

**PLYMOUTH COUNTY
CONTRIBUTORY RETIREMENT SYSTEM**

December 31, 2021 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, 2022, of the Plymouth County Contributory Retirement System.

The actuarial valuation is based on:

- Provisions of Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2022.
- 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, 2021

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2022.

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 37 years ending as of December 31, 2021 was 9.36%. The average return for the past 10 years ending December 31, 2021 was 10.07%.

Net Position Restricted for Pensions

The Net Position Restricted for Pensions as of December 31, 2021 is \$1,440,354,319. The 2021 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, 2020 Net Position	1,239,611,831
Employer Contributions	89,068,346
Employee Contributions	31,028,150
Other Payments	7,109,305
Benefit Payments	(128,873,828)
Expenses	(2,136,679)
Investment Income	<u>204,547,194</u>
December 31, 2021 Net Position	1,440,354,319

Pension Liability as of December 31, 2021

The following presents the changes in the pension liability during 2021.

December 31, 2020 Liability	1,825,753,036
Service Cost	31,462,854
Interest on Liability and Service Cost	141,277,497
Change in Plan Provisions	0
Experience (Gain) and Loss	38,494,413
Change in Assumptions	0
Benefit Payments	(128,873,828)
Other	0
December 31, 2021 Liability	1,908,113,972

Net Pension Liability as of December 31, 2021

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:

	1% Decrease (6.875%)	Current Discount Rate (7.875%)	1% Increase (8.875%)
Total Pension Liability	2,103,246,268	1,908,113,972	1,741,786,329
Plan Fiduciary Net Position	<u>1,440,354,319</u>	<u>1,440,354,319</u>	<u>1,440,354,319</u>
Net Pension Liability	662,891,949	467,759,653	301,432,010

The Plan Fiduciary Net Position as a percentage of the Total Pension Liability is 75.5%.

	Unit	1% Decrease (6.875%)	Current Discount Rate (7.875%)	1% Increase (8.875%)
County of Plymouth	1	10,522,747	7,425,217	4,784,932
Hospital	2	0	0	0
Abington	3	24,150,479	17,041,420	10,981,771
Bridgewater	4	34,040,164	24,019,926	15,478,835
Bridgewater Housing	5	473,305	333,980	215,222
Bridgewater/Raynham				
Regional School	6	15,580,612	10,994,223	7,084,858
Carver	7	18,749,236	13,230,114	8,525,703
Carver/Marion/Wareham				
Regional Refuse	8	0	0	0
Duxbury	9	37,066,266	26,155,249	16,854,872
Duxbury Housing	10	186,936	131,908	85,004
East Bridgewater	11	23,691,758	16,717,730	10,773,180
East Bridgewater Housing	12	375,860	265,220	170,912
Halifax	13	11,234,030	7,927,123	5,108,368
Hanover	14	32,003,098	22,582,501	14,552,535
Hanson	15	14,727,470	10,392,216	6,696,915
Kingston	16	23,129,626	16,321,070	10,517,566
Kingston Housing	17	41,762	29,469	18,990
Lakeville	18	9,806,823	6,920,036	4,459,385
Marion	19	10,982,131	7,749,374	4,993,824
Marshfield	20	54,453,259	38,424,117	24,761,132
Marshfield Housing	21	360,613	254,461	163,979
Mattapoisett	22	11,603,924	8,188,133	5,276,567
Middleborough	23	60,272,125	42,530,111	27,407,103
Middleborough Housing	24	1,143,489	806,885	519,970
Norwell	25	24,546,226	17,320,672	11,161,726
Norwell Housing	26	318,188	224,525	144,687
Old Rochester Regional				
School	27	6,351,168	4,481,605	2,888,020
Onset Fire District	28	2,430,162	1,714,807	1,105,050
Pembroke	29	31,186,415	22,006,221	14,181,170
Plymouth County Mosquito				
Control	30	1,449,745	1,022,990	659,232
Plympton	31	4,685,983	3,306,593	2,130,823
Rochester	32	7,464,163	5,266,974	3,394,124
Rockland	33	36,545,896	25,788,057	16,618,248
Scituate	34	44,412,435	31,338,961	20,195,342
Scituate Housing	35	739,787	522,020	336,398
Silver Lake Regional School	36	6,636,874	4,683,210	3,017,937
South Shore Regional				
School	38	3,265,406	2,304,184	1,484,854
Wareham	39	36,467,012	25,732,394	16,582,378

	<u>Unit</u>	1% Decrease (6.875%)	Current Discount Rate (7.875%)	1% Increase (8.875%)
Wareham Fire District	40	8,241,736	5,815,656	3,747,704
Wareham Housing	41	403,701	284,866	183,572
West Bridgewater	42	19,861,569	14,015,015	9,031,506
Whitman	43	19,103,883	13,480,365	8,686,969
Whitman/Hanson Regional School	44	10,478,333	7,393,877	4,764,736
Whitman Housing	45	723,878	510,794	329,164
Abington Housing	46	304,267	214,702	138,357
Pembroke Housing	47	780,224	550,553	354,785
Hanson Housing	48	235,327	166,055	107,008
Rockland Housing	49	330,783	233,412	150,415
Halifax Housing	50	0	0	0
Mattapoisett Housing	51	222,732	157,167	101,281
Hanover Housing	52	0	0	0
Acushnet/Rochester/Marion Health District	53	0	0	0
West Bridgewater Housing	54	139,207	98,230	63,301
South Shore Tri Town Development	55	971,137	685,268	441,598
Carver Housing	56	0	0	0
Retirement Staff	59	0	0	0
Total		662,891,949	467,759,653	301,432,010

Employer Contributions during 2021

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
County of Plymouth	1	6,027,484	0.067673
Hospital	2	-	-
Abington	3	3,144,709	0.035307
Bridgewater	4	4,115,684	0.046208
Bridgewater Housing	5	63,836	0.000717
Bridgewater/Raynham			
Regional School	6	1,964,050	0.022051
Carver	7	2,406,381	0.027017
Carver/Marion/Wareham			
Regional Refuse	8	-	-
Duxbury	9	4,672,835	0.052463
Duxbury Housing	10	25,467	0.000286
East Bridgewater	11	2,960,238	0.033236
East Bridgewater Housing	12	44,203	0.000496
Halifax	13	1,462,365	0.016418
Hanover	14	4,056,304	0.045541
Hanson	15	1,886,532	0.021181
Kingston	16	2,882,108	0.032358
Kingston Housing	17	1,926	0.000022
Lakeville	18	1,286,448	0.014443
Marion	19	1,289,828	0.014481
Marshfield	20	6,955,238	0.078089
Marshfield Housing	21	49,286	0.000553
Mattapoissett	22	1,494,792	0.016783
Middleborough	23	7,750,693	0.087020
Middleborough Housing	24	151,466	0.001701
Norwell	25	3,089,469	0.034686
Norwell Housing	26	34,198	0.000384
Old Rochester Regional			
School	27	800,827	0.008991
Onset Fire District	28	289,082	0.003246
Pembroke	29	3,990,309	0.044801
Plymouth County Mosquito			
Control	30	195,592	0.002196
Plympton	31	568,080	0.006378
Rochester	32	938,903	0.010541
Rockland	33	4,601,255	0.051660
Scituate	34	5,759,996	0.064669
Scituate Housing	35	101,092	0.001135
Silver Lake Regional School	36	890,159	0.009994
South Shore Regional			
School	38	434,147	0.004874
Wareham	39	4,716,527	0.052954

	<u>Unit</u>	<u>Contribution</u>	<u>Portion</u>
Wareham Fire District	40	1,069,908	0.012012
Wareham Housing	41	54,736	0.000615
West Bridgewater	42	2,515,249	0.028240
Whitman	43	2,407,960	0.027035
Whitman/Hanson Regional School	44	1,381,333	0.015509
Whitman Housing	45	86,461	0.000971
Abington Housing	46	42,603	0.000478
Pembroke Housing	47	112,197	0.001260
Hanson Housing	48	32,537	0.000365
Rockland Housing	49	49,731	0.000558
Halifax Housing	50	-	-
Mattapoissett Housing	51	28,632	0.000321
Hanover Housing	52	-	-
Acushnet/Rochester/Marion Health District	53	19,935	0.000224
West Bridgewater Housing	54	18,369	0.000206
South Shore Tri Town Development	55	147,186	0.001653
Carver Housing	56	-	-
Retirement Staff	59	-	-
		89,068,346	100.0000%

Pension Expense for 2021

Service Cost	31,462,854
Interest	141,277,497
Difference in Experience - Amortization	35,478,812
Change in Assumptions - Amortization	4,540,241
Changes in Plan Provisions	0
Employee Contributions	(31,028,150)
Projected Earnings	(97,472,460)
Administration Expense	2,136,679
Other Changes in Fiduciary Net Position	0
Asset (Gain) / Loss Amortization	<u>(36,891,953)</u>
Total Expense	49,503,520

Schedules of Required Supplementary Information

	<u>2021</u>
Total Pension Liability – Beginning	1,825,753,036
Total Pension Liability – Ending (a)	1,908,113,972
Plan Fiduciary Net Position – Beginning	1,239,611,831
Plan Fiduciary Net Position – Ending (b)	1,440,354,319
Net Pension Liability – Ending (a) – (b)	467,759,653
Plan Fiduciary Net Positions as a percentage of the Total Pension Liability	75.5%
Covered-employee payroll	316,714,508
Net Pension Liability as a percentage of Covered-employee Payroll	147.7%

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>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>
2021	(107,074,734)	5	(21,414,947)	(21,414,947)	(21,414,947)	(21,414,947)	(21,414,946)
2020	(57,527,931)	5	(11,505,586)	(11,505,586)	(11,505,586)	(11,505,587)	
2019	(95,891,389)	5	(19,178,278)	(19,178,278)	(19,178,279)		
2018	150,935,263	5	30,187,053	30,187,051			
2017	(74,900,971)	5	(14,980,194)				

Experience

<u>Year</u>	<u>(Gain) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>
2021	38,494,413	4.33	8,890,165	8,890,165	8,890,165	8,890,165	2,933,753
2019	55,982,071	4.36	12,839,925	12,839,925	4,622,371		
2018	59,806,942	4.35	13,748,722	4,812,054			

Assumptions

<u>Year</u>	<u>(Gain) / Loss</u>	<u>Period</u>	<u>Increase (Decrease) arising from (Gains) or Losses</u>				
			<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>
2018	19,750,049	4.35	4,540,241	1,589,085			

Reconciliation of Net Pension Liability for 2021

NPL Beginning	586,141,205
Expense	49,503,520
Contribution	(89,068,346)
Deferred Outflow Changes	(31,711,693)
Deferred Inflow Changes	(39,995,728)
Revenue	<u>(7,109,305)</u>
NPL Ending	467,759,652

	<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	7,425,217	0	17,041,420	24,019,926	333,980	10,994,223
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	823,522	0	1,890,041	2,664,018	37,041	1,219,354
Net Asset Loss	479,189	0	1,099,775	1,550,135	21,554	709,516
Changes in Assumptions	25,225	0	57,894	81,601	1,135	37,350
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	261,682	0	203,861	905,935	0	83,151
Total Deferred Outflows	1,589,618	0	3,251,571	5,201,689	59,730	2,049,371
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	2,516,555	0	5,775,678	8,140,833	113,192	3,726,163
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	9,368,236	0	138,099	131,772	65,685	94,394
Total Deferred Inflows	11,884,791	0	5,913,777	8,272,605	178,877	3,820,557
Pension Expense						
Proportionate share of plan Pension Expense	785,819	0	1,803,512	2,542,055	35,346	1,163,531
Net Amortization from changes in Share Proportions	(4,965,684)	0	24,753	496,460	(61,734)	(196,571)
Total Employer Pension Expense	(4,179,865)	0	1,828,265	3,038,515	(26,388)	966,960
Revenue	112,853	0	259,006	365,070	5,076	167,097

	<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	13,230,114	0	26,155,249	131,908	16,717,730	265,220
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	1,467,335	0	2,900,843	14,630	1,854,142	29,416
Net Asset Loss	853,811	0	1,687,939	8,513	1,078,885	17,116
Changes in Assumptions	44,946	0	88,855	448	56,794	901
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	207,772	52,054	1,144,495	1,480	379,050	17,003
Total Deferred Outflows	2,573,864	52,054	5,822,132	25,071	3,368,871	64,436
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	4,483,949	0	8,864,537	44,707	5,665,973	89,889
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	230,669	268,414	0	12,902	173,198	12,527
Total Deferred Inflows	4,714,618	268,414	8,864,537	57,609	5,839,171	102,416
Pension Expense						
Proportionate share of plan Pension Expense	1,400,158	0	2,768,039	13,960	1,769,256	28,068
Net Amortization from changes in Share Proportions	(52,394)	(216,342)	619,683	(11,735)	82,526	(865)
Total Employer Pension Expense	1,347,764	(216,342)	3,387,722	2,225	1,851,782	27,203
Revenue	201,080	0	397,524	2,005	254,087	4,031

	<u>Halifax</u>	<u>Hanover</u>	<u>Hanson</u>	<u>Kingston</u>	<u>Kingston Housing</u>	<u>Lakeville</u>
Net Pension Liability	7,927,123	22,582,501	10,392,216	16,321,070	29,469	6,920,036
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	879,186	2,504,595	1,152,587	1,810,148	3,268	767,491
Net Asset Loss	511,580	1,457,370	670,666	1,053,287	1,902	446,587
Changes in Assumptions	26,930	76,718	35,305	55,446	100	23,509
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	315,290	675,972	352,140	1,006,066	10,711	218,042
Total Deferred Outflows	1,732,986	4,714,655	2,210,698	3,924,947	15,981	1,455,629
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	2,686,659	7,653,662	3,522,129	5,531,536	9,988	2,345,339
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	42,491	0	24,074	16,083	1,918	18,169
Total Deferred Inflows	2,729,150	7,653,662	3,546,203	5,547,619	11,906	2,363,508
Pension Expense						
Proportionate share of plan Pension Expense	838,936	2,389,931	1,099,820	1,727,277	3,119	732,355
Net Amortization from changes in Share Proportions	261,914	312,107	246,487	570,777	6,706	152,782
Total Employer Pension Expense	1,100,850	2,702,038	1,346,307	2,298,054	9,825	885,137
Revenue	120,481	343,223	157,947	248,058	448	105,175

	<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	7,749,374	38,424,117	254,461	8,188,133	42,530,111	806,885
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	859,473	4,261,568	28,223	908,135	4,716,958	89,491
Net Asset Loss	500,109	2,479,715	16,422	528,424	2,744,697	52,073
Changes in Assumptions	26,326	130,535	864	27,817	144,484	2,741
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	622,852	479,560	29,873	502,561	435,752	53,533
Total Deferred Outflows	2,008,760	7,351,378	75,382	1,966,937	8,041,891	197,838
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	2,626,419	13,022,701	86,242	2,775,122	14,414,305	273,470
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	6,964	38,661	7,496	24,736	207,168	2,448
Total Deferred Inflows	2,633,383	13,061,362	93,738	2,799,858	14,621,473	275,918
Pension Expense						
Proportionate share of plan Pension Expense	820,125	4,066,467	26,930	866,559	4,501,009	85,394
Net Amortization from changes in Share Proportions	406,472	35,157	4,298	356,976	(78,459)	35,203
Total Employer Pension Expense	1,226,597	4,101,624	31,228	1,223,535	4,422,550	120,597
Revenue	117,780	583,994	3,867	124,448	646,399	12,264

		<u>Old Rochester</u>				<u>Plymouth</u>
	<u>Norwell</u>	<u>Norwell</u>	<u>Regional</u>	<u>Onset Fire</u>	<u>Pembroke</u>	<u>County</u>
		<u>Housing</u>	<u>School</u>	<u>District</u>		<u>Mosquito</u>
						<u>Control</u>
Net Pension Liability	17,320,672	224,525	4,481,605	1,714,807	22,006,221	1,022,990
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	1,921,013	24,902	497,049	190,187	2,440,680	113,458
Net Asset Loss	1,117,796	14,490	289,222	110,666	1,420,180	66,019
Changes in Assumptions	58,842	763	15,225	5,826	74,760	3,475
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	598,737	11,085	57,773	133,347	490,622	662
Total Deferred Outflows	3,696,388	51,240	859,269	440,026	4,426,242	183,614
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	5,870,322	76,096	1,518,905	581,182	7,458,348	346,713
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	45,806	1,064	0	29,926	37,301	167,733
Total Deferred Inflows	5,916,128	77,160	1,518,905	611,108	7,495,649	514,446
Pension Expense						
Proportionate share of plan Pension Expense	1,833,066	23,762	474,293	181,480	2,328,943	108,264
Net Amortization from changes in Share Proportions	411,032	3,523	(15,325)	45,651	176,629	(118,445)
Total Employer Pension Expense	2,244,098	27,285	458,968	227,131	2,505,572	(10,181)
Revenue	263,250	3,412	68,114	26,063	334,464	15,548

	<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	3,306,593	5,266,974	25,788,057	31,338,961	522,020	4,683,210
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	366,730	584,153	2,860,119	3,475,762	57,897	519,409
Net Asset Loss	213,392	339,906	1,664,242	2,022,472	33,689	302,233
Changes in Assumptions	11,233	17,893	87,608	106,466	1,773	15,910
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	174,588	287,582	667,406	637,886	5,801	130,268
Total Deferred Outflows	765,943	1,229,534	5,279,375	6,242,586	99,160	967,820
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	1,120,670	1,785,082	8,740,089	10,621,400	176,922	1,587,234
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	46,593	41,848	310,898	225,648	74,827	137,324
Total Deferred Inflows	1,167,263	1,826,930	9,050,987	10,847,048	251,749	1,724,558
Pension Expense						
Proportionate share of plan Pension Expense	349,940	557,410	2,729,179	3,316,637	55,246	495,629
Net Amortization from changes in Share Proportions	83,746	179,988	231,896	320,080	(50,882)	(106,521)
Total Employer Pension Expense	433,686	737,398	2,961,075	3,636,717	4,364	389,108
Revenue	50,256	80,051	391,943	476,309	7,934	71,178

	<u>South Shore</u> <u>Mosquito</u> <u>Control</u>	<u>South Shore</u> <u>Regional</u> <u>School</u>	<u>Wareham</u>	<u>Wareham Fire</u> <u>District</u>	<u>Wareham</u> <u>Housing</u>	<u>West</u> <u>Bridgewater</u>
Net Pension Liability	0	2,304,184	25,732,394	5,815,656	284,866	14,015,015
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	0	255,555	2,853,946	645,007	31,594	1,554,386
Net Asset Loss	0	148,701	1,660,650	375,316	18,384	904,464
Changes in Assumptions	0	7,828	87,419	19,757	968	47,612
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	60,452	806,184	488,327	59,043	527,851
Total Deferred Outflows	0	472,536	5,408,199	1,528,407	109,989	3,034,313
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	0	780,935	8,721,223	1,971,041	96,546	4,749,969
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	0	115,669	473,574	10,353	17,066	0
Total Deferred Inflows	0	896,604	9,194,797	1,981,394	113,612	4,749,969
Pension Expense						
Proportionate share of plan Pension Expense	0	243,854	2,723,288	615,477	30,148	1,483,224
Net Amortization from changes in Share Proportions	0	(113,832)	463,310	395,382	7,190	235,061
Total Employer Pension Expense	0	130,022	3,186,598	1,010,859	37,338	1,718,285
Revenue	0	35,020	391,097	88,390	4,330	213,009

	<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	13,480,365	7,393,877	510,794	214,702	550,553	166,055
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	1,495,089	820,045	56,652	23,812	61,061	18,417
Net Asset Loss	869,961	477,167	32,964	13,856	35,530	10,716
Changes in Assumptions	45,796	25,119	1,735	729	1,870	564
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	520,871	48,291	131,597	6,253	8,502	147
Total Deferred Outflows	2,931,717	1,370,622	222,948	44,650	106,963	29,844
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	4,568,765	2,505,933	173,118	72,767	186,594	56,279
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer Contributions and proportionate share of contributions	29,277	141,141	90,648	30,068	36,697	13,310
Total Deferred Inflows	4,598,042	2,647,074	263,766	102,835	223,291	69,589
Pension Expense						
Proportionate share of plan Pension Expense	1,426,642	782,502	54,058	22,722	58,266	17,574
Net Amortization from changes in Share Proportions	292,255	(55,336)	(3,462)	(29,593)	(17,415)	(12,001)
Total Employer Pension Expense	1,718,897	727,166	50,596	(6,871)	40,851	5,573
Revenue	204,883	112,377	7,763	3,263	8,368	2,524

	<u>Rockland</u>	<u>Halifax</u>	<u>Mattapoissett</u>	<u>Hanover</u>	<u>Acushnet/Roc hester/Marion</u>	<u>West Bridgewater</u>
	<u>Housing</u>	<u>Housing</u>	<u>Housing</u>	<u>Housing</u>	<u>Health District</u>	<u>Housing</u>
Net Pension Liability	233,412	0	157,167	0	0	98,230
Deferred Outflows of Resources						
Differences between Expected and Actual Experience	25,888	0	17,431	0	0	10,895
Net Asset Loss	15,063	0	10,143	0	0	6,339
Changes in Assumptions	793	0	534	0	0	334
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	4,044	11,538	73,953	0	4,786	11,150
Total Deferred Outflows	45,788	11,538	102,061	0	4,786	28,718
Deferred Inflows of Resources						
Differences between Expected and Actual Experience	0	0	0	0	0	0
Net Asset Gain	79,107	0	53,268	0	0	33,293
Changes in Assumptions	0	0	0	0	0	0
Changes in Proportion and Differences between Employer						
Contributions and proportionate share of contributions	75,576	123,454	43,242	0	61,221	2,127
Total Deferred Inflows	154,683	123,454	96,510	0	61,221	35,420
Pension Expense						
Proportionate share of plan Pension Expense	24,702	0	16,633	0	0	10,396
Net Amortization from changes in Share Proportions	(31,300)	(63,801)	66,976	0	(49,287)	11,902
Total Employer Pension Expense	(6,598)	(63,801)	83,609	0	(49,287)	22,298
Revenue	3,548	0	2,389	0	0	1,493

	<u>South Shore</u> <u>Tri Town</u> <u>Development</u>	<u>Carver</u> <u>Housing</u>	<u>No Carver</u> <u>Water District</u>	<u>Other</u> <u>(Retirement</u> <u>Staff)</u>	<u>Total</u>
Net Pension Liability	685,268	0	0	0	467,759,653
Deferred Outflows of Resources					
Differences between Expected and Actual Experience	76,002	0	0	0	51,878,605
Net Asset Loss	44,224	0	0	0	30,187,050
Changes in Assumptions	2,328	0	0	0	1,589,084
Changes in Proportion and Differences between Employer					
Contributions and proportionate share of contributions	43,030	924	0	22,911	13,984,446
Total Deferred Outflows	165,584	924	0	22,911	97,639,185
Deferred Inflows of Resources					
Differences between Expected and Actual Experience	0	0	0	0	0
Net Asset Gain	232,252	0	0	0	158,533,102
Changes in Assumptions	0	0	0	0	0
Changes in Proportion and Differences between Employer					
Contributions and proportionate share of contributions	82,892	59,332	0	573,776	13,984,495
Total Deferred Inflows	315,144	59,332	0	573,776	172,517,597
Pension Expense					
Proportionate share of plan Pension Expense	72,523	0	0	0	49,503,524
Net Amortization from changes in Share Proportions	(49,775)	(24,118)	0	(212,037)	7
Total Employer Pension Expense	22,748	(24,118)	0	(212,037)	49,503,531
Revenue	10,415	0	0	0	7,109,304

EXHIBITS

EXHIBIT 4 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2022, 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 \$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.

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, 2022.

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. 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 2022 is \$2,100,000 and is anticipated to increase at 3.75% per year.

CERTIFICATION:

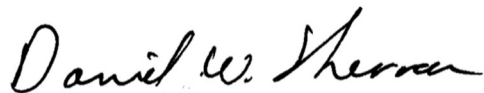
This report fairly represents the actuarial position of the Plymouth County Retirement System as of December 31, 2021, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued 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

June, 2021