

**NORFOLK COUNTY  
CONTRIBUTORY RETIREMENT SYSTEM**

Actuarial Valuation Report

January 1, 2010

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## Report Summary:

### Highlights

January 1, 2008

January 1, 2010

#### Contributions

Funding Schedule FY 2011	\$42,794,150	\$39,749,857
Funding Schedule FY 2012	44,402,071	41,206,587

#### Funded Ratios

GAS No. 25	65.7%	60.0%
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#### Participants

Actives	5,794	5,526
Retirees and Beneficiaries	2,508	2,557
Inactives	2,151	2,059
Disabled	<u>305</u>	<u>313</u>
Total	10,758	10,455

#### Payroll

Payroll of Active Members	\$223,814,977	\$223,332,595
Average Payroll	38,629	40,415

#### Normal Cost

Employer	8,212,533	8,381,932
Employee	18,522,075	18,649,762
Administrative Expenses	<u>1,307,000</u>	<u>1,307,000</u>
Total	28,041,608	28,338,694

#### Actuarial Accrued Liabilities

Actives	449,424,988	491,501,685
Retirees, Beneficiaries, Disabilities and Inactives	<u>458,294,136</u>	<u>510,379,370</u>
Total	907,719,124	1,001,881,055

#### Actuarial Value of Assets

596,157,147                      600,790,835

#### Unfunded Actuarial Accrued Liabilities

\$311,561,977                      \$401,090,220

## **Introduction**

This report presents the Norfolk County actuarial valuation findings as of January 1, 2010, under the Commonwealth of Massachusetts Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2010.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Norfolk County Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2010.

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.

### Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the last year the total unfunded actuarial accrued liability increased by 28.7% to \$401,090,220. The increase is the result of net unfavorable actuarial experience during the preceding year. The impact on the unfunded accrued liability by source is as follows:

Investment loss	\$79,585,699
Salary Increases	(7,185,295)
New Participants	7,165,301
Active – Retirements	(4,677,348)
Active – Terminations	3,735,446
Active – Mortality	(260,137)
Active – Disabilities	1,159,373
Inactive - Mortality and data adjustments	5,560,226
Other	10,226,281
Sherriff Transfers	<u>(20,910,661)</u>
Total (gain)/loss	\$74,398,885

The interest rate decreased from 8.50% to 8.25%. This change increased the unfunded actuarial accrued liability by \$23,403,142.

## Actuarial Costs and Liabilities:

### Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

**Table I**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
Superannuation	\$18,155,874	\$18,754,055
Termination	2,941,865	2,840,569
Death	1,475,203	1,487,616
Disability	4,161,666	3,949,454
Administrative Expenses	<u>1,307,000</u>	<u>1,307,000</u>
Total Normal Cost	28,041,608	28,338,694
% of Pay	12.5%	12.7%
Employee Contributions	18,522,075	18,649,762
% of Pay	8.3%	8.4%
Employer Normal Cost	\$9,519,533	\$9,688,932
% of Pay	4.3%	4.3%

**Present Value of Actuarial Accrued Liabilities**

The actuarial accrued liabilities (AAL) represents today's value of all benefits based on the past service of the actives and inactive. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

**Table II**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
Actives		
Superannuations	\$393,584,083	\$435,397,880
Termination	10,419,281	10,485,593
Death	14,817,890	15,996,465
Disability	30,603,734	29,621,747
Retirees and Inactives		
Retirees and Beneficiaries	364,947,186	405,898,721
Terminated (Refund)	9,508,480	10,817,007
Disabled	<u>83,838,470</u>	<u>93,663,642</u>
Total	\$907,719,124	\$1,001,881,055

**Present Value of Future Benefits**

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

**Table III**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
Actives		
Superannuation	\$538,779,915	\$582,102,302
Termination	22,101,693	21,728,648
Death	25,859,459	26,971,386
Disability	69,172,706	65,584,128
Retirees and Inactives		
Retirees and Beneficiaries	364,947,186	405,898,721
Terminated (Refund)	9,508,480	10,817,007
Disabled	<u>83,838,470</u>	<u>93,663,642</u>
Total	\$1,114,207,909	\$1,206,765,834



## Funded Status and Appropriations:

### Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

**Table IV**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
Cash equivalents	\$5,971,067	\$11,297,968
Short term investments	0	0
Fixed income securities	100,856,569	125,572,835
Equities	326,345,273	223,212,650
International	52,787,705	43,301,926
Real Estate	41,929,668	23,269,599
Venture Capital	0	0
Other	80,275,623	73,665,627
Accounts receivable	6,117,324	7,888,791
Accounts payable	(1,898,856)	(1,914,344)
Accrued income	<u>697,359</u>	<u>967,180</u>
Total Market Value	\$613,081,732	\$507,262,231
Total Actuarial Value	\$596,157,147	\$600,790,835

## Actuarial Value of Assets

The actuarial value of assets is determined by projecting the actuarial value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.5%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 20%. The calculation of the actuarial value of assets as of January 1, 2010 is presented in Table V.

**Table V**

	<u>January 1, 2010</u>
(1) Market value at January 1, 2009	\$431,055,767
(2) 2009 Contributions	\$66,244,473
(3) 2009 Benefit Payments	(\$79,888,027)
(4) Net interest adjustment at 8.5% on (1), (2), and (3) to December 31, 2009	\$36,776,089
(5) Expected market value on January 1, 2010	\$454,188,302
(1) + (2) + (3) + (4)	
(6) Actual market value on January 1, 2010	\$507,262,231
(7) 2009 (Gain) / Loss	(\$53,073,929)
(8) 80% of 2009 (Gain) / Loss	(\$42,459,143)
(9) 2008 (Gain) / Loss	\$237,939,661
(10) 60% of 2008 (Gain) / Loss	\$142,763,797
(11) 2007 (Gain) / Loss	(\$4,423,521)
(12) 40% of 2007 (Gain) / Loss	(\$1,769,409)
(13) 2006 (Gain) / Loss	(\$25,033,203)
(14) 20% of 2006 (Gain) / Loss	(\$5,006,641)
(15) Actuarial value on January 1, 2010, (6) + (8) + (10) + (12) + (14)	\$600,790,835
(16) but not less than 80% nor greater than 120% of (6)	\$600,790,835
(17) Ratio of actuarial value to market value	118.44%
(18) 2009 Market Value Return on Assets	21.18%
(19) 2009 Actuarial Value Return on Assets	19.04%
(20) 2008 Market Value Return on Assets	-30.20%
(21) 2008 Actuarial Value Return on Assets	-13.80%

**Unfunded Actuarial Accrued Liabilities**

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

**Table VI**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
Actuarial Accrued Liability	\$907,719,124	\$1,001,881,055
Actuarial Assets	<u>596,157,147</u>	<u>600,790,835</u>
Unfunded Actuarial Accrued Liability	\$311,561,977	\$401,090,220
Funded Status	65.7%	60.0%

## Appropriations

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2028, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the prior unfunded actuarial accrued liability by June 30, 2031  
\$ 373,269,285 over 21 years with 4.0% increasing payments
- Increasing amortization of the 2002 Early Retirement Incentive by June 30, 2028  
\$ 8,602,501 over 18 years with 4.5% increasing payments
- Increasing amortization of the 2003 Early Retirement Incentive by June 30, 2028  
\$ 5,446,734 over 18 years with 4.5% increasing payments
- Interest adjustment for payments deposited semiannually.

The pension appropriation is shown in Table VII.

**Table VII**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
Normal cost	\$9,519,533	\$9,688,932
Amortization payment of the unfunded liability	26,839,168	25,766,208
Amortization payment of 2002 ERI liability	590,974	634,249
Amortization payment of 2003 ERI liability	<u>374,179</u>	<u>401,579</u>
Total cost	\$37,323,854	\$36,490,968
% of Pay	16.7%	16.3%
Fiscal 2011 cost	\$42,794,150	\$39,749,857
Fiscal 2012 cost	\$44,402,071	\$41,206,587

\* The last payment was made in FYE08.

## **Appropriation Forecast**

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2039 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be spread over the fiscal year.

The employer total cost is expected to increase during the next 21 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total FY11 cost increase represents 19.2% of payroll, decreasing to 14.4% by the time the unfunded liabilities are fully paid off, leaving only 2% to 3% thereafter. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

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**Appropriation Forecast**

Fiscal Year	Employee Payroll*	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Funded Ratio %**
2011	\$223,332,595	\$18,649,762	\$10,286,248	\$29,463,609	\$39,749,857	17.8	60.0
2012	\$233,382,562	\$19,668,150	\$10,558,936	\$30,647,651	\$41,206,587	17.7	61.4
2013	\$243,884,777	\$20,740,427	\$10,835,336	\$31,879,303	\$42,714,639	17.5	62.9
2014	\$254,859,592	\$21,869,382	\$11,115,230	\$33,160,480	\$44,275,710	17.4	64.4
2015	\$266,328,274	\$23,057,942	\$11,398,373	\$34,493,174	\$45,891,547	17.2	66.0
2016	\$278,313,046	\$24,309,188	\$11,684,491	\$35,879,458	\$47,563,949	17.1	67.5
2017	\$290,837,133	\$25,626,354	\$11,973,278	\$37,321,488	\$49,294,766	16.9	69.1
2018	\$303,924,804	\$27,012,838	\$12,264,394	\$38,821,508	\$51,085,902	16.8	70.8
2019	\$317,601,420	\$28,472,213	\$12,557,465	\$40,381,851	\$52,939,316	16.7	72.5
2020	\$331,893,484	\$30,008,230	\$12,852,077	\$42,004,944	\$54,857,021	16.5	74.2
2021	\$346,828,691	\$31,624,832	\$13,147,776	\$43,693,313	\$56,841,089	16.4	76.0
2022	\$362,435,982	\$33,326,163	\$13,444,061	\$45,449,584	\$58,893,645	16.2	77.9
2023	\$378,745,601	\$35,116,572	\$13,740,388	\$47,276,491	\$61,016,879	16.1	79.8
2024	\$395,789,153	\$37,000,633	\$14,036,161	\$49,176,875	\$63,213,036	16.0	81.9
2025	\$413,599,665	\$38,983,148	\$14,330,728	\$51,153,695	\$65,484,423	15.8	83.9
2026	\$432,211,650	\$41,069,164	\$14,623,383	\$53,210,025	\$67,833,408	15.7	86.1
2027	\$451,661,174	\$43,263,980	\$14,913,358	\$55,349,067	\$70,262,425	15.6	88.3
2028	\$471,985,927	\$45,573,164	\$15,199,818	\$57,574,150	\$72,773,968	15.4	90.5
2029	\$493,225,294	\$48,002,566	\$15,481,860	\$57,460,101	\$72,941,961	14.8	92.9
2030	\$515,420,432	\$50,558,328	\$15,758,506	\$59,758,505	\$75,517,011	14.7	95.2
2031	\$538,614,352	\$53,246,903	\$16,028,699	\$62,148,845	\$78,177,544	14.5	97.6
2032	\$562,851,997	\$56,075,069	\$16,291,299	\$0	\$16,291,299	2.9	100.0
2033	\$588,180,337	\$59,049,946	\$16,545,074	\$0	\$16,545,074	2.8	100.0
2034	\$614,648,452	\$62,179,009	\$16,788,700	\$0	\$16,788,700	2.7	100.0
2035	\$642,307,633	\$65,470,112	\$17,020,748	\$0	\$17,020,748	2.6	100.0
2036	\$671,211,476	\$68,931,501	\$17,239,683	\$0	\$17,239,683	2.6	100.0
2037	\$701,415,993	\$72,571,839	\$17,443,856	\$0	\$17,443,856	2.5	100.0
2038	\$732,979,712	\$76,400,221	\$17,631,493	\$0	\$17,631,493	2.4	100.0
2039	\$765,963,799	\$80,426,199	\$17,800,694	\$0	\$17,800,694	2.3	100.0
2040	\$800,432,170	\$84,045,378	\$18,601,726	\$0	\$18,601,726	2.3	100.0
2041	\$836,451,618	\$87,827,420	\$19,438,803	\$0	\$19,438,803	2.3	100.0
2042	\$874,091,941	\$91,779,654	\$20,313,549	\$0	\$20,313,549	2.3	100.0

\* Calendar basis

\*\* Beginning of Fiscal Year

**GASB Statements No. 25 and No. 27**

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GASB Statement No. 5, 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.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies, and information about contributions, legally required reserves, and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to \$0. The required disclosure information is shown in Table VIII.

**Table VIII**

	<u>January 1, 2008</u>	<u>January 1, 2010</u>
(1) Actuarial Accrued Liability	\$907,719,124	\$1,001,881,055
(2) Actuarial Value of Assets	<u>596,157,147</u>	<u>600,790,835</u>
(3) Unfunded Actuarial Accrued Liability	311,561,977	401,090,220
(4) Funded Ratio (2)/(1)	65.7%	60.0%
(5) Covered Payroll	\$223,814,977	\$223,332,595
(6) UAAL as a percentage of payroll: (3)/(5)	139.2%	179.6%
(7) Annual Required Contribution (ARC)	\$38,920,499	\$39,749,857
(8) Net Pension Obligation	\$0	\$0

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**PERAC Annual Statement**  
**APPENDIX PAGE 3**  
**ACTUARIAL VALUATION AND ASSUMPTIONS**

The most recent actuarial valuation of the System was prepared by Buck Consultants as of January 1, 2010.

The normal cost for employees on that date was:	\$18,649,762	8.4% of pay
The normal cost for the employer was:	8,381,932	3.8% of pay
The actuarial liability for active members was:		\$491,501,685
The actuarial liability for retired and inactive members was:		510,379,370
Total actuarial accrued liability:		1,001,881,055
System assets as of that date:		600,790,835
Unfunded actuarial accrued liability:		\$401,090,220
The ratio of system's assets to total actuarial liability was		60.0%

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

Investment Return:	8.3%
Rate of Salary Increase:	4.0%

**SCHEDULE OF FUNDING PROGRESS**

Actuarial Valuation Date	Actuarial Value of Assets  (a)	Actuarial Accrued Liability  (b)	Unfunded Actuarial Accrued Liability  (b-a)	Funded Ratio  (a/b)	Covered Payroll  (c)	UAAL as a percent of Covered Payroll  (b-a)/c
01/01/10	\$600,790,835	#####	\$401,090,220	60.0%	\$223,332,595	179.6%
01/01/08	596,157,147	907,719,124	311,561,977	65.7%	223,814,977	139.2%
01/01/07	533,077,948	855,677,413	322,599,465	62.3%	219,620,865	146.9%
01/01/05	467,186,566	762,900,650	295,714,084	61.2%	196,639,163	150.4%
01/01/03	415,150,776	675,275,257	260,124,481	61.5%	185,281,985	140.4%
01/01/00	371,646,793	533,959,970	162,313,177	69.6%	163,542,978	99.2%
01/01/97	258,771,070	392,463,080	133,692,010	65.9%	126,219,194	105.9%

Attach Copy of Current Approved Funding Schedule



## **EXHIBITS**

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## Age/Service Distribution with Salary as of January 1, 2010

Attained Age	Average Salary	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	22	0	0	0	0	0	0	0	0	0	22
	23,706	0	0	0	0	0	0	0	0	0	23,706
20-24	161	1	0	0	0	0	0	0	0	0	162
	24,053	17,566	0	0	0	0	0	0	0	0	24,013
25-29	319	47	1	0	0	0	0	0	0	0	367
	29,058	46,256	16,680	0	0	0	0	0	0	0	31,227
30-34	150	117	28	2	0	0	0	0	0	0	297
	38,341	47,749	50,971	54,952	0	0	0	0	0	0	43,350
35-39	150	119	112	29	3	0	0	0	0	0	413
	35,390	47,788	59,882	58,192	56,793	0	0	0	0	0	47,361
40-44	273	157	152	91	50	0	0	0	0	0	723
	26,337	40,347	57,933	63,854	62,624	0	0	0	0	0	43,253
45-49	302	248	161	83	100	29	1	0	0	0	924
	26,674	31,939	45,304	54,266	68,967	64,501	60,098	0	0	0	39,612
50-54	264	268	220	70	112	59	26	2	0	0	1,021
	29,933	32,618	38,494	47,653	60,950	70,144	68,794	56,054	0	0	40,464
55-59	140	184	177	83	105	50	52	35	4	0	830
	29,924	32,044	35,959	42,789	50,790	68,928	72,076	74,600	72,439	0	42,687
60-64	71	78	95	74	71	40	28	16	12	0	485
	28,111	33,849	35,785	38,464	38,557	51,011	69,612	70,104	79,500	0	40,587
65-69	26	36	34	20	29	28	11	2	3	0	189
	35,862	29,737	35,914	35,544	44,039	47,629	54,551	54,972	62,152	0	39,376
70+	12	8	14	11	19	14	3	8	4	0	93
	19,253	29,989	33,344	34,173	34,752	43,962	31,251	38,851	71,747	0	35,279
Total Employees	1,890	1,263	994	463	489	220	121	63	23	0	5,526
Average Salary	29,217	36,666	44,438	49,530	55,281	61,114	68,096	67,707	74,661	0	40,416

## Retiree Distribution as of January 1, 2010

Attained Age	Number of Employees			Total Payments		
	Male	Female	Total	Male	Female	Total
< 20	0	1	1	0	24,593	24,593
20-24	0	0	0	0	0	0
25-29	1	0	1	9,620	0	9,620
30-34	0	0	0	0	0	0
35-39	1	1	2	9,769	3,278	13,047
40-44	1	2	3	2,967	7,971	10,938
45-49	11	9	20	203,582	155,476	359,058
50-54	23	6	29	422,822	108,878	531,699
55-59	76	51	127	2,603,836	598,624	3,202,461
60-64	174	152	326	6,339,849	2,382,101	8,721,950
65-69	220	213	433	6,653,825	3,315,953	9,969,778
70-74	179	248	427	4,697,326	4,088,209	8,785,536
75-79	194	220	414	3,905,626	2,946,380	6,852,007
80-84	156	214	370	2,835,951	2,355,454	5,191,404
85-89	86	177	263	1,131,697	1,508,039	2,639,736
90-94	39	80	119	412,368	580,929	993,297
95-99	6	16	22	30,738	108,272	139,010
Total	1,167	1,390	2,557	29,259,976	18,184,157	47,444,133
Average (Age/Payment)	72.4	75.3	74.0	25,073	13,082	18,555
Frequency Percent	45.6%	54.4%	100.0%	61.7%	38.3%	100.0%

## Disabled Retiree Distribution as of January 1, 2010

Attained Age	Number of Employees			Total Payments		
	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	1	0	1	5,669	0	5,669
30-34	1	0	1	40,605	0	40,605
35-39	3	1	4	114,935	42,301	157,236
40-44	12	0	12	414,139	0	414,139
45-49	19	4	23	661,444	104,032	765,476
50-54	20	5	25	594,413	111,750	706,163
55-59	40	8	48	1,469,377	153,435	1,622,812
60-64	56	9	65	1,775,214	155,449	1,930,663
65-69	52	8	60	1,554,152	168,066	1,722,218
70-74	34	5	39	899,284	129,863	1,029,147
75-79	16	4	20	429,478	61,977	491,455
80-84	8	2	10	171,961	25,668	197,629
85-89	5	0	5	100,069	0	100,069
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	267	46	313	8,230,741	952,542	9,183,282
Average (Age/Payment)	62.8	62.6	62.8	30,827	20,707	29,340
Frequency Percent	85.3%	14.7%	100.0%	89.6%	10.4%	100.0%

**EXHIBIT 4 - CASHFLOW FORECAST:**

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

Plan Year Ending	Benefit Payments	Employee Contributions	Employer Contributions	Investment Returns	Net change in plan assets
2010	\$63,207,631	\$18,649,762	\$39,749,857	\$47,914,057	\$43,106,044
2011	66,827,009	19,668,150	41,206,587	51,372,924	45,420,653
2012	70,280,944	20,740,427	42,714,639	55,032,026	48,206,148
2013	74,129,808	21,869,382	44,275,710	58,907,685	50,922,969
2014	77,774,548	23,057,942	45,891,547	63,018,601	54,193,541
2015	81,495,170	24,309,188	47,563,949	67,399,282	57,777,249
2016	85,167,691	25,626,354	49,294,766	72,080,734	61,834,163
2017	89,138,410	27,012,838	51,085,902	77,088,158	66,048,487
2018	93,064,032	28,472,213	52,939,316	82,448,592	70,796,089
2019	97,000,616	30,008,230	54,857,021	88,203,947	76,068,582
2020	101,071,215	31,624,832	56,841,089	94,392,740	81,787,446
2021	105,312,635	33,326,163	58,893,645	101,050,512	87,957,685
2022	109,732,046	35,116,572	61,016,879	108,214,419	94,615,824
2023	114,336,915	37,000,633	63,213,036	115,924,632	101,801,387
2024	119,135,026	38,983,148	65,484,423	124,224,584	109,557,128
2025	124,134,488	41,069,164	67,833,408	133,161,228	117,929,312
2026	129,343,751	43,263,980	70,262,425	142,785,335	126,967,990
2027	134,771,619	45,573,164	72,773,968	153,151,807	136,727,320
2028	140,427,266	48,002,566	72,941,961	164,272,311	144,789,572
2029	146,320,250	50,558,328	75,517,011	176,099,998	155,855,087
2030	152,460,531	53,246,903	78,177,544	188,836,900	167,800,816
2031	158,858,487	56,075,069	16,291,299	201,286,116	114,793,997
2032	165,524,932	59,049,946	16,545,074	210,577,035	120,647,123
2033	172,471,131	62,179,009	16,788,700	220,344,824	126,841,402
2034	179,708,825	65,470,112	17,020,748	230,617,451	133,399,486
2035	187,250,247	68,931,501	17,239,683	241,424,747	140,345,683
2036	195,108,142	72,571,839	17,443,856	252,798,540	147,706,092
2037	203,295,792	76,400,221	17,631,493	264,772,813	155,508,736
2038	211,827,033	80,426,199	17,800,694	277,383,854	163,783,714
2039	218,936,717	84,045,378	18,601,726	290,704,501	174,414,889

## **EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:**

This summary is prepared in accordance with Chapter 32 as of January 1, 2010, and does not take into account any subsequent changes.

### **1. Administration**

Each of the 107 contributory retirement systems for public employees for 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.

### 3. **Salary**

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

### 4. **Member Contributions**

Member contributions vary depending upon date hired as follows:

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

### 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.)

### 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) if an employee is a State Police officer (Group 3), attainment of age 50



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:

<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 Group 3 (State Police), the benefit is 50% of the participant's final year's rate of regular salary, plus an additional 1% for each year of service in excess of 20 years. In addition, for veterans (all groups) there is an additional benefit of \$15 per year for each year of service, up to a maximum of 20 years of service.

## 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).

**b. Benefit Amount:**

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. 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, 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 \$12,000. 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 6 – 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, 2010.

### **3. Actuarial Cost Method**

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

### **4. Rate of Investment Return**

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.25% per annum.

### **5. Salary Scale**

It is assumed that salaries including longevity will increase at a rate of 4.0% per year.

### **6. Cost-of-Living Increases**

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and \$12,000 per year.

### **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 different from the assumed returns. The results must be within 20% of market value.

#### 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	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

#### 9. Annual Rate of Mortality

It is assumed that both preretirement and postretirement mortality are represented by the RP-2000 Mortality Table for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years.

## 10. Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

<u>Age</u>	<u>Male General Employees</u>	<u>Female General Employees</u>	<u>Male and Female Police and Fire Employees</u>
45	0.0000	0.0000	0.0100
46	0.0000	0.0000	0.0100
47	0.0000	0.0000	0.0100
48	0.0000	0.0000	0.0100
49	0.0000	0.0000	0.0100
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

### 11. 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	0.0001	0.0001
30	0.0003	0.0003
40	0.0010	0.0030
50	0.0019	0.0125

In addition, it is assumed for the general employees that 40% of all disabilities are ordinary (60% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

### 12. Family Composition

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

### 13. 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 2010 is \$1,307,000 and is anticipated to increase at 4.5% per year.



## EXHIBIT 7 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

### 1. Actuarial Accrued Liability

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

### 2. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

### 3. Actuarial Cost Method

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

### 4. Actuarial Present Value

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

### 5. Forecast

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

**6. Normal Cost**

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

**7. Unfunded Actuarial Accrued Liability**

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

**8. Valuation Method**

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

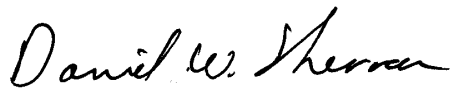
**9. Vested Liability**

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

**CERTIFICATION:**

This report fairly represents the actuarial position of the Norfolk County Contributory Retirement System contributing as of January 1, 2010, 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. Daniel Sherman is an Associate of the Society of Actuaries. He is a Member of the American Academy of Actuaries and meets the Qualification Standards of the Academy to render the actuarial opinions contained herein. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions concerning it.

Buck Consultants, LLC



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Daniel W. Sherman, ASA, MAAA  
Enrolled Actuary No. 08-4086

March 2011