

**City of Cambridge Contributory Retirement  
System**

*Actuarial Valuation and Review  
as of January 1, 2010*

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*August 2, 2010*

*Retirement Board  
City of Cambridge Contributory Retirement System  
255 Bent Street, 3rd Floor  
Cambridge, MA 02141*

*Dear Board Members:*

*We are pleased to submit this Actuarial Valuation and Review as of January 1, 2010. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2011 and later years and analyzes the preceding two years' experience.*


*The census information and financial information on which our calculations were based was prepared by the staff of the Cambridge Retirement System. That assistance is gratefully acknowledged. The actuarial calculations were completed under my supervision.*

*This actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.*

*We look forward to reviewing this report at your next meeting and to answering any questions.*

*Sincerely,*

*THE SEGAL COMPANY*

By:   
*Kathleen A. Riley, FSA, MAAA, EA  
Senior Vice President and Actuary*

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## SECTION 1

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## SECTION 1: Valuation Summary for the City of Cambridge Contributory Retirement System

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### Purpose

This report has been prepared by The Segal Company to present a valuation of the City of Cambridge Contributory Retirement System as of January 1, 2010. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of M.G.L. Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of January 1, 2010;
- The assets of the Plan as of December 31, 2009;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

### Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- The actuarial valuation report as of January 1, 2010 is based on financial information as of that date. Changes in the value of assets subsequent to that date, to the extent that they exist, are not reflected.
- During the plan years ended 2008 and 2009, the market value rates of return were -28.81% and 19.63%, respectively. Because the actuarial value of assets gradually recognizes market value fluctuations over a five-year period, the actuarial rates of return for the plan years ended 2008 and 2009 were -11.59% and 16.51%, respectively. The actuarial value of assets as of December 31, 2009 was \$796.0 million, or 116.8% of the market value of assets of \$681.3 million (as reported in the Annual Statement). As of December 31, 2007, the actuarial value of assets was 96.7% of market value.
- As indicated in Section 2, Subsection B of this report, the total unrecognized investment loss as of December 31, 2009 is \$114,686,246. This investment loss will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent it is not offset by recognition of investment gains derived from future experience. This implies that earning the assumed rate of investment return of 8.25% (net of expenses) per year on a **market value** basis will result in investment losses on the actuarial value of assets in the next few years. The funding schedule in Section 3, Exhibit F reflects the emergence of the deferred investment losses in accordance with the asset valuation method adopted by the Board.

## SECTION 1: Valuation Summary for the City of Cambridge Contributory Retirement System

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- The unfunded liability has increased from \$67.0 million as of January 1, 2008 to \$153.9 million as of January 1, 2010 compared to an expected unfunded liability of \$41.2 million as of January 1, 2010. The increase is primarily due to an investment loss over the two-year period and assumption changes discussed below.
- This valuation reflects the following changes in assumptions:
  - The net investment return assumption was lowered from 8.50% to 8.25%.
  - The long-term salary scale assumption was lowered from 5.5% to 5.0% per year.
  - The administrative expense assumption was lowered from \$900,000 to \$850,000 for calendar year 2010.
- The recommended contribution for fiscal 2011 was set at the City's previously budgeted amount of \$28,353,542, plus an additional contribution of \$200,000, for a total amount of \$28,553,452. Based on an amortization schedule with 4.50% increasing amortization payments, the unfunded actuarial accrued liability would be paid off in approximately 11 years. In projecting the unfunded actuarial accrued liability for future fiscal years, the deferred investment losses have been reflected in accordance with the asset valuation method approved by the Board. As shown in the funding schedule in Section 3, Exhibit F, the unfunded liability increases significantly for the next three fiscal years.

In fiscal 2012, the recommended contribution will be the prior year's budgeted amount increased 5.50% plus an additional contribution of \$2,300,000. In 2013 and later, the recommended contribution will be the prior year's budgeted amount increased 5.50% plus an additional contribution of \$300,000. This will result in a total fiscal 2012 appropriation of \$32,212,987 and a total fiscal 2013 appropriation of \$31,858,201. The effective amortization period increases from 11 years to 19 years then gradually decreases as the unfunded liability is projected to be paid off by 2029. The prior funding schedule fully funded the System in 2013. Exhibit F in Section 3 shows the detail of the funding schedule.

**SECTION 1: Valuation Summary for the City of Cambridge Contributory Retirement System**

**Summary of Key Valuation Results**

	<b>2010</b>	<b>2008</b>
<b>Contributions:</b>		
Recommended for fiscal 2011 and 2009	\$28,553,542	\$26,925,933
Recommended for fiscal 2012 and 2010	32,212,987	27,727,711
Recommended for fiscal 2013 and 2011	31,858,201	28,553,542
<b>Funding elements for plan year beginning January 1:</b>		
Normal cost, including administrative expenses	\$31,154,952	\$30,298,159
Market value of assets	681,329,524	792,321,860
Actuarial value of assets	796,015,770	766,030,562
Actuarial accrued liability	949,907,739	833,034,229
Unfunded actuarial accrued liability	153,891,969	67,003,667
<b>GASB 25/27 for fiscal year beginning July 1:</b>		
Annual required contributions	\$28,553,542	\$26,891,503
Actual contributions	--	26,891,503
Percentage contributed	--	100.00%
Funded ratio	83.80%	91.96%
<b>Demographic data for plan year beginning January 1:</b>		
Number of retired participants and beneficiaries	1,809	1,756
Number of inactive participants entitled to a return of their employee contributions	1,001	835
Number of inactive participants with a vested right to a deferred or immediate benefit	173	83
Number of active participants	3,614	4,119
Total payroll*	\$222,162,255	\$222,115,415
Average payroll*	61,473	53,925

\* Payroll figures are for the prior calendar year. Calendar year 2007 payroll figures were increased by 3.0% for members of the Police Department to reflect unsettled bargaining contracts.

**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

**A. PARTICIPANT DATA**

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A and B.

*A historical perspective of how the participant population has changed over the past seven valuations can be seen in this chart.*

**CHART 1**  
**Participant Population: 1997 – 2009**

<b>Year Ended December 31</b>	<b>Active Participants</b>	<b>Inactive Participants*</b>	<b>Retired Participants and Beneficiaries</b>
1997	3,400	380	1,606
1999	3,655	392	1,629
2001	3,870	675	1,662
2003	3,825	822	1,746
2005	3,739	1,070	1,739
2007	4,119	918	1,756
2009	3,614	1,174	1,809

\* Excludes terminated participants due a refund of employee contributions prior to 2001.

**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

**Active Participants**

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 3,614 active participants with an average age of 46.4, average years of service of 12.0 years and average payroll of \$61,473. The 4,119 active participants in the prior valuation had an average age of 44.9, average service of 10.6 years and average payroll of \$53,925.

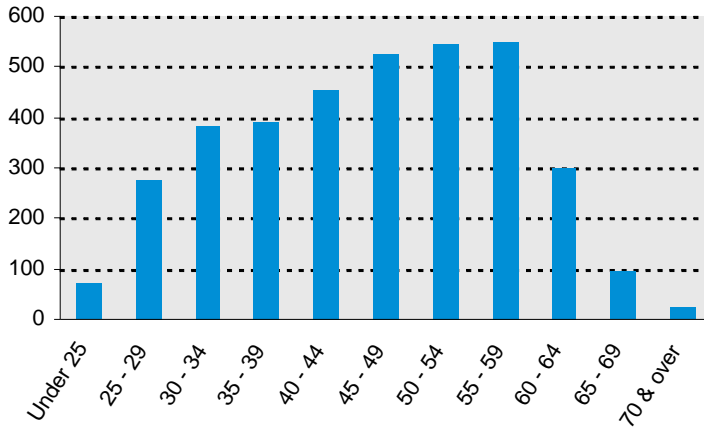
Among the active participants, there were none with unknown age and/or service information.

**Inactive Participants**

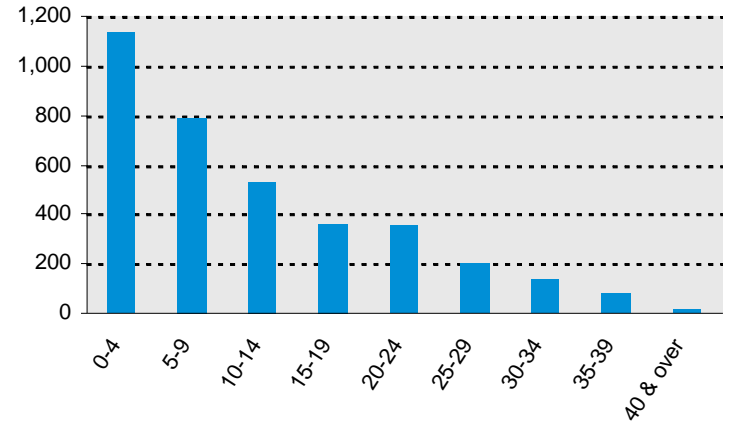
In this year's valuation, there were 173 participants with a vested right to a deferred or immediate vested benefit and 1,001 participants entitled to a return of their employee contributions.

*These graphs show a distribution of active participants by age and by years of service.*

**CHART 2**  
**Distribution of Active Participants by Age as of December 31, 2009**



**CHART 3**  
**Distribution of Active Participants by Years of Service as of December 31, 2009**



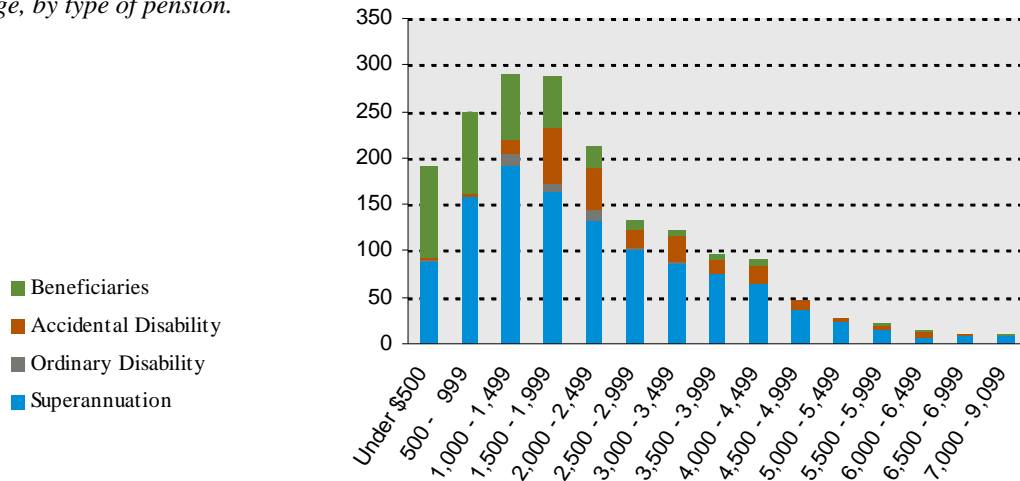
**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

**Retired Participants and Beneficiaries**

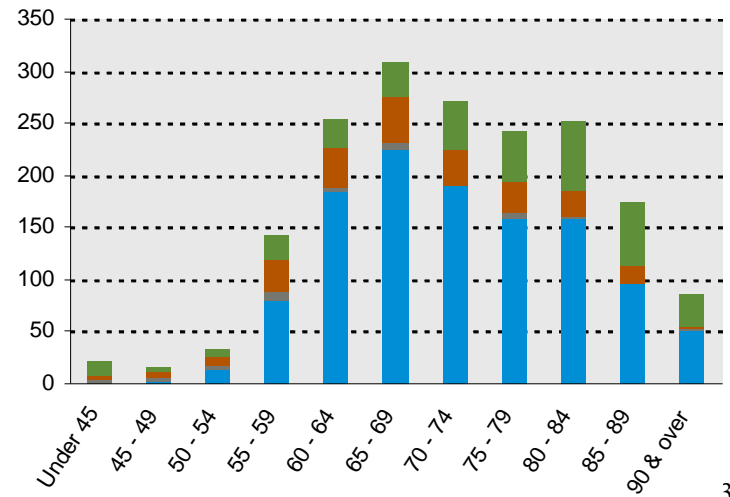
As of December 31, 2009, 1,434 retired participants and 371 beneficiaries were receiving total monthly benefits of \$3,800,661 excluding COLAs reimbursed by the Commonwealth. For comparison, in the previous valuation, there were 1,376 retired participants and 376 beneficiaries receiving monthly benefits of \$3,359,231 excluding COLAs reimbursed by the Commonwealth. There were 4 retired participants in suspended status this year and in the prior valuation.

*These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.*

**CHART 4**  
**Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of December 31, 2009**



**CHART 5**  
**Distribution of Retired Participants and Beneficiaries by Type and by Age as of December 31, 2009**



**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

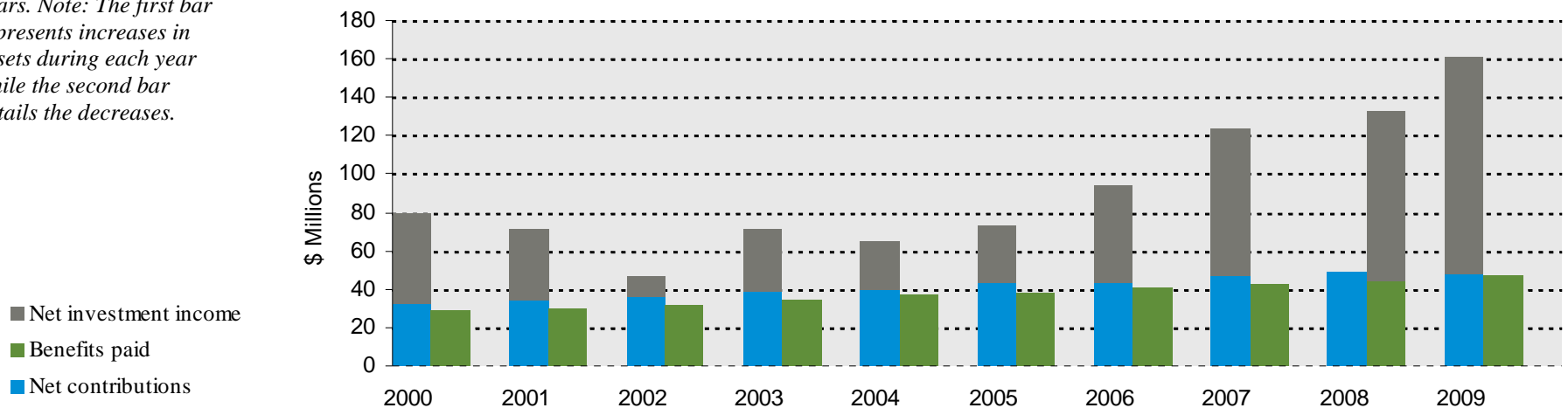
**B. FINANCIAL INFORMATION**

Retirement plan funding anticipates that, over the long term, both net contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits C and D.

*The chart depicts the components of changes in the actuarial value of assets over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.*

**CHART 6**  
**Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended December 31, 2000 – 2009**



## SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

*The chart shows the determination of the actuarial value of assets as of the valuation date.*

### CHART 7 Determination of Actuarial Value of Assets

		December 31, 2009	December 31, 2008
1. Market value of assets		\$681,329,524	\$568,421,838
2. Calculation of unrecognized return*	<u>Original Amount</u>	<u>Unrecognized Return</u>	<u>Unrecognized Return</u>
(a) Year ended December 31, 2009	\$63,324,242	\$50,659,394	N/A
(b) Year ended December 31, 2008	-296,592,305	-177,955,384	-\$237,273,843
(c) Year ended December 31, 2007	18,469,167	7,387,667	11,081,500
(d) Year ended December 31, 2006	26,110,383	5,222,077	10,444,153
(e) Year ended December 31, 2005	-12,370,548	<u>N/A</u>	-2,474,110
(f) Total unrecognized return		-114,686,246	-218,222,300
3. Preliminary actuarial value: (1) - (2f)		796,015,770	786,644,138
4. Adjustment to be within 20% corridor		0	-104,537,933
5. Final actuarial value of assets: (3) + (4)		<u>\$796,015,770</u>	<u>\$682,106,205</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1)		116.8%	120.0%

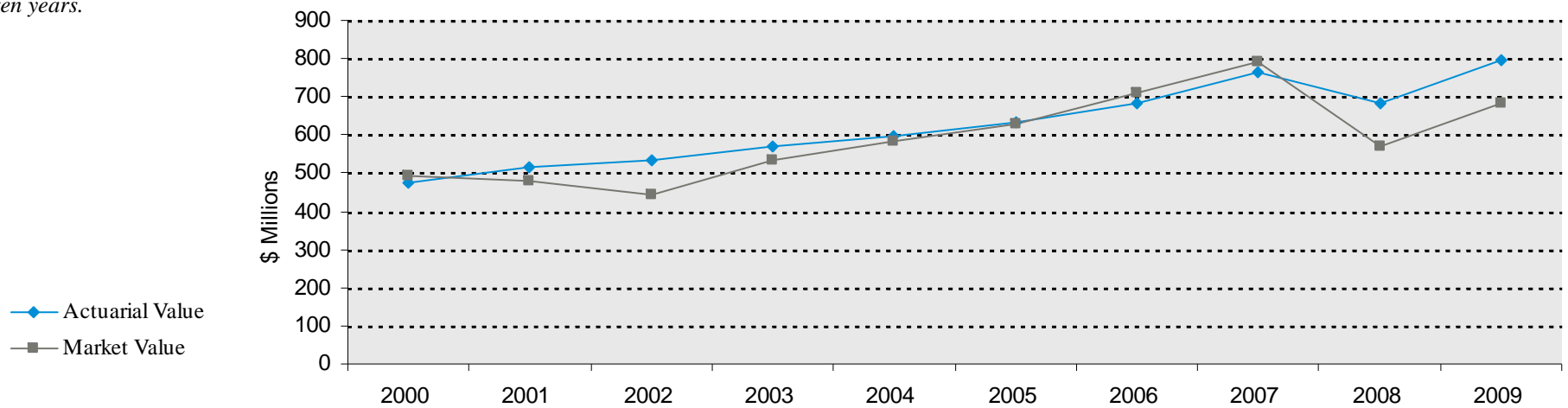
\* Unrecognized return is the difference between the total return and the expected return on a market value basis and is recognized over a five-year period.

## SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System

Both the actuarial value and market value of assets are representations of the Cambridge Retirement System's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Cambridge Retirement System's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

*This chart shows the change in the actuarial value of assets versus the market value over the past ten years.*

**CHART 8**  
**Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2000 – 2009**



**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

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**C. ACTUARIAL EXPERIENCE**

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss over the two-year period is \$100,597,577. A discussion of the major components of the actuarial experience is on the following pages.

*This chart provides a summary of the actuarial experience over the past two years.*

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**CHART 9**  
**Actuarial Experience for Two-Year Period Ended December 31, 2009**

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1. Net loss from investments*	-\$112,841,391
2. Net gain from administrative expenses	262,823
3. Net gain from other experience**	<u>11,980,991</u>
4. Net experience loss: (1) + (2) + (3)	-\$100,597,577

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\* Details in Chart 10

\*\* Details in Chart 13

**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

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**Investment Rate of Return**

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Cambridge Retirement System’s investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 8.25%. The actual rates of return on an actuarial basis for 2009 and 2008 were 16.51% and -11.59%, respectively.

Since the actual combined returns for the two years were less than the assumed return, the Cambridge Retirement System experienced an actuarial loss of \$112,841,391 (including an interest adjustment) during the two-year period ending December 31, 2009 with regard to its investments.

*This chart shows the gain/(loss) due to investment experience.*

**CHART 10**  
**Actuarial Value Investment Experience**

	Year Ended	
	December 31, 2009	December 31, 2008
1. Actual return	\$112,693,654	-\$89,051,384
2. Average value of assets	682,714,161	768,594,075
3. Actual rate of return: (1) ÷ (2)	16.51%	-11.59%
4. Assumed rate of return	8.50%	8.50%
5. Expected return: (2) x (4)	\$58,030,705	\$65,330,496
6. Actuarial gain/(loss): (1) – (5)	<u>\$54,662,949</u>	<u>-\$154,381,880</u>

**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

Based upon this experience and future expectations, we have changed the assumed rate of return to 8.25%.

**CHART 11**

**Investment Return – Actuarial Value vs. Market Value: 2000 - 2009**

Year Ended December 31	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
2000	\$46,386,113	10.87%	\$28,567,163	6.20%
2001	37,316,201	7.81	-17,337,367	-3.51
2002	11,102,978	2.14	-39,456,419	-8.20
2003	32,551,116	6.09	84,572,135	18.96
2004	25,462,238	4.46	49,379,640	9.25
2005	29,628,112	4.94	37,534,023	6.39
2006	50,222,320	7.93	79,521,825	12.66
2007	77,029,038	11.21	78,925,557	11.10
2008	-89,051,384	-11.59	-229,027,048	-28.81
2009	<u>112,693,654</u>	16.51	<u>111,691,774</u>	19.63
Total	\$333,340,386		\$184,371,283	
	Five-year average return	5.35%		2.39%
	Ten-year average return	5.65%		3.23%

*Note: Each year's yield is weighted by the average asset value in that year.*

**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

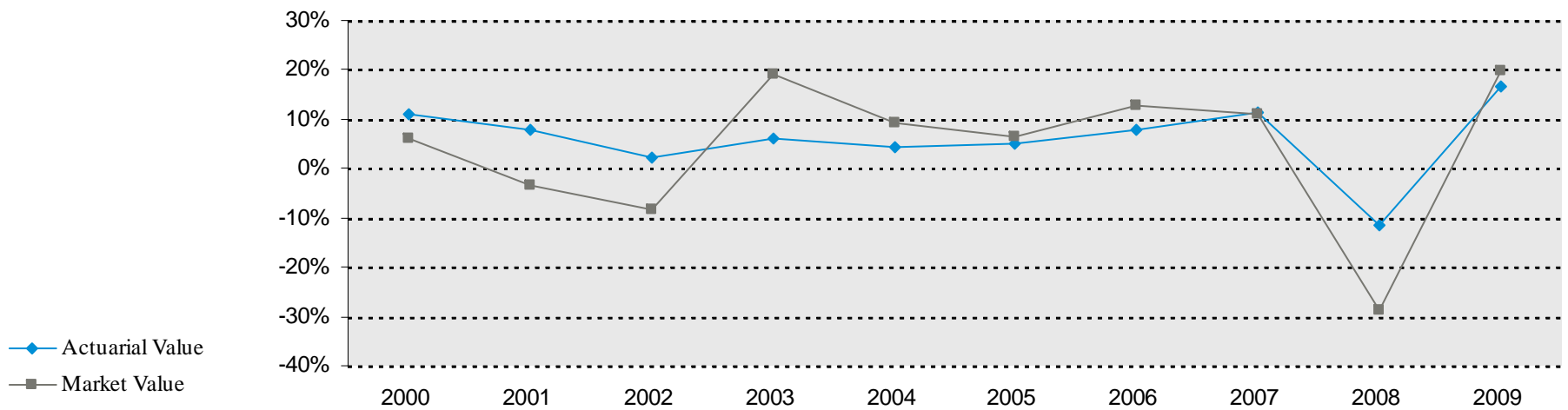
Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

**Administrative Expenses**

Administrative expenses for the years ended December 31, 2008 and 2009 were \$859,128 and \$805,860, respectively, compared to the assumption of \$900,000 for calendar 2008 and \$940,500 for calendar 2009. This resulted in a gain of \$262,823 for the two-year period, including an adjustment for interest. We have lowered the assumption from \$900,000 to \$850,000 for calendar 2010.

*This chart illustrates how this leveling effect has actually worked over the years 2000 - 2009.*

**CHART 12**  
**Market and Actuarial Rates of Return for Years Ended December 31, 2000 - 2009**



**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

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**Other Experience**

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed.

The net gain from this other experience for the two-year period ending December 31, 2009 amounted to \$11,980,991 which is 1.3% of the actuarial accrued liability.

A brief summary of the demographic gain/(loss) experience of the Cambridge Retirement System for the two-year period ending December 31, 2009 is shown in the chart below.

This valuation reflects the following changes in assumptions:

- The net investment return was lowered from 8.50% to 8.25%.
- The salary scale assumption was lowered from 5.5% to 5.0% per year.
- The administrative expense assumption was decreased from \$900,000 to \$850,000 for calendar year 2010.

Changing these assumptions resulted in a net increase in the unfunded liability of \$12,130,465.

*The chart shows elements of the experience gain/(loss) for the most recent years.*

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**CHART 13**

**Experience Due to Changes in Demographics for Two-Year Period Ended December 31, 2009**

1. Salary increases greater than expected for continuing actives	-\$2,253,936
2. Miscellaneous gain	<u>14,234,927</u>
3. Total	\$11,980,991

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**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

**D. RECOMMENDED CONTRIBUTION**

The amount of annual contribution required to fund the Plan is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability.

The recommended contribution for fiscal 2011 was set at the City's previously budgeted amount of \$28,353,542, plus an additional contribution of \$200,000, for a total amount of \$28,553,452. Based on an amortization schedule with 4.50% increasing amortization payments, the unfunded actuarial accrued liability would be paid off in approximately 11 years. In projecting the unfunded actuarial accrued liability for future fiscal years, the deferred investment losses have been reflected in accordance with the asset valuation method approved by the Board. As shown in the funding schedule in Section 3,

Exhibit F, the unfunded liability increases significantly for the next three fiscal years.

In fiscal 2012, the recommended contribution will be the prior year's budgeted amount increased 5.50% plus an additional contribution of \$2,300,000. In 2013 and later, the recommended contribution will be the prior year's budgeted amount increased 5.50% plus an additional contribution of \$300,000. This will result in a total fiscal 2012 appropriation of \$32,212,987 and a total fiscal 2013 appropriation of \$31,858,201. The effective amortization period increases from 11 years to 19 years then gradually decreases as the unfunded liability is projected to be paid off by 2029. The prior funding schedule fully funded the System in 2013. Exhibit F in Section 3 shows the detail of the funding schedule.

*The chart compares this valuation's recommended contribution with the prior valuation.*

**CHART 14  
Recommended Contribution**

	Year Beginning January 1		2008	
	2010	% of Payroll	Amount	% of Payroll
1. Total normal cost	\$30,304,952	13.01%	\$29,398,159	12.68%
2. Administrative expenses	850,000	0.37%	900,000	0.39%
3. Expected employee contributions	<u>-21,513,682</u>	<u>-9.24%</u>	<u>-21,078,502</u>	<u>-9.09%</u>
4. Employer normal cost: (1) + (2) + (3)	\$9,641,270	4.14%	\$9,219,657	3.98%
5. Actuarial accrued liability	949,907,739		833,034,229	
6. Actuarial value of assets	<u>796,015,770</u>		<u>766,030,562</u>	
7. Unfunded actuarial accrued liability: (5) - (6)	\$153,891,969		\$67,003,667	
8. Employer normal cost projected to July 1, 2010 and 2008, adjusted for timing	10,229,746	4.31%	9,770,118	4.14%
9. Projected unfunded actuarial accrued liability	160,114,222		69,793,253	
10. Payment on projected unfunded actuarial accrued liability, including additional \$200,000 contribution, adjusted for timing	18,323,796	7.72%	17,155,815	7.28%
11. Recommended contribution: (8) + (10)	<u>\$28,553,542</u>	<u>12.02%</u>	<u>\$26,925,933</u>	<u>11.42%</u>
12. Projected payroll	\$237,453,300		\$235,791,842	

*Note: Recommended contributions are assumed to be paid in the middle of the fiscal year.*

**SECTION 2: Valuation Results for the City of Cambridge Contributory Retirement System**

**E. INFORMATION REQUIRED BY THE GASB**

Governmental Accounting Standards Board (GASB) reporting information provides standardized information for comparative purposes of governmental pension plans. This information allows a reader of the financial statements to compare the funding status of one governmental plan to another on relatively equal terms.

Critical information to the GASB is the historical comparison of the GASB required contribution to the actual contributions. This comparison demonstrates whether a plan is being funded within the range of the GASB reporting requirements. Chart 15 below presents a graphical representation of this information for the Plan.

The other critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the

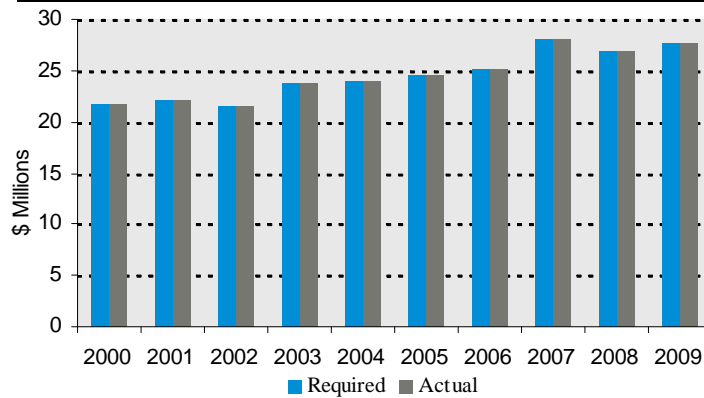
actuarial value of assets to the actuarial accrued liabilities of the plan as calculated under the GASB. High ratios indicate a well-funded plan with assets sufficient to pay most benefits. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

Although the GASB requires that the actuarial value of assets be used to determine the funded ratio, Chart 16 shows the funded ratio calculated using both the actuarial value of assets (83.80%) and the market value of assets (71.73%).

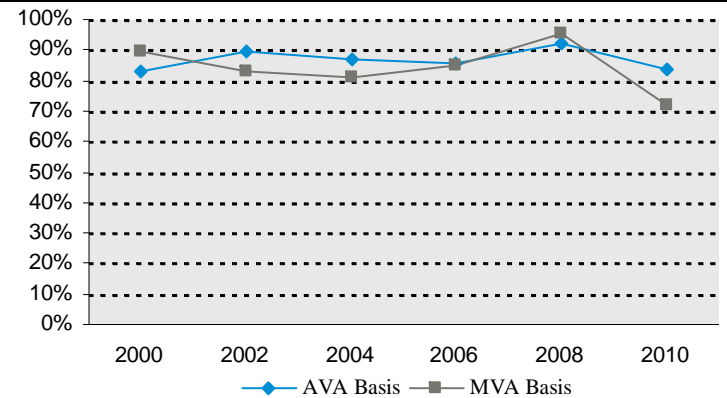
The details regarding the calculations of these values and other GASB numbers may be found in Section 4, Exhibits II, III, and IV.

*These graphs show key GASB factors.*

**CHART 15**  
**Required Versus Actual Contributions**



**CHART 16**  
**Funded Ratio**



**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT A**

**Table of Plan Coverage**

<b>Category</b>	<b>Year Ended December 31</b>		<b>Change From Prior Valuation</b>
	<b>2009</b>	<b>2007</b>	
<b>Active participants in valuation:</b>			
Number	3,614	4,119	-12.3%
Average age	46.4	44.9	N/A
Average service	12.0	10.6	N/A
Total payroll*	\$222,162,255	\$222,115,415	0.0%
Average payroll*	61,473	53,925	14.5%
Member contributions	184,034,315	170,858,008	7.7%
<b>Inactive participants entitled to a return of their employee contributions</b>	1,001	835	19.9%
<b>Inactive participants with a vested right to a deferred or immediate benefit</b>	173	83	108.4%
<b>Retired participants:</b>			
Number in pay status	1,157	1,108	4.4%
Average age	72.4	72.5	N/A
Average monthly benefit	\$2,263	\$2,049	10.4%
Number in suspended status	4	4	0.0%
<b>Disabled participants:</b>			
Number in pay status	277	268	3.4%
Average age	67.8	67.3	N/A
Average monthly benefit	\$2,616	\$2,444	7.0%
<b>Beneficiaries in pay status</b>	371	376	-1.3%

\* Payroll figures are for the prior calendar year. Calendar year 2007 payroll figures were increased by 3.0% for members of the Police Department to reflect unsettled bargaining contracts.

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT B**

**Participants in Active Service as of December 31, 2009  
By Age, Years of Service, and Average Payroll**

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
<b>Under 25</b>	73	72	1	--	--	--	--	--	--	--
	\$100,292	\$100,819	\$62,339	--	--	--	--	--	--	--
<b>25 - 29</b>	277	228	46	3	--	--	--	--	--	--
	\$43,158	\$42,395	\$46,258	\$53,603	--	--	--	--	--	--
<b>30 - 34</b>	384	230	116	38	--	--	--	--	--	--
	\$47,947	\$44,320	\$53,131	\$54,080	--	--	--	--	--	--
<b>35 - 39</b>	389	142	129	94	24	--	--	--	--	--
	\$57,088	\$45,398	\$58,688	\$68,881	\$71,455	--	--	--	--	--
<b>40 - 44</b>	454	126	115	100	67	46	--	--	--	--
	\$60,398	\$54,105	\$55,913	\$62,372	\$70,744	\$69,485	--	--	--	--
<b>45 - 49</b>	526	115	123	86	66	91	38	7	--	--
	\$63,463	\$54,859	\$60,650	\$65,949	\$64,924	\$71,345	\$72,507	\$58,378	--	--
<b>50 - 54</b>	545	99	108	70	79	93	59	33	4	--
	\$66,453	\$58,108	\$57,812	\$59,923	\$67,156	\$75,999	\$81,325	\$78,437	\$66,513	--
<b>55 - 59</b>	548	75	90	70	74	72	59	63	40	5
	\$69,204	\$60,839	\$65,610	\$59,878	\$67,868	\$70,213	\$76,283	\$80,942	\$78,935	\$85,842
<b>60 - 64</b>	299	39	44	46	38	32	36	26	31	7
	\$67,945	\$56,213	\$57,814	\$65,565	\$57,391	\$73,518	\$78,734	\$71,824	\$92,508	\$65,761
<b>65 - 69</b>	95	10	20	18	10	18	5	7	2	5
	\$62,916	\$44,973	\$51,052	\$61,940	\$55,124	\$59,263	\$58,464	\$80,501	\$74,841	\$153,559
<b>70 &amp; over</b>	24	2	1	3	1	5	4	4	3	1
	\$43,008	\$15,617	\$44,779	\$64,509	\$79,935	\$52,530	\$44,437	\$11,703	\$48,542	\$49,880
<b>Total</b>	3,614	1,138	793	528	359	357	201	140	80	18
	\$61,473	\$52,443	\$57,468	\$63,087	\$66,516	\$71,411	\$76,411	\$75,530	\$82,331	\$94,845

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT C**

**Summary Statement of Income and Expenses on an Actuarial Value Basis**

	Year Ended December 31, 2009	Year Ended December 31, 2008
<b>Contribution income:</b>		
Employer contributions	\$27,727,711	\$26,891,503
Employee contributions	21,199,168	22,966,497
Federal grant reimbursement and other contributions	0	4,430
Less administrative expenses	<u>-805,680</u>	<u>-859,128</u>
Net contribution income	\$48,121,199	\$49,003,302
<b>Net investment income</b>	<u>112,693,654</u>	<u>-89,051,384</u>
<b>Total income available for benefits</b>	\$160,814,853	-\$40,048,082
<b>Less benefit payments:</b>		
Pensions and annuities	-\$43,820,291	-\$41,119,726
Net (8)c reimbursements	-114,173	-59,813
Refunds to members	<u>-2,970,824</u>	<u>-2,696,736</u>
Net benefit payments	-\$46,905,288	-\$43,876,275
<b>Change in reserve for future benefits</b>	\$113,909,565	-\$83,924,357

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT D**

**Development of the Fund Through December 31, 2009**

<b>Year Ended December 31</b>	<b>Employer Contributions</b>	<b>Employee Contributions</b>	<b>Other Contributions</b>	<b>Net Investment Return*</b>	<b>Administrative Expenses</b>	<b>Benefit Payments</b>	<b>Actuarial Value of Assets at End of Year</b>
2000	\$21,668,642	\$11,847,844	\$0	\$46,386,113	\$585,980	\$28,506,568	\$475,416,220
2001	22,030,446	12,607,588	0	37,316,200	581,002	29,842,417	516,947,036
2002	21,398,751	15,252,588	0	11,102,978	572,725	31,634,273	532,494,355
2003	23,761,798	15,390,623	0	32,551,116	641,854	34,055,983	569,500,055
2004	23,977,875	16,696,190	0	25,462,238	708,462	37,512,633	597,415,263
2005	24,577,322	19,558,281	0	29,628,112	768,175	38,351,476	632,059,327
2006	25,220,175	19,077,798	3,917	50,222,320	794,692	41,076,592	684,712,253
2007	28,066,908	19,725,429	0	77,029,038	830,697	42,672,369	766,030,562
2008	26,891,503	22,966,497	4,430	-89,051,384	859,128	43,876,275	682,106,205
2009	27,727,711	21,199,168	0	112,693,654	805,680	46,905,288	796,015,770

\* Net of investment expenses.

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT E**

**Development of Unfunded Actuarial Accrued Liability and (Gain)/Loss**

	Year Ended	
	December 31, 2009	December 31, 2008
1. Unfunded actuarial accrued liability at beginning of year	\$53,590,898	\$67,003,667
2. Normal cost at beginning of year	31,358,595	30,298,159
3. Total contributions	-48,926,879	-49,862,430
4. Interest		
(a) For whole year on (1) + (2)	\$7,220,707	\$8,270,655
(b) For half year on (3)	<u>-2,079,394</u>	<u>-2,119,153</u>
(c) Total interest	<u>5,141,313</u>	<u>6,151,502</u>
5. Expected unfunded actuarial accrued liability	\$41,163,927	\$53,590,898
6. Changes due to:		
(a) Experience loss	\$100,597,577	
(b) Assumption changes	<u>12,130,465</u>	
(c) Total changes	<u>112,728,042</u>	
7. Unfunded actuarial accrued liability at end of year: (5) + (6c)	<u>\$153,891,969</u>	

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT F**

**Funding Schedule**

(1) Fiscal Year Ended June 30	(2) Employer Normal Cost	(3) Amortization of Remaining Unfunded Liability	(4) Total Plan Cost: (2) + (3)	(5) Additional Payment	(6) Total Unfunded Actuarial Accrued Liability at Beginning of Fiscal Year	(7) Percent Change in Total Plan Cost
2011	\$10,229,746	\$18,123,796	\$28,353,542	\$200,000	\$160,114,222	3.0000%
2012	10,638,936	19,274,051	29,912,987	2,300,000	203,534,672	5.5000%
2013	11,064,493	20,493,708	31,558,201	300,000	249,599,879	5.5000%
2014	11,507,073	21,786,829	33,293,902	300,000	300,844,242	5.5000%
2015	11,967,356	23,157,711	35,125,067	300,000	289,563,723	5.5000%
2016	12,446,050	24,610,896	37,056,946	300,000	290,500,521	5.5000%
2017	12,943,892	26,151,186	39,095,078	300,000	290,060,177	5.5000%
2018	13,461,648	27,783,659	41,245,307	300,000	286,469,465	5.5000%
2019	14,000,114	29,513,685	43,513,799	300,000	280,884,041	5.5000%
2020	14,560,119	31,346,939	45,907,058	300,000	273,037,845	5.5000%
2021	15,142,524	33,289,422	48,431,946	300,000	262,636,960	5.5000%
2022	15,748,225	35,347,478	51,095,703	300,000	249,356,979	5.5000%
2023	16,378,154	37,527,813	53,905,967	300,000	232,840,131	5.5000%
2024	17,033,280	39,837,515	56,870,795	300,000	212,692,152	5.5000%
2025	17,714,611	42,284,078	59,998,689	300,000	188,478,875	5.5000%
2026	18,423,195	44,875,422	63,298,617	300,000	159,722,519	5.5000%
2027	19,160,123	47,619,918	66,780,041	300,000	125,897,645	5.5000%
2028	19,926,528	50,526,415	70,452,943	300,000	86,426,756	5.5000%
2029	20,723,589	42,020,120	62,743,709	300,000	40,675,504	-10.9424%
2030	21,552,533	-	21,552,533	-	-	-65.6499%

*Notes: Recommended contributions are assumed to be paid in the middle of the fiscal year.*

*Item (2) is assumed to increase 4% per year.*

*Anticipates deferred investment losses.*

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT G**

**Department Statistics as of December 31, 2009**

<b>Category</b>	<b>Fire</b>	<b>Police</b>	<b>Water</b>	<b>Sewer</b>	<b>Housing</b>	<b>Redevel.</b>	<b>PHC</b>	<b>School</b>	<b>Other</b>	<b>Total</b>
<b>Active participants in valuation</b>										
Number	246	246	45	216	158	3	1,442	537	721	3,614
Average age	44.4	43.6	48.0	48.6	46.6	58.0	46.1	47.0	47.2	46.4
Average service	17.0	17.0	15.8	12.4	11.7	16.6	9.8	11.3	13.4	12.0
Total payroll	\$19,528,979	\$19,839,696	\$2,633,242	\$10,939,499	\$8,745,133	\$349,060	\$98,251,082	\$20,180,795	\$41,694,769	\$222,162,255
Average payroll	79,386	80,649	58,516	50,646	55,349	116,353	68,135	37,581	57,829	61,473
<b>Inactive participants entitled to a return of their employee contributions</b>										
	11	7	4	16	32	0	572	225	134	1,001
<b>Inactive participants with a vested right to a deferred or immediate benefit</b>										
	19	19	3	7	10	1	57	19	38	173
<b>Retired participants and beneficiaries in pay status</b>										
Retired participants	113	136	25	83	45	9	344	203	203	1,161
Disabled participants	83	64	8	28	9	0	37	30	18	277
Beneficiaries	73	66	23	64	22	4	41	42	36	371
Total number in pay status	269	266	56	175	76	13	422	275	257	1,809
Total monthly benefits	\$841,766	\$821,220	\$100,169	\$278,016	\$130,387	\$17,151	\$785,465	\$375,123	\$459,142	\$3,808,439
Average monthly benefit	3,129	3,087	1,789	1,589	1,716	1,319	1,861	1,364	1,787	2,105

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT H**

**Department Results as of January 1, 2010  
– Estimated Payroll Allocation for Fiscal 2010 – 2012**

<b>Category</b>	<b>Fire</b>	<b>Police</b>	<b>Water</b>	<b>Sewer</b>	<b>Housing</b>	<b>Redevel.</b>	<b>PHC</b>	<b>School</b>	<b>Other</b>	<b>Total</b>
1. Total normal cost	\$3,223,307	\$3,223,397	\$319,664	\$1,466,871	\$1,140,625	\$45,651	\$13,019,892	\$2,747,226	\$5,118,319	\$30,304,952
2. Administrative expenses	90,408	90,411	8,966	41,143	31,993	1,280	365,185	77,055	143,559	850,000
3. Expected employee contributions	<u>-1,862,702</u>	<u>-1,914,133</u>	<u>-250,499</u>	<u>-1,009,569</u>	<u>-844,372</u>	<u>-14,408</u>	<u>-9,904,578</u>	<u>-1,845,185</u>	<u>-3,868,236</u>	<u>-21,513,682</u>
4. Employer normal cost: (1) + (2) + (3)	\$1,451,013	\$1,399,675	\$78,131	\$498,445	\$328,246	\$32,523	\$3,480,499	\$979,096	\$1,393,642	\$9,641,270
5. Employer normal cost as a percent of payroll	7.08%	6.72%	2.83%	4.35%	3.58%	8.87%	3.38%	4.63%	3.19%	4.14%
6. Actuarial accrued liability	\$160,940,857	\$155,939,150	\$16,840,379	\$54,005,103	\$32,427,721	\$3,153,458	\$283,943,478	\$88,622,813	\$154,034,780	\$949,907,739
7. Actuarial value of assets	<u>134,867,267</u>	<u>130,675,872</u>	<u>14,112,115</u>	<u>45,255,883</u>	<u>27,174,194</u>	<u>2,642,575</u>	<u>237,942,568</u>	<u>74,265,272</u>	<u>129,080,024</u>	<u>796,015,770</u>
8. Unfunded actuarial accrued liability: (6) – (7)	\$26,073,590	\$25,263,278	\$2,728,264	\$8,749,220	\$5,253,527	\$510,883	\$46,000,910	\$14,357,541	\$24,954,756	\$153,891,969
9. Projected calendar year payroll	20,481,582	20,831,680	2,764,904	11,468,099	9,157,676	366,513	102,963,079	21,129,614	43,678,970	232,842,117
10. Approximate payroll allocation of fiscal 2011	2,494,074	2,536,706	336,687	1,396,488	1,115,144	44,631	12,537,972	2,572,986	5,318,854	28,353,542
11. Approximate payroll allocation of fiscal 2012	2,631,248	2,676,224	355,204	1,473,295	1,176,477	47,086	13,227,561	2,714,500	5,611,392	29,912,987
12. Approximate payroll allocation of fiscal 2013	2,775,966	2,823,417	374,741	1,554,326	1,241,183	49,675	13,955,076	2,863,797	5,920,020	31,558,201

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT H (continued)**

**Department Results as of January 1, 2010 – Allocation of Fiscal 2011 – 2012 Appropriation by Actuarial Cost**

<b>Category</b>	<b>Fire</b>	<b>Police</b>	<b>Water</b>	<b>Sewer</b>	<b>Housing</b>	<b>Redevel.</b>	<b>PHC</b>	<b>School</b>	<b>Other</b>	<b>Total</b>
1. Total normal cost	\$3,223,307	\$3,223,397	\$319,664	\$1,466,871	\$1,140,625	\$45,651	\$13,019,892	\$2,747,226	\$5,118,319	\$30,304,952
2. Administrative expenses	\$90,408	\$90,411	\$8,966	\$41,143	\$31,993	\$1,280	\$365,185	\$77,055	\$143,559	\$850,000
3. Expected employee contributions	<u>-\$1,862,702</u>	<u>-\$1,914,133</u>	<u>-\$250,499</u>	<u>-\$1,009,569</u>	<u>-\$844,372</u>	<u>-\$14,408</u>	<u>-\$9,904,578</u>	<u>-\$1,845,185</u>	<u>-\$3,868,236</u>	<u>-\$21,513,682</u>
4. Employer normal cost: (1) + (2) + (3)	\$1,451,013	\$1,399,675	\$78,131	\$498,445	\$328,246	\$32,523	\$3,480,499	\$979,096	\$1,393,642	\$9,641,270
5. Employer normal cost as a percent of payroll	7.08%	6.72%	2.83%	4.35%	3.58%	8.87%	3.38%	4.63%	3.19%	4.14%
6. Actuarial accrued liability	\$160,940,857	\$155,939,150	\$16,840,379	\$54,005,103	\$32,427,721	\$3,153,458	\$283,943,478	\$88,622,813	\$154,034,780	\$949,907,739
7. Actuarial value of assets	<u>134,867,267</u>	<u>130,675,872</u>	<u>14,112,115</u>	<u>45,255,883</u>	<u>27,174,194</u>	<u>2,642,575</u>	<u>237,942,568</u>	<u>74,265,272</u>	<u>129,080,024</u>	<u>796,015,770</u>
8. Unfunded actuarial accrued liability: (6) – (7)	\$26,073,590	\$25,263,278	\$2,728,264	\$8,749,220	\$5,253,527	\$510,883	\$46,000,910	\$14,357,541	\$24,954,756	\$153,891,969
9. Projected calendar payroll	20,481,582	20,831,680	2,764,904	11,468,099	9,157,676	366,513	102,963,079	21,129,614	43,678,970	232,842,117
10. Employer normal cost, projected to July 1, 2010, adjusted for timing	1,539,579	1,485,107	82,900	528,869	348,281	34,508	3,692,939	1,038,857	1,478,706	10,229,746
11. Projected unfunded accrued liability	27,127,813	26,284,738	2,838,575	9,102,974	5,465,941	531,539	47,860,847	14,938,054	25,963,741	160,114,222
12. Payment on remaining unfunded accrued liability	3,070,676	2,975,246	321,307	1,030,392	618,706	60,166	5,417,509	1,690,882	2,938,912	18,123,796
13. Fiscal 2011 appropriation: (10) + (12)	4,610,255	4,460,353	404,207	1,559,261	966,987	94,674	9,110,448	2,729,739	4,417,618	28,353,542
14. Fiscal 2012 appropriation	4,866,724	4,708,586	427,915	1,645,812	1,020,185	99,873	9,601,997	2,878,607	4,663,288	29,912,987
15. Fiscal 2013 appropriation	5,137,413	4,970,588	452,986	1,737,154	1,076,309	105,358	10,120,199	3,035,613	4,922,581	31,558,201

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT H (continued)**

**Unit Results as of January 1, 2010**

<b>Category</b>	<b>Housing</b>	<b>Redevelopment</b>	<b>PHC</b>	<b>City</b>	<b>Total</b>
1. Total normal cost	\$1,140,625	\$45,651	\$13,019,892	\$16,098,784	\$30,304,952
2. Administrative expenses	31,993	1,280	365,185	451,542	850,000
3. Expected employee contributions	<u>-844,372</u>	<u>-14,408</u>	<u>-9,904,578</u>	<u>-10,750,324</u>	<u>-21,513,682</u>
4. Employer normal cost: (1) + (2) + (3)	\$328,246	\$32,523	\$3,480,499	\$5,800,002	\$9,641,270
5. Employer normal cost as a percent of payroll	3.58%	8.87%	3.38%	4.82%	4.14%
6. Actuarial accrued liability	\$32,427,721	\$3,153,458	\$283,943,478	\$630,383,082	\$949,907,739
7. Actuarial value of assets	<u>27,174,194</u>	<u>2,642,575</u>	<u>237,942,568</u>	<u>528,256,433</u>	<u>796,015,770</u>
8. Unfunded actuarial accrued liability: (6) – (7)	\$5,253,527	\$510,883	\$46,000,910	\$102,126,649	\$153,891,969
9. Projected calendar year payroll	9,157,676	366,513	102,963,079	120,354,849	232,842,117
10. Payroll allocation - fiscal 2011	1,115,144	44,631	12,537,972	14,655,794	28,353,541
11. Payroll allocation - fiscal 2012	1,176,477	47,086	13,227,561	15,461,863	29,912,986
12. Payroll allocation - fiscal 2013	1,241,183	49,675	13,955,076	16,312,267	31,558,202
13. Actuarial allocation - fiscal 2011 appropriation	966,987	94,674	9,110,448	18,181,433	28,353,542
14. Actuarial allocation - fiscal 2012 appropriation	1,020,185	99,873	9,601,997	19,190,932	29,912,987
15. Actuarial allocation - fiscal 2013 appropriation	1,076,309	105,358	10,120,199	20,256,335	31,558,201

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

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**EXHIBIT I**

**Definitions of Pension Terms**

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The following list defines certain technical terms for the convenience of the reader:

**Assumptions or actuarial assumptions:**

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

**Normal cost:**

The amount of contributions required to fund the benefit allocated to the current year of service.

**Actuarial accrued liability for actives:**

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

**Actuarial accrued liability for pensioners:**

The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

**Unfunded actuarial accrued liability:**

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There are many approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

**SECTION 3: Supplemental Information for the City of Cambridge Contributory Retirement System**

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**Amortization of the unfunded  
actuarial accrued liability:**

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

**Investment return:**

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT I**

**Summary of Actuarial Valuation Results**

The valuation was made with respect to the following data supplied to us:

1. Retired participants as of the valuation date (including 371 beneficiaries in pay status and 4 retired participants in suspended status)	1,809
2. Participants active during the year ended December 31, 2009 with total accumulated contributions of \$184,034,315 and projected payroll of \$232,842,117	3,614
3. Inactive participants with a right to a return of their employee contributions as of December 31, 2009	1,001
4. Inactive participants with a vested right to a deferred or immediate benefit as of December 31, 2009	173

The actuarial factors as of January 1, 2010 are as follows:

1. Normal cost, including administrative expenses	\$31,154,952
2. Expected employee contributions	<u>-21,513,682</u>
3. Employer normal cost: (1) + (2)	\$9,641,270
4. Actuarial accrued liability	949,907,739
Retired participants and beneficiaries	\$408,685,754
Active participants	506,437,567
Inactive participants	34,784,418
5. Actuarial value of assets (\$681,329,524 at market value as reported in the Annual Statement)	796,015,770
6. Unfunded actuarial accrued liability: (4) – (5)	153,891,969

The actuarial factors projected to July 1, 2010 are as follows:

1. Employer normal cost projected to July 1, 2010, adjusted for timing	\$10,229,746
2. Projected unfunded actuarial accrued liability	160,114,222
3. Payment on projected unfunded actuarial accrued liability, including additional \$200,000 contribution, adjusted for timing	18,323,796
4. Total recommended contribution: (1) + (3)	<u>\$28,553,542</u>
5. Projected payroll	\$237,453,300
6. Total recommended contribution as a percentage of projected payroll: (4) ÷ (5)	12.02%

*Note: Recommended contributions are assumed to be paid in the middle of the fiscal year.*

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

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**EXHIBIT II**

**Supplementary Information Required by the GASB – Schedule of Employer Contributions**

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<b>Plan Year Ended December 31</b>	<b>Annual Required Contributions</b>	<b>Actual Contributions</b>	<b>Percentage Contributed</b>
2000	\$21,668,642	\$21,668,642	100.0%
2001	22,030,446	22,030,446	100.0%
2002	21,398,751	21,398,751	100.0%
2003	23,761,798	23,761,798	100.0%
2004	23,977,875	23,977,875	100.0%
2005	24,577,322	24,577,322	100.0%
2006	25,220,175	25,220,175	100.0%
2007	28,066,908	28,066,908	100.0%
2008	26,891,503	26,891,503	100.0%
2009	27,727,711	22,727,711	100.0%

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**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

**EXHIBIT III**

**Supplementary Information Required by the GASB – Schedule of Funding Progress**

<b>Actuarial Valuation Date</b>	<b>Actuarial Value of Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) (b)</b>	<b>Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)</b>	<b>Funded Ratio (a) / (b)</b>	<b>Covered Payroll (c)</b>	<b>UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)</b>
01/01/1991	\$118,507,379	\$251,034,632	\$132,527,253	47.21%	\$83,459,875	158.79%
01/01/1994	182,631,507	323,643,787	141,012,280	56.43%	109,774,937	128.46%
01/01/1996	233,883,060	361,884,553	128,001,493	64.63%	114,484,265	111.81%
01/01/1998	342,787,664	436,216,298	93,428,634	78.58%	132,439,810	70.54%
01/01/2000*	424,606,168	510,972,656	86,366,488	83.10%	140,488,609	61.48%
01/01/2002	516,947,036	578,049,645	61,102,609	89.43%	167,302,844	36.52%
01/01/2004	569,500,055	655,106,691	85,606,636	86.93%	184,254,181	46.46%
01/01/2006	632,059,327	740,320,358	108,261,031	85.38%	201,087,686	53.84%
01/01/2008	766,030,562	833,034,229	67,003,667	91.96%	231,770,736	28.91%
01/01/2010	796,015,770	949,907,739	153,891,969	83.80%	232,842,117	66.09%

\* Reflects change in asset valuation method.

## SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System

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### EXHIBIT IV

#### Supplementary Information Required by the GASB

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<b>Valuation date</b>	January 1, 2010
<b>Actuarial cost method</b>	Entry Age Normal Cost Method
<b>Amortization method</b>	Increasing amortization for remaining unfunded liability
<b>Remaining amortization period</b>	19 years from July 1, 2010 for remaining unfunded liability
<b>Asset valuation method</b>	The difference between the expected return and the actual investment return on a market value basis is recognized over a five-year period.
<b>Actuarial assumptions:</b>	
Investment rate of return	8.25% (previously, 8.50%)
Projected salary increases	5.00% (previously, 5.50%)
Cost of living adjustments	3.00% of first \$12,000 of retirement income
<b>Plan membership:</b>	
Retired participants and beneficiaries receiving benefits	1,809
Terminated participants entitled to a return of their employee contributions	1,001
Terminated participants with a vested right to a deferred or immediate benefit	173
Active participants	<u>3,614</u>
Total	6,597

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**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

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**EXHIBIT V**

**Actuarial Assumptions and Actuarial Cost Method**

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**Mortality Rates:**

*Healthy:* 1994 Group Annuity Mortality Table  
*Disabled:* 1994 Group Annuity Mortality Table set forward five years

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**Termination Rates before Retirement:**

Age	Groups 1 and 2 - Rate (%)				
	Mortality		Disability	Withdrawal	
	Male	Female		PHC	All Other Departments
20	0.05	0.03	0.06	9.94	7.94
25	0.07	0.03	0.09	9.67	7.72
30	0.08	0.04	0.11	9.30	7.22
35	0.09	0.05	0.15	8.71	6.28
40	0.11	0.07	0.22	7.75	5.15
45	0.16	0.10	0.36	6.35	3.98
50	0.26	0.14	0.61	4.22	2.56
55	0.44	0.23	1.01	1.55	0.00
60	0.80	0.44	1.63	0.15	0.00

*Notes:* 50% of the disability rates shown represent accidental disability.  
 20% of the accidental disabilities will die from the same cause as the disability  
 50% of the death rates shown represent accidental death.

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

Age	Group 4 - Rate (%)			
	Mortality		Disability	Withdrawal
	Male	Female		
20	0.05	0.03	0.12	0.00
25	0.07	0.03	0.17	0.00
30	0.08	0.04	0.22	0.00
35	0.09	0.05	0.29	0.00
40	0.11	0.07	0.44	0.00
45	0.16	0.10	0.72	0.00
50	0.26	0.14	1.21	0.00
55	0.44	0.23	2.02	0.00
60	0.80	0.44	3.25	0.00

*Notes: 90% of the disability rates shown represent accidental disability.  
60% of the accidental disabilities will die from the same cause as the disability  
50% of the death rates shown represent accidental death.*

**Retirement Rates:**

Groups 1 and 2		Group 4	
Age	Rate (%)	Age	Rate (%)
55	5.0	50	5.0
56	2.0	51	2.0
57	2.0	52	2.0
58	2.0	53	2.0
59	2.0	54	2.0
60	5.0	55	25.0
61	2.0	56	2.0
62	25.0	57	2.0
63	5.0	58	2.0
64	5.0	59	2.0
65	10.0	60	25.0
66	10.0	61	10.0

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

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**Retirement Rates (continued):**

Groups 1 and 2		Group 4	
Age	Rate (%)	Age	Rate (%)
67	100.0	62	10.0
68	100.0	63	10.0
69	100.0	64	10.0
70	100.0	65	100.0

**Unknown Data for Participants:** Same as those exhibited by participants with similar known characteristics.

**Age of Spouse:** Males are assumed to be three years older than their spouses.

**Percent Married:** 75%

**Net Investment Return:** 8.25% (previously, 8.50%)

**Interest on Employee Contributions:** 3.50%

**Salary Increases:**

Age	Present salary as a percent of salary at 65	Annual increase rate (%)
20	11.13%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
25	14.20%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
30	18.13%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
35	23.13%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
40	29.53%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
45	37.69%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
50	48.10%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
55	61.39%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)
60	78.35%	5.00% (previously, 4.50% for 1 year, 5.50% thereafter)

*Includes allowance for inflation of 4.00% (previously, 4.50%).*

**Administrative Expenses:** \$850,000 for calendar 2010, increasing 4.00% per year (previously, \$900,000 for calendar year 2008, increasing 4.50% per year).

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

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<b>Total Service:</b>	Total creditable service as reported in the data.
<b>2009 Salary:</b>	2009 salaries are equal to salaries provided in the data, except for actives missing salary, where salaries were calculated from annualized contributions divided by the contribution rates provided.
<b>Actuarial Value of Assets:</b>	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected market return and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.  Market value of assets as reported in the Annual Statement.
<b>Actuarial Cost Method:</b>	Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant less total creditable service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary.
<b>Changes in Assumptions:</b>	The net investment return was lowered from 8.50% to 8.25%.  The salary scale assumption was lowered from 5.5% to 5.0% per year.  The administrative expense assumption was lowered from \$900,000 to \$850,000 for calendar year 2010.

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

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**EXHIBIT VI**

**Summary of Plan Provisions**

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This exhibit summarizes the major provisions of Chapter 32 of the Laws of Massachusetts.

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**Plan Year:** January 1 – December 31

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**Retirement Benefits**

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

The annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the member at retirement:

**Age Last Birthday at Date of Retirement**

<b>Percent</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 4</b>
2.5	65 or over	60 or over	55 or over
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	--	49
1.8	58	--	48
1.7	57	--	47
1.6	56	--	46
1.5	55	--	45

**SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System**

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A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement. The \$30,000 cap on salary used in a benefit determination for any employee hired after January 1, 1979 has been removed.

The maximum annual amount of the retirement allowance is 80 percent of the member's final three-year average salary. Any member who is a veteran also receives an additional yearly retirement allowance of \$15 per year of creditable service, not exceeding \$300. The veteran allowance is paid in addition to the 80 percent maximum.

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**Employee Contributions**

<u>Date of Hire</u>	<u>Contribution Rate</u>
Prior to January 1, 1975	5%
January 1, 1975 – December 31, 1983	7%
January 1, 1984 – June 30, 1996	8%
July 1, 1996 onward	9%

In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of \$30,000.

Employees hired after 1983 who leave with less than five years of credited service receive no interest on their contributions, and employees who leave with five but less than ten years receive one-half the rate of regular interest otherwise payable.

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**Retirement Benefits (Superannuation)**

Members of Group 1, 2 or 4 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

Members who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System).

## SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System

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### Ordinary Disability Benefits

A member who is unable to perform his/her job due to a non-occupational disability will receive a retirement allowance if he/she has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the member retired for superannuation at age 55, based on the amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the member's most recent year's pay plus an annuity based on his/her own contributions.

### Accidental Disability Benefit

For a job-connected disability, the benefit is 72 percent of the member's most recent annual pay plus an annuity based on his/her own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become members after January 1, 1988.

### Death Benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C. The surviving spouse of a member who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. There is also a minimum widow's pension of \$500 per month, and there are additional amounts for surviving children. If an employee's death is job-connected, the spouse will receive 72 percent of the member's most recent annual pay, in addition to a refund of the member's accumulated deductions, plus additional amounts for surviving children. However, in accordance with Section 100 of Chapter 32, the surviving spouse of a police officer, firefighter or corrections officer is killed in the line of duty will be eligible to receive an annual benefit equal to the maximum salary held by the member at the time of death.

## SECTION 4: Reporting Information for the City of Cambridge Contributory Retirement System

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### "Heart And Lung Law" And Cancer Presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman, permanent member of a police department, or certain employees of a county correctional facility is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

### Options

Members may elect to receive a full retirement allowance payable for life under Option A. Under Option B a member may elect to receive a lower monthly allowance in exchange for a guarantee that at the time of death any contributions not expended for annuity payments will be refunded to the beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing a survivor with two-thirds of the lesser amount. Option C pensioners will have their benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

### Post-Retirement Benefits

The Board has adopted the provisions of Section 51 of Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first \$12,000 of a retirement allowance. Cost-of-living increases granted prior to July 1, 1998 are reimbursed by the Commonwealth and not reflected in this report.

### Changes in Plan Provisions

There have been no changes in plan provisions since the last valuation.