

**TOWN OF DANVERS  
CONTRIBUTORY RETIREMENT SYSTEM**

Actuarial Valuation Report

January 1, 2010

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## Report Summary:

<u>Highlights</u>	<u>January 1, 2009</u>	<u>January 1, 2010</u>
<u>Contributions</u>		
Funding Schedule FY 2011	\$5,065,582	\$4,262,439
Funding Schedule FY 2012	5,266,631	4,434,567
<u>Funded Ratios</u>		
GAS No. 25	59.4%	64.4%
<u>Participants</u>		
Actives	460	464
Retirees and Beneficiaries	369	362
Vested	0	0
Inactives	57	46
Disabled	<u>28</u>	<u>27</u>
Total	914	899
<u>Payroll</u>		
Payroll of Active Members	\$22,650,368	\$23,028,086
Average Payroll	49,240	49,629
<u>Normal Cost</u>		
Employer	1,015,214	921,665
Employee	1,871,655	1,902,769
Administrative Expenses	<u>N/A</u>	<u>N/A</u>
Total	2,886,869	2,824,434
<u>Actuarial Accrued Liabilities</u>		
Actives	60,574,811	63,722,545
Retirees, Beneficiaries, Disabilities and Inactives	<u>66,069,885</u>	<u>66,649,835</u>
Total	126,644,696	130,372,380
<u>Actuarial Value of Assets</u>	<u>75,217,536</u>	<u>84,017,923</u>
<u>Unfunded Actuarial Accrued Liabilities</u>	\$51,427,160	\$46,354,457

## **Introduction**

This report presents the findings of an actuarial valuation as of January 1, 2010, of Danvers Contributory 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 Town of Danvers 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.

Since the last actuarial valuation, the total unfunded actuarial accrued liability decreased by 9.9% to \$46,354,457. The plan had net favorable actuarial experience during the preceding year. The actuarial value of assets for 2009 had a return of 14.8%. The sources of the (gain)/loss are as follows:

Investment	(4,841,418)
Salary Loss	(1,675,446)
Retiree Mortality Loss	601,782
Active Decrements (Termination)	15,294
Active Decrements (Disability)	116,083
Active Decrements (Retirement)	(281,899)
Active Decrements (Death)	(28,228)
New Entrants	284,809
Other (Data corrections, Section 3(8)(c), software etc.)	<u>205,060</u>
Total (gain)/loss	(5,603,963)

## 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, 2009</u>	<u>January 1, 2010</u>
Superannuation	\$1,985,822	\$1,991,657
Termination	278,674	214,569
Death	123,090	124,485
Disability	499,283	493,723
Administrative Expenses	<u>N/A</u>	<u>N/A</u>
Total Normal Cost	2,886,869	2,824,434
% of Pay	12.7%	12.3%
Employee Contributions	1,871,655	1,902,769
% of Pay	8.3%	8.3%
Employer Normal Cost	\$1,015,214	\$921,665
% of Pay	4.5%	4.0%

**Present Value of Actuarial Accrued Liabilities**

The actuarial accrued liabilities (AAL) represents today's value of all benefits earned by the actives and inactives. 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, 2009</u>	<u>January 1, 2010</u>
Actives		
Superannuations	\$53,566,888	\$56,823,995
Termination	990,116	870,164
Death	1,471,683	1,503,509
Disability	4,546,124	4,524,877
Retirees and Inactives		
Retirees and Beneficiaries	57,986,492	58,447,294
Terminated (Refund)	465,620	576,134
Disabled	<u>7,617,773</u>	<u>7,626,407</u>
Total	\$126,644,696	\$130,372,380

**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, 2009</u>	<u>January 1, 2010</u>
Actives		
Superannuation	\$71,160,854	\$74,332,299
Termination	2,070,341	1,721,153
Death	2,508,645	2,528,929
Disability	9,503,300	9,350,386
Retirees and Inactives		
Retirees and Beneficiaries	57,986,492	58,447,294
Terminated (Refund)	465,620	576,134
Disabled	<u>7,617,773</u>	<u>7,626,407</u>
Total	<u>\$151,313,025</u>	<u>\$154,582,602</u>

## 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, 2009</u>	<u>January 1, 2010</u>
Cash equivalents	\$6,120,054	\$5,047,872
Short term investments	0	0
Fixed income securities	18,602,036	19,015,009
Equities	32,039,793	30,488,359
International	2,324,213	11,815,261
Real Estate	1,124,343	707,062
Venture Capital	0	0
PRIT Fund	0	3,053,150
Other	0	3,514,414
Accounts receivable	90,854	54,075
Accounts payable	(142,100)	(624,088)
Accrued income	<u>14,836</u>	<u>189,434</u>
Total Market Value	\$60,174,029	\$73,260,548
Total Actuarial Value	\$75,217,536	\$84,017,923

**Actuarial Value of Assets**

The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.25%) 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 25%. 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	\$60,174,029
(2) 2009 Contributions	\$7,512,507
(3) 2009 Payments	(\$9,669,989)
(4) Net interest adjustment at 8.25% on (1), (2), and (3) to December 31, 2009	\$4,867,945
(5) Expected market value on January 1, 2010	\$62,884,492
(1) + (2) + (3) + (4)	
(6) Actual market value on January 1, 2010	\$73,260,548
(7) 2009 (Gain) / Loss	(\$10,376,056)
(8) 80% of 2009 (Gain) / Loss	(\$8,300,845)
(9) 2008 (Gain) / Loss	\$30,878,457
(10) 60% of 2008 (Gain) / Loss	\$18,527,074
(11) 2007 (Gain) / Loss	\$2,533,052
(12) 40% of 2007 (Gain) / Loss	\$1,013,221
(13) 2006 (Gain) / Loss	(\$2,410,375)
(14) 20% of 2006 (Gain) / Loss	(\$482,075)
Actuarial value on January 1, 2010, (6) + (8) + (10) + (12) + (14)	
(15) but not less than 75% nor greater than 125% of (6)	\$84,017,923
(16) Ratio of actuarial value to market value	114.68%
(17) Actuarial Value Return for 2008	-10.66%
(18) Actuarial Value Return for 2009	14.78%
(19) Market Value Return for 2008	-28.11%
(20) Market Value Return for 2009	25.80%

## **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, 2009</u>	<u>January 1, 2010</u>
Actuarial Accrued Liability	\$126,644,696	\$130,372,380
Actuarial Assets	<u>75,217,536</u>	<u>84,017,923</u>
Unfunded Actuarial Accrued Liability	\$51,427,160	\$46,354,457
Funded Status	59.4%	64.4%

## **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 unfunded actuarial accrued liability by June 30, 2030  
\$ 46,354,457 over 20 years with 4.5% increasing payments
- Interest adjustment for payments deposited at the beginning of the fiscal year.

The pension appropriation is shown in Table VII.

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**Table VII**

	<u>January 1, 2009</u>	<u>January 1, 2010</u>
Normal cost	\$1,015,214	\$921,665
Amortization payment of the prior accrued liability	2,261,301	3,557,530
Amortization payment of current (gains)/losses	<u>1,387,718</u>	<u>(383,697)</u>
Total cost	\$4,664,233	\$4,095,498
% of Pay	20.6%	17.8%
Fiscal 2011 cost	\$5,065,582	\$4,262,439
Fiscal 2012 cost	\$5,266,631	\$4,434,567

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## **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 2034 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be made at the beginning of the year.

The employer total cost is expected to increase during the next 19 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost represents 18.3% of payroll, decreasing to 15.3% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of 2.1% the following year. The subsequent decreases in the cost as a percentage of payroll are a result of the increase in member deductions, which levels off in 2034, leaving a normal cost of 1.8% thereafter.

**Appropriation Forecast**

<u>Fiscal Year Ending</u>	<u>Payroll*</u>	<u>Employee Contribution</u>	<u>Employer Normal Cost with Interest</u>	<u>Amortization Payments with Interest</u>	<u>Employer Total Cost with Interest</u>	<u>Employer Total Cost % of Payroll</u>	<u>Funded Ratio %**</u>
2011	\$23,028,086	\$1,902,769	\$959,234	\$3,303,205	\$4,262,439	18.5	64.4
2012	\$24,179,490	\$2,021,427	\$982,718	\$3,451,849	\$4,434,567	18.3	65.5
2013	\$25,388,465	\$2,147,193	\$1,006,152	\$3,607,182	\$4,613,334	18.2	66.6
2014	\$26,657,888	\$2,280,482	\$1,029,473	\$3,769,506	\$4,798,979	18.0	67.8
2015	\$27,990,782	\$2,421,733	\$1,052,610	\$3,939,133	\$4,991,743	17.8	69.0
2016	\$29,390,322	\$2,571,407	\$1,075,488	\$4,116,394	\$5,191,882	17.7	70.3
2017	\$30,859,838	\$2,729,994	\$1,098,022	\$4,301,632	\$5,399,654	17.5	71.6
2018	\$32,402,830	\$2,898,012	\$1,120,120	\$4,495,206	\$5,615,326	17.3	73.0
2019	\$34,022,971	\$3,076,006	\$1,141,684	\$4,697,490	\$5,839,174	17.2	74.5
2020	\$35,724,120	\$3,264,555	\$1,162,603	\$4,908,877	\$6,071,480	17.0	76.1
2021	\$37,510,326	\$3,464,268	\$1,182,760	\$5,129,776	\$6,312,536	16.8	77.8
2022	\$39,385,842	\$3,675,792	\$1,202,027	\$5,360,616	\$6,562,643	16.7	79.5
2023	\$41,355,134	\$3,899,807	\$1,220,263	\$5,601,844	\$6,822,107	16.5	81.4
2024	\$43,422,891	\$4,137,034	\$1,237,317	\$5,853,927	\$7,091,244	16.3	83.4
2025	\$45,594,035	\$4,388,235	\$1,253,026	\$6,117,354	\$7,370,380	16.2	85.4
2026	\$47,873,737	\$4,654,213	\$1,267,214	\$6,392,635	\$7,659,849	16.0	87.6
2027	\$50,267,424	\$4,935,818	\$1,279,687	\$6,680,303	\$7,959,990	15.8	89.9
2028	\$52,780,795	\$5,233,948	\$1,290,239	\$6,980,917	\$8,271,156	15.7	92.3
2029	\$55,419,835	\$5,549,552	\$1,298,648	\$7,295,058	\$8,593,706	15.5	94.8
2030	\$58,190,826	\$5,883,631	\$1,304,671	\$7,623,336	\$8,928,007	15.3	97.3
2031	\$61,100,368	\$6,237,244	\$1,308,051	\$0	\$1,308,051	2.1	100.0
2032	\$64,155,386	\$6,611,509	\$1,308,506	\$0	\$1,308,506	2.0	100.0
2033	\$67,363,155	\$7,007,608	\$1,305,738	\$0	\$1,305,738	1.9	100.0
2034	\$70,731,313	\$7,426,788	\$1,299,421	\$0	\$1,299,421	1.8	100.0
2035	\$74,267,879	\$7,798,127	\$1,364,392	\$0	\$1,364,392	1.8	100.0
2036	\$77,981,273	\$8,188,034	\$1,432,611	\$0	\$1,432,611	1.8	100.0
2037	\$81,880,336	\$8,597,435	\$1,504,242	\$0	\$1,504,242	1.8	100.0
2038	\$85,974,353	\$9,027,307	\$1,579,454	\$0	\$1,579,454	1.8	100.0
2039	\$90,273,071	\$9,478,672	\$1,658,427	\$0	\$1,658,427	1.8	100.0
2040	\$94,786,724	\$9,952,606	\$1,741,348	\$0	\$1,741,348	1.8	100.0
2041	\$99,526,061	\$10,450,236	\$1,828,415	\$0	\$1,828,415	1.8	100.0
2042	\$104,502,364	\$10,972,748	\$1,919,836	\$0	\$1,919,836	1.8	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, 2009</u>	<u>January 1, 2010</u>
(1) Actuarial Accrued Liability	\$126,644,696	\$130,372,380
(2) Actuarial Value of Assets	<u>75,217,536</u>	<u>84,017,923</u>
(3) Unfunded Actuarial Accrued Liability	51,427,160	46,354,457
(4) Funded Ratio (2)/(1)	59.4%	64.4%
(5) Covered Payroll	\$22,650,368	\$23,028,086
(6) UAAL as a percentage of payroll: (3)/(5)	227.0%	201.3%
(7) Annual Required Contribution (ARC)	\$4,625,000	\$4,262,439
(8) Net Pension Obligation	\$0	\$0

**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:	\$1,902,769	8.3% of pay
The normal cost for the employer was:	921,665	4.0% of pay
The actuarial liability for active members was:		\$63,722,545
The actuarial liability for retired members was:		66,649,835
Total actuarial accrued liability:		130,372,380
System assets as of that date:		84,017,923
Unfunded actuarial accrued liability:		\$46,354,457
The ratio of system's assets to total actuarial liability was		64.4%

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

Investment Return:	8.25%
Rate of Salary Increase:	4.75%/5.25%

**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	\$84,017,923	\$130,372,380	\$46,354,457	64.4%	\$23,028,086	201.3%
01/01/09	75,217,536	126,644,696	51,427,160	59.4%	22,650,368	227.0%
01/01/07	80,141,766	112,391,450	32,249,684	71.3%	20,383,176	158.2%
01/01/05	74,769,888	101,890,509	27,120,621	73.4%	18,845,955	144.0%
01/01/03	72,105,466	96,413,574	24,308,108	74.8%	17,105,250	142.0%
01/01/01	72,004,870	86,832,829	14,827,959	82.9%	15,110,384	98.0%
01/01/98	49,283,745	69,977,307	20,693,562	70.4%	13,763,498	150.0%

Attach Copy of Current Approved Funding Schedule

**EXHIBITS**

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		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
20-24		9	0	0	0	0	0	0	0	0	9
		27,834	0	0	0	0	0	0	0	0	27,834
25-29		15	0	0	0	0	0	0	0	0	15
		34,228	0	0	0	0	0	0	0	0	34,228
30-34		11	13	2	0	0	0	0	0	0	26
		41,075	52,529	61,028	0	0	0	0	0	0	48,337
35-39		8	13	20	2	0	0	0	0	0	43
		26,744	56,636	63,051	67,248	0	0	0	0	0	54,552
40-44		17	17	12	12	6	0	0	0	0	64
		35,211	49,154	63,338	64,430	66,774	0	0	0	0	52,626
45-49		22	19	18	7	16	5	0	0	0	87
		32,846	39,037	55,485	76,296	61,196	50,884	0	0	0	48,628
50-54		13	27	12	6	12	12	6	0	0	88
		29,043	32,209	36,483	44,578	58,644	88,094	82,745	0	0	47,838
55-59		5	15	14	5	4	9	7	10	0	69
		38,361	40,107	39,737	44,819	50,775	62,687	94,263	72,823	0	54,046
60-64		5	5	6	6	4	5	2	9	0	42
		29,019	49,647	32,442	48,846	55,798	51,248	43,604	79,017	0	51,401
65-69		1	4	3	0	3	2	1	0	2	16
		16,792	36,598	46,722	0	53,061	64,334	40,651	0	82,299	49,778
70+		0	1	0	1	0	2	0	0	1	5
		0	42,948	0	21,015	0	28,164	0	0	48,398	33,738
Total Employees		106	114	87	39	45	35	16	19	3	464
Average Salary		32,851	43,029	51,388	57,625	59,311	66,199	80,261	75,757	70,999	49,629

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	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	1	0	1	27,093	0	27,093
45-49	0	1	1	0	28,057	28,057
50-54	3	1	4	73,690	10,045	83,735
55-59	7	4	11	303,895	30,756	334,652
60-64	25	15	40	1,053,423	158,830	1,212,253
65-69	27	33	60	913,204	483,036	1,396,240
70-74	28	39	67	847,800	511,755	1,359,555
75-79	36	38	74	937,395	428,798	1,366,193
80-84	16	39	55	319,806	396,950	716,756
85-89	11	20	31	197,334	160,630	357,965
90-94	1	10	11	6,325	65,520	71,846
95-99	1	6	7	5,574	63,610	69,184
Total	156	206	362	4,685,541	2,337,987	7,023,528
Average (Age/Payment)	72.2	76.5	74.6	30,036	11,349	19,402
Frequency Percent	43.1	56.9	100	66.7	33.3	100

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	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	1	0	1	52,904	0	52,904
45-49	0	0	0	0	0	0
50-54	0	0	0	0	0	0
55-59	4	0	4	165,493	0	165,493
60-64	3	1	4	90,984	7,450	98,433
65-69	4	0	4	161,862	0	161,862
70-74	4	0	4	111,988	0	111,988
75-79	3	1	4	90,143	16,593	106,735
80-84	5	1	6	111,907	8,015	119,922
85-89	0	0	0	0	0	0
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	24	3	27	785,281	32,057	817,338
Average (Age/Payment)	69.4	73.8	69.9	32,720	10,686	30,272
Frequency Percent	88.9	11.1	100	96.1	3.9	100

**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	\$8,367,094	\$1,902,769	\$4,262,439	\$6,921,092	\$4,719,206
2011	8,727,079	2,021,427	4,434,567	7,312,563	5,041,479
2012	9,117,639	2,147,193	4,613,334	7,730,239	5,373,127
2013	9,534,334	2,280,482	4,798,979	8,175,115	5,720,242
2014	10,074,758	2,421,733	4,991,743	8,644,569	5,983,287
2015	10,507,542	2,571,407	5,191,882	9,141,065	6,396,813
2016	10,943,690	2,729,994	5,399,654	9,672,583	6,858,541
2017	11,419,326	2,898,012	5,615,326	10,241,693	7,335,705
2018	11,859,184	3,076,006	5,839,174	10,852,765	7,908,761
2019	12,293,358	3,264,555	6,071,480	11,512,555	8,555,232
2020	12,723,084	3,464,268	6,312,536	12,227,130	9,280,851
2021	13,193,211	3,675,792	6,562,643	13,001,272	10,046,496
2022	13,676,306	3,899,807	6,822,107	13,839,462	10,885,070
2023	14,200,568	4,137,034	7,091,244	14,746,648	11,774,358
2024	14,662,710	4,388,235	7,370,380	15,731,266	12,827,170
2025	15,080,882	4,654,213	7,659,849	16,806,150	14,039,330
2026	15,531,807	4,935,818	7,959,990	17,981,432	15,345,433
2027	16,012,555	5,233,948	8,271,156	19,265,068	16,757,616
2028	16,440,835	5,549,552	8,593,706	20,669,227	18,371,650
2029	16,865,444	5,883,631	8,928,007	22,208,689	20,154,882
2030	17,135,929	6,237,244	1,308,051	23,584,116	13,993,482
2031	17,447,321	6,611,509	1,308,506	24,756,884	15,229,578
2032	17,716,533	7,007,608	1,305,738	26,035,005	16,631,818
2033	17,930,477	7,426,788	1,299,421	27,432,809	18,228,541
2034	18,003,739	7,798,127	1,364,392	28,966,943	20,125,723
2035	18,053,334	8,188,034	1,432,611	30,660,213	22,227,524
2036	18,019,797	8,597,435	1,504,242	32,531,988	24,613,868
2037	17,981,176	9,027,307	1,579,454	34,602,674	27,228,259
2038	17,755,056	9,478,672	1,658,427	36,898,553	30,280,596
2039	18,416,794	9,952,606	1,741,348	39,412,371	32,689,532

## **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 of the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

### **2. Participation**

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

- (i) Group 1: Most general employees in State and local government
- (ii) Group 2: Certain specified hazardous duty positions
- (iii) Group 3: State police officers and inspectors
- (iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

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

### 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

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

## 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 \$648.48 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 the following rates:

<u>Year</u>	<u>Groups 1 &amp; 2</u>	<u>Group 4</u>
2010	4.00%	4.00%
2011	4.00%	4.00%
2012	4.00%	4.00%
2013+	4.75%	5.25%

**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 greater than or less than the assumed rate of return.

**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 pre-retirement and post retirement 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 for all disabled members.

## 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

Rates are 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	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

## 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.

## **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.

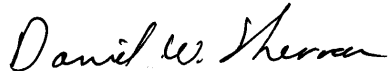
**9. Vested Liability**

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 Town of Danvers 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.

Buck Consultants, LLC



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

July 2010

## **BREAKOUTS**

### Breakouts - Pay Basis - 8.25%

	<u>Total</u>	<u>Town</u>	<u>Housing Authority</u>	<u>School Lunch</u>	<u>Hospital</u>	<u>Electric</u>	<u>School</u>	<u>Water</u>	<u>Sewer</u>
(1) Participants									
(a) Actives	464	282	8	13	0	16	119	21	5
(b) Inactives	46	8	0	1	1	7	22	4	3
(c) Retirees	362	181	8	17	89	8	46	11	2
(d) Disabled Retirees	<u>27</u>	<u>21</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>1</u>
(e) Total	899	492	16	32	92	31	187	38	11
(2) Payroll of Active Participants	\$23,028,086	\$15,132,856	\$414,772	\$331,051	\$0	\$2,761,504	\$2,953,641	\$1,203,854	\$230,408
(3) Normal Cost*	921,665	605,670	16,601	13,250	0	110,525	118,215	48,182	9,222
(4) Actuarial Accrued Liability*	130,372,380	85,673,922	2,348,211	1,874,229	0	15,634,120	16,721,894	6,815,560	1,304,444
(5) Assets*	<u>84,017,923</u>	<u>55,212,193</u>	<u>1,513,295</u>	<u>1,207,839</u>	<u>0</u>	<u>10,075,341</u>	<u>10,776,353</u>	<u>4,392,259</u>	<u>840,643</u>
(6) Unfunded Actuarial Accrued Liability (4) - (5)	46,354,457	30,461,729	834,916	666,390	0	5,558,779	5,945,541	2,423,301	463,801
(7) Amortizations	3,173,834	2,085,677	57,166	45,627	0	380,603	407,084	165,921	31,756
(8) Total Required Employer Contributions (3) + (7)	4,095,499	2,691,347	73,767	58,877	0	491,128	525,299	214,103	40,978
(9) Fiscal 2012 Cost	\$4,434,567	\$2,914,164	\$79,874	\$63,751	\$0	\$531,789	\$568,789	\$231,829	\$44,371
(10) Fiscal 2013 Cost	\$4,613,334	\$3,031,642	\$83,094	\$66,321	\$0	\$553,226	\$591,718	\$241,174	\$46,159
(11) Fiscal 2014 Cost	\$4,798,979	\$3,153,637	\$86,438	\$68,990	\$0	\$575,489	\$615,529	\$250,879	\$48,017
(12) Fiscal 2015 Cost	\$4,991,743	\$3,280,311	\$89,910	\$71,761	\$0	\$598,605	\$640,254	\$260,957	\$49,945
(13) Fiscal 2016 Cost	\$5,191,882	\$3,411,832	\$93,515	\$74,639	\$0	\$622,605	\$665,924	\$271,419	\$51,948
(14) Percentage of Total Cost	100.0%	65.7%	1.8%	1.4%	0.0%	12.0%	12.8%	5.2%	1.0%

\* Allocation is based on the ratio of the division payroll to the total payroll.

### Breakouts - Actuarial Basis - 8.25%

	<u>Total</u>	<u>Town</u>	<u>Housing Authority</u>	<u>School Lunch</u>	<u>Hospital</u>	<u>Electric</u>	<u>School</u>	<u>Water</u>	<u>Sewer</u>
(1) Participants									
(a) Actives	464	282	8	13	0	16	119	21	5
(b) Inactives	46	8	0	1	1	7	22	4	3
(c) Retirees	362	181	8	17	89	8	46	11	2
(d) Disabled Retirees	<u>27</u>	<u>21</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>1</u>
(e) Total	899	492	16	32	92	31	187	38	11
(2) Payroll of Active Participants	\$23,028,086	\$15,132,856	\$414,772	\$331,051	\$0	\$2,761,504	\$2,953,641	\$1,203,854	\$230,408
(3) Normal Cost									
(a) Total Normal Cost	2,824,434	1,838,602	54,680	33,008	0	413,479	362,536	100,022	22,107
(b) Expected Employee Contributions	<u>1,902,769</u>	<u>1,259,406</u>	<u>36,737</u>	<u>24,878</u>	<u>0</u>	<u>217,699</u>	<u>244,492</u>	<u>99,380</u>	<u>20,177</u>
(c) Net Employer Normal Cost (a) - (b)	921,665	579,196	17,943	8,130	0	195,780	118,044	642	1,930
(4) Actuarial Accrued Liability	130,372,380	88,339,631	1,987,388	1,984,953	7,191,090	14,723,057	9,816,741	5,559,389	770,131
(5) Assets	<u>84,017,923</u>	<u>56,930,097</u>	<u>1,280,764</u>	<u>1,279,195</u>	<u>4,634,267</u>	<u>9,488,211</u>	<u>6,326,357</u>	<u>3,582,724</u>	<u>496,308</u>
(6) Unfunded Actuarial Accrued Liability (4) - (5)	46,354,457	31,409,534	706,624	705,758	2,556,823	5,234,846	3,490,384	1,976,665	273,823
(7) Amortizations*	3,173,834	2,150,573	48,382	48,322	175,063	358,424	238,982	135,340	18,748
(8) Total Required Employer Contributions (3c) + (7)	4,095,499	2,729,769	66,325	56,452	175,063	554,204	357,026	135,982	20,678
(9) Fiscal 2012 Cost	\$4,434,567	\$2,955,766	\$71,816	\$61,126	\$189,557	\$600,087	\$386,585	\$147,240	\$22,390
(10) Fiscal 2013 Cost	\$4,613,334	\$3,074,919	\$74,711	\$63,590	\$197,198	\$624,278	\$402,169	\$153,176	\$23,293
(11) Fiscal 2014 Cost	\$4,798,979	\$3,198,658	\$77,717	\$66,149	\$205,133	\$649,399	\$418,353	\$159,340	\$24,230
(12) Fiscal 2015 Cost	\$4,991,743	\$3,327,140	\$80,839	\$68,806	\$213,373	\$675,484	\$435,157	\$165,740	\$25,204
(13) Fiscal 2016 Cost	\$5,191,882	\$3,460,539	\$84,080	\$71,565	\$221,928	\$702,567	\$452,604	\$172,385	\$26,214
(14) Percentage of Total Cost	100.0%	66.7%	1.6%	1.4%	4.3%	13.5%	8.7%	3.3%	0.5%

\* Allocation is based on the ratio of the Unfunded Actuarial Accrued Liability.