

**PLYMOUTH COUNTY  
CONTRIBUTORY RETIREMENT SYSTEM**

December 31, 2020 Actuarial Valuation Report

GASB 67 & 68

**TABLE OF CONTENTS**

	<u>Page</u>
REPORT SUMMARY	
Introduction	1
GASB Statements No. 67 & No. 68	2
EXHIBITS	
1 Age/Service Distribution with Salary	22
2 Retiree Distribution	23
3 Disabled Retiree Distribution	24
4 Summary of Plan Provisions	25
5 Actuarial Methods and Assumptions	34
CERTIFICATION	39

## **Introduction**

This report presents the Governmental Accounting Standards Statements 67 & 68 based on the findings of an actuarial valuation as of January 1, 2020, of the Plymouth County Contributory Retirement System. Liabilities were rolled forward to December 31, 2020.

The actuarial valuation is based on:

- Provisions of Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2020.
- 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, 2020

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2020.

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 7.875% as the long term expectation of investment returns. The average return for the 35 years ending as of December 31, 2019 was 9.01%. The average return for the past 10 years ending December 31, 2019 was 8.50%.

## Net Position Restricted for Pensions

The Net Position Restricted for Pensions as of December 31, 2020 is \$1,239,611,831. The 2020 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, 2018 Net Position	1,094,928,104
Employer Contributions	85,337,687
Employee Contributions	29,823,323
Other Payments	7,313,745
Benefit Payments	(119,549,784)
Expenses	(2,029,359)
Investment Income	<u>143,788,115</u>
December 31, 2020 Net Position	1,239,611,831

**Pension Liability as of December 31, 2020**

The following presents the changes in the pension liability during 2020.

December 31, 2019 Liability	1,777,175,519
Service Cost	30,398,893
Interest on Liability and Service Cost	137,728,408
Change in Plan Provisions	0
Experience (Gain) and Loss	0
Change in Assumptions	0
Benefit Payments	(119,549,784)
Other	0
December 31, 2020 Liability	1,825,753,036

**Net Pension Liability as of December 31, 2020**

The following presents the net pension liability of the system calculated using the discount rate of 7.875%, 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 (6.875%) or 1-percentage-point higher (8.875%) than the current rate:

	<b>1% Decrease (6.875%)</b>	<b>Current Discount Rate (7.875%)</b>	<b>1% Increase (8.875%)</b>
Total Pension Liability	2,050,392,964	1,825,753,036	1,667,239,757
Plan Fiduciary Net Position	<u>1,239,611,831</u>	<u>1,239,611,831</u>	<u>1,239,611,831</u>
Net Pension Liability	810,781,133	586,141,205	427,627,926

The Plan Fiduciary Net Position as a percentage of the Total Pension Liability is 67.9%.

	Unit	1% Decrease (6.875%)	Current Discount Rate (7.875%)	1% Increase (8.875%)
County of Plymouth	1	37,970,502	27,450,165	20,026,671
Hospital	2	0	0	0
Abington	3	29,131,366	21,060,053	15,364,671
Bridgewater	4	38,978,303	28,178,738	20,558,213
Bridgewater Housing	5	674,570	487,669	355,786
Bridgewater/Raynham				
Regional School	6	19,164,434	13,854,620	10,107,841
Carver	7	22,310,264	16,128,848	11,767,038
Carver/Marion/Wareham				
Regional Refuse	8	549,710	397,404	289,932
Duxbury	9	43,726,237	31,611,181	23,062,402
Duxbury Housing	10	252,153	182,290	132,992
East Bridgewater	11	28,028,704	20,262,901	14,783,097
East Bridgewater Housing	12	427,282	308,896	225,360
Halifax	13	12,882,501	9,313,198	6,794,580
Hanover	14	38,116,443	27,555,670	20,103,644
Hanson	15	17,139,102	12,390,439	9,039,627
Kingston	16	26,737,129	19,329,179	14,101,886
Kingston Housing	17	19,459	14,067	10,263
Lakeville	18	11,536,605	8,340,203	6,084,718
Marion	19	12,090,368	8,740,538	6,376,788
Marshfield	20	65,628,679	47,445,200	34,614,342
Marshfield Housing	21	455,659	329,411	240,327
Mattapoisett	22	13,238,434	9,570,514	6,982,309
Middleborough	23	72,921,655	52,717,540	38,460,856
Middleborough Housing	24	1,331,303	962,444	702,165
Norwell	25	28,406,528	20,536,043	14,982,372
Norwell Housing	26	364,852	263,764	192,433
Old Rochester Regional				
School	27	7,764,851	5,613,474	4,095,393
Onset Fire District	28	2,741,251	1,981,743	1,445,810
Pembroke	29	37,320,256	26,980,080	19,683,713
Plymouth County Mosquito				
Control	30	1,915,876	1,385,052	1,010,485
Plympton	31	5,281,428	3,818,124	2,785,568
Rochester	32	8,534,282	6,169,722	4,501,212
Rockland	33	43,007,885	31,091,860	22,683,523
Scituate	34	52,742,123	38,129,072	27,817,624
Scituate Housing	35	976,991	706,300	515,292
Silver Lake Regional School	36	8,500,229	6,145,104	4,483,251
South Shore Regional				
School	38	4,340,111	3,137,614	2,289,092
Wareham	39	42,210,887	30,515,683	22,263,165

	<u>Unit</u>	<b>1% Decrease (6.875%)</b>	<b>Current Discount Rate (7.875%)</b>	<b>1% Increase (8.875%)</b>
Wareham Fire District	40	9,134,260	6,603,467	4,817,656
Wareham Housing	41	544,845	393,887	287,366
West Bridgewater	42	23,702,376	17,135,252	12,501,275
Whitman	43	22,302,157	16,122,986	11,762,761
Whitman/Hanson Regional School	44	12,756,020	9,221,760	6,727,870
Whitman Housing	45	832,672	601,967	439,174
Abington Housing	46	462,145	334,100	243,748
Pembroke Housing	47	1,032,935	746,744	544,798
Hanson Housing	48	315,394	228,009	166,347
Rockland Housing	49	445,119	321,792	234,768
Halifax Housing	50	24,323	17,584	12,829
Mattapoisett Housing	51	51,079	36,927	26,941
Hanover Housing	52	0	0	0
Acushnet/Rochester/Marion Health District	53	183,237	132,468	96,644
West Bridgewater Housing	54	140,265	101,402	73,980
South Shore Tri Town Development	55	1,435,893	1,038,056	757,329
Carver Housing	56	0	0	0
Retirement Staff	59	0	0	0
<b>Total</b>		<b>866,436,543</b>	<b>682,248,098</b>	<b>525,265,208</b>



**Employer Contributions during 2020**

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
County of Plymouth	1	8,300,896	0.046613
Hospital	2	-	-
Abington	3	2,888,071	0.035765
Bridgewater	4	3,864,267	0.047854
Bridgewater Housing	5	66,894	0.000828
Bridgewater/Raynham			
Regional School	6	1,899,914	0.023528
Carver	7	2,261,815	0.027391
Carver/Marion/Wareham			
Regional Refuse	8	425,741	0.005272
Duxbury	9	4,334,944	0.053683
Duxbury Housing	10	24,975	0.000309
East Bridgewater	11	2,778,694	0.034411
East Bridgewater Housing	12	42,331	0.000524
Halifax	13	1,277,154	0.015816
Hanover	14	3,778,828	0.046796
Hanson	15	1,699,136	0.021042
Kingston	16	2,650,687	0.032826
Kingston Housing	17	1,916	0.000024
Lakeville	18	1,143,753	0.014164
Marion	19	1,198,637	0.014844
Marshfield	20	6,506,332	0.080573
Marshfield Housing	21	45,138	0.000559
Mattapoissett	22	1,312,405	0.016253
Middleborough	23	7,229,368	0.089527
Middleborough Housing	24	131,978	0.001634
Norwell	25	2,816,209	0.034875
Norwell Housing	26	36,181	0.000448
Old Rochester Regional			
School	27	769,779	0.009533
Onset Fire District	28	271,801	0.003366
Pembroke	29	3,699,885	0.045819
Plymouth County Mosquito			
Control	30	189,900	0.002352
Plympton	31	523,613	0.006484
Rochester	32	846,103	0.010478
Rockland	33	4,263,777	0.052802
Scituate	34	5,228,790	0.064752
Scituate Housing	35	96,873	0.001200
Silver Lake Regional School	36	842,701	0.010436
South Shore Regional			
School	38	430,279	0.005328
Wareham	39	4,184,691	0.051822

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
Wareham Fire District	40	905,558	0.011214
Wareham Housing	41	54,019	0.000669
West Bridgewater	42	2,349,842	0.029100
Whitman	43	2,211,038	0.027381
Whitman/Hanson Regional School	44	1,264,645	0.015661
Whitman Housing	45	82,579	0.001023
Abington Housing	46	45,779	0.000567
Pembroke Housing	47	102,395	0.001268
Hanson Housing	48	31,305	0.000388
Rockland Housing	49	44,123	0.000546
Halifax Housing	50	2,387	0.000030
Mattapoissett Housing	51	5,078	0.000063
Hanover Housing	52	-	-
Acushnet/Rochester/Marion Health District	53	18,197	0.000225
West Bridgewater Housing	54	13,930	0.000173
South Shore Tri Town Development	55	142,356	0.001763
Carver Housing	56	-	-
Retirement Staff	59	-	-
		85,337,687	100.0000%

### Pension Expense for 2020

Service Cost	30,398,893
Interest	137,728,408
Difference in Experience - Amortization	28,624,130
Change in Assumptions - Amortization	2,316,451
Changes in Plan Provisions	0
Employee Contributions	(29,823,323)
Projected Earnings	(86,260,185)
Administration Expense	2,029,359
Other Changes in Fiduciary Net Position	0
Asset (Gain) / Loss Amortization	<u>(13,725,642)</u>
Total Expense	71,288,091

**Schedules of Required Supplementary Information**

	<u>2020</u>
Total Pension Liability – Beginning	1,777,175,519
Total Pension Liability – Ending (a)	1,825,753,036
Plan Fiduciary Net Position – Beginning	1,094,928,104
Plan Fiduciary Net Position – Ending (b)	1,239,611,831
Net Pension Liability – Ending (a) – (b)	586,141,205
Plan Fiduciary Net Positions as a percentage of the Total Pension Liability	67.9%
Covered-employee payroll	304,925,554
Net Pension Liability as a percentage of Covered-employee Payroll	192.2%

**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>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
2020	(57,527,931)	5	(11,505,586)	(11,505,586)	(11,505,586)	(11,505,586)	(11,505,587)
2019	(95,891,389)	5	(19,178,278)	(19,178,278)	(19,178,278)	(19,178,279)	
2018	150,935,263	5	30,187,053	30,187,053	30,187,051		
2017	(74,900,971)	5	(14,980,194)	(14,980,194)			
2016	8,756,807	5	1,751,363				

**Experience**

<u>Year</u>	<u>(Gain) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
2019	55,982,071	4.36	12,839,925	12,839,925	12,839,925	4,622,371	
2018	59,806,942	4.35	13,748,722	13,748,722	4,812,054		
2016	21,421,023	4.42	2,035,483				

**Assumptions**

<u>Year</u>	<u>(Gain) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
2018	19,750,049	4.35	4,540,241	4,540,241	1,589,085		
2016	(23,402,726)	4.42	(2,223,790)				

**Reconciliation of Net Pension Liability for 2020**

NPL Beginning	682,247,415
Expense	71,288,091
Contribution	(85,337,687)
Deferred Outflow Changes	(65,102,787)
Deferred Inflow Changes	(9,640,083)
Revenue	<u>(7,313,745)</u>
NPL Ending	586,141,204

	<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	27,450,165	0	21,060,053	28,178,738	487,669	13,854,620
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	2,288,352	0	1,755,648	2,349,088	40,654	1,154,975
Net Asset Loss	2,827,440	0	2,169,242	2,902,485	50,232	1,427,062
Changes in Assumptions	287,049	0	220,227	294,667	5,099	144,879
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	1,100,543	0	117,784	71,364	7,738	118,384
Total Deferred Outflows	6,503,384	0	4,262,901	5,617,604	103,723	2,845,300
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	5,551,342	0	4,259,048	5,698,685	98,623	2,801,868
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	1,542,469	0	222,876	273,261	65,858	118,407
Total Deferred Inflows	7,093,811	0	4,481,924	5,971,946	164,481	2,920,275
Pension Expense						
Proportionate share of plan Pension Expense	3,338,564	0	2,561,381	3,427,175	59,312	1,685,037
Net Amortization from changes in Share Proportions	3,704,953	0	(374,420)	(425,790)	(20,087)	(11,953)
Total Employer Pension Expense	7,043,517	0	2,186,961	3,001,385	39,225	1,673,084
Revenue	342,517	0	262,783	351,608	6,085	172,875

	<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	16,128,848	397,404	31,611,181	182,290	20,262,901	308,896
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	1,344,564	33,129	2,635,230	15,197	1,689,194	25,751
Net Asset Loss	1,661,314	40,934	3,256,036	18,776	2,087,132	31,818
Changes in Assumptions	168,661	4,155	330,561	1,906	211,891	3,230
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	96,067	991,132	5,285	124,126	9,551
Total Deferred Outflows	3,174,539	174,285	7,212,959	41,164	4,112,343	70,350
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	3,261,794	80,368	6,392,840	36,864	4,097,836	62,470
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	414,463	129,215	89,228	11,703	302,178	23,215
Total Deferred Inflows	3,676,257	209,583	6,482,068	48,567	4,400,014	85,685
Pension Expense						
Proportionate share of plan Pension Expense	1,961,634	48,333	3,844,638	22,171	2,464,429	37,569
Net Amortization from changes in Share Proportions	(194,601)	289,680	475,761	(6,017)	(354,717)	5,000
Total Employer Pension Expense	1,767,033	338,013	4,320,399	16,154	2,109,712	42,569
Revenue	201,252	4,959	394,438	2,275	252,836	3,854

	<u>Halifax</u>	<u>Hanover</u>	<u>Hanson</u>	<u>Kingston</u>	<u>Kingston Housing</u>	<u>Lakeville</u>
Net Pension Liability	9,313,198	27,555,670	12,390,439	19,329,179	14,067	8,340,203
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	776,384	2,297,147	1,032,914	1,611,355	1,173	695,272
Net Asset Loss	959,284	2,838,308	1,276,248	1,990,956	1,448	859,064
Changes in Assumptions	97,389	288,152	129,568	202,127	147	87,214
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	80,277	531,408	124,428	719,923	2,563	121,005
Total Deferred Outflows	1,913,334	5,955,015	2,563,158	4,524,361	5,331	1,762,555
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	1,883,441	5,572,678	2,505,762	3,909,007	2,845	1,686,669
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	121,978	45,663	92,851	62,029	6,361	70,084
Total Deferred Inflows	2,005,419	5,618,341	2,598,613	3,971,036	9,206	1,756,753
Pension Expense						
Proportionate share of plan Pension Expense	1,132,696	3,351,396	1,506,959	2,350,867	1,711	1,014,358
Net Amortization from changes in Share Proportions	(101,943)	135,204	(80,674)	480,026	(978)	(11,527)
Total Employer Pension Expense	1,030,753	3,486,600	1,426,285	2,830,893	733	1,002,831
Revenue	116,208	343,834	154,605	241,185	176	104,067

	<u>Marion</u>	<u>Marshfield</u>	<u>Marshfield</u> <u>Housing</u>	<u>Mattapoissett</u>	<u>Middleboroug</u> <u>h</u>	<u>Middleboroug</u> <u>h Housing</u>
Net Pension Liability	8,740,538	47,445,200	329,411	9,570,514	52,717,540	962,444
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	728,645	3,955,215	27,461	797,835	4,394,738	80,234
Net Asset Loss	900,298	4,886,982	33,930	985,788	5,430,047	99,134
Changes in Assumptions	91,400	496,138	3,445	100,080	551,271	10,064
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	259,673	279,287	46,554	300,940	300,994	47,740
Total Deferred Outflows	1,980,016	9,617,622	111,390	2,184,643	10,677,050	237,172
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	1,767,628	9,595,009	66,618	1,935,479	10,661,251	194,639
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	26,858	149,122	10,104	95,408	382,494	8,188
Total Deferred Inflows	1,794,486	9,744,131	76,722	2,030,887	11,043,745	202,827
Pension Expense						
Proportionate share of plan Pension Expense	1,063,048	5,770,415	40,064	1,163,992	6,411,651	117,055
Net Amortization from changes in Share Proportions	146,543	(270,234)	39,072	115,300	(712,387)	34,876
Total Employer Pension Expense	1,209,591	5,500,181	79,136	1,279,292	5,699,264	151,931
Revenue	109,063	592,011	4,110	119,419	657,798	12,009



	<u>Norwell</u>	<u>Norwell</u>	<u>Old Rochester</u>	<u>Onset Fire</u>	<u>Pembroke</u>	<u>Plymouth</u>
		<u>Housing</u>	<u>Regional</u>	<u>District</u>		<u>County</u>
			<u>School</u>			<u>Mosquito</u>
						<u>Control</u>
Net Pension Liability	20,536,043	263,764	5,613,474	1,981,743	26,980,080	1,385,052
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	1,711,964	21,988	467,960	165,205	2,249,164	115,464
Net Asset Loss	2,115,268	27,168	578,202	204,124	2,779,020	142,664
Changes in Assumptions	214,747	2,758	58,701	20,724	282,133	14,484
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	117,864	9,214	118,304	98,845	375,088	2,557
Total Deferred Outflows	4,159,843	61,128	1,223,167	488,898	5,685,405	275,169
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	4,153,075	53,341	1,135,232	400,776	5,456,276	280,103
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	119,759	4,793	25,675	80,282	143,878	185,157
Total Deferred Inflows	4,272,834	58,134	1,160,907	481,058	5,600,154	465,260
Pension Expense						
Proportionate share of plan Pension Expense	2,497,650	32,080	682,726	241,025	3,281,391	168,454
Net Amortization from changes in Share Proportions	(156,392)	(2,943)	6,262	41,068	71,974	(158,602)
Total Employer Pension Expense	2,341,258	29,137	688,988	282,093	3,353,365	9,852
Revenue	256,244	3,291	70,044	24,728	336,652	17,282

	<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	3,818,124	6,169,722	31,091,860	38,129,072	706,300	6,145,104
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	318,293	514,332	2,591,938	3,178,587	58,880	512,279
Net Asset Loss	393,276	635,498	3,202,544	3,927,396	72,750	632,962
Changes in Assumptions	39,926	64,518	325,130	398,719	7,386	64,260
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	65,062	151,368	213,860	230,589	22,380	192,486
Total Deferred Outflows	816,557	1,365,716	6,333,472	7,735,291	161,396	1,401,987
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	772,152	1,247,725	6,287,815	7,710,975	142,838	1,242,745
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	118,844	94,195	545,589	438,256	91,529	26,314
Total Deferred Inflows	890,996	1,341,920	6,833,404	8,149,231	234,367	1,269,059
Pension Expense						
Proportionate share of plan Pension Expense	464,371	750,378	3,781,477	4,637,362	85,902	747,384
Net Amortization from changes in Share Proportions	49,097	68,015	(683,633)	(502,427)	(39,078)	30,127
Total Employer Pension Expense	513,468	818,393	3,097,844	4,134,935	46,824	777,511
Revenue	47,642	76,984	387,958	475,766	8,813	76,677

	<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	3,137,614	30,515,683	6,603,467	393,887	17,135,252
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	0	261,564	2,543,905	550,491	32,836	1,428,461
Net Asset Loss	0	323,182	3,143,196	680,174	40,572	1,764,976
Changes in Assumptions	0	32,810	319,105	69,053	4,119	179,184
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	92,878	27,240	249,682	88,004	528,975
Total Deferred Outflows	0	710,434	6,033,446	1,549,400	165,531	3,901,596
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	634,530	6,171,292	1,335,441	79,657	3,465,322
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	5,688	786,489	26,575	2,204	41,665
Total Deferred Inflows	0	640,218	6,957,781	1,362,016	81,861	3,506,987
Pension Expense						
Proportionate share of plan Pension Expense	0	381,605	3,711,401	803,132	47,906	2,084,036
Net Amortization from changes in Share Proportions	0	52,233	(775,769)	213,752	78,921	241,173
Total Employer Pension Expense	0	433,838	2,935,632	1,016,884	126,827	2,325,209
Revenue	0	39,150	380,768	82,397	4,915	213,810

	<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	16,122,986	9,221,760	601,967	334,100	746,744	228,009
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	1,344,075	768,762	50,183	27,853	62,252	19,008
Net Asset Loss	1,660,710	949,866	62,004	34,414	76,916	23,486
Changes in Assumptions	168,599	96,433	6,295	3,494	7,808	2,384
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	282,501	49,013	174,715	11,563	28,403	1,484
Total Deferred Outflows	3,455,885	1,864,074	293,197	77,324	175,379	46,362
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	3,260,608	1,864,949	121,738	67,567	151,016	46,111
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	112,928	214,239	164,732	1,280	24,213	7,531
Total Deferred Inflows	3,373,536	2,079,188	286,470	68,847	175,229	53,642
Pension Expense						
Proportionate share of plan Pension Expense	1,960,922	1,121,576	73,213	40,634	90,821	27,731
Net Amortization from changes in Share Proportions	14,034	(325,808)	80,374	4,719	(25,347)	(4,758)
Total Employer Pension Expense	1,974,956	795,768	153,587	45,353	65,474	22,973
Revenue	201,179	115,067	7,511	4,169	9,318	2,845

	<u>Rockland</u>	<u>Halifax</u>	<u>Mattapoisett</u>	<u>Hanover</u>	<u>Acushnet/Roc</u> <u>hester/Marion</u>	<u>West</u> <u>Bridgewater</u>
	<u>Housing</u>	<u>Housing</u>	<u>Housing</u>	<u>Housing</u>	<u>Health District</u>	<u>Housing</u>
Net Pension Liability	321,792	17,584	36,927	0	132,468	101,402
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	26,826	1,467	3,078	0	11,043	8,454
Net Asset Loss	33,146	1,812	3,804	0	13,644	10,444
Changes in Assumptions	3,365	184	386	0	1,385	1,060
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	15,602	44,506	873	0	8,093	3,712
Total Deferred Outflows	78,939	47,969	8,141	0	34,165	23,670
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	65,077	3,556	7,467	0	26,789	20,507
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	94,255	202,546	62,775	0	565	4,256
Total Deferred Inflows	159,332	206,102	70,242	0	27,354	24,763
Pension Expense						
Proportionate share of plan Pension Expense	39,137	2,139	4,491	0	16,111	12,333
Net Amortization from changes in Share Proportions	(90,232)	(116,917)	(62,364)	0	2,451	(3,456)
Total Employer Pension Expense	(51,095)	(114,778)	(57,873)	0	18,562	8,877
Revenue	4,015	219	461	0	1,653	1,265

	<u>South Shore</u>			<u>Other</u>	
	<u>Tri Town</u>	<u>Carver</u>	<u>No Carver</u>	<u>(Retirement</u>	
	<u>Development</u>	<u>Housing</u>	<u>Water District</u>	<u>Staff)</u>	<u>Total</u>
Net Pension Liability	1,038,056	0	0	0	586,141,205
Deferred Outflows of Resources					
Differences between Expected and Actual Experience	86,536	0	0	0	48,863,003
Net Asset Loss	106,922	0	0	0	60,374,098
Changes in Assumptions	10,855	0	0	0	6,129,325
Changes in Proportion and Differences between Employer					
Contributions and proportionate share of contributions	96,544	2,306	0	88,373	8,848,850
Total Deferred Outflows	300,857	2,306	0	88,373	124,215,276
Deferred Inflows of Resources					
Differences between Expected and Actual Experience	0	0	0	0	0
Net Asset Gain	209,931	0	0	0	118,537,372
Changes in Assumptions	0	0	0	0	0
Changes in Proportion and Differences between Employer					
Contributions and proportionate share of contributions	22,551	84,832	0	851,275	8,848,883
Total Deferred Inflows	232,482	84,832	0	851,275	127,386,255
Pension Expense					
Proportionate share of plan Pension Expense	126,251	0	0	0	71,288,094
Net Amortization from changes in Share Proportions	45,956	(88,227)	0	(825,498)	(208)
Total Employer Pension Expense	172,207	(88,227)	0	(825,498)	71,287,886
Revenue	12,953	0	0	0	7,313,743

**EXHIBITS**

**Exhibit 1 - Age/Service Distribution with Salary as of January 1, 2020**

Attained Age	Average Salary	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	6	0	0	0	0	0	0	0	0	0	6
	34,578	0	0	0	0	0	0	0	0	0	34,578
20-24	178	5	0	0	0	0	0	0	0	0	183
	33,991	58,978	0	0	0	0	0	0	0	0	34,674
25-29	366	50	0	0	0	0	0	0	0	0	416
	43,884	59,336	0	0	0	0	0	0	0	0	45,741
30-34	235	144	32	0	0	0	0	0	0	0	411
	48,532	68,061	70,607	0	0	0	0	0	0	0	57,093
35-39	188	116	104	32	1	0	0	0	0	0	441
	44,198	62,124	74,519	75,492	61,003	0	0	0	0	0	58,373
40-44	180	95	59	78	35	1	0	0	0	0	448
	35,645	54,098	74,199	75,915	84,002	83,820	0	0	0	0	55,533
45-49	216	153	99	99	111	32	1	0	0	0	711
	34,070	42,464	57,805	71,366	85,162	90,333	91,533	0	0	0	54,964
50-54	227	189	150	128	100	71	55	1	0	0	921
	36,572	37,404	44,406	59,943	74,198	97,236	99,626	177,043	0	0	53,947
55-59	145	155	195	193	129	73	62	18	1	0	971
	40,095	41,160	41,401	47,064	57,585	76,697	92,527	95,617	147,778	0	51,476
60-64	87	102	120	175	151	63	52	23	8	0	781
	40,146	44,233	43,201	44,055	48,047	53,644	73,444	91,155	80,927	0	48,779
65-69	29	28	47	67	57	37	25	1	4	0	295
	33,395	35,863	38,515	47,592	48,453	47,794	58,383	69,740	77,557	0	45,224
70+	21	17	13	22	15	12	13	6	6	0	125
	27,567	40,190	53,066	36,802	43,864	35,436	35,846	36,507	48,544	0	38,569
Total Employees	1,878	1,054	819	794	599	289	208	49	19	0	5,709
Average Salary	39,917	48,912	51,927	55,247	63,401	72,839	81,982	87,418	73,510	0	51,616



**Exhibit 2 - Retiree Distribution as of January 1, 2020**

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	3	0	3	42,494	0	42,494
35-39	2	0	2	23,233	0	23,233
40-44	0	0	0	0	0	0
45-49	3	9	12	35,715	218,248	253,963
50-54	15	17	32	387,009	596,048	983,057
55-59	90	103	193	1,379,327	4,322,199	5,701,526
60-64	243	189	432	3,764,091	8,853,850	12,617,941
65-69	481	326	807	9,562,464	12,844,675	22,407,139
70-74	527	337	864	10,358,196	12,476,715	22,834,911
75-79	461	263	724	8,424,424	8,627,143	17,051,567
80-84	296	136	432	5,267,504	3,591,672	8,859,175
85-89	190	64	254	2,879,210	1,387,758	4,266,968
90-94	100	28	128	1,329,251	608,557	1,937,807
95+	49	11	60	403,291	185,063	588,354
<b>Total</b>	<b>2460</b>	<b>1483</b>	<b>3943</b>	<b>43,856,207</b>	<b>53,711,929</b>	<b>97,568,136</b>
<b>Average (Age/Payment)</b>	<b>74.34</b>	<b>71.73</b>	<b>73.36</b>	<b>17,828</b>	<b>36,218</b>	<b>24,745</b>
<b>Frequency Percent</b>	<b>62.4</b>	<b>37.6</b>	<b>100</b>	<b>44.9</b>	<b>55.1</b>	<b>100</b>

**Exhibit 3 - Disabled Retiree Distribution as of January 1, 2020**

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	0	0	0	0	0
40-44	2	5	7	56,083	259,471	315,554
45-49	4	15	19	181,427	687,983	869,410
50-54	8	31	39	341,167	1,331,579	1,672,746
55-59	14	42	56	423,947	1,750,633	2,174,580
60-64	11	44	55	305,629	1,818,867	2,124,496
65-69	12	49	61	220,299	1,706,012	1,926,310
70-74	11	60	71	253,598	1,999,946	2,253,544
75-79	10	38	48	275,216	1,205,254	1,480,470
80-84	2	22	24	34,241	657,242	691,482
85-89	1	10	11	449	278,026	278,475
90-94	0	3	3	0	59,358	59,358
95-99	0	0	0	0	0	0
<b>Total</b>	<b>75</b>	<b>319</b>	<b>394</b>	<b>2,092,055</b>	<b>11,754,371</b>	<b>13,846,427</b>
<b>Average (Age/Payment)</b>	<b>64.16</b>	<b>66.73</b>	<b>66.24</b>	<b>27,894</b>	<b>36,848</b>	<b>35,143</b>
<b>Frequency Percent</b>	<b>19.0</b>	<b>81.0</b>	<b>100</b>	<b>15.1</b>	<b>84.9</b>	<b>100</b>

## **EXHIBIT 4 – SUMMARY OF PLAN PROVISIONS:**

This summary is prepared in accordance with Chapter 32 as of January 1, 2020, 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:

<b><u>Date of Hire</u></b>	<b><u>Member Contribution Rate</u></b>
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 \$16,000. 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. The previous valuation had a COLA base of \$14,000.

**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, 2020.

### **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 7.875% 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 9.01%. 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 \$16,000 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 2020 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, 2020, 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

May, 2021