PROPOSED CHANGES IN ACTUARIAL ASSUMPTIONS AND METHODS FOR DETERMINING EMPLOYER CONTRIBUTIONS FOR FISCAL YEARS BEGINNING ON AND AFTER JULY 1, 2005 FOR THE NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

OFFICE OF THE ACTUARY

August 31, 2005

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August 31, 2005

Board of Trustees
New York City Board of Education
Retirement System
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Re: Actuarial Assumptions and Methods

Dear Members:

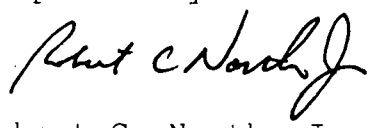
This Report presents Proposed Changes in Actuarial Assumptions and Methods for Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2005 for the New York City Board of Education Retirement System.

This Report, which provides for proposed actuarial assumptions and methods to be effective Fiscal Year 2006, supersedes my Report dated April 13, 2005 which proposed changes in actuarial assumptions and methods effective Fiscal Year 2005.

Although the economic and demographic assumptions presented in this Report are unchanged from those proposed in the April 13, 2005 Report, certain of these proposed assumptions and methods need to be reconsidered if the proposed package of actuarial assumptions and methods is not adopted during the next couple of months. Therefore, the Actuary requests that the Board of Trustees act expeditiously on this proposed package of actuarial assumptions and methods.

I will be pleased to discuss this Report and answer any questions you may have with regard to these findings and proposals.

Respectfully Submitted,



Robert C. North, Jr., F.S.A.
Chief Actuary

RCN/bs

Att.

cc: Ms. C.A. Bailey
Mr. J.R. Gibney
Mr. B.S. Kheel
Mr. S.H. Rumley

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ACRONYMS

This is a listing of acronyms used throughout this Report.

Actuarial Asset Valuation Method ..... AAVM

Actuarial Asset Value ..... AAV

Actuarially-Determined Contribution ..... ADC

Actuarial Interest Rate ..... AIR

Actuarial Present Value of Benefits ..... APVB

Actuarial Standard of Practice ..... ASOP

Actuarial Standard of Practice Number 27 ..... ASOP27

Administrative Code of the City of New York ..... ACNY

American Statistical Association ..... ASA

Annual Required Contribution ..... ARC

Annuity Savings Fund ..... ASF

Chapter 85 of the Laws of 2000 ..... Chapter 85/00

Chapter 125 of the Laws of 2000 ..... Chapter 125/00

Chapter 278 of the Laws of 2002 ..... Chapter 278/02

Chapter 133 of the Laws of 2004 ..... Chapter 133/04

Chapter 93 of the Laws of 2005 ..... Chapter 93/05

Chapter 104 of the Laws of 2005 ..... Chapter 104/05

Chapter 133 of the Laws of 2005 ..... Chapter 133/05

Consumer Price Inflation ..... CPI

Cost-of-Living Adjustments ..... COLA

ACRONYMS (Cont'd)

Economic Funded Ratio ..... EFR

Expected Investment Returns ..... EIR

Frozen Initial Liability ..... FIL

Gabriel, Roeder, Smith & Company ..... GRS

General Wage Increase ..... GWI

Governmental Accounting Standards Board ..... GASB

Improved Retirement Program ..... IRP

Increased-Take-Home-Pay ..... ITHP

KPMG Peat Marwick ..... KPMG

Market Value of Assets ..... MVA

Market Value-related Accumulated Benefit Obligation ... MVABO

National Bureau of Economic Research ..... NBER

New York City Board of Education Retirement System .... BERS

New York City Employees' Retirement System ..... NYCERS

New York City Fire Pension Fund ..... FIRE

New York City Police Pension Fund ..... POLICE

New York City Retirement Systems ..... NYCRS

New York City Teachers' Retirement System ..... TRS

New York State and Local Retirement Systems ..... NYSLRS

New York State Teachers' Retirement System ..... NYSTRS

ACRONYMS (Cont'd)

Price/Earnings ..... P/E

Public Employee Retirement Systems ..... PERS

Standard and Poor's 500 Stock Index ..... S&P 500

Unexpected Investment Returns ..... UIR

Unfunded Actuarial (Accrued) Liability ..... UAL

Variable Annuity Fund ..... VAF

Watson Wyatt and Company ..... Wyatt

World Trade Center ..... WTC

PROPOSED CHANGES IN ACTUARIAL ASSUMPTIONS AND METHODS FOR DETERMINING EMPLOYER CONTRIBUTIONS FOR FISCAL YEARS BEGINNING ON AND AFTER JULY 1, 2005 FOR THE NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

SECTION I - EXECUTIVE SUMMARY

In accordance with the Administrative Code of the City of New York ("**ACNY**") and with appropriate practice, the Boards of Trustees of the five actuarially-funded New York City Retirement Systems ("**NYCRS**")[1] are to periodically review and adopt actuarial assumptions for use in the determination of employer contributions.

This Report proposes changes to certain actuarial assumptions and methods to be used to determine employer contributions payable to the New York City Board of Education Retirement System ("**BERS**") for Fiscal Years beginning on and after July 1, 2005 (i.e., beginning Fiscal Year 2006).

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[1] New York City Employees' Retirement System ("**NYCERS**")
New York City Teachers' Retirement System ("**TRS**")
New York City Board of Education Retirement System ("**BERS**")
New York City Police Pension Fund ("**POLICE**")
New York City Fire Pension Fund ("**FIRE**")

This Report supersedes a Report dated April 13, 2005 that presented proposed changes in actuarial assumptions and methods to determine employer contributions to **BERS** for Fiscal Years beginning on and after July 1, 2004 (i.e., beginning Fiscal Year 2005).

This Report reflects the best judgment of the Actuary regarding the appropriate financing of **BERS** and takes into account the recent actuarial experience study and recommendations prepared by Gabriel, Roeder, Smith & Company ("**GRS**") in their Report dated October 2003 ("**GRS Report**").

This Report also reflects the best judgment of the Actuary regarding the appropriate financing of the World Trade Center ("**WTC**") Disability Law enacted during June 2005 (i.e., Chapter 104 of the Laws of 2005 ("**Chapter 104/05**") as amended by Chapter 93 of the Laws of 2005 ("**Chapter 93/05**")).

The Actuary agrees with most of the recommendations made by **GRS** on demographic and merit salary increase assumptions, but has refined certain of those recommendations where the Actuary either believes that future experience may differ from that of the experience period or desires to smooth some of the recommended values.

The Actuary also generally agrees with the ranges recommended by **GRS** for the various economic assumptions. In particular, the Actuary notes that one of the most significant proposals to be made is that for the Actuarial Interest Rate ("**AIR**") assumption.

In order to arrive at an appropriate **AIR** assumption for **BERS**, the Actuary has reviewed (1) recent, actual investment performance of all five actuarially-funded **NYCRS**, (2) longer-term historical performance of the U.S. capital markets, (3) likely expectations for future investment performance of the assets of **BERS** and (4) the relationships among the economic assumptions used for actuarial valuation purposes.

Consideration also has been given to the effects of the modestly greater diversification of the assets of **BERS** over the past six years.

In addition, and more significantly for this actuarial review, consideration has been given to whether the **AIR** assumption of 8.0% per annum, which was originally established effective July 1, 1999, is still an appropriate estimate of the return on the Fund over the long term.

While the period July 1, 1999 to June 30, 2005 includes a three-year period during which rates of return on equity securities were significantly less than expected, this six year period also represents only the beginning of the longer term over which the **AIR** assumption of 8.0% per annum was expected to apply.

In summary, and subject to the qualifications and actions discussed later in this Section and to continued review of certain detailed accounting and technical requirements, the Actuary proposes the following actions with respect to the current actuarial assumptions and methods of **BERS** for determining employer contributions for Fiscal Years beginning on and after July 1, 2005 (i.e., Fiscal Year 2006).

Demographic Assumptions

The Actuary proposes the following actions with respect to demographic assumptions:

- Active Service Withdrawal: Revise the probabilities by applying a service-based table (versus the current age-based table) as recommended by **GRS** but modestly revise and smooth the probabilities recommended by **GRS**.

- Active Service Ordinary Mortality: Revise the probabilities to reduce the expected number of such deaths, smooth somewhat the probabilities for males recommended by **GRS** and revise the probabilities for females to more closely retain the historical relationship between male and female mortality.

- Active Service Accidental Mortality: Retain the current probabilities of zero percent.

- Active Service Ordinary Disability: Modestly revise the current probabilities.

- Active Service Accidental Disability: Reduce the probabilities at most ages.

- Service Retirement: For those not electing Improved Retirement Program ("**IRP**") generally increase the probabilities and extend the probabilities to younger ages. For those electing **IRP** retain the current probabilities but extend the probabilities to younger ages.

- Post-Retirement Mortality: Continue the use of the existing Base Tables and Valuation Tables for the probabilities of post-retirement mortality where the Base Tables reflect reasonably current probabilities of mortality and the Valuation Tables are adjusted to reflect the impact of expected improvements in future mortality experience.

Specifically, continue the use of Valuation Table probabilities of mortality equal to the Base Table probabilities of mortality multiplied by 93% for males and 97% for females.

- **WTC** Disability Law: The Actuary currently believes that the impact of the **WTC** Disability Law on **BERS** is not material. Therefore, the Actuary proposes not to modify any of the demographic assumptions for **BERS** as a result of this law. If in the future the impact is determined to be material the Actuary proposes to reflect the financial impact through the use of actuarial methodologies.

Economic Assumptions

The Actuary proposes the following economic assumptions:

- Consumer Price Inflation ("**CPI**"): Retain the current **CPI** assumption at 2.5% per year.

- General Wage Increase ("**GWI**"): Retain the current **GWI** component of the Salary Scale at 3.0% per year. This retains the current expected real wage growth assumption of .50% per year.

- Merit Salary Increases: Increase the Merit Increase component and convert to a service-based Salary Scale.

- Actuarial Interest Rate ("**AIR**") Assumption: Retain the current **AIR** assumption of 8.0% per annum, gross of Investment Expenses (i.e., Investment Expenses are provided for and recovered separately).

Other Actuarial Assumptions and Methods

The Actuary proposes the following other components to the proposed package of actuarial assumptions and methods:

- Actuarial Cost Method: Retain the Frozen Initial Liability ("**FIL**") actuarial cost method utilizing the Initial Liability of $0 originally established as of June 30, 1999 and the existing Unfunded Actuarial (Accrued) Liabilities ("**UAL**") established since that date.

- Conversions into Variable Annuities at Retirement: Retain the methodology for determining the actuarial losses sustained upon conversion at retirement of all or portions of member Annuity Savings Fund ("**ASF**") account balances and Increased-Take-Home-Pay ("**ITHP**") Reserves into variable annuities.

- Liabilities: Recognize all liabilities by eliminating the deferral of the actuarial liabilities attributable to Chapter 125 of the Laws of 2000 ("**Chapter 125/00**"). Currently, such actuarial liabilities are being recognized for funding purposes over a period of ten years in accordance with Chapter 278 of the Laws of 2002 ("**Chapter 278/02**").

- Lag Valuation: Introduce a "**One-Year Lag**" methodology into the actuarial valuation process. Under this method the census data and asset information as of the June 30 second preceding a Fiscal Year would be used to determine the employer contribution for that Fiscal Year.

- Actuarial Asset Valuation Method ("**AAVM**"): Revise the current factors (i.e., 10%, 15%, 20%, 25% and 30%) used to phase Unexpected Investment Returns ("**UIR**") into the **AAVM** over five years to proposed factors (i.e., 15%, 15%, 15%, 15%, 20% and 20%) to phase **UIR** into the **AAVM** over six years.

- Expenses: Continue to concurrently recover, with interest, the Administrative Expenses and Investment Expenses paid from the Fund.

  In conjunction with the **One-Year Lag** methodology, this requires recovering such expenses with interest during the second Fiscal Year following expenditure beginning with the expenses paid during Fiscal Year 2005. Such expenses would be recovered during Fiscal Year 2007.

  Note: Because they were recovered during Fiscal Year 2005, the expenses paid during Fiscal Year 2004 would not be recovered again during Fiscal Year 2006.

Financial Impact

All estimates of employer contributions and changes in employer contributions presented in this Report have been developed using estimated Fiscal Year 2006 employer contributions.

These estimates of employer contributions for Fiscal Year 2006 differ from the estimates for Fiscal Year 2005 provided in the April 13, 2005 Report due to the different Fiscal Year, the use of updated wage patterns reflecting recent labor agreements, a different transition year for implementing the **One-Year Lag** methodology and a modest revision in the **AAVM**.

The overall impact of implementing the proposed actuarial assumptions and methods presented in this Report would decrease Fiscal Year 2006 employer contributions by approximately $19 million (calculated by comparing a June 30, 2004 actuarial valuation based on new actuarial assumptions and methods, including a **One-Year Lag** methodology, with a June 30, 2004 actuarial valuation (projected on an estimated basis to June 30, 2005) based on current actuarial assumptions and methods).

Note: Final Fiscal Year 2006 employer contributions based on the current actuarial assumptions and methods could differ significantly from those shown herein due to the "true-up" requirements for using census data as of June 30, 2005.

Also Note: Final Fiscal Year 2006 employer contributions based on the proposed actuarial assumptions and methods could differ from those shown herein due to additional labor contract settlements, benefit changes and/or refinements in actuarial calculations.

The following paragraphs present estimates of the financial impact of various components of the proposed package of changes in actuarial assumptions and methods.

Note: Ascribing financial impact to the individual changes in actuarial assumptions and methods is dependent upon the order in which the changes are considered. Thus, the amounts shown by source should not be relied upon to estimate the impact of alternative constructions.

On their own, using the June 30, 2004 census data, the recognition of the proposed changes in certain demographic and economic assumptions would increase employer contributions by approximately $1 million for Fiscal Year 2006.

On its own, the recognition of all actuarial liabilities, including the benefits attributable to **Chapter 125/00** that are currently being phased into the funding of **BERS** over a period of ten years in accordance with **Chapter 278/02**, would increase employer contributions by approximately $7 million for Fiscal Year 2006.

Before implementation of the **One-Year Lag** methodology, the proposed change in **AAVM** as of June 30, 2005 would decrease Fiscal Year 2006 employer contributions to **BERS** by approximately $10 million compared with employer contributions computed using the current **AAVM**.

After recognition of all changes in actuarial assumptions, the recognition of all actuarial liabilities and the recognition of the impact of a revision in the **AAVM**, the implementation of the **One-Year Lag** methodology would decrease employer contributions to **BERS** for Fiscal Year 2006 by approximately $17 million. This amount includes a one-time transition reduction of approximately $10 million because the expenses paid two years earlier during Fiscal Year 2004 were already reimbursed during Fiscal Year 2005.

Requisite Actions

The following actions are required and assumed to take place in advance of, or concurrent with, the adoption of these proposed changes in actuarial assumptions and methods:

- Benefits payable under **BERS** are not changed because of the changes in actuarial assumptions or methods (e.g., interest credited to Tier I and Tier II **ASF** account balances and **ITHP** Reserves continues to be based on a rate of 8.25% per annum).

Note, however, that if these actuarial assumptions are adopted, then **ASF** account balances and **ITHP** Reserves would continue to be credited with interest at a rate greater than the expected earnings on the Fund. This fact may be worthy of further consideration, although separately.

- The asset allocation of **BERS** continues to include a well-diversified portfolio of at least 70% equity securities in the Fixed Benefit Program.

- The proposed changes presented in this Report are adopted as a **package** and that no changes be made to this **package** of actuarial assumptions and methods.

- The proposed changes in actuarial assumptions and methods are adopted expeditiously. The Actuary finds that, as bond yields have declined, support of the proposed **AIR** assumption of 8.0% per annum becomes more difficult.

As noted, the Actuary has designed the actuarial assumptions and methods presented in this Report as a balanced **package**, designed **in combination** to provide a reasonable and appropriate level of funding for **BERS** consistent with the concept of intergenerational equity.

The consideration of a change to any individual component of this proposed **package** of actuarial assumptions and methods would require a review and possible revision to some or all of the other proposed actuarial assumptions and methods.

Legislation Required

Finally, it should be noted that the proposed continuation of the **AIR** assumption, the elimination of the phase-in of the actuarial liabilities in accordance with **Chapter 278/02** attributable to benefits payable in accordance with **Chapter 125/00** and the adoption of a **One-Year Lag** methodology require approval of the New York State Legislature and the Governor to become effective.

With respect to the **AIR** assumption, legislation must specify the period for which the proposed assumption is to be effective.

Following past practice, while recognizing that these proposed actuarial assumptions and methods are being adopted effective one year later than originally expected, the Actuary proposes that legislation establish the **AIR** assumption to be used to determine employer contributions for the four-year period from July 1, 2005 to June 30, 2009 (i.e., Fiscal Years 2006 to 2009).

Such legislation would continue the **AIR** assumption of 8.0% per annum that was originally established by Chapter 85 of the Laws of 2000 ("**Chapter 85/00**") and used to determine employer contributions for Fiscal Years 2000 to 2004. Chapter 133 of the Laws of 2004 ("**Chapter 133/04**") extended for one year only the **AIR** assumption of 8.0% per annum to determine, under current actuarial assumptions and methods, employer contributions for Fiscal Year 2005. Chapter 133 of the Laws of 2005 ("**Chapter 133/05**") now provides a similar extension of the **AIR** assumption of 8.0 per annum for Fiscal Year 2006.

In addition to the **AIR** assumption, legislation should also specify the interest rate (currently 8.25% per annum) to use in crediting Tier I and Tier II **ASF** account balances and **ITHP** Reserves.

Since additional review of certain technical issues may identify alternative approaches that are preferable, the Actuary requests discretion to make minor adjustments during the legislative process to the extent necessary to better implement the intent of these proposed changes in actuarial assumptions and methods.

SECTION II - BACKGROUND AND INTRODUCTION

During October 2003 **GRS** presented their "Final Experience Study Report of the New York City Retirement Systems for Fiscal Years Ending 1998 - 2001."

In accordance with the requirements of the **ACNY** and taking into account the results of the **GRS Report,** the Actuary has reviewed the current actuarial assumptions and methods used to determine employer contributions.

As a result of that review the Actuary has concluded that the actuarial assumptions and methods currently in effect should be modified.

In a Report dated April 13, 2005, the Actuary proposed changes to the current actuarial assumptions and methods to be made effective for determining employer contributions for Fiscal Year 2005 and after.

The Board of Trustees, desiring more time to consider the proposals made by the Actuary, did not adopt the proposed changes in actuarial assumptions and methods to be effective Fiscal Year 2005.

The major components of the proposed changes in actuarial assumptions and methods presented in this Report are generally the same as those in the April 13, 2005 Report.

Those proposed changes have been revised slightly to recognize the potential impact of the **WTC** Disability Law and to make other modest changes the Actuary believes appropriate.

The Actuary considers these proposals to be appropriate for only a limited period of time and respectfully requests the Board of Trustees act expeditiously upon them.

Assuming adoption of a **One-Year Lag** methodology, these assumptions would first be employed in conjunction with a June 30, 2004 actuarial valuation date.

Note: Adoption of these proposals would result in the preparation of two June 30, 2004 actuarial valuations. The first June 30, 2004 actuarial valuation, based on current actuarial assumptions and methods, has already been used to determine Fiscal Year 2005 employer contributions. The second June 30, 2004 actuarial valuation, based on the actuarial assumptions and methods proposed herein including the use of the **One-Year Lag** methodology (referred to as the June 30, 2004 (Lag) actuarial valuation), would be used to determine Fiscal Year 2006 employer contributions.

This Report presents the changes proposed by the Actuary for certain actuarial assumptions and methods for **BERS**.

If supported by the Board of Trustees and if enabling legislation is enacted, these proposals may be used to satisfy the requirements of **ACNY** Section 13-638.2 for Fiscal Years beginning on and after July 1, 2005 (i.e., Fiscal Year 2006).

Section III of this Report discusses a philosophy for developing an appropriate level of employer contributions.

Section IV discusses the findings and recommendations presented in the **GRS Report**.

Section V discusses the development of demographic assumptions.

Section VI reviews the economic assumptions, including the **AIR** assumption.

Section VII discusses other actuarial assumptions and methods, including the **One-Year Lag** methodology and the **AAVM**.

Section VIII summarizes the financial impact of the proposed changes in actuarial assumptions and methods presented in this Report.

Section IX presents the findings and proposals of this Report.

Following the Sections of this Report, Appendix A presents the rates of investment return earned by the actuarially-funded **NYCRS** for Fiscal Year 1983 through Fiscal Year 2005.

Appendix B summarizes the economic assumptions used in the actuarial valuations of **BERS** since Fiscal Year 1981.

Appendix C discusses **AIR** assumptions used by corporate pension plans and public employee retirement systems.

Appendix D presents detailed tables of the proposed demographic and salary scale assumptions being proposed by the Actuary.

Appendix E presents, for informational purposes only, a discussion of financial economics, funding and disclosure noting some of the issues currently being debated in the actuarial, accounting and investment communities that may impact financing methodologies and financial reporting for the **NYCRS** in the future.

Appendix F acknowledges the input and assistance provided to the Actuary in preparing this Report.

SECTION III - PHILOSOPHY FOR DEVELOPING AN APPROPRIATE LEVEL OF EMPLOYER CONTRIBUTIONS

A major objective of actuarial methodologies is to estimate the value of benefits to be received by participants of a retirement system and to allocate over time the financing of those benefits.

There is no single answer to the question of what is the correct level of employer contributions. Actuaries determine contribution levels by using a combination of: (1) actuarial assumptions, (2) Actuarial Cost Methods, (3) amortization methods and periods for paying off any Unfunded Actuarial Liabilities and (4) Actuarial Asset Valuation Methods. Each of these components exerts a significant impact on the calculated level of employer contributions.

For purposes of designing the proposals in this Report, a philosophic structure has been developed to provide guidance for developing an appropriate level of employer contributions.

The philosophic structure chosen is rooted in the principles of accrual accounting where a guiding concept is that expenses of an employer should be reflected on the books of that employer during the period that those expenses are incurred.

Most authorities would concur that pensions are earned over the working lifetimes of employees, and, therefore, pension expense should also be allocated over the working lifetimes of employees. This is the period of time during which public employees provide service to the taxpayers.

In the case of the five actuarially-funded **NYCRS**, as with most governmental entities, there are generally no material differences between the pension expense recorded on the employers' financial statements and the actual contributions made to the Funds. In this Report references to pension expense and contributions are used interchangeably.

Under the requirements of Governmental Accounting Standards Board ("**GASB**") Statement Number 27 ("**GASB27**"), an employer participating in a cost-sharing, multiple-employer Public Employee Retirement System ("**PERS**") is deemed to have met its employer contribution obligations by paying its contractually-required contribution to that **PERS**. For employers participating in **BERS**, the contractually-required contribution is referred to as the Statutorily-Required Contribution or Statutory Contribution.

Since Fiscal Year 2001, the employers participating in **BERS** have reported pension expense on their Financial Statements equal to their actual, Statutory Contributions but these Statutory Contributions are not equal to their Actuarially-Determined Contributions ("**ADC**"), or Annual Required Contributions ("**ARC**") in **GASB27** terminology.

The difference between the Statutory Contributions and the **ADC** or **ARC** is the consequence of **Chapter 278/02** which phases-in over 10 years the actuarial liabilities attributable to the benefits provided by **Chapter 125/00** (i.e., automatic Cost-of-Living Adjustments ("**COLA**")).

The proposals presented in this Report attempt to follow a basic philosophy that pension expense and employer contributions attributable to current employees should be financed over the working lifetimes of those employees. Pension expense should not deliberately be deferred to future generations. This Report refers to this concept as "intergenerational equity."

The Actuary believes that the combined effect of all of the proposed changes in actuarial assumptions and methods presented in this Report will help maintain the philosophy of "intergenerational equity" and provide for the orderly financing of the Retirement System.

SECTION IV - COMMENTS ON FINDINGS AND RECOMMENDATIONS PRESENTED IN OCTOBER 2003 GRS REPORT

In their "Final Experience Study of the New York City Retirement Systems for Fiscal Years Ending 1998 - 2001," **GRS** presents a review of the actuarial assumptions currently in use for the **NYCRS** and makes recommendations for changes where **GRS** believes such changes are appropriate. In particular, **GRS** recommends that revisions be made to certain demographic and economic assumptions for **BERS**.

The Actuary has reviewed the **GRS** recommendations in detail and generally agrees with most of those recommendations. Subjecting those recommendations to some refinements, primarily reflecting greater familiarity with the **NYCRS**, the Actuary has developed the proposals for actuarial assumptions and methods presented herein.

Section V of this Report develops the Actuary's proposals on demographic assumptions for **BERS**.

Section VI of this Report reviews the economic assumptions for **BERS** including, in particular, continuing the use of the current **AIR** assumption of 8.0% per annum, gross of Investment Expenses (i.e., Investment Expenses are recovered separately), assuming a continuation of the current asset allocation policy that includes 70% equity securities in the Fixed Benefit Program.

SECTION V - DEVELOPMENT OF DEMOGRAPHIC ASSUMPTIONS

A. Decrements from Active Service

Members in active service are subject to the following types of decrements:

- Withdrawal
- Ordinary Mortality
- Accidental Mortality
- Ordinary Disability Retirement
- Accidental Disability Retirement
- Service Retirement

The **GRS Report** provides comparisons of actual experience versus expected experience over the past few years for each of these decrements.

Based upon these comparisons and upon extensive actuarial analyses, **GRS** has recommended changes in the decrements from active service on account of Withdrawal and Service Retirement.

GRS has not recommended changes in the probabilities of decrements from active service on account of Ordinary Mortality, Accidental Mortality, Ordinary Disability and Accidental Disability.

Following is a discussion of each of the demographic assumptions.

Withdrawal

A review of Withdrawal experience from July 1, 1988 to June 30, 2001 indicates that there were approximately 50% and 83% more Withdrawals than expected over this 13-year period for males and females, respectively.

Over the 4-year period from July 1, 1997 to June 30, 2001, there were approximately 2% and 15% less Withdrawals than expected for males and females, respectively.

Further review of this data suggested to **GRS** that it would be better to utilize probabilities of Withdrawal from active service based on years of service rather than age.

The Actuary agrees with the **GRS** recommendation to utilize probabilities of Withdrawal based on years of service.

The following Table IA compares the current and proposed probabilities of active service Withdrawal at selected years of service:

TABLE IA

COMPARISON OF ACTIVE SERVICE DECREMENTS

Years of Service	Probabilities of Withdrawal*	
	Current#	Proposed
0	5.16%/4.39%	6.00%/4.50%
1	5.06%/4.44%	5.60%/4.30%
2	4.66%/3.97%	5.20%/4.10%
3	4.20%/3.47%	4.80%/3.90%
4	3.86%/3.09%	4.40%/3.70%
5	3.81%/2.99%	4.00%/3.50%
10	2.95%/2.34%	2.50%/2.50%
15	2.54%/2.54%	1.50%/2.00%
20	2.32%/2.23%	1.00%/1.50%

* Separate probabilities are used for males/females.

Current probabilities are age based. Probabilities shown here are the service-based probability equivalents of the age-based probabilities that were developed by **GRS** using group demographics from Fiscal Years 1998 to 2001.

Ordinary Mortality - Males

A review of male active service Ordinary Mortality experience from July 1, 1988 to June 30, 2001 indicates that there were approximately 35% fewer Ordinary Deaths than expected over this 13-year period.

Over the 4-year period from July 1, 1997 to June 30, 2001, there were approximately 21% fewer Ordinary Deaths than expected.

Review of this data suggested to **GRS** that it would be appropriate to continue utilizing the probabilities of male active service Ordinary Mortality currently in effect.

The Actuary proposes changes in the probabilities of male Ordinary Mortality.

Ordinary Mortality - Females

A review of female active service Ordinary Mortality experience from July 1, 1988 to June 30, 2001 indicates that there were approximately 37% fewer such Ordinary Deaths than expected over this 13-year period.

Over the 4-year period from July 1, 1997 to June 30, 2001, there were approximately 13% fewer female active service Ordinary Deaths than expected.

Review of this data suggested to **GRS** that it would be appropriate to continue utilizing the probabilities of female active service Ordinary Mortality currently in effect.

However, retaining the current probabilities for females would result in probabilities of death for females that are not correlated to the probabilities of death for males.

Consequently, to help maintain reasonable expectations for the probabilities of active service Ordinary Mortality between males and females, the Actuary proposes to revise the probabilities of female active service Ordinary Mortality to equal 50% of the probabilities of male active service Ordinary Mortality.

Accidental Mortality

In the past, the Actuary has utilized a probability of zero percent for active service Accidental Mortality. Review of the experience data and judgment suggest to the Actuary that it would be appropriate to use same zero percent assumption for active service Accidental Mortality.

GRS did not recommend any changes in the probabilities of Accidental Mortality. As noted, the Actuary believes it is appropriate to use the current probabilities.

The following Table IB compares the current and proposed probabilities of decrement from active service at selected ages for Ordinary Mortality and Accidental Mortality:

TABLE IB

COMPARISON OF ACTIVE SERVICE DECREMENTS

	Probabilities of Decrement			
	Ordinary Mortality*		Accidental Mortality**	
Age	Current	Proposed#	Current	Proposed##
25	.043%/.025%	.040%/.020%	.00%	.00%
30	.057%/.033%	.040%/.020%	.00%	.00%
35	.080%/.046%	.050%/.025%	.00%	.00%
40	.115%/.065%	.060%/.030%	.00%	.00%
45	.203%/.098%	.110%/.055%	.00%	.00%
50	.364%/.160%	.160%/.080%	.00%	.00%
55	.570%/.247%	.210%/.105%	.00%	.00%
60	.852%/.411%	.260%/.130%	.00%	.00%

* Separate probabilities are used for males/females and the current probabilities are rounded.

** The same probabilities are used for males and females.

The Actuary has modified the probabilities of male Ordinary Mortality and has revised the probabilities of female Ordinary Mortality to maintain expectation consistency. **GRS** did not recommend any changes in these probabilities.

The Actuary agrees with the **GRS** recommendation.

Ordinary Disability

A review of Ordinary Disability experience from July 1, 1988 to June 30, 2001 indicates that there were varying numbers of Ordinary Disabilities relative to expected over this 13-year period.

Over the 4-year period from July 1, 1997 to June 30, 2001, there were also varying numbers of Ordinary Disabilities relative to expected.

Review of this data suggested to **GRS** that it would be appropriate to continue utilizing the probabilities of decrement by Ordinary Disability from active service currently in effect.

After reviewing the experience data, the comments and recommendations of **GRS** and applying actuarial judgment, the Actuary proposes modest revisions to the probabilities.

Accidental Disability

A review of Accidental Disability experience from July 1, 1988 to June 30, 2001 indicates that there were varying numbers of Accidental Disabilities relative to expected over this 13-year period.

Over the 4-year period from July 1, 1997 to June 30, 2001, there were generally also varying numbers of Accidental Disabilities relative to expected.

Review of this data suggested to **GRS** that it would be appropriate to continue utilizing the probabilities of decrement by Accidental Disability from active service currently in effect.

After reviewing the experience data, the comments and recommendations of **GRS** and applying actuarial judgment, the Actuary proposes to reduce the probabilities at most ages.

The following Table IC compares the current and proposed probabilities of decrement from active service at selected ages for Ordinary Disability and Accidental Disability:

TABLE IC

COMPARISON OF ACTIVE SERVICE DECREMENTS

Age	Probabilities of Decrement*			
	Ordinary Disability		Accidental Disability	
	Current	Proposed**	Current	Proposed#
25	.04%/.04%	.10%/.05%	.02%/.01%	.02%/.01%
30	.05%/.05%	.10%/.05%	.03%/.01%	.02%/.01%
35	.08%/.06%	.15%/.05%	.05%/.01%	.02%/.01%
40	.21%/.14%	.20%/.10%	.07%/.02%	.02%/.01%
45	.36%/.30%	.30%/.20%	.08%/.02%	.02%/.01%
50	.49%/.45%	.40%/.30%	.09%/.02%	.02%/.01%
55	.50%/.50%	.50%/.40%	.10%/.02%	.02%/.01%
60	.50%/.50%	.50%/.40%	.10%/.02%	.02%/.01%

* Separate probabilities are used for males/females. **GRS** did not recommend any changes in these probabilities.

** The Actuary has modified slightly probabilities of Ordinary Disability.

The Actuary has modified the probabilities of Accidental Disability.

Service Retirement

GRS has made recommendations for changes to the probabilities of Service Retirement.

The Actuary generally agrees with these **GRS** recommendations but has made multiple adjustments.

After reviewing the experience data, the comments and recommendations of **GRS** and applying actuarial judgment, the Actuary proposes the following changes in the assumptions for Service Retirement:

- For members who did not elect the Improved Retirement Program ("**IRP**"), generally, increase the probabilities for all years of eligibility and extend the probabilities to younger ages.

- For members who elected the **IRP**, retain the current probabilities but extend the probabilities to younger ages.

The following Tables ID and IE present a comparison of the current probabilities of Service Retirement with those proposed by the Actuary:

TABLE ID

COMPARISON OF ACTIVE SERVICE DECREMENTS

Members Not Electing Improved Retirement Program*

Age	Probabilities of Service Retirement**					
	Year One		Year Two		Ultimate	
	Current	Proposed#	Current	Proposed#	Current	Proposed#
40	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%
45	0.0%	20.0%	0.0%	15.0%	0.0%	15.0%
50	12.0%	20.0%	0.0%	15.0%	0.0%	15.0%
55	12.0%	20.0%	10.0%	15.0%	8.0%	15.0%
60	12.0%	20.0%	10.0%	15.0%	8.0%	15.0%
65	30.0%	25.0%	30.0%	25.0%	30.0%	25.0%
70	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* Probabilities are applicable only to members who either did not choose to participate in an **IRP** such as Chapter 96 of the Laws of 1995 or who were mandated into an **IRP**.

** The same probabilities are used for males and females.

The Actuary proposes generally greater probabilities than those recommended by **GRS** and extends them to younger years.

TABLE IE

COMPARISON OF ACTIVE SERVICE DECREMENTS

Members Electing Improved Retirement Program*

Age	Probabilities of Service Retirement**					
	Year One		Year Two		Ultimate	
	Current	Proposed#	Current	Proposed#	Current	Proposed#
40	0.0%	60.0%	0.0%	0.0%	0.0%	0.0%
45	0.0%	60.0%	0.0%	40.0%	0.0%	20.0%
50	60.0%	60.0%	0.0%	40.0%	0.0%	20.0%
55	60.0%	60.0%	40.0%	40.0%	20.0%	20.0%
60	60.0%	60.0%	40.0%	40.0%	20.0%	20.0%
65	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
70	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* Probabilities are applicable only to members who voluntarily elected to participate in an **IRP** such as Chapter 96 of the Laws of 1995.

** The same probabilities are used for males and females.

The Actuary agrees with **GRS** to retain the current probabilities but extends them to younger ages.

B. Mortality after Retirement

The probabilities of mortality for retirees differ depending upon whether they are receiving Service Retirement benefits or Disability Retirement benefits.

GRS has recommended no changes in the probabilities of mortality after Service Retirement or after Disability Retirement for either males or females.

In general, the Actuary agrees and proposes no changes in these probabilities.

However, the Actuary believes that the following discussion regarding mortality trends and tables is important.

Over the past 50 years, the average life expectancy has increased approximately 3.5 years for males age 65 and approximately 5.6 years for females age 65.

Since 1900 rates of mortality have declined an average of approximately .59% per year for males age 65 and approximately .96% for females age 65.

In recent years, however, rates of mortality improvement for females have slowed relative to males.

Thus, it is reasonable to anticipate that mortality rates will continue to decline in the future.

There are two main methodologies employed to reflect future mortality improvements:

- Generational Mortality Tables which provide for probabilities of death that differ not just by age and gender, but also by Calendar Year or Fiscal Year.

- Reduced Probabilities of mortality that differ by age and gender, but not by year, and are intended to develop a weighted average impact on actuarial liabilities of anticipated mortality improvements.

The Actuary agreed where Watson Wyatt and Company ("**Wyatt**") made recommendations in their 1999 Report ("**Wyatt Report**") that Reduced Probabilities could be used as an appropriate method for implementing the impact of improving mortality for developing actuarial liabilities for the **NYCRS**.

Therefore, the Actuary proposed then and continues to propose that there be two types of post-retirement Mortality Tables:

- Base Tables - Do not reflect mortality improvements.

- Valuation Tables - Reflect mortality improvements.

The Valuation Tables would be used for determining actuarial liabilities used to compute employer contributions.

The Base Tables would be used, as appropriate, for other purposes (e.g., development of option factors).

Wyatt recommended in 1999 the use of Valuation Tables with probabilities of mortality equal to between 93% and 97% of the Base Table probabilities and the Actuary proposes Valuation Tables as follows:

TABLE IIA

Post-Retirement Mortality Valuation Tables

Probabilities as a Percentage of Base Table Probabilities

Group	Percentage
Male	93%
Female	97%

Use of these Reduced Probabilities for the Valuation Tables allow the Actuary to recognize the financial implications of improving mortality without the complexities of developing full generational Mortality Tables.

Normally, in a report prepared four years later, one would expect the need to recognize further improvements in mortality.

In their review of the actuarial experience, however, **GRS** concluded that such recognition is not currently required.

Consequently, **GRS** recommended retaining the current probabilities of mortality after retirement.

The Actuary agrees and the following Table IIB presents the proposed (which are also the current) probabilities of mortality for Service Retirees:

TABLE IIB

PROPOSED PROBABILITIES OF MORTALITY AFTER SERVICE RETIREMENT*

Age	Males		Females	
	Base Table	Valuation Table**	Base Table	Valuation Table**
40	.13%	.12%	.07%	.07%
50	.71%	.66%	.23%	.22%
60	1.49%	1.39%	.74%	.71%
70	3.34%	3.11%	1.80%	1.74%
80	7.82%	7.27%	4.76%	4.61%
90	17.82%	16.57%	12.65%	12.27%
100	35.28%	32.81%	29.52%	28.63%
110#	100.00%	100.00%	100.00%	100.00%

* These are the probabilities currently in effect and are rounded.

** Probabilities shown for the Valuation Tables are used to determine actuarial liabilities to compute employer contributions and equal those of the Base Tables multiplied by 93% for males and 97% for females.

Tables end at age 110.

GRS also reviewed and made no recommendation for change to the probabilities of mortality after Disability Retirement.

The Actuary agrees and the following Table IIC presents the proposed (which are also the current) probabilities of mortality for Disability Retirees:

TABLE IIC

PROPOSED PROBABILITIES OF MORTALITY AFTER DISABILITY RETIREMENT*

Age	Males		Females	
	Base Table	Valuation Table**	Base Table	Valuation Table**
40	2.48%	2.31%	3.23%	3.13%
50	2.97%	2.76%	3.37%	3.27%
60	4.05%	3.76%	3.52%	3.41%
70	5.78%	5.38%	4.19%	4.06%
80	9.78%	9.09%	7.22%	7.00%
90	18.11%	16.84%	13.47%	13.07%
100	35.28%	32.81%	29.52%	28.63%
110#	100.00%	100.00%	100.00%	100.00%

* These are the probabilities currently in effect and are rounded.

** Probabilities shown for the Valuation Tables are used to determine actuarial liabilities to compute employer contributions and equal those of the Base Tables multiplied by 93% for males and 97% for females.

Tables end at age 110.

Currently, the Mortality Tables for beneficiaries of retired **NYCERS** General (Clerical) employees are used for beneficiaries of retired **BERS** members and the Actuary proposes continuing this practice.

Detailed tables of the demographic assumptions that are discussed in this Section, together with the Salary Scale assumptions discussed in Section VI, are presented in Appendix D.

SECTION VI - DEVELOPMENT OF ECONOMIC ASSUMPTIONS

A. Background Concepts

In accordance with Actuarial Standard of Practice ("**ASOP**") No. 27 ("**ASOP27**") and professional practice guidelines, the Actuary must justify the use of whatever economic assumptions are employed at each measurement date (e.g., the use of an **AIR** assumption of 8.0% per annum as of June 30, 2004).

The publication "Recommendations for Measuring Pension Obligations" developed by the Pension Committee of the Actuarial Standards Board and subsequently adopted by the American Academy of Actuaries states, in part, that "...while giving primary emphasis to the combined impact of all assumptions, the actuary should consider the reasonableness of each actuarial assumption independently on the basis of its own merits and its consistency with each other assumption."

Further, "...the actuary should consider the actual experience of the covered group but should emphasize expected long-term future trends rather than give undue weight to recent past experience."

The construction of economic assumptions for actuarial valuations can be undertaken in multiple ways. The Actuary has considered several methodologies, but believes that the "Building Block" methodology of developing economic assumptions to be amongst the most robust.

The Building Block methodology develops total investment return by combining expected future inflation with an expected future real rate of return on assets.

Similarly, a **GWI** assumption is determined by combining expected future inflation with an expected future real growth in wages.

Overall, the Actuary is proposing to retain the current economic assumptions for inflation, **GWI** and **AIR**.

When established effective as of June 30, 1999, the Actuary believed that these assumptions were appropriate, long-term economic expectations.

Between June 30, 1999 and June 30, 2003, the annual yield available on the 10-year U.S. Treasury Note declined from 5.81% to 3.54%, an arithmetic decline of 2.27% over a four-year period. On June 30, 2004 the yield on the 10-year U.S. Treasury Note equaled 4.62%, an arithmetic decline of 1.19% over the five-year period since June 30, 1999. On June 30, 2005 the yield on the 10-year U.S. Treasury Note equaled 3.94%, an arithmetic decline of 1.87% over the six-year period since June 30, 1999.

The magnitude of these changes in yield since June 30, 1999 are significant but the Actuary does not believe that four years (i.e., June 30, 1999 to June 30, 2003) or five years (i.e., June 30, 1999 to June 30, 2004) or even six years (i.e., June 30, 1996 to June 30, 2005) constitute the long term.

In addition to events in the bond markets, between March 2000 and March 2003 the equity markets experienced an extended period of significant decline. This extended decline, while significant, is also a statistical outlier amongst ongoing, expected experience. Consequently, the Actuary believes that this experience should be considered unusual and a short-term event within a long-term time period.

As **GRS** noted in their Report, an **AIR** assumption of 8.0% per annum would currently be considered optimistic but within an acceptable range.

This observation is consistent with the changes in the economic environment since June 30, 1999, particularly the decrease in bond yields.

The Actuary agrees with **GRS** and believes that the justification for continuing the **AIR** assumption at 8.0% per annum has become more challenging over the recent past.

Nevertheless, in this Section of the Report, the components required for the Building Block methodology will be developed and the proposal to continue the economic assumptions currently in use will be described.

B. Consumer Price Inflation Assumption

In 1999, after considerable analysis and as the foundation of the Building Block methodology, the Actuary proposed that inflation be defined as **CPI** and that the expected future **CPI** assumption be set equal to 2.5% per year.

The Actuary believes that this assumption should be continued.

In developing this proposal, the Actuary reviewed and analyzed information from multiple sources as described hereafter.

Actuarial Auditor Recommendations

In October 1999 **Wyatt** recommended that the Actuary utilize a **CPI** assumption between 2.0% per year and 3.0% per year.

In October 2003 **GRS** recommended that the Actuary utilize a **CPI** assumption between 2.5% per year and 3.5% per year.

KPMG Peat Marwick ("**KPMG**") Surveys

In their "1999 Survey of Economic and Capital Market Expectations," **KPMG** presented their twenty-third annual survey of professionals "involved in developing economic forecasts or investment policies at sixty-one leading international financial institutions and investment organizations." Amongst many of the statistics included in the **KPMG** Survey was an average annual growth rate in the **CPI** of 2.4% per year from Calendar Year 1999 through 2008 (i.e., the following 10 years).

In their "2004 Summary of Economic and Capital Market Expectations" the **KPMG** Survey shows an average expected growth rate in the **CPI** of 2.5% per year from Calendar Year 2004 through 2013 (i.e., the following 10 years).

Survey of Professional Forecasters

On a quarterly basis the Federal Reserve Bank of Philadelphia publishes a Survey of Professional Forecasters.

This survey was formerly conducted by the American Statistical Association ("**ASA**") and the National Bureau of Economic Research ("**NBER**") and was known as the **ASA/NBER** survey. The survey began in 1968 and the Federal Reserve Bank of Philadelphia assumed responsibility for it beginning June 1990.

In the Fourth Quarter 1999 survey, published November 19, 1999, the forecasters expected long-term inflation, as measured by the 10-year average rate of growth in the **CPI**, to equal 2.5% per year for the next 10 years.

In the Fourth Quarter 2003 survey, published November 24, 2003, the forecasters expected long-term inflation, as measured by the 10-year average rate of growth in the **CPI**, to also equal 2.5% per year for the next 10 years.

In the Second Quarter 2005 Survey, published May 16, 2005, the forecasters expected long-term inflation, as measured by the 10-year average rate of growth in the **CPI**, to again equal 2.5% per year for the next 10 years.

Historical Average **CPI**

The compound average annual **CPI** over the 79-year period ending December 31, 2004 as reported by Ibbotson Associates, Inc. was approximately 3.0%.

Government Securities Yield Method - Historical Approach

The Government Securities Yield Method to estimate **CPI** argues that government bond investors establish the prices of their securities by seeking a total rate of return adequate to provide some **real** rate of return over **CPI**.

It is often assumed that government bond investors are seeking a **real** rate of return of approximately 3.0% per year for holding riskless, long-duration debt securities such as 30-year United States Treasury Bonds.

If so, then the total yield on 30-year Treasury Bonds as of June 30, 1999 of approximately 6.0% per year would suggest that investors believed at that time that **CPI** would average approximately 2.9% per year (i.e., [(1.06 divided by 1.03) minus 1.00], rounded) over the 30 years from that point.

Similarly, the total yields on a proxy for 30-year Treasury Bonds as of June 30, 2003, June 30, 2004 and June 30, 2005 of approximately 4.70% per year, 5.41% per year and 4.19% per year, respectively, would suggest that investors believed that **CPI** would average approximately 1.7% per year, 2.3% per year and 1.2% per year, respectively, over the 30 years from these points.

Over a shorter time horizon, intermediate-term government bond investors may be seeking a **real** rate of return of approximately 2.5% per year for holding riskless, intermediate duration debt securities such as 10-year Treasury Notes. If so, then the total yield as of June 30, 1999 on 10-year Treasury Notes of approximately 5.8% per year would suggest that investors believed at that time that **CPI** would average approximately 3.2% per year (i.e., [(1.058 divided by 1.025) minus 1.0], rounded) over the 10 years from that point.

Similarly, the total yield on 10-year Treasury Notes as of June 30, 2003, June 30, 2004 and June 30, 2005 of approximately 3.54% per year, 4.62% per year and 3.94% per year, respectively, would suggest that investors believed that **CPI** would average approximately 1.0%, 2.1% and 1.4% per year, respectively, over the 10 years from those points.

However, it should also be noted that over the past 79 years bond investors have almost never been correct in their expectations. The ex-post, implicit **real** rates of return that bond investors seem to have incorporated into the pricing of the government bonds they have held has varied from less than zero to over 10% per year.

For example, at the end of Calendar Year 1981, 10-year Treasury Notes were sold with a yield to maturity of approximately 14% per year, suggesting an expected **CPI** of at least 11% per year over the following 10 years. The actual **CPI** over those 10 years was approximately 3.9% per year.

Government Securities Yield Method - Inflation Indexed Bonds

In January 1997 the United States Treasury began selling Inflation-Indexed Treasury Bonds of durations ranging from five to 30 years. Note: The Treasury ceased sales of 30-year bonds (nominal and inflation-indexed) during Calendar Year 2002 but proxies for 30-year Treasury Yields are currently available. The Treasury recently announced plans to resume sales of 30-year bonds during Calendar Year 2006 at which time proxies should no longer be required.

These bonds are sold to provide an estimated real rate of return by indexing to the rate of inflation the coupons and principal repayments.

Consequently, since the advent of Inflation-Indexed Treasury Bonds, it is possible to ascertain the inflation expectations of such bond investors. In particular, given that Inflation-Indexed Treasury Bonds are reported at an expected real-dollar yield, comparing this expected real-dollar yield with the nominal-dollar yield available on regular Treasury Bonds can provide an estimate of the expectations of inflation of these bond investors.

As of June 30, 1999 the yields available on Nominal-Yield and Inflation-Indexed Treasury Bonds suggest that inflation over the 5 to 30 years from that point would be less than 2.0% per year as shown in the following table:

TABLE IIIA

Comparison of Treasury Yields as of June 30, 1999

Duration	Yield on June 30, 1999		Estimated Inflation Expectation#
	Inflation-Indexed Bonds*	Nominal-Yield Bonds*	
5 years	3.97%	5.65%	1.62%
10 years	4.01%	5.81%	1.73%
30 years	3.94%	5.97%	1.95%

* Bond-equivalent rates as reported by Bloomberg.

\# Equals [[(1.0 plus Nominal Bond Yield) divided by (1.0 plus Inflation-Indexed Bond Yield)] minus 1.0].

As of June 30, 2003 the yields available on Nominal-Yield and Inflation-Indexed Treasury Bonds suggest that inflation over the next 5 to 30 years from that point would be increasing but less than 2.3% per year as shown in the following table:

TABLE IIIB

Comparison of Treasury Yields as of June 30, 2003

Duration	Yield on June 30, 2003		Estimated Inflation Expectation**
	Inflation-Indexed Bonds*	Nominal-Yield Bonds*	
5 years	1.01%	2.46%	1.44%
10 years	1.90%	3.54%	1.61%
30 years	2.41%#	4.70%	2.24%

* As reported by U.S. Treasury.

** Equals [[(1.0 plus Nominal Bond Yield) divided by (1.0 plus Inflation-Indexed Bond Yield)] minus 1.0].

From U.S. Treasury estimate of Real Long-Term Rate Average for U.S. Treasury Securities of 10-plus year duration.

As of June 30, 2004 the yields available on Nominal-Yield and Inflation-Indexed Treasury Bonds suggest that inflation over the next 5 to 30 years from that point would be increasing and less than 3.0% per year as shown in the following table:

TABLE IIIC

Comparison of Treasury Yields as of June 30, 2004

Duration	Yield on June 30, 2004		Estimated Inflation Expectation**
	Inflation-Indexed Bonds*	Nominal-Yield Bonds*	
5 years	1.38%	3.81%	2.40%
10 years	2.10%	4.62%	2.47%
30 years	2.37%#	5.41%	2.97%

* As reported by U.S. Treasury.

** Equals [[(1.0 plus Nominal Bond Yield) divided by (1.0 plus Inflation-Indexed Bond Yield)] minus 1.0].

From U.S. Treasury estimate of Real Long-Term Rate Average for U.S. Treasury Securities of 10-plus year duration.

As of June 30, 2005 the yields available on Nominal-Yield and Inflation-Indexed Treasury Bonds suggest that inflation over the next 5 to 30 years from that point would be less than 2.5% per year as shown in the following table:

TABLE IIID

Comparison of Treasury Yields as of June 30, 2005

Duration	Yield on June 30, 2005		Estimated Inflation Expectation**
	Inflation-Indexed Bonds*	Nominal-Yield Bonds*	
5 years	1.41%	3.72%	2.28%
10 years	1.67%	3.94%	2.23%
20 years	1.79%	4.28%	2.45%
30 years	1.76%#	4.19%	2.39%

* As reported by U.S. Treasury.

** Equals [[(1.0 plus Nominal Bond Yield) divided by (1.0 plus Inflation-Indexed Bond Yield)] minus 1.0].

\# From U.S. Treasury estimate of Real Long-Term Rate Average for U.S. Treasury Securities of 10-plus year duration.

Regression Analysis

Regression analysis has shown that one of the better predictors of one year's **CPI** is the preceding year's **CPI.**

In their analysis of historical **CPI** statistics, Ibbotson Associates, Inc. has reported that those statistics indicate that **CPI** tends to follow a trend as opposed to a random walk, which is consistent with the comments in the preceding paragraph.

The following table presents the annual increases in the **CPI** from June 1990 to June 2005 on a Fiscal Year basis.

TABLE IV

RECENT CONSUMER PRICE INFLATION
FISCAL YEAR 1990 THROUGH FISCAL YEAR 2005

Fiscal Year*	CPI	3-Year Average CPI
1990	4.7%	4.6%
1991	4.7%	4.9%
1992	3.1%	4.2%
1993	3.0%	3.6%
1994	2.5%	2.9%
1995	3.0%	2.8%
1996	2.8%	2.8%
1997	2.3%	2.7%
1998	1.7%	2.3%
1999	2.0%	2.0%
2000	3.7%	2.5%
2001	3.2%	3.0%
2002	1.1%	2.7%
2003	2.1%	2.1%
2004	3.3%	2.2%
2005	2.5%	2.6%

* From June of prior year to June of year shown (i.e., Fiscal Year).

As Table IV shows, **CPI** has been in a general downtrend over the last 14 years (generally consistent over the last 10 years with some leveling or slight increasing in the last couple of years) with the three-year average of **CPI** running at an annual rate of approximately 2.6% for the three years ending June 30, 2005.

Possible Overstatement of Current **CPI** Statistics

Just a few years ago, many economists, as well as Federal Reserve Chairman Alan Greenspan, believed that reported **CPI** figures were overstated by as much as 1.5% per year due to the delays in rebalancing the market basket of goods and failure to recognize substitution in the determination of **CPI**.

Since that time the Bureau of Labor Statistics has made changes in the market basket weights and in methodology that has significantly reduced, but probably not eliminated, the **CPI** overstatement.

Combining Various Analyses

The Actuary believes that continuing an average **CPI** expectation of approximately 2.5% per year is reasonable based on a review of the following sources of information:

- 1999 **Wyatt Report** recommendation of between 2.0% per year and 3.0% per year.

- 2003 **GRS Report** recommendation of between 2.5% per year and 3.5% per year.

- 1999 and 2004 **KPMG** Survey forecasts of 2.4% and 2.5% per year, respectively.

- Fall 1999, Fall 2003 and Spring 2005 Surveys of Professional Forecasters long-term inflation expectations of approximately 2.5% per year in each summary.

- Historical average **CPI** of 3.0% per year.

- Recently-reported **CPI** running at a rate of approximately 2.5% per year for Fiscal Year 2005 and at an average of approximately 2.6% per year over the most recent three Fiscal Years.

- Possible, modest overstatement in currently reported **CPI**.

- Long-term Treasury Bond investor expectations from June 30, 2003, June 30, 2004 and June 30, 2005 of:

  - 1.7% per year from June 30, 2003, 2.3% per year from June 30, 2004 and 1.2% per year from June 30, 2005 (based on annual real yields of 3.0% per year).

  - 2.2% per year from June 30, 2003, 3.0% per year from June 30, 2004 and 2.4% per year from June 30, 2005 (based on the relationship between Nominal-Yield and Inflation-Indexed Yield Treasury Bonds).

Summary

The Actuary believes 2.5% per year remains a reasonable **CPI** assumption to use in the development of the other economic assumptions and proposes its continuation.

C. General Wage Increase Component of Salary Scale

The Actuary currently assumes a **GWI** of 3.0% per year for **BERS**, consisting of 2.5% per year for **CPI** and 0.5% per year for real wage growth. This assumption for **GWI** has been in effect since Fiscal Year 2000.

The **GRS Report** recommends that the real wage growth component of the **GWI** be in the range of .50% per year to 1.0% per year.

Although a real wage growth component of approximately 1.0% per year would be more consistent with expected nationwide trends, the Actuary believes that real wage growth for active members of the five **NYCRS** is likely to be less than the national and local, private industry averages.

In particular, the Actuary believes that real wage growth for New York City government workers may be restrained but is not likely to be much below the current assumption of .50% per year over the longer term. Therefore, the Actuary proposes continuing to use a real wage growth component of .50% per year which is at the bottom of the range recommended by **GRS**.

Applying the Building Block methodology to develop an assumption for **GWI**, the Actuary proposes combining a **CPI** assumption of 2.5% per year and a real wage growth increase assumption of .50% per year to create a **GWI** assumption of 3.0% per year (i.e., [(1.025 times 1.005) minus 1.000], rounded).

D. Merit Increase Component of Salary Scale

Separate from the development of the **GWI** component of the Salary Scale, an estimate must be made of the Merit Increase component of the Salary Scale (i.e., that portion of the salary increase attributable to the individual's progression of age and service (e.g., longevity increases, promotion increases, step increases, performance increases, etc.)).

In their review, **GRS** recommends revising the existing Merit Increase component of the Salary Scale for **BERS**.

The Actuary is proposing changes in the Merit Increase component of the total Salary Scale for **BERS** including revising the Salary Scale from an age-based to a service-based table.

The following Table V presents at five-year intervals the Merit Increase component of the service-related Salary Scale proposed by the Actuary:

TABLE V

MERIT INCREASE COMPONENT OF SALARY SCALE*

Service	Current#	Proposed
0	2.08%	5.00%
5	1.67%	2.50%
10	1.47%	2.00%
15	1.51%	1.50%
20	1.43%	1.50%
25	1.27%	1.50%
30	1.23%	1.50%
35	1.13%	1.50%
40	1.03%	1.50%

* Table is based on years of service. Percentages llustrated are those for year following service shown (i.e., service equal to five is the sixth year of employment). The same percentages are used for males and females. The total Salary Scale at each year of service is developed using arithmetic methodology and equals the Merit Increase component plus the **GWI** assumption of 3.0% per year.

\# Current rates are age based. Rates shown here are the service-based rates equivalents of the age-based rates that were developed by **GRS** using group demographics from Fiscal Years 1998 to 2001.

It should be noted that the particular five-year intervals presented in Table V do not always provide an adequate overview of the pattern of the Merit Increase component of the Salary Scale. The entire range of year-by-year proposed Merit Increases is presented in Appendix D.

Combining the Merit Increase component of the Salary Scale with the **GWI** component of the Salary Scale creates the total expected rates of salary increase for each year of service.

A year-by-year detailed presentation of the proposed Merit Increase component of the Salary Scale and the total Salary Scale are provided in Appendix D.

It should be noted that the Actuary has chosen to develop year-by-year rates of salary increase in the proposed Salary Scale by adding the **GWI** and Merit Increase, rather than by using compounding methodology. The Actuary feels this makes it easier to understand the construction of the Salary Scale, is consistent with the development of the underlying experience data and does not materially impact the assumptions.

E. Actuarial Interest Rate Assumption

The **AIR** assumption is used in the calculation of the Actuarial Present Value of Benefits and other actuarial values dependent upon the time value of money.

The **AIR** assumption is usually established based upon an expected rate of return on assets with a possible adjustment for adverse deviation.

To develop an appropriate **AIR** assumption, an expectation must be developed for the possible future rates of return on assets. Toward that end, and keeping in mind the guidelines of the Actuarial Standards Board, the Actuary has reviewed:

- The recent, actual investment performance of the assets of the five actuarially-funded **NYCRS**.

- The long-term performance of the U.S. capital markets.

- The expectations for future performance of the capital markets and, therefore, the expected investment returns for **BERS** taking into account anticipated asset allocation.

- The relationships in the actuarial valuation model among assumed **CPI**, **GWI**, individual salary increases and total rates of investment return.

Actual Investment Performance in Recent Years

Reviewing the investment performance for all five actuarially-funded **NYCRS** provides some insight into the impact of diversification of assets. **NYCERS**, **POLICE** and **FIRE** have included equities in their asset allocations since the 1970's, whereas the Fixed Benefit Program portions of **TRS** and **BERS** were invested entirely in fixed income securities prior to Fiscal Year 1991.

Appendix A shows that all five actuarially-funded **NYCRS** achieved average annual rates of investment return on a market value basis over the 23 fiscal years ending June 30, 2005 in excess of the current **AIR** assumption of 8.0% per annum.

The best-performing fund was **POLICE**, which is well diversified and achieved a 23-year compound average annual rate of return of 11.72% (10.46% after the transfer ("SKIM") to the Variable Supplements Funds).

Particularly impressive were the returns for Fiscal Years 1995 to 1999. The annual compound rates of return during this period averaged about 18% per year for the five **NYCRS**.

Just as impressive but, unfortunately, in the opposite direction, were the returns for Fiscal Years 2001 to 2003. The annual compounded rates of return during this period averaged between negative 4% and negative 5% (i.e., -4% to -5%) per year for the five **NYCRS**.

The returns received by equity and bond investors over the past 23 years (particularly, some of the recent periods) are not representative of the levels of returns that have been obtained over similar time periods in the past. For this reason, consideration will also be given to the longer-term performance of the U.S. capital markets.

Longer-Term Historical Performance of U.S. Capital Markets

As noted earlier in this report, recent investment performance of the actuarially-funded **NYCRS** has been favorable. However, this performance may not be sustainable. Therefore, a review of longer-term historical performance of the U.S. capital markets is appropriate.

Reviewing rate of return data on the U.S. capital markets for the period from 1926 to 2004, as compiled by Ibbotson Associates, Inc., the data show that long-term government bonds returned a compound annual rate of return of 5.4% over the 79-year period ending December 31, 2004. Long-term corporate bonds, over the same period, returned a compound annual rate of return of 5.9%.

The **real** rate of return for an asset is defined as the excess of the rate of return on that asset over the rate of **CPI**.

The annualized rate of **CPI** for the 79-year period ending December 31, 2004 equaled approximately 3.0%.

Comparing the compound annual rate of return of approximately 5.9% for long-term corporate bonds with the annualized rate of **CPI** of approximately 3.0%, the long-term compound annual **real** rate of return for long-term corporate bonds is calculated to equal approximately 2.8% over this period.

Equities, as represented by the Standard & Poor's 500 Index, returned a compound annual rate of return of approximately 10.4% for the 79-year period ending December 31, 2004. Thus, equities have earned a compound annual **real** rate of return of approximately 7.2% over this period.

Over more recent periods, specifically the 10-year and 5-year periods ending December 31, 2004, **real** rates of return on bonds have been considerably higher. For example, the compound annual **real** rates of return on long-term corporate bonds have been approximately 6.9% for this 10-year period and approximately 8.0% for this 5-year period.

However, where bonds have performed well during recent periods, the compound annual **real** rates of return on equities have been volatile during the last 10 calendar years and even more so during the last 5 calendar years. Specifically, the corresponding compound annual **real** rates of return on equities have been 7.2% for this 10-year period and 4.7% for this 5-year year period.

Real rates of return are volatile on a year-by-year basis. **Real** rates of return over periods of 5 years or 10 years vary significantly, reflecting the economic characteristics of the particular period selected. **Real** rates of return are more stable and consistent the longer the time periods measured.

Thus, **real** rates of return for any particular historical period may not provide reliable estimates of future performances.

Expectations for Future Performance of Capital Markets

Using the information on **real** rates of return measured over the 79 years ending December 31, 2004 can be used to help smooth out the distortions that can occur in measuring rates of return over shorter periods when either bull markets or bear markets predominate.

However, even the 79-year period may be flawed as a predictor of future **real** rates of return on bonds. The period since 1925 has been marked by recurring periods of inflation during which **real** rates of return on bonds were low or negative. Unless an escalating inflationary environment is predicted to recur in the future, **real** rates of return on bonds may reasonably be expected to be higher in the future than the 2.8% compound annual **real** rate of return computed for long-term corporate bonds for the 79-year period ending December 31, 2004.

Although there is general consensus among investment professionals that the future **real** rate of return on bonds may be expected to exceed the long-term historical average, there is not unanimous agreement on what the best estimate of the **real** rate of return should be for the future.

It may also be argued that the 7.2% compound annual **real** rate of return for equities for the 79-year period ending December 31, 2004 may be above long-term expectations since the period ending December 31, 2004 represents a point in time at which stocks were still at relatively high Price/Earnings ("**P/E**") levels after an extended period of above average performance in the 1980s and 1990s, even when followed by poor performance during parts of Calendar Years 2000, 2001, 2002 and 2003.

For example, the average dividend yield (i.e., ratio of annual dividend payout to current price) on the Standard and Poor's 500 Stock Index ("**S&P 500**") has been under 2.0% for some time. This dividend yield is historically low and, when low in the past, the equity markets have tended to underperform the historical averages in following years.

In addition, the **P/E** ratio of equities (using the **S&P 500** as a proxy and prior year earnings) was approximately 36 on June 30, 1999. As of December 31, 2004, the **P/E** ratio for the **S&P 500** was approximately 18. These ratios compare with a long-term, historical average **P/E** ratio of approximately 15.

In order to return immediately to the historical average **P/E**, the **S&P 500** would have to decline approximately 15% from its December 31, 2004 level.

Related analyses, such as that published in a 1993 article in the Journal of Portfolio Management by William Reichenstein and Steven P. Rich, building upon prior work by Eugene Fama and others, suggest that either dividend to price ratios or earnings to price ratios are better predictors of future returns on equities than are historical average returns.

This work and that of other authors suggest that long-term **real** rates of return have a tendency to "revert to the mean" and, given that **real** rates of return over the recent past 20 years (even with the poor performance of portions of Calendar Years 2000 to 2003) have exceeded the long-term averages, **real** rates of return over the near future may tend to underperform the recent past and the long-term averages.

The further investment policy diversification since 1999 of **BERS** assets into private equities and real estate does offer somewhat greater expectations for investment return than a portfolio limited to only large-capitalization U.S. equities.

For the purpose of establishing an **AIR** assumption, the objective is to develop a **real** rate of return that is attainable over the lifetimes of the current members of the retirement system, typically 30 to 50 years. This is the period of time during which most of the contributions are made, assets accumulate and benefits are disbursed for the current members of the retirement system who are included in the actuarial valuations.

Taking into account recent and long-term historical investment performance, and adjusting that long-term historical information to reflect possible differences in the future, the Actuary still believes that bond portfolios comparable to those of the **NYCRS** can earn a long-term, compound **real** rate of return between 3.3% per year and 3.8% per year and equities[2] can earn a compound **real** rate of return between 5.5% per year and 6.0% per year from June 30, 2004.

Relationship of Economic Components of Actuarial Assumptions and Development of an **AIR** Assumption

An **AIR** assumption can now be developed by relating this information on **real** rates of return to the other economic components of the actuarial assumptions.

[2] Note: The term equities as used henceforth in this Report is intended to refer to a well-diversified portfolio of equity and equity-type securities. Such a portfolio would include more than just large-capitalization U.S. equities and should include one or more, but need not include all, of the following: international equities (developed and/or emerging international markets), small capitalization equities, alternative investment types (e.g., private equity, venture capital) and/or equity real estate.

The five actuarially-funded **NYCRS** may be considered as investing essentially in two broad asset classes: equities and bonds. As such, a reasonable expectation for the long-term future performance of these Retirement Systems can be based upon the future, expected performance of equities and bonds, applied in proportion to the percentages that these asset classes represent in the portfolios and adjusted for the diversification effect.

BERS currently has an Investment Policy establishing an asset allocation for the Fixed Benefit Program providing that 70% of its investments be held in equities and 30% in bonds. Assuming that the future expectations for **real** rates of return for bonds and equities are similar to those suggested earlier (i.e., between 3.3% and 3.8% per year for bonds and between 5.5% and 6.0% per year for equities), the Actuary believes a **real** rate of return assumption (gross of expenses) of approximately 5.4% per year is appropriate.

Note, this **real** rate of return falls near the upper end of the implicit range recommended by **GRS**. This estimated implicit **real** rate of return (adjusted for estimated expenses and computed arithmetically in excess of inflation) ranges between 4.5% per year and 5.5% per year.

Consistent with the **GRS** comment that the current economic assumptions used for the **NYCRS** are at the "optimistic end of the range," it should also be noted that few, if any, major Public Employee Retirement Systems (other than the **NYCRS**), utilize a **real** rate of return assumption of 5.0% per year or greater.

When establishing an **AIR** assumption it is important to handle consistently the economic assumptions used in the actuarial valuation. In particular, the **AIR** assumption should be based upon the same underlying **CPI** assumption as that used in the assumption for salary increases.

As described earlier in this Section, the Actuary believes a long-term projection for **CPI** of 2.5% per year is reasonable at this time. This figure is at the lower end of the range recommended by **GRS** (i.e., **GRS** recommended a **CPI** assumption between 2.5% per year and 3.5% per year).

By combining a **CPI** assumption of 2.5% per year with a **real** rate of return assumption of 5.4% per year for a portfolio anticipated to be invested 70% in equities and 30% in bonds, the total expected rate of return on investments equals 8.04% per year using the mathematics of compounding (i.e., 8.04% equals (1.025 times 1.054 minus 1.0)).

Assuming the Actuary does not choose to provide for any adverse deviation from expected rates of return and that all Administrative Expenses and Investment Expenses are handled explicitly, then this total expected rate of return on investments could justify an **AIR** assumption of 8.0% per annum.

F. Investment Expenses

IMPORTANT: It should be noted that the **AIR** assumption developed above presumes that investment and/or any other expenses from **BERS** would be insignificant, would be paid separately or would be reimbursed concurrently.

With respect to Investment Expenses, which are currently being deducted from the assets of the Fund, the Actuary proposes that these expenses continue to be recovered with interest in the following Fiscal Year.

Explicitly, in conjunction with the other changes proposed in this Report (particularly the proposal to utilize a **One-Year Lag** methodology), the Actuary proposes that Investment Expenses incurred during one Fiscal Year be recovered with interest in the second Fiscal Year following the year of expenditure.

Because the Investment Expenses paid during Fiscal Year 2004 were already recovered with interest during Fiscal Year 2005, it is not necessary to recover those expenses again, during Fiscal Year 2006, under the **One-Year Lag** methodology.

Fiscal Year 2005 expenses would be recovered, under the proposed **One-Year Lag** methodology, with two years of interest, during Fiscal Year 2007.

SECTION VII - OTHER ACTUARIAL ASSUMPTIONS AND METHODS

A. Conversions into Variable Annuities at Retirement

The **Wyatt Report** recommended that calculations of actuarial liabilities for **BERS** include the impact of the actuarial losses that are sustained whenever members choose to convert at retirement all or portions of the their **ASF** account balances or **ITHP** Reserves into variable annuities.

GRS did not explicitly discuss this methodology and the Actuary continues to agree with the appropriateness of recognizing actuarial losses that occur upon the conversion of member **ASF** account balances and **ITHP** Reserves into variable annuities at retirement.

The Actuary has developed estimates of the financial impact of this issue upon **BERS** by reviewing the percentage of active member variable account balances that have been converted in the past and by estimating the actuarial loss per dollar of account balance converted.

B. Actuarial Cost Method and Unfunded Actuarial Liabilities

With the proposed continuation of the **AIR** assumption of 8.0% per annum, the Actuary also proposes continuation of the current Frozen Initial Liability (**"FIL"**) Actuarial Cost Method with the Initial Liability of $0 originally established as of June 30, 1999 and the existing additional Unfunded Actuarial (Accrued) Liability (**"UAL"**) established since that time.

C. Liability Recognition

The Actuary proposes, as an integral part of the proposed changes in actuarial assumptions and methods, that all liabilities of the Fund be recognized.

To do so, it is necessary to eliminate the current 10-year phase-in period set forth in **Chapter 278/02** for funding liabilities attributable to **Chapter 125/00** that was enacted during Calendar Year 2000 and provided for certain supplementation benefits and automatic Cost-of-Living Adjustments ("**COLA**").

Failure to recognize all liabilities in the funding process results in understated employer contributions, postponing such funding to the future and stretching the principles of intergenerational equity.

D. **One-Year Lag** Methodology

The Actuary is proposing that the actuarial assumptions and methods presented herein be effective for determining Fiscal Year 2006 employer contributions based on the same June 30, 2004 actuarial valuation date that was used to determine Fiscal Year 2005 employer contributions. This will be referred to as "**One-Year Lag**" methodology.

On an ongoing basis, the **One-Year Lag** methodology would use a June 30, XX-2 actuarial valuation instead of a June 30, XX-1 actuarial valuation to determine Fiscal Year XX employer contributions.

In the short run, the use of the **One-Year Lag** methodology helps mitigate the increases in employer contribution attributable to the proposed actuarial assumptions and the recognition of all liabilities.

The primary benefit of the use of the **One-Year Lag** methodology is that it would bring more certainty to the budgeting processes of the employers participating in **BERS**.

Specifically, rather than contributing on an estimated basis throughout a Fiscal Year and then receiving (near the end of a Fiscal Year) a "true-up" letter with their final employer contribution for that Fiscal Year that could differ significantly from the estimate, each employer would be provided with their expected employer contribution in advance of a Fiscal Year.

Except for changes due to legislative requirements and/or the impact of labor contract settlements with retroactive impact, their expected employer contributions would not change.

E. Actuarial Asset Valuation Method

The Actuary currently utilizes a Five-Year Average of Market Values **AAVM** to determine the Actuarial Asset Value ("**AAV**") to be used in the actuarial valuations of **BERS** as of each June 30.

Under this methodology Expected Investment Returns ("**EIR**") (i.e., investment returns equal to the amount that would be earned if the **AAV** earned the **AIR**) are recognized in the **AAV** immediately.

UIR (i.e., investment returns greater or less than the amount that would have been earned if the **AAV** earned the **AIR**) are currently phased into the **AAV** at a rate of 10%, 15%, 20%, 25% and 30% per year (i.e., cumulative rates of 10%, 25%, 45%, 70% and 100% over five years).

The purpose of an **AAVM** is to reduce the impact of short-term fluctuations in the value of assets used as of each June 30 actuarial valuation date and, consequently, the volatility in employer contributions for the following Fiscal Year.

As of June 30, 2004, as part of the package of proposed changes in actuarial assumptions and methods, the Actuary proposes to base the **AAV** on a Six-Year Average of Market Values.

Under this revised **AAVM**, **UIR** would be phased into the **AAV** at a rate of 15%, 15%, 15%, 15%, 20% and 20% per year (i.e., cumulative rates of 15%, 30%, 45%, 60%, 80% and 100% over six years).

The Actuary proposes that the revised averaging factors be applied against the **UIR** computed under the current **AAVM** and that the revised **AAV** be utilized first as of the June 30, 2004 actuarial valuation to determine the Fiscal Year 2006 employer contribution in conjunction with the **One-Year Lag** methodology.

An important reason for this proposed revision in the **AAVM** is that the New York City economic cycle often runs more than five years, and, given that both the amounts of Retirement System assets and Wall Street profits (and, hence, New York City tax revenues) depend heavily on the equity markets, spreading the **UIR** over a time-period somewhat greater than five years would help reduce the negative correlation between tax revenue and employer contribution requirements.

In addition, under the proposed **AAVM**, the maximum amount of **UIR** phased-in during any one year would not exceed 20% versus a maximum amount phased-in of 30% under the current **AAVM**.

As a consequence of the lesser maximum phase-in of **UIR** in any one year, use of the proposed **AAVM** would reduce the volatility of employer contributions.

Note: In conjunction with the proposed **One-Year Lag** methodology, the proposed six-year **AAVM** would result in each Fiscal Year **UIR** being phased into the calculation of employer contributions over a total of seven Fiscal Years and, as noted earlier, at a rate not greater than 20% in any year.

F. Administrative Expenses

The Actuary proposes continuing the current practice of recovering with interest any Administrative Expenses incurred by the Retirement System.

In conjunction with the **One-Year Lag** methodology, Administrative Expenses for a Fiscal Year would be recovered with two years interest in the second following Fiscal Year (e.g., Fiscal Year 2005 expenses would be recovered in Fiscal Year 2007).

However, as an additional consequence of introducing the **One-Year Lag** methodology, in a manner similar to the discussion on the recovery of Investment Expenses in Section VI.F, Administrative Expenses for Fiscal Year 2004 have already been recovered with interest during Fiscal Year 2005 and need not be recovered again during Fiscal Year 2006.

SECTION VIII - FINANCIAL IMPACT

The following Table VI presents the estimated financial impact on the Fiscal Year 2006 employer contribution of the proposals presented in this Report:

TABLE VI

ESTIMATED FINANCIAL IMPACT OF PROPOSED CHANGES IN ACTUARIAL ASSUMPTIONS AND METHODS

Estimated Fiscal Year 2006 Employer Contribution	Amount (Millions)	
Before Proposals*		$109
Changes on Account of Proposals:		
• Revised **Assumptions**		
•• Demographic	$ (2)	
•• Salary Scale	3	
Subtotal	$ 1	
• Recognition of **All Liabilities**	7	
• **One-Year Lag** Methodology		
•• Basic Methodology	(7)	
•• Expense Transition*#	(10)	
• Revised **AAVM**	(10)	
Total Proposals		(19)
After Proposals#		$90

* Equals estimated employer contribution for Fiscal Year 2006 based upon the census data used for the June 30, 2004 actuarial valuation and projected new entrants to June 30, 2005 and on current actuarial assumptions and methods.

*# Represents one-time, for Fiscal Year 2006 only, transition reduction due to not needing to reimburse Fiscal Year 2004 expenses during Fiscal Year 2006 as such expenses were already reimbursed during Fiscal Year 2005 under current actuarial methodology. Fiscal Year 2005 expenses will be reimbursed during Fiscal Year 2007.

Equals estimated employer contribution for Fiscal Year 2006 based upon census data used for the June 30, 2004 actuarial valuation and on proposed actuarial assumptions and methods, including **One-Year Lag** methodology.

It should be noted that the estimates of the total change in the Fiscal Year 2006 employer contributions may be fairly developed. However, the allocation of the total change to its component parts may not be particularly precise.

In addition, the final Fiscal Year 2006 employer contribution for **BERS** may differ somewhat from the estimates presented in Table VI.

For example, benefit provisions to be funded during Fiscal Year 2006 may change depending upon further actions of the New York State Legislature and the Governor. Salary adjustments for labor organizations that currently do not have settled contracts may not follow the pattern established by those that have settled.

SECTION IX - FINDINGS AND PROPOSALS

As discussed earlier in this Report, the objective of actuarial methodology is to estimate the value of benefits to be paid to the participants and to allocate over time the financing of those benefits.

Actuaries develop contribution levels by using a combination of: (1) actuarial assumptions, (2) Actuarial Cost Methods, (3) amortization methods and periods for paying off any Unfunded Actuarial Liabilities and (4) Actuarial Asset Valuation Methods. Each of these components exerts a significant impact on the calculated level of employer contributions.

This Report proposes following a philosophy of financing benefits over the working lifetime of the employees who earn them, thus maintaining "intergenerational" equity.

This Report also notes that guidelines of professional conduct for actuaries emphasize that in the development of actuarial assumptions, primary emphasis should be placed on the combined impact of all actuarial assumptions, but the reasonableness of each actuarial assumption should be considered independently.

With respect to the Actuarial Interest Rate assumption, the Actuary proposes that **BERS** retain its current **AIR** assumption of 8.0% per annum. This proposal is appropriate only if any Investment Expenses are paid separately and concurrently.

It is also intended that benefits payable to members not be increased from current levels and not be affected by the proposed changes to actuarial assumptions and methods.

The Actuary proposes changes in certain demographic and economic assumptions and proposes changes in certain actuarial methods.

The Actuary proposes that the **FIL** Actuarial Cost Method be continued with the Initial Liability (i.e., zero) originally established as of June 30, 1999 and the existing additional **UAL** established since that time.

The Actuary proposes that all liabilities be recognized.

The Actuary proposes that a **One-Year Lag** methodology be adopted.

Further, the Actuary proposes to introduce a Six-Year Average of Market Values ("**AAVM**") effective June 30, 2004 using the **UIR** determined under the current **AAVM** for Fiscal Years prior to Fiscal Year 2005 and that the proposed **AAVM** be used in conjunction with the **One-Year Lag** methodology to determine Fiscal Year 2006 and later employer contributions.

Since additional review of certain technical issues may identify alternative approaches that are preferable, the Actuary requests discretion to make minor adjustments during the legislative process to the extent necessary to better implement the intent of these proposed changes in actuarial assumptions and methods.

Legislation implementing any proposed changes in the **AIR** assumption must also specify the period for which the assumption will be used. Following past practice, but recognizing that the major elements of these proposed changes in actuarial assumptions and methods were not made effective as of Fiscal Year 2005, four years (i.e., Fiscal Year 2006 to Fiscal Year 2009) is the proposed period of time to include in the legislation. This represents a reasonable period of time between planned reviews of this assumption.

Finally, it should be emphasized that the proposed changes in actuarial assumptions and methods presented in this Report are an interconnected **package**, the individual components of which may not be revised without consideration of probable revision to other components.

APPENDIX A - RECENT HISTORY OF INVESTMENT RETURNS

The following table presents information on rates of investment return earned by the five actuarially-funded **NYCRS** during the past 23 years:

TABLE VII

NEW YORK CITY RETIREMENT SYSTEMS

RATES OF INVESTMENT RETURN BASED ON MARKET VALUE*
FISCAL YEAR 1983 THROUGH FISCAL YEAR 2005
BY RETIREMENT SYSTEM

YEAR ENDED	NYCERS**	TRS	BERS	POLICE**	FIRE**
6/30/83	31.09%	25.33%	27.20%	36.28% 33.21	33.55% 30.34
6/30/84	-1.85	2.20	2.20	-1.49	-2.49
6/30/85	27.08	20.89	18.74	26.00 25.20	23.07 23.07
6/30/86	22.70	17.89	16.77	26.10 15.76	23.70 13.77
6/30/87	11.10	4.43	5.46	13.80 8.51	13.40 8.32
6/30/88	3.60	7.70	8.26	1.80	2.50
6/30/89	15.90	12.92	13.22	16.00	15.90
6/30/90	10.00 9.95	7.40	6.90	10.70 10.38	11.30 10.08
6/30/91	8.80	12.80	10.70	8.30	8.40
6/30/92	14.70 14.57	14.00	14.90	14.30 13.58	13.40 12.80
6/30/93	15.30 15.04	14.20	14.10	14.00 12.48	14.30 10.15
6/30/94	1.80	0.30	0.80	1.00	1.20
6/30/95	19.20	17.70	18.60	18.30 13.80	18.40 14.66
6/30/96	17.94	15.00	16.60	17.76 13.54	17.46 16.09
6/30/97	22.37	20.42	20.84	22.23	22.49
6/30/98	21.29	19.66	19.13	19.96	19.17
6/30/99	13.47	12.97	13.95	12.68	12.63
6/30/00	9.43 9.19	9.92	9.52	9.30	8.30
6/30/01	-8.30	-8.20	-8.61	-8.24	-8.00
6/30/02	-8.64	-8.05	-7.64	-7.87	-8.53
6/30/03	3.94	4.01	4.39	2.99	4.11
6/30/04	16.30	15.87	16.35	17.04	16.93
6/30/05	9.22	10.63	10.20	10.28	10.88
23-Year Compound Average Return	11.55% 11.52%	10.53%	10.64%	11.72% 10.46%	11.36% 10.16%

* Annual and compound performance figures for Fiscal Years ending June 30, 1983 through June 30, 1989 were taken from the October 1989 Report on **AIR** by Buck Consultants, Inc. Figures for Fiscal Years ending June 30, 1990 through June 30, 2005 were taken from Reports issued by the Office of the Comptroller of the City of New York.

** Figures shown are before and after SKIM to Variable Supplements Funds during years in which there were such SKIM payments of material amounts.

APPENDIX B - RECENT HISTORY OF ECONOMIC ASSUMPTIONS USED IN ACTUARIAL VALUATIONS

The economic assumptions used in the actuarial valuations for determining employer contributions of **BERS** over the past 25 years are illustrated in the following table:

TABLE VIII

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

ECONOMIC ASSUMPTIONS USED IN ACTUARIAL VALUATIONS FOR DETERMINING EMPLOYER CONTRIBUTIONS

Actuarial Valuation		Actuarial Interest Rate	General Wage Increase*
As of June 30	For Fiscal Years		
1980-1981	1981-1982	7.50%	6.00%
1982-1984	1983-1985	8.00%	6.50%
1985-1987	1986-1988	8.00%	6.00%
1988	1989	8.25%	6.00%
1989	1990	8.25%	5.50%
1990-1994	1991-1995	9.00%	5.50%
1995-1998	1996-1999	8.75%	4.00%
1999-2004#	2000-2005	8.00%	3.00%
2004-2007 Proposed#	2006-2009 Proposed	8.00%	3.00%

* In addition to the **GWI** shown, the total Salary Scale includes an additional Merit Increase component.

Due to **One-Year Lag**, there are two actuarial valuations as of June 30, 2004.

In terms of recent legislation, these **AIR** assumptions were established in several New York State Chapter laws.

Chapter 948 of the Laws of 1990 and Chapters 607, 608 and 610 of the Laws of 1991 increased from 8.25% per annum to 9.00% per annum (8.50% per annum for **POLICE** and **FIRE**) the statutory rate of interest to be used by the Actuary for Fiscal Years 1991 through 1995 (for use in the actuarial valuations as of June 30, 1990 through June 30, 1994) in valuing pension liabilities to compute employer contributions to the five actuarially-funded **NYCRS**.

Chapter 249 of the Laws of 1996 updated the **AIR** assumption to 8.75% per annum for all of **NYCRS** except **POLICE**. Chapter 598 of the Laws of 1996 extended for Fiscal Year 1996 the use of an **AIR** assumption of 8.50% per annum for **POLICE**. Chapter 157 of the Laws of 1997 established the **AIR** assumption for **POLICE** at 8.75% per annum for Fiscal Years 1997 to 2000.

Chapter 85 of the Laws of 2000 superseded (for Fiscal Year 2000) Chapter 249 of the Laws of 1996 and Chapter 157 of the Laws of 1997 and established an **AIR** assumption of 8.0% per annum for all the **NYCRS** effective for Fiscal Years 2000 to 2004.

Chapter 133 of the Laws of 2004 extended to Fiscal Year 2005 the **AIR** assumption of 8.0% per annum for all of the **NYCRS**.

Chapter 133 of the Laws of 2005 further extended to Fiscal Year 2006 the **AIR** assumption of 8.0% per annum for all of the **NYCRS**.

With respect to the future, pursuant to Section 13-638.2(e) of the **ACNY**, the Boards of Trustees of the actuarially-funded **NYCRS** are charged with submitting to the Governor, Leaders of the New York State Legislature, Superintendent of Insurance, Chairman of the Permanent Pension Commission (which no longer exists), Mayor of the City of New York and the Council of the City of New York written recommendations as to the **AIR** assumption and the period for which it shall be effective.

ACNY Section 13-638.2 as currently written requires these recommendations be provided for the Fiscal Year beginning July 1, 2006 (i.e., Fiscal Year 2007).

The proposals in this Report would meet these requirements and, given that no change is proposed in the **AIR** assumption, would also be effective for determining the employer contributions for Fiscal Year 2006.

APPENDIX C - ACTUARIAL INTEREST RATE ASSUMPTIONS USED BY CORPORATE PENSION PLANS AND PUBLIC EMPLOYEE RETIREMENT SYSTEMS

As noted earlier in this Report, the appropriateness of any individual actuarial assumption should be evaluated in relation to the actuarial assumptions in the aggregate.

The determination of employer contributions depends upon the combined effect of the actuarial assumptions, the Actuarial Cost Method, the period of time and method chosen to amortize any Unfunded Actuarial Liabilities and the **AAVM**.

How the individual **AIR** assumption for one pension plan compares with the average **AIR** used by all pension plans is an interesting but not necessarily important or useful fact for determining the appropriateness of that individual assumption for any individual pension plan.

Nevertheless, knowing how the proposed **AIR** assumption compares with the averages does provide a certain perspective.

In a study entitled "2003 Survey of Actuarial Assumptions and Funding," the 35th such annual survey, **Wyatt** reports an average **AIR** assumption of 8.1% per annum being used to determine employer contributions for over 500 corporate pension plans.

In its "2004 Wilshire Report on City & County Retirement Systems: Funding Levels and Asset Allocations," Wilshire Associates Incorporated reports an average **AIR** assumption of 7.9% per annum for over 100 Public Employee Retirement Systems, with approximately 50% of those Retirement Systems reporting an **AIR** assumption of 8.0% per annum.

Thus, the continued use of an **AIR** assumption of 8.0% per annum would place **BERS** near the median for both Public Employee Retirement Systems and corporate pension plans.

In addition, with respect to other Public Employee Retirement Systems within New York State, it may be noted that the New York State Teachers' Retirement System ("**NYSTRS**") has been using an **AIR** assumption of 8.0% per annum for many years.

In addition, the New York State and Local Retirement Systems ("**NYSLRS**"), which includes both the New York State and Local Employees' Retirement System and the New York State Police and Fire Retirement System, has been utilizing an **AIR** assumption of 8.0% per annum during the last few years.

Thus, the proposed **AIR** assumption herein is also consistent with that in use for other, major New York State Retirement Systems.

APPENDIX D - TABLES OF PROPOSED DEMOGRAPHIC AND SALARY SCALE ASSUMPTIONS

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

PROBABILITIES OF MORTALITY AFTER SERVICE RETIREMENT RECOMMENDED BY THE ACTUARY

BASE TABLES*

Age	Males	Females	Age	Males	Females
19	0.0383%	0.0188%	65	2.3625%	1.2009%
20	0.0396%	0.0198%	66	2.5578%	1.3133%
21	0.0412%	0.0211%	67	2.7531%	1.4410%
22	0.0428%	0.0223%	68	2.9484%	1.5791%
23	0.0445%	0.0236%	69	3.1437%	1.6886%
24	0.0466%	0.0251%	70	3.3390%	1.7955%
25	0.0487%	0.0266%	71	3.5931%	2.0139%
26	0.0512%	0.0281%	72	3.8472%	2.2323%
27	0.0539%	0.0298%	73	4.1013%	2.4507%
28	0.0569%	0.0317%	74	4.3554%	2.6691%
29	0.0601%	0.0336%	75	4.6095%	2.8875%
30	0.0637%	0.0359%	76	5.2521%	3.2613%
31	0.0677%	0.0382%	77	5.8947%	3.6351%
32	0.0721%	0.0407%	78	6.5373%	4.0089%
33	0.0771%	0.0435%	79	7.1799%	4.3827%
34	0.0824%	0.0465%	80	7.8225%	4.7565%
35	0.0903%	0.0500%	81	8.6016%	5.2920%
36	0.0952%	0.0527%	82	9.3807%	5.8275%
37	0.1014%	0.0563%	83	10.1598%	6.3630%
38	0.1091%	0.0602%	84	10.9389%	6.8985%
39	0.1184%	0.0648%	85	11.7180%	7.4340%
40	0.1300%	0.0698%	86	12.9381%	8.4777%
41	0.1884%	0.0759%	87	14.1582%	9.5214%
42	0.2468%	0.0842%	88	15.3783%	10.5651%
43	0.3052%	0.0945%	89	16.5984%	11.6088%
44	0.3636%	0.1071%	90	17.8185%	12.6525%
45	0.4220%	0.1222%	91	19.6407%	14.1323%
46	0.4804%	0.1397%	92	21.4045%	15.5897%
47	0.5388%	0.1593%	93	23.1144%	17.0464%
48	0.5972%	0.1806%	94	24.8183%	18.4915%
49	0.6556%	0.2034%	95	26.5253%	20.0660%
50	0.7140%	0.2273%	96	28.2293%	21.7898%
51	0.7938%	0.2563%	97	29.9296%	23.5367%
52	0.8736%	0.2874%	98	31.6513%	25.3655%
53	0.9534%	0.3209%	99	33.4235%	27.3549%
54	1.0332%	0.3570%	100	35.2792%	29.5187%
55	1.1130%	0.3959%	101	37.4703%	32.5225%
56	1.1886%	0.4554%	102	39.7764%	35.8897%
57	1.2642%	0.5196%	103	43.5427%	39.5843%
58	1.3398%	0.5881%	104	48.2196%	43.8360%
59	1.4154%	0.6605%	105	53.6598%	48.7816%
60	1.4910%	0.7364%	106	60.0475%	54.5886%
61	1.6653%	0.8317%	107	67.5740%	61.4309%
62	1.8396%	0.9170%	108	76.4374%	69.4885%
63	2.0139%	1.0038%	109	86.8421%	78.9474%
64	2.1882%	1.0984%	110	100.0000%	100.0000%

* Probabilities before adjustment for future mortality improvements.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

PROBABILITIES OF MORTALITY AFTER SERVICE RETIREMENT RECOMMENDED BY THE ACTUARY

VALUATION TABLES*

Age	Males	Females	Age	Males	Females
19	0.0356%	0.0182%	65	2.1971%	1.1649%
20	0.0368%	0.0192%	66	2.3788%	1.2739%
21	0.0383%	0.0205%	67	2.5604%	1.3978%
22	0.0398%	0.0216%	68	2.7420%	1.5317%
23	0.0414%	0.0229%	69	2.9236%	1.6379%
24	0.0433%	0.0243%	70	3.1053%	1.7416%
25	0.0453%	0.0258%	71	3.3416%	1.9535%
26	0.0476%	0.0273%	72	3.5779%	2.1653%
27	0.0501%	0.0289%	73	3.8142%	2.3772%
28	0.0529%	0.0307%	74	4.0505%	2.5890%
29	0.0559%	0.0326%	75	4.2868%	2.8009%
30	0.0592%	0.0348%	76	4.8845%	3.1635%
31	0.0630%	0.0371%	77	5.4821%	3.5260%
32	0.0671%	0.0395%	78	6.0797%	3.8886%
33	0.0717%	0.0422%	79	6.6773%	4.2512%
34	0.0766%	0.0451%	80	7.2749%	4.6138%
35	0.0840%	0.0485%	81	7.9995%	5.1332%
36	0.0885%	0.0511%	82	8.7241%	5.6527%
37	0.0943%	0.0546%	83	9.4486%	6.1721%
38	0.1015%	0.0584%	84	10.1732%	6.6915%
39	0.1101%	0.0629%	85	10.8977%	7.2110%
40	0.1209%	0.0677%	86	12.0324%	8.2234%
41	0.1752%	0.0736%	87	13.1671%	9.2358%
42	0.2295%	0.0817%	88	14.3018%	10.2481%
43	0.2838%	0.0917%	89	15.4365%	11.2605%
44	0.3381%	0.1039%	90	16.5712%	12.2729%
45	0.3925%	0.1185%	91	18.2659%	13.7083%
46	0.4468%	0.1355%	92	19.9062%	15.1220%
47	0.5011%	0.1545%	93	21.4964%	16.5350%
48	0.5554%	0.1752%	94	23.0810%	17.9368%
49	0.6097%	0.1973%	95	24.6685%	19.4640%
50	0.6640%	0.2205%	96	26.2532%	21.1361%
51	0.7382%	0.2486%	97	27.8345%	22.8306%
52	0.8124%	0.2788%	98	29.4357%	24.6045%
53	0.8867%	0.3113%	99	31.0839%	26.5343%
54	0.9609%	0.3463%	100	32.8097%	28.6331%
55	1.0351%	0.3840%	101	34.8474%	31.5468%
56	1.1054%	0.4417%	102	36.9921%	34.8130%
57	1.1757%	0.5040%	103	40.4947%	38.3968%
58	1.2460%	0.5705%	104	44.8442%	42.5209%
59	1.3163%	0.6407%	105	49.9036%	47.3182%
60	1.3866%	0.7143%	106	55.8442%	52.9509%
61	1.5487%	0.8067%	107	62.8438%	59.5880%
62	1.7108%	0.8895%	108	71.0868%	67.4038%
63	1.8729%	0.9737%	109	80.7632%	76.5790%
64	2.0350%	1.0654%	110	100.0000%	100.0000%

* Probabilities equal 93% of Base Tables for males, 97% for females.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

PROBABILITIES OF MORTALITY AFTER DISABILITY RETIREMENT RECOMMENDED BY THE ACTUARY

BASE TABLES*

Age	Males	Females	Age	Males	Females
19	1.4868%	2.9185%	65	4.7703%	3.6656%
20	1.5171%	2.9332%	66	4.9416%	3.7326%
21	1.5551%	2.9479%	67	5.1271%	3.8165%
22	1.5940%	2.9625%	68	5.3282%	3.9186%
23	1.6338%	2.9772%	69	5.5462%	4.0408%
24	1.6747%	2.9919%	70	5.7836%	4.1852%
25	1.7165%	3.0065%	71	6.0425%	4.3539%
26	1.7593%	3.0212%	72	6.3252%	4.5492%
27	1.8032%	3.0359%	73	6.6331%	4.7727%
28	1.8481%	3.0505%	74	6.9670%	5.0254%
29	1.8941%	3.0652%	75	7.3280%	5.3087%
30	1.9411%	3.0799%	76	7.7518%	5.6240%
31	1.9894%	3.0945%	77	8.2080%	5.9721%
32	2.0387%	3.1092%	78	8.6969%	6.3530%
33	2.0893%	3.1239%	79	9.2196%	6.7686%
34	2.1411%	3.1385%	80	9.7769%	7.2198%
35	2.1942%	3.1532%	81	10.3691%	7.6524%
36	2.2485%	3.1679%	82	10.9966%	8.1151%
37	2.3041%	3.1825%	83	11.6644%	8.6148%
38	2.3610%	3.1972%	84	12.3756%	9.1546%
39	2.4193%	3.2119%	85	13.1331%	9.7383%
40	2.4790%	3.2265%	86	14.0005%	10.3698%
41	2.5296%	3.2412%	87	14.9277%	11.0538%
42	2.5812%	3.2559%	88	15.9188%	11.7950%
43	2.6339%	3.2705%	89	16.9788%	12.5989%
44	2.6876%	3.2852%	90	18.1123%	13.4715%
45	2.7425%	3.2999%	91	19.6407%	14.3136%
46	2.7635%	3.3145%	92	21.4045%	15.5897%
47	2.7842%	3.3292%	93	23.1144%	17.0464%
48	2.8470%	3.3438%	94	24.8183%	18.4915%
49	2.9095%	3.3585%	95	26.5253%	20.0660%
50	2.9719%	3.3732%	96	28.2293%	21.7898%
51	3.0611%	3.3878%	97	29.9296%	23.5367%
52	3.1519%	3.4025%	98	31.6513%	25.3655%
53	3.2472%	3.4172%	99	33.4235%	27.3549%
54	3.3441%	3.4318%	100	35.2792%	29.5187%
55	3.4421%	3.4465%	101	37.4703%	32.5225%
56	3.5576%	3.4612%	102	39.7764%	35.8897%
57	3.6755%	3.4758%	103	43.5427%	39.5843%
58	3.7963%	3.4905%	104	48.2196%	43.8360%
59	3.9205%	3.5052%	105	53.6598%	48.7816%
60	4.0483%	3.5198%	106	60.0475%	54.5886%
61	4.1804%	3.5291%	107	67.5740%	61.4309%
62	4.3176%	3.5469%	108	76.4374%	69.4885%
63	4.4605%	3.5746%	109	86.8421%	78.9474%
64	4.6107%	3.6136%	110	100.0000%	100.0000%

* Probabilities before adjustment for future mortality improvements.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

PROBABILITIES OF MORTALITY AFTER DISABILITY RETIREMENT RECOMMENDED BY THE ACTUARY

VALUATION TABLES*

Age	Males	Females	Age	Males	Females
19	1.3827%	2.8309%	65	4.4364%	3.5556%
20	1.4109%	2.8452%	66	4.5957%	3.6206%
21	1.4462%	2.8595%	67	4.7682%	3.7020%
22	1.4824%	2.8736%	68	4.9552%	3.8010%
23	1.5194%	2.8879%	69	5.1580%	3.9196%
24	1.5575%	2.9021%	70	5.3787%	4.0596%
25	1.5963%	2.9163%	71	5.6195%	4.2233%
26	1.6361%	2.9306%	72	5.8824%	4.4127%
27	1.6770%	2.9448%	73	6.1688%	4.6295%
28	1.7187%	2.9590%	74	6.4793%	4.8746%
29	1.7615%	2.9732%	75	6.8150%	5.1494%
30	1.8052%	2.9875%	76	7.2092%	5.4553%
31	1.8501%	3.0017%	77	7.6334%	5.7929%
32	1.8960%	3.0159%	78	8.0881%	6.1624%
33	1.9430%	3.0302%	79	8.5742%	6.5655%
34	1.9912%	3.0443%	80	9.0925%	7.0032%
35	2.0406%	3.0586%	81	9.6433%	7.4228%
36	2.0911%	3.0729%	82	10.2268%	7.8716%
37	2.1428%	3.0870%	83	10.8479%	8.3564%
38	2.1957%	3.1013%	84	11.5093%	8.8800%
39	2.2499%	3.1155%	85	12.2138%	9.4462%
40	2.3055%	3.1297%	86	13.0205%	10.0587%
41	2.3525%	3.1440%	87	13.8828%	10.7222%
42	2.4005%	3.1582%	88	14.8045%	11.4412%
43	2.4495%	3.1724%	89	15.7903%	12.2209%
44	2.4995%	3.1866%	90	16.8444%	13.0674%
45	2.5505%	3.2009%	91	18.2659%	13.8842%
46	2.5701%	3.2151%	92	19.9062%	15.1220%
47	2.5893%	3.2293%	93	21.4964%	16.5350%
48	2.6477%	3.2435%	94	23.0810%	17.9368%
49	2.7058%	3.2577%	95	24.6685%	19.4640%
50	2.7639%	3.2720%	96	26.2532%	21.1361%
51	2.8468%	3.2862%	97	27.8345%	22.8306%
52	2.9313%	3.3004%	98	29.4357%	24.6045%
53	3.0199%	3.3147%	99	31.0839%	26.5343%
54	3.1100%	3.3288%	100	32.8097%	28.6331%
55	3.2012%	3.3431%	101	34.8474%	31.5468%
56	3.3086%	3.3574%	102	36.9921%	34.8130%
57	3.4182%	3.3715%	103	40.4947%	38.3968%
58	3.5306%	3.3858%	104	44.8442%	42.5209%
59	3.6461%	3.4000%	105	49.9036%	47.3182%
60	3.7649%	3.4142%	106	55.8442%	52.9509%
61	3.8878%	3.4232%	107	62.8438%	59.5880%
62	4.0154%	3.4405%	108	71.0868%	67.4038%
63	4.1483%	3.4674%	109	80.7632%	76.5790%
64	4.2880%	3.5052%	110	100.0000%	100.0000%

* Probabilities equal 93% of Base Tables for males, 97% for females.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

AGE-RELATED PROBABILITIES OF DECREMENT FROM ACTIVE SERVICE RECOMMENDED BY THE ACTUARY

MEMBERS WHO DO NOT ELECT AN IMPROVED RETIREMENT PROGRAM*

MALES

Age	Ordinary Death	Accidental Death	Ordinary Disability	Accidental Disability	Reduced Svc Ret	** Unreduced Service Retirement ** Year 1	Year 2	Ultimate
19	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
20	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
21	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
22	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
23	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
24	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
25	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
26	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
27	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
28	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
29	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
30	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
31	0.042%	0.00%	0.11%	0.02%	0.00%	0.00%	0.00%	0.00%
32	0.044%	0.00%	0.12%	0.02%	0.00%	0.00%	0.00%	0.00%
33	0.046%	0.00%	0.13%	0.02%	0.00%	0.00%	0.00%	0.00%
34	0.048%	0.00%	0.14%	0.02%	0.00%	0.00%	0.00%	0.00%
35	0.050%	0.00%	0.15%	0.02%	0.00%	0.00%	0.00%	0.00%
36	0.052%	0.00%	0.16%	0.02%	0.00%	0.00%	0.00%	0.00%
37	0.054%	0.00%	0.17%	0.02%	0.00%	0.00%	0.00%	0.00%
38	0.056%	0.00%	0.18%	0.02%	0.00%	0.00%	0.00%	0.00%
39	0.058%	0.00%	0.19%	0.02%	0.00%	0.00%	0.00%	0.00%
40	0.060%	0.00%	0.20%	0.02%	0.00%	20.00%	0.00%	0.00%
41	0.070%	0.00%	0.22%	0.02%	0.00%	20.00%	15.00%	0.00%
42	0.080%	0.00%	0.24%	0.02%	0.00%	20.00%	15.00%	15.00%
43	0.090%	0.00%	0.26%	0.02%	0.00%	20.00%	15.00%	15.00%
44	0.100%	0.00%	0.28%	0.02%	0.00%	20.00%	15.00%	15.00%
45	0.110%	0.00%	0.30%	0.02%	0.00%	20.00%	15.00%	15.00%
46	0.120%	0.00%	0.32%	0.02%	0.00%	20.00%	15.00%	15.00%
47	0.130%	0.00%	0.34%	0.02%	0.00%	20.00%	15.00%	15.00%
48	0.140%	0.00%	0.36%	0.02%	0.00%	20.00%	15.00%	15.00%
49	0.150%	0.00%	0.38%	0.02%	0.00%	20.00%	15.00%	15.00%
50	0.160%	0.00%	0.40%	0.02%	2.00%	20.00%	15.00%	15.00%
51	0.170%	0.00%	0.42%	0.02%	2.00%	20.00%	15.00%	15.00%
52	0.180%	0.00%	0.44%	0.02%	2.00%	20.00%	15.00%	15.00%
53	0.190%	0.00%	0.46%	0.02%	2.00%	20.00%	15.00%	15.00%
54	0.200%	0.00%	0.48%	0.02%	2.00%	20.00%	15.00%	15.00%
55	0.210%	0.00%	0.50%	0.02%	2.00%	20.00%	15.00%	15.00%
56	0.220%	0.00%	0.50%	0.02%	2.00%	20.00%	15.00%	15.00%
57	0.230%	0.00%	0.50%	0.02%	2.00%	20.00%	15.00%	15.00%
58	0.240%	0.00%	0.50%	0.02%	3.00%	20.00%	15.00%	15.00%
59	0.250%	0.00%	0.50%	0.02%	4.00%	20.00%	15.00%	15.00%
60	0.260%	0.00%	0.50%	0.02%	5.00%	20.00%	15.00%	15.00%
61	0.270%	0.00%	0.50%	0.02%	6.00%	20.00%	15.00%	15.00%
62	0.280%	0.00%	0.50%	0.02%	0.00%	30.00%	30.00%	30.00%
63	0.290%	0.00%	0.50%	0.02%	0.00%	20.00%	15.00%	15.00%
64	0.300%	0.00%	0.50%	0.02%	0.00%	20.00%	15.00%	15.00%
65	0.320%	0.00%	0.50%	0.02%	0.00%	25.00%	25.00%	25.00%
66	0.350%	0.00%	0.50%	0.02%	0.00%	20.00%	15.00%	15.00%
67	0.390%	0.00%	0.50%	0.02%	0.00%	20.00%	15.00%	15.00%
68	0.440%	0.00%	0.50%	0.02%	0.00%	20.00%	15.00%	15.00%
69	0.500%	0.00%	0.50%	0.02%	0.00%	20.00%	15.00%	15.00%
70	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%

* Applies to members who did not voluntarily elect to participate in an Improved Retirement Program such as Chapter 96 of the Laws of 1995 and to members who are mandated into an Improved Retirement Program.

Note All probabilities are rounded as shown and apply to males only at age/service when member is eligible. Assumptions are for use in actuarial valuations on and after June 30, 2004 in conjunction with One-Year Lag methodology to determine Fiscal Year 2006 and later employer contributions.

NA: Not Applicable as members age 70 and greater are assumed to leave active employment immediately.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

AGE-RELATED PROBABILITIES OF DECREMENT FROM ACTIVE SERVICE RECOMMENDED BY THE ACTUARY

MEMBERS WHO DO NOT ELECT AN IMPROVED RETIREMENT PROGRAM*

FEMALES

Age	Ordinary Death	Accidental Death	Ordinary Disability	Accidental Disability	Reduced Svc Ret	** Unreduced Service Retirement ** Year 1	Year 2	Ultimate
19	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
20	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
21	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
22	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
23	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
24	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
25	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
26	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
27	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
28	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
29	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
30	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
31	0.021%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
32	0.022%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
33	0.023%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
34	0.024%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
35	0.025%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
36	0.026%	0.00%	0.06%	0.01%	0.00%	0.00%	0.00%	0.00%
37	0.027%	0.00%	0.07%	0.01%	0.00%	0.00%	0.00%	0.00%
38	0.028%	0.00%	0.08%	0.01%	0.00%	0.00%	0.00%	0.00%
39	0.029%	0.00%	0.09%	0.01%	0.00%	0.00%	0.00%	0.00%
40	0.030%	0.00%	0.10%	0.01%	0.00%	20.00%	0.00%	0.00%
41	0.035%	0.00%	0.12%	0.01%	0.00%	20.00%	15.00%	0.00%
42	0.040%	0.00%	0.14%	0.01%	0.00%	20.00%	15.00%	15.00%
43	0.045%	0.00%	0.16%	0.01%	0.00%	20.00%	15.00%	15.00%
44	0.050%	0.00%	0.18%	0.01%	0.00%	20.00%	15.00%	15.00%
45	0.055%	0.00%	0.20%	0.01%	0.00%	20.00%	15.00%	15.00%
46	0.060%	0.00%	0.22%	0.01%	0.00%	20.00%	15.00%	15.00%
47	0.065%	0.00%	0.24%	0.01%	0.00%	20.00%	15.00%	15.00%
48	0.070%	0.00%	0.26%	0.01%	0.00%	20.00%	15.00%	15.00%
49	0.075%	0.00%	0.28%	0.01%	0.00%	20.00%	15.00%	15.00%
50	0.080%	0.00%	0.30%	0.01%	2.00%	20.00%	15.00%	15.00%
51	0.085%	0.00%	0.32%	0.01%	2.00%	20.00%	15.00%	15.00%
52	0.090%	0.00%	0.34%	0.01%	2.00%	20.00%	15.00%	15.00%
53	0.095%	0.00%	0.36%	0.01%	2.00%	20.00%	15.00%	15.00%
54	0.100%	0.00%	0.38%	0.01%	2.00%	20.00%	15.00%	15.00%
55	0.105%	0.00%	0.40%	0.01%	2.00%	20.00%	15.00%	15.00%
56	0.110%	0.00%	0.40%	0.01%	2.00%	20.00%	15.00%	15.00%
57	0.115%	0.00%	0.40%	0.01%	2.00%	20.00%	15.00%	15.00%
58	0.120%	0.00%	0.40%	0.01%	3.00%	20.00%	15.00%	15.00%
59	0.125%	0.00%	0.40%	0.01%	4.00%	20.00%	15.00%	15.00%
60	0.130%	0.00%	0.40%	0.01%	5.00%	20.00%	15.00%	15.00%
61	0.135%	0.00%	0.40%	0.01%	6.00%	20.00%	15.00%	15.00%
62	0.140%	0.00%	0.40%	0.01%	0.00%	30.00%	30.00%	30.00%
63	0.145%	0.00%	0.40%	0.01%	0.00%	20.00%	15.00%	15.00%
64	0.150%	0.00%	0.40%	0.01%	0.00%	20.00%	15.00%	15.00%
65	0.160%	0.00%	0.40%	0.01%	0.00%	25.00%	25.00%	25.00%
66	0.175%	0.00%	0.40%	0.01%	0.00%	20.00%	15.00%	15.00%
67	0.195%	0.00%	0.40%	0.01%	0.00%	20.00%	15.00%	15.00%
68	0.220%	0.00%	0.40%	0.01%	0.00%	20.00%	15.00%	15.00%
69	0.250%	0.00%	0.40%	0.01%	0.00%	20.00%	15.00%	15.00%
70	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%

* Applies to members who did not voluntarily elect to participate in an Improved Retirement Program such as Chapter 96 of the Laws of 1995 and to members who are mandated into an Improved Retirement Program.

Note All probabilities are rounded as shown and apply to females only at age/service when member is eligible. Assumptions are for use in actuarial valuations on and after June 30, 2004 in conjunction with One-Year Lag methodology to determine Fiscal Year 2006 and later employer contributions.

NA: Not Applicable as members age 70 and greater are assumed to leave active employment immediately.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

AGE-RELATED PROBABILITIES OF DECREMENT FROM ACTIVE SERVICE RECOMMENDED BY THE ACTUARY

MEMBERS WHO ELECTED AN IMPROVED RETIREMENT PROGRAM*

MALES

Age	Ordinary Death	Accidental Death	Ordinary Disability	Accidental Disability	Reduced Svc Ret	** Unreduced Service Retirement ** Year 1	Year 2	Ultimate
19	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
20	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
21	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
22	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
23	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
24	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
25	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
26	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
27	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
28	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
29	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
30	0.040%	0.00%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%
31	0.042%	0.00%	0.11%	0.02%	0.00%	0.00%	0.00%	0.00%
32	0.044%	0.00%	0.12%	0.02%	0.00%	0.00%	0.00%	0.00%
33	0.046%	0.00%	0.13%	0.02%	0.00%	0.00%	0.00%	0.00%
34	0.048%	0.00%	0.14%	0.02%	0.00%	0.00%	0.00%	0.00%
35	0.050%	0.00%	0.15%	0.02%	0.00%	0.00%	0.00%	0.00%
36	0.052%	0.00%	0.16%	0.02%	0.00%	0.00%	0.00%	0.00%
37	0.054%	0.00%	0.17%	0.02%	0.00%	0.00%	0.00%	0.00%
38	0.056%	0.00%	0.18%	0.02%	0.00%	0.00%	0.00%	0.00%
39	0.058%	0.00%	0.19%	0.02%	0.00%	0.00%	0.00%	0.00%
40	0.060%	0.00%	0.20%	0.02%	0.00%	60.00%	0.00%	0.00%
41	0.070%	0.00%	0.22%	0.02%	0.00%	60.00%	40.00%	0.00%
42	0.080%	0.00%	0.24%	0.02%	0.00%	60.00%	40.00%	20.00%
43	0.090%	0.00%	0.26%	0.02%	0.00%	60.00%	40.00%	20.00%
44	0.100%	0.00%	0.28%	0.02%	0.00%	60.00%	40.00%	20.00%
45	0.110%	0.00%	0.30%	0.02%	0.00%	60.00%	40.00%	20.00%
46	0.120%	0.00%	0.32%	0.02%	0.00%	60.00%	40.00%	20.00%
47	0.130%	0.00%	0.34%	0.02%	0.00%	60.00%	40.00%	20.00%
48	0.140%	0.00%	0.36%	0.02%	0.00%	60.00%	40.00%	20.00%
49	0.150%	0.00%	0.38%	0.02%	0.00%	60.00%	40.00%	20.00%
50	0.160%	0.00%	0.40%	0.02%	0.00%	60.00%	40.00%	20.00%
51	0.170%	0.00%	0.42%	0.02%	0.00%	60.00%	40.00%	20.00%
52	0.180%	0.00%	0.44%	0.02%	0.00%	60.00%	40.00%	20.00%
53	0.190%	0.00%	0.46%	0.02%	0.00%	60.00%	40.00%	20.00%
54	0.200%	0.00%	0.48%	0.02%	0.00%	60.00%	40.00%	20.00%
55	0.210%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
56	0.220%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
57	0.230%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
58	0.240%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
59	0.250%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
60	0.260%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
61	0.270%	0.00%	0.50%	0.02%	0.00%	60.00%	40.00%	20.00%
62	0.280%	0.00%	0.50%	0.02%	0.00%	60.00%	60.00%	60.00%
63	0.290%	0.00%	0.50%	0.02%	0.00%	40.00%	40.00%	40.00%
64	0.300%	0.00%	0.50%	0.02%	0.00%	40.00%	40.00%	40.00%
65	0.320%	0.00%	0.50%	0.02%	0.00%	60.00%	60.00%	60.00%
66	0.350%	0.00%	0.50%	0.02%	0.00%	40.00%	40.00%	40.00%
67	0.390%	0.00%	0.50%	0.02%	0.00%	40.00%	40.00%	40.00%
68	0.440%	0.00%	0.50%	0.02%	0.00%	40.00%	40.00%	40.00%
69	0.500%	0.00%	0.50%	0.02%	0.00%	40.00%	40.00%	40.00%
70	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%

* Applies to members who voluntarily elected to participate in an Improved Retirement Program such as those who elected to participate in Chapter 96 of the Laws of 1995.

Note All probabilities are rounded as shown and apply to males only at age/service when member is eligible. Assumptions are for use in actuarial valuations on and after June 30, 2004 in conjunction with One-Year Lag methodology to determine Fiscal Year 2006 and later employer contributions.

NA: Not Applicable as members age 70 and greater are assumed to leave active employment immediately.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

AGE-RELATED PROBABILITIES OF DECREMENT FROM ACTIVE SERVICE RECOMMENDED BY THE ACTUARY

MEMBERS WHO ELECTED AN IMPROVED RETIREMENT PROGRAM*

FEMALES

Age	Ordinary Death	Accidental Death	Ordinary Disability	Accidental Disability	Reduced Svc Ret	** Unreduced Service Retirement ** Year 1	Year 2	Ultimate
19	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
20	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
21	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
22	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
23	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
24	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
25	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
26	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
27	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
28	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
29	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
30	0.020%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
31	0.021%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
32	0.022%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
33	0.023%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
34	0.024%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
35	0.025%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%
36	0.026%	0.00%	0.06%	0.01%	0.00%	0.00%	0.00%	0.00%
37	0.027%	0.00%	0.07%	0.01%	0.00%	0.00%	0.00%	0.00%
38	0.028%	0.00%	0.08%	0.01%	0.00%	0.00%	0.00%	0.00%
39	0.029%	0.00%	0.09%	0.01%	0.00%	0.00%	0.00%	0.00%
40	0.030%	0.00%	0.10%	0.01%	0.00%	60.00%	0.00%	0.00%
41	0.035%	0.00%	0.12%	0.01%	0.00%	60.00%	40.00%	0.00%
42	0.040%	0.00%	0.14%	0.01%	0.00%	60.00%	40.00%	20.00%
43	0.045%	0.00%	0.16%	0.01%	0.00%	60.00%	40.00%	20.00%
44	0.050%	0.00%	0.18%	0.01%	0.00%	60.00%	40.00%	20.00%
45	0.055%	0.00%	0.20%	0.01%	0.00%	60.00%	40.00%	20.00%
46	0.060%	0.00%	0.22%	0.01%	0.00%	60.00%	40.00%	20.00%
47	0.065%	0.00%	0.24%	0.01%	0.00%	60.00%	40.00%	20.00%
48	0.070%	0.00%	0.26%	0.01%	0.00%	60.00%	40.00%	20.00%
49	0.075%	0.00%	0.28%	0.01%	0.00%	60.00%	40.00%	20.00%
50	0.080%	0.00%	0.30%	0.01%	0.00%	60.00%	40.00%	20.00%
51	0.085%	0.00%	0.32%	0.01%	0.00%	60.00%	40.00%	20.00%
52	0.090%	0.00%	0.34%	0.01%	0.00%	60.00%	40.00%	20.00%
53	0.095%	0.00%	0.36%	0.01%	0.00%	60.00%	40.00%	20.00%
54	0.100%	0.00%	0.38%	0.01%	0.00%	60.00%	40.00%	20.00%
55	0.105%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
56	0.110%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
57	0.115%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
58	0.120%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
59	0.125%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
60	0.130%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
61	0.135%	0.00%	0.40%	0.01%	0.00%	60.00%	40.00%	20.00%
62	0.140%	0.00%	0.40%	0.01%	0.00%	60.00%	60.00%	60.00%
63	0.145%	0.00%	0.40%	0.01%	0.00%	40.00%	40.00%	40.00%
64	0.150%	0.00%	0.40%	0.01%	0.00%	40.00%	40.00%	40.00%
65	0.160%	0.00%	0.40%	0.01%	0.00%	60.00%	60.00%	60.00%
66	0.175%	0.00%	0.40%	0.01%	0.00%	40.00%	40.00%	40.00%
67	0.195%	0.00%	0.40%	0.01%	0.00%	40.00%	40.00%	40.00%
68	0.220%	0.00%	0.40%	0.01%	0.00%	40.00%	40.00%	40.00%
69	0.250%	0.00%	0.40%	0.01%	0.00%	40.00%	40.00%	40.00%
70	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%

* Applies to members who voluntarily elected to participate in an Improved Retirement Program such as those who elected to participate in Chapter 96 of the Laws of 1995.

Note All probabilities are rounded as shown and apply to females only at age/service when member is eligible. Assumptions are for use in actuarial valuations on and after June 30, 2004 in conjunction with One-Year Lag methodology to determine Fiscal Year 2006 and later employer contributions.

NA: Not Applicable as members age 70 and greater are assumed to leave active employment immediately.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

SERVICE-RELATED PROBABILITIES OF DECREMENT FROM ACTIVE SERVICE RECOMMENDED BY THE ACTUARY

Years of Service	******** Withdrawal ******** Male	Female
0	6.00%	4.50%
1	5.60%	4.30%
2	5.20%	4.10%
3	4.80%	3.90%
4	4.40%	3.70%
5	4.00%	3.50%
6	3.70%	3.30%
7	3.40%	3.10%
8	3.10%	2.90%
9	2.80%	2.70%
10	2.50%	2.50%
11	2.30%	2.40%
12	2.10%	2.30%
13	1.90%	2.20%
14	1.70%	2.10%
15	1.50%	2.00%
16	1.40%	1.90%
17	1.30%	1.80%
18	1.20%	1.70%
19	1.10%	1.60%
20	1.00%	1.50%
21	1.00%	1.40%
22	1.00%	1.30%
23	1.00%	1.20%
24	1.00%	1.10%
25	1.00%	1.00%
26	1.00%	1.00%
27	1.00%	1.00%
28	1.00%	1.00%
29	1.00%	1.00%
30	1.00%	1.00%
31	1.00%	1.00%
32	1.00%	1.00%
33	1.00%	1.00%
34	1.00%	1.00%
35	1.00%	1.00%
36	1.00%	1.00%
37	1.00%	1.00%
38	1.00%	1.00%
39	1.00%	1.00%
40	1.00%	1.00%
41	1.00%	1.00%
42	1.00%	1.00%

Note: All probabilities are rounded as shown and apply to both males and females only until members are eligible for retirement. Assumptions are for use in actuarial valuations on and after June 30, 2004 in conjunction with One-Year Lag methodology to determine Fiscal Year 2006 and later employer contributions.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

ANNUAL RATES OF SALARY INCREASE RECOMMENDED BY THE ACTUARY

Years of Service	Merit Increase	Salary Scale*
0	5.00%	8.00%
1	4.20%	7.20%
2	3.50%	6.50%
3	3.00%	6.00%
4	2.70%	5.70%
5	2.50%	5.50%
6	2.40%	5.40%
7	2.30%	5.30%
8	2.20%	5.20%
9	2.10%	5.10%
10	2.00%	5.00%
11	1.90%	4.90%
12	1.80%	4.80%
13	1.70%	4.70%
14	1.60%	4.60%
15	1.50%	4.50%
16	1.50%	4.50%
17	1.50%	4.50%
18	1.50%	4.50%
19	1.50%	4.50%
20	1.50%	4.50%
21	1.50%	4.50%
22	1.50%	4.50%
23	1.50%	4.50%
24	1.50%	4.50%
25	1.50%	4.50%
26	1.50%	4.50%
27	1.50%	4.50%
28	1.50%	4.50%
29	1.50%	4.50%
30	1.50%	4.50%
31	1.50%	4.50%
32	1.50%	4.50%
33	1.50%	4.50%
34	1.50%	4.50%
35	1.50%	4.50%
36	1.50%	4.50%
37	1.50%	4.50%
38	1.50%	4.50%
39	1.50%	4.50%
40	1.50%	4.50%
41	1.50%	4.50%
42	1.50%	4.50%
43	1.50%	4.50%
44	1.50%	4.50%
45	1.50%	4.50%
46	1.50%	4.50%
47	1.50%	4.50%
48	1.50%	4.50%
49	1.50%	4.50%
50	1.50%	4.50%

* Includes General Wage Increase of 3.0% per year.

APPENDIX E - DISCUSSION OF FINANCIAL ECONOMICS, FUNDING AND DISCLOSURE

As noted in Section VI of this Report, the economic assumptions proposed herein have been developed in accordance with the current requirements of Actuarial Standard of Practice Number 27 which is the prevailing guidance on this issue for professional actuaries in the United States.

The economic assumptions proposed herein were also developed in conjunction with the other actuarial assumptions and methods to provide an overall package of actuarial assumptions and methods that is designed to, as well as possible, meet the goals of providing security for plan participants while establishing an expected pattern of employer contributions that should be less volatile, more predictable and consistent with the principles of intergenerational equity.

However, Trustees should be aware that changes are being discussed with respect to the requirements of **ASOP27** and accounting practice. In addition, investor expectations are expanding with respect to disclosure of information on the financial condition of pension funds.

These changes are unfolding most rapidly with respect to private sector pension plans and are generally described as intended to provide more transparency to the relationship between pension fund assets and liabilities or as "marking-to-market" the assets and liabilities of the pension funds.

The impact of these changes on the requirements for funding for public sector pension plans is not likely to occur soon or to be as direct or dramatic as for private sector pension plans. Nevertheless, change is expected to occur and may well impact taxpayer and investor perception of public sector pension plans in the not-too-distant future and possibly impact financing of such plans thereafter.

With an eye to that future, since June 30, 2003, the Actuarial Section of the Comprehensive Annual Financial Report for **BERS** has included a new subsection called "Other Measures of Funding."

One of those Other Measures of Funding is a Funded Ratio calculated as the Market Value of Assets ("**MVA**") divided by a liability measure referred to as the Market Value-related Accumulated Benefit Obligation ("**MVABO**"). This Funded Ratio will be referred to hereafter as the Economic Funded Ratio ("**EFR**").

The **EFR** is a measure of funded status where:

- Assets are determined at Market Value without any smoothing.

- Liabilities are determined using assumptions that are independent of the asset allocation of the Fund and exclusive of any advance recognition of expected asset risk premia (e.g., equity risk premium).

The **EFR** provides an estimate of the financial status of **BERS** that meets the criteria of economic transparency and that is consistent with anticipated changes to disclosure requirements for private sector pension plans and, at some point thereafter, possibly for public sector pension plans.

To the extent that the liabilities of a pension plan are bond-like instruments, a review of the **EFR** over a period of years highlights the overall economic relationship, and whatever mismatch may exist, between the assets and liabilities of a pension fund.

In the case of an asset allocation that is 70% equities, it is to be expected that the **EFR** would be volatile.

Depending upon the goals and objectives of a pension fund, such volatility is not necessarily a cause for concern but it should be monitored. In fact, eliminating such volatility could only be achieved by investing the assets of a fund in duration-matched, bond-like securities.

Doing so, however, would result in less expected investment return for a fund based on currently-available bond yields. As a consequence of the fundamental rule of pension funding (i.e., contributions plus investment income pay for benefits plus expenses), a full match between the assets and liabilities of a fund could significantly increase employer contributions to that fund.

The proposals in this Report for the ongoing funding of **BERS** are intended to strike the appropriate balance amongst participant security, contribution stability and predictability, and intergenerational equity.

The disclosure of Other Measures of Funding is intended to provide users with a more robust understanding of the economic status of the Fund of each valuation date. These additional disclosures also illustrate the implications and dynamics of the funding and investment policies employed to finance the Fund.

APPENDIX F - ACKNOWLEDGEMENTS

The Actuary acknowledges and expresses appreciation to **GRS** whose Report formed the basis for several of the Actuary's proposals.

The Actuary also thanks the staff of the Office of the Actuary who offered suggestions and prepared computations and supporting information and other members of the actuarial profession who provided reference material and offered insights and suggestions.

Of particular note, the Actuary offers special thanks to Mr. A. Norman Crowder III - Chairman and Mr. Murray L. Becker, members of his Actuarial Advisory Committee, who have given generously of their time and expertise to provide assistance and support to the Actuary during the development of these proposals.

The Actuary further wishes to express appreciation to the many members of the Boards of Trustees of the five actuarially-funded **NYCRS** and representatives of their participating employers who provided valuable viewpoints.

Finally, the Actuary wishes to thank the members of the Board of Trustees of **BERS** whose ongoing support has made much easier the professional challenge of developing these proposals.