

**Town of Brookline Contributory Retirement System**

*Actuarial Valuation and Review  
as of January 1, 2006*

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*April 11, 2006*

*Town of Brookline Contributory Retirement System  
Town Hall, 333 Washington Street  
Brookline, MA 02445*

*Dear Board Members:*

*We are pleased to submit this Actuarial Valuation and Review as of January 1, 2006. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2007 and later 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 Brookline 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: Valuation Summary for the Town of Brookline Contributory Retirement System**

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### **Purpose**

This report has been prepared by The Segal Company to present a valuation of the Town of Brookline Contributory Retirement System as of January 1, 2006. 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, 2006;
- The assets of the Plan as of December 31, 2005;
- 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, 2006 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected.
- During the plan years ended 2004 and 2005, the market value rates of return were 10.85% and 7.00%, 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 2004 and 2005 were 4.36% and 6.14%, respectively. The actuarial value of assets as of December 31, 2005 was \$190.8 million, or 98.5% of the market value of assets.
- As of January 1, 2004 the System had an unfunded liability of \$88.3 million. The unfunded liability was expected to decrease to \$87.4 million as of January 1, 2006. An experience loss of \$10.7 million, primarily due to investment performance on actuarial basis, and an increase in liabilities of \$10.5 due to recommended changes in assumptions resulted in an unfunded liability of \$108.5 million.
- The preliminary recommended contribution of \$10,834,919 is based on a 3-year level dollar amortization of the 1993 ERI, a 20-year increasing amortization (4.5% per year) of the 2003 ERI and a 20-year increasing amortization (4.5% per year) of the remaining unfunded actuarial accrued liability. Because fiscal 2007 has already been budgeted at \$10,239,000, the increase will first be reflected in the fiscal 2008 appropriation of \$11,367,567.

## SECTION 1: Valuation Summary for the Town of Brookline Contributory Retirement System

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- The preliminary recommended contribution of \$10,834,919 is \$595,919 more than the budgeted amount. The increase is due to the investment loss (\$930,034), changes in assumptions noted below (\$913,032), and other miscellaneous factors (\$336,898), partially offset by the change in the funding schedule (-\$1,584,045).
- The following actuarial assumptions were changed with this valuation:
  - We recommend the assumed retirement ages be changed for both Group 1 and Group 4 to the rates shown in Exhibit V of Section 4. These new rates increase the average age at retirement.
  - We recommend that the disability rates be increased as shown in Exhibit V of Section 4. These new rates assume a higher incidence of disability, especially at older ages.
- In 2004 the Public Employee Retirement Administration Commission approved a new mortality table and interest rate to be used in the calculation of the optional form of payment factors. This valuation reflects the change to the new factors.
- The prior actuarial valuation did not include an assumption for accidental disability retirees who die from the same cause as their disability and whose beneficiaries will receive an accidental death benefit. We recommend an assumption that 20% of Group 1 and 60% of Group 4 accidental disability retirees will die from the same cause as the disability leaving an accidental death beneficiary.
- The prior actuarial valuation did not include an assumption for the percentage of deaths that are accidental. In this valuation, we assume 55% of Group 1 deaths and 90% of Group 4 deaths are accidental.

**SECTION 1: Valuation Summary for the Town of Brookline Contributory Retirement System**

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**Summary of Key Valuation Results**

	<b>2006</b>	<b>2004</b>
<b>Contributions:</b>		
Recommended for fiscal 2007 and 2005	\$10,239,000	\$9,533,000
Recommended for fiscal 2008 and 2006	11,367,567	9,936,789
<b>Funding elements for plan year beginning January 1:</b>		
Normal cost, including administrative expenses	\$7,685,763	\$6,433,328
Market value of assets	193,691,396	167,965,120
Actuarial value of assets	190,818,205	177,153,465
Actuarial accrued liability	299,355,769	265,441,629
Unfunded/(overfunded) actuarial accrued liability	108,537,564	88,288,164
<b>GASB 25/27:</b>		
Annual required contributions	\$10,239,000	\$9,310,000
Actual contributions	--	9,310,000
Percentage contributed	--	100.00%
Funded ratio	63.74%	66.74%
<b>Demographic data for plan year beginning January 1:</b>		
Number of retired participants and beneficiaries	817	811
Number of inactive participants	924	626
Number of active participants	1,440	1,420
Total payroll	\$54,437,893	\$52,378,086
Average payroll	37,804	36,886

**SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System**

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**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 four valuations can be seen in this chart.*

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**CHART 1**  
**Participant Population: 1999 – 2005**

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<b>Year Ended December 31</b>	<b>Active Participants</b>	<b>Inactive Participants</b>	<b>Retired Participants and Beneficiaries</b>
1999	1,158	507	790
2001	1,278	504	789
2003	1,420	626	811
2005	1,440	924	817

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**SECTION 2: Valuation Results for the Town of Brookline 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 1,440 active participants with an average age of 40.8, average years of service of 10.1 years and average payroll of \$37,804. The 1,420 active participants in the prior valuation had an average payroll of \$36,886.

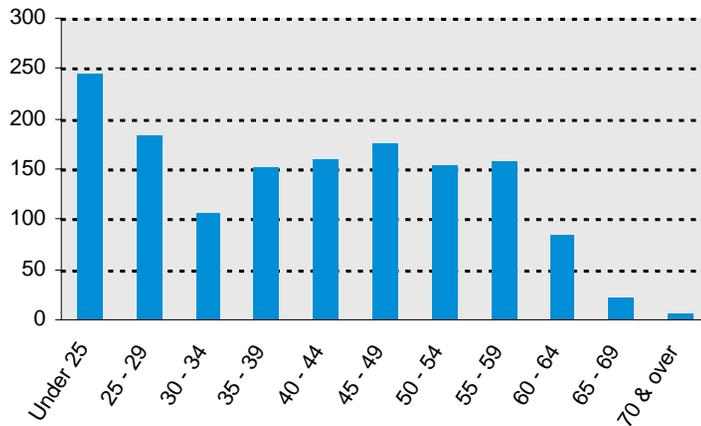
Among the active participants, there were none with unknown age and/or service information.

**Inactive Participants**

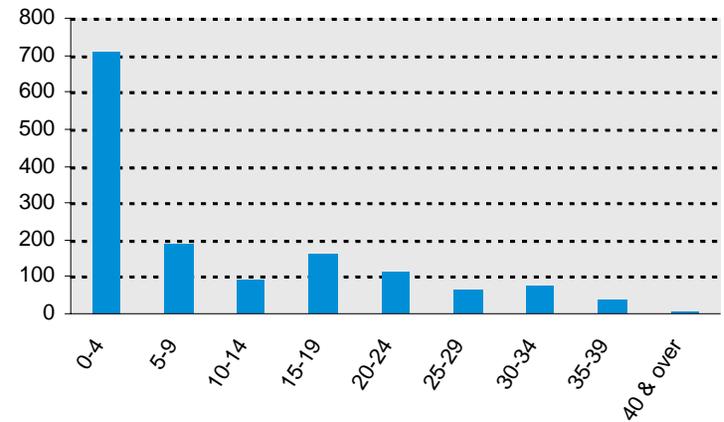
In this year's valuation, there were 32 participants with a vested right to a deferred or immediate vested benefit and 892 participants entitled to a return of their employee contributions.

*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, 2005**



**CHART 3**  
**Distribution of Active Participants by Years of Service as of December 31, 2005**



**SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System**

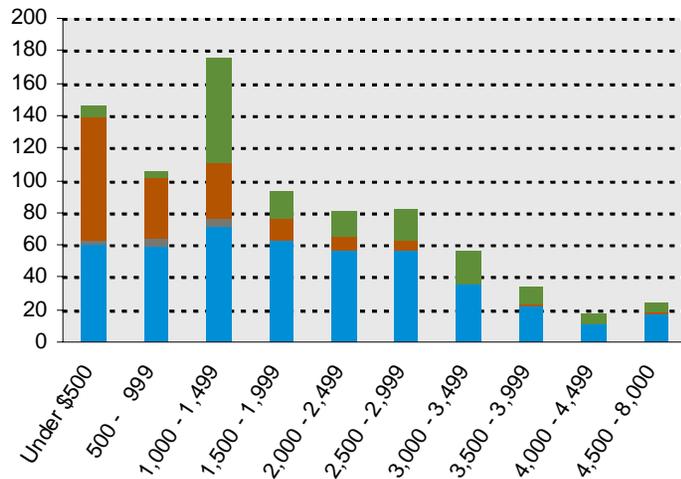
**Retired Participants and Beneficiaries**

As of December 31, 2005, 817 retired participants and beneficiaries were receiving total monthly benefits of \$1,424,710. For comparison, in the previous valuation, there were 811 retired participants and beneficiaries receiving monthly benefits of \$1,331,683.

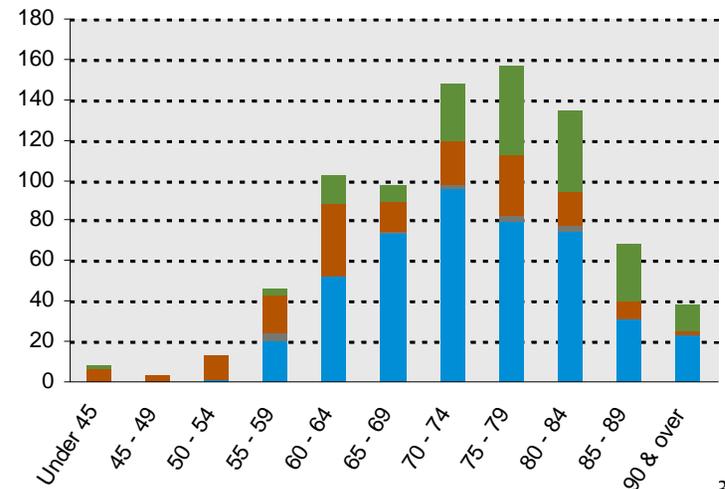
*These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.*

- Beneficiaries
- Accidental Disability
- Ordinary Disability
- Superannuation

**CHART 4**  
**Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of December 31, 2005**



**CHART 5**  
**Distribution of Retired Participants and Beneficiaries by Type and by Age as of December 31, 2005**



## SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

### B. FINANCIAL INFORMATION

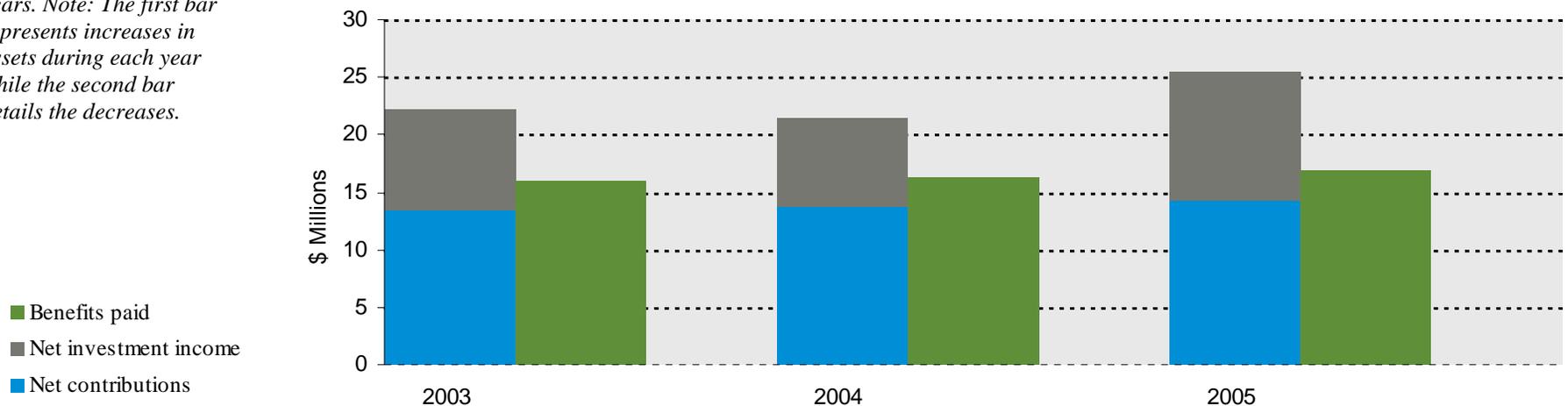
Retirement plan funding anticipates that, over the long term, both net contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

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 three 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, 2003 – 2005



## SECTION 2: Valuation Results for the Town of Brookline 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

	Year Ended	
	December 31, 2005	December 31, 2004
1. Market value of assets	\$193,691,396	\$183,412,449
2. Calculation of unrecognized return*		
	Original	Unrecognized
	Amount	Return
(a) Year ended December 31, 2005	-\$2,272,900	-\$1,818,320
(b) Year ended December 31, 2004	4,333,975	2,600,385
(c) Year ended December 31, 2003	16,883,518	6,753,407
(d) Year ended December 31, 2002	-23,311,409	-4,662,281
(e) Year ended December 31, 2001	-15,262,935	N/A
(f) Total unrecognized return		
	2,873,191	1,220,140
3. Preliminary actuarial value: (1) - (2f)	190,818,205	182,192,309
4. Adjustment to be within 10% corridor	0	0
5. Final actuarial value of assets: (3) + (4)	<u>\$190,818,205</u>	<u>\$182,192,309</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1)	98.5%	99.3%

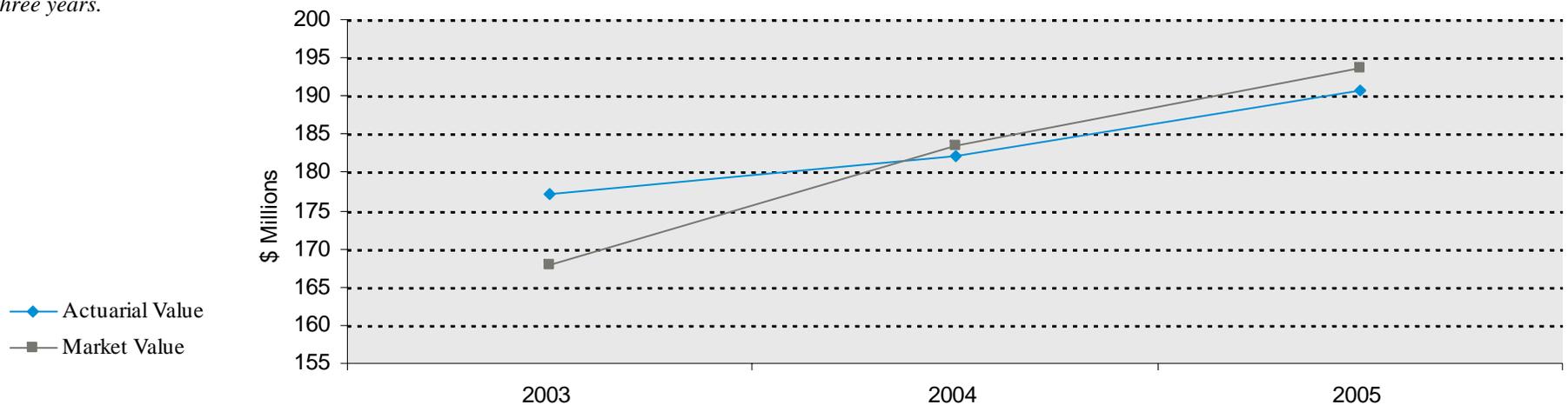
\* Unrecognized return is the difference between the total return and the expected return on a market value basis and is recognized over a five-year period.

## SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Both the actuarial value and market value of assets are representations of the Brookline 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 Brookline 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 three years.*

**CHART 8**  
**Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2003 – 2005**



**SECTION 2: Valuation Results for the Town of Brookline 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 \$10,660,704. 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, 2005**

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1. Net loss from investments*	-\$10,657,837
2. Net gain from administrative expenses	166,578
3. Net loss from other experience	<u>-169,445</u>
4. Net experience loss: (1) + (2) + (3)	-\$10,660,704

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\* Details in Chart 10

**SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System**

**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 Brookline Retirement System’s investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 8.25%. The actual rate of return on an actuarial basis for the 2005 plan year was 6.14% and 4.36% for the 2004 plan year.

Since the actual return for the past two years was less than the assumed return, the Brookline Retirement System experienced an actuarial loss during the two-year period ending December 31, 2005 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, 2005	December 31, 2004
1. Actual return	\$11,103,381	\$7,673,916
2. Average value of assets	180,953,567	175,835,929
3. Actual rate of return: (1) ÷ (2)	6.14%	4.36%
4. Assumed rate of return	8.25%	8.25%
5. Expected return: (2) x (4)	\$14,928,669	\$14,506,465
6. Actuarial gain/(loss): (1) – (5)	<u>-\$3,825,288</u>	<u>-\$6,832,549</u>

**SECTION 2: Valuation Results for the Town of Brookline 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 three years, including an average return over that period.

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

**CHART 11**

**Investment Return – Actuarial Value vs. Market Value: 2003 - 2005**

Year Ended December 31	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
2003	\$8,763,601	5.16%	\$28,068,228	19.88%
2004	7,673,916	4.36	18,082,401	10.85
2005	<u>11,103,381</u>	6.14	<u>12,756,431</u>	7.00
Total	\$27,540,898		\$58,907,060	
	Three-year average return	5.23%		12.02%

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

## SECTION 2: Valuation Results for the Town of Brookline 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 level pension plan costs.

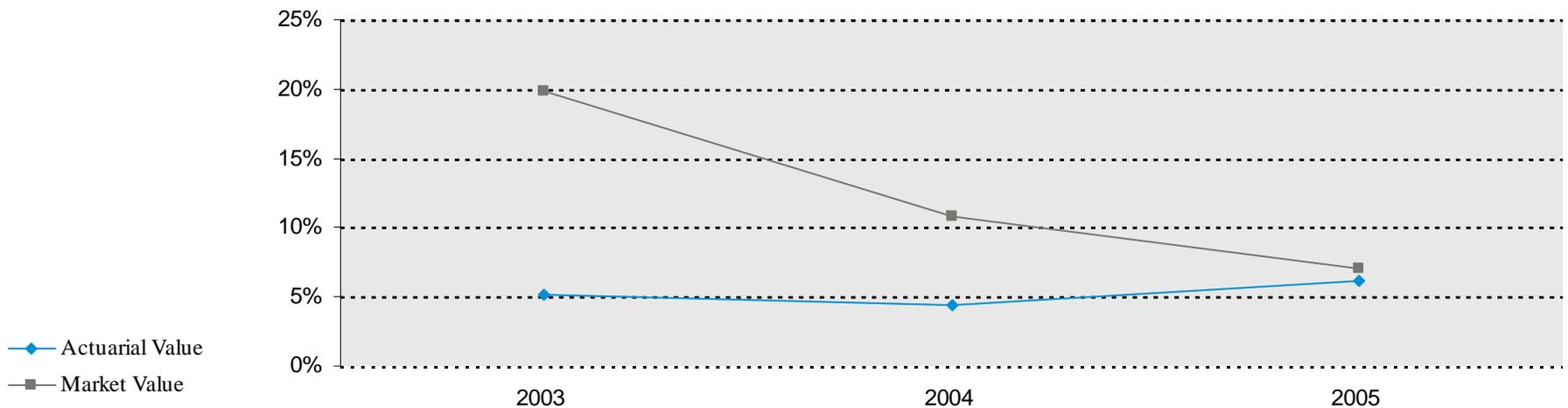
### Administrative Expenses

Administrative expenses for the years ended December 31, 2005 and 2004 totaled \$269,410 and \$263,603 compared to the assumption of \$325,000. This resulted in a gain of \$166,578 for the two-year period including an adjustment for interest. We have maintained the assumption of \$325,000 for the current and following year.

*This chart illustrates how this leveling effect has actually worked over the years 2003 - 2005.*

**CHART 12**

**Market and Actuarial Rates of Return for Years Ended December 31, 2003 - 2005**



## SECTION 2: Valuation Results for the Town of Brookline 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 loss from this other experience for the two-year period ending December 31, 2005 amounted to \$169,445.

With this valuation, we recommend the following assumption changes:

- We recommend the assumed retirement ages be changed for both Group 1 and Group 4 to the rates shown in Exhibit V of Section 4. These new rates increase the average age at retirement.
- We recommend that the disability rates be increased as shown in Exhibit V of Section 4. These new rates assume a higher incidence of disability, especially at older ages.
- In 2004 the Public Employee Retirement Administration Commission approved a new mortality table and interest rate to be used in the calculation of the optional form of payment factors. This valuation reflects the change to the new factors.

- The prior actuarial valuation did not include an assumption for accidental disability retirees who die from the same cause as their disability and whose beneficiaries will receive an accidental death benefit. We recommend an assumption that 20% of Group 1 and 60% of Group 4 accidental disability retirees will die from the same cause as the disability leaving an accidental death beneficiary.
- The prior actuarial valuation did not include an assumption for the percentage of deaths that are accidental. We recommend 55% of Group 1 deaths and 90% of Group 4 deaths be considered accidental.

Changing these assumptions resulted in a net increase in the unfunded liability of \$10,462,999.

**SECTION 2: Valuation Results for the Town of Brookline 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 preliminary recommended contribution of \$10,834,919 is based on a 3-year level dollar amortization of the 1993 ERI, a 20-year increasing amortization (4.5% per year) of the 2003 ERI and a 20-year increasing amortization (4.5% per year) of the remaining unfunded actuarial accrued liability. Because fiscal 2007 has already been budgeted at \$10,239,000, the increase will first be reflected in the fiscal

2008 appropriation of \$11,367,567. The System will be fully funded by June 30, 2026. The prior funding schedule fully funded the System by June 30, 2023 with payments that increased 3.5% per year.

Exhibit G in Section 3 shows the recommended contributions through fiscal 2028 based on this funding schedule.

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

**CHART 13**  
**Recommended Contribution**

	Year Beginning January 1			
	2006		2004	
	Amount	% of Payroll	Amount	% of Payroll
1. Total normal cost	\$7,360,763	12.91%	\$6,108,328	11.11%
2. Administrative expenses	325,000	0.57%	325,000	0.59%
3. Expected employee contributions	<u>-4,870,296</u>	<u>-8.54%</u>	<u>-4,117,411</u>	<u>-7.49%</u>
4. Employer normal cost: (1) + (2) + (3)	\$2,815,467	4.94%	\$2,315,917	4.21%
5. Actuarial accrued liability	299,355,769		265,441,629	
6. Actuarial value of assets	<u>190,818,205</u>		<u>177,153,465</u>	
7. Unfunded actuarial accrued liability: (5) - (6)	\$108,537,564		\$88,288,164	
8. Employer normal cost projected to July 1, 2006 and 2004, adjusted for timing*	2,935,726	5.04%	2,457,000	4.37%
9. Projected unfunded actuarial accrued liability	112,926,020		91,857,884	
10. Payment on projected unfunded actuarial accrued liability, adjusted for timing*	7,899,193	13.55%	7,166,712	12.75%
11. Preliminary recommended contribution: (8) + (10), adjusted for timing*	10,834,919	18.59%	9,623,712	17.12%
12. Budgeted appropriation	<u>\$10,239,000</u>	17.57%	<u>\$9,533,000</u>	16.96%
13. Projected payroll	\$58,277,406		\$56,220,806	

\*Recommended contributions are paid semimonthly from July through December.

## SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

### 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 GASB is the historical comparison of the GASB required contribution to the actual contributions. This comparison demonstrates whether a plan is being funded on an actuarially sound basis and in accordance with the GASB funding requirements. Chart 14 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

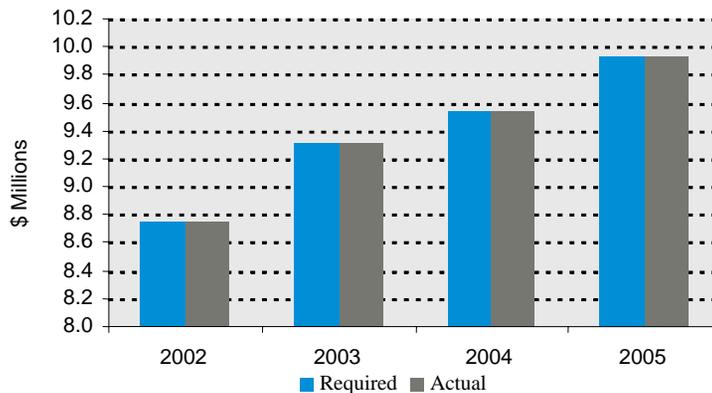
actuarial value of assets to the actuarial accrued liabilities of the plan as calculated under GASB. High ratios indicate a well-funded plan with assets sufficient to pay most benefits. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor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

Although GASB requires that the actuarial value of assets be used to determine the funded ratio, Chart 15 shows the funded ratio calculated using both the actuarial value of assets and the market value of assets.

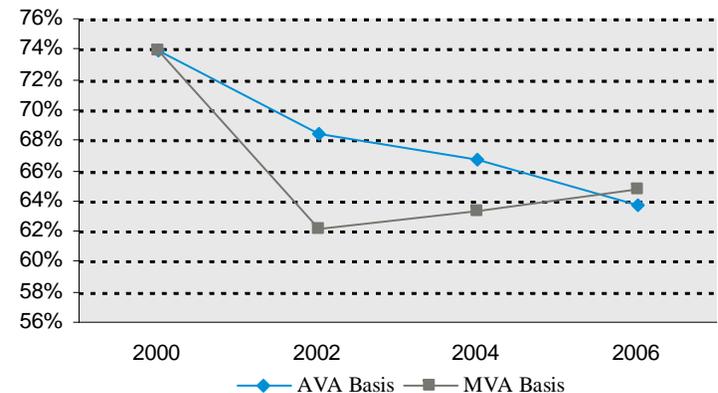
The details regarding the calculations of these values and other GASB numbers may be found in Section 4, Exhibits II, III, and IV.

*These graphs show key GASB factors.*

**CHART 14**  
Required Versus Actual Contributions



**CHART 15**  
Funded Ratio



**SECTION 3: Supplemental Information for the Town of Brookline 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>2005</b>	<b>2003</b>	
<b>Active participants in valuation:</b>			
Number	1,440	1,420	1.4%
Average age	40.8	N/A	N/A
Average service	10.1	N/A	N/A
Total payroll	\$54,437,893	\$52,378,086	3.9%
Average payroll	37,804	36,886	2.5%
Account balances	46,717,016	N/A	N/A
<b>Inactive participants with a vested right to a return of their contributions or a deferred or immediate benefit</b>			
	924	616	47.6%
<b>Retired participants:</b>			
Number in pay status	449	629*	N/A
Average age	74.1	74.9	N/A
Average monthly benefit	\$1,934	\$1,571	N/A
<b>Disabled participants:</b>			
Number in pay status	186	182	2.2%
Average age	67.9	67.5	N/A
Average monthly benefit	\$2,058	\$1,889	8.9%
<b>Beneficiaries in pay status*</b>	182	N/A	N/A

\* Includes pensioners and beneficiaries.

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

**EXHIBIT B**

**Participants in Active Service as of December 31, 2005  
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
Under 25	244	243	1	--	--	--	--	--	--	--
	\$13,438	\$13,359	\$32,574	--	--	--	--	--	--	--
25 - 29	183	163	19	1	--	--	--	--	--	--
	\$28,134	\$25,359	\$51,522	\$36,130	--	--	--	--	--	--
30 - 34	106	74	25	7	--	--	--	--	--	--
	\$38,754	\$32,145	\$53,816	\$54,820	--	--	--	--	--	--
35 - 39	152	62	49	20	20	1	--	--	--	--
	\$46,536	\$34,484	\$51,933	\$58,791	\$57,470	\$65,485	--	--	--	--
40 - 44	159	57	28	16	43	15	--	--	--	--
	\$46,129	\$32,072	\$46,477	\$52,228	\$56,954	\$61,359	--	--	--	--
45 - 49	175	45	27	11	33	49	8	2	--	--
	\$50,056	\$27,209	\$46,063	\$53,264	\$54,487	\$66,626	\$67,187	\$52,759	--	--
50 - 54	153	32	19	13	19	23	28	19	--	--
	\$50,078	\$22,247	\$35,874	\$37,280	\$55,632	\$59,451	\$73,723	\$68,167	--	--
55 - 59	157	22	13	9	25	12	12	42	22	--
	\$52,341	\$28,008	\$39,444	\$47,047	\$39,637	\$49,323	\$61,015	\$66,623	\$70,549	--
60 - 64	84	8	5	11	12	7	13	9	16	3
	\$50,653	\$34,463	\$27,148	\$45,811	\$42,454	\$34,712	\$70,472	\$48,384	\$65,914	\$60,288
65 - 69	21	3	1	1	5	3	2	3	1	2
	\$40,462	\$14,329	\$16,548	\$18,675	\$35,599	\$74,436	\$43,318	\$36,222	\$76,398	\$49,248
70 & over	6	--	--	--	2	1	1	2	--	--
	\$38,762	--	--	--	\$35,542	\$61,725	\$43,063	\$28,349	--	--
Total	1,440	709	187	89	159	111	64	77	39	5
	\$37,804	\$23,407	\$47,023	\$49,976	\$51,591	\$60,701	\$68,433	\$62,333	\$68,797	\$55,872

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

**EXHIBIT C**

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

	Year Ended December 31, 2005	Year Ended December 31, 2004
<b>Contribution income:</b>		
Employer contributions	\$9,937,000	\$9,533,000
Employee contributions	4,660,864	4,398,536
Other contributions	34,078	34,350
Less administrative expenses	<u>-269,410</u>	<u>-263,603</u>
Net contribution income	\$14,362,532	\$13,702,283
<b>Net investment income</b>	<u>11,103,381</u>	<u>7,673,916</u>
<b>Total income available for benefits</b>	\$25,465,913	\$21,376,199
<b>Less benefit payments:</b>		
Pensions	-\$16,196,374	-\$15,877,788
Net 3(8)(c) reimbursements	-210,837	318
Refunds, annuities, and Option B refunds	<u>-432,806</u>	<u>-459,885</u>
Net benefit payments	-\$16,840,017	-\$16,337,355
<b>Change in reserve for future benefits</b>	\$8,625,896	\$5,038,844

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

**EXHIBIT D**

**Development of the Fund Through December 31, 2005**

<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>
2003	\$9,310,000	\$4,289,561	\$28,933	\$8,763,601	\$229,298	\$15,967,163	\$177,153,465
2004	9,533,000	4,398,536	34,350	7,673,916	263,603	16,337,355	182,192,309
2005	9,937,000	4,660,864	34,078	11,103,381	269,410	16,840,017	190,818,205

\* *Net of investment fees*

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

**EXHIBIT E**

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

	Year Ended	
	December 31, 2005	December 31, 2004
1. Unfunded/(overfunded) actuarial accrued liability at beginning of year	\$88,049,602	\$88,288,164
2. Normal cost at beginning of year	6,722,828	6,433,328
3. Total contributions	-14,631,942	-13,965,886
4. Interest		
(a) For whole year on (1) + (2)	\$7,818,725	\$7,814,523
(b) For half year on (3)	<u>-545,352</u>	<u>-520,527</u>
(c) Total interest	<u>7,273,373</u>	<u>7,293,996</u>
5. Expected unfunded/(overfunded) actuarial accrued liability	\$87,413,861	\$88,049,602
6. Changes due to:		
(a) Experience loss	10,660,704	--
(b) Assumption changes	<u>10,462,999</u>	--
(c) Total changes	\$21,123,703	--
7. Unfunded actuarial accrued liability at end of year, after plan changes: (5) + (6)(c)	<u>\$108,537,564</u>	--

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

**EXHIBIT F**

**Table of Amortization Bases as of July 1, 2006**

<b>Type</b>	<b>Annual Payment*</b>	<b>Years Remaining</b>	<b>Outstanding Balance</b>
1993 ERI	\$15,464	3.00	\$42,104
2003 ERI	3,878	20.00	55,535
Remaining unfunded liability	<u>7,879,851</u>	20.00	<u>112,828,381</u>
<b>Total</b>	<b>\$7,899,193</b>		<b>\$112,926,020</b>

*Notes: Payments are adjusted for timing.*

*Does not reflect adjustment to set fiscal 2007 appropriation to budgeted amount.*

*Refer to Exhibit G for information on payments in fiscal year 2007 and later.*

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

**EXHIBIT G**

**Funding Schedule**

(1) Fiscal Year Ended June 30	(2) Employer Normal Cost	(3) Amortization of 1993 ERI Liability	(4) Amortization of 2003 ERI Liability	(5) Amortization of Remaining Unfunded Liability	(6) Total Plan Cost: (2) + (3) + (4) + (5)	(7) Total Unfunded Actuarial Accrued Liability
2007	\$2,935,726	\$15,464	\$3,878	\$7,283,931	\$10,239,000	\$112,926,020
2008	3,067,834	15,464	4,054	8,280,215	11,367,567	114,491,760
2009	3,205,887	15,464	4,235	8,652,825	11,878,412	115,129,173
2010	3,350,152	-	4,426	9,042,202	12,396,780	115,423,545
2011	3,500,909	-	4,625	9,449,102	12,954,635	115,345,182
2012	3,658,450	-	4,834	9,874,312	13,537,595	114,828,318
2013	3,823,080	-	5,051	10,318,655	14,146,786	113,817,333
2014	3,995,119	-	5,279	10,782,995	14,783,392	112,251,148
2015	4,174,899	-	5,515	11,268,230	15,448,644	110,062,727
2016	4,362,769	-	5,764	11,775,300	16,143,833	107,178,551
2017	4,559,094	-	6,023	12,305,188	16,870,305	103,518,034
2018	4,764,253	-	6,295	12,858,921	17,629,469	98,992,902
2019	4,978,644	-	6,577	13,437,573	18,422,794	93,506,505
2020	5,202,683	-	6,874	14,042,264	19,251,821	86,953,081
2021	5,436,804	-	7,183	14,674,166	20,118,153	79,216,952
2022	5,681,460	-	7,506	15,334,503	21,023,469	70,171,653
2023	5,937,126	-	7,844	16,024,556	21,969,526	59,678,986
2024	6,204,297	-	8,197	16,745,661	22,958,154	47,587,991
2025	6,483,490	-	8,566	17,499,216	23,991,272	33,733,837
2026	6,775,247	-	8,951	18,286,680	25,070,878	17,936,607
2027	7,080,133	-	-	-	7,080,133	-
2028	7,398,739	-	-	-	7,398,739	-

*Notes: Recommended contributions are assumed to be paid semimonthly July through December.  
Assumes amortization payments of remaining liability increase at 4.50% per year.  
Assumes contributions of budgeted amount for fiscal year 2007.*

**SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**

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**EXHIBIT H**

**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 is a wide range of 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 Town of Brookline 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 Town of Brookline 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 182 beneficiaries in pay status)	817
2. Participants active during the year ended December 31, 2005 with total accumulated contributions of \$46,717,016 and projected payroll of \$57,008,822	1,440
3. Inactive participants with a vested right to a return of their contributions or a deferred or immediate benefit as of December 31, 2005	924

The actuarial factors as of January 1, 2006 are as follows:

1. Normal cost, including administrative expenses	\$7,685,763
2. Expected employee contributions	<u>-4,870,296</u>
3. Employer normal cost: (1) + (2)	\$2,815,467
4. Actuarial accrued liability	299,355,769
Retired participants and beneficiaries	\$153,375,604
Active participants	142,191,807
Inactive participants	3,788,358
5. Actuarial value of assets (\$193,691,396 at market value)	190,818,205
6. Unfunded actuarial accrued liability: (4) - (5)	108,537,564

The actuarial factors projected to July 1, 2006 are as follows:

1. Employer normal cost projected to July 1, 2006, adjusted for timing <sup>1</sup>	\$2,935,726
2. Projected unfunded actuarial accrued liability	112,926,020
3. Payment on projected unfunded actuarial accrued liability, adjusted for timing <sup>1</sup>	7,899,193
4. Preliminary recommended contribution: (1) + (3), adjusted for timing <sup>1</sup>	<u>\$10,834,919</u>
5. Budgeted appropriation	10,239,000
6. Projected payroll	58,277,406

<sup>1</sup> Recommended contributions are assumed to be paid semimonthly July through December.

**SECTION 4: Reporting Information for the Town of Brookline 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>
2002	\$8,743,000	\$8,743,000	100.0%
2003	9,310,000	9,310,000	100.0%
2004	9,533,000	9,533,000	100.0%
2005	9,937,000	9,937,000	100.0%

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**SECTION 4: Reporting Information for the Town of Brookline 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>
01/01/1996	\$93,285,890	\$156,258,190	\$62,972,300	59.70%	\$36,686,332	171.65%
01/01/1998	121,604,190	192,305,540	70,701,350	63.23%	40,150,666	176.09%
01/01/2000	160,983,529	217,964,030	56,980,501	73.86%	43,028,894	132.42%
01/01/2002	171,285,347	250,478,343	79,192,996	68.38%	45,109,610	175.56%
01/01/2004	177,153,465	265,441,629	88,288,164	66.74%	52,378,086	168.56%
01/01/2006	190,818,205	299,355,769	108,537,564	63.74%	58,277,406	186.24%

**SECTION 4: Reporting Information for the Town of Brookline 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, 2006
<b>Actuarial cost method</b>	Entry Age Normal Cost Method
<b>Amortization method</b>	Level dollar for 1993 ERI and increasing at 4.50% per year for 2003 ERI and remaining unfunded liability
<b>Remaining amortization period</b>	3 years remaining as of July 1, 2006 for 1993 ERI and 20 years remaining as of July 1, 2006 for 2003 ERI and remaining unfunded liability
<b>Asset valuation method</b>	The difference between the expected return and 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%
Projected salary increases	5.00%
Cost of living adjustments	3.00% of first \$12,000 of retirement income
<b>Plan membership:</b>	
Retired participants and beneficiaries receiving benefits	817
Inactive participants	924
Active participants	<u>1,440</u>
Total	3,181

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**SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System**

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**EXHIBIT V**

**Actuarial Assumptions and Actuarial Cost Method**

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**Mortality Rates:**

<i>Pre-Retirement:</i>	RP-2000 Employee Mortality Table
<i>Healthy Retiree:</i>	RP-2000 Healthy Annuitant Mortality Table
<i>Disabled Retiree:</i>	RP-2000 Healthy Annuitant Mortality Table set forward 2 years

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**Termination Rates before Retirement:**

**Groups 1 and 2 – Rate (%)**

Age	Mortality			Disability	Previous Disability
	Male	Female			
20	0.03	0.02		0.01	0.01
25	0.04	0.02		0.02	0.02
30	0.04	0.03		0.03	0.03
35	0.08	0.05		0.06	0.06
40	0.11	0.07		0.20	0.10
45	0.15	0.11		0.29	0.15
50	0.21	0.17		0.58	0.19
55	0.30	0.25		0.71	0.24
60	0.49	0.39		0.84	0.28

*Notes: 55% of the disability rates shown represent accidental disability.  
 20% (previously, 0%) of the accidental disabilities will die from the same cause as the disability.  
 55% (previously, 0%) of the death rates shown represent accidental death.*

**SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System**

**Termination Rates before Retirement (continued):**

Age	Group 4 – Rate (%)				Previous Disability
	Mortality		Disability		
	Male	Female			
20	0.03	0.02	0.10	0.10	
25	0.04	0.02	0.20	0.20	
30	0.04	0.03	0.30	0.30	
35	0.08	0.05	0.30	0.30	
40	0.11	0.07	0.60	0.30	
45	0.15	0.11	2.00	1.00	
50	0.21	0.17	3.75	1.25	
55	0.30	0.25	3.60	1.20	
60	0.49	0.39	2.55	0.85	

*Notes: 90% of the disability rates shown represent accidental disability.  
 60% (previously 0%) of the accidental disabilities will die from the same cause as the disability.  
 90% (previously 0%) of the death rates shown represent accidental death.*

**Withdrawal Rates:**

Years of Service	Rate per year (%)		
	Groups 1 and 2	Years of Service	Group 4
0	15.0	0 – 10	1.5
1	12.0	11+	0.0
2	10.0		
3	9.0		
4	8.0		
5 – 9	7.6		
10 – 14	5.4		
15 – 19	3.3		
20 – 24	2.0		
25 - 29	1.0		
30+	0.0		

**SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System**

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**Retirement Rates:**

Age	Rate per year (%)	
	Groups 1 and 2	Group 4
55	5.0	15.0
56 – 58	2.5	10.0
59	2.5	15.0
60	10.0	20.0
61	15.0	20.0
62 - 63	10.0	25.0
64	10.0	30.0
65	40.0	100.0
66 - 67	25.0	--
68 - 69	30.0	--
70	100.0	--

Age	Previously		Group 4
	Male	Female	
50 – 51	1.0	1.5	2.0
52	1.0	2.0	2.0
53	1.0	2.5	5.0
54	2.0	2.5	7.5
55	2.0	5.5	15.0
56 – 57	2.5	6.5	10.0
58	5.0	6.5	10.0
59	6.5	6.5	15.0
60	12.0	5.0	20.0
61	20.0	13.0	20.0
62	30.0	15.0	25.0
63	25.0	12.5	25.0
64	22.0	18.0	30.0
65	40.0	15.0	100.0
66 - 67	25.0	20.0	--
68	30.0	25.0	--

**SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System**

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	Age	Previously		Group 4
		Groups 1 and 2		
		Male	Female	
	69	30.0	20.0	--
	70	100.0	100.0	--
<b>Unknown Data for Participants:</b>	Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.			
<b>Age of Spouse:</b>	Female (or male) spouses 3 years younger (or older) than their spouses.			
<b>Percent Married:</b>	80%			
<b>Net Investment Return:</b>	8.25%			
<b>Interest on Employee Contributions:</b>	3.5%			
<b>Investment Expenses:</b>	\$325,000 assumed to increase 4.5% annually, payable at the beginning of the year			
<b>Salary Increases:</b>	5.0%			
<b>2005 Salary:</b>	Salary reported in the data for employees hired in 2004 or earlier. Salary estimated from contributions, then annualized, for employees hired in 2005.			
<b>Total Service:</b>	Total creditable service reported in the data.			
<b>Actuarial Value of Assets:</b>	Market value of assets less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 10% of the market value.			
<b>Actuarial Cost Method:</b>	Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant less service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary.			

**SECTION 4: Reporting Information for the Town of Brookline 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:

<b>Age Last Birthday at Date of Retirement</b>			
<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

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

## **SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System**

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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 fifteen dollars per year of creditable service, not exceeding three hundred dollars. The veteran allowance is paid in addition to the 80 percent maximum.

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### **Employee Contributions**

Employees hired before January 1, 1975 contribute 5 percent of their salary; employees hired after December 31, 1974 and before January 1, 1984 contribute 7 percent; employees hired after January 1, 1984 contribute 8 percent; employees hired after July 1, 1996 contribute 9 percent. 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).

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### **Ordinary Disability Benefits**

A member who is unable to perform his job due to a non-occupational disability will receive a retirement allowance if he 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

## SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

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percent of the member's most recent year's pay plus an annuity based on his own contributions.

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### **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 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.

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### **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 his death, a spouse's benefit will be paid the full amount the employee would have received under Option C (previously, two-thirds of the amount). 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.

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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 or permanent member of a police department 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

## SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

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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.

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### **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 his death any of his contributions not expended for annuity payments will be refunded to his beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing his 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.

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### **Post-Retirement Benefits**

The Board has adopted the provisions of Section 51 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.