New York City Retirement Systems

INDEPENDENT ACTUARY'S STATEMENT

2nd Biennial Period—FY 2006 Audit

November 30, 2006

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Section 1: Introduction and Certification

Introduction

In January 2005, The Office of the Comptroller of the City of New York retained The Segal Company (Segal) to perform actuarial audits and related services with respect to the following five actuarially-funded New York City Retirement Systems (collectively the NYCRS, “Retirement Systems”, or “Systems”):

- New York City Employees’ Retirement System (NYCERS)
- Teachers’ Retirement System of the City of New York (TRS)
- New York City Board of Education Retirement System (BERS)
- New York City Police Pension Fund (POLICE)
- New York City Fire Pension Fund (FIRE)

The contract covers two consecutive engagements covering two biennial periods. Each engagement is comprised of the following for the five Systems:

1. An Experience Study which compares actual experience with the assumptions used to calculate pension contributions and comments on the appropriateness of each assumption. The first engagement reviews experience data through June 30, 2003 while the second engagement reviews experience data through June 30, 2005.

2. An audit of Employer Pension Contributions, which confirms the computations of actuarial assets and liabilities, including the software used, and the appropriateness and legality of the actuarial assumptions and methods used. The first engagement audits Employer Pension Contributions for Fiscal Year 2004 while the second engagement audits Employer Pension Contributions for Fiscal Year 2006.

3. An Administrative Review which reviews the actuarial valuation and data processes and comments on the quality and completeness of the data and financial, actuarial and operational procedures used in the valuations.

4. An Independent Actuary’s Statement which, in conjunction with the audit of Employer Pension Contributions (“Contribution Audit”), provides certification with respect to the Office of the Actuary’s (OA) valuation results, the valuation methods and assumptions used in arriving at those results, and the determination of contribution amounts required to fund the Retirement Systems for Fiscal Year 2006.

This report is the deliverable for the **Independent Actuary’s Statement** for the second engagement, which focuses on the Fiscal Year 2006 contribution requirements determined by the OA, as well as the methods and procedures used in determining those amounts.

Certifications

Based on the results of the Contribution Audit for the 2nd engagement, as shown in our report presented to the Office of the Comptroller, we hereby certify that:

- The results of the OA's actuarial valuations completed on behalf of the New York City Retirement Systems (NYCRS) for purposes of Fiscal Year 2006 contribution requirements were in accordance with standards of practice prescribed by the Actuarial Standards Board (ASB), as well as the State of New York statutes and the Administrative Code of the City of New York (ACNY);

- Actuarial and asset valuation methods and assumptions used by the OA for purposes of determining contribution amounts were appropriate and produced results which were reasonable;

- Our independent valuations closely matched (within a reasonable level of tolerance differences) the contribution amounts calculated by the OA, and we thus conclude that such amounts are accurate and satisfy the Systems' funding requirements.

In addition to auditing the accuracy and validity of the calculations as well as assumptions and methods used by the OA in determining the NYCRS Fiscal Year 2006 contribution requirement, Segal also completed a comprehensive experience study which compares the actual plan experience which has emerged over selected historical periods to the currently used actuarial assumptions applied to those periods. The second engagement experience study covers the four year period beginning June 30, 2001, as well as the 17 year period beginning June 30, 1988. Segal has published a separate report which includes the detailed numerical output which supports recommendations for modifications in various actuarial assumptions and methods, as well as the cost impact of those recommendations on the NYCRS contribution requirement.

Finally, Segal's audit also included a review of the administrative processes involved in the transmission of actuarial valuation data elements between the Retirement Systems and the OA. Segal has published a separate report which certifies that the data transmission process is efficient and accurate, that the technology used in the process is advanced, and that the OA continually implements new technology and administrative procedures to better the process.

The remaining sections of this report provide a summary of the methods and assumptions used by the OA to arrive at their results, as well as a summary of the key quantitative results from the Systems' valuations as computed by the OA and as computed by Segal.

We would like to acknowledge the cooperation of the staff of the Office of the Actuary, which was received throughout the period of the second engagement audit. That cooperation is greatly appreciated.

Sincerely yours,

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Section 2: Actuarial Methods/Assumptions

Actuarial Valuation Method

The Frozen Initial Liability (FIL) actuarial cost method is used by the OA for determining liabilities and funding requirements. Under the FIL method, actuarial gains and losses (difference of actual emerging experience from that assumed) are reflected in the employer normal cost. The employer normal cost is determined by spreading the unfunded present value of future benefits (net of any unfunded actuarial accrued liability and future employee contributions) over the future working lifetime of the active participants as a level percent of pay. The unfunded actuarial accrued liabilities, determined initially using the Entry Age Normal actuarial cost method (but not less than $0), are being amortized under different schedules, as described in the next section.

FIL is a reasonable and appropriate funding method for funding the liabilities of the NYCRS, although the majority of large governmental pension plans do not use the FIL method. Furthermore, FIL satisfies the criteria offered under ASOP No. 4 of the ASB for acceptable funding methods. An additional benefit of using the FIL method is that it provides that the retirement benefits earned by the covered members are funded for over their aggregate working careers and not beyond. That is, under FIL there is preservation of intergenerational equity, which is often lost when using other actuarial cost methods, if such actuarial cost methods are combined with the use of long amortization periods.

Unfunded Actuarial Accrued Liability

As mentioned, in addition to the normal cost component of the funding requirement determined under the FIL method, the Systems also contribute according to an amortization schedule applied to its outstanding balance of unfunded actuarial accrued liability (UAAL), if any. Many large governmental Retirement Systems operate with some level of UAAL. The UAAL under the FIL method can exist for reasons such as a decision to recognize past service for benefit purposes, when benefit increases are adopted or when a change in the actuarial assumptions or methods occurs.

The NYCRS fund UAAL over closed time periods, either in level dollar amounts or in installments which increase annually at a fixed rate. As of Fiscal Year ending June 30, 2006, POLICE had no outstanding UAAL amortization payments due. FIRE consolidated its UAAL as of June 30, 1999 based on updated actuarial assumptions and assets, using an 11 year increasing amortization schedule at a 3%/year increase rate. There are 4 years left on this schedule after Fiscal Year ending June 30, 2006. NYCERS, TRS and BERS established new UAAL amounts in Fiscal Year 2003, and are amortizing these amounts over 5 years in level installments. There are 2 years remaining on this amortization schedule for each System affected, following payment of the Fiscal Year 2006 amortization amount. NYCERS also established a new UAAL amount in Fiscal Year 2001; the final amortization to fund that amount was applied for the Fiscal Year 2006 contribution. The amortization periods as well as the payment schedules adopted for each of the NYC Retirement Systems are reasonable.

One-Year Lag Methodology

The Fiscal Year 2006 contribution is the first which is calculated based on the One-Year Lag Methodology, a methodology required by a recent amendment to the ACNY. Under this methodology as applied to the Fiscal Year 2006 contribution, actuarial assets and liabilities, as well as other valuation measures, are determined as of June 30, 2004, with certain adjustments made in order to actuarially determine the appropriate contribution requirement for Fiscal Year 2006. We have reviewed the OA's application of the methodology for the Fiscal Year 2006 contribution calculation, both with respect to the interpretation of the adjustments to the actuarial components of the contribution, as well as to the accuracy of their calculation, and we agree that the OA has applied the methodology correctly in all material aspects.

Asset Valuation Method (AVM)

The selection of an asset valuation method involves balancing smoothing investment returns and being responsive to changes in market value. The most responsive method is market value, but that comes with significant volatility in the contribution requirements. Other methods have varying degrees of smoothing, but will be below market values in times of favorable markets and above market values in times of unfavorable investment returns. The Systems fresh started the actuarial value of assets at market value as of June 30, 1999. Since then, the Systems use for purposes of the actuarial value of assets a smoothing methodology which uses the assumed investment return and spreads the investment gains or losses in excess/below the assumed return in any Fiscal Year over future Fiscal Years. For purposes of the 2006 Fiscal Year contribution determination, the AVM was changed to a method which reset the actuarial value of assets to market value (i.e. market value restart) as of June 30, 1999. As of each June 30 thereafter the AVM recognizes investment gains or losses greater or less than expected over a period of six years.

Under this revised AVM, any unexpected investment returns for Fiscal Years 2000 and later are phased into the actuarial value of assets beginning the following June 30 at a rate of 15%, 15%, 15%, 15%, 20% and 20% per year (or cumulative rate of 15%, 30%, 45%, 60%, 80% and 100% over a period of six years). These revised averaging factors were applied against the unexpected investment returns computed under the prior five-year AVM used for Fiscal Years 2000 to 2004.

The revised AVM was utilized for the first time in the June 30, 2004 (Lag) actuarial valuation to determine the Fiscal Year 2006 Employer Contributions in conjunction with the One-Year Lag Methodology and the revised actuarial assumptions and methods.

Note, the unexpected investment return which occurred in Fiscal Year 2006 will be spread over a period beginning with Fiscal Year 2006 using the above averaging factors. The AVM as of June 30, 2006 will be used to determine Fiscal Year 2008 employer contributions.

The assumed return asset smoothing method is a common method both in the public and private sectors. In the majority of cases, investment gains or losses under this type of method are spread over five years. The OA however, uses a six year smoothing period combined with a moderate step-rate approach (e.g. 15% for each of the first four years and 20% for each of the last two years), in order to make budgeting of each Fiscal Year's result less volatile. We find the use of the assumed return asset smoothing method in conjunction with using a slightly graded schedule for recognizing excess or deficit returns to be reasonable, and the AVM to be appropriate for the NYCRS.

Actuarial Assumptions

There are two classes of actuarial assumptions which are used in the development of the OA's valuation results, economic assumptions and demographic assumptions:

Economic Assumptions

These represent assumptions with regards to anticipated performance of the financial markets which affect the growth of the NYCRS asset reserves, as well as the expected long term rate of wage inflation, which is a component in the determination of the salary scale assumption. Unlike demographic assumptions, these assumptions are external in nature; they are not solely a function of the NYCRS and their participants, and they can not be studied by looking exclusively at historical experience of the NYCRS population/investment returns.

The key economic assumptions for the NYCRS valuations are:

1. Long term rate of investment return – 8%
2. Wage inflation – 3% (consisting of 2.5% CPI inflation and 0.5% real wage growth)

In order to verify the reasonability of these assumptions, we applied the principles for the selection of economic assumptions offered under Actuarial Standard of Practice No. 27. In addition, we compared the OA's assumptions to what relevant surveys show are currently being used by other public sector plans. Our conclusion is that the OA's economic assumptions are reasonable, and are within a range of values for these assumptions derived based on applying future expectations of relevant economic indices to the specific investment allocation of the NYCRS pension funds. Furthermore, we verified that the assumptions used by the OA are consistent with the assumptions used by public sector plans included in the surveys we studied.

Demographic Assumptions

These assumptions represent expected probabilities of decrement from active service or death after retirement for members of the NYCRS. Specifically, these assumptions include probabilities of withdrawal, ordinary and accidental disability, ordinary and accidental death, and service retirement, reduced and unreduced. In addition, compensation measures such as the merit component of base compensation as well as overtime pay are developed in conjunction with these assumptions. Since these assumptions are exclusively a function of the activity of the NYCRS members, they are continually updated and refined based on experience studies with respect to historical performance of these measures as exhibited by the NYCRS members.

The demographic assumptions effective for the Fiscal Year 2006 valuation results were recommended by the Chief Actuary of the Systems and based upon the Chief Actuary's best estimate of future experience subsequent to his review of an experience study completed by Gabriel, Roeder, Smith & Company (GRS) covering activity from July 1, 1997 – June 30, 2001. These assumptions have either been approved by the Boards of Trustees of each of the Retirement Systems or enacted by the State Legislature and Governor (as per applicable requirements), were first applied for the Fiscal Year 2006 valuation, and are consistent with the observed experience shown in the previous auditor's (GRS) study.

Future Fiscal Years

As mentioned above, part of Segal's engagement involved completing an experience study covering historical experience through June 30, 2005. The results of this study, and recommendations thereof, may contribute to the Chief Actuary's proposing revised demographic and economic assumptions, which would be effective for future years' valuations. It should be noted that both historical periods covered in the 2nd biennial experience study (beginning June 30, 1988 and beginning June 30, 2001) include the World Trade Center (WTC) events of September 11, 2001. Segal's experience study report shows that certain decrements were significantly affected by the WTC events over the approximate 4 year period since these events occurred. The impact of 9/11 on certain decrements represents initial experience findings. Ultimately, assessing the long term impact of the WTC events will require several additional years of future experience in order to allow for the data since the events to mature, which can then be appropriately used for formulating ongoing assumptions for the affected decrements. As a result, the assumptions recommendations included in the experience study report do not include the impact of 9/11 events on the affected decrements. However, ongoing monitoring and tracking of emerging experience due to 9/11 will be critical in the coming years for determining if and when assumption modifications are appropriate.

Section 3: Summary of Audit Results

NEW YORK CITY RETIREMENT SYSTEMS
INDEPENDENT ACTUARY'S STATEMENT
Summary of Fiscal Year 2006 Actuarial Valuation Results
(In $ Millions)

	NYCERS	TRS	BERS	POLICE	FIRE	Total
Covered Payroll						
• OA	$ 9,361	$ 6,176	$ 625	$ 2,758	$ 865	$ 19,785
• Segal	9,361	6,176	625	2,758	865	19,785
• Ratio	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Present Value of Future Benefits						
• OA	$50,839	$48,081	$2,748	$29,589	$12,219	$143,476
• Segal	51,043	48,019	2,767	29,494	12,216	143,539
• Ratio	1.0040	0.9987	1.0069	0.9968	0.9998	1.0004
Normal Cost Rate						
• OA	10.711%	21.162%	14.674%	48.848%	67.040%	21.841%
• Segal	10.984%	20.813%	14.576%	48.732%	66.102%	21.743%
• Ratio	1.0255	0.9835	0.9933	0.9976	0.9860	0.9955
Total Computed Contribution						
• OA	$ 1,024	$ 1,317	$ 91	$ 1,338	$ 609	$ 4,379
• Segal	1,039	1,288	90	1,320	599	4,336
• Ratio	1.0146	0.9780	0.9890	0.9865	0.9836	0.9902