319	1,818,487	51,920
Revenue	71,464	3,022	122,334	1,379	87,214	1,470

	<u>Halifax</u>	<u>Hanover</u>	<u>Hanson</u>	<u>Kingston</u>	<u>Kingston Housing</u>	<u>Lakeville</u>
Net Pension Liability	8,613,086	23,401,319	11,195,508	16,170,753	37,061	7,509,327
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	188,075	510,988	244,464	353,102	808	163,972
Net Asset Loss	629,075	1,709,164	817,687	1,181,065	2,706	548,460
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	55,922	178,503	0	30,929	18,362	0
Total Deferred Outflows	873,072	2,398,655	1,062,151	1,565,096	21,876	712,432
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	961,555	2,612,495	1,249,853	1,805,283	4,137	838,332
Changes in Assumptions	205,473	558,260	267,079	385,770	883	179,143
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	149,196	964,261	263,290	357,576	9,647	98,604
Total Deferred Inflows	1,316,223	4,135,016	1,780,222	2,548,629	14,668	1,116,080
Pension Expense						
Proportionate share of plan Pension Expense	903,328	2,454,297	1,174,169	1,695,966	3,887	787,567
Net Amortization from changes in Share Proportions	(43,235)	(299,739)	(113,241)	(129,931)	2,958	(42,128)
Total Employer Pension Expense	860,093	2,154,558	1,060,928	1,566,035	6,845	745,439
Revenue	40,581	110,255	52,748	76,189	175	35,380

	<u>Marion</u>	<u>Marshfield</u>	<u>Marshfield</u> <u>Housing</u>	<u>Mattapoisett</u>	<u>Middleboroug</u> <u>h</u>	<u>Middleboroug</u> <u>h Housing</u>
Net Pension Liability	7,420,166	42,233,986	259,961	8,409,522	47,224,270	1,224,609
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	162,026	922,216	5,677	183,630	1,031,184	26,741
Net Asset Loss	541,947	3,084,648	18,987	614,207	3,449,124	89,442
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	0	446,448	25,815	55,087	0	332,610
Total Deferred Outflows	703,973	4,453,312	50,479	852,924	4,480,308	448,793
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	828,378	4,714,952	29,022	938,829	5,272,061	136,714
Changes in Assumptions	177,016	1,007,533	6,202	200,618	1,126,580	29,214
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	177,108	881,963	13,680	328,315	1,517,344	34,487
Total Deferred Inflows	1,182,503	6,604,448	48,904	1,467,762	7,915,985	200,415
Pension Expense						
Proportionate share of plan Pension Expense	778,217	4,429,440	27,264	881,979	4,952,814	128,435
Net Amortization from changes in Share Proportions	(70,708)	(158,079)	4,207	(118,803)	(608,135)	111,227
Total Employer Pension Expense	707,509	4,271,361	31,471	763,176	4,344,679	239,662
Revenue	34,960	198,986	1,225	39,622	222,497	5,770

		<u>Old Rochester</u>				<u>Plymouth</u>
	<u>Norwell</u>	<u>Norwell</u>	<u>Regional</u>	<u>Onset Fire</u>	<u>Pembroke</u>	<u>County</u>
		<u>Housing</u>	<u>School</u>	<u>District</u>		<u>Mosquito</u>
						<u>Control</u>
Net Pension Liability	18,447,559	203,027	4,653,516	1,892,236	23,908,888	1,553,857
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	402,819	4,433	101,613	41,319	522,071	33,931
Net Asset Loss	1,347,356	14,829	339,879	138,203	1,746,236	113,490
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	198,587	13,670	148,872	111,843	552,397	28,682
Total Deferred Outflows	1,948,762	32,932	590,364	291,365	2,820,704	176,103
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	2,059,463	22,666	519,513	211,247	2,669,160	173,471
Changes in Assumptions	440,084	4,843	111,015	45,140	570,370	37,069
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	345,085	32,087	326,514	114,805	318,075	61,020
Total Deferred Inflows	2,844,633	59,596	957,041	371,192	3,557,605	271,560
Pension Expense						
Proportionate share of plan Pension Expense	1,934,754	21,293	488,054	198,455	2,507,530	162,966
Net Amortization from changes in Share Proportions	(55,675)	(6,594)	(63,799)	(5,867)	101,421	(11,837)
Total Employer Pension Expense	1,879,079	14,699	424,255	192,588	2,608,951	151,129
Revenue	86,916	957	21,925	8,915	112,647	7,321

	<u>Plympton</u>	<u>Rochester</u>	<u>Rockland</u>	<u>Scituate</u>	<u>Scituate Housing</u>	<u>Silver Lake Regional School</u>
Net Pension Liability	3,787,695	5,274,951	28,586,574	34,543,117	1,259,522	5,135,303
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	82,708	115,182	624,213	754,280	27,503	112,133
Net Asset Loss	276,643	385,267	2,087,881	2,522,929	91,992	375,068
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	499,257	344,138	0	234,586	472,645	0
Total Deferred Outflows	858,608	844,587	2,712,094	3,511,795	592,140	487,201
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	422,854	588,889	3,191,371	3,856,352	140,611	573,299
Changes in Assumptions	90,358	125,840	681,961	824,059	30,047	122,508
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	293,380	888,124	650,141	0	711,645
Total Deferred Inflows	513,212	1,008,109	4,761,456	5,330,552	170,658	1,407,452
Pension Expense						
Proportionate share of plan Pension Expense	397,248	553,229	2,998,119	3,622,833	132,097	538,583
Net Amortization from changes in Share Proportions	199,818	31,136	(365,410)	(159,511)	184,324	(291,756)
Total Employer Pension Expense	597,066	584,365	2,632,709	3,463,322	316,421	246,827
Revenue	17,846	24,853	134,686	162,750	5,934	24,195

	<u>South Shore</u> <u>Mosquito</u> <u>Control</u>	<u>South Shore</u> <u>Regional</u> <u>School</u>	<u>Wareham</u>	<u>Wareham Fire</u> <u>District</u>	<u>Wareham</u> <u>Housing</u>	<u>West</u> <u>Bridgewater</u>
Net Pension Liability	0	2,606,592	28,406,105	5,457,032	278,223	14,128,126
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	0	56,918	620,273	119,159	6,074	308,499
Net Asset Loss	0	190,378	2,074,700	398,566	20,320	1,031,878
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	0	41,373	467,446	265,824	53,429	119,400
Total Deferred Outflows	0	288,669	3,162,419	783,549	79,823	1,459,777
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	290,997	3,171,224	609,216	31,060	1,577,247
Changes in Assumptions	0	62,182	677,656	130,182	6,638	337,041
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	0	110,870	1,023,256	215,780	3,435	722,263
Total Deferred Inflows	0	464,049	4,872,136	955,178	41,133	2,636,551
Pension Expense						
Proportionate share of plan Pension Expense	0	273,376	2,979,192	572,326	29,180	1,481,738
Net Amortization from changes in Share Proportions	0	(25,617)	(201,372)	25,295	18,679	(232,110)
Total Employer Pension Expense	0	247,759	2,777,820	597,621	47,859	1,249,628
Revenue	0	12,281	133,836	25,711	1,311	66,565

	<u>Whitman</u>	<u>Whitman/Han son Regional School</u>	<u>Whitman Housing</u>	<u>Abington Housing</u>	<u>Pembroke Housing</u>	<u>Hanson Housing</u>
Net Pension Liability	14,324,171	8,506,202	765,918	268,018	876,563	335,156
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	312,780	185,740	16,725	5,852	19,140	7,318
Net Asset Loss	1,046,196	621,268	55,940	19,575	64,022	24,479
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	0	132,235	5,685	140,639	100,967
Total Deferred Outflows	1,358,976	807,008	204,900	31,112	223,801	132,764
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	1,599,133	949,622	85,506	29,921	97,858	37,416
Changes in Assumptions	341,716	202,924	18,271	6,394	20,911	7,996
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	357,028	552,187	14,343	17,382	9,571	0
Total Deferred Inflows	2,297,877	1,704,733	118,120	53,697	128,340	45,412
Pension Expense						
Proportionate share of plan Pension Expense	1,502,299	892,118	80,328	28,109	91,933	35,151
Net Amortization from changes in Share Proportions	(149,207)	(224,811)	44,526	(4,360)	49,309	38,659
Total Employer Pension Expense	1,353,092	667,307	124,854	23,749	141,242	73,810
Revenue	67,488	40,077	3,609	1,263	4,130	1,579

	<u>Rockland</u>	<u>Halifax</u>	<u>Mattapoisett</u>	<u>Hanover</u>	<u>Acushnet/Roc hester/Marion</u>	<u>West Bridgewater</u>
	<u>Housing</u>	<u>Housing</u>	<u>Housing</u>	<u>Housing</u>	<u>Health District</u>	<u>Housing</u>
Net Pension Liability	566,113	284,131	148,242	0	149,854	82,715
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	12,361	6,205	3,238	0	3,272	1,805
Net Asset Loss	41,347	20,751	10,827	0	10,945	6,042
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	120,505	66,256	6,260	0	32,551	5,068
Total Deferred Outflows	174,213	93,212	20,325	0	46,768	12,915
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	63,200	31,720	16,550	0	16,729	9,234
Changes in Assumptions	13,506	6,778	3,536	0	3,574	1,972
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	0	80,413	8,983	0	16,098	10,850
Total Deferred Inflows	76,706	118,911	29,069	0	36,402	22,056
Pension Expense						
Proportionate share of plan Pension Expense	59,373	29,799	15,547	0	15,716	8,675
Net Amortization from changes in Share Proportions	46,689	(4,030)	(1,723)	0	5,366	(1,952)
Total Employer Pension Expense	106,062	25,769	13,824	0	21,082	6,723
Revenue	2,667	1,339	698	0	706	390

	<u>South Shore</u> <u>Tri Town</u> <u>Development</u>	<u>Carver</u> <u>Housing</u>	<u>No Carver</u> <u>Water District</u>	<u>Other</u> <u>(Retirement</u> <u>Staff)</u>	<u>Total</u>
Net Pension Liability	638,623	140,723	0	1,065,088	537,109,400
Deferred Outflows of Resources					
Differences between Expected and Actual Experience	13,944	3,073	0	23,256	11,728,252
Net Asset Loss	46,643	10,278	0	77,791	39,228,914
Changes in Assumptions	0	0	0	0	0
Changes in Proportion and Differences between Employer					
Contributions and proportionate share of contributions	179,712	0	0	122,475	19,353,083
Total Deferred Outflows	240,299	13,351	0	223,522	70,310,249
Deferred Inflows of Resources					
Differences between Expected and Actual Experience	0	0	0	0	0
Net Asset Gain	71,295	15,710	0	118,905	59,962,251
Changes in Assumptions	15,234	3,357	0	25,408	12,813,260
Changes in Proportion and Differences between Employer					
Contributions and proportionate share of contributions	188,215	21,431	0	304,188	19,353,097
Total Deferred Inflows	274,744	40,498	0	448,501	92,128,608
Pension Expense					
Proportionate share of plan Pension Expense	66,978	14,759	0	111,705	56,331,268
Net Amortization from changes in Share Proportions	3,960	(8,848)	0	(66,789)	23
Total Employer Pension Expense	70,938	5,911	0	44,916	56,331,291
Revenue	3,009	663	0	5,018	2,530,598

EXHIBITS

Exhibit 1 - Age/Service Distribution with Salary as of January 1, 2017

Attained Age	Average Salary	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	9 16,320	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	9 16,320
20-24	137 30,985	1 59,932	0 0	0 0	0 0	0 0	0 0	0 0	0 0	138 31,194
25-29	306 43,426	32 55,804	0 0	0 0	0 0	0 0	0 0	0 0	0 0	338 44,598
30-34	180 43,462	98 57,025	45 62,658	4 88,238	0 0	0 0	0 0	0 0	0 0	327 50,716
35-39	158 42,725	63 57,904	99 63,935	30 68,198	1 99,291	0 0	0 0	0 0	0 0	351 53,770
40-44	389 28,081	82 45,855	106 58,675	116 73,063	38 70,865	2 54,286	0 0	0 0	0 0	733 43,902
45-49	271 28,954	127 39,250	130 55,099	117 62,967	98 78,864	46 88,826	6 94,247	0 0	0 0	795 49,989
50-54	247 32,224	215 34,654	223 39,027	164 51,788	93 65,029	87 78,903	42 90,085	3 101,474	0 0	1,074 46,188
55-59	141 34,937	136 36,279	215 39,235	235 40,133	130 43,995	75 71,687	57 76,246	25 88,706	0 0	1,014 44,760
60-64	68 31,798	72 35,969	136 37,063	164 39,143	111 47,122	90 51,941	38 69,219	15 83,589	5 80,527	699 43,496
65-69	29 18,668	21 33,150	44 39,503	42 40,880	33 45,981	34 44,138	20 51,183	6 52,994	8 66,388	237 40,436
70+	14 23,792	12 28,114	17 33,536	14 36,003	14 33,275	16 32,040	6 28,023	6 35,728	2 45,168	101 31,643
Total Employees	1,949	859	1,015	886	518	350	169	55	15	5,816
Average Salary	34,349	41,717	46,324	50,572	56,953	66,068	74,066	78,332	68,272	45,578

Exhibit 2 - Retiree Distribution as of January 1, 2017

Attained Age	Number of Employees			Total Payments		
	Female	Male	Total	Female	Male	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	1	1	2	6,716	13,000	19,716
35-39	0	0	0	0	0	0
40-44	0	0	0	0	0	0
45-49	1	11	12	7,496	285,899	293,395
50-54	10	29	39	199,134	876,723	1,075,857
55-59	73	87	160	739,144	3,400,851	4,139,995
60-64	236	214	450	3,591,610	9,293,020	12,884,630
65-69	452	343	795	8,164,885	12,658,976	20,823,861
70-74	444	335	779	7,634,020	10,892,583	18,526,603
75-79	330	221	551	5,513,790	5,999,274	11,513,065
80-84	248	145	393	3,692,390	3,154,117	6,846,507
85-89	151	85	236	1,956,304	1,682,892	3,639,196
90-94	93	43	136	992,512	653,252	1,645,764
95+	32	17	49	265,197	198,647	463,843
Total	2071	1531	3602	32,763,199	49,109,234	81,872,433
Average (Age/Payment)	73.99	71.95	73.13	15,820	32,077	22,730
Frequency Percent	57.5	42.5	100	40.0	60.0	100

Exhibit 3 - Disabled Retiree Distribution as of January 1, 2017

Attained Age	Number of Employees			Total Payments		
	Female	Male	Total	Female	Male	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	1	1	0	56,362	56,362
40-44	1	6	7	32,714	268,537	301,252
45-49	3	16	19	66,380	607,485	673,865
50-54	9	30	39	300,235	1,160,759	1,460,994
55-59	16	33	49	460,460	1,321,059	1,781,519
60-64	7	50	57	163,505	1,803,934	1,967,439
65-69	11	54	65	211,303	1,753,264	1,964,568
70-74	12	48	60	309,593	1,544,735	1,854,327
75-79	4	37	41	81,188	1,051,123	1,132,311
80-84	1	20	21	5,317	521,931	527,247
85-89	0	7	7	0	138,850	138,850
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	64	302	366	1,630,695	10,228,038	11,858,734
Average (Age/Payment)	63.03	65.92	65.41	25,480	33,868	32,401
Frequency Percent	17.5	82.5	100	13.8	86.2	100

EXHIBIT 4 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2017, and does not take into account any subsequent changes.

1. Administration

Each of the 104 contributory retirement systems for public employees of the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

2. Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

- (i) Group 1: Most general employees in State and local government
- (ii) Group 2: Certain specified hazardous duty positions
- (iii) Group 3: State police officers and inspectors
- (iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

Chapter 176 of the Acts of 2011 created different plan provisions within these groups for those hired on or after April 2, 2012.

3. **Salary**

Salary is defined as gross regular compensation. Salary does not include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

4. **Member Contributions**

Member contributions vary depending upon date hired as follows:

<u>Date of Hire</u>	<u>Member Contribution Rate</u>
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later	9.0% of Salary
1979 and Later	Plus 2.0% of Salary in excess of \$30,000

For Group 1 employees who become members on or after April 2, 2012, the Contribution Rate shall be 6% after the completion of 30 years of service.

5. **Average Salary**

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.). For employees who become members on or after April 2, 2012, the averaging period shall be five years.

6. **Creditable Service**

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

7. Service Retirement

a. Eligibility:

For an employee to be eligible for service retirement (also referred to as superannuation), one of the following conditions must be met:

- (i) completion of 20 years of service
- (ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member
- (iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service
- (iv) for a Group 1 employee hired on or after April 2, 2012, attainment of age 60 and completion of ten years of service

b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table for those hired prior to April 2, 2012:

<u>Age at Retirement</u>	<u>Percentage of Average Salary</u>		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
65 or Over	.025	.025	.025
64	.024	.025	.025
63	.023	.025	.025
62	.022	.025	.025
61	.021	.025	.025
60	.020	.025	.025
59	.019	.024	.025
58	.018	.023	.025
57	.017	.022	.025
56	.016	.021	.025
55	.015	.020	.025
54	.014	.014	.024
53	.013	.013	.023
52	.012	.012	.022
51	.011	.011	.021
50	.010	.010	.020
49	.009	.009	.019
48	.008	.008	.018
47	.007	.007	.017
46	.006	.006	.016
45	.005	.005	.015
44	.004	.004	.004
43	.003	.003	.003
42	.002	.002	.002
41	.001	.001	.001

For those hired after April 1, 2012 who retire with less than 30 years of service, the following rates are applied:

<u>Age at Retirement</u>	<u>Percentage of Average Salary</u>		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
67 or Over	.0250	.0250	.0250
66	.0235	.0250	.0250
65	.0220	.0250	.0250
64	.0205	.0250	.0250
63	.0190	.0250	.0250
62	.0175	.0250	.0250
61	.0160	.0235	.0250
60	.0145	.0220	.0250
59		.0205	.0250
58		.0190	.0250
57		.0175	.0250
56		.0160	.0235
55		.0145	.0220
54			.0205
53			.0190
52			.0175
51			.0160
50			.0145

For those hired after April 1, 2012 who retire with at least 30 years of service, the following rates are applied:

Age at Retirement	Percentage of Average Salary		
	Group 1	Group 2	Group 4
67 or Over	.02500	.02500	.02500
66	.02375	.02500	.02500
65	.02250	.02500	.02500
64	.02125	.02500	.02500
63	.02000	.02500	.02500
62	.01875	.02500	.02500
61	.01750	.02375	.02500
60	.01625	.02250	.02500
59		.02125	.02500
58		.02000	.02500
57		.01875	.02500
56		.01750	.02375
55		.01625	.02250
54			.02125
53			.02000
52			.01875
51			.01750
50			.01625

8. Deferred Vested Retirement

a. Eligibility:

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years.

b. Benefit Amount:

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

c. Refund of Contributions:

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

9. Accidental Disability

a. Eligibility:

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

b. Benefit Amount:

The accidental disability amount is 72% of annual salary plus \$450 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

10. Ordinary Disability

a. Eligibility:

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55 or age 60 if hired on or after April 2, 2012).

b. Benefit Amount:

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55 (age 60 if hired on or after April 2, 2012). If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55 (age 60 if hired on or after April 2, 2012), he

will receive not less than the superannuation allowance to which he is entitled.

11. Survivor Benefits

a. Occupational Death:

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

b. Non-Occupational Death:

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of \$250 per month to the surviving spouse, plus \$120 for the first child, plus \$90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of \$250 per month plus \$120 for the first child and \$90 for each additional child.

c. Refund of Contributions:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

12. Cost-of-Living Increases

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$14,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

13. Postretirement Death Benefits

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

- (i) Option A – Life annuity
- (ii) Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member
- (iii) Option C – Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

EXHIBIT 5 – ACTUARIAL METHODS AND ASSUMPTIONS:

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

1. Member Data

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

2. Valuation Date

January 1, 2017.

3. Actuarial Cost Method

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

4. Rate of Investment Return

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.00% per annum, net of investment expenses. The rationale for the selection of this rate is based on past performance and future expectations. Since 1987 the fund has had an average return of 9.04%. The asset policy continues to have a high concentration in equities and equity like investments. The Board continues to take an aggressive posture in its investment allocations.

5. Salary Scale

It is assumed that salaries including longevity will increase at a rate of 3.75% per year. The rationale for this assumption is based on the 2015 Experience Study and the history of municipal revenue and Proposition 2-1/2. The member units are limited to how much it can raise in property tax revenue to 2.5% of the previous year's figure, plus new growth. This restriction limits the largest portion of their revenue to about 3% per year. By extension, payroll increases are limited by the growth in revenue. Over an employee's career, promotions are expected to add .75% to the increases.

6. Cost-of-Living Increases

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and \$14,000 per year. Under State law the increase is limited to 3% or CPI. The Board has always granted 3%.

7. Value of Investments

Assets held by the fund are valued at market value as reported by the Public Employees' Retirement Administration Commission (PERAC). The actuarial value of assets is determined using a five-year smoothing of asset returns greater than or less than the assumed rate of return, with a 20% corridor.

8. Annual Rate of Withdrawal Prior to Retirement

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

<u>Service</u>	<u>General Employees</u>	<u>Police and Fire Employees</u>
0	0.1821	0.1500
5	0.1020	0.1000
10	0.0650	0.0600
15	0.0417	0.0600
20	0.0400	0.0000
25	0.0400	0.0000

9. Annual Rate of Mortality

It is assumed that both pre-retirement mortality and beneficiary mortality is represented by the RP-2014 Blue Collar Mortality with Scale MP-2016, fully generational. Mortality for retired members for Group 1 and 2 is represented by the RP-2014 Blue Collar Mortality Table set forward five years for males and 3 years for females, fully generational. Mortality for retired members for Group 4 is represented by the RP-2014 Blue Collar Mortality Table set forward three years for males, and six years for females, fully generational. Mortality for disabled members for Group 1 and 2 is represented by the RP-2000 Mortality Table set forward six years. Mortality for disabled members for Group 4 is represented by the RP-2000 Mortality Table set forward two years. Generational adjusting is based on Scale MP-2016.

10. Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages for those hired prior to April 2, 2012:

<u>Age</u>	<u>Male General Employees</u>	<u>Female General Employees</u>	<u>Male and Female Police and Fire Employees</u>
50	0.0360	0.1019	0.0382
51	0.0405	0.0714	0.0351
52	0.0437	0.0562	0.0436
53	0.0366	0.0448	0.0527
54	0.0451	0.0488	0.0999
55	0.0477	0.0469	0.1110
56	0.0574	0.0518	0.1413
57	0.0632	0.0509	0.1292
58	0.0765	0.0552	0.1499
59	0.0917	0.0645	0.1679
60	0.1057	0.0774	0.1871
61	0.1224	0.1038	0.2073
62	0.1473	0.1168	0.2176
63	0.1777	0.1440	0.3338
64	0.2136	0.1708	0.5664
65	0.2615	0.1939	1.0000
66	0.2682	0.1959	1.0000
67	0.2500	0.2000	1.0000
68	0.2500	0.2000	1.0000
69	0.2500	0.2000	1.0000
70 to 76	0.2500	0.2500	1.0000
77 to 79	0.3500	0.2500	1.0000
80	1.0000	1.0000	1.0000

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages for those hired on or after April 2, 2012:

<u>Age</u>	<u>Male General Employees</u>	<u>Female General Employees</u>	<u>Male and Female Police and Fire Employees</u>
50	0.0000	0.0000	0.0191
51	0.0000	0.0000	0.0176
52	0.0000	0.0000	0.0436
53	0.0000	0.0000	0.0211
54	0.0000	0.0000	0.0266
55	0.0000	0.0000	0.0370
56	0.0000	0.0000	0.1060
57	0.0000	0.0000	0.1938
58	0.0000	0.0000	0.1499
59	0.0000	0.0000	0.1119
60	0.0477	0.0469	0.0936
61	0.0574	0.0518	0.1555
62	0.0632	0.0509	0.1741
63	0.0765	0.0552	0.2670
64	0.0917	0.0645	0.4720
65	0.1057	0.0774	1.0000
66	0.1224	0.1038	1.0000
67	0.1473	0.1168	1.0000
68	0.1777	0.1440	1.0000
69	0.2136	0.1708	1.0000
70	0.2615	0.1939	1.0000
70 to 76	0.2682	0.1959	1.0000
77 to 79	0.2500	0.2000	1.0000

12. Annual Rate of Disability Prior to Retirement

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

<u>Attained Age</u>	<u>General Employees</u>	<u>Police and Fire Employees</u>
20	0.000100	0.000500
30	0.000152	0.000967
40	0.000663	0.002500
50	0.001271	0.007634

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

13. Family Composition

It is assumed that 80% of all male members will be survived by a spouse and 60% of all female members will be survived by a spouse. Females (males) are three years younger (older) than members.

14. Administrative Expenses

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 2018 is \$2,000,000 and is anticipated to increase at 3.75% per year.

CERTIFICATION:

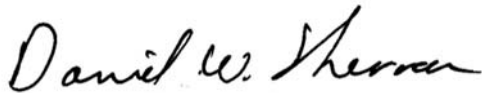
This report fairly represents the actuarial position of the Plymouth County Retirement System as of December 31, 2017, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost are reasonably related to plan experience and to reasonable expectations and represents our best estimate of anticipated plan experience.

The funded status measure is appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. The funded status measure is appropriate for assessing the need for or the amount of future contributions. The funded status measure would be different if the measure reflected the market value of assets rather than the actuarial value of assets.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

The report was prepared under the supervision of Daniel Sherman, an Associate of the Society of Actuaries and a Member of the American Academy of Actuaries, who takes responsibility for the overall appropriateness of the analysis, assumptions and results. Daniel Sherman is deemed to meet the General Qualification Standard and the basic education and experience requirement in the pension area. Based on over thirty years of performing valuations of similar complexity, Mr. Sherman is qualified by experience. Daniel Sherman has met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sherman Actuarial Services, LLC



Daniel W. Sherman, ASA, MAAA

July 2018