

**ACTUARIAL VALUATION REPORT**

*as of*

***JUNE 30, 2010***



*New York State Teachers' Retirement System*

**Office of the Actuary  
July 14, 2011**

# NEW YORK STATE TEACHERS' RETIREMENT SYSTEM

## Actuarial Valuation Report as of June 30, 2010

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# NEW YORK STATE TEACHERS' RETIREMENT SYSTEM

## Actuarial Valuation Report as of June 30, 2010

### A. INTRODUCTION

This report presents the results of the annual actuarial valuation of assets and liabilities of the New York State Teachers' Retirement System as of June 30, 2010. The purpose of this report is to summarize the determination of the Employer Contribution Rate which will be applied to member salaries earned during the July 1, 2011 to June 30, 2012 fiscal year and to review the funded status of the Retirement System. Use of the valuation results contained herein for purposes other than those stated above may not be appropriate.

### B. EMPLOYER CONTRIBUTION RATE

The Employer Contribution Rate to be applied to member salaries for the July 1, 2011 to June 30, 2012 fiscal year and collected in the fiscal year ending June 30, 2013 consists of four components. These components may be described as follows:

The **Normal Rate** represents the annual cost of accruing active member benefits. This component includes the cost of benefits accruing to active members on account of retirement, withdrawal, disability and death, except for benefits funded by the group life insurance rate. This rate is determined by an annual actuarial valuation of Retirement System assets and liabilities.

The **Expense Rate** is a one-year term rate representing the administrative cost of the Retirement System and is set during the budget process.

The **Group Life Insurance Rate** is a one-year term rate representing the cost of the first \$50,000 of member death benefits.

The **Excess Benefit Plan Rate** is a one-year term rate representing the cost of benefit payments in excess of the Internal Revenue Code Section 415 limits.

The actuarially computed Employer Contribution Rate to be applied to the member salaries for the fiscal year ending June 30, 2012 is **11.11%**. The Employer Contribution Rates determined by the actuarial valuations as of June 30, 2010 and June 30, 2009 and the changes between the two are summarized below:

	As of <u>6/30/2010</u>	As of <u>6/30/2009</u>	<u>Change</u>
Normal Rate	10.71%	8.21%	+2.50%
Expense Rate	0.27	0.27	0.00
Group Life Insurance Rate	0.13	0.13	0.00
Excess Benefit Plan Rate	<u>0.00</u>	<u>0.01</u>	<u>-0.01</u>
Employer Contribution Rate	<b>11.11%</b>	<b>8.62%</b>	<b>+2.49%</b>

As in prior years, the actual employer contributions made by participating employers during the fiscal year ending June 30, 2010 were equal to the employer contributions determined in accordance with the annual actuarial valuation. Additional payments are made by certain participating employers as required by statute for participation in early retirement incentives and Section 803 of Article 18 of the Retirement and Social Security Law.

### C. GAIN/LOSS IN THE EMPLOYER CONTRIBUTION RATE

The Employer Contribution Rate of 11.11% represents a 249 basis point increase over the prior year's rate of 8.62%.

#### NORMAL RATE

The Normal Rate component of the Employer Contribution Rate has increased by 250 basis points over the prior year's rate. This change may be broken down as follows:

<b><u>Salary/Service:</u></b>	This gain is due to salary and service data coming in lower than expected.	-0.23
<b><u>Net Investment Loss:</u></b>	The investment return on the actuarial value of assets was approximately 4.4% which was less than the 8.0% expected return.	+2.47
<b><u>New Entrants:</u></b>	New entrants join the Retirement System with no accumulated assets and entered this fiscal year for the most part as Tier 4 members, with a long-term expected contribution rate of approximately 12.1%. Because of this, New Entrants exerted upward pressure on the Employer Contribution Rate.	+0.12
<b><u>Withdrawal:</u></b>	Fewer members withdrew than expected.	+0.21
<b><u>Mortality:</u></b>	Members are living longer than expected and receive benefits for a longer period.	+0.03
<b><u>Retirement:</u></b>	There were fewer retirements than expected.	-0.20
<b><u>Pension Payments:</u></b>	Actual payments to retirees were greater than expected.	+0.17
<b><u>Cost of Living Adjustment:</u></b>	The actual COLA increase of 1.00% was lower than the expected increase of 1.75%.	-0.07
<b><u>TOTAL CHANGE IN THE NORMAL RATE</u></b>		<b>+2.50%</b>

## OTHER COMPONENTS

The **Expense Rate** is set during the budget process and is unchanged from the previous year.

The **Group Life Insurance Rate** is unchanged from the previous year. Although the premiums collected have generally been more than sufficient to cover payments over the past several years, this rate is being held constant in anticipation of rising payouts in the future due to Tier 2, 3, 4 and 5 post-retirement death benefits and the inactive death benefit.

The **Excess Benefit Plan Rate** has decreased by one basis point from the previous year. This rate represents the retirement benefits paid in excess of the Internal Revenue Code Section 415 limits. These payments are made exclusively from the Excess Benefit Plan. This fund was established in accordance with the Excess Benefit Plan which received final IRS approval in August 2001. It is anticipated that the current fund balance is sufficiently large to cover at least two years' worth of payments, allowing us to set this component equal to 0.00% in this year's Employer Contribution Rate.

### **D. EMPLOYER CONTRIBUTION RATE HISTORY**

The following chart summarizes the Employer Contribution Rate for the last 20 years:

<i>Salary Year</i>	<i>Employer Contribution Rate</i>	<i>Salary Year</i>	<i>Employer Contribution Rate</i>
1992-1993	8.00%	2002-2003	0.36%
1993-1994	8.41	2003-2004	2.52
1994-1995	7.24	2004-2005	5.63
1995-1996	6.37	2005-2006	7.97
1996-1997	3.57	2006-2007	8.60
1997-1998	1.25	2007-2008	8.73
1998-1999	1.42	2008-2009	7.63
1999-2000	1.43	2009-2010	6.19
2000-2001	0.43	2010-2011	8.62
2001-2002	0.36	2011-2012	11.11

The complete Employer Contribution Rate history is presented in Appendix 13.

## E. EMPLOYER CONTRIBUTION RATE INCREASE

The Employer Contribution Rate has increased this year from 8.62% to 11.11%, representing an increase of approximately 29%. The Normal Rate component equals 10.71%, an increase of approximately 30% over the prior year's Normal Rate of 8.21%. The rate of return on the System's market value of assets for the fiscal year ending June 30, 2010 was 12.1%, which compares very favorably to the 8.0% actuarial rate of return assumption. Primarily due to the very large investment loss during the prior fiscal year, however, the System's five-year market value rate of return stands at 2.2%. While the asset smoothing method did help to dampen the impact of last year's loss on the Employer Contribution Rate, the loss continued to exert an upward pressure on the rate. This investment experience again overwhelmed the other gain/loss items for the year, and was the primary reason for the continued increase in the rate.

## F. MEMBER DATA

The member data for the valuation was determined as of June 30, 2010. Compared with the previous year, the total number of members increased from 419,635 to 427,490; the number of active members increased from 280,338 to 285,774; the number of retired members increased from 134,287 to 136,626; and the number of beneficiaries receiving monthly benefits increased from 5,010 to 5,090.

The number of retirements decreased from 5,644 during the 2008-2009 fiscal year to 5,501 during the 2009-2010 fiscal year. The number of retirements in recent years has decreased, likely due to the recent weakening of the economy. Two early retirement incentives were effective during the summer of 2010, however, and will likely lead to an increase in the number of retirements in the fiscal year ending June 30, 2011. The number of retirements over each of the last ten years is as follows:

<i>Fiscal Year</i>	<i>Total Number of Retirements</i>	<i>Fiscal Year</i>	<i>Total Number of Retirements</i>
2000-2001*	7,946	2005-2006	7,281
2001-2002	7,344	2006-2007	6,900
2002-2003*	10,173	2007-2008	6,330
2003-2004	7,287	2008-2009	5,644
2004-2005	7,182	2009-2010	5,501

\*Denotes an early retirement incentive offered during that fiscal year.

Historical member statistics, including statistics specific to retired members, appear in the appendices to this report. Additional member statistics may also be found in the Retirement System's most recent Comprehensive Annual Financial Report.

## **G. FUNDED STATUS**

As of June 30, 2010, the actuarial value of plan assets was equal to \$88.54 billion. The accrued pension benefit liability calculated in accordance with the Entry Age Normal Cost Method was equal to \$88.32 billion. These two values produced a funded ratio of 100.3% as of June 30, 2010.

In accordance with Governmental Accounting Standards Board (GASB) Statement No. 50 "Pension Disclosures", the plan liabilities have been calculated in accordance with the Entry Age Normal Cost Method, for purposes of this funded ratio calculation. The Retirement System is funded in accordance with the Aggregate Cost Method. GASB requires that the Entry Age Normal Cost Method be used to calculate the accrued liability for purposes of presenting the funded ratio calculation for plans funded in accordance with the Aggregate Cost Method.

A history of the Retirement System's funded status is provided in Appendix 4 of this report.

## **H. ACTUARIAL EXPERIENCE**

Each year the Retirement System completes an experience study in order to regularly monitor the reasonableness and appropriateness of the actuarial assumptions used in the actuarial valuation. These assumptions are used to estimate the probability a member will cease teaching due to retirement, withdrawal, disability, or death. In addition, the assumptions are used to estimate future salary increases, future investment earnings, and the probability of death for retired members and beneficiaries. A summary of the results of the most recent experience study is contained in Appendix 10. The current actuarial assumptions were adopted by the Retirement Board on October 26, 2006, and first effective with the actuarial valuation of the Retirement System's assets and liabilities as of June 30, 2006. New actuarial assumption tables are being



developed based on more recent member experience, with the goal of first utilizing these revised assumptions with the June 30, 2011 actuarial valuation.

The Retirement Board, in consultation with Retirement System staff and the external investment consultant, annually reviews the asset allocation policy to determine if any changes to the policy are appropriate. According to the System's external investment consultant, the System's asset allocation as of June 30, 2010 produces a long-term (15 year) expected annual geometric rate of return of 7.20%, and an expected annual arithmetic rate of return of 7.99%.

The Retirement System's asset allocation, including targets and ranges, can be found in Appendix 11. Historical rate of return information can be found at the end of Appendix 10. Detailed investment information is available in the System's Comprehensive Annual Financial Report.

## **I. NEW LEGISLATION**

The following legislation affecting the Retirement System was signed into law during the 2010 Legislative Session:

### **Retirement Incentives:**

**Chapter 45 and Chapter 105 of the Laws of 2010** each provided a retirement incentive to certain members of the Retirement System. Under Chapter 45, eligible Tier 2, 3, or 4 educators represented by the New York State United Teachers (NYSUT) were permitted to retire without early retirement reduction upon attainment of at least age 55 with 25 years of service. Costs incurred under Chapter 45 were socialized across all employers. Under Chapter 105, employers had the option of offering Part A, Part B, or both parts. Part A provided eligible employees with a benefit of one-twelfth of a year of additional service credit for each year of accrued service credit up to a maximum of three additional years. Part B permitted Tier 2, 3, or 4 members to retire without early retirement reduction upon attainment of at least age 55 with 25 years of service. Employers elected whether or not to participate in Part A or Part B and each employer is billed the full cost for their participating members.

## **J. SENSITIVITY ANALYSIS**

Included in Appendix 12 is a Sensitivity Analysis. The purpose of this exhibit is to illustrate what the Employer Contribution Rate would have been had various actuarial assumptions been altered. The chart also gives the reader a feel for the significance of the assumptions on the valuation results, and the potential impact of modifying them.

## **K. FUTURE EXPECTATIONS**

The next Employer Contribution Rate (ECR) will be determined based upon the actuarial valuation as of June 30, 2011. Looking ahead, the capital markets continued the financial rebound of the prior year and posted very strong returns for the twelve months ending June 30, 2011. The System's market value rate of return, though still only estimated, should be in the neighborhood of +21%. The System's market value of assets as of June 30, 2011 will be up substantially over one year ago, however still short of its value as of the end of the fiscal year in 2007 and even 2008. The System's five-year rate of return will still be well below 8.0%. The smoothing method dampened the impact of the dramatic investment loss during the fiscal year ending 2009, however it continues to exert an upward pressure on the ECR. Continued increases in the ECR over the next couple of years are still likely, although hopefully at a diminishing rate of increase.

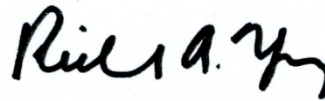
The ECR has still not reached the New Entrant Rate, or long-term expected cost of the Tier 4 benefit structure, of 12.1% of pay. This hypothetical rate represents the long-term expected employer cost of the benefit structure for Tier 4, assuming all actuarial assumptions are met year after year. The Tier 5 benefit structure, effective January 1, 2010, represents a benefit reduction for new members, as well as a significant shifting of costs from employer to employee, with an increase in both the employee contribution rate, and the length of time it must be made. The long-term expected employer cost for Tier 5 is 8.8% of pay. It will be at least several years, however, before Tier 5 members make up a large enough percentage of the membership for it to have a noticeable impact on the overall ECR. There will in time, however, be a cost-lowering impact due to this change.

The System's Actuarial Department is developing revised actuarial assumption tables to reflect more recent experience, with the goal of utilizing them with the June 30, 2011 actuarial valuation. Obviously they will have an impact on the ECR also. When completed, a separate report will detail the development of these assumptions, as well as their impact on plan costs.

## **L. CERTIFICATION**

This actuarial valuation relies on member data provided by the participating employers to the Retirement System's administrative staff. The administrative and actuarial staffs review this data for reasonability as well as reconcile it against prior data. In addition, the valuation relies on financial data provided by the Retirement System's Finance Department. All data is reviewed by the Retirement System's independent auditors as part of the annual audit.

The benefits recognized in this actuarial valuation are prescribed by New York State statute (Article 11 of the Education Law and Articles 11, 14, 15, 18, 19, and 20 of the Retirement and Social Security Law), and are summarized in Appendix 17. All benefits are included in the actuarial valuation. The actuarial methods, calculations, and actuarial assumptions are in accordance with standards of practice prescribed by the Actuarial Standards Board and generally accepted actuarial principles and procedures. The assumptions used in determining the liabilities and costs are internally consistent and reasonably related to actual and anticipated future experience of the Retirement System. I am a member of the American Academy of Actuaries and I meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



Richard A. Young, A.S.A., E.A., M.A.A.A., F.C.A.  
Actuary



New York State Teachers' Retirement System  
Office of the Actuary  
July 14, 2011

APPENDIX 1

**RECONCILIATION OF THE ACTUARIAL VALUE OF ASSETS**

From June 30, 2009 to June 30, 2010

	Actuarial Value* (in thousands)
1. Actuarial Value of Assets as of June 30, 2009 <sup>1</sup>	\$88,681,798
2. Contributions and Transfers	
Employer contributions	1,030,481
Member contributions	163,406
Net transfers (in/out)	<u>6,037</u>
Subtotal	1,199,923
3. Net Investment Income/(Loss)	3,860,452
4. Distributions	
Benefit payments	5,327,295
Return of member contributions	<u>17,071</u>
Subtotal	5,344,365
5. Actuarial Value of Assets as of June 30, 2010 <sup>2</sup>	<u>\$88,397,808</u>
6. Market Value of Assets as of June 30, 2010	\$76,844,937

\*Totals may not add due to rounding.

<sup>1</sup> Effective June 30, 2007, the Retirement System's asset valuation method was changed.

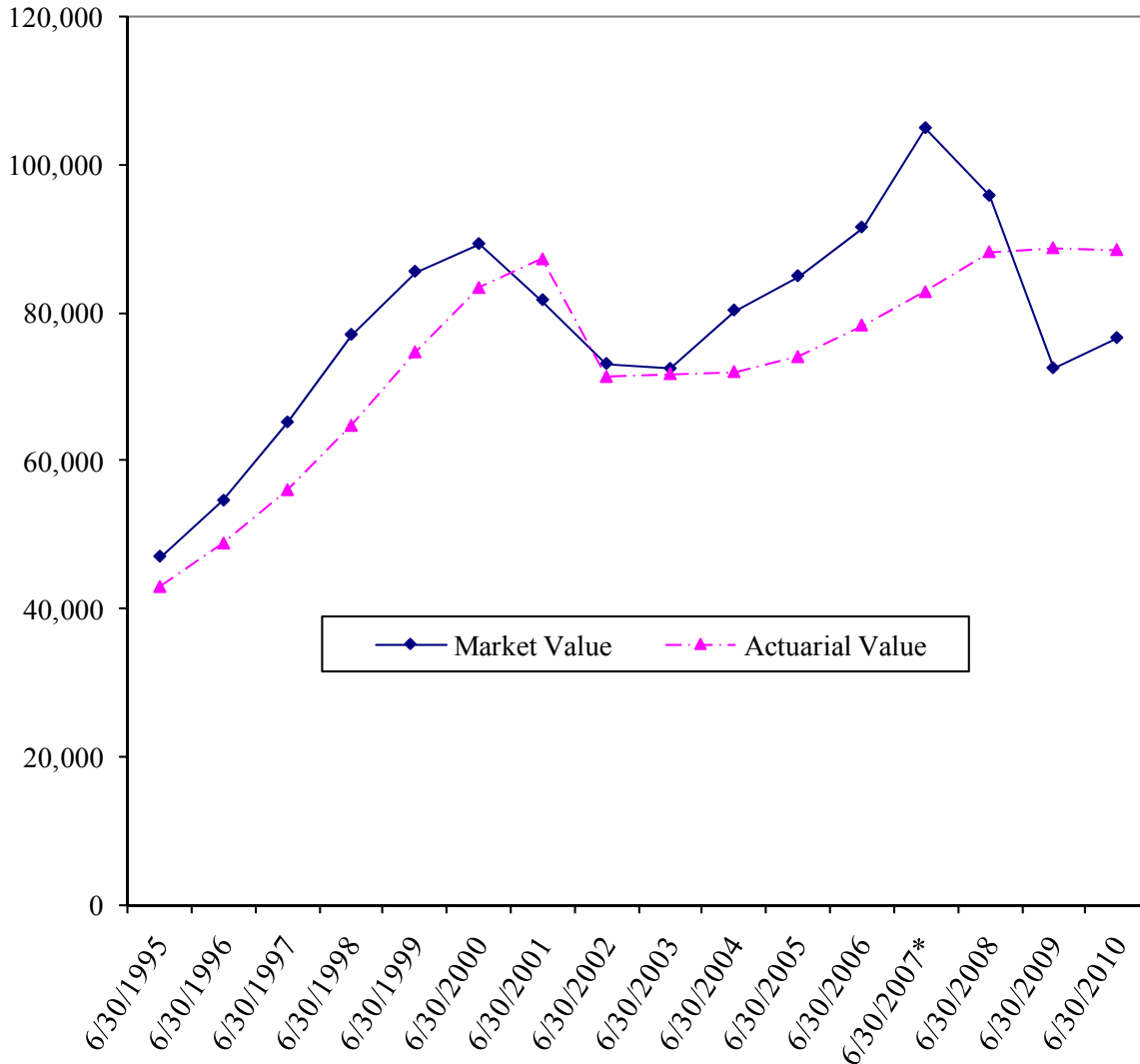
<sup>2</sup> Actuarial value of assets used in determining the Normal Rate, and excludes the net asset value of the Group Life Insurance Fund.

APPENDIX 2

**COMPARISON OF MARKET VALUE TO ACTUARIAL VALUE OF ASSETS**  
(in Millions)

Fiscal Year Ending	Market Value	Actuarial Value	Fiscal Year Ending	Market Value	Actuarial Value
6/30/1995	\$ 46,999.1	\$ 42,984.8	6/30/2003	\$ 72,391.5	\$ 71,780.4
6/30/1996	54,567.5	48,865.4	6/30/2004	80,276.2	72,044.4
6/30/1997	65,152.4	56,085.3	6/30/2005	84,908.5	74,074.3
6/30/1998	76,980.5	64,778.9	6/30/2006	91,492.2	78,335.8
6/30/1999	85,514.4	74,721.1	6/30/2007*	104,912.9	82,858.9
6/30/2000	89,247.3	83,421.8	6/30/2008	95,769.3	88,254.7
6/30/2001	81,664.2	87,295.3	6/30/2009	72,471.8	88,805.5
6/30/2002	73,041.2	71,374.4	6/30/2010	76,844.9	88,544.4

Market Value vs. Actuarial Value  
(in Millions)



\*Effective June 30, 2007, the Retirement System's asset valuation method was changed.

APPENDIX 3

**THE ACTUARY'S VALUATION BALANCE SHEET**

as of June 30, 2010  
(in Thousands)

Since the liabilities of a retirement system consist largely of obligations on account of benefits which have not yet matured, an annual statement of its receipts and disbursements or of its income and expenditures is not sufficient to indicate its true financial position. These statements give a clear picture of the current transactions of a retirement system and show what the present assets are, but since these present assets are held for the payment of future benefits coming due over a longer period of time, we have no basis for judging the financial solvency of the system unless we determine by actuarial valuation what these future benefits are likely to amount to and whether the present assets, together with the prospective assets, will be sufficient to cover their costs.

The following balance sheet furnishes this comparison. It presents the results of the annual actuarial valuation of the present and prospective assets and liabilities of the retirement system, which was prepared by the Actuary as of June 30, 2010.

**ASSETS**

Present Assets of System for Valuation Purposes <sup>1</sup>	\$88,544,366
Present Value of Prospective Contributions to Pension Accumulation Fund	
from Employer Contributions	16,720,934
from Member Contributions	<u>576,504</u>
<b><u>TOTAL ASSETS</u></b>	<b><u>\$105,841,804</u></b>

**LIABILITIES**

Present Value of Future Benefits for:	
Retired Members and Beneficiaries	\$50,541,999
Active Members	55,268,523
Member Contributions Accumulated to Date in the Annuity Savings Fund	17,581
Benefits Due and Unpaid	<u>13,701</u>
<b><u>TOTAL LIABILITIES</u></b>	<b><u>\$105,841,804</u></b>

<sup>1</sup> Differs from the assets presented in the Retirement System's financial statements because the actuarial value of assets is not at market value.

APPENDIX 4

**FUNDING PROGRESS**

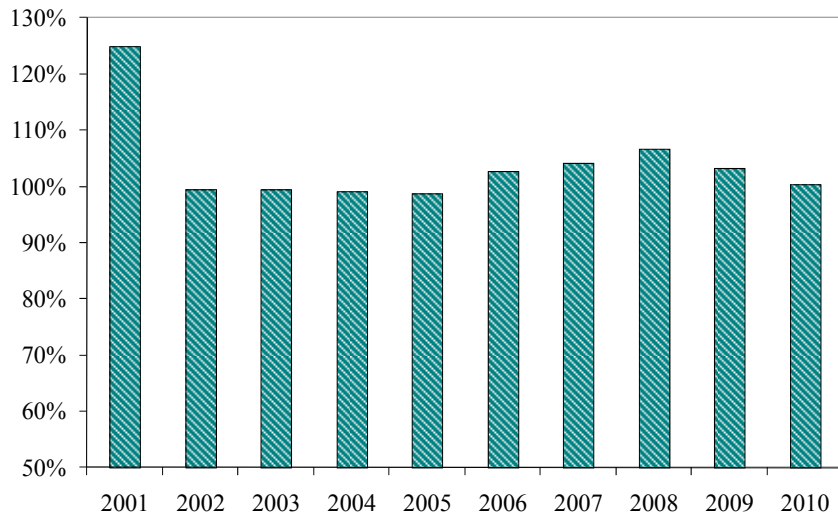
The Actuary’s Valuation Balance Sheet provides a point-in-time comparison, as determined by actuarial valuation, between the present value of projected future benefits and the present assets as well as prospective contributions. In order to effectively assess the funding progress of a retirement system, it is necessary to compare the actuarial value of assets and the accrued pension benefit liabilities over a period of time.

The Retirement System’s funding method has allowed the accumulation of assets sufficient for the funding of its liabilities in a systematic and reasonable manner.

**Analysis of Funding Progress  
(in Millions)**

<u>Fiscal Year Ending</u>	<u>Actuarial Value of Assets<sup>1</sup></u>	<u>Accrued Pension Benefit Liability<sup>2</sup></u>	<u>Percent Funded</u>
2001	\$87,295.3	\$69,817.0	125.0%
2002	71,374.4	71,693.4	99.6
2003	71,780.4	72,209.4	99.4
2004	72,044.4	72,604.9	99.2
2005	74,074.3	74,961.1	98.8
2006	78,335.8	76,353.0	102.6
2007	82,858.9	79,537.2	104.2
2008	88,254.7	82,777.5	106.6
2009	88,805.5	86,062.0	103.2
2010	88,544.4	88,318.8	100.3

**Percent Funded**



<sup>1</sup> Effective June 30, 2007, the Retirement System’s asset valuation method was changed.

<sup>2</sup> Effective June 30, 2006, the Accrued Pension Benefit Liability is calculated under the Entry Age Normal Cost Method as required by Governmental Accounting Standards Board (GASB) Statement No. 50 – *Pension Disclosures*. NYSTRS is funded in accordance with the Aggregate Cost Method. GASB now requires that the Entry Age Normal Cost Method be used to calculate the accrued liability for purposes of presenting the funded percentage.

APPENDIX 5

**EMPLOYER CONTRIBUTION RATE**

2010 Valuation

8.00% Interest

<b>Normal Rate</b>	10.71%
<b>Group Life Insurance Rate</b>	0.13
<b>Excess Benefit Plan Rate</b>	0.00
<b>Expense Rate</b>	0.27
<b>Computed Contribution Rate as of June 30, 2010</b>	<b>11.11%</b>



APPENDIX 5 (Cont'd.)

**NORMAL RATE CALCULATION**

2010 Valuation  
8.00% Interest

**Liabilities**

**Active Tier 1**

Service Pension	\$2,936,084,020
Disability Pension	4,752
Vested Pension	45,954
Active Death over \$50,000	9,650,943
Death Benefit After 10-Yr Withdrawal over \$50,000	6
Annuity Savings Fund	17,581,003
COLA	58,851,009
Total	<u>\$3,022,217,687</u>

**Active Tier 2**

Service Pension	\$3,096,428,401
Post Retired Death over \$50,000	2,570,280
Disability Pension	139,722
Post Disabled Death over \$50,000	2,924
Vested Pension	1,188,463
Active Death over \$50,000	5,305,452
Death Benefit After 10-Yr Withdrawal over \$50,000	292
COLA	66,725,435
Total	<u>\$3,172,360,969</u>

**Active Tier 3**

Service Pension	\$6,957,709,196
Post Retired Death over \$50,000	5,701,106
Disability Pension	7,509,838
Post Disabled Death over \$50,000	159,761
Refund on Active Death	3,204,923
Active Death over \$50,000	14,971,066
Refund on Quit	242,177
Vested Pension	61,644,398
Death Benefit After 10-Yr Withdrawal over \$50,000	17,915
Refund on Death after Vested Withdrawal	9,556
COLA	175,461,212
Total	<u>\$7,226,631,148</u>

APPENDIX 5 (Cont'd.)

**NORMAL RATE CALCULATION (Cont'd.)**

2010 Valuation  
8.00% Interest

**Liabilities (Cont'd.)**

**Active Tier 4**

Service Pension	\$37,093,306,104
Post Retired Death over \$50,000	79,564,139
Disability Pension	249,843,956
Post Disabled Death over \$50,000	9,211,442
Refund on Active Death	25,280,316
Active Death over \$50,000	239,018,766
Refund on Quit	189,082,451
Vested Pension	2,070,682,396
Death Benefit After 10-Yr Withdrawal over \$50,000	4,260,422
Refund on Death after Vested Withdrawal	2,083,357
COLA	910,200,197
Total	<u>\$40,872,533,546</u>

**Active Tier 5**

Service Pension	\$19,051,723
Post Retired Death over \$50,000	14,613
Disability Pension	178,084
Post Disabled Death over \$50,000	2,696
Refund on Active Death	54,679
Active Death over \$50,000	121,658
Refund on Quit	1,072,220
Vested Pension	1,173,232
Death Benefit After 10-Yr Withdrawal over \$50,000	1,449
Refund on Death after Vested Withdrawal	3,026
COLA	959,635
Total	<u>\$22,633,015</u>

## APPENDIX 5 (Cont'd.)

**NORMAL RATE CALCULATION (Cont'd.)**

2010 Valuation

8.00% Interest

**Liabilities (Cont'd.)****Retirees**

Retired Pension	\$44,978,802,895
Retired Annuity	163,878,222
Disability Pension	276,447,415
Disability Annuity	1,077,937
Beneficiary Pension	563,890,747
Beneficiary Annuity	8,463,546
DBA Pension	6,118,330
DBA Annuity	511,371
Escalation	5,193,427
Post Retired Death over \$50,000	1,207,446
COLA	3,663,975,350
Catch-Up & Prior §532 Supp	762,839,887
Total	<u>\$50,432,406,573</u>

**Vesteds**

Inactive Vested	\$184,374,663
Death Benefit After 10-Yr Withdrawal over \$50,000	328,084
Active Vested	339,469,388
Death Benefit After 10-Yr Withdrawal over \$50,000	1,231,987
COLA	12,674,047
Total	<u>\$538,078,169</u>

**TIAA**

Service Pension	\$4,394,817
Disability Pension	58,389
Vested Pension	85,880
Active Death over \$50,000	3,602
COLA	363,964
Total	<u>\$4,906,652</u>

**Miscellaneous**

Incurred Death but not Paid	\$3,291,954
Unclaimed Non-Member Funds	7,022,028
Total	<u>\$10,313,982</u>

**Total Liabilities**\$105,302,081,741

APPENDIX 5 (Cont'd.)

**NORMAL RATE CALCULATION (Cont'd.)**

2010 Valuation  
8.00% Interest

**Assets for Valuation**

Current Total Assets		\$75,829,228,763	
Less:	Expense Fund	<u>36,698,151</u>	
	Sub-total		\$75,792,530,612
Plus:	5 Year Smoothing Adjustment		<u>12,751,834,933</u>
	<b>Assets for Valuation Purposes</b>		\$88,544,365,545
Less:	Group Life Insurance Fund Net Asset Value		<u>146,558,008</u>
	<b>Assets for Normal Rate Valuation Purposes</b>		\$88,397,807,537

**Receivables**

Assets receivable from Normal Rate in 2010-2011 fiscal year (2009-2010 paybase)(2008 Normal Rate)(1.08) <sup>-7/24</sup> (14,792,116,202) (0.0573)(1.08) <sup>-7/24</sup>		\$828,774,417
Assets receivable from Normal Rate in 2011-2012 fiscal year (2010-2011 paybase)(2009 Normal Rate)(1.08) <sup>-1 7/24</sup> (15,029,000,000) (0.0821)(1.08) <sup>-1 7/24</sup>		\$1,117,122,736
Assets receivable from the amortization of Article 18		\$0
Present Value of Future Member Contributions (Tier 4 Present Value of Future Employee Contributions)(1.08) <sup>-7/24</sup> (582,103,586) (1.08) <sup>-7/24</sup>		\$569,182,684
(Tier 5 Present Value of Future Employee Contributions)(1.08) <sup>-7/24</sup> (7,487,082) (1.08) <sup>-7/24</sup>		<u>\$7,320,892</u>
<b>Total Receivables</b>		\$2,522,400,729

APPENDIX 5 (Cont'd.)

**NORMAL RATE CALCULATION (Cont'd.)**

2010 Valuation  
8.00% Interest

**Present Value of Future Salaries**

	<u>Total PVFS</u>		
Tier 1	\$602,355,046		
Tier 2	1,008,571,854		
Tier 3	3,825,209,627		
Tier 4	131,723,222,947		
Tier 5	<u>184,531,801</u>		
	\$137,343,891,275	$\times (1.08)^{-7/24} =$	\$134,295,281,061

**Normal Rate**

$$\frac{\text{Total Liabilities - (Assets + Receivables)}}{\text{Present Value of Future Salaries}}$$

$$\frac{\$14,381,873,475}{\$134,295,281,061} = 10.7091\%$$

10.71% (rounded)

APPENDIX 5 (Cont'd.)

**GROUP LIFE INSURANCE FUND**

2010 Valuation  
8.00% Interest

**A) Calculation of June 30, 2010 Balance**

Actuarial Value as of July 1, 2009		\$175,653,007
Interest	[ 175,653,007 x .08 ]	\$14,052,241
October 15, 2009 actual premium	\$18,680,880	
October 15, 2009 deferred premium	<u>(\$18,198,700)</u>	
Premium Gain/(Loss)		\$482,180
Interest	[ 482,180 x (1.08 <sup>8.5/12</sup> - 1) ]	\$27,015
Death Benefits paid in 2009-2010		(\$6,493,145)
Interest	[ (6,493,145) x (1.08 <sup>-5</sup> - 1) ]	(\$254,729)
October 15, 2012 deferred premium [from B]		\$19,908,200
Interest discount	[ 19,908,200 x (1.08 <sup>-(2 + 3.5/12)</sup> - 1) ]	<u>(\$3,218,986)</u>
<b>Actuarial Value as of June 30, 2010</b>		<b>\$200,155,783</b>

**B) Calculation of Required Premium, GLIF Rate and Deferred Premium**

Death benefits	[ 6,493,145 x 1.08 <sup>2+9.5/12</sup> ]	\$8,049,392
Interest	[ (14,052,241) x 1.08 <sup>2+3.5/12</sup> ]	(\$16,762,612)
Premium Loss/(Gain)	[ (482,180) x 1.08 <sup>3</sup> ]	(\$607,408)
Adjustment to the GLIF reserve		<u>\$29,228,828</u>
Total required premium		\$19,908,200
GLIF Rate	=	$\frac{\text{Required premium}}{\text{Estimated 2011-2012 paybase}}$
	=	$\frac{\$19,908,200}{\$15,314,000,000}$
	=	0.13%
October 15, 2012 deferred premium	[ 15,314,000,000 x 0.0013 ]	= \$19,908,200

**C) Summary of Deferred Premiums**

	<u>Deferred Premium</u>	<u>Present Value as of 6/30/2010</u>
Due October 15, 2010	\$19,119,100	\$18,694,715
Due October 15, 2011	\$20,117,500	\$18,213,846
Due October 15, 2012	\$19,908,200	<u>\$16,689,214</u>
		\$53,597,775

**D) GLIF Net Asset Value (A - C)**

\$200,155,783 - \$53,597,775 = \$146,558,008

APPENDIX 5 (Cont'd.)

**EXCESS BENEFIT PLAN FUND\***  
2010 Valuation

<b>Balance as of July 1, 2010</b>	\$4,037,158
<b>less</b> Accrual Final Adjustment for the 2010 Fiscal Year	(\$120,900)
<b>plus</b> Employer contribution (paid 10/15/2010) [ 0.0001 X \$14,792,116,202 (6/30/2008 Excess Benefit Plan rate of .01% times '09-'10 paybase) ]	\$1,479,212
<b>less</b> Annual Estimated Payments	<u>\$600,000</u>
<b>Expected Balance as of June 30, 2011</b>	\$5,037,270
<b>plus</b> Employer contribution (payable 10/15/2011) [ .0001 X \$15,029,000,000 (6/30/2009 Excess Benefit Plan rate of .01% times est'd. '10-'11 paybase) ]	\$1,502,900
<b>less</b> Annual Estimated Payments	<u>\$600,000</u>
<b>Expected Balance as of June 30, 2012</b>	\$5,940,170

\* Fund is in a zero-interest checking account

APPENDIX 5 (Cont'd.)

The Administrative Employer Contribution Rate (Rate) and Employer Contributions<sup>1</sup>

The administrative portion of the employer contribution rate is adopted annually by the Retirement Board in the amount necessary to defray Retirement Administration related expenses for the following fiscal year. The first step in determining the Rate is to divide the projected Retirement Administration related expenses by the projected member salary base. Consideration is then given to the overall health of the fund balance.

In 2008-09, the Rate increased to 0.32% in response to GASB 45 and business plan projects. For 2011-12, the 14.30% decrease in employer contributions is a product of the reduction of the Rate from 0.32% to 0.27%.

**Employer Contributions to the Administrative Expense Fund**

Member Salary Base		Rate	Employer Contributions (Net of Billing Adjustments)		Increase/Decrease in Contributions to the Administrative Fund
Year	Amount		Year Collected	Amount	Percent
2006-07	13,083,003,687	0.25 %	2007-08	32,764,295	4.41 %
2007-08	13,690,128,086	0.32	2008-09	43,808,410	33.71
2008-09	14,366,386,886	0.32	2009-10	45,997,949	5.00
2009-10	14,792,116,202	0.32	2010-11	47,356,505	2.95
<b>2010-11</b>	<b>15,029,000,000 *</b>	<b>0.27</b>	<b>2011-12</b>	<b>40,578,300</b>	<b>-14.30</b>
2011-12	15,314,000,000 *	0.27 *	2012-13	41,347,800	1.90
2012-13	15,621,000,000 *	0.27 *	2013-14	42,176,700	2.00

\*Projected.

Estimated Member Salary Base

The member salary base is actuarially determined. It increases as new members join the System and as a result of pay increases members receive from their employers. Annual retirements and other forms of separation from service mitigate this increase. The member salary base is projected to increase 2.0% annually from 2010-11 through 2012-13.

The Proposed Administrative Employer Contribution Rate Calculation (2012 – 13): 0.27%

Several factors are considered when anticipating the expenses to be used in calculating the administrative rate, which include general price increases, an estimated 10% increase in health insurance premiums, and planned capital asset purchases.

Calculation of Administrative Employer Contribution Rate		
Projected 2012-13 Retirement Administration Related Expenses	=	\$41,150,000 = 0.27%
Estimated 2011-12 Member Salary Base		\$15,029,000,000
Proposed Administrative Rate for 2012-13 Collections	=	0.27%

<sup>1</sup> From the NYSTRS 2011-12 Operating Budget Report.



APPENDIX 5 (Cont'd.)

**ASSET VALUATION METHOD  
DEVELOPMENT OF SMOOTHING ADJUSTMENT**

<u>FYE</u>	<u>Market Value</u>	<u>Contributions</u>	<u>Benefit Payments</u>	<u>Average Market Value<sup>1</sup></u>
06/30/2005	84,011,699,408	494,425,829	4,190,897,542	
06/30/2006	90,319,347,651	872,914,574	4,484,684,109	82,387,671,843
06/30/2007	103,651,575,130	1,176,264,166	4,722,377,152	88,791,346,193
06/30/2008	94,458,424,385	1,306,481,575	4,980,254,119	102,086,872,519
06/30/2009	71,249,898,676	1,357,000,550	5,217,944,754	92,810,660,731
06/30/2010	75,829,228,763	1,260,000,256	5,399,946,740	69,442,425,487

<u>FYE</u>	<u>Actual Gain<sup>2</sup></u>	<u>3.0% Expected Gain<sup>3</sup></u>	<u>Unexpected Gain<sup>4</sup></u>	<u>Smoothing Adjustment<sup>5</sup></u>
06/30/2005	5,977,703,650			
06/30/2006	7,914,023,262	2,471,630,155	5,442,393,107	
06/30/2007	14,721,967,106	2,663,740,386	12,058,226,720	
06/30/2008	(7,781,949,313)	3,062,606,176	(10,844,555,489)	
06/30/2009	(21,516,277,258)	2,784,319,822	(24,300,597,080)	
06/30/2010	6,776,647,973	2,083,272,765	4,693,375,208	<b>(12,751,834,933)</b>

<sup>1</sup> Average Market Value = Market Value<sub>(previous yr)</sub> - (.5 x Benefit Payments) + ((8.5/12) x Contributions)

<sup>2</sup> Actual Gain = Net Appreciation (Realized and Unrealized)

<sup>3</sup> Expected Gain = 3.0% x Average Market Value

<sup>4</sup> Unexpected Gain = Actual Gain - Expected Gain

<sup>5</sup> Smoothing Adjustment = (.20 x Unexpected Gain 6/30/2007)  
+ (.40 x Unexpected Gain 6/30/2008)  
+ (.60 x Unexpected Gain 6/30/2009)  
+ (.80 x Unexpected Gain 6/30/2010)

APPENDIX 6

**MEMBER RECONCILIATION**

**ACTIVE MEMBERS:**

	<b>Male</b>	<b>Female</b>	<b>Total</b>
June 30, 2009.....	66,977	213,361	<b>280,338</b>
Changes During Year:			
Added.....	4,205	12,050	<b>16,255</b>
Withdrawn.....	1,321	3,817	<b>5,138</b>
Retired.....	1,518	3,983	<b>5,501</b>
Died.....	74	106	<b>180</b>
Total Membership June 30, 2010.....	68,269	217,505	<b>285,774</b>

**MEMBERS RETIRED FOR:**

	<b>Service*</b>			<b>Disability</b>			<b>Total</b>		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
June 30, 2009.....	48,964	83,265	132,229	537	1,521	2,058	<b>49,501</b>	<b>84,786</b>	<b>134,287</b>
Changes During Year:									
Retired.....	1,496	3,890	5,386	22	93	115	<b>1,518</b>	<b>3,983</b>	<b>5,501</b>
Died.....	1,122	1,751	2,873	25	81	106	<b>1,147</b>	<b>1,832</b>	<b>2,979</b>
Lump Sum.....	45	137	182	0	0	0	<b>45</b>	<b>137</b>	<b>182</b>
Restored to Active Membership....	0	0	0	0	1	1	<b>0</b>	<b>1</b>	<b>1</b>
June 30, 2010.....	49,293	85,267	134,560	534	1,532	2,066 **	<b>49,827</b>	<b>86,799</b>	<b>136,626</b>

**BENEFICIARIES OF DECEASED:**

	<b>Service Annuitants</b>			<b>Disability Annuitants</b>			<b>Active Members</b>			<b>Total</b>		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
June 30, 2009.....	962	3,591	4,553	81	169	250	32	175	207	<b>1,075</b>	<b>3,935</b>	<b>5,010</b>
Changes During Year:												
Added.....	98	270	368	5	5	10	0	0	0	<b>103</b>	<b>275</b>	<b>378</b>
Died.....	76	203	279	3	5	8	1	10	11	<b>80</b>	<b>218</b>	<b>298</b>
June 30, 2010.....	984	3,658	4,642	83	169	252	31	165	196	<b>1,098</b>	<b>3,992</b>	<b>5,090</b>

**SUMMARY:**

	<b>Male</b>	<b>Female</b>	<b>Total</b>
Active Members.....	68,269	217,505	<b>285,774</b>
Retired Members.....	49,827	86,799	<b>136,626</b>
Beneficiaries.....	1,098	3,992	<b>5,090</b>
Total.....	119,194	308,296	<b>427,490</b>

\*Also includes vested retirees.

\*\*Includes 43 males and 50 females retired for disability who receive a service benefit.

APPENDIX 7

**DISTRIBUTION OF ACTIVE MEMBERS**

Distribution by Age as of June 30, 2010

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total Members</u>
15-19	40	74	114
20-24	2,317	7,629	9,946
25-29	8,179	25,637	33,816
30-34	10,674	30,311	40,985
35-39	10,366	28,938	39,304
40-44	9,675	29,077	38,752
45-49	7,950	27,872	35,822
50-54	7,313	27,419	34,732
55-59	6,792	24,918	31,710
60-64	3,765	12,541	16,306
65-69	876	2,419	3,295
70-74	220	491	711
75-79	75	138	213
80-84	19	38	57
85 or older	8	3	11
	<hr/>	<hr/>	<hr/>
Total	68,269	217,505	285,774

*Average Male age is 41 years 11 months*

*Average Female age is 42 years 7 months*

APPENDIX 7 (Cont'd.)

Distribution of Active Members by Age and New York State Service as of June 30, 2010

**Male**

<u>Age</u>	<u>Less Than 10 Years New York State Service</u>	<u>10 or more Years New York State Service</u>	<u>Total New York State Service</u>
15-19	40	0	40
20-24	2,317	0	2,317
25-29	8,178	1	8,179
30-34	9,428	1,246	10,674
35-39	5,325	5,041	10,366
40-44	3,567	6,108	9,675
45-49	2,611	5,339	7,950
50-54	2,172	5,141	7,313
55-59	1,682	5,110	6,792
60-64	1,098	2,667	3,765
65-69	357	519	876
70-74	126	94	220
75-79	47	28	75
80-84	10	9	19
85 or older	4	4	8
Total	36,962	31,307	68,269

**Female**

<u>Age</u>	<u>Less Than 10 Years New York State Service</u>	<u>10 or more Years New York State Service</u>	<u>Total New York State Service</u>
15-19	74	0	74
20-24	7,629	0	7,629
25-29	25,636	1	25,637
30-34	27,154	3,157	30,311
35-39	16,732	12,206	28,938
40-44	13,988	15,089	29,077
45-49	12,547	15,325	27,872
50-54	10,031	17,388	27,419
55-59	5,812	19,106	24,918
60-64	2,454	10,087	12,541
65-69	623	1,796	2,419
70-74	162	329	491
75-79	46	92	138
80-84	16	22	38
85 or older	3	0	3
Total	122,907	94,598	217,505

APPENDIX 7 (Cont'd.)

Distribution of Active Members by Total Service as of June 30, 2010

<u>Years of Service</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
0-4	22,292	70,946	93,238
5-9	13,967	48,849	62,816
10-14	12,615	38,612	51,227
15-19	6,743	21,257	28,000
20-24	5,045	18,177	23,222
25-29	3,567	11,484	15,051
30-34	2,390	5,945	8,335
35 or more	<u>1,650</u>	<u>2,235</u>	<u>3,885</u>
Total	68,269	217,505	285,774

*Average Male has 11 Years of Total Service*

*Average Female has 10 Years of Total Service*

APPENDIX 8

**HISTORICAL MEMBER STATISTICS**

**Active Members and Annuityants 1925-2010**

As of <u>June 30</u>	Active <u>Members</u>	Retirees & <u>Beneficiaries</u>
1925	29,057	1,815
1930	39,663	2,732
1935	45,031	3,919
1940	48,193	4,771
1945	52,359	5,637
1950	56,504	6,374
1955	71,273	7,897
1960	99,555	10,796
1965	129,543	16,043
1970	186,914	22,700
1975	227,038	35,252
1980	203,330	46,812
1985	178,516	57,366
1990	195,194	69,127
1995	199,398	82,459
2000	224,986	100,839
2005	260,356	125,325
2010	285,774	141,716

**Number of Active Members by Tier**

As of <u>June 30</u>	<u>Tier 1</u>	<u>Tier 2</u>	<u>Tier 3</u>	<u>Tier 4</u>	<u>Tier 5</u>	<u>Total</u>
1991	81,010	18,224	28,348	67,723	--	195,305
1992	74,872	17,801	27,495	72,205	--	192,373
1993	70,180	17,448	26,788	78,475	--	192,891
1994	67,423	17,212	26,121	84,935	--	195,691
1995	64,093	17,012	25,206	93,087	--	199,398
1996	58,850	16,596	24,546	100,926	--	200,918
1997	53,502	16,186	23,861	110,167	--	203,716
1998	49,266	15,860	23,302	120,652	--	209,080
1999	50,859	15,776	20,726	128,906	--	216,267
2000	47,234	15,700	20,159	141,893	--	224,986
2001	41,169	15,472	19,914	157,795	--	234,350
2002	35,601	15,121	19,674	172,438	--	242,834
2003	28,327	14,463	19,083	185,374	--	247,247
2004	22,986	13,947	18,835	198,747	--	254,515
2005	17,901	13,210	18,535	210,710	--	260,356
2006	13,621	12,084	18,173	220,532	--	264,410
2007	10,838	10,178	17,743	231,286	--	270,045
2008	8,630	8,171	17,007	241,093	--	274,901
2009	6,943	6,752	16,111	250,532	--	280,338
2010	5,582	5,706	14,942	255,966	3,578	285,774

APPENDIX 9

**RETIREMENT STATISTICS**

**RETIREMENT STATISTICS 2009-10 MEMBERS RETIRED FOR:**

	<b>Service*</b>	<b>Disability</b>
Number Retired.....	<b>5,386</b>	<b>115</b>
Age at Retirement:		
Average.....	60 yrs., 0 mos.	52 yrs., 6 mos.
Median.....	59 yrs., 7 mos.	53 yrs., 3 mos.
Years of Service:		
Average.....	27 yrs., 5 mos.	18 yrs., 3 mos.
Median.....	30 yrs., 1 mo.	18 yrs., 0 mos.
**Benefit:		
Average.....	\$46,489	\$24,111
Median.....	\$48,232	\$22,742
Final Average Salary (FAS):		
Average.....	\$79,615	\$67,467
Median.....	\$80,087	\$65,361
***Benefit as % of FAS:		
Average.....	52.50%	34.47%
Median.....	60.17%	33.33%

**2009-10 MEMBERS RETIRED FOR SERVICE\* WITH:**

	<b>Less Than 20 Yrs. N.Y.</b>	<b>Between 20 Yrs. N.Y. and 35 Yrs. Total</b>	<b>35 Yrs. Total or More</b>
Number Retired.....	<b>1,085</b>	<b>2,873</b>	<b>1,428</b>
Age at Retirement:			
Average.....	60 yrs., 5 mos.	59 yrs., 8 mos.	60 yrs., 3 mos.
Median.....	59 yrs., 11 mos.	59 yrs., 3 mos.	59 yrs., 10 mos.
Years of Service:			
Average.....	11 yrs., 6 mos.	28 yrs., 2 mos.	38 yrs., 4 mos.
Median.....	11 yrs., 3 mos.	30 yrs., 0 mos.	38 yrs., 0 mos.
**Benefit:			
Average.....	\$7,845	\$46,291	\$76,247
Median.....	\$5,386	\$46,340	\$71,940
Final Average Salary (FAS):			
Average.....	\$42,869	\$83,134	\$100,455
Median.....	\$36,268	\$80,931	\$93,621
***Benefit as % of FAS:			
Average.....	16.62%	54.49%	75.76%
Median.....	15.74%	60.00%	76.00%

\*Also includes vested retirees.

\*\*The Maximum, even though the member may have chosen an option.

\*\*\*The average and median of individual benefits as percentages of final average salary.

APPENDIX 9 (Cont'd.)

**RETIREMENT STATISTICS ALL RETIREES AS OF JUNE 30, 2010 RETIRED FOR:**

	<b>Service*</b>	<b>Disability</b>
Number Retired.....	<b>134,653</b>	<b>1,973</b>
Age at Retirement:		
Average.....	58 yrs., 2 mos.	49 yrs., 5 mos.
Median.....	56 yrs., 11 mos.	50 yrs., 2 mos.
Years of Service:		
Average.....	28 yrs., 4 mos.	19 yrs., 0 mos.
Median.....	30 yrs., 6 mos.	18 yrs., 5 mos.
**Benefit:		
Average.....	\$37,005	\$17,620
Median.....	\$36,471	\$15,857
Final Average Salary (FAS):		
Average.....	\$61,683	\$47,331
Median.....	\$61,889	\$46,626
***Benefit as % of FAS:		
Average.....	55.27%	36.22%
Median.....	60.89%	33.33%

**ALL RETIREES AS OF JUNE 30, 2010 RETIRED FOR SERVICE\* WITH:**

	<b>Less Than 20 Yrs. N.Y.</b>	<b>Between 20 Yrs. N.Y. and 35 Yrs. Total</b>	<b>35 Yrs. Total or More</b>
Number Retired.....	<b>22,269</b>	<b>79,618</b>	<b>32,766</b>
Age at Retirement:			
Average.....	58 yrs., 5 mos.	57 yrs., 11 mos.	58 yrs., 7 mos.
Median.....	56 yrs., 7 mos.	56 yrs., 6 mos.	57 yrs., 11 mos.
Years of Service:			
Average.....	14 yrs., 2 mos.	28 yrs., 7 mos.	37 yrs., 2 mos.
Median.....	14 yrs., 3 mos.	30 yrs., 0 mos.	36 yrs., 6 mos.
**Benefit:			
Average.....	\$7,324	\$36,064	\$59,463
Median.....	\$5,576	\$35,055	\$57,009
Final Average Salary (FAS):			
Average.....	\$32,809	\$62,067	\$80,374
Median.....	\$26,611	\$61,419	\$77,627
***Benefit as % of FAS:			
Average.....	21.92%	56.95%	73.86%
Median.....	20.56%	59.56%	73.11%

\*Also includes vested retirees.

\*\*The Maximum, even though the member may have chosen an option.

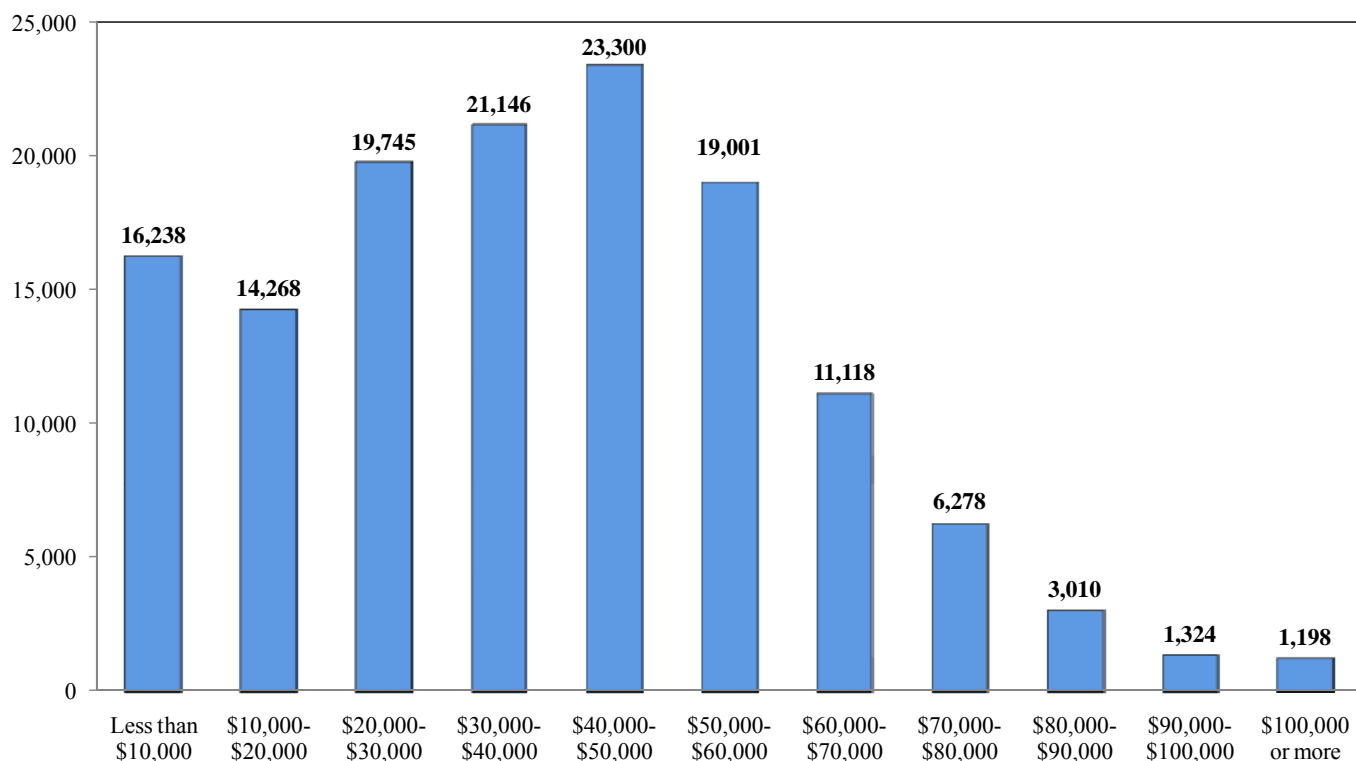
\*\*\*The average and median of individual benefits as percentages of final average salary.



**Retired Members' Characteristics<sup>1</sup>  
By Year of Retirement**

<u>Retired in Fiscal Year Ended</u>	<u>Number of Retired Members</u>	<u>Average Age at Retirement (yrs.- mos.)</u>	<u>Average Service at Retirement (yrs.- mos.)</u>	<u>Average Final Average Salary</u>	<u>Average Maximum Annual Benefit</u>
2001	7,946	57-9	29-7	\$67,027	\$42,266
2002	7,344	57-6	28-6	68,014	41,731
2003	10,173	57-4	30-1	70,427	44,898
2004	7,287	57-7	28-8	72,799	45,063
2005	7,182	57-10	28-6	72,126	45,394
2006	7,281	58-4	28-2	71,840	43,914
2007	6,900	58-7	28-1	74,185	44,204
2008	6,330	58-11	27-8	77,066	45,779
2009	5,644	59-6	27-7	78,050	46,061
2010	5,501	60-0	27-5	79,615	46,489

**Distribution of the Annual Benefit<sup>2</sup> of All Retired Members**



<sup>1</sup> Averages are for service and vested retirees.

<sup>2</sup> Maximum annual retirement benefit as of June 30, 2010 including supplementation and COLA.

APPENDIX 10

2006 – 2010 EXPERIENCE STUDY  
 NUMBER OF SERVICE RETIREMENTS  
 TIER 1 AND TIERS 2,3,4,5 AT LEAST AGE 62 OR WITH 30 YEARS OF SERVICE  
 EXPOSURE BASED ON ACTIVE TEACHERS  
 ASSUMPTIONS ADOPTED OCTOBER 2006

AGE	MALE				FEMALE			
	EXPOSURES	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED	EXPOSURES	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED
50	22	0	0.00	N/A	41	0	0.00	N/A
51	70	2	0.00	N/A	128	1	0.00	N/A
52	489	3	0.00	N/A	852	1	0.00	N/A
53	1,403	6	0.00	N/A	2,462	2	0.00	N/A
54	2,569	116	0.00	N/A	4,709	175	0.00	N/A
55	3,784	1,320	1,423.85	0.927	7,510	2,505	2,305.47	1.087
56	3,424	974	1,055.55	0.923	7,220	1,928	1,804.41	1.068
57	3,173	664	840.23	0.790	6,841	1,198	1,305.86	0.917
58	3,171	714	818.53	0.872	6,918	1,281	1,317.37	0.972
59	2,788	680	783.88	0.867	6,336	1,201	1,284.81	0.935
60	2,227	562	668.57	0.841	5,189	1,058	1,213.35	0.872
61	1,663	424	498.72	0.850	4,133	905	989.56	0.915
62	2,524	597	948.34	0.630	7,883	1,872	2,380.30	0.786
63	1,631	325	518.87	0.626	5,253	1,022	1,569.34	0.651
64	1,154	174	340.17	0.512	3,678	629	1,048.93	0.600
65	841	164	271.60	0.604	2,759	592	897.03	0.660
66	560	124	153.82	0.806	1,955	397	576.08	0.689
67	379	49	107.05	0.458	1,325	229	328.51	0.697
68	304	43	83.40	0.516	937	170	266.28	0.638
69	216	23	51.73	0.445	669	113	186.11	0.607
70	173	26	32.35	0.804	503	91	129.10	0.705
71	696	84	696.00	0.121	1,603	248	1,603.00	0.155
TOTAL	33,261	7,074	9,292.66	0.761	78,904	15,618	19,205.51	0.813

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF SERVICE RETIREMENTS  
 TIERS 2,3,4,5 LESS THAN AGE 62 AND WITH LESS THAN 30 YEARS OF SERVICE  
 EXPOSURE BASED ON ACTIVE TEACHERS  
 ASSUMPTIONS ADOPTED OCTOBER 2006

AGE	EXPOSURES	MALE			FEMALE			RATIO OF ACTUAL TO EXPECTED
		ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED	EXPOSURES	ACTUAL	EXPECTED	
50	6,237	0	0.00	N/A	23,057	0	0.00	N/A
51	6,408	0	0.00	N/A	23,517	0	0.00	N/A
52	6,188	0	0.00	N/A	23,748	0	0.00	N/A
53	5,807	0	0.00	N/A	23,290	0	0.00	N/A
54	5,446	42	0.00	N/A	22,461	140	0.00	N/A
55	4,878	189	458.87	0.412	20,740	936	1,591.73	0.588
56	4,231	142	326.08	0.435	17,864	704	1,116.14	0.631
57	3,628	117	240.18	0.487	15,044	566	717.93	0.788
58	3,110	132	200.70	0.658	12,401	531	590.37	0.899
59	2,534	98	178.11	0.550	9,841	445	498.89	0.892
60	2,066	109	155.06	0.703	7,749	402	452.99	0.887
61	1,658	99	124.31	0.796	6,003	403	359.32	1.122
TOTAL	52,191	928	1,683.31	0.551	205,715	4,127	5,327.37	0.775

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF DEATHS AMONG ACTIVE MEMBERS  
 EXPOSURE BASED ON ACTIVE TEACHERS  
 ASSUMPTIONS ADOPTED OCTOBER 2006

CENTRAL AGE	MALE			FEMALE		
	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED
20	0	0.08	0.000	1	0.25	4.000
25	7	3.20	2.188	4	7.27	0.550
30	11	7.13	1.543	19	15.22	1.248
35	11	9.84	1.118	19	20.17	0.942
40	15	12.77	1.175	23	28.10	0.819
45	25	19.12	1.308	45	45.83	0.982
50	30	27.42	1.094	85	63.98	1.329
55	38	47.08	0.807	101	87.90	1.149
60	37	35.04	1.056	56	62.02	0.903
65	18	9.62	1.871	21	19.56	1.074
70	20	2.54	7.874	14	4.20	3.333
TOTAL	212	173.84	1.220	388	354.50	1.094

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF DISABILITY RETIREMENTS  
 EXPOSURE BASED ON ACTIVE TEACHERS  
 ASSUMPTIONS ADOPTED OCTOBER 2006

CENTRAL <u>AGE</u>	MALE			FEMALE		
	<u>ACTUAL</u>	<u>EXPECTED</u>	RATIO OF ACTUAL TO <u>EXPECTED</u>	<u>ACTUAL</u>	<u>EXPECTED</u>	RATIO OF ACTUAL TO <u>EXPECTED</u>
30	0	0.96	0.000	0	1.92	0.000
35	2	3.23	0.619	10	15.74	0.635
40	4	6.28	0.637	16	38.76	0.413
45	21	16.84	1.247	49	76.85	0.638
50	25	48.20	0.519	111	165.63	0.670
54	19	28.02	0.678	74	93.06	0.795
TOTAL	71	103.53	0.686	260	391.96	0.663

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 COMPARISON OF SALARY SCALE TO ACTUAL SALARY INCREASES  
 ASSUMPTIONS ADOPTED OCTOBER 2006

<b>MALE</b>			RATIO OF
CENTRAL	ACTUAL	EXPECTED	ACTUAL TO
<u>AGE</u>	<u>SALARIES</u>	<u>SALARIES</u>	<u>EXPECTED</u>
20	18,622,473	15,457,308	1.205
25	964,810,769	944,698,991	1.021
30	2,195,325,078	2,220,785,787	0.989
35	2,792,888,631	2,822,059,889	0.990
40	2,734,298,446	2,757,319,154	0.992
45	2,370,049,955	2,386,483,455	0.993
50	2,449,133,879	2,466,073,295	0.993
55	3,047,119,554	3,082,613,709	0.988
60	1,684,874,556	1,705,247,275	0.988
65	322,570,643	327,242,919	0.986
70	84,100,794	86,062,450	0.977
TOTAL	18,663,794,778	18,814,044,232	0.992

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 COMPARISON OF SALARY SCALE TO ACTUAL SALARY INCREASES  
 ASSUMPTIONS ADOPTED OCTOBER 2006

**FEMALE**

CENTRAL <u>AGE</u>	<u>ACTUAL SALARIES</u>	<u>EXPECTED SALARIES</u>	<u>RATIO OF ACTUAL TO EXPECTED</u>
20	76,340,108	60,855,677	1.254
25	3,118,966,527	3,067,916,029	1.017
30	5,799,838,932	5,882,746,516	0.986
35	6,343,992,604	6,393,265,503	0.992
40	6,387,743,256	6,423,046,194	0.995
45	6,610,626,059	6,655,914,719	0.993
50	7,393,049,910	7,436,040,230	0.994
55	8,653,190,397	8,704,953,270	0.994
60	4,391,728,479	4,413,751,623	0.995
65	885,574,449	892,925,512	0.992
70	194,942,683	196,655,347	0.991
<b>TOTAL</b>	<b>49,855,993,404</b>	<b>50,128,070,620</b>	<b>0.995</b>

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF WITHDRAWALS  
 EXPOSURE BASED ON ACTIVE TEACHERS  
 ASSUMPTIONS ADOPTED OCTOBER 2006

CENTRAL AGE	MALE			FEMALE		
	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED
20	252	272.80	0.924	695	914.68	0.760
25	2,555	2,481.98	1.029	8,424	8,283.60	1.017
30	2,153	1,714.56	1.256	7,837	8,127.20	0.964
35	1,531	1,234.66	1.240	6,442	6,855.62	0.940
40	1,185	1,046.35	1.133	4,428	4,631.05	0.956
45	1,013	902.19	1.123	3,948	3,776.02	1.046
50	932	923.44	1.009	3,458	3,607.30	0.959
54	367	388.00	0.946	1,163	1,375.73	0.845
TOTAL	9,988	8,963.98	1.114	36,395	37,571.20	0.969



APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF DEATHS AMONG MEMBERS RETIRED FOR DISABILITY  
 MORTALITY ADOPTED OCTOBER 2006

CENTRAL <u>AGE</u>	MALE			FEMALE		
	<u>ACTUAL</u>	<u>EXPECTED</u>	RATIO OF ACTUAL TO <u>EXPECTED</u>	<u>ACTUAL</u>	<u>EXPECTED</u>	RATIO OF ACTUAL TO <u>EXPECTED</u>
30	0	0.00	N/A	0	0.00	N/A
35	1	0.31	3.226	3	1.26	2.381
40	0	0.42	0.000	4	3.31	1.208
45	5	6.56	0.762	18	21.62	0.833
50	8	9.63	0.831	30	53.70	0.559
55	24	21.84	1.099	87	91.22	0.954
60	27	24.14	1.118	53	70.87	0.748
65	16	18.30	0.874	26	30.69	0.847
70	14	13.37	1.047	26	18.93	1.373
75	10	11.89	0.841	19	19.38	0.980
80	12	11.34	1.058	18	18.95	0.950
85	11	5.04	2.183	18	12.15	1.481
90	1	1.48	0.676	15	9.52	1.576
95	0	0.00	N/A	7	4.62	1.515
100	0	0.00	N/A	2	4.11	0.487
105	0	0.00	N/A	0	0.40	0.000
110	0	0.00	N/A	0	0.00	N/A
TOTAL	129	124.32	1.038	326	360.73	0.904

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF DEATHS AMONG MEMBERS RETIRED FOR SERVICE  
 MORTALITY ADOPTED OCTOBER 2006

CENTRAL <u>AGE</u>	MALE			FEMALE		
	<u>ACTUAL</u>	<u>EXPECTED</u>	RATIO OF ACTUAL TO <u>EXPECTED</u>	<u>ACTUAL</u>	<u>EXPECTED</u>	RATIO OF ACTUAL TO <u>EXPECTED</u>
55	33	48.38	0.682	75	82.36	0.911
60	249	295.72	0.842	310	370.43	0.837
65	404	483.29	0.836	422	500.77	0.843
70	545	614.90	0.886	542	581.41	0.932
75	925	959.44	0.964	780	864.30	0.902
80	1,100	1,203.24	0.914	1,142	1,263.94	0.904
85	1,129	1,087.95	1.038	1,572	1,670.61	0.941
90	607	640.16	0.948	1,831	1,835.77	0.997
95	275	259.00	1.062	1,320	1,254.06	1.053
100	50	46.76	1.069	487	435.23	1.119
105	2	1.34	1.493	56	55.93	1.001
110	0	0.00	N/A	0	0.00	N/A
TOTAL	5,319	5,640.18	0.943	8,537	8,914.81	0.958

APPENDIX 10 (Cont'd.)

2006-2010 EXPERIENCE STUDY  
 NUMBER OF DEATHS AMONG BENEFICIARIES  
 MORTALITY ADOPTED OCTOBER 2006

CENTRAL AGE	MALE			FEMALE		
	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED	ACTUAL	EXPECTED	RATIO OF ACTUAL TO EXPECTED
5	0	0.00	N/A	0	0.00	N/A
10	0	0.00	N/A	0	0.00	N/A
15	0	0.00	N/A	0	0.00	N/A
20	0	0.00	N/A	0	0.00	N/A
25	0	0.00	N/A	0	0.00	N/A
30	0	0.00	N/A	0	0.00	N/A
35	0	0.01	0.000	0	0.00	N/A
40	0	0.03	0.000	0	0.05	0.000
45	1	0.09	11.111	1	0.08	12.500
50	0	0.22	0.000	1	0.27	3.704
55	1	0.65	1.538	0	1.21	0.000
60	2	2.17	0.922	4	4.85	0.825
65	4	4.49	0.891	12	11.65	1.030
70	10	8.89	1.125	33	24.37	1.354
75	25	22.86	1.094	52	52.97	0.982
80	44	44.99	0.978	121	119.47	1.013
85	82	71.20	1.152	232	225.94	1.027
90	92	88.40	1.041	272	253.43	1.073
95	38	42.86	0.887	175	168.27	1.040
100	11	8.82	1.247	51	47.79	1.067
105	0	0.00	N/A	4	6.95	0.576
110	0	0.00	N/A	0	0.00	N/A
TOTAL	310	295.68	1.048	958	917.30	1.044

APPENDIX 10 (Cont'd.)

Investment Rate of Return<sup>1</sup>  
on  
Market and Actuarial Value of Assets  
as of June 30, 2010

Annualized rate of return over the last:

	<u>Based Upon Market Value of Assets</u>	<u>Based Upon Actuarial Value of Assets<sup>2</sup></u>
1 Year:	12.1%	4.4%
3 Years:	-5.8%	6.8%
5 Years:	2.2%	9.2%
10 Years:	2.7%	5.5%
15 Years:	7.1%	9.2%
20 Years:	8.1%	
25 Years:	9.2%	

Annualized inflation over the last:

	<u>Inflation Assumption</u>		<u>COLA Benefit</u>	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected<sup>3</sup></u>
1 Year:	2.31%	3.0%	1.2%	1.75%
3 Years:	1.95%	3.0%	1.4%	1.75%
5 Years:	2.40%	3.0%	1.5%	1.75%

<sup>1</sup> The interest rate for valuation purposes is a level 8.0%.

<sup>2</sup> Effective June 30, 2007, the Retirement System's asset valuation method was changed.

<sup>3</sup> The annual percentage for estimating future COLA benefit payments is 1.75%. The COLA percentage is one-half of the increase in the CPI with a floor of 1.0% and a cap of 3.0%. Therefore the estimate of inflation for the COLA benefit is the result of analyzing available CPI data with percentages bounded between 2.0% and 6.0%, and reduced by 50%. The COLA benefit was first initiated in 2001.

APPENDIX 11

**ASSET ALLOCATION**

The table below displays the Retirement System's asset allocation targets and ranges as of June 30, 2010.

	<b>Target</b>	<b>Range</b>
<b>Domestic Equity</b>	42%	35-49%
<b>International Equity</b>	15%	11-19%
<b>Real Estate</b>	10%	6-14%
<b>Private Equity</b>	<u>7%</u>	4-12%
<i>Total Equities</i>	74%	
<b>Domestic Fixed Income</b>	18%	13-23%
<b>Mortgages</b>	8%	5-11%
<b>Cash Equivalents</b>	<u>0%</u>	0-5%
<i>Total Fixed Income</i>	26%	

APPENDIX 12

**SENSITIVITY ANALYSIS**

Valuation results are highly dependent on the actuarial assumptions used to project future events. If actual experience emerges differently from the assumptions used in the valuation process, actuarial gains or losses will result, and future Employer Contribution Rates will be higher or lower. In this section, results of a sensitivity analysis are presented in order to illustrate how deviations in specific assumptions would have changed the current Employer Contribution Rate of 11.11%.

It is important to note that the results displayed here, with the exception of those for the investment return, are the consequence of altering each assumption individually without accounting for possible correlation between assumptions. Therefore, these results are presented in order to provide an illustration as to the degree of impact that a variation in key assumptions could have on valuation results. There is no guarantee that future experience will be consistent with either our current or the following alternative set of assumptions.

<u>Assumption</u>	<u>Adjustment Made</u>	<u>Calculated Employer Contribution Rate</u>
<b>Current Assumptions</b>		<b>11.11%</b>
<b>Investment Return<sup>1</sup></b>	Decrease from 8.0% to 7.75%	13.24%
<b>Investment Return<sup>1</sup></b>	Decrease from 8.0% to 7.5%	15.39%
<b>Investment Return<sup>1</sup></b>	Decrease from 8.0% to 7.0%	19.90%
<b>Salary Scale</b>	Decrease of 10%	9.36%
<b>Salary Scale</b>	Increase of 10%	12.85%
<b>Service Retirement Rates</b>	Decrease of 10%	10.57%
<b>Service Retirement Rates</b>	Increase of 10%	11.62%
<b>Healthy Annuitant Mortality</b>	Decrease of 10%	12.36%
<b>Healthy Annuitant Mortality</b>	Increase of 10%	9.95%
<b>Active Mortality</b>	Decrease of 10%	11.12%
<b>Active Mortality</b>	Increase of 10%	11.10%

<sup>1</sup> In the event that a change to the long term investment return assumption would be warranted, it is likely that a related change to the salary scale assumption would also be necessary in order for these assumptions to remain consistent with overall inflation. Therefore, for the results presented here, the salary scale assumption was decreased by one-half of the reduction in the investment return assumption.

APPENDIX 13

**HISTORY OF THE EMPLOYER CONTRIBUTION RATE**

<u>Salary Year</u>	<u>Employer Contribution Rate</u>	<u>Salary Year</u>	<u>Employer Contribution Rate</u>	<u>Salary Year</u>	<u>Employer Contribution Rate</u>
1921-22	5.10 %	1956-57	10.90 %	1991-92	6.64 %
1922-23	5.10	1957-58	11.20	1992-93	8.00
1923-24	5.20	1958-59	13.40	1993-94	8.41
1924-25	5.20	1959-60	14.00	1994-95	7.24
1925-26	5.20	1960-61	18.35	1995-96	6.37
1926-27	5.20	1961-62	18.55	1996-97	3.57
1927-28	5.20	1962-63	19.55	1997-98	1.25
1928-29	5.30	1963-64	21.13	1998-99	1.42
1929-30	5.50	1964-65	17.67	1999-00	1.43
1930-31	5.50	1965-66	17.70	2000-01	0.43
1931-32	5.50	1966-67	17.72	2001-02	0.36
1932-33	5.50	1967-68	18.50	2002-03	0.36
1933-34	5.50	1968-69	18.80	2003-04	2.52
1934-35	5.60	1969-70	18.60	2004-05	5.63
1935-36	5.70	1970-71	18.80	2005-06	7.97
1936-37	5.80	1971-72	18.80	2006-07	8.60
1937-38	5.93	1972-73	18.80	2007-08	8.73
1938-39	6.03	1973-74	18.80	2008-09	7.63
1939-40	6.13	1974-75	18.80	2009-10	6.19
1940-41	6.23	1975-76	19.40	2010-11	8.62
1941-42	6.33	1976-77	19.40	2011-12	11.11
1942-43	6.43	1977-78	20.40		
1943-44	6.53	1978-79	21.40	<b>Average</b>	<b>10.79 %</b>
1944-45	7.10	1979-80	22.49		
1945-46	7.20	1980-81	23.49		
1946-47	7.50	1981-82	23.49		
1947-48	7.80	1982-83	23.49		
1948-49	8.00	1983-84	22.90		
1949-50	8.40	1984-85	22.80		
1950-51	8.80	1985-86	21.40		
1951-52	9.60	1986-87	18.80		
1952-53	9.90	1987-88	16.83		
1953-54	9.90	1988-89	14.79		
1954-55	10.30	1989-90	6.87		
1955-56	10.40	1990-91	6.84		

**HISTORY OF THE MEMBER CONTRIBUTION RATE**

<u>Year of Membership</u>	<u>Required Contribution</u>
1921	4%
1948	5% (new members - 1948 and after)
1948	Voluntary 4% <u>could</u> be contributed (all members eligible)
1951	If member elected special retirement allowance: 4% went to 6.5%, 5% went to 8% (all members eligible)
1957	If member elected 1/120th plan: 6.5% went to 9%, 8% went to 11% (all members eligible)
1968	0%
1976	3% (new members - 1976 and after)
2000	3% employee contribution ceases after ten years of service or membership
2010	3.5% throughout career for members joining 2010 and after

As of August 1, 1921, when the Retirement System was established, members contributed 4% of salary. These contributions were used to fund a separate annuity, over and above the regular pension. New members on or after July 1, 1948 were required to contribute 5% of salary. Additional contributions, not in excess of 4% of salary, were permitted during the five-year period beginning July 1, 1948.

Under the provisions of a law passed in 1950, members could elect before July 1, 1951, or within one year of their date of membership, if later, to contribute towards a special service retirement allowance that would allow them to retire up to five years earlier. If their rate of contribution had been 4%, their new rate would be 6.5%. If their rate of contribution had been 5%, their new rate would be 8%. In 1956, an amendment was passed which provided additional benefits for service in excess of 25 years, but not in excess of 35 years, for those members who elected to contribute an additional 2.5% or 3% of their salaries. This increased the rate of contribution to 9% or 11% depending on whether the member's rate of contribution had been 6.5% or 8%.

Throughout the 1960's the advent of the "take-home pay" program effectively reduced the required contribution rate to zero for many members. As of July 1, 1968, all members were no longer required to make contributions, nor permitted to make voluntary contributions unless they had been making them previously.

The law that created Tier 3 in 1976 reinstated member contributions and required members who joined the System after July 26, 1976 to contribute 3% of their annual salary. This money, however, helps fund the member's pension and does not fund a separate annuity as before. Effective October 1, 2000, however, in accordance with Chapter 126 of the Laws of 2000, the 3% required member contribution ceases upon the attainment of the earlier of 10 years of service credit or 10 years of membership. In accordance with Tier 5, enacted in 2009, members joining on or after January 1, 2010 must contribute 3.5% of salary throughout their working career towards the funding of their pension.



**ACTUARIAL COST AND ASSET VALUATION METHODS**

1. Actuarial Cost Method

The cost method used to determine the liabilities and normal cost in this valuation is the Aggregate Cost Method. This funding method is required by statute, specifically Section 517 of the New York State Education Law.

Each year a normal rate percentage is developed as a level percentage of total member compensation. This percentage equals the portion of the actuarial present value of projected benefits which exceeds the actuarial value of assets divided by one percent of the present value of future compensation of the active members, as of the valuation date.

The cost of active member death benefits up to \$50,000, Retirement System administrative expenses, and benefits in excess of the IRC §415 limits are each determined using a one-year term cost method.

Each year, actuarial gains and losses will occur because actual experience will vary from the actuarial assumptions. All gains and losses are automatically amortized as part of the normal rate, over the expected future working lifetime of active members.

2. Asset Valuation Method

The actuarial value of assets is determined by recognizing each year's realized and unrealized appreciation, in excess of (or less than) an assumed inflationary gain of 3%, at a rate of 20% per year, until fully recognized after five years.

## APPENDIX 16

### PRESENT ACTUARIAL ASSUMPTIONS

Actuarial assumptions have been developed based upon actual member experience. Various actuarial and graduation techniques are applied to experience data and tables are developed. An experience study is performed annually and assumptions are revised when warranted.

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APPENDIX 16 (Cont'd.)

Mortality Rates  
for Active Members

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	0.000050	20	0.000042
21	0.000064	21	0.000061
22	0.000082	22	0.000063
23	0.000103	23	0.000072
24	0.000116	24	0.000074
25	0.000124	25	0.000083
26	0.000135	26	0.000098
27	0.000141	27	0.000109
28	0.000159	28	0.000113
29	0.000167	29	0.000125
30	0.000171	30	0.000140
31	0.000187	31	0.000150
32	0.000195	32	0.000151
33	0.000207	33	0.000166
34	0.000214	34	0.000171
35	0.000224	35	0.000184
36	0.000239	36	0.000193
37	0.000248	37	0.000201
38	0.000258	38	0.000210
39	0.000270	39	0.000244
40	0.000317	40	0.000269
41	0.000379	41	0.000288
42	0.000437	42	0.000310
43	0.000499	43	0.000343
44	0.000540	44	0.000391
45	0.000581	45	0.000425
46	0.000640	46	0.000441
47	0.000682	47	0.000465
48	0.000735	48	0.000489
49	0.000785	49	0.000525

APPENDIX 16 (Cont'd.)

Mortality Rates  
for Active Members  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
50	0.000847	50	0.000549
51	0.000916	51	0.000570
52	0.001013	52	0.000594
53	0.001082	53	0.000616
54	0.001154	54	0.000637
55	0.001207	55	0.000684
56	0.001309	56	0.000723
57	0.001404	57	0.000789
58	0.001506	58	0.000825
59	0.001558	59	0.000880
60	0.001652	60	0.000969
61	0.001702	61	0.001043
62	0.001803	62	0.001108
63	0.001906	63	0.001174
64	0.002009	64	0.001261
65	0.002205	65	0.001362
66	0.002408	66	0.001462
67	0.002603	67	0.001609
68	0.003006	68	0.001810
69	0.003508	69	0.002000
70	0.005003	70	0.002305

## APPENDIX 16 (Cont'd.)

Disability Retirement Rates  
for Active Members

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
30	0.000015	30	0.000015
31	0.000038	31	0.000025
32	0.000062	32	0.000046
33	0.000065	33	0.000072
34	0.000070	34	0.000099
35	0.000073	35	0.000133
36	0.000078	36	0.000178
37	0.000085	37	0.000229
38	0.000089	38	0.000279
39	0.000119	39	0.000319
40	0.000153	40	0.000361
41	0.000202	41	0.000406
42	0.000264	42	0.000459
43	0.000341	43	0.000522
44	0.000417	44	0.000591
45	0.000484	45	0.000663
46	0.000564	46	0.000767
47	0.000799	47	0.000914
48	0.001154	48	0.001113
49	0.001401	49	0.001272
50	0.001571	50	0.001436
51	0.001673	51	0.001564
52	0.001751	52	0.001663
53	0.001811	53	0.001739
54	0.001867	54	0.001777

APPENDIX 16 (Cont'd.)

Withdrawal Rates  
for Active Members

Males

<u>Age</u>	<u>0 Years of Service</u>	<u>1 Year of Service</u>	<u>2 Years of Service</u>	<u>3 Years of Service</u>	<u>4 Years of Service</u>	<u>5 Years of Service</u>	<u>6 Years of Service</u>	<u>7 Years of Service</u>	<u>8 Years of Service</u>	<u>9 Years of Service</u>	<u>10 or more Years of Service</u>
20	0.260517	0.101803	0.065606	0.037313	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
21	0.260517	0.101803	0.065606	0.037313	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
22	0.260517	0.101803	0.065606	0.037313	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
23	0.262212	0.101803	0.065606	0.037313	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
24	0.263908	0.103029	0.065606	0.037313	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
25	0.265603	0.104254	0.065949	0.037313	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
26	0.267299	0.105480	0.066291	0.038886	0.025162	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
27	0.268994	0.106706	0.066634	0.040459	0.026449	0.020051	0.017520	0.014856	0.010593	0.003281	0.010398
28	0.270690	0.107931	0.066976	0.042032	0.027735	0.020787	0.017520	0.014856	0.010593	0.003281	0.010398
29	0.272385	0.109157	0.067319	0.043605	0.029022	0.021523	0.018688	0.014856	0.010593	0.003281	0.010398
30	0.274081	0.110383	0.067661	0.045178	0.030309	0.022260	0.019856	0.014940	0.010593	0.003281	0.010398
31	0.271427	0.110812	0.068886	0.045112	0.031596	0.022996	0.021024	0.015025	0.011516	0.003281	0.010398
32	0.268773	0.111241	0.070112	0.045046	0.032882	0.023732	0.022191	0.015109	0.012439	0.005117	0.010398
33	0.266119	0.111670	0.071337	0.044979	0.034169	0.024468	0.023359	0.015194	0.013362	0.006954	0.010244
34	0.263465	0.112100	0.072562	0.044913	0.035456	0.025205	0.024527	0.015279	0.014285	0.008790	0.010090
35	0.260811	0.112529	0.073787	0.044847	0.036742	0.025941	0.025695	0.015363	0.015208	0.010627	0.009935
36	0.263803	0.115408	0.075717	0.046966	0.037348	0.028379	0.024681	0.017463	0.015639	0.012464	0.009781
37	0.266794	0.118287	0.077646	0.049086	0.037955	0.030816	0.023668	0.019563	0.016070	0.014300	0.009626
38	0.269786	0.121165	0.079575	0.051206	0.038561	0.033254	0.022654	0.021662	0.016501	0.016137	0.009472
39	0.272778	0.124044	0.081505	0.053326	0.039167	0.035692	0.021640	0.023762	0.016933	0.017973	0.009318
40	0.275770	0.126923	0.083434	0.055446	0.039773	0.038129	0.020626	0.025862	0.017364	0.019810	0.009163
41	0.273127	0.128411	0.083212	0.058174	0.041323	0.038680	0.024053	0.027373	0.019111	0.020298	0.008855
42	0.270485	0.129899	0.082990	0.060902	0.042873	0.039231	0.027479	0.028884	0.020858	0.020786	0.008546
43	0.267842	0.131388	0.082768	0.063631	0.044423	0.039782	0.030905	0.030394	0.022605	0.021275	0.008238
44	0.265200	0.132876	0.082546	0.066359	0.045973	0.040333	0.034331	0.031905	0.024352	0.021763	0.007929
45	0.262557	0.134364	0.082324	0.069088	0.047523	0.040884	0.037757	0.033416	0.026099	0.022251	0.007621
46	0.266854	0.135077	0.086828	0.069149	0.050506	0.045896	0.038026	0.034646	0.028790	0.025757	0.007882
47	0.271151	0.135791	0.091332	0.069211	0.053490	0.050909	0.038294	0.035877	0.031481	0.029263	0.008143
48	0.275448	0.136504	0.095837	0.069272	0.056473	0.055921	0.038563	0.037107	0.034173	0.032769	0.008404
49	0.279745	0.137218	0.100341	0.069334	0.059457	0.060934	0.038831	0.038338	0.036864	0.036275	0.008664
50	0.284043	0.137931	0.104845	0.069395	0.062440	0.065946	0.039100	0.039568	0.039555	0.039781	0.008925
51	0.288340	0.138644	0.109349	0.069456	0.065423	0.070958	0.039368	0.040799	0.042246	0.043286	0.009186
52	0.292637	0.139358	0.113853	0.069518	0.068407	0.075971	0.039636	0.042029	0.044937	0.046792	0.009447
53	0.296934	0.140071	0.118357	0.069579	0.071390	0.080983	0.039905	0.043260	0.047629	0.050298	0.009708
54	0.301231	0.140785	0.122861	0.069641	0.074374	0.085996	0.040173	0.044490	0.050320	0.053804	0.009969

APPENDIX 16 (Cont'd.)

Withdrawal Rates  
for Active Members

Females

Age	0 Years of Service	1 Year of Service	2 Years of Service	3 Years of Service	4 Years of Service	5 Years of Service	6 Years of Service	7 Years of Service	8 Years of Service	9 Years of Service	10 or more Years of Service
20	0.239474	0.101131	0.061054	0.046437	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
21	0.239474	0.101131	0.061054	0.046437	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
22	0.239474	0.101131	0.061054	0.046437	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
23	0.245399	0.101131	0.061054	0.046437	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
24	0.251323	0.103802	0.061054	0.046437	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
25	0.257247	0.106473	0.066031	0.046437	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
26	0.263171	0.109143	0.071008	0.051351	0.052638	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
27	0.269095	0.111814	0.075985	0.056266	0.054905	0.052717	0.050623	0.051462	0.050984	0.054963	0.037037
28	0.275019	0.114485	0.080962	0.061180	0.057172	0.055094	0.050623	0.051462	0.050984	0.054963	0.037037
29	0.280943	0.117155	0.085939	0.066094	0.059439	0.057471	0.053375	0.051462	0.050984	0.054963	0.037037
30	0.286867	0.119826	0.090916	0.071009	0.061705	0.059848	0.056127	0.053786	0.050984	0.054963	0.037037
31	0.280855	0.120841	0.091119	0.071390	0.063972	0.062225	0.058878	0.056111	0.053483	0.054963	0.037037
32	0.274843	0.121855	0.091322	0.071771	0.066239	0.064601	0.061630	0.058435	0.055983	0.054963	0.037037
33	0.268831	0.122870	0.091525	0.072152	0.068506	0.066978	0.064381	0.060760	0.058482	0.054963	0.037037
34	0.262819	0.123884	0.091728	0.072534	0.070772	0.069355	0.067133	0.063084	0.060981	0.054963	0.037037
35	0.256807	0.124899	0.091931	0.072915	0.073039	0.071732	0.069885	0.065409	0.063480	0.054963	0.037037
36	0.251402	0.119873	0.088700	0.069278	0.067732	0.065074	0.064350	0.060394	0.058585	0.051900	0.033579
37	0.245997	0.114846	0.085469	0.065641	0.062424	0.058416	0.058815	0.055378	0.053691	0.048837	0.030121
38	0.240593	0.109820	0.082239	0.062004	0.057117	0.051758	0.053281	0.050363	0.048796	0.045774	0.026664
39	0.235188	0.104794	0.079008	0.058366	0.051809	0.045101	0.047746	0.045348	0.043902	0.042712	0.023206
40	0.229784	0.099768	0.075777	0.054729	0.046502	0.038443	0.042211	0.040332	0.039007	0.039649	0.019748
41	0.230350	0.100167	0.075293	0.052637	0.045548	0.037934	0.039791	0.037762	0.035936	0.035894	0.018024
42	0.230916	0.100566	0.074809	0.050545	0.044594	0.037425	0.037370	0.035192	0.032865	0.032139	0.016299
43	0.231482	0.100966	0.074326	0.048454	0.043640	0.036917	0.034950	0.032622	0.029794	0.028383	0.014575
44	0.232048	0.101365	0.073842	0.046362	0.042686	0.036408	0.032530	0.030052	0.026723	0.024628	0.012851
45	0.232615	0.101764	0.073358	0.044270	0.041732	0.035900	0.030109	0.027482	0.023652	0.020873	0.011127
46	0.240807	0.105514	0.076273	0.048294	0.043248	0.037497	0.031159	0.029064	0.024572	0.022283	0.011271
47	0.249000	0.109263	0.079187	0.052318	0.044763	0.039094	0.032209	0.030646	0.025493	0.023692	0.011416
48	0.257193	0.113013	0.082102	0.056342	0.046278	0.040692	0.033260	0.032227	0.026414	0.025102	0.011560
49	0.265385	0.116763	0.085017	0.060366	0.047794	0.042289	0.034310	0.033809	0.027335	0.026512	0.011705
50	0.273578	0.120512	0.087931	0.064390	0.049309	0.043886	0.035360	0.035391	0.028256	0.027921	0.011849
51	0.281771	0.124262	0.090846	0.068414	0.050825	0.045484	0.036410	0.036972	0.029177	0.029331	0.011994
52	0.289964	0.128012	0.093761	0.072438	0.052340	0.047081	0.037460	0.038554	0.030097	0.030741	0.012139
53	0.298156	0.131761	0.096675	0.076462	0.053855	0.048679	0.038511	0.040135	0.031018	0.032151	0.012283
54	0.306349	0.135511	0.099590	0.080486	0.055371	0.050276	0.039561	0.041717	0.031939	0.033560	0.012428

APPENDIX 16 (Cont'd.)

Service Retirement Rates  
 For Tier 1 Members and Tier 2, 3 and 4 Members  
 at Least Age 62 or with 30 Years of Service  
 and Tier 5 Members at Least Age 62

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
55	0.376281	55	0.306987
56	0.308279	56	0.249918
57	0.264807	57	0.190887
58	0.258131	58	0.190426
59	0.281161	59	0.202779
60	0.300213	60	0.233832
61	0.299891	61	0.239428
62	0.375728	62	0.301954
63	0.318129	63	0.298751
64	0.294776	64	0.285191
65	0.322943	65	0.325128
66	0.274670	66	0.294672
67	0.282458	67	0.247931
68	0.274328	68	0.284185
69	0.239470	69	0.278190
70	0.187019	70	0.256669
71	1.000000	71	1.000000



APPENDIX 16 (Cont'd.)

Service Retirement Rates  
 For Tier 2, 3 and 4 Members Less Than Age 62  
 and with Less Than 30 Years of Service

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
55	0.094070	55	0.076747
56	0.077070	56	0.062480
57	0.066202	57	0.047722
58	0.064533	58	0.047607
59	0.070290	59	0.050695
60	0.075053	60	0.058458
61	0.074973	61	0.059857

APPENDIX 16 (Cont'd.)

Service Retirement Rates  
 For Tier 5 Members Less Than Age 62  
 and with Less Than 30 Years of Service

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
55	0.047035	55	0.038374
56	0.038535	56	0.031240
57	0.033101	57	0.023861
58	0.032267	58	0.023804
59	0.035145	59	0.025348
60	0.037527	60	0.029229
61	0.037487	61	0.029929

APPENDIX 16 (Cont'd.)

Service Retirement Rates  
 For Tier 5 Members Less Than Age 62  
 and with 30 Years of Service

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
55	0.047035	55	0.038374
56	0.038535	56	0.031240
57	0.376281	57	0.306987
58	0.308279	58	0.249918
59	0.264807	59	0.190887
60	0.258131	60	0.190426
61	0.281161	61	0.202779

APPENDIX 16 (Cont'd.)

Mortality Rates for Service  
and Deferred Annuitants and Beneficiaries  
(Also used in calculating the benefits pursuant to  
subdivision b.3 of Section 512 of the Education Law)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
1	0.000637	1	0.000571
2	0.000430	2	0.000372
3	0.000357	3	0.000278
4	0.000278	4	0.000208
5	0.000255	5	0.000188
6	0.000244	6	0.000176
7	0.000234	7	0.000165
8	0.000216	8	0.000147
9	0.000209	9	0.000140
10	0.000212	10	0.000141
11	0.000219	11	0.000143
12	0.000228	12	0.000148
13	0.000240	13	0.000155
14	0.000254	14	0.000162
15	0.000269	15	0.000170
16	0.000284	16	0.000177
17	0.000301	17	0.000184
18	0.000316	18	0.000188
19	0.000331	19	0.000190
20	0.000345	20	0.000191
21	0.000357	21	0.000192
22	0.000366	22	0.000194
23	0.000373	23	0.000197
24	0.000376	24	0.000201
25	0.000376	25	0.000207
26	0.000378	26	0.000214
27	0.000382	27	0.000223
28	0.000393	28	0.000235
29	0.000412	29	0.000248

## APPENDIX 16 (Cont'd.)

Mortality Rates for Service  
and Deferred Annuitants and Beneficiaries  
(Also used in calculating the benefits pursuant to  
subdivision b.3 of Section 512 of the Education Law)  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
30	0.000444	30	0.000264
31	0.000499	31	0.000307
32	0.000562	32	0.000350
33	0.000631	33	0.000394
34	0.000702	34	0.000435
35	0.000773	35	0.000475
36	0.000841	36	0.000514
37	0.000904	37	0.000554
38	0.000964	38	0.000598
39	0.001021	39	0.000648
40	0.001079	40	0.000706
41	0.001142	41	0.000774
42	0.001215	42	0.000852
43	0.001299	43	0.000937
44	0.001397	44	0.001029
45	0.001508	45	0.001124
46	0.001616	46	0.001223
47	0.001734	47	0.001326
48	0.001860	48	0.001434
49	0.001995	49	0.001550
50	0.002138	50	0.001676
51	0.002449	51	0.001852
52	0.002667	52	0.002018
53	0.002916	53	0.002207
54	0.003196	54	0.002424
55	0.003490	55	0.002660
56	0.003804	56	0.002900
57	0.004108	57	0.003132
58	0.004396	58	0.003352
59	0.004704	59	0.003554

APPENDIX 16 (Cont'd.)

Mortality Rates for Service  
and Deferred Annuitants and Beneficiaries  
(Also used in calculating the benefits pursuant to  
subdivision b.3 of Section 512 of the Education Law)  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
60	0.005082	60	0.003803
61	0.005591	61	0.004070
62	0.006149	62	0.004354
63	0.006824	63	0.004703
64	0.007708	64	0.005173
65	0.008710	65	0.005742
66	0.009844	66	0.006373
67	0.011123	67	0.007074
68	0.012239	68	0.007852
69	0.013464	69	0.008716
70	0.014946	70	0.009762
71	0.016590	71	0.010933
72	0.018414	72	0.012136
73	0.020256	73	0.013592
74	0.022484	74	0.015360
75	0.025182	75	0.017356
76	0.028708	76	0.019439
77	0.032724	77	0.021772
78	0.036657	78	0.024384
79	0.041239	79	0.027310
80	0.046187	80	0.030861
81	0.052192	81	0.035181
82	0.058455	82	0.040458
83	0.064885	83	0.046123
84	0.073320	84	0.053041
85	0.082118	85	0.060467
86	0.091973	86	0.068932
87	0.103929	87	0.079272
88	0.116400	88	0.090370
89	0.130369	89	0.102118

APPENDIX 16 (Cont'd.)

Mortality Rates for Service  
and Deferred Annuity and Beneficiaries  
(Also used in calculating the benefits pursuant to  
subdivision b.3 of Section 512 of the Education Law)  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
90	0.144709	90	0.114372
91	0.160627	91	0.126953
92	0.176690	92	0.142188
93	0.194359	93	0.159250
94	0.213795	94	0.178360
95	0.235174	95	0.196196
96	0.256340	96	0.213854
97	0.276847	97	0.233101
98	0.298995	98	0.251749
99	0.325904	99	0.274406
100	0.355236	100	0.299103
101	0.387207	101	0.329013
102	0.418183	102	0.361914
103	0.447456	103	0.398106
104	0.474304	104	0.433935
105	0.502762	105	0.468650
106	0.527900	106	0.501456
107	0.554295	107	0.531543
108	0.582010	108	0.558120
109	0.611110	109	0.586026
110	0.641666	110	0.615327

APPENDIX 16 (Cont'd.)

Mortality Rates for  
Disabled Annuitants

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
30	0.025310	30	0.035341
31	0.028145	31	0.036899
32	0.032542	32	0.038946
33	0.035000	33	0.039428
34	0.038165	34	0.040473
35	0.042432	35	0.041935
36	0.048006	36	0.042849
37	0.054112	37	0.042928
38	0.060124	38	0.043225
39	0.065006	39	0.044281
40	0.072142	40	0.045084
41	0.078563	41	0.050017
42	0.088195	42	0.052569
43	0.094091	43	0.057009
44	0.098659	44	0.061248
45	0.101034	45	0.065552
46	0.099347	46	0.068744
47	0.096113	47	0.071598
48	0.093684	48	0.073556
49	0.093042	49	0.075532
50	0.092882	50	0.076793
51	0.090847	51	0.076422
52	0.086215	52	0.073796
53	0.078395	53	0.069154
54	0.068565	54	0.063134
55	0.058441	55	0.056557
56	0.049080	56	0.050331
57	0.042276	57	0.045190
58	0.037908	58	0.041109
59	0.036513	59	0.038283



APPENDIX 16 (Cont'd.)

Mortality Rates for  
Disabled Annuitants  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
60	0.035343	60	0.036275
61	0.033208	61	0.034031
62	0.032877	62	0.031506
63	0.032076	63	0.028898
64	0.032520	64	0.026691
65	0.034208	65	0.025801
66	0.036150	66	0.026486
67	0.038988	67	0.028334
68	0.040047	68	0.030330
69	0.041535	69	0.032655
70	0.042186	70	0.033325
71	0.043699	71	0.034535
72	0.044923	72	0.035391
73	0.045511	73	0.037100
74	0.046988	74	0.039842
75	0.047350	75	0.041951
76	0.049896	76	0.043826
77	0.052758	77	0.045256
78	0.055654	78	0.047337
79	0.060161	79	0.049481
80	0.062129	80	0.051959
81	0.068638	81	0.054581
82	0.073036	82	0.058699
83	0.080164	83	0.061989
84	0.086903	84	0.063698
85	0.092528	85	0.069228
86	0.100695	86	0.076222
87	0.110949	87	0.081432
88	0.120296	88	0.094991
89	0.130369	89	0.102118

## APPENDIX 16 (Cont'd.)

Mortality Rates for  
Disabled Annuitants  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
90	0.144709	90	0.114372
91	0.160627	91	0.126953
92	0.176690	92	0.142188
93	0.194359	93	0.159250
94	0.213795	94	0.178360
95	0.235174	95	0.196196
96	0.256340	96	0.213854
97	0.276847	97	0.233101
98	0.298995	98	0.251749
99	0.325904	99	0.274406
100	0.355236	100	0.299103
101	0.387207	101	0.329013
102	0.418183	102	0.361914
103	0.447456	103	0.398106
104	0.474304	104	0.433935
105	0.502762	105	0.468650
106	0.527900	106	0.501456
107	0.554295	107	0.531543
108	0.582010	108	0.558120
109	0.611110	109	0.586026
110	0.641666	110	0.615327

## APPENDIX 16 (Cont'd.)

## Salary Scale

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
20	1.1265	20	1.1327
21	1.1245	21	1.1315
22	1.1223	22	1.1294
23	1.1204	23	1.1259
24	1.1176	24	1.1204
25	1.1130	25	1.1107
26	1.1064	26	1.1040
27	1.1019	27	1.0972
28	1.0972	28	1.0904
29	1.0928	29	1.0854
30	1.0889	30	1.0816
31	1.0855	31	1.0783
32	1.0827	32	1.0754
33	1.0802	33	1.0734
34	1.0777	34	1.0718
35	1.0751	35	1.0704
36	1.0728	36	1.0695
37	1.0706	37	1.0689
38	1.0686	38	1.0682
39	1.0666	39	1.0671
40	1.0645	40	1.0658
41	1.0626	41	1.0649
42	1.0608	42	1.0643
43	1.0592	43	1.0636
44	1.0578	44	1.0630
45	1.0565	45	1.0623
46	1.0552	46	1.0615
47	1.0534	47	1.0603
48	1.0521	48	1.0589
49	1.0511	49	1.0574

APPENDIX 16 (Cont'd.)

Salary Scale  
(cont'd.)

<u>Males</u>		<u>Females</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
50	1.0502	50	1.0556
51	1.0490	51	1.0534
52	1.0492	52	1.0527
53	1.0472	53	1.0500
54	1.0457	54	1.0475
55	1.0432	55	1.0435
56	1.0411	56	1.0418
57	1.0398	57	1.0414
58	1.0395	58	1.0411
59	1.0386	59	1.0407
60	1.0369	60	1.0404
61	1.0363	61	1.0397
62	1.0361	62	1.0388
63	1.0360	63	1.0381
64	1.0358	64	1.0369
65	1.0357	65	1.0359
66	1.0355	66	1.0351
67	1.0354	67	1.0351
68	1.0353	68	1.0362
69	1.0351	69	1.0364
70	1.0347	70	1.0367

Valuation Rate of Interest Assumption

The interest rate for valuation purposes is a level 8.0%. This valuation rate of interest is made up of a 3.0%<sup>1</sup> annual rate of inflation and a 5.0% real rate of return.

The valuation rate of interest assumption represents our best estimate of the anticipated annual rate of return on plan assets over a very long-term horizon.

The valuation rate of interest assumption is developed based upon the Retirement System's specific asset allocation, and capital market assumptions, based upon recommendations from Hewitt Ennis Knupp, the System's investment consultant. Using expected returns and standard deviations for each asset class, and including anticipated correlation between the classes, a long-term anticipated rate of return is developed. As of June 30, 2010, Hewitt Ennis Knupp has estimated the geometric annual rate of return to be 7.20%, and the arithmetic annual rate of return to be 7.99%, given our asset allocation. This analysis is performed annually, and intended to be over a 15-year time horizon.

Projected COLA Assumption

The annual percentage for estimating future COLA benefit payments is 1.75%.<sup>2</sup>

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<sup>1</sup> The average annual rate of increase in the Consumer Price Index (CPI) for 1925 – 2010 was 3.02%.

<sup>2</sup> The COLA percentage is one-half of the increase in the CPI with a floor of 1.0% and a cap of 3.0%. Therefore the estimate of inflation for the COLA benefit is the result of analyzing available CPI data with percentages bounded between 2.0% and 6.0%, and reduced by 50%.

**SUMMARY OF BENEFIT PROVISIONS**1. Membership

Membership is mandatory for all full-time New York State public school teachers, outside New York City, except those employed under the Comprehensive Employment and Training Act (CETA). Membership is optional for teachers employed on other than a full-time basis and for certain employees of the State University of New York, community colleges, and the State Education Department. Generally, the membership of any person credited with less than 5 years of service will terminate when seven years have elapsed since (s)he last rendered at least 20 days of credited service in a school year.

Tiers are determined by a member's most recent date of membership in the Retirement System as follows:

Tier 1:	Membership prior to 7/1/73;
Tier 2:	Membership 7/1/73 - 7/26/76;
Tier 3:	Membership 7/27/76 - 8/31/83;
Tier 4:	Membership 9/1/83 - 12/31/09;
Tier 5:	Membership on or after 1/1/10.

Tier 3 members are entitled to receive the benefits of either Tier 3 or Tier 4, however, they may not mix the provisions of the two tiers. For valuation purposes, Tier 3 members are assumed to receive the Tier 4 benefit at retirement, as that is generally always the larger benefit.

2. Service Retirement

The service retirement benefits are payable for life generally as follows:

Tier 1:*Non-Contributory Plan*

For Tier 1 members with a date of membership prior to July 1, 1970 the benefit is generally calculated as:

*For New York State service prior to 7/1/1959 and all out-of-state service:*

$1/100^{\text{th}}$  of final average salary (FAS) per year for each of the first 25 years of service, plus  $1/120^{\text{th}}$  of FAS per year for each of the next 10 years of service, plus  $1/140^{\text{th}}$  of FAS per year for each year of NYS service in excess of 35, *plus*

*For New York State service subsequent to 7/1/1959:*

$1/50^{\text{th}}$  of final average salary (FAS) per year for each of the first 25 years of NYS service, plus  $1/60^{\text{th}}$  of FAS per year for each of the next 10 years of NYS service, plus  $1/70^{\text{th}}$  of FAS per year for each year of NYS service in excess of 35.

Non-Contributory Plan members generally may retire at:

- Age 55 with 20 years of total service or
- Any age with 35 years of total service.

## APPENDIX 17 (Cont'd.)

### Career Plan

If 20 or more years of NYS service: 2% of final average salary (FAS) per year of NYS service after July 1, 1959, plus 1.8% of FAS per year of NYS service prior to that date, plus 1% of FAS per year of out-of-state service. Out-of-state service is allowed only up to a maximum of 10 years, and only to the extent that it does not raise the total service credit to greater than 35 years. The maximum pension permitted is 75% of FAS.

If less than 20 years of NYS service, the above formula is used except the benefit is reduced by 5% for each year of service less than 20, subject to a maximum reduction of 50%.

Career Plan members generally may retire at:

- Age 55 with 2 years of NYS service or
- Any age with 35 years of total service.

The provisions of Article 19 of the Retirement and Social Security Law, effective July 11, 2000, provides to eligible Tier 1 and 2 members additional service credit of one-twelfth of a year of service for each year of retirement credit as of the date of retirement or death, up to a maximum of two additional years. The maximum pension, as a result of Article 19, can be 79% of FAS.

Tier 2: Computed under the Tier 1 Career Plan formula, but may be reduced for early retirement, as noted below.

Tier 2 members generally may retire at:

- Age 62 with 5 years of service,
- Age 55 with 30 years of service, or
- Age 55 with 5 years of service, with benefit reduced by 6% for each of the first 2 years under age 62 and 3% for each of the next 5 years.

Tier 3: 1 $\frac{2}{3}$ % of FAS per year of NYS service (if less than 20 years) or 2% of FAS per year of NYS service (if 20 to 30 years). There is no additional benefit for more than 30 years of service. At age 62 the benefit is reduced by 50% of the primary Social Security benefit accrued while in NYS public employment. A member may be eligible for automatic cost-of-living adjustments.

Tier 3 members generally may retire at:

- Age 62 with 5 years of service,
- Age 55 with 30 years of service, or
- Age 55 with 5 years of service, with benefit reduced by 1/15th for each of the first 2 years under age 62 and 1/30th for each of the next 5 years.

## APPENDIX 17 (Cont'd.)

Tier 4:  $1\frac{2}{3}\%$  of FAS per year of NYS service (if less than 20 years), or 2% of FAS per year of NYS service (if 20 to 30 years), plus  $1\frac{1}{2}\%$  of FAS per year of NYS service in excess of 30 years.

Tier 4 members generally may retire at:

- Age 62 with 5 years of service,
- Age 55 with 30 years of service, or
- Age 55 with 5 years of service, with benefit reduced by 6% for each of the first 2 years under age 62 and 3% for each of the next 5 years.

Tier 5:  $1\frac{2}{3}\%$  of FAS per year of NYS service (if less than 25 years), or 2% of FAS per year of NYS service (if 25 to 30 years), plus  $1\frac{1}{2}\%$  of FAS per year of NYS service in excess of 30 years.

Tier 5 members generally may retire at:

- Age 62 with 10 years of service,
- Age 57 with 30 years of service, or
- Age 55 with 10 years of service, with benefit reduced by  $6\frac{2}{3}\%$  for each of the first 2 years under age 62 and 5% for each of the next 5 years.

### 3. Disability Retirement

Generally a member with at least 10 years of service may qualify for a disability retirement benefit of the smaller of 1)  $1\frac{2}{3}\%$  of FAS per year of projected service to age 60 or 2)  $\frac{1}{3}$  of FAS; but the benefit shall not be less than  $1\frac{2}{3}\%$  of FAS per year of completed service.

### 4. Death Benefits

#### *a) Active Service*

The Tier 1 death benefit is generally equal to the greater of 1) 3 times annual salary after 36 years of service (proportionately reduced for less than 36 years) or 2) for members who are at least age 55 with 20 years of service, the pension reserve calculated under a prior, lower service retirement formula.

The death benefit for Tier 2, 3, 4 and 5 members is generally equal to one of the following two options based on the member's election at entry: 1) 3 times annual salary after 3 years of service (proportionately reduced for service under 3 years) or 2) the greater of (1) above or the Tier 1 death benefit.

#### *b) Not in Active Service*

The death benefit for members of all tiers with at least ten years of service credit who die when not in active service is equal to one-half the active member death benefit.



5. Deferred Retirement

*Tiers 1-4:*

A member with at least 5 years of credited service who ceases teaching has a vested right to receive a deferred service retirement benefit. A member with at least five, but less than ten years of service credit, has the choice of receiving a refund of their member contributions with interest or a deferred service retirement benefit. A member with ten or more years of service credit will receive the deferred service retirement benefit.

*Tier 5:*

A member with at least 10 years of credited service who ceases teaching has a vested right to receive a deferred service retirement benefit. Members with less than 10 years of credited service who cease teaching may receive a refund of their member contributions with interest.

6. Member Contributions

Tier 3 and 4 members are required to contribute 3% of pay to fund a portion of their benefit. Effective October 1, 2000, such contributions cease upon the attainment of the earlier of 10 years of service credit or 10 years of membership. Tier 5 members are required to contribute 3.5% of their salary throughout their active membership. Certain Tier 1 and 2 members may elect to contribute in order to receive an additional benefit.

7. Cost-of-Living Adjustment (COLA)

A permanent, annually-adjusted cost-of-living benefit is provided to both current and future retired members. This benefit was first paid commencing September 2001, and is increased every September thereafter, to retired members who meet one of the following eligibility criteria:

- Age 62 and retired for 5 years,
- Age 55 and retired for 10 years, or
- Retired for 5 years under a disability retirement.

The annual COLA percentage is equal to 50% of the increase in the annual CPI; not to exceed 3% nor be lower than 1%. It is applied to the first \$18,000 of annual benefit. Additionally, commencing September 2000, members retired before 1997 are eligible for a "Catch-Up" supplemental benefit upon satisfaction of the above eligibility criteria.