



DUKES COUNTY CONTRIBUTORY RETIREMENT SYSTEM

ACTUARIAL VALUATION

as of

January 1, 2018

Prepared by:

KMS Actuarial, LLC
814 Elm Street, Suite 204
Manchester, NH 03101

January, 2019



January 3, 2019

Dukes County Contributory Retirement Board
9 Airport Road
Suite 1
Vineyard Haven, MA 02568

Dear Board Members:

We are pleased to present the enclosed report providing the results of our actuarial valuation of the Dukes County Contributory Retirement System as of January 1, 2018. Our valuation was performed in accordance with the provisions contained in Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2018. Disclosures under GASB Statement No. 67, Financial Reporting for Pension Plans (GASB 67) and GASB Statement No. 68, Accounting and Financial Reporting for Pensions (GASB 68) are provided in a separate report.

The principal results of our valuation are summarized in Section 2. The Summary of Plan Provisions and Actuarial Methods and Assumptions are shown in Sections 5 and 6, respectively. Section 7 summarizes the demographic profile of active members, retired plan members and beneficiaries and disabled plan members. Asset information and actuarial liabilities are presented in Section 2. The development of the required appropriations pursuant to Chapter 32 of the M.G.L. is shown in Section 3, including a 30-year forecast of the required appropriations and projected cash flows. The summary of information for PERAC is presented in Section 4.

This valuation is based upon member data provided by the Dukes County Contributory Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Retirement Board. Although we did not audit the data used in the valuation, we believe that the information is complete and reliable.

Liabilities presented in this report are based on a long-term investment return rate assumption of 7.5%, net of investment expense, compounded annually.

This report was completed in accordance with generally accepted actuarial standards and procedures, and conforms to the Code of Professional Conduct of the American Academy of Actuaries. The actuarial assumptions used in the determination of costs are reasonably related to the experience of the System and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the System.

K M S A C T U A R I E S

814 Elm Street, Suite 204 · Manchester, NH 03101 · p: (603) 792-9494 · f: (603) 792-9492 · lindab@kmsactuaries.com · kmsactuaries.com

Future actuarial valuation results may differ significantly from the current results presented in this report. Examples of potential sources of volatility include plan experience differing from that anticipated by the economic or demographic assumptions, the effect of new entrants, changes in economic or demographic assumptions, the effect of law changes and the delayed effect of smoothing techniques.

Our valuation follows generally accepted actuarial methods and we perform such tests as we consider necessary to assure the accuracy of the results. The amounts presented in this report have been appropriately determined according to the actuarial assumptions and methods stated herein.

This report is intended for the sole use of the Dukes County Contributory Retirement System and is intended to provide information to comply with the stated purpose of the report. It may not be appropriate for other purposes.

The undersigned credentialed actuaries are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein. They are available to answer any questions with regard to this report.

Respectfully submitted,



Linda L. Bournival, FSA
Member, American Academy of Actuaries
(603) 792-9494



Amanda J. Makarevich, ASA
Member, American Academy of Actuaries
(603) 702-8009



David M. Mirabito, FSA
Member, American Academy of Actuaries
(978) 766-5532

TABLE OF CONTENTS

SECTION 1 - SUMMARY	1
SECTION 2 - PRINCIPAL VALUATION RESULTS	6
Exhibit 2.1 - PLAN ASSETS	
Exhibit 2.2 - ACTUARIAL PRESENT VALUE OF FUTURE BENEFITS	
Exhibit 2.3 - ACTUARIAL ACCRUED LIABILITY	
Exhibit 2.4 - UNFUNDED ACTUARIAL ACCRUED LIABILITY	
Exhibit 2.5 - NORMAL COST	
Exhibit 2.6 - ACTUARIAL EXPERIENCE	
SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS	14
Exhibit 3.1 - ANNUAL APPROPRIATIONS	
Exhibit 3.2 - 30-YEAR FORECAST OF ANNUAL APPROPRIATIONS	
Exhibit 3.3 - 30-YEAR FORECAST OF CASH FLOW	
SECTION 4 - REQUIRED DISCLOSURES	18
Exhibit 4.1 - GASB 67 AND GASB 68 DISCLOSURES	
Exhibit 4.2 - PERAC DISCLOSURE INFORMATION	
SECTION 5 - SUMMARY OF PLAN PROVISIONS	20
SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS	25
SECTION 7 - PLAN MEMBER INFORMATION	29
Exhibit 7.1 - ACTIVE MEMBERS BY AGE and YEARS OF SERVICE	
Exhibit 7.2 - RETIRED and DISABLED PLAN MEMBERS and BENEFICIARIES	
SECTION 8 - GLOSSARY OF TERMS	31
SECTION 9 - MEMBER UNIT APPROPRIATIONS	33
SECTION 10 - RESULTS BY MEMBER UNIT	35

SECTION 1 - SUMMARY

Background

We have completed the Actuarial Valuation of the Dukes County Contributory Retirement System as of January 1, 2018. This valuation is based upon census data provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Dukes County Contributory Retirement Board. Information for the prior valuation completed as of January 1, 2016 was obtained from the valuation report prepared by KMS Actuaries, LLC.

Massachusetts General Laws

The valuation was prepared in accordance with Chapter 32 of the Massachusetts General Laws ("M.G.L."). The results are based on the active, inactive and retired members and beneficiaries as of January 1, 2018, the assets as of December 31, 2017 and assumptions regarding investment returns, salary increases, death, turnover, disability and retirement.

The valuation does not take into consideration:

- Changes in the law after the valuation date,
- Transfers between retirement systems pursuant to Section 3(8)(c) of Chapter 32,
- State-mandated benefits and
- Cost-of-living increases granted to members in pay status between 1982 and 1997.

GASB Statement Numbers 67 and 68

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, Financial Reporting for Pension Plans, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, Accounting and Financial Reporting for Pensions, replaced the requirements of Statement No. 27.

The new pension standards reflect changes from those previously in place regarding how governments calculate total pension liability and pension expense. Further, the new standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

The required disclosures and notes under the new GASB Statements for the fiscal year ending December 31, 2017 are provided in a separate report.

SECTION 1 - SUMMARY

Actuarial Valuation

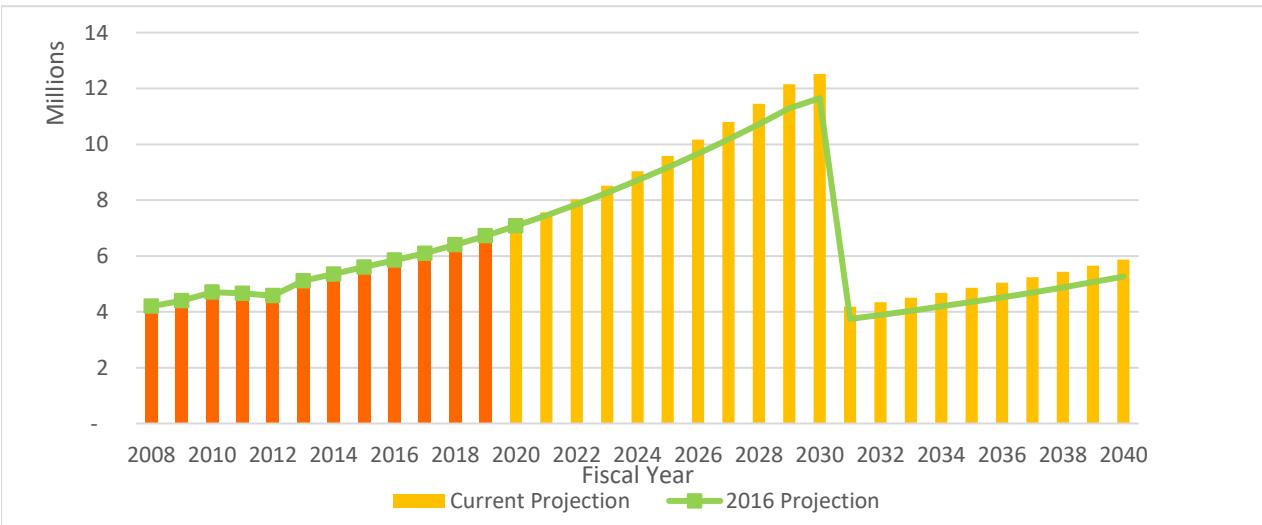
During the two years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease from \$46,029,551 as of January 1, 2016 to \$42,563,423 as of January 1, 2018, for a total decrease of \$3,466,128. The actual unfunded actuarial accrued liability, before any assumption or plan changes, was \$40,561,267, resulting in an actuarial gain of \$2,002,156. The actuarial gain was primarily due to an asset gain of \$4,104,179 and a demographic experience loss of \$2,102,023. The details of the gain and loss analysis are provided in Exhibit 2.6.

Appropriations

The funding appropriation for each year is computed as the sum of the normal cost, net 3(8)(c) transfers and an amortization payment to pay off the Unfunded Actuarial Liability, adjusted for semi-annual payments of the appropriation made July 1 and January 1. The appropriation calculated as of the January 1, 2018 valuation is \$7,004,459, and is made up of a normal cost payment of \$2,355,103, net 3(8)(c) transfers of \$189,472, and an amortization payment of \$4,459,884. The amortization method is an increasing amortization of the unfunded actuarial accrued liability at 4.5% over 12 years and is expected to fully pay the unfunded actuarial accrued liability by the year 2030. The development of the appropriation as of January 1, 2018 is presented in Exhibit 3.1.

For fiscal year 2019, we show the actual appropriation developed under the previous funding schedule and reported on the PERAC "Required Fiscal Year 2019 Appropriation" letter dated December 4, 2017 of \$6,720,539. For fiscal year 2020, we developed an annual appropriation of \$7,130,492, which is made up of a normal cost of \$2,585,405, net 3(8)(c) transfers of \$200,000 and payment toward the unfunded actuarial accrued liability (including payments for the Early Retirement Incentives) of \$4,345,087. The unfunded actuarial accrued liability is expected to be fully paid by 2030. The Board adopted a schedule that limits the annual increase in appropriation to 6.1% for each year. The current funding schedule is shown in Exhibit 3.2.

The chart below shows the historical (orange bars) and projected (yellow bars) annual appropriations compared to the projected amounts shown in the prior valuation and funding schedule (green line).

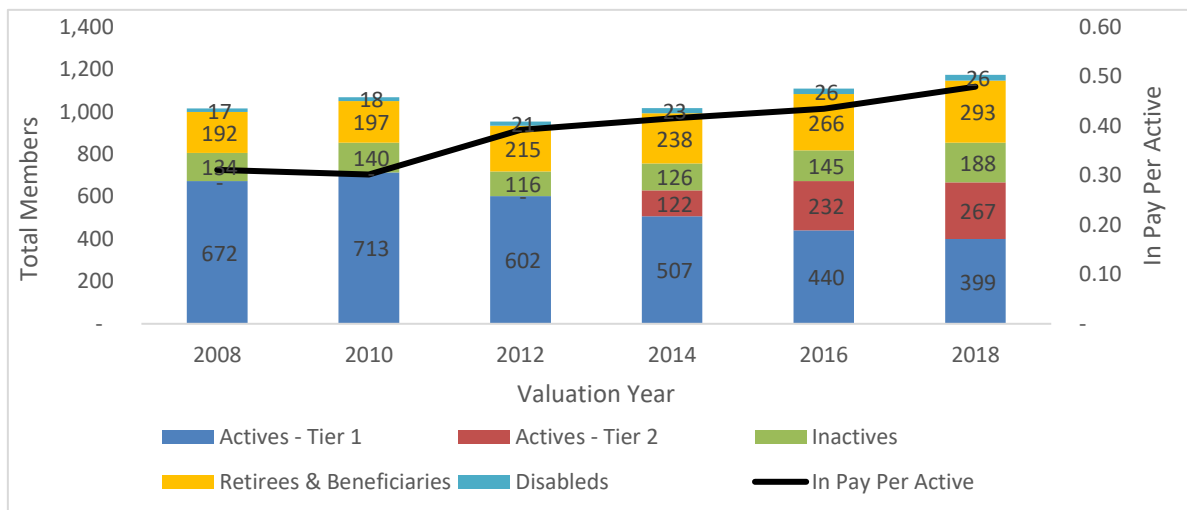


Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 1 - SUMMARY

A summary of principal valuation results from the current valuation and the prior valuation follows. Changes in actuarial assumptions and methods and Plan provisions are discussed below, as well as changes in census data and asset information.

Valuation Date	<u>1/1/2018</u>	<u>1/1/2016</u>	<u>Increase/ (Decrease)</u>
Summary of Member Data			
Active Members	666	672	(0.9%)
Average Age	49.2	48.7	1.1%
Average Service	10.9	10.8	0.6%
Valuation Salary	\$41,262,496	\$37,993,450	8.6%
Average Salary	\$61,956	\$56,538	9.6%
Retired Members and Beneficiaries			
Retired Members and Beneficiaries	293	266	10.2%
Average Age	71.6	71.0	0.8%
Total Annual Retirement Allowance	\$7,130,536	\$5,943,040	20.0%
Average Annual Retirement Allowance	\$24,336	\$22,342	8.9%
State Reimbursed COLAs	\$17,621	\$22,923	(23.1%)
Total System-Funded Retirement Allowance	\$7,112,915	\$5,920,117	20.1%
Disabled Members			
Disabled Members	26	26	0.0%
Average Age	62.1	63.0	(1.5%)
Total Annual Retirement Allowance	\$1,045,966	\$982,480	6.5%
Average Annual Retirement Allowance	\$40,229	\$37,788	6.5%
State Reimbursed COLAs	\$990	\$1,344	(26.3%)
Total System-Funded Retirement Allowance	\$1,044,976	\$981,136	6.5%
Inactive Members			
Inactive Members	188	145	29.7%
Annuity Savings Fund	\$2,283,407	\$1,790,199	27.6%



Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 1 - SUMMARY

Valuation Date	<u>1/1/2018</u>	<u>1/1/2016</u>	<u>Increase/ (Decrease)</u>
Funded Status - Market Value of Assets			
Actuarial Accrued Liability (AAL)	\$193,470,945	\$167,672,546	15.4%
Market Value of Assets (MVA)	\$155,586,109	\$121,844,510	27.7%
Unfunded Accrued Liability	\$37,884,836	\$45,828,036	(17.3%)
Funded Status	80.4%	72.7%	10.6%
Funded Status - Actuarial Value of Assets			
Actuarial Accrued Liability (AAL)	\$193,470,945	\$167,672,546	15.4%
Actuarial Value of Assets (AVA)	147,758,673	\$121,642,995	21.5%
Unfunded Accrued Liability	\$45,712,272	\$46,029,551	(0.7%)
Funded Status	76.4%	72.5%	5.4%
Normal Cost			
Total Normal Cost	\$5,918,030	\$5,203,131	13.7%
Employee Normal Cost	3,937,927	3,602,882	9.3%
Administrative Expenses	375,000	350,000	7.1%
Net Employer Normal Cost	\$2,355,103	\$1,950,249	20.8%
Appropriations			
Fiscal Year 2018	N/A	\$6,400,513	N/A
Fiscal Year 2019	\$6,720,539	\$6,720,539	0.0%
Fiscal Year 2020	\$7,130,492	\$7,078,252	0.7%
Fiscal Year 2021	\$7,565,452	\$7,455,007	1.5%

Actuarial Assumptions and Methods

Some Actuarial Assumptions and Methods used in this valuation have changed since the last valuation, including increasing the administrative expense assumption from \$350,000 to \$375,000, increasing the 3(8)(c) net transfer assumption from \$175,000 to \$200,000 and reducing the investment return rate from 7.75% to 7.5%. Changing these assumptions resulted in a net increase in the unfunded actuarial accrued liability of \$5,151,005 and an increase in the employer normal cost of \$277,294. The Actuarial Assumptions and Methods utilized in this valuation are detailed in Section 6, Actuarial Assumptions and Methods.

Plan Provisions

All Plan provisions used in this valuation are the same as those used in the prior valuation and are summarized in Section 5, Summary of Plan Provisions.

SECTION 1 - SUMMARY

Census Data

As of January 1, 2018, there are 666 active members who may be eligible for benefits in the future, 293 retirees and beneficiaries, 188 inactives and 26 disabled retirees. Summaries of the active, retired and disabled employees are included in Section 7, Demographic Information.

Assets

This valuation is based upon asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Dukes County Contributory Retirement Board. The market value of assets increased from \$121,844,510 as of December 31, 2015 to \$155,586,109 as of December 31, 2017. During the plan years ended 2016 and 2017, the market value rates of return were 7.94% and 17.50%, respectively.

The actuarial value of assets increased from \$121,642,995 as of January 1, 2016 to \$147,758,673 as of January 1, 2018. During the plan years ended 2016 and 2017, the rates of return on the actuarial value of assets were 8.64% and 9.94%, respectively.

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Asset information is reported annually to the Public Employee Retirement Administration Commission by the Dukes County Contributory Retirement System. The Market Value of Assets for the three most recent calendar years are as follows:

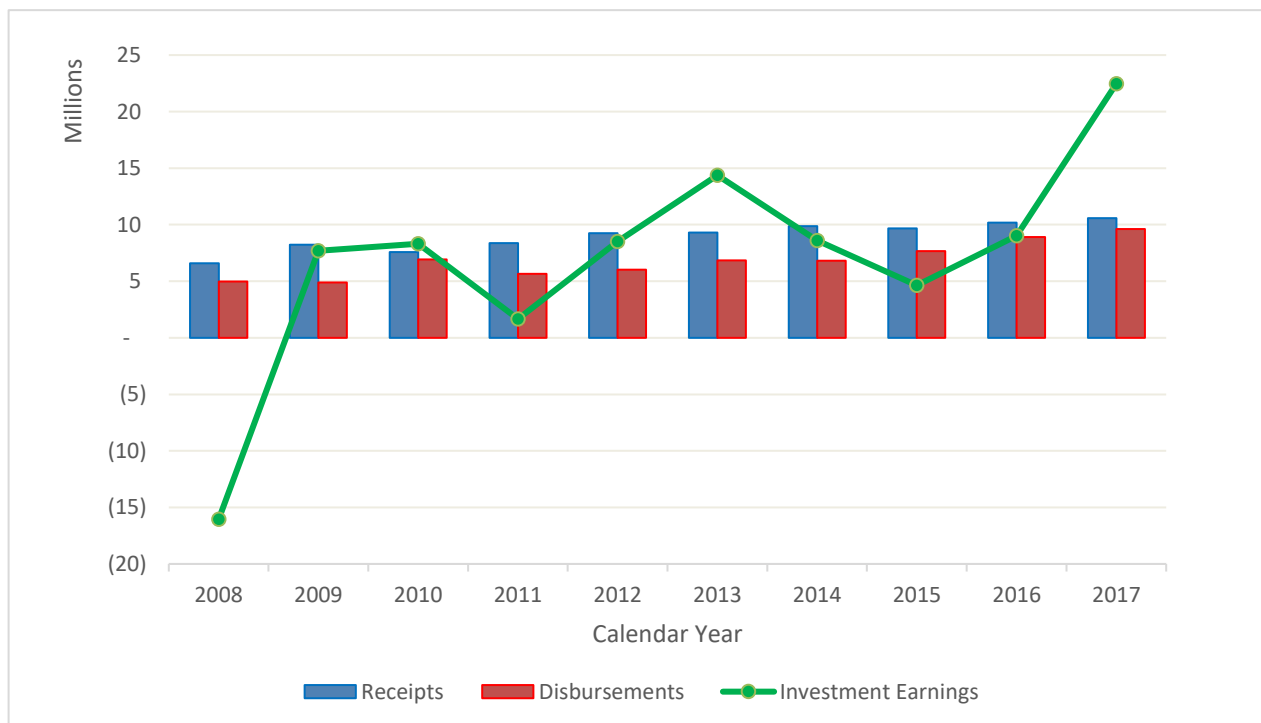
Calendar Year	2017	2016	2015
Trust Fund Composition at Year-End			
Cash	\$5,160,972	\$5,025,170	\$4,104,081
Short-Term Investments	0	0	0
Fixed Income Securities	13,947,194	13,431,898	12,925,671
Equities	38,055,637	30,909,981	28,430,271
Pooled Short Term Funds	0	0	0
Pooled Domestic Equity Funds	19,018,574	16,235,301	13,891,469
Pooled International Equity Funds	6,842,946	3,760,950	3,701,476
Pooled Global Equity Funds	0	0	0
Pooled Domestic Fixed Income Funds	0	0	0
Pooled International Fixed Income Funds	0	0	0
Pooled Global Fixed Income Funds	0	0	0
Pooled Alternative Investments	0	0	0
Pooled Real Estate Funds	12,179,800	11,232,911	10,473,908
Pooled Domestic Balanced Funds	0	0	0
Pooled International Balanced Funds	0	0	0
Hedge Funds	0	0	0
PRIT Cash	0	0	0
PRIT Fund	59,981,693	51,144,165	47,534,126
Interest Due & Accrued	58,902	77,072	53,614
Prepaid Expenses	0	0	0
Accounts Receivable	353,526	425,764	840,739
Land	0	0	0
Buildings	0	0	0
Accumulated Depreciation - Buildings	0	0	0
Accounts Payable	(13,135)	(95,870)	(110,845)
Total Market Value of Assets	\$155,586,109	\$132,147,342	\$121,844,510

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Calendar Year	2017	2016	2015
Funds			
Annuity Savings Fund	\$35,886,136	\$34,257,994	\$32,820,580
Annuity Reserve Fund	9,506,295	8,824,061	8,125,332
Special Military Service Fund	30,136	13,426	13,413
Pension Fund	8,479,646	9,070,196	136,012
Expense Fund	0	0	0
Pension Reserve Fund	101,683,896	79,981,665	80,749,173
Total Market Value of Assets	\$155,586,109	\$132,147,342	\$121,844,510
Asset Activity			
Market value as of Beginning of Year	\$132,147,342	\$121,844,510	\$115,193,525
Contributions and Receipts	10,584,908	10,188,855	9,668,417
Benefit Payments and Expenses	(9,617,774)	(8,918,717)	(7,665,399)
Investment Return	22,471,633	9,032,694	4,647,967
Market Value as of End of Year	\$155,586,109	\$132,147,342	\$121,844,510
Rate of Return			
	17.50%	7.94%	4.45%

Below are the receipts and disbursements during the last 10 years. The green line reflects investment gains and losses, which vacillate as investment markets fluctuate. Blue bars indicate contributions, from employees and employers, and red bars show benefit payments and administrative expenses.



Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

The Actuarial Value of Assets is the market value of assets as of the valuation date adjusted to phase in investment gains and losses over a 5-year period, further constrained to be within 20% of the market value of assets. Investment gains and losses are the excess or deficiency of the expected returns over the actual returns.

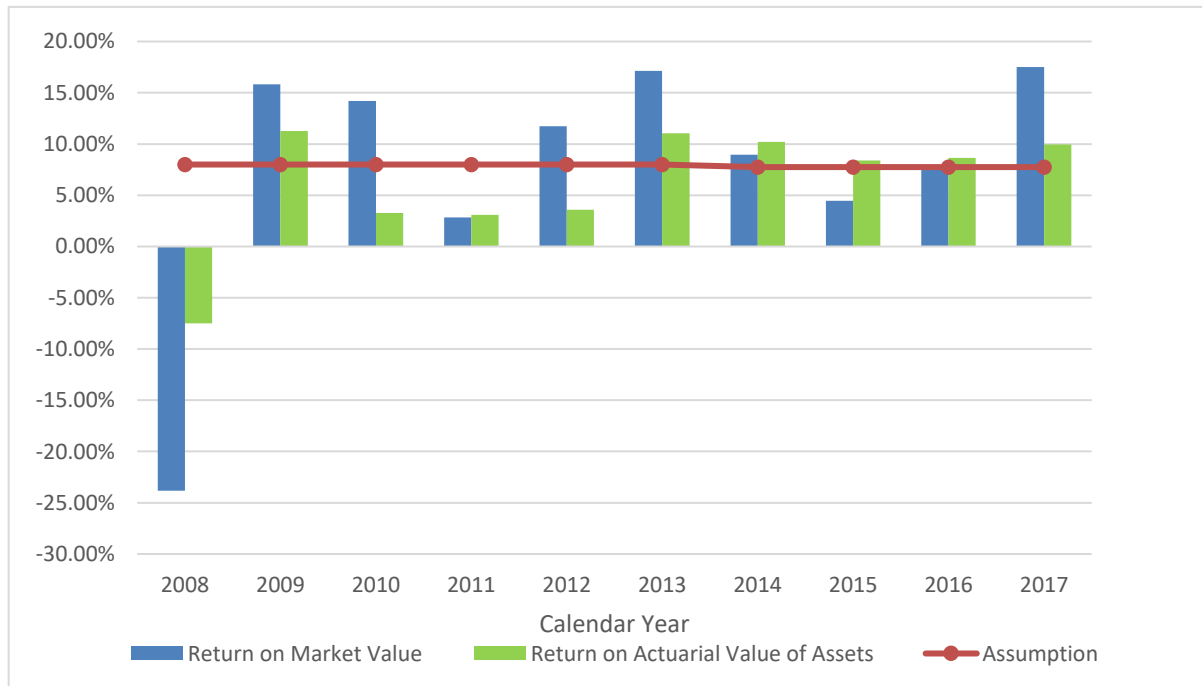
Valuation Date	1/1/2018	1/1/2017	1/1/2016
1. Market Value of Assets as of prior January 1	\$132,147,342	\$121,844,510	\$115,193,525
a. Prior Year Contributions and Receipts	10,584,908	10,188,855	9,668,417
b. Prior Year Benefit Payments and Expenses	(9,617,774)	(8,918,717)	(7,665,399)
c. Expected Investment Return Rate	7.75%	7.75%	7.75%
d. Expected Investment Return	10,278,895	9,492,167	9,005,115
e. Expected Market Value of Assets as of Valuation Date	\$143,393,371	\$132,606,815	\$126,201,658
2. Prior Year Gain / (Loss)			
a. Market Value of Assets as of January 1	\$155,586,109	\$132,147,342	\$121,844,510
b. Expected Market Value of Assets	143,393,371	132,606,815	126,201,658
c. Prior Year Gain / (Loss)	12,192,738	(459,473)	(4,357,148)
3. Phase-In of Asset Gains and Losses			
	Gain / (Loss)	Unrecognized Gain / (Loss)	Unrecognized Gain / (Loss)
a. 2017	\$12,192,738	\$9,754,190	-
b. 2016	(459,473)	(275,684)	(367,578)
c. 2015	(4,357,148)	(1,742,859)	(2,614,289)
d. 2014	458,946	91,789	183,578
e. 2013	7,335,115	-	1,467,023
f. 2012	2,389,094	-	-
g. Total deferred gains/(losses)		7,827,436	(1,331,266)
			201,515

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Valuation Date	1/1/2018	1/1/2017	1/1/2016
4. Actuarial Value of Assets			
a. Market Value of Assets	\$155,586,109	\$132,147,342	\$121,844,510
b. Deferred gains/(losses)	7,827,436	(1,331,266)	201,515
c. Market Value of Assets Less deferred gains/(losses)	\$147,758,673	\$133,478,608	\$121,642,995
d. 80% of Market Value of Assets	124,468,887	105,717,874	97,475,608
e. 120% of Market Value of Assets	186,703,331	158,576,810	146,213,412
f. Actuarial Value of Assets, a., but not less than b. and not greater than c.	\$147,758,673	\$133,478,608	\$121,642,995
g. Ratio of Actuarial Value of Assets to Market Value of Assets	94.97%	101.01%	99.83%
5. Rate of Return on Actuarial Value of Assets for Prior Calendar Year	9.94%	8.64%	8.41%

Below are the investment returns during the last 10 years. The red line reflects the investment return actuarial assumption. Blue bars indicate investment return rates on market value of assets, and green bars show investment return rates on actuarial value of assets.



Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.2 - Actuarial Present Value of Future Benefits

The **Actuarial Present Value of Future Benefits** is the present value of the cost to finance all benefits payable in the future, discounted to reflect the probability of payment and the time value of money. Below is the Actuarial Present Value of Future Benefits from the current valuation and the prior valuation:

Valuation Date	<u>1/1/2018</u>	<u>1/1/2016</u>
Actives	\$155,723,886	\$136,516,906
Retired Members and Beneficiaries	72,774,081	60,535,933
Disabled Members	12,487,774	11,456,586
Inactive Members	2,283,407	1,790,199
Total Present Value of Future Benefits	\$243,269,148	\$210,299,624

Exhibit 2.3 - Actuarial Accrued Liability

The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Future Benefits which is allocated to all periods prior to a valuation year and therefore is not provided for by future Normal Costs. Below is the Actuarial Accrued Liability from the current valuation and the prior valuation:

Valuation Date	<u>1/1/2018</u>	<u>1/1/2016</u>
Actives	\$105,925,683	\$93,889,828
Retired Members and Beneficiaries	72,774,081	60,535,933
Disabled Members	12,487,774	11,456,586
Inactive Members	2,283,407	1,790,199
Total Actuarial Accrued Liability	\$193,470,945	\$167,672,546

Exhibit 2.4 - Unfunded Actuarial Accrued Liability

Valuation Date	<u>1/1/2018</u>	<u>1/1/2016</u>
Unfunded Actuarial Accrued Liability		
a. Actuarial Accrued Liability	\$193,470,945	\$167,672,546
b. Actuarial Value of Assets	147,758,673	121,642,995
c. Unfunded Actuarial Accrued Liability (a. - b.)	\$45,712,272	\$46,029,551
d. Funded Ratio (b. divided by a.)	76.4%	72.5%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Below are the accrued liabilities, asset values (actuarial and market) and funded status during the last 10 years. The black solid line reflects the funded status on an actuarial value of assets (AVA) basis and the black dotted line reflects the funded status on a market value (MVA) basis. Blue bars indicate actuarial accrued liabilities, red bars indicate actuarial value of assets and green bars indicate market value of assets.

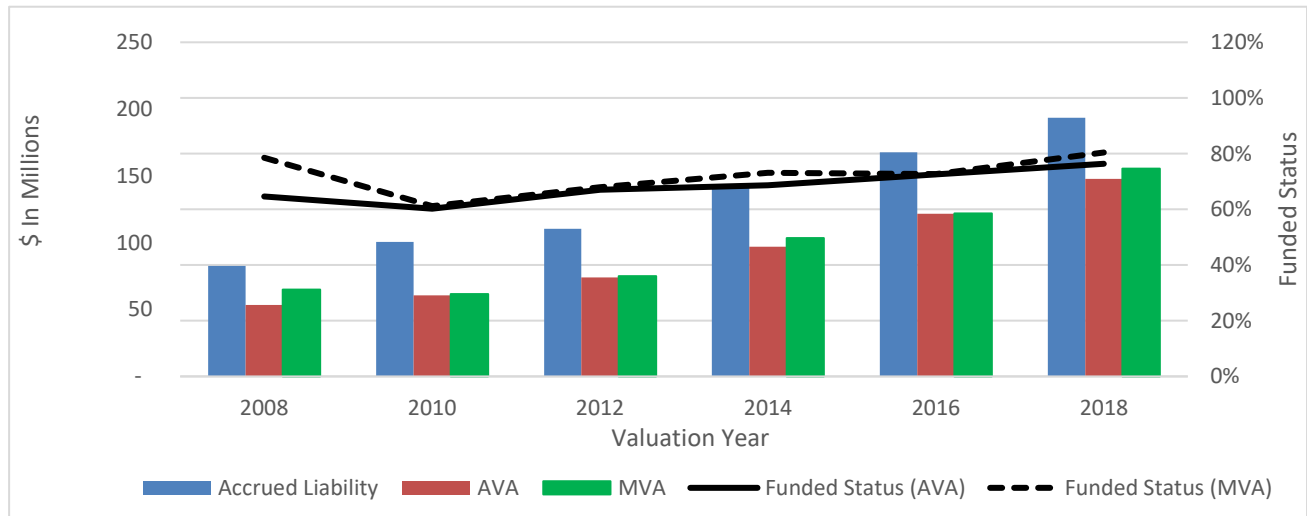


Exhibit 2.5 - Normal Cost

The **Normal Cost** is the portion of the Actuarial Present Value of Future Benefits which is allocated to a valuation year. Only active employees who have not reached Normal Retirement Age incur a Normal Cost. Below is the Normal Cost from the current valuation and the prior valuation:

Valuation Date	<u>1/1/2018</u>	<u>1/1/2016</u>
Total Normal Cost	\$5,918,030	\$5,203,131
As of Percentage of Salary	14.3%	13.7%
Employee Normal Cost	\$3,937,927	\$3,602,882
As of Percentage of Salary	9.5%	9.5%
Administrative Expenses	\$375,000	\$350,000
As a Percentage of Salary	0.9%	0.9%
Net Employer Normal Cost	\$2,355,103	\$1,950,249
As a Percentage of Salary	5.7%	5.1%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.6 - Actuarial Experience

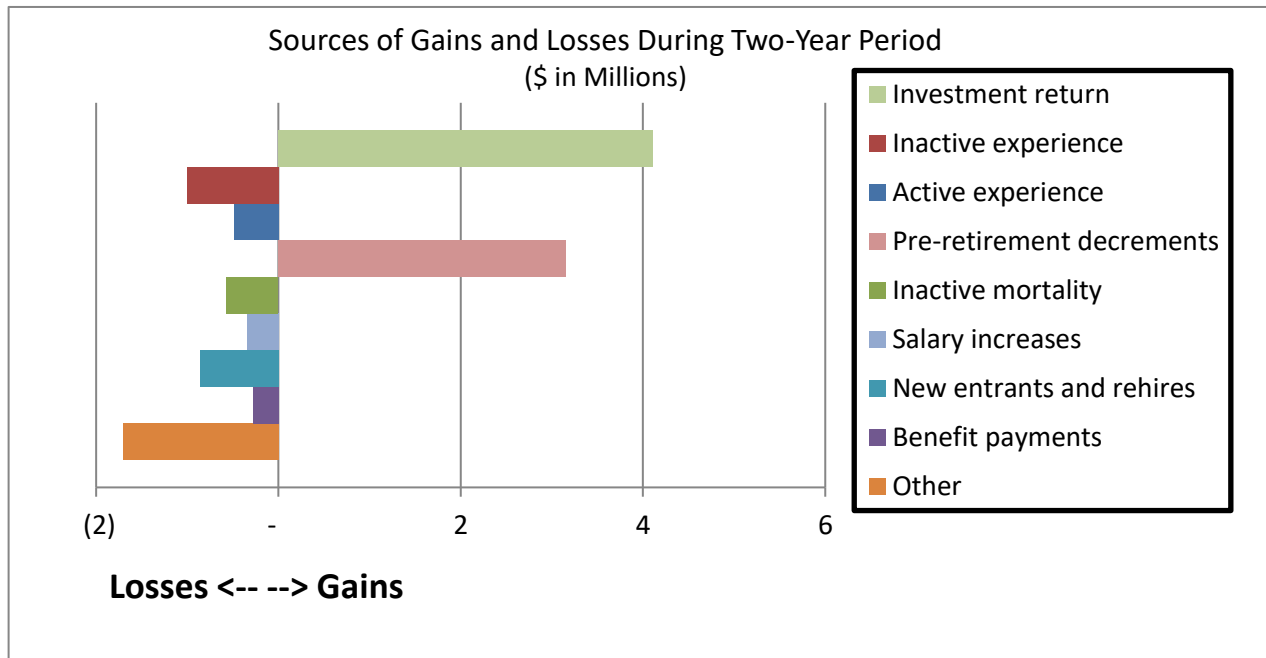
In performing the actuarial valuation, various assumptions are made regarding mortality, retirement, disability and withdrawal rates as well as salary increases and investment returns. A comparison of the results of the current valuation and the prior valuation is made to determine how closely actual experience relates to expected. During the two years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease by \$3,466,128. Below is the development of the Actuarial Gain for the current 2-year period:

Calendar Year Ending	<u>12/31/2017</u>	<u>12/31/2016</u>
Expected Unfunded Actuarial Accrued Liability		
a. Unfunded Actuarial Accrued Liability, beginning of year	\$44,619,542	\$46,029,551
b. Normal cost, beginning of year	\$5,086,719	5,203,131
c. Total contributions	10,584,908	10,188,855
d. Interest (full year on a. and b., one-half year on c.)	3,442,070	3,575,715
e. Expected Unfunded Actuarial Accrued Liability	\$42,563,423	\$44,619,542
f. Unfunded Actuarial Accrued Liability (before changes)	40,561,267	
g. (Gain)/Loss	(\$2,002,156)	
Asset (gain)/loss		
a. Actuarial value of assets, beginning of year	\$133,478,608	\$121,642,995
b. Contributions and Receipts	10,584,908	10,188,855
c. Benefit Payments and Expenses	(9,617,774)	(8,918,717)
d. Assumed rate of return (prior valuation)	7.75%	7.75%
e. Expected return	10,382,069	9,476,550
f. Actuarial value of assets, end of year	147,758,673	133,478,608
g. Actual return	13,312,931	10,565,475
h. Actual rate of return	9.94%	8.64%
i. Asset (gain)/loss	(\$2,930,862)	(\$1,088,925)
j. Total asset (gain)/loss, 2-year period	(\$4,104,179)	

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.6 - Actuarial Experience

Below are the various sources of gains and losses over the 2-year period. The asset gain during the period was \$4,104,179, and the total demographic loss during the period was \$2,102,023, which totals to an overall gain of \$2,002,156.



Actual Unfunded Actuarial Accrued Liability

a. Changes due to:	
i) Asset (gain)/loss	(\$4,104,179)
ii) (Gain)/loss from demographic experience	2,102,023
iii) (Gain)/loss prior to changes	(2,002,156)
iv) Plan change	-
v) Assumption change	5,151,005
vi) Total (gain)/loss (including changes)	3,148,849
b. Unfunded Actuarial Accrued Liability, end of year	\$45,712,272

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.1 - Annual Appropriations

The **Annual Appropriation** is determined in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws ("M.G.L."). The appropriation is comprised of the annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. Below are the details of the annual appropriations for the current and prior valuations, adjusted for semi-annual payments made each July 1 and January 1. The appropriations shown are based on the results of the valuations and do not account for any adjustments made to appropriations in the selected funding schedule.

Amortization Payments	<u>1/1/2018</u>	<u>1/1/2016</u>
a. Early Retirement Incentive Plan (2002)		
Fully Funded Year	2028	2028
Investment Return Rate	7.50%	7.75%
Balance as of valuation date	\$1,370,228	\$1,462,804
Amortization Amount	\$155,122	\$143,462
Increasing Rate	4.50%	4.50%
Remaining Payment Period (from Valuation date)	10	12
b. Early Retirement Incentive Plan (2003)		
Fully Funded Year	2028	2028
Investment Return Rate	7.50%	7.75%
Balance as of valuation date	\$473,044	\$505,004
Amortization Amount	\$53,553	\$49,527
Increasing Rate	4.50%	4.50%
Remaining Payment Period (from Valuation date)	10	12
c. Unfunded Actuarial Accrued Liability		
Fully Funded Year	2030	2030
Balance as of valuation date	\$43,869,000	\$44,061,743
Amortization Amount	\$4,251,209	\$3,811,407
Increasing Rate	4.50%	4.50%
Remaining Payment Period (from Valuation date)	12	14
d. Total Amortization Payments	\$4,459,884	\$4,004,396
Normal Cost	\$2,355,103	\$1,950,249
Net 3(8)(c) Transfers	\$189,472	\$165,501
Total Appropriation as of January 1	\$7,004,459	\$6,120,146
Adjusted for Payments as of July 1 and January 1	\$7,393,668	\$6,471,413

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibits 3.2 and 3.3 are based on the assumptions below:

Exhibit 3.2:

- The Employer Normal Cost is expected to increase 4% per year.
- The Unfunded Actuarial Accrued Liability ("UAL") is computed as of January 1 of each year assuming no future gains or losses.
- The Amortization Payment of UAL is an increasing payment at 4.5% paid over 12 years through 2030.
- The Amortization Payment of the Early Retirement Incentive Plan (2002) is an increasing payment at 4.5% paid over 10 year(s) through 2028.
- The Amortization Payment of the Early Retirement Incentive Plan (2003) is an increasing payment at 4.5% paid over 10 year(s) through 2028.
- Net 3(8)(c) transfers are a level dollar amount based on the net transfers expected to be paid by the Dukes County Contributory Retirement Board during the current year offset by the amount received during the same period.
- Total Employer Cost is the sum of the Employer Normal Cost, net 3(8)(c) transfers and the Amortization of the UAL (including ERIs), all computed as of January 1 of each year and adjusted for semi-annual payments made on July 1 and January 1.
- For fiscal year 2019, we show the actual appropriation developed under the previous funding schedule of \$6,720,539. For fiscal years 2020 and later, the Board has selected a funding schedule that fully amortizes the unfunded actuarial accrued liability by 2030, with annual employer costs limited to increases of 6.1% over the prior year.

Exhibit 3.3:

- Expected benefit payments include payments expected to be made to retired members, beneficiaries, disabled members and active members expected to retire. In addition, expected benefit payments include distribution of the annuity savings fund attributed to inactive members.
- Benefit payments exclude cost-of-living increases granted to members in pay status between 1982 and 1997. In addition, benefit payments are as expected for the first ten years of the forecast, then increase by the greater of 4.5% per year thereafter or the expected future payments for the current population projected by our computer model.
- Calendar year cash flow entries are developed as of each January 1.

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.2 - 30-Year Forecast of Annual Appropriations

Fiscal Year Ending	Employer Normal Cost	Amortization Payment of UAL	Amortization Payment of ERI 2002	Amortization Payment of ERI 2003	Net 3(8)(c) Transfers	Total Employer Cost	Increase over Prior Year	Unfunded Actuarial Accrued Liability
2019	\$2,485,967	\$3,814,301	\$163,742	\$56,529	\$200,000	\$6,720,539		\$45,712,272
2020	2,585,405	4,114,904	171,110	59,073	200,000	7,130,492	6.10%	45,031,839
2021	2,688,821	4,436,090	178,810	61,731	200,000	7,565,452	6.10%	43,984,142
2022	2,796,375	4,779,205	186,856	64,509	200,000	8,026,945	6.10%	42,520,220
2023	2,908,230	5,145,682	195,265	67,412	200,000	8,516,589	6.10%	40,586,047
2024	3,024,558	5,537,048	204,051	70,444	200,000	9,036,101	6.10%	38,122,068
2025	3,145,540	5,954,915	213,234	73,614	200,000	9,587,303	6.10%	35,062,683
2026	3,271,362	6,401,009	222,829	76,928	200,000	10,172,128	6.10%	31,335,704
2027	3,402,217	6,877,165	232,857	80,389	200,000	10,792,628	6.10%	26,861,748
2028	3,538,306	7,385,332	243,335	84,005	200,000	11,450,978	6.10%	21,553,584
2029	3,679,838	8,269,650	-	-	200,000	12,149,488	6.10%	15,315,433
2030	3,827,031	8,489,060	-	-	200,000	12,516,091	3.02%	8,042,188
2031	3,980,113	-	-	-	200,000	4,180,113	-66.60%	-
2032	4,139,317	-	-	-	200,000	4,339,317	3.81%	-
2033	4,304,889	-	-	-	200,000	4,504,889	3.82%	-
2034	4,477,085	-	-	-	200,000	4,677,085	3.82%	-
2035	4,656,169	-	-	-	200,000	4,856,169	3.83%	-
2036	4,842,415	-	-	-	200,000	5,042,415	3.84%	-
2037	5,036,111	-	-	-	200,000	5,236,111	3.84%	-
2038	5,237,556	-	-	-	200,000	5,437,556	3.85%	-
2039	5,447,058	-	-	-	200,000	5,647,058	3.85%	-
2040	5,664,941	-	-	-	200,000	5,864,941	3.86%	-
2041	5,891,538	-	-	-	200,000	6,091,538	3.86%	-
2042	6,127,199	-	-	-	200,000	6,327,199	3.87%	-
2043	6,372,287	-	-	-	200,000	6,572,287	3.87%	-
2044	6,627,179	-	-	-	200,000	6,827,179	3.88%	-
2045	6,892,266	-	-	-	200,000	7,092,266	3.88%	-
2046	7,167,957	-	-	-	200,000	7,367,957	3.89%	-
2047	7,454,675	-	-	-	200,000	7,654,675	3.89%	-
2048	7,752,862	-	-	-	200,000	7,952,862	3.90%	-

Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.3 - 30-Year Forecast of Cash Flow

Calendar Year	Market Value of Assets, BOY	Benefit Payments	Employee Contributions	Employer Contributions	Investment Return	Market Value of Assets, EOY
2018	\$155,586,109	\$11,979,173	\$3,937,927	\$6,366,764	\$11,992,591	\$165,904,218
2019	165,904,218	10,635,118	4,095,444	6,755,137	12,857,793	178,977,473
2020	178,977,473	11,546,571	4,259,262	7,167,200	13,847,299	192,704,663
2021	192,704,663	12,449,016	4,429,632	7,604,400	14,888,564	207,178,243
2022	207,178,243	13,370,345	4,606,817	8,068,268	15,987,612	222,470,595
2023	222,470,595	14,323,834	4,791,090	8,560,433	17,149,515	238,647,799
2024	238,647,799	15,231,822	4,982,734	9,082,619	18,382,293	255,863,623
2025	255,863,623	16,071,052	5,182,043	9,636,658	19,698,510	274,309,781
2026	274,309,781	16,912,162	5,389,325	10,224,495	21,110,064	294,121,503
2027	294,121,503	17,719,161	5,604,898	10,848,188	22,628,626	315,484,054
2028	315,484,054	18,565,512	5,829,094	11,509,928	24,265,524	338,523,088
2029	338,523,088	19,415,837	6,062,258	11,857,233	26,005,100	363,031,842
2030	363,031,842	20,289,550	6,304,748	3,960,068	27,236,391	380,243,498
2031	380,243,498	21,202,580	6,556,938	4,110,892	28,523,253	398,232,001
2032	398,232,001	22,156,696	6,819,216	4,267,748	29,868,046	417,030,315
2033	417,030,315	23,153,747	7,091,985	4,430,879	31,273,223	436,672,655
2034	436,672,655	24,195,666	7,375,664	4,600,536	32,741,327	457,194,516
2035	457,194,516	25,284,471	7,670,691	4,776,978	34,274,996	478,632,710
2036	478,632,710	26,422,272	7,977,519	4,960,478	35,876,968	501,025,402
2037	501,025,402	27,611,274	8,296,620	5,151,318	37,550,078	524,412,144
2038	524,412,144	28,853,781	8,628,485	5,349,792	39,297,265	548,833,905
2039	548,833,905	30,152,201	8,973,624	5,556,205	41,121,573	574,333,106
2040	574,333,106	31,509,050	9,332,569	5,770,874	43,026,152	600,953,651
2041	600,953,651	32,926,957	9,705,872	5,994,130	45,014,263	628,740,958
2042	628,740,958	34,408,670	10,094,107	6,226,316	47,089,278	657,741,989
2043	657,741,989	35,957,060	10,497,871	6,467,790	49,254,684	688,005,274
2044	688,005,274	37,575,128	10,917,786	6,718,923	51,514,081	719,580,936
2045	719,580,936	39,266,009	11,354,497	6,980,101	53,871,190	752,520,715
2046	752,520,715	41,032,979	11,808,677	7,251,726	56,329,847	786,877,986
2047	786,877,986	42,879,463	12,281,024	7,534,216	58,894,012	822,707,774

SECTION 4 - REQUIRED DISCLOSURES

Exhibit 4.1 - GASB 67 and GASB 68 Disclosures

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaced the requirements of Statement No. 27.

The new pension standards reflect changes from those currently in place regarding how governments calculate total pension liability and pension expense. Further, the new standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

GASB 67 requires defined benefit pension plans, such as the Dukes County Contributory Retirement System, to present a statement of fiduciary net position (pension plan assets) and a statement of changes in fiduciary net position. Further, the statement requires that notes to financial statements include descriptive information such as the types of benefits provided, the classes of plan members covered and the composition of the pension plan's retirement board. Finally, GASB 67 requires pension plans to present in required supplementary information the sources of the changes in the net pension liability and information about the actuarially determined contributions compared with the actual contributions made to the plan and related ratios.

GASB 67 and GASB 68 require projected benefit payments be discounted to their actuarial present value using the single rate that reflects:

- (1) a long-term expected rate of return on pension plan investments *to the extent that the pension plan's assets are sufficient to pay benefits and pension plan assets are expected to be invested using a strategy to achieve that return and*
- (2) a tax-exempt, high-quality municipal bond rate *to the extent that the conditions for use of the long-term expected rate of return are not met.*

GASB 68 establishes standards for measuring and recognizing liabilities, deferred outflows of resources, deferred inflows of resources and pension expense by state and local governments.

The effective date for GASB 67 is for plan years beginning after June 15, 2013, which is fiscal year ending December 31, 2014 for the Dukes County Contributory Retirement System. The effective date for GASB 68 is for employers' fiscal years beginning after June 15, 2014. The GASB report, submitted under separate cover and prepared as of December 31, 2017 (the measurement date), presents information to assist the Dukes County Contributory Retirement System in providing the required information under GASB 68 to participating employers.

SECTION 4 - REQUIRED DISCLOSURES

Exhibit 4.2 - PERAC Disclosure Information

The most recent actuarial valuation of the System was prepared by KMS Actuaries, LLC as of January 1, 2018.

The normal cost for employees on that date was:	\$3,937,927	9.5% of payroll
The normal cost for the employer was:	\$2,355,103	5.7% of payroll

The actuarial liability for active members was:	\$105,925,683
The actuarial liability for retired and inactive members was:	87,545,262
Total actuarial liability:	\$193,470,945
System assets as of that date:	\$147,758,673
Unfunded actuarial accrued liability:	\$45,712,272

The ratio of System assets to total actuarial accrued liability was: 76.4%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	7.50%
Rate of Salary Increase:	Based on service, 6% graded down to 4.25% for Group 1 Based on service, 7% graded down to 4.75% for Group 4

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Administration

There are 104 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws and other applicable statutes. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

Participation

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the local retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are four classes of membership in the Retirement System:

Group 1:	General employees, including clerical, administrative, technical and all other employees not otherwise classified.
Group 2:	Certain specified hazardous duty positions.
Group 3:	State police officers and inspectors.
Group 4:	Local police officers, firefighters and other specified hazardous positions.

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

Member Contributions

Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of Salary
1975 - 1983:	7% of Salary
1984 - June 30, 1996:	8% of Salary
July 1, 1996 - present:	9% of Salary
1979 - present:	An additional 2% of Salary in excess of \$30,000.
Group 1 members hired on or after April 2, 2012:	6% of Salary with 30 or more years of creditable service.

Rate of Interest

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least ten financial institutions.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Retirement Age	The mandatory retirement age for some Group 2 and Group 4 members is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for members in Group 1.
Salary	Gross regular compensation. This does not include bonuses, overtime, severance pay, unused sick leave credit or other similar compensation.
Average Salary	<p>Membership before April 2, 2012: Average annual rate of regular compensation received during the three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.</p> <p>Membership on or after April 2, 2012: Average annual rate of regular compensation received during the five consecutive years that produce the highest average, or, if greater, during the last five years (whether or not consecutive) preceding retirement.</p>
Creditable Service	The period during which a member contributes to the retirement system plus certain periods of military service and “purchased” service.
Benefit Rate	The benefit rate varies with the member's retirement age, Group, membership date and years of creditable service at retirement. Each year a member retires prior to the age at which the 2.5% maximum benefit rate applies, a reduction is applied to each year of age under the maximum age. The maximum age and reduction for each Group and membership date is as follows:

	Group 1	Group 2	Group 4
2.5% for Membership before April 2, 2012:			
Maximum age:	65	60	55
Reduction:	0.1%	0.1%	0.1%
2.5% for Membership on or after April 2, 2012 (less than 30 years of service):			
Maximum age:	67	62	57
Reduction:	0.15%	0.15%	0.15%
2.5% for Membership on or after April 2, 2012 (30+ years of service):			
Maximum age:	67	62	57
Reduction:	0.125%	0.125%	0.125%

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Superannuation Retirement	Eligibility if membership before April 2, 2012:	<ul style="list-style-type: none">• completion of 20 years of Creditable Service, or• attainment of age 55 if hired prior to 1978, or• attainment of age 55 with 10 years of Creditable Service, if hired after 1978.
	Eligibility if membership on or after April 2, 2012:	<ul style="list-style-type: none">• attainment of age 60 with 10 years of Creditable Service if classified in Group 1• attainment of age 55 with 10 years of Creditable Service if classified in Group 2• attainment of age 55 if classified in Group 4
	Benefit Amount	Product of the member's Benefit Rate, Average Salary and Creditable Service.
	Maximum Benefit	80% of the member's Average Salary.
	Veteran's Benefit	Additional benefit of \$15 per year of Creditable Service, up to a maximum of \$300.
Deferred Vested	Eligibility	<ul style="list-style-type: none">• completion of ten or more years of Creditable Service.• elected officials hired prior to 1978, completion of six years of Creditable Service.
	Benefit Amount	Accrued benefit payable commencing at age 55, or the completion of 20 years of Creditable Service, or may be deferred until later at the participant's option.
Withdrawal of Contributions		<p>Contributions may be withdrawn upon termination of employment.</p> <ul style="list-style-type: none">• Members hired on or after January 1, 1984 who terminate with less than ten years of Creditable Service receive contributions plus interest on the Annuity Savings Account at an annual rate of 3%.• All other withdrawals receive contributions plus 100% of the regular interest that has accrued to the Annuity Savings Account.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Ordinary Disability Retirement	Eligibility	Non-job related disability after completion of ten years of Creditable Service.
	Benefit Amount for Group 1 membership before April 2, 2012 or Group 2 or Group 4	Superannuation benefit determined if the member is age 55, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
	Benefit Amount for Group 1 membership on or after April 2, 2012	Superannuation benefit determined if the member is age 60, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
Accidental Disability Retirement	Eligibility	Disabled as a result of an accident in the performance of duties. There is no minimum age or service requirement.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of Creditable Service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$415 per year for each child.
Non-Occupational Death	Eligibility	For members with at least two years of creditable service who die while in active service, but not due to occupational injury.
	Benefit Amount	Benefit as if Option C had been elected. Minimum benefit of \$250 per month for surviving spouse, \$120 per month for first child and \$90 per month for each additional child.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Accidental Death	Eligibility	For members who die as a result of an occupational injury.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of creditable service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$708.60 per year for each child until age 18 (or age 22 if a full-time student).
Cost-of-Living Adjustment (COLA)	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 benefit payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$14,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the Commonwealth of Massachusetts and are not the liability of the Retirement System.	
Optional Forms of Payment	A member may elect to receive his or her retirement allowance, payable in monthly installments, in one of three forms of payment: <ul style="list-style-type: none">• Option A – Total annual allowance commencing at retirement and terminating at member's death.• Option B – A reduced annual allowance commencing at retirement with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member.• Option C – A reduced annual allowance commencing at retirement with 66⅔% of benefit continued to designated beneficiary upon death of member. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement.	

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Valuation Date January 1, 2018

Investment Return 7.50% per year. Previously, 7.75% per year.
 The investment return assumption is a long-term assumption based on capital market expectations by asset class, historical returns and professional judgment. We considered analysis prepared by the Board's investment advisors using a building block approach and using the target asset allocation, expected returns by asset class and risk analysis to determine a long-term expected average annual rate of return.

Annuity Savings Fund Interest Rate 2.00% per year

Amortization Method *Unfunded Actuarial Accrued Liability (UAL):*
 Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability to zero on or before June 30, 2030.

Early Retirement Incentive Program (ERI) for 2002:
 Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability attributable to the 2002 ERI to zero on or before June 30, 2028.

Early Retirement Incentive Programs (ERI) for 2003:
 Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability attributable to the 2003 ERI to zero on or before June 30, 2028.

Salary Scale The assumed annual rates for salary increases including longevity are illustrated by the following rates:

Years of Service	Groups 1 and 2	Group 4
0	6.00%	7.00%
1	5.50%	6.50%
2	5.50%	6.00%
3	5.25%	5.75%
4	5.25%	5.25%
5	4.75%	5.25%
6	4.75%	4.75%
7	4.50%	4.75%
8	4.50%	4.75%
9+	4.25%	4.75%

The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations and professional judgment.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Cost-of-Living Allowance Cost-of-Living Allowances (COLA) are assumed to be 3% of the pension amount, capped at \$420 per year.

Mortality Rates RP-2000 Mortality Table (base year 2009) with full generational mortality improvement using Scale BB. For disabled members, RP-2000 Mortality Table (base year 2012) with full generational mortality improvement using Scale BB.

General Employees: 55% of deaths are job-related.

Police and Fire: 90% of deaths are job-related.

The underlying tables with generational mortality improvement reasonably reflect the mortality experience of the System as of the valuation date based on historical and current demographic data. Further, PERAC reviewed a sampling of a few larger local retirement systems and compared the results with the results found in performing the analysis of the State Retirement System for years 2012 - 2014. For the State Retirement System analysis, the mortality assumptions reflect the recent experience study published in 2014.

Turnover Rates Illustrative turnover rates are shown below:

Creditable Service	Groups 1 and 2	Group 4
0	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

Disability Rates Illustrative disability rates are shown below:

Attained Age	Groups 1 and 2	Group 4
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125
60	0.0028	0.0085

General Employees: 55% of disabilities are accidental and 45% are ordinary.

Police and Fire: 90% of disabilities are accidental and 10% are ordinary.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Retirement Rates

Illustrative retirement rates are shown below:

Age	Groups 1 and 2		Group 4
	Male	Female	Male & Female
50	0.0100	0.0150	0.0200
51	0.0100	0.0150	0.0200
52	0.0100	0.0200	0.0200
53	0.0100	0.0250	0.0500
54	0.0200	0.0250	0.0750
55	0.0200	0.0550	0.1500
56	0.0250	0.0650	0.1000
57	0.0250	0.0650	0.1000
58	0.0500	0.0650	0.1000
59	0.0650	0.0650	0.1500
60	0.1200	0.0500	0.2000
61	0.2000	0.1300	0.2000
62	0.3000	0.1500	0.2500
63	0.2500	0.1250	0.2500
64	0.2200	0.1800	0.3000
65	0.4000	0.1500	1.0000
66	0.2500	0.2000	1.0000
67	0.2500	0.2000	1.0000
68	0.3000	0.2500	1.0000
69	0.3000	0.2000	1.0000
70	1.0000	1.0000	1.0000

The turnover, disability and retirement rates are based on PERAC's most recent experience analysis of local retirement systems which reviewed age, gender and job group. The assumptions reflect this analysis as well as professional judgment.

Actuarial Cost Method

Individual Entry Age Normal.

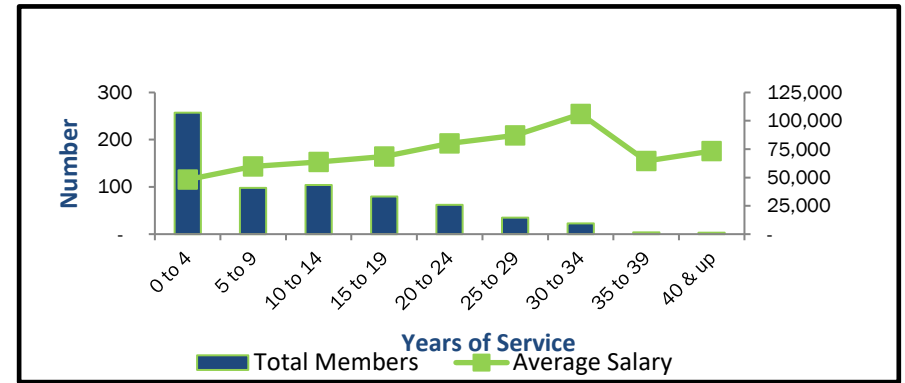
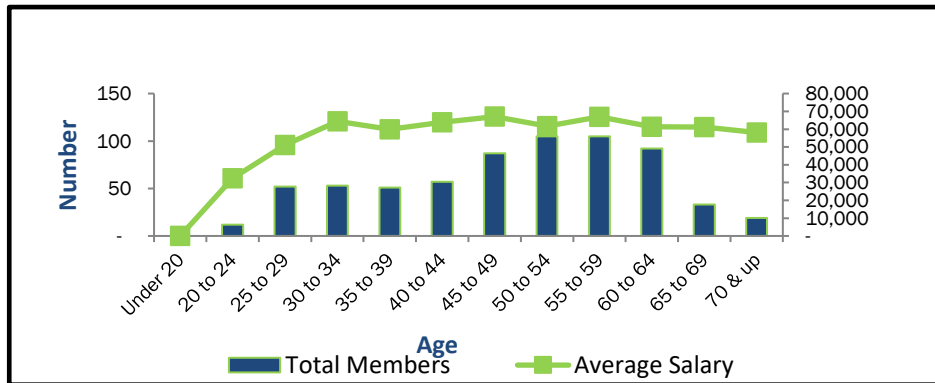
SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Asset Method	<p>The Actuarial Value of Assets is the market value of assets as of the valuation date reduced by the sum of:</p> <ul style="list-style-type: none">a) 80% of gains and losses of the prior year,b) 60% of gains and losses of the second prior year,c) 40% of gains and losses of the third prior year, andd) 20% of gains and losses of the fourth prior year. <p>Investment gains and losses are determined by the excess or deficiency of the expected return over the actual return on the market value. The actuarial valuation of assets is further constrained to be not less than 80% or more than 120% of market value.</p>
Census Data	<p>Census data as of the valuation date were submitted by the Retirement Board.</p>
Asset Data	<p>Asset information is reported annually to the Public Employee Retirement Administration Commission by the Dukes County Contributory Retirement System.</p>
Dependents	<p>80% of all members will be survived by a spouse. Age assumption for spouses is that males are assumed to be three years older than females.</p>
Net Section 3(8)(c) Transfers	<p>Reimbursements paid to and received from other retirement systems for that portion of a retiree's pension that is based on service earned in another retirement system. Net 3(8)(c) transfers are assumed to be \$200,000 per year. Previously, \$175,000 per year.</p>
Administrative Expenses	<p>The anticipated administrative expenses for the fiscal year. For the current valuation, the administrative expenses were assumed to be \$375,000 and are anticipated to increase 4% per year. Previously, \$350,000 as of the prior valuation date.</p> <p>The administrative expense assumption is based on information relating to the System's administrative expenses provided by the Retirement System.</p>

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.1 - ACTIVE MEMBERS BY AGE and YEARS OF SERVICE AS OF JANUARY 1, 2018

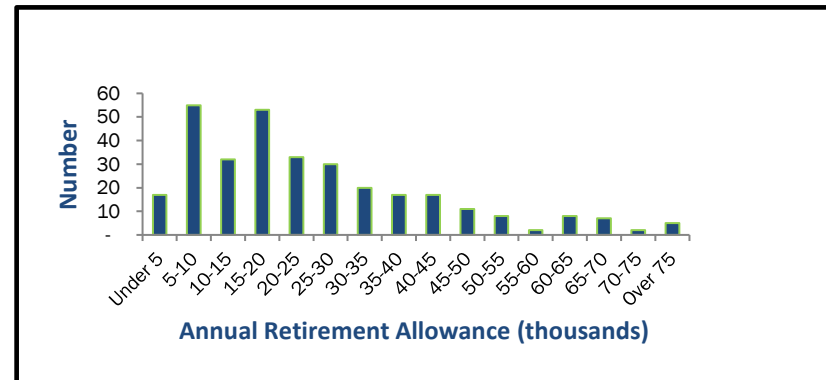
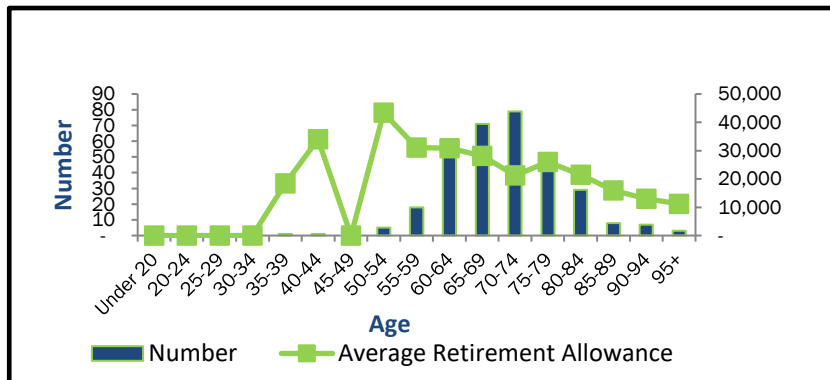
Age	Years of Service									Total	Total Salary	Average Salary	
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up				
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	-
20 to 24	12	-	-	-	-	-	-	-	-	-	12	389,026	32,419
25 to 29	52	-	-	-	-	-	-	-	-	-	52	2,660,624	51,166
30 to 34	34	16	3	-	-	-	-	-	-	-	53	3,412,755	64,392
35 to 39	25	15	9	2	-	-	-	-	-	-	51	3,058,570	59,972
40 to 44	21	12	13	7	4	-	-	-	-	-	57	3,637,295	63,812
45 to 49	26	19	14	13	13	1	1	-	-	-	87	5,831,279	67,026
50 to 54	34	14	17	15	10	10	5	-	-	-	105	6,487,178	61,783
55 to 59	30	12	21	11	15	10	6	-	-	-	105	7,021,354	66,870
60 to 64	16	7	16	23	11	12	4	2	1	-	92	5,642,082	61,327
65 to 69	6	2	7	5	6	1	5	1	-	-	33	2,016,614	61,110
70 & up	1	1	4	4	3	1	2	1	2	-	19	1,105,720	58,196
Total	257	98	104	80	62	35	23	4	3	666	41,262,496	61,956	
Average Salary	48,098	59,675	63,805	68,465	80,199	87,203	106,001	64,558	73,164				
Average Age:							49.24		Average Service:		10.87		



SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.2 - Retired Plan Members and Beneficiaries Annual Pensions as of January 1, 2018

Attained Age	Service Retirements		Disability Retirements		Beneficiaries	
	Number	Annual Retirement Allowance	Number	Annual Retirement Allowance	Number	Annual Retirement Allowance
Under 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	1	18,440	0	0
40-44	0	0	1	33,997	0	0
45-49	0	0	0	0	0	0
50-54	2	142,175	1	42,496	2	32,141
55-59	11	312,359	6	232,966	1	15,113
60-64	45	1,294,772	6	329,700	4	72,498
65-69	61	1,686,127	7	293,068	3	20,267
70-74	70	1,507,077	3	77,485	6	98,678
75-79	40	1,073,354	1	17,814	1	1,925
80-84	25	550,364	0	0	4	72,240
85-89	7	119,141	0	0	1	7,969
90-94	6	64,549	0	0	1	26,316
95+	1	4,087	0	0	2	29,384
Total	268	6,754,005	26	1,045,966	25	376,531
Average Age	71.4		62.1		73.7	
Average Retirement Allowance		25,202		40,229		15,061



Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 8 - GLOSSARY OF TERMS

Actuarial Accrued Liability – That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions – Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the commencement, amount and duration of pension benefits, such as: changes in compensation, mortality, withdrawal, disablement and retirement; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

Actuarial Cost Method (or Funding Method) – A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the current year (Normal Cost) and the past (Actuarial Accrued Liability).

Actuarial Gain or Loss (or Experience Gain or Loss) – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between the valuation date and the most recent immediately preceding valuation date.

Actuarial Present Value – The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

Amortization Payment – That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

Annual Statement – The statement submitted by the local retirement board to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Reserve Fund – The fund into which total accumulated Member Contributions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Annuity Savings Fund – The fund in which Member Contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Assets – The total value of the investments held by the Plan trust that are for the payment of promised benefits. Employer appropriations and Member Contributions, as well as investment earnings, are added to the Plan trust. Benefit payments and other disbursements are withdrawn from the Plan trust. For valuation purposes, assets are usually measured at market value.

Cost of Benefits – The estimated payment from the pension system for benefits for the fiscal year.

Expense Fund – The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

SECTION 8 - GLOSSARY OF TERMS

Funded Ratio – The Actuarial Value of Assets expressed as a percentage of the Actuarial Accrued Liability.

Funding Schedule – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22D of M.G.L. Chapter 32.

GASB – Governmental Accounting Standards Board.

Normal Cost – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is expected to accrue in the current fiscal year. The Employee Normal Cost is the amount of the expected Member Contributions for the current fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

Pension Fund – The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund – The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

Present Value of Future Benefits – The actuarial present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value of money and the probabilities of payment.

Special Fund for Military Service Credit – The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

Total Pension Liability – The portion of the Actuarial Present Value attributable to past service in accordance with the Entry Age cost method as stipulated by GASB Statement Number 67 (GASB 67).

Unfunded Actuarial Accrued Liability – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

SECTION 9 - MEMBER UNIT FY2020 APPROPRIATION

		FY2020 Appropriation								
		Actuarial Allocation Method								
Unit	Unit Name	Normal Cost	Amortization of UAL	2002 ERI	2003 ERI	Net 3(8)(c) Transfers	Total FY2020 Appropriation	FY2019 Appropriation	Increase over 2019	Payment on 7/1/2019
1	Up-Island School	77,206	135,218	2,872	-	7,216	222,512	218,620		218,561
2	Dukes County	188,120	276,062	25,073	4,528	20,045	513,828	501,660		504,704
3	Tisbury	419,407	734,346	43,942	-	39,423	1,237,118	1,201,127		1,215,150
4	Edgartown	566,634	1,049,568	31,868	20,763	48,730	1,717,563	1,572,582		1,687,064
5	Oak Bluffs	448,500	716,181	21,238	9,012	38,163	1,233,094	1,110,013		1,211,198
6	West Tisbury	216,982	282,419	11,647	5,644	10,917	527,609	513,618		518,240
7	Chilmark	139,353	188,075	14,718	7,793	6,970	356,909	368,063		350,571
8	Aquinnah	99,385	91,018	-	-	3,958	194,361	185,643		190,910
9	Gosnold	13,843	19,988	-	-	857	34,688	32,020		34,072
10	MV Transit Authority	20,859	37,127	-	-	-	57,986	40,841		56,956
11	MV Regional School	290,663	325,449	19,752	-	15,695	651,559	600,109		639,989
12	MV Landbank	12,800	66,252	-	5,709	1,508	86,269	76,888		84,737
13	MV Refuse	29,959	56,826	-	-	977	87,762	85,103		86,204
14	MV Commission	43,963	86,198	-	5,624	4,366	140,151	138,961		137,663
15	OB Water Dept	17,731	50,177	-	-	1,175	69,083	75,291		67,856
Total		2,585,405	4,114,904	171,110	59,073	200,000	7,130,492	6,720,539	6.10%	7,003,875

Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 9 - MEMBER UNIT FY2021 APPROPRIATION

Unit	Unit Name	FY2021 Appropriation						FY2020 Appropriation	Increase over 2020	Payment on 7/1/2020
		Actuarial Allocation Method								
		Normal Cost	Amortization of UAL	2002 ERI	2003 ERI	Net 3(8)(c) Transfers	Total FY2021 Appropriation			
1	Up-Island School	80,295	145,773	3,001	-	6,508	235,577	222,512	231,893	
2	Dukes County	195,645	297,610	26,201	4,732	13,531	537,719	513,828	535,491	
3	Tisbury	436,183	791,665	45,921	-	35,309	1,309,078	1,237,118	1,289,274	
4	Edgartown	589,299	1,131,491	33,302	21,697	50,877	1,826,666	1,717,563	1,789,975	
5	Oak Bluffs	466,439	772,082	22,194	9,418	34,637	1,304,770	1,233,094	1,285,081	
6	West Tisbury	225,662	304,463	12,171	5,898	13,912	562,106	527,609	549,853	
7	Chilmark	144,927	202,755	15,380	8,144	9,449	380,655	356,909	371,956	
8	Aquinnah	103,360	98,122	-	-	4,482	205,964	194,361	202,555	
9	Gosnold	14,397	21,548	-	-	962	36,907	34,688	36,150	
10	MV Transit Authority	21,693	40,025	-	-	1,741	63,459	57,986	60,431	
11	MV Regional School	302,289	350,852	20,640	-	15,818	689,599	651,559	679,029	
12	MV Landbank	13,312	71,423	-	5,966	3,309	94,010	86,269	89,906	
13	MV Refuse	31,157	61,262	-	-	2,721	95,140	87,762	91,462	
14	MV Commission	45,722	92,926	-	5,876	4,341	148,865	140,151	146,060	
15	OB Water Dept	18,441	54,093	-	-	2,403	74,937	69,083	71,995	
Total		2,688,821	4,436,090	178,810	61,731	200,000	7,565,452	7,130,492	6.10%	7,431,111

Dukes County Contributory Retirement System
Actuarial Valuation as of January 1, 2018

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Up-Island School	Dukes County	Tisbury	Edgartown	Oak Bluffs	West Tisbury
Summary of Member Data						
Active Members	38	32	101	113	83	28
Average Age	45.3	47.1	51.6	52.0	48.3	54.2
Groups 1 & 2 Average Service	8.3	9.3	11.0	12.5	9.1	13.1
Salary	1,538,227	2,135,879	5,493,320	6,584,914	4,200,336	1,816,479
Average Salary	40,480	66,746	54,389	58,274	50,606	64,874
Group 4 Active Members	0	7	11	24	26	9
Average Age	0.0	49.0	43.1	43.9	38.6	45.2
Average Service	0.0	12.0	12.8	15.7	11.5	18.0
Salary	0	500,796	1,101,711	2,680,248	2,532,429	941,496
Average Salary	0	71,542	100,156	111,677	97,401	104,611
Retired Members and Survivors	16	25	57	60	52	17
Annual Pensions	243,626	666,394	1,526,137	1,710,030	1,210,490	446,307
Average Age	67.6	71.8	72.1	71.8	70.8	72.6
Average Pension	15,227	26,656	26,774	28,501	23,279	26,253
Disabled Members	1	5	3	6	8	0
Annual Pensions	51,373	153,108	85,572	282,194	349,689	0
Average Age	62.1	64.9	54.1	62.7	60.7	0.0
Average Pension	51,373	30,622	28,524	47,032	43,711	0
Inactive Members	26	8	32	25	43	8
Annuity Savings Fund	129,428	113,627	568,472	375,446	263,102	129,242

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Up-Island School	Dukes County	Tisbury	Edgartown	Oak Bluffs	West Tisbury
Actuarial Accrued Liability - January 1, 2018						
Active Employees	2,764,512	5,159,459	17,468,724	27,877,243	16,067,131	8,925,303
Retired Members and Survivors	2,690,425	6,531,201	15,489,820	17,124,440	12,650,941	4,394,414
Disabled Members	619,516	1,742,861	1,094,646	3,444,980	4,240,754	0
Inactive Members	129,428	113,627	568,472	375,446	263,102	129,242
Total	6,203,881	13,547,148	34,621,662	48,822,109	33,221,928	13,448,959
Actuarial Value of Plan Assets - January 1, 2018						
Actuarial Value of Assets	4,738,061	10,346,301	26,441,443	37,286,685	25,372,430	10,271,311
Unfunded Actuarial Accrued Liability						
Unfunded Actuarial Accrued Liability	1,442,824	2,963,804	7,828,328	11,113,970	7,607,258	3,039,184
ERI 2002	22,996	200,781	351,891	255,194	170,074	93,267
ERI 2003	0	36,262	0	166,260	72,166	45,197
Total	1,465,820	3,200,847	8,180,219	11,535,424	7,849,498	3,177,648
Normal Cost - January 1, 2018						
Total Normal Cost	200,427	409,937	933,070	1,292,845	1,001,128	431,312
Administrative Expenses	12,700	25,976	59,125	81,922	63,437	27,330
Total Normal Cost	213,127	435,913	992,195	1,374,767	1,064,565	458,642
Employee Normal Cost	(142,798)	(264,550)	(610,148)	(858,608)	(656,017)	(260,988)
Employer Normal Cost	70,329	171,363	382,047	516,159	408,548	197,654
Employer Normal Cost as % of Salary	4.57%	6.50%	5.79%	5.57%	6.07%	7.17%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Up-Island School	Dukes County	Tisbury	Edgartown	Oak Bluffs	West Tisbury
2019 Appropriation						
Non-ERI Appropriation	215,872	473,334	1,159,076	1,522,218	1,081,065	497,072
ERI 2002	2,748	23,993	42,051	30,496	20,324	11,145
ERI 2003	0	4,333	0	19,868	8,624	5,401
Total Appropriation	218,620	501,660	1,201,127	1,572,582	1,110,013	513,618
2020 Appropriation						
Actuarial Allocation Method:						
Employer Normal Cost	77,206	188,120	419,407	566,634	448,500	216,982
Amortization Payment of UAL	135,218	276,062	734,346	1,049,568	716,181	282,419
ERI 2002	2,872	25,073	43,942	31,868	21,238	11,647
ERI 2003	0	4,528	0	20,763	9,012	5,644
Net 3(8)(c) Transfers	7,216	20,045	39,423	48,730	38,163	10,917
Total Appropriation	222,512	513,828	1,237,118	1,717,563	1,233,094	527,609
2020 Appropriation Increase over 2019	1.78%	2.43%	3.00%	9.22%	11.09%	2.72%
2021 Appropriation						
Actuarial Allocation Method:						
Employer Normal Cost	80,295	195,645	436,183	589,299	466,439	225,662
Amortization Payment of UAL	145,773	297,610	791,665	1,131,491	772,082	304,463
ERI 2002	3,001	26,201	45,921	33,302	22,194	12,171
ERI 2003	0	4,732	0	21,697	9,418	5,898
Net 3(8)(c) Transfers	6,508	13,531	35,309	50,877	34,637	13,912
Total Appropriation	235,577	537,719	1,309,078	1,826,666	1,304,770	562,106
2021 Appropriation Increase over 2020	5.87%	4.65%	5.82%	6.35%	5.81%	6.54%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Chilmark	Aquinnah	Gosnold	MV Transit Authority	MV Regional School
Summary of Member Data					
Active Members	31	13	5	9	89
Average Age	51.4	50.4	59.5	48.5	49.7
Groups 1 & 2 Average Service	10.2	7.0	16.6	10.8	7.7
Salary	1,868,804	638,663	157,402	666,223	4,740,369
Average Salary	60,284	49,128	31,480	74,025	53,263
Group 4 Active Members	6	4	0	0	0
Average Age	41.5	47.8	0.0	0.0	0.0
Average Service	14.1	18.8	0.0	0.0	0.0
Salary	500,031	408,815	0	0	0
Average Salary	83,339	102,204	0	0	0
Retired Members and Survivors	16	5	4	0	29
Annual Pensions	284,964	111,248	35,045	0	568,194
Average Age	70.8	72.8	75.1	0.0	72.8
Average Pension	17,810	22,250	8,761	0	19,593
Disabled Members	0	1	0	0	2
Annual Pensions	0	50,564	0	0	73,466
Average Age	0.0	64.9	0.0	0.0	69.1
Average Pension	0	50,564	0	0	36,733
Inactive Members	6	1	0	4	32
Annuity Savings Fund	159,902	864	0	123,938	372,492

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Chilmark	Aquinnah	Gosnold	MV Transit Authority	MV Regional School
Actuarial Accrued Liability - January 1, 2018					
Active Employees	6,048,988	2,606,829	589,680	1,509,380	8,660,775
Retired Members and Survivors	3,156,504	1,036,094	313,242	0	5,695,238
Disabled Members	0	561,553	0	0	783,464
Inactive Members	159,902	864	0	123,938	372,492
Total	9,365,394	4,205,340	902,922	1,633,318	15,511,969
Actuarial Value of Plan Assets - January 1, 2018					
Actuarial Value of Assets	7,152,589	3,211,725	689,584	1,247,406	11,846,885
Unfunded Actuarial Accrued Liability					
Unfunded Actuarial Accrued Liability	2,032,542	993,615	213,338	385,912	3,506,916
ERI 2002	117,857	0	0	0	158,168
ERI 2003	62,406	0	0	0	0
Total	2,212,805	993,615	213,338	385,912	3,665,084
Normal Cost - January 1, 2018					
Total Normal Cost	336,610	182,196	24,898	81,708	677,221
Administrative Expenses	21,330	11,545	1,578	5,177	42,913
Total Normal Cost	357,940	193,741	26,476	86,885	720,134
Employee Normal Cost	(231,000)	(103,209)	(13,866)	(67,884)	(455,363)
Employer Normal Cost	126,940	90,532	12,610	19,001	264,771
Employer Normal Cost as % of Salary	5.36%	8.64%	8.01%	2.85%	5.59%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Chilmark	Aquinnah	Gosnold	MV Transit Authority	MV Regional School
2019 Appropriation					
Non-ERI Appropriation	346,521	185,643	32,020	40,841	581,208
ERI 2002	14,084	0	0	0	18,901
ERI 2003	7,458	0	0	0	0
Total Appropriation	368,063	185,643	32,020	40,841	600,109
2020 Appropriation					
Actuarial Allocation Method:					
Employer Normal Cost	139,353	99,385	13,843	20,859	290,663
Amortization Payment of UAL	188,075	91,018	19,988	37,127	325,449
ERI 2002	14,718	0	0	0	19,752
ERI 2003	7,793	0	0	0	0
Net 3(8)(c) Transfers	6,970	3,958	857	0	15,695
Total Appropriation	356,909	194,361	34,688	57,986	651,559
2020 Appropriation Increase over 2019	-3.03%	4.70%	8.33%	41.98%	8.57%
2021 Appropriation					
Actuarial Allocation Method:					
Employer Normal Cost	144,927	103,360	14,397	21,693	302,289
Amortization Payment of UAL	202,755	98,122	21,548	40,025	350,852
ERI 2002	15,380	0	0	0	20,640
ERI 2003	8,144	0	0	0	0
Net 3(8)(c) Transfers	9,449	4,482	962	1,741	15,818
Total Appropriation	380,655	205,964	36,907	63,459	689,599
2021 Appropriation Increase over 2020	6.65%	5.97%	6.40%	9.44%	5.84%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	MV Landbank	MV Refuse	MV Commission	OB Water Dept	Total
Summary of Member Data					
Active Members	7	10	10	10	579
Average Age	50.4	49.3	51.0	47.2	50.2
Groups 1 & 2 Average Service	16.9	13.4	11.7	11.4	10.4
Salary	635,058	661,163	831,196	628,936	32,596,969
Average Salary	90,723	66,116	83,120	62,894	56,299
Active Members	0	0	0	0	87
Average Age	0.0	0.0	0.0	0.0	42.8
Group 4 Average Service	0.0	0.0	0.0	0.0	14.0
Salary	0	0	0	0	8,665,526
Average Salary	0	0	0	0	99,604
Retired Members and Survivors	2	2	6	2	293
Annual Pensions	61,634	39,944	178,487	48,034	7,130,534
Average Age	65.7	71.5	71.0	73.4	71.6
Average Pension	30,817	19,972	29,748	24,017	24,336
Disabled Members	0	0	0	0	26
Annual Pensions	0	0	0	0	1,045,966
Average Age	0.0	0.0	0.0	0.0	62.1
Average Pension	0	0	0	0	40,229
Inactive Members	0	2	0	1	188
Annuity Savings Fund	0	46,042	0	852	2,283,407

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	MV Landbank	MV Refuse	MV Commission	OB Water Dept	Total
Actuarial Accrued Liability - January 1, 2018					
Active Employees	2,369,616	2,129,176	1,996,582	1,752,285	105,925,683
Retired Members and Survivors	735,072	377,868	2,077,274	501,548	72,774,081
Disabled Members	0	0	0	0	12,487,774
Inactive Members	0	46,042	0	852	2,283,407
Total	3,104,688	2,553,086	4,073,856	2,254,685	193,470,945
Actuarial Value of Plan Assets - January 1, 2018					
Actuarial Value of Assets	2,371,129	1,949,857	3,111,307	1,721,960	147,758,673
Unfunded Actuarial Accrued Liability					
Unfunded Actuarial Accrued Liability	687,838	603,229	917,517	532,725	43,869,000
ERI 2002	0	0	0	0	1,370,228
ERI 2003	45,721	0	45,032	0	473,044
Total	733,559	603,229	962,549	532,725	45,712,272
Normal Cost - January 1, 2018					
Total Normal Cost	70,232	86,137	117,186	73,123	5,918,030
Administrative Expenses	4,450	5,458	7,426	4,633	375,000
Total Normal Cost	74,682	91,595	124,612	77,756	6,293,030
Employee Normal Cost	(63,022)	(64,305)	(84,565)	(61,604)	(3,937,927)
Employer Normal Cost	11,660	27,290	40,047	16,152	2,355,103
Employer Normal Cost as % of Salary	1.84%	4.13%	4.82%	2.57%	5.71%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	MV Landbank	MV Refuse	MV Commission	OB Water Dept	Total
2019 Appropriation					
Non-ERI Appropriation	71,424	85,103	133,580	75,291	6,500,268
ERI 2002	0	0	0	0	163,742
ERI 2003	5,464	0	5,381	0	56,529
Total Appropriation	76,888	85,103	138,961	75,291	6,720,539
2020 Appropriation					
Actuarial Allocation Method:					
Employer Normal Cost	12,800	29,959	43,963	17,731	2,585,405
Amortization Payment of UAL	66,252	56,826	86,198	50,177	4,114,904
ERI 2002	0	0	0	0	171,110
ERI 2003	5,709	0	5,624	0	59,073
Net 3(8)(c) Transfers	1,508	977	4,366	1,175	200,000
Total Appropriation	86,269	87,762	140,151	69,083	7,130,492
2020 Appropriation Increase over 2019	12.20%	3.12%	0.86%	-8.25%	6.10%
2021 Appropriation					
Actuarial Allocation Method:					
Employer Normal Cost	13,312	31,157	45,722	18,441	2,688,821
Amortization Payment of UAL	71,423	61,262	92,926	54,093	4,436,090
ERI 2002	0	0	0	0	178,810
ERI 2003	5,966	0	5,876	0	61,731
Net 3(8)(c) Transfers	3,309	2,721	4,341	2,403	200,000
Total Appropriation	94,010	95,140	148,865	74,937	7,565,452
2021 Appropriation Increase over 2020	8.97%	8.41%	6.22%	8.47%	6.10%