

**PLYMOUTH COUNTY
CONTRIBUTORY RETIREMENT SYSTEM**

December 31, 2016 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, 2016.

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, 2016

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 32 years ending as of December 31, 2016 was 9.00%. The average return for the past 5 years ending December 31, 2016 was 8.47%.

Net Position Restricted for Pensions

The Net Position Restricted for Pensions as of December 31, 2016 is \$884,718,724. 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, 2015 Net Position	832,637,491
Employer Contributions	66,575,591
Employee Contributions	27,127,550
Other Payments	3,513,051
Benefit Payments	(100,786,029)
Expenses	(1,985,196)
Investment Income	<u>57,636,266</u>
December 31, 2016 Net Position	884,718,724

Pension Liability as of December 31, 2016

The following presents the changes in the pension liability during 2015.

December 31, 2015 Liability	1,466,863,880
Service Cost	33,239,607
Interest on Liability and Service Cost	116,054,394
Change in Plan Provisions	6,700,296
Experience (Gain) and Loss	21,421,023
Change in Assumptions	(23,402,726)
Benefit Payments	(100,786,029)
Other	<u>0</u>
December 31, 2016 Liability	1,520,090,445

Net Pension Liability as of December 31, 2016

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	1,678,952,974	1,520,090,445	1,384,666,365
Plan Fiduciary Net Position	<u>884,718,724</u>	<u>884,718,724</u>	<u>884,718,724</u>
Net Pension Liability	794,234,250	635,371,721	499,947,641

The Plan Fiduciary Net Position as a percentage of the Total Pension Liability is 58.2%.

	Unit	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
County of Plymouth	1	32,248,289	25,797,995	20,299,372
Hospital	2	3,644,742	2,915,722	2,294,261
Abington	3	28,888,681	23,110,375	18,184,595
Bridgewater	4	39,146,218	31,316,202	24,641,420
Bridgewater Housing	5	793,441	634,737	499,448
Bridgewater/Raynham				
Regional School	6	18,886,097	15,108,505	11,888,255
Carver	7	23,244,854	18,595,425	14,631,968
Carver/Marion/Wareham				
Regional Refuse	8	555,964	444,760	349,963
Duxbury	9	40,880,824	32,703,852	25,733,304
Duxbury Housing	10	252,568	202,049	158,984
East Bridgewater	11	27,906,215	22,324,421	17,566,161
East Bridgewater Housing	12	462,244	369,786	290,969
Halifax	13	12,629,912	10,103,681	7,950,167
Hanover	14	36,306,831	29,044,748	22,854,107
Hanson	15	16,628,883	13,302,778	10,467,404
Kingston	16	24,472,740	19,577,709	15,404,886
Kingston Housing	17	19,855	15,884	12,498
Lakeville	18	11,104,983	8,883,767	6,990,268
Marion	19	11,239,208	8,991,145	7,074,759
Marshfield	20	63,994,630	51,194,441	40,282,781
Marshfield Housing	21	336,755	269,397	211,978
Mattapoisett	22	12,330,486	9,864,146	7,761,687
Middleborough	23	71,732,061	57,384,233	45,153,271
Middleborough Housing	24	1,177,849	942,256	741,422
Norwell	25	27,819,644	22,255,166	17,511,666
Norwell Housing	26	359,789	287,824	226,477
Old Rochester Regional				
School	27	7,476,920	5,981,388	4,706,506
Onset Fire District	28	2,585,232	2,068,134	1,627,329
Pembroke	29	35,854,911	28,683,221	22,569,636
Plymouth County Mosquito				
Control	30	2,404,941	1,923,905	1,513,841
Plympton	31	5,179,201	4,143,259	3,260,158
Rochester	32	8,358,521	6,686,652	5,261,449
Rockland	33	42,924,391	34,338,665	27,019,671
Scituate	34	52,150,216	41,719,143	32,827,063
Scituate Housing	35	1,191,351	953,057	749,921
Silver Lake Regional School	36	7,965,377	6,372,144	5,013,976
South Shore Regional				
School	38	4,053,772	3,242,937	2,551,733
Wareham	39	43,842,525	35,073,155	27,597,610

	<u>Unit</u>	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Wareham Fire District	40	8,434,767	6,747,647	5,309,443
Wareham Housing	41	314,518	251,608	197,980
West Bridgewater	42	22,138,486	17,710,352	13,935,541
Whitman	43	21,314,071	17,050,836	13,416,595
Whitman/Hanson Regional School	44	12,955,550	10,364,184	8,155,146
Whitman Housing	45	886,365	709,074	557,941
Abington Housing	46	427,298	341,830	268,972
Pembroke Housing	47	1,028,535	822,808	647,433
Hanson Housing	48	317,694	254,149	199,979
Rockland Housing	49	660,804	528,630	415,957
Halifax Housing	50	557,551	446,030	350,962
Mattapoisett Housing	51	207,295	165,832	130,486
Acushnet/Rochester/Marion Health District	53	159,641	127,710	100,490
West Bridgewater Housing	54	142,962	114,367	89,991
South Shore Tri Town Development	55	1,302,545	1,042,010	819,914
Carver Housing	56	215,236	172,185	135,485
Retirement Staff	59	2,119,811	1,695,807	1,334,360

Employer Contributions during 2015

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
County of Plymouth	1	3,279,650	0.049262
Hospital	2	355,010	0.005332
Abington	3	2,393,438	0.035951
Bridgewater	4	3,187,198	0.047873
Bridgewater Housing	5	78,107	0.001173
Bridgewater/Raynham			
Regional School	6	1,572,928	0.023626
Carver	7	1,924,823	0.028912
Carver/Marion/Wareham			
Regional Refuse	8	49,050	0.000737
Duxbury	9	3,286,712	0.049368
Duxbury Housing	10	25,014	0.000376
East Bridgewater	11	2,343,657	0.035203
East Bridgewater Housing	12	39,758	0.000597
Halifax	13	1,090,406	0.016378
Hanover	14	2,961,848	0.044488
Hanson	15	1,417,027	0.021284
Kingston	16	2,047,367	0.030753
Kingston Housing	17	7,570	0.000114
Lakeville	18	950,594	0.014278
Marion	19	939,265	0.014108
Marshfield	20	5,347,669	0.080325
Marshfield Housing	21	32,910	0.000494
Mattapoisett	22	1,063,989	0.015982
Middleborough	23	5,976,786	0.089774
Middleborough Housing	24	96,825	0.001454
Norwell	25	2,336,032	0.035088
Norwell Housing	26	25,699	0.000386
Old Rochester Regional			
School	27	589,094	0.008848
Onset Fire District	28	239,686	0.0036
Pembroke	29	3,026,915	0.045466
Plymouth County Mosquito			
Control	30	197,117	0.002961
Plympton	31	481,229	0.007228
Rochester	32	669,036	0.010049
Rockland	33	3,619,099	0.054361
Scituate	34	4,373,651	0.065695
Scituate Housing	35	111,318	0.001672
Silver Lake Regional School	36	651,056	0.009779
South Shore Regional			
School	38	329,995	0.004957
Wareham	39	3,600,317	0.054079

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
Wareham Fire District	40	691,774	0.010391
Wareham Housing	41	20,613	0.00031
West Bridgewater	42	1,787,957	0.026856
Whitman	43	1,812,841	0.02723
Whitman/Hanson Regional School	44	1,075,550	0.016155
Whitman Housing	45	32,674	0.000491
Abington Housing	46	34,019	0.000511
Pembroke Housing	47	37,377	0.000561
Hanson Housing	48	14,323	0.000215
Rockland Housing	49	51,021	0.000766
Halifax Housing	50	21,361	0.000321
Mattapoisett Housing	51	26,971	0.000405
Acushnet/Rochester/Marion Health District	53	11,889	0.000179
West Bridgewater Housing	54	10,490	0.000158
South Shore Tri Town Development	55	79,442	0.001193
Carver Housing	56	17,401	0.000261
Retirement Staff	59	<u>132,047</u>	<u>0.001983</u>
		66,575,591	100.0000%

Pension Expense for 2016

Service Cost	33,239,607
Interest	116,054,394
Difference in Experience - Amortization	4,846,385
Change in Assumptions - Amortization	(5,294,734)
Changes in Plan Provisions	6,700,296
Employee Contributions	(27,127,550)
Projected Earnings	(66,393,073)
Administration Expense	1,985,196
Other Changes in Fiduciary Net Position	0
Asset (Gain) / Loss Amortization	<u>22,108,151</u>
Total Expense	86,118,672

Schedules of Required Supplementary Information

	<u>2016</u>
Total Pension Liability – Beginning	1,466,863,880
Total Pension Liability – Ending (a)	1,520,090,445
Plan Fiduciary Net Position – Beginning	832,637,491
Plan Fiduciary Net Position – Ending (b)	884,718,724
Net Pension Liability – Ending (a) – (b)	635,371,721
Plan Fiduciary Net Positions as a percentage of the Total Pension Liability	58.2%
Covered-employee payroll	265,029,194
Net Pension Liability as a percentage of Covered-employee Payroll	239.7%

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) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
2016	8,756,807	5	1,751,361	1,751,361	1,751,361	1,751,361	1,751,361
2015	68,091,068	5	13,618,039	13,618,039	13,618,039	13,618,039	0
2014	33,693,756	5	6,738,751	6,738,751	6,738,751	0	0

Experience

<u>Year</u>	<u>(Gain) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</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>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</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 2016

NPL Beginning	634,226,391
Expense	86,118,672
Contribution	(66,575,591)
Deferred Outflows	10,047,150
Deferred Inflows	(24,931,856)
Revenue	<u>(3,513,052)</u>
NPL Ending	635,371,715

	<u>County of Plymouth</u>	<u>Hospital</u>	<u>Abington</u>	<u>Bridgewater</u>	<u>Bridgewater Housing</u>	<u>Bridgewater/ R aynham Regional School</u>
Net Pension Liability	25,797,998	2,915,721	23,110,376	31,316,201	634,736	15,108,504
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	672,980	76,061	602,869	816,931	16,558	394,128
Net Asset Loss	2,490,471	281,476	2,231,012	3,023,182	61,276	1,458,535
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	2,611,984	0	0	99,719	63,740	379,560
Total Deferred Outflows	5,775,435	357,537	2,833,882	3,939,832	141,573	2,232,223
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	735,239	83,098	658,642	892,507	18,090	430,590
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	3,204,308	919,007	208,864	101,393	0	38,712
Total Deferred Inflows	3,939,547	1,002,104	867,506	993,900	18,090	469,302
Pension Expense						
Proportionate share of plan Pension Expense	3,496,676	395,199	3,132,394	4,244,617	86,033	2,047,816
Net Amortization from changes in Share Proportions	(74,893)	(278,184)	(63,801)	(4,306)	18,994	98,206
Total Employer Pension Expense	3,421,783	117,015	3,068,593	4,240,311	105,027	2,146,022
Revenue	142,640	16,121	127,780	173,151	3,510	83,537

	<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	18,595,424	444,760	32,703,853	202,048	22,324,421	369,786
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	485,090	11,602	853,130	5,271	582,366	9,646
Net Asset Loss	1,795,153	42,936	3,157,142	19,506	2,155,140	35,698
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	831,879	0	739,413	0	122,793	65,742
Total Deferred Outflows	3,112,122	54,538	4,749,684	24,777	2,860,299	111,087
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	529,967	12,676	932,055	5,758	636,242	10,539
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	17,697	25,466	87,247	24,141	159,022	0
Total Deferred Inflows	547,664	38,142	1,019,302	29,899	795,264	10,539
Pension Expense						
Proportionate share of plan Pension Expense	2,520,435	60,283	4,432,700	27,386	3,025,866	50,121
Net Amortization from changes in Share Proportions	237,399	(7,644)	187,408	(7,330)	(16,577)	19,377
Total Employer Pension Expense	2,757,834	52,639	4,620,108	20,056	3,009,289	69,498
Revenue	102,816	2,459	180,824	1,117	123,435	2,045

	<u>Halifax</u>	<u>Hanover</u>	<u>Hanson</u>	<u>Kingston</u>	<u>Kingston Housing</u>	<u>Lakeville</u>
Net Pension Liability	10,103,681	29,044,747	13,302,778	19,577,709	15,884	8,883,767
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	263,570	757,676	347,023	510,714	414	231,747
Net Asset Loss	975,381	2,803,901	1,284,215	1,889,979	1,534	857,615
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	0	252,264	0	43,709	0	0
Total Deferred Outflows	1,238,951	3,813,842	1,631,238	2,444,402	1,948	1,089,361
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	287,953	827,771	379,127	557,962	453	253,186
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	213,662	103,754	322,997	93,949	13,682	140,151
Total Deferred Inflows	501,616	931,525	702,124	651,910	14,135	393,337
Pension Expense						
Proportionate share of plan Pension Expense	1,369,459	3,936,743	1,803,067	2,653,575	2,153	1,204,111
Net Amortization from changes in Share Proportions	(64,467)	39,518	(98,518)	(18,226)	(4,035)	(41,964)
Total Employer Pension Expense	1,304,992	3,976,261	1,704,549	2,635,349	(1,882)	1,162,147
Revenue	55,865	160,592	73,553	108,248	88	49,119

	<u>Marion</u>	<u>Marshfield</u>	<u>Marshfield Housing</u>	<u>Mattapoissett</u>	<u>Middleboroug h</u>	<u>Middleboroug h Housing</u>
Net Pension Liability	8,991,145	51,194,441	269,398	9,864,146	57,384,232	942,256
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	234,548	1,335,485	7,028	257,321	1,496,955	24,580
Net Asset Loss	867,981	4,942,173	26,007	952,258	5,539,718	90,963
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	630,931	1,157	0	0	0
Total Deferred Outflows	1,102,529	6,908,589	34,192	1,209,579	7,036,673	115,543
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	256,246	1,459,033	7,678	281,127	1,635,441	26,854
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	54,443	106,743	19,332	467,972	748,156	49,367
Total Deferred Inflows	310,689	1,565,776	27,010	749,099	2,383,597	76,221
Pension Expense						
Proportionate share of plan Pension Expense	1,218,665	6,938,926	36,514	1,336,992	7,777,894	127,714
Net Amortization from changes in Share Proportions	(17,556)	149,255	(5,270)	(139,657)	(229,473)	(14,880)
Total Employer Pension Expense	1,201,109	7,088,181	31,244	1,197,335	7,548,421	112,834
Revenue	49,713	283,061	1,490	54,540	317,285	5,210

		<u>Old Rochester</u>				<u>Plymouth</u>
		<u>Norwell</u>	<u>Regional</u>	<u>Onset Fire</u>	<u>Pembroke</u>	<u>County</u>
	<u>Norwell</u>	<u>Housing</u>	<u>School</u>	<u>District</u>		<u>Mosquito</u>
						<u>Control</u>
Net Pension Liability	22,255,165	287,823	5,981,389	2,068,135	28,683,221	1,923,906
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	580,560	7,508	156,034	53,950	748,245	50,188
Net Asset Loss	2,148,454	27,786	577,427	199,652	2,769,000	185,729
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	280,648	19,319	210,389	0	780,660	40,534
Total Deferred Outflows	3,009,662	54,613	943,850	253,603	4,297,906	276,451
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	634,269	8,203	170,469	58,942	817,467	54,831
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	90,878	1,177	20,178	163,051	82,331	6,987
Total Deferred Inflows	725,146	9,380	190,646	221,992	899,798	61,818
Pension Expense						
Proportionate share of plan Pension Expense	3,016,479	39,012	810,721	280,316	3,887,741	260,767
Net Amortization from changes in Share Proportions	52,069	5,261	54,858	(48,245)	201,091	9,546
Total Employer Pension Expense	3,068,548	44,273	865,579	232,071	4,088,832	270,313
Revenue	123,052	1,591	33,072	11,435	158,593	10,638

	<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	4,143,259	6,686,652	34,338,665	41,719,143	953,058	6,372,143
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	108,083	174,431	895,776	1,088,307	24,862	166,227
Net Asset Loss	399,978	645,510	3,314,962	4,027,453	92,007	615,150
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	393,485	486,522	0	331,522	170,634	0
Total Deferred Outflows	901,546	1,306,463	4,210,738	5,447,283	287,503	781,377
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	118,082	190,569	978,646	1,188,989	27,162	181,605
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	0	0	780,411	130,728	0	734,067
Total Deferred Inflows	118,082	190,569	1,759,058	1,319,717	27,162	915,673
Pension Expense						
Proportionate share of plan Pension Expense	561,580	906,313	4,654,284	5,654,638	129,178	863,684
Net Amortization from changes in Share Proportions	115,829	142,383	(235,330)	53,791	50,631	(217,732)
Total Employer Pension Expense	677,409	1,048,696	4,418,954	5,708,429	179,809	645,952
Revenue	22,909	36,971	189,863	230,670	5,270	35,232

	<u>South Shore</u>		<u>Wareham Fire</u>	<u>Wareham</u>	<u>West</u>	
	<u>Regional</u>	<u>Wareham</u>	<u>District</u>	<u>Housing</u>	<u>Bridgewater</u>	<u>Whitman</u>
	<u>School</u>					
Net Pension Liability	3,242,937	35,073,154	6,747,648	251,607	17,710,351	17,050,835
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	84,597	914,937	176,023	6,564	462,001	444,797
Net Asset Loss	313,065	3,385,867	651,399	24,290	1,709,710	1,646,042
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	58,469	660,605	375,668	3,555	168,739	0
Total Deferred Outflows	456,131	4,961,409	1,203,089	34,409	2,340,450	2,090,839
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	92,423	999,579	192,307	7,171	504,742	485,946
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	9,136	85,918	35,539	5,126	100,094	410,116
Total Deferred Inflows	101,560	1,085,497	227,846	12,297	604,837	896,062
Pension Expense						
Proportionate share of plan Pension Expense	439,550	4,753,837	914,580	34,103	2,400,472	2,311,081
Net Amortization from changes in Share Proportions	14,080	164,804	98,115	(652)	16,304	(122,782)
Total Employer Pension Expense	453,630	4,918,641	1,012,695	33,451	2,416,776	2,188,299
Revenue	17,931	193,924	37,309	1,391	97,923	94,276

	<u>Whitman/Han son Regional School</u>	<u>Whitman Housing</u>	<u>Abington Housing</u>	<u>Pembroke Housing</u>	<u>Hanson Housing</u>	<u>Rockland Housing</u>
Net Pension Liability	10,364,184	709,075	341,830	822,806	254,149	528,629
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	270,365	18,497	8,917	21,464	6,630	13,790
Net Asset Loss	1,000,530	68,453	32,999	79,433	24,534	51,032
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	4,274	8,035	0	10,724	39,448
Total Deferred Outflows	1,270,896	91,224	49,951	100,897	41,888	104,271
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	295,378	20,209	9,742	23,450	7,243	15,066
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	503,584	20,269	1,651	13,604	0	0
Total Deferred Inflows	798,962	40,478	11,393	37,053	7,243	15,066
Pension Expense						
Proportionate share of plan Pension Expense	1,404,768	96,108	46,332	111,524	34,447	71,651
Net Amortization from changes in Share Proportions	(149,627)	(4,515)	1,805	(4,032)	3,237	11,590
Total Employer Pension Expense	1,255,141	91,593	48,137	107,492	37,684	83,241
Revenue	57,305	3,921	1,890	4,549	1,405	2,923

	<u>Halifax</u>	<u>Mattapoissett</u>	<u>Acushnet/Roc</u> <u>hester/Marion</u>	<u>West</u> <u>Bridgewater</u>	<u>South Shore</u> <u>Tri Town</u>	<u>Carver</u> <u>Housing</u>
Net Pension Liability	446,031	165,832	127,710	114,367	1,042,010	172,186
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	11,635	4,326	3,332	2,983	27,182	4,492
Net Asset Loss	43,058	16,009	12,328	11,041	100,593	16,622
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	93,635	0	0	7,202	255,072	0
Total Deferred Outflows	148,328	20,335	15,660	21,227	382,847	21,114
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	0	0	0	0	0
Changes in Assumptions	12,712	4,726	3,640	3,259	29,697	4,907
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	12,261	13,059	23,084	0	0	25,086
Total Deferred Inflows	24,973	17,786	26,724	3,259	29,697	29,994
Pension Expense						
Proportionate share of plan Pension Expense	60,455	22,477	17,310	15,501	141,235	23,338
Net Amortization from changes in Share Proportions	23,333	(4,077)	(6,986)	2,135	75,361	(7,412)
Total Employer Pension Expense	83,788	18,400	10,324	17,636	216,596	15,926
Revenue	2,466	917	706	632	5,761	952

	<u>Other</u> <u>(Retirement</u>	
	<u>Staff)</u>	<u>Total</u>
Net Pension Liability	1,695,807	635,371,721
Deferred Outflows of Resources		
Differences between Expected and Actual Experience	44,238	16,574,638
Net Asset Loss	163,705	61,337,071
Changes in Assumptions	0	0
Changes in Proportion and Differences between Employer		
Contributions and proportionate share of contributions	173,085	10,415,115
Total Deferred Outflows	381,027	88,326,824
Deferred Inflows of Resources		
Differences between Expected and Actual Experience	0	0
Net Asset Gain	0	0
Changes in Assumptions	48,330	18,107,992
Changes in Proportion and Differences between Employer		
Contributions and proportionate share of contributions	26,721	10,415,123
Total Deferred Inflows	75,052	28,523,115
Pension Expense		
Proportionate share of plan Pension Expense	229,851	86,118,672
Net Amortization from changes in Share Proportions	41,790	0
Total Employer Pension Expense	271,641	86,118,672
Revenue	9,376	3,513,052

EXHIBITS

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

Attained Age	Average Salary	<5	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	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	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	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	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	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	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	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	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	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	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	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	6 45,168	2 45,168	101 31,643
Total Employees	1,949	859	1,015	886	518	350	169	55	15	15	5,816
Average Salary	34,349	41,717	46,324	50,572	56,953	66,068	74,066	78,332	68,272	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:

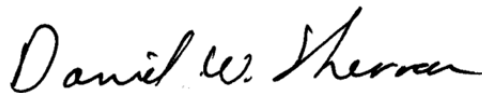
This report fairly represents the actuarial position of the Plymouth County Retirement System as of December 31, 2016, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued 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 2017