REPORT ON EXAMINATION

OF THE

TEACHERS' RETIREMENT SYSTEM OF THE CITY OF NEW YORK

AS OF JUNE 30, 2018

EXAMINER: **COURTNEY WILLIAMS**

DATE OF REPORT: **SEPTEMBER 15, 2022**

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September 5, 2025

Honorable Adrienne A. Harris
Superintendent of Financial Services
New York, New York 10004

Dear Adrienne A. Harris:

In accordance with instructions contained in Appointment No. 31867, dated February 12, 2019, and annexed hereto, an examination has been made into the condition and affairs of the Teachers' Retirement System of the City of New York, hereinafter referred to as "the System," or "TRSNYC" at its home office located at 55 Water Street, New York, NY 10041.

Wherever "Department" appears in this report, it refers to the State of New York Department of Financial Services.

The report indicating the results of this examination is respectfully submitted.

1. EXECUTIVE SUMMARY

During the examination of the System, the examiner identified several areas for consideration by the System which are summarized below. A separate examination of the investments and investment practices for the five New York City retirement systems was performed. The Investment Examination Report is submitted with this report as a separate document as referenced in section 7. The following areas for consideration are noted:

- The System violated Section 13-507 of Title 13, Chapter 4 of the Administrative Code of the City of New York (i.e., the System's By-laws) by failing to have seven members on its Board as required by the Code. (See section 3C of this report.)
- The System is directed to have seven board members as required by its Administrative Code. (See section 3C of this report.)
- The System should consider establishing or maintaining separate accounts for each benefit plan or fund and account for distributions, contributions, and investment experience by plan or fund. (See section 8G of this report.)
- The System should consider ceasing asset transfers or benefit payments from the qualified pension plan ("QPP") for providing any non-QPP benefits. (See section 8G of this report.)
- The System should consider disclosing the assets and liabilities for each benefit plan or fund separately as well as separately determining the employer contribution for each benefit plan or fund in future actuarial valuation reports. (See section 8G of this report.)
- The System should consider establishing a separate fund for providing the Tax Deferred Annuity Program ("TDA") guaranteed annuities and TDA fixed guaranteed returns in the Fixed Return Fund such that the QPP does not provide for any shortfalls in contribution requirements and any additional returns earned would not be transferred to the QPP. (See section 8G of this report.)
- The System should consider revising the actuarial cost method to follow the entry age normal ("EAN") actuarial cost method as defined by the Actuarial Standards Board ("ASB") and described under New York City Administrative Code ("NYCAC") Section 13-527(b)(5). (See section 8B of this report.)

- The System should consider determining the normal contribution from the explicitly calculated plan normal cost based on expected salaries for the same fiscal year in accordance with NYCAC Section 13-527(b)(5). The System should also consider using the EAN actuarial cost method defined by the ASB for determining the explicitly calculated plan normal cost. (See section 8F of this report.)
- The System may want to consider revising the amortization method so that the unfunded accrued liability ("UAL") as of the valuation date is scheduled to be fully amortized. If the current amortization method is retained, then the actuarial valuation report should disclose that the UAL as of the valuation date is not expected to be fully amortized. (See section 8E of this report.)
- The System should also consider removing adjustments to increase or decrease the UAL as of the valuation date for TDA assets below or exceeding the present value of retiree TDA annuities when determining the required contribution for the QPP. (See section 8E of this report.)

2. SCOPE OF EXAMINATION

The prior examination was conducted as of June 30, 2013. This examination covers the period from July 1, 2013, through June 30, 2018. As necessary, the examiner reviewed transactions occurring subsequent to June 30, 2018, but prior to the date of this report (i.e., the completion date of the examination).

The Superintendent has the authority under New York Insurance Law Section 314(b)(3) to "make an examination into the affairs" of the System. The examination provides an independent review of the System to better enable the System's Board to determine appropriate action as may be needed in the interest of the System and to assist the Board in meeting its obligations in overseeing the affairs of the System. The examination was conducted in accordance with New York Insurance Law Section 310. In accordance with the direction in New York Insurance Law Section 314(b)(3), the objective of this examination was to review and report on the System's governance, including but not limited to fiduciary, financial, actuarial, investment, risk management, information technology, and member treatment.

The examination comprised a verification of assets and liabilities as of June 30, 2018 to determine whether the System's filed 2018 annual statement fairly presents its financial condition. The examiner reviewed the System's income and disbursements necessary to accomplish such verification and utilized examination procedures, as deemed appropriate, in such review and in the review or audit of the following matters:

History of the System
Management and control
Corporate governance
Growth of the System
Accounts and records
Financial statements
Member benefits
Investments
Actuarial

Sections 1 to 6 of this report on examination are confined to financial statements and comments on those matters that involve laws, regulations or rules, or which require explanation or description.

A separate examination on the investments and investment practices for the five New York City retirement systems was performed. The Investment Examination Report is submitted with this report as a separate document as referenced in section 7.

The actuarial review is included under section 8 of this report.

3. DESCRIPTION OF SYSTEM

A. History

The System was established as of August 1, 1917 under Chapter 303 of the Laws of 1917. The System operates pursuant to the provisions of NYCAC Title 13, Chapter 4 and the New York State Retirement and Social Security Law. The System's members consist of all the teachers and administrative personnel employed by the New York City Department of Education, the City University of New York and certain employees of New York City Charter Schools.

The System operates a QPP and a TDA for the benefit of its members. The QPP is a defined benefit plan, administered under Section 401(a) of the Internal Revenue Code ("IRC"). The QPP enables the members to receive a monthly retirement allowance upon meeting certain eligibility requirements. The TDA is a defined contribution program, established under IRC Section 403(b). The members are given the option to participate in the TDA, which provides a means of deferring income tax payments on their voluntary contributions until after retirement or upon withdrawal.

The assets of the QPP and TDA are co-invested within the fixed and variable annuity investments programs: 1) the Pension Fund, 2) the Diversified Equity Fund, 3) the Balanced Fund, 4) the International Equity Fund, 5) the Inflation Protection Fund, and 6) the Socially Responsive Equity Fund. Until January 1, 2018, the Balanced Fund was called the Bond Fund.

The System files two annual statements with the Department: one for the QPP and the other for the TDA program.

The System administers additional benefit plans for eligible members. Section 8G of this report addresses these other benefit plans.

B. Management

Pursuant to Title 13 of Chapter 4 of the Administrative Code of the City of New York (i.e. the System's By-laws), the System's Retirement Board ("Board") consists of the following: 1) Three representatives from the members, 2) two representatives of the Mayor's Office, one of which must be a member of the Department of Education ("DOE"), 3) the Comptroller of the City of New York, and 4) the Chancellor of the DOE. The Comptroller and the Chancellor may designate a representative to act on his or her behalf.

As of June 30, 2018, the Board had six (6) instead of seven members. The six board members and their titles were as follows:

Name	Principal Business Affiliation	First Year Elected
John Adler Brooklyn, NY	Director Mayor's Office of Pensions and Investments; Mayoral Appointee	2015
Thomas Brown Brooklyn, NY	Teacher Member and Assistant Treasurer United Federation of Teachers	2014
David Kazansky Bronx, NY	Teacher Member	2015
Lindsey Oates New York, NY	Chief Financial Officer Department of Education Representative of the President of the Board of Education	2018
Debra Penny Staten Island, NY	Teacher Member	2016
Scott M. Stringer New York, NY	Comptroller The City of New York	2016

In April 2019, Natalie Green Giles was appointed to the Board to fill the Panel for Education Policy (a DOE) position that had been vacant since March 2014 when Joseph Lewis left the Board. In May 2019, John Adler's term as Chairman of the Board expired and Debra Penny was elected as the chairperson.

The examiner's review of the minutes of the meetings of the Board and its committees indicated that meetings were well attended and that each trustee attended majority of the meetings.

The following is a listing of the principal officers of the System as of June 30, 2018:

Name	Title
Patricia Reilly	Executive Director
Sherry S. Chan	Chief Actuary
Paul Raucci	Chief Accountant

C. Number of Members of the Board of Trustees

Section 13-507 - Teachers' Retirement Board; Membership; Elections of Title 13, Chapter 4 of the Administrative Code of the City of New York states, in part:

> "The president of the board of education or an authorized representative designated by him or her …
>
> 2. The comptroller.
>
> 3. Two members appointed by the mayor, one of whom shall be a member of the board of education; they shall serve until their successors are appointed. Should the board of education member of the retirement board cease to be a member of the board of education, he or she shall cease to be a member of the retirement board. The mayor may … designate one or more alternates to act in the place of either of such appointed members in the event of the absence of such member; provided that only a member of the board of education may be designated to act in the place of such board of education member …
>
> 4. Three members of the retirement association elected from the contributors …"

Thus, the Board is a seven (7)-member board that sets policy and oversees the System's operations.

The review of the minutes of the board meetings held during the examination period as well as the System's filed annual statements for each of the years under examination revealed that the number of the System's trustees was less than the required 7 members as stated in the Administrative Code.

The System violated Section 13-507 of Title 13, Chapter 4 of the Administrative Code of the City of New York (i.e., the System's By-laws) by failing to have seven members on its Board as required by the Code.

The System is directed to have seven board members as required by its Administrative Code.

D. Membership and Employers

Membership in the System is eligible for certain public-school teachers and certain other school and college teachers in New York City. The employers are The City of New York ("The City"), the City University of New York and certain Charter Schools. Substantially, all teachers in the public schools of The City become members of the System and certain other specified school and college personnel may become members on the first day of permanent employment.

All members in the System are in the category of Tier I, II, III, IV or VI. On March 16, 2012, the Governor signed into law Chapter 18 of the Laws of 2012, which amends portions of the Retirement and Social Security Law and Education Law by introducing the Tier VI level of

benefits for all employees who are hired, or who elect to join a retirement system on or after April 1, 2012. Tier VI increased the age requirement from 62 to 63 to receive a full pension, required member contributions from 3% to 6% in accordance with a scheduled salary, lengthened the final average salary ("FAS") period from three to five years, and capped FAS to an amount equal to the Governor's salary.

4. FINANCIAL STATEMENTS

The following statements show the plan net assets of the System as of June 30, 2018, as contained in the System's 2018 filed annual statement and the statement of changes in the plan net assets for each of the fiscal years under review.

A. QPP - Statement of Plan Net Assets as of Fiscal Year Ended June 30, 2018 (In thousands)

Cash	$ 75,847
Receivable for investment securities sold	839,544
Receivable for accrued interest and dividends	273,387
Member loan receivable	312,219
Investments, at fair value	78,901,469
Collateral from securities lending	1,117,592
Other assets	62,852
Total assets	$81,582,910
Accounts payable	$ 643,567
Payable for investments purchased	1,568,064
Accrued benefits payable	13,858
Due to TDA Program's Fixed Return Fund	23,707,352
Payable for securities lending transactions	1,117,593
Total liabilities	$27,050,434
Plan net assets held in trust for benefits	$54,532,476

B. QPP - Statement of Change in Plan Net Assets (In thousands)

	2014	2015	2016	2017	2018
ADDITIONS:					
Contributions:					
Member contributions	$ 154,962	$ 158,590	$ 173,696	$ 180,076	$ 195,241
Employer contributions	2,998,694	3,270,007	3,702,569	3,888,399	3,889,710
Other employer contributions	55,730	55,521	58,145	57,369	59,979
Total contributions	$3,209,386	$ 3,484,118	$ 3,934,410	$ 4,125,844	$ 4,144,930
Investment income:					
Interest income	$ 709,594	$ 758,526	$ 860,223	$ 932,169	$ 1,330,009
Dividend income	854,701	889,231	896,208	981,087	1,056,636
Net appreciation (depreciation) in fair value of investments	8,027,414	146,833	(598,443)	6,516,379	4,223,813
Total investment income	9,591,709	1,794,590	1,157,988	8,429,635	6,610,458
Less:					
Investment expenses	162,208	209,321	222,163	316,180	356,269
Net (decrease) in variable expense provision	0	(6,360)	(7,095)	(2,379)	(5,601)
Net investment income	$ 9,429,501	$1,591,629	$ 942,920	$8,115,834	$6,259,790
Securities lending transactions:					
Securities lending income	7,699	21,713	18,742	18,806	16,654
Less securities lending fees	(1,294)	(1,413)	(1,395)	(1,360)	(1,329)
Net securities lending income	$ 6,405	$ 20,300	$ 17,347	$ 17,446	$ 15,325
Other					
Interest (to) from TDA Programs					
Fixed return fund	(1,147,923)	0	0	0	0

	2014	2015	2016	2017	2018
Net receipts (to) from other retirement systems	$ 404	$ 329	$ 1,233	$ 0	$ 0
Total additions	$ 11,497,773	$ 5,096,376	$ 4,895,910	$ 12,259,124	$ 10,420,045
DEDUCTIONS:					
Benefits payments and withdrawals	3,818,248	4,024,272	4,107,455	4,219,312	4,351,924
Administrative expenses	46,042	58,391	59,367	60,790	65,076
Other:					
Net receipts to other retirement Systems	0	0	0	2,291	3,534
Statutory Interest for TDA Program's Fixed Return Fund	0	1,248,988	1,354,207	1,466,615	1,595,462
TDA rebalance	0	0	0	43,938	(32,704)
Total deductions	$ 3,864,290	$ 5,331,651	$ 5,521,029	$ 5,792,946	$ 5,983,292
Net increase in plan net assets	$ 7,633,483	$ (235,275)	$ (625,119)	$ 6,466,178	$ 4,436,753
Plan net assets held in trust for benefits:					
Beginning of year	36,856,456	44,489,939	44,254,664	43,629,545	50,095,723
End of Year	$44,489,939	$44,254,664	$43,629,545	$50,095,723	$54,532,476

C. TDA - Statement of Plan Net Assets as of Fiscal Year Ended June 30, 2018 (In thousands)

Cash	$ 7,371
Receivables for investment securities sold	7,250
Receivables for accrued interest and dividends	15,580
Member loan receivables	386,804
Investments, at fair value	9,427,324
Collateral from securities lending	95,170
Other assets	18,613
Sub-total	$ 9,958,112
TDA investment in TRSNYC Pension Fund	$23,707,352
Total assets	$33,665,464
Accounts payable	$ 85,715
Payable for investment securities purchased	12,473
Accrued benefits payable	91,124
Payable for securities lending transactions	95,170
Total liabilities	$ 284,482
Total net assets held in trust for benefits	$33,380,982

D. TDA - Statement of Change in Plan Net Assets (In thousands)

	2014	2015	2016	2017	2018
Contributions:					
Member contributions	$ 638,979	$662,601	$717,566	$ 743,663	$ 856,294
Investment income:					
Interest income	33,367	32,627	33,469	34,368	35,177
Dividend income	116,160	126,867	128,383	138,237	146,932
Net appreciation in fair value of investments	1,487,702	275,464	(182,355)	1,218,575	873,699
Total Investment Income	$1,637,229	$434,958	$ (20,503)	$1,391,180	$1,055,808
Less:					
Investment expenses	7,528	13,049	12,062	12,478	10,436
Net (decrease) in variable expense Provision	0	(10,291)	(17,707)	(17,996)	(8,288)
Net Investment Income	$1,629,701	$432,200	$ (14,858)	$1,396,698	$1,053,660
Securities lending income	1,895	3,811	4,054	2,014	1,706
Less - securities lending fees	185	379	390	212	175
Net securities lending income	$ 1,710	$ 3,432	$ 3,664	$ 1,802	$ 1,531
Other					
Interest (to) from TDA Programs					
Fixed return fund	1,147,923	1,248,988	0	0	0
Total additions	$3,418,313	$ 2,347,221	$ 706,372	$2,142,163	$1,911,485
Benefits payments and withdrawals	757,312	861,345	917,189	1,011,931	1,122,898

	2014	2015	2016	2017	2018
Administrative expenses	17,188	25,783	32,632	33,032	22,456
Statutory Interest for TDA Program Program's Fixed Return Fund			(1,354,207)	(1,466,615)	(1,595,462)
TDA Rebalance	0	0	0	(43,938)	32,704
Total deductions	$ 774,500	$ 887,128	$ (404,386)	$ (465,590)	$ (417,404)
Net increase in plan net assets	$ 2,643,813	$ 1,460,093	$ 1,110,758	$ 2,607,753	$ 2,328,889
Plan net assets held in trust for benefits:					
Beginning of year	23,229,676	25,873,489	27,333,582	28,444,340	31,052,093
End of Year	$25,873,489	$27,333,582	$28,444,340	$31,052,093	$33,380,982

5. TREATMENT OF MEMBERS

The examiner reviewed a sample of various types of retirement benefits to members and beneficiaries. The examiner also reviewed the various controls involved, checked the accuracy of the computations and traced the accounting data to the books of account.

Based upon the samples reviewed, no significant findings were noted.

6. TAX DEFERRED ANNUITY PROGRAM

According to the System's financial statements, The TDA Program are made by members only. A member may elect to contribute to the TDA Program any amount not in excess of the annual maximum permissible under IRC Section 403(b). The Internal Revenue Service ("IRS") established the required minimum distribution rules that require members to begin taking withdrawals from their retirement plans by a specified time. Non-working or retired members must begin receiving amounts from the TDA Program by April 1 of the year following the calendar year the member attains age 70½, and subsequently annually by each December 31.

Members may choose to invest their contributions in variable funds or in a non-variable fund (the TDA Fixed Program). TDA Fixed Program funds are pooled with QPP assets. The annual rate of interest credited in the TDA Fixed Program for the examination period was 7% for United Federation of Teachers members and 8.25% for all other members.

The TDA Program is maintained as a separate plan with assets held in a separate trust from the QPP. At June 30, 2018, the TDA net assets totaled approximately $33.38 billion of which roughly $23.71 billion is held in the TDA Fixed Program.

7. INVESTMENT EXAMINATION REPORT

The Investment Examination Report is submitted with this report as a separate document.

The Investment Examination Report is based on a review of the five New York City retirement systems and includes all related findings and recommendations.

8. ACTUARIAL REVIEW

A. Actuarial Valuation

Each year the New York City Office of the Actuary ("OA") performs an actuarial valuation to determine the System's funded status and the annual required contribution from participating employers. Annual required employer contributions together with member contributions and investment income are intended to fund members' retirement benefits during their active service.

The valuation date each year is the System's fiscal year end, June 30th. Fiscal and member information are provided as of the valuation date and are used to calculate the required employer contribution for the fiscal year starting one year after the valuation date. For example, the results of the June 30, 2017 actuarial valuation were used to determine the annual required employer contribution for the fiscal year July 1, 2018 to June 30, 2019. The lag between the valuation date and fiscal year required employer contribution allows participating employers to budget for upcoming pension costs and provides the Board with information to make appropriate decisions regarding the plan. OA has implemented a one-year lag methodology[1] ("OYLM") to determine the fiscal year required employer contribution using actuarial valuation results from one year before.

As the actuarial valuation projects future expected events and the present value of benefits payable from such events, the results of the actuarial valuation are highly dependent on the actuarial assumptions used to predict the future as well as member and financial information as of the valuation date. Financial information and member data are provided to OA by the System. Actuarial assumptions are adopted by the System's Board.

The results of an actuarial valuation estimate the System's funded status and annual required employer contribution. This is done by applying actuarial methods to allocate the present

[1] The one-year lag methodology was revised starting with the June 30, 2017 actuarial valuation

value of future benefits between the past and the future (actuarial cost method), determine the value of plan assets (asset valuation method), and amortization of the unfunded accrued liability (amortization method). Together these methods determine the annual required employer contribution and represent the System's contribution allocation procedure.

B. Actuarial Cost Method

An actuarial cost method allocates the cost or present value of projected benefits to individual time periods before benefits are expected to be paid. As pension plans are generally funded over long periods of time, actuaries often use an actuarial cost method as a fundamental component for determining the required employer contribution each year.

There are various actuarial cost methods that may be used to allocate costs. Costs may be determined on an individual member or group basis, but the allocation should relate to expected compensation or service or the benefit formula on which the projected benefit is based.

The cost allocated to a time period, generally one year, is called the normal cost ("NC"). The present value of future benefits not funded by the present value of future normal costs is called the actuarial accrued liability or accrued liability ("AL"). The sum of the AL and the present value of future normal costs should equal the present value of future benefits ("PVFB") as shown in the following formula:

$$PVFB = AL + PVFNC$$

Costs are determined annually as of the June 30th valuation date, based on the System's fiscal year, July 1st to June 30th. Accordingly, if as of the June 30, 2017 valuation date, salaries are expected to be paid for only the next ten years, then there would be ten years of future NCs; one NC for each year of future salary.

The Board adopted an entry age normal ("EAN") actuarial cost method to allocate the costs for the System beginning with the June 30, 2010 actuarial valuation. Regarding EAN and the resulting normal contribution, NYCAC Section 13-527(b)(5) provides:

> (a) Notwithstanding the preceding paragraphs of this subdivision or any other provision of law to the contrary, the normal contribution payable to the contingent

reserve fund in fiscal year two thousand eleven--two thousand twelve, and in each fiscal year thereafter, shall be the entry age normal contribution, as determined by the actuary pursuant to this paragraph in a manner consistent with the entry age actuarial cost method. The actuary shall determine the entry age normal contribution for each such fiscal year as of June thirtieth of the second fiscal year preceding the fiscal year in which such normal contribution is payable, based on the latest mortality and other tables applicable at the time he or she performs such calculations, and the valuation rate of interest as provided for the retirement system in paragraph two of subdivision b of section 13-638.2 of this title.

(b) In calculating the entry age normal contribution payable in any such fiscal year pursuant to this paragraph, the actuary, in his or her discretion, may make certain adjustments in the calculation methodology, provided that such adjustments are generally accepted as consistent with the entry age actuarial cost method, and are designed, in general, to fund, on a level basis over the working lifetimes of members from their ages at entry, the actuarial present value of benefits to which such members are expected to become entitled, as determined by the actuary. Such generally accepted adjustments in the calculation methodology, in the discretion of the actuary, may include, but are not limited to, the calculation of the entry age normal contribution (i) on an individual member basis by calculating the amount of the entry age normal contribution attributable to each individual member, and then adding together such individual member amounts, (ii) on an aggregate basis for all members or (iii) on any combination of an individual member basis and an aggregate basis which is consistent with the entry age actuarial cost method, and the preceding provisions of this subparagraph.

(c) For each such fiscal year, the actuary, in his or her discretion, shall determine, in accordance with the provisions of subparagraph (b) of this paragraph, the methodology for calculating the entry age normal contribution payable for that particular fiscal year.

(d) The methodology determined by the actuary in accordance with subparagraph (c) of this paragraph may provide for the actuary to calculate the entry age normal contribution on an individual member basis by (i) multiplying the entry age normal

contribution rate for each individual member, as determined by the actuary, by the salary expected to be paid to that member during the fiscal year in which such normal contribution is payable, and (ii) calculating the sum of the individual entry age normal contributions attributable to all such members. The actuary, in his or her discretion, may make any adjustments to such methodology for determining the entry age normal contribution on an individual basis which he or she deems appropriate, and which are consistent with the provisions of subparagraph (b) of this paragraph.

(e) In the alternative, the methodology determined by the actuary in accordance with subparagraph (c) of this paragraph may provide for the actuary to calculate the entry age normal contribution on an aggregate basis by multiplying the entry age normal contribution rate for all members in the aggregate, as determined by the actuary, by the aggregate amount of the salaries expected to be paid to all members during the fiscal year in which the normal contribution is payable. The actuary, in his or her discretion, may make any adjustments to such methodology for determining the entry age normal contribution on an aggregate basis which he or she deems appropriate, and which are consistent with the provisions of subparagraph (b) of this paragraph.

(f) In the alternative, the methodology determined by the actuary in accordance with subparagraph (c) of this paragraph may provide for the calculation of the entry age normal contribution on any other basis which the actuary deems appropriate, and which is consistent with the entry age actuarial cost method and the provisions of subparagraph (b) of this paragraph.

(g) (i) Where the methodology determined by the actuary in accordance with subparagraph (c) of this paragraph requires the determination of an entry age normal contribution rate for each individual member in order to calculate the entry age normal contribution for each individual member, the actuary shall determine such rate for each such member in accordance with the entry age actuarial cost method, and such rate, as determined by the actuary for each such member, shall be consistent with a method designed, in general, to fund, on a level basis over the working lifetime of that particular member from his or her age at entry, the actuarial

present value of benefits to which such member is expected to become entitled, as determined by the actuary.

(ii) Where the methodology determined by the actuary in accordance with subparagraph (c) of this paragraph requires the determination of an entry age normal contribution rate for all members in the aggregate in order to calculate the entry age normal contribution for all members in the aggregate, the actuary shall determine such rate in accordance with the entry age actuarial cost method, and such rate, as determined by the actuary, shall be consistent with a method designed, in general, to fund, on a level basis over the working lifetimes of members from their ages at entry, the actuarial present value of benefits to which such members are expected to become entitled, as determined by the actuary.

The June 30, 2017 actuarial valuation report defines this method as:

"Under this method, the Present Value (PV) of Future Benefits (PVFB) of each individual included in the actuarial valuation is allocated on a level basis over the earnings (or service) of the individual between the entry age and the assumed exit age(s). The employer portion of this PVFB allocated to a valuation year is the Normal Cost. The portion of this PVFB not provided for at the valuation date by the PV of Future Normal Costs or future member contributions is the Accrued Liability (AL)."

Under the adopted actuarial cost method, the QPP's NC and AL is equal to the sum of the individually determined NC and AL.

The calculation of the QPP's AL under the EAN cost method from June 30, 2014 to June 30, 2017, as reported in annual statement filings with the Department, is provided in Table 1 below.

Table 1: Actuarial Accrued Liability under the Entry Age Normal Cost Method (Results in $ Thousands)				
Valuation Date June 30,	2014	2015	2016	2017
Present Value of Future Benefits (PVFB)	$ 81,378,493	$ 84,781,623	$ 85,762,241	$ 86,010,300
Present Value of Future Normal Costs (PVFNC)	14,068,516	15,156,015	15,797,829	16,457,920
Actuarial Accrued Liability (AL): [AL = PVFB – PVFNC]	67,309,977	69,625,608	69,964,412	69,552,380

It is important to note that the actuarial cost method alone does not determine the required employer contribution each year under the System's contribution allocation procedure. Additional considerations, such as the level of QPP assets accumulated as of the valuation date and the need for additional employer contributions if QPP experience was less favorable than expected, are needed when determining the required employer contribution. These items are covered in the Asset Valuation Method and Amortization Method.

Observations:

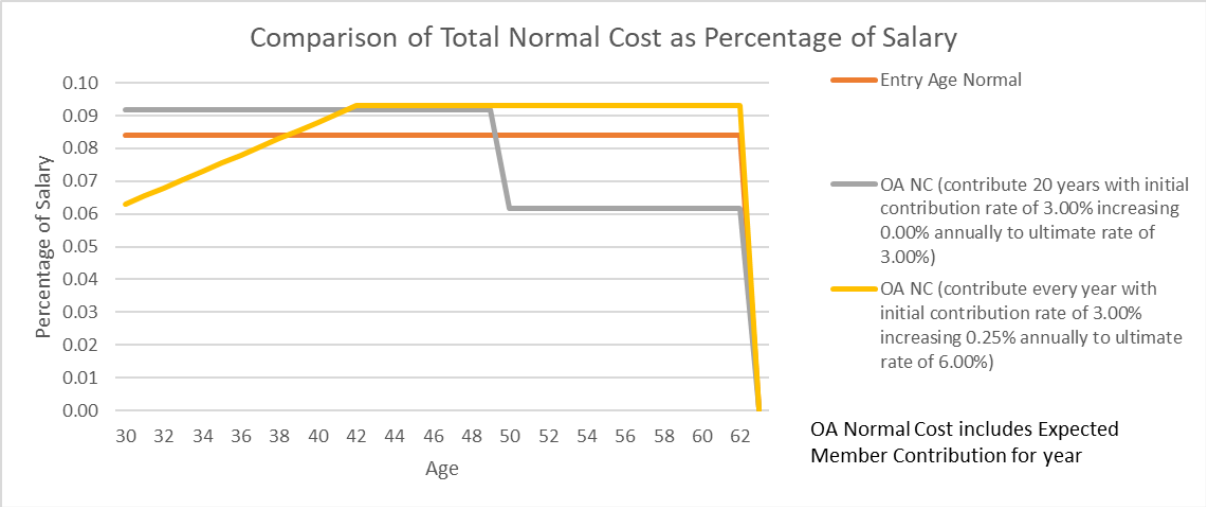
The EAN actuarial cost method used does not appear to follow the EAN actuarial cost method as defined under NYCAC Section 13-527(b)(5) or by the ASB. The ASB defines the EAN actuarial cost method as:

> "A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the *Actuarial accrued liability*. (ASOP No. 4)"

NYCAC Section 13-527(b)(5) and ASB require the entire PVFB (i.e., actuarial present value of benefits to which such members are expected to become entitled as referred to under NYCAC Section 13-527(b)(5)) to be allocated on a level basis. However, the method used by OA only allocates *a portion* of the PVFB on a level basis. Under OA's method, the "employer" portion of the PVFB is allocated on a level basis as NCs. The "employee" portion of the PVFB is then allocated each year as the expected employee contribution for the year that may increase, decrease,

or even stop based on the member's benefit plan or tier. As a result, the QPP's NC (or total NC) is not determined on a level basis each year as defined under the ASB definition of the EAN actuarial cost method or the methodology described under NYCAC Section 13-527(b)(5).

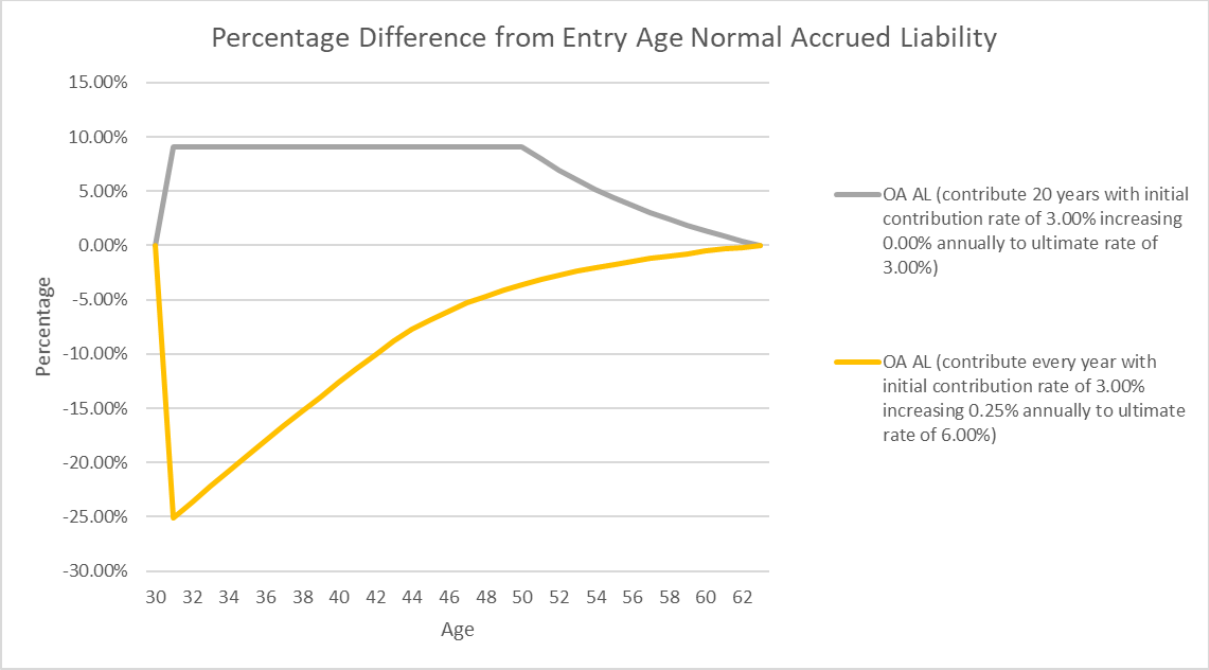
This is illustrated in the following example for an individual who enters the QPP at age 30 with a starting salary of $40,000, receives 3% annual salary increases, and retires at age 63 with a retirement benefit valued (present value) at $600,000 at retirement. The example also assumes an interest rate of 7% and that the member works each year until retirement (i.e., not assumed to leave for any reason prior to retirement).



The orange line represents the level percent of pay EAN NC as defined by the ASB, while the gray and yellow line represent OA's calculation of the QPP's NC (employee and employer portions) for the same individual under two different employee contribution scenarios.

In this illustrative example, OA's method does not provide a level total NC as a percentage of salary. The member contributing for only 20 years (gray line) has a higher total NC than the EAN actuarial cost method for the first 20 years followed by a lower NC after 20 years once member contributions stop. The member contributing an increasing percentage of salary (yellow line) initially has a lower total NC than the EAN actuarial cost method. However, the total NC increases each year as the member's contribution percentage increases and eventually leading to a higher total NC.

OA's method also causes the AL to deviate from the EAN AL as defined by the ASB as illustrated below:



As shown in the example above, OA's method will consistently overstate or understate the AL depending on the schedule of member contributions after entry until the ultimate retirement age.

The purpose of an actuarial cost method is to allocate plan costs to the past (AL) and future (NC). Future contributions and who pays such future contributions should not impact the actuarial cost method's allocation to the past (AL). The allocation of NC and AL should reflect the plan's benefit formula or the member's compensation or service. Allowing the attribution of NC to vary based on expected member contributions does not appear to follow generally accepted actuarial practices for selecting an actuarial cost method[2] or NYCAC Section 13-527(b)(5).

Recommendations:

The System should consider revising the actuarial cost method to follow the EAN actuarial cost method as defined by the ASB and described under NYCAC Section 13-527(b)(5).

C. Asset Valuation Method

Fluctuations in the market value of assets can lead to dramatic changes in required employer contributions and funded status from year to year. To mitigate these fluctuations,

[2] ASOP 4 (Doc. No. 205), Section 3.13(b)

actuaries often use an asset valuation method to calculate an actuarial value of assets ("AVA") to be used in place of the market value of assets ("MVA"). AVA is typically designed to provide a more stable and predictable value of assets from year to year often by recognizing investment gains or losses over a period of time instead of immediately as under the MVA. However, the AVA should still relate to the MVA within a reasonable range and recognize investment gains and losses over a reasonable period.

The System's Board adopted a new asset valuation method beginning with the June 30, 2011 actuarial valuation. Under this method investment gains and losses from the Fixed Program or Fixed Return Funds are recognized or "phased-in" over a six-year period. The annual percentage recognized is 15% for the first four years and 20% for the last two years. Investment gains and losses from Fixed Return Funds are determined based on an assumed 7% expected return on the AVA for Fixed Return Funds. If the total net investment income on the MVA for Fixed Return Funds exceeds the expected investments return of 7% on the AVA for Fixed Return Funds then there is an investment gain. If the total net investment income on the MVA for Fixed Return Funds is less than the assumed 7% investment return on the AVA for Fixed Return Funds then there is an investment loss. These investment gains and losses for Fixed Return Funds are referred to in the asset valuation method as unexpected investment returns ("UIR"). The MVA for Fixed Return Funds is then adjusted by the unrecognized portion of the UIRs to determine the AVA. The adjusted value of the Fixed Return Funds is combined with the MVA for the Variable Asset Funds to equal the total AVA.

Beginning with the June 30, 2014 actuarial valuation, the asset valuation method was revised to restrict the Fixed Return Fund portion of the AVA to within 80% to 120% of the market value for Fixed Return Funds as of the valuation date.

An abbreviated summary of the System's pension plan AVA calculation from June 30, 2014 to June 30, 2017 is provided in Table 2 below.

Table 2: Actuarial Value of Assets (Results in $ Thousands)					
Valuation Date (VD) June 30,		2014	2015	2016	2017
Fixed Return Funds					
(1)	MVA as of the VD	$ 41,199,955	$ 41,452,045	$ 41,440,456	$ 43,920,339
(2)	Actual Investment Return on MVA for fiscal year ending on the VD	8,736,896	1,457,155	981,059	7,327,840
(3)	Expected Investment Return on AVA for fiscal year ending on the VD	2,197,176	2,354,023	2,519,379	2,548,141
(4)	Unexpected Investment Return (UIR): [(2) – (3)]	6,539,720	(896,868)	(1,538,320)	4,779,699
(5)	Phase-in of current year and 5 prior year's UIR	6,968,516	4,964,592	2,614,458	5,714,017
(6)	Preliminary AVA: [(1) – (5)]	34,231,439	36,487,453	38,825,998	38,206,322
(7)	Minimum AVA: [80% x (1)]	32,959,964	33,161,636	33,152,365	35,136,271
(8)	Maximum AVA: [120% x (1)]	49,439,946	49,742,454	49,728,547	52,704,407
(9)	AVA (Fixed Return Fund Only): [(6), but not less than (7) and not greater than (8)]	34,231,439	36,487,453	38,825,998	38,206,322
Variable Return Funds					
(10)	MVA as of the VD	3,289,985	2,802,619	2,189,089	6,175,384
Total Assets					
(11)	Final MVA as of the VD: [(1) + (10)]	44,489,940	44,254,664	43,629,545	50,095,723
(12)	Final AVA as of the VD: [(9) + (10)]	$ 37,521,424	$ 39,290,072	$ 41,015,087	$ 44,381,706

The MVA exceeded the AVA each year during the examination period primarily due to large unexpected investment returns for the fiscal years ended June 30, 2013 and June 30, 2014, which are slowly being recognized in the AVA over the six-year phase-in period.

Observations:

The asset valuation method used results in an investment gain or loss even if the actual investment return on the MVA exactly matched the assumed return on the MVA for the year. For example, if the AVA was greater than the MVA at the beginning of the year there would be an investment loss if the actual investment income on the MVA matched the assumed return assumption (7%). Similarly, if the actual investment income on the MVA matched the assumed return, but the AVA was less than the MVA at the beginning of the year, then there would be an investment gain. Consequently, the AVA is not expected to converge to the MVA until many years into the future even if expected investment returns on MVA are exactly met.

Recommendations:

The System should consider revising the asset valuation method to determine the investment gain or loss by comparing the actual net investment income on the MVA against the expected investment income on the MVA. The recommended change would allow the AVA to timely converge to the MVA over the phase-in period if assumed investment returns on MVA are exactly met in the future in accordance with generally accepted actuarial practices.

The System indicated that the asset valuation method was changed starting with the June 30, 2019 actuarial valuation and reflects expected investment income on the MVA consistent with this recommendation.

D. Funding Ratios

A measure for evaluating a pension plan's funding adequacy is the funding ratio or funded status. Specifically, it is the ratio of AVA to AL as of the valuation date. A funding ratio of 100% signifies the AVA is sufficient to cover all benefit costs or NCs attributed to service or salaries rendered to date, and that future contributions will be needed to pay only for benefit costs attributed to future service or salaries, specifically future NCs. However, a plan will rarely have a funding ratio of exactly 100%. Plan experience, the difference between what was assumed in the actuarial valuation and what occurred each year, will cause the plan to deviate from a funding ratio of 100%. A plan with a funding ratio of less than 100% has an unfunded actuarial accrued liability ("UAL") which is equal to AL minus AVA. A plan with UAL will need to make contributions exceeding the NC to fund all benefit costs if actuarial assumptions are exactly met in the future. The

additional contribution needed to eliminate the UAL is generally amortized over a period of time in accordance with a pension plan's amortization method.

The System's funded ratio for each of the last ten years (2008-2017) is shown in Table 3[3] below.

Table 3: Unfunded Actuarial Accrued Liability and Funded Ratio (Results in $ Thousands)				
Valuation Date June 30	AVA	AL	UAL	Funded Ratio
2008	$ 32,227,375	$ 49,400,762	$ 17,173,387	65.2%
2009	30,774,981	47,988,459	17,213,478	64.1%
2010	32,477,527	55,138,366	22,660,839	58.9%
2011	33,601,537	57,702,731	24,101,194	58.2%
2012	33,871,180	58,783,399	24,912,219	57.6%
2013	35,186,072	61,988,933	26,802,861	56.8%
2014	37,521,424	67,309,977	29,788,553	55.7%
2015	39,290,072	69,625,608	30,335,536	56.4%
2016	41,015,087	69,964,412	28,949,325	58.6%
2017	44,381,706	69,552,380	25,170,674	63.8%

The System has yet to regain the level of funded status from 2008 (65.2%) despite an increasing funded ratio for each of the last three years of the examination period (2015-2017). In addition, the UAL increased from approximately $17.2 billion as of June 30, 2008 to $25.2 billion as of June 30, 2017.

E. Amortization Method for Unfunded Actuarial Accrued Liability

In conjunction with the System's adoption of the EAN actuarial cost method commencing with the June 30, 2010 actuarial valuation, an amortization method for determining the additional annual contribution needed to eliminate the System's UAL was established.

An initial UAL balance (or base) of $20,524,022,955 was established by the System effective June 30, 2010 equal to the System's UAL after OA's adjustment for the OYLM. Pursuant to the System's amortization method, the initial UAL ("IUAL") was amortized over 21 annual installments with the first installment due for the fiscal year beginning July 1, 2011 (one year after the valuation date). Annual installments would increase by 3% each year from a first installment

[3] Results from Table VI-1 of the June 30, 2017 (lag) actuarial valuation report dated December 31, 2019.

of approximately $1.542 billion to a projected final installment of roughly $2.785 billion for the fiscal year beginning July 1, 2031.

Starting with the June 30, 2011 actuarial valuation and each actuarial valuation thereafter, the UAL is re-measured by OA and additional separate UAL bases are established to amortize changes in UAL attributed to the following:

- Actuarial gains and losses (amortized over 14 annual installments)
- Actuarial assumption or method changes (amortized over 19 annual installments)
- Enacted changes in benefits (per OA's valuation reports, if not defined by statute, then amortized on the remaining working lifetime of the members impacted by the benefit change)

Unlike the IUAL installments, the annual installments for each of the post-2010 bases are fixed amounts and will not increase each year in the future.

The total remaining amortization balance as of June 30, 2017 for each amortization base listed in the June 30, 2017 (lag) actuarial valuation report is summarized in Table 4 below:

Table 4: Schedule of Unfunded Accrued Liability Bases as of June 30, 2017
(Amounts in $1,000s)

Amortization Base	Date Established	Outstanding Balance at 6/30/2017	Remaining Payments	Payment on 12/31/2017
Initial UAL	6/30/2010	$ 20,727,772	15	$1,841,243*
(Gain)/Loss	6/30/2011	1,060,099	9	157,299
(Gain)/Loss	6/30/2012	669,088	10	92,094
(Gain)/Loss	6/30/2013	1,895,407	11	244,358
(Gain)/Loss	6/30/2014	964,696	12	117,417
Assumption Change	6/30/2014	2,263,650	17	224,142
(Gain)/Loss	6/30/2015	751,007	13	86,870
(Gain)/Loss	6/30/2016	(907,822)	14	(100,352)
(Gain)/Loss	6/30/2017	(2,235,026)	14	0
ASAF Method Change	6/30/2017	116,240	19	0
Assumption Change	6/30/2017	(1,078,726)	19	0
Method Changes	6/30/2017	9,078	19	0
	Total	$ 24,235,463		$ 165,986

* Payments to increase by 3% annually

The projected net amortization payments each year and their discounted value as of June 30, 2017 are estimated by the examiner as follows:

Fiscal Year Ending 6/30	Mid-Year Net Amortization Payment (Amounts in $1,000s)	Discounted Value as of June 30, 2017 (Amounts in $1,000s)
2018	$ 2,663,072	$ 2,574,488
2019	2,358,532	2,130,915
2020	2,415,426	2,039,550
2021	2,474,028	1,952,366
2022	2,534,387	1,869,158
2023	2,596,557	1,789,728
2024	2,660,592	1,713,893
2025	2,726,548	1,641,477
2026	2,794,483	1,572,314
2027	2,707,158	1,423,533
2028	2,687,136	1,320,565
2029	2,517,012	1,156,037
2030	2,476,057	1,062,829
2031	2,467,942	990,043
2032	2,649,412	993,310
2033	128,723	45,103
2034	128,723	42,153
2035	(95,419)	(29,202)
2036	(95,419)	(27,292)
2037	(95,419)	(25,507)
	Total	$ 24,235,463

The discounted value of projected net amortization payments as of June 30, 2017 was approximately $24.235 billion. However, the UAL as of June 30, 2017 was approximately $25.171 billion.

Observations:

The amortization payments are not expected to amortize the UAL as of the valuation date due to the OYLM adjustment. The OYLM adjusts the UAL as of the valuation date by the present value of the employer normal cost contribution for the year immediately following the valuation date and future administrative expense reimbursements as shown in Table 5 below:

Table 5: Development of Adjusted UAL / Outstanding Amortization Balance (Amounts in $1,000s)				
June 30 Valuation Date	2014	2015	2016	2017
1. Accrued Liability (AL)	$ 67,309,977	$ 69,625,608	$ 69,964,412	$69,552,380
2. Actuarial Value of Assets (AVA)	37,521,424	39,290,072	41,015,087	44,381,706
3. Unfunded Accrued Liability (UAL): [(1) - (2)]	29,788,553	30,335,536	28,949,325	25,170,674
4. PV 1-year Adjusted Employer Contribution	1,015,997	1,050,590	1,088,218	3,707,659*
5. PV Future Administrative Expense Reimbursement	76,284	89,600	100,403	105,290
6. PV of retiree TDA annuities exceeding TDA assets	464,899	486,005	488,763	303,249
7. Adjusted UAL / Outstanding Amortization Balance: [(3) - (4) - (5) + (6)]	$ 29,161,171	$ 29,681,351	$ 28,249,467	$21,660,975

* Prior to the June 30, 2017 actuarial valuation only the adjusted employer normal cost was included. Starting with the June 30, 2017 actuarial valuation the entire employer contribution was adjusted by OA.

The adjustments under OYLM include using employer contributions (lines 4 and 5 from Table 5) for fiscal years starting after the valuation date to reduce the UAL as of the valuation date. However, only one component of the employer contribution, the amortization of the unfunded accrued liability as shown in valuations reports under the table entitled “statutory contributions”, by definition, is intended to apply towards reducing the UAL. The normal cost and administrative expense components of the statutory employer contributions are not intended to fund the UAL but are instead intended, by definition, to fund future expected costs which would otherwise increase the UAL at the next valuation date. That is, reflecting future fiscal year contributions for normal cost and administrative expenses would have little effect on changing the UAL from year to year if a reasonable actuarially determined contribution is paid each year. Employer normal cost contributions during the year would fund the expected increase in AL attributed to the normal cost for the year. Similarly, administrative expense contributions for the year would fund administrative expenses incurred during the year. Consequently, if all actuarial assumptions were exactly met during the year, the UAL next year wouldn’t be impacted by the employer normal cost

and administrative expense contributions for the year. Only contributions made to amortize the UAL would then reduce the UAL next year if all actuarial assumptions were exactly met.

It appears OYLM is effectively measuring assets and the AL at different dates which results in the OYLM apparently double counting the employer normal cost contribution and administrative expense contributions by applying them to fund the UAL at the valuation date and future costs after the valuation date. Consideration should be given as to whether this practice deviates from generally accepted actuarial practices for calculating assets and liabilities as of the same measurement date[4] (i.e., valuation date) or appropriately reflecting events after the measurement date.[5]

Line 6 of Table 5 includes an additional adjustment to the UAL for TDA annuities. If TDA assets held for current TDA annuitants is greater than OA's calculated present value of expected annuity payments, then the UAL for the QPP is reduced by the excess TDA assets. If the value of TDA expected annuity payments is greater than the TDA assets held for current TDA annuitants, then the QPP UAL is increased by the TDA asset shortfall. The System has indicated this adjustment is appropriate since it reflects a payable (receivable) from the TDA to the QPP.

This adjustment for the TDA annuities appears to conflict with applicable guidance (as described below) and previous statements and reporting by the System. Annual statement filings made by the System with the Department stated the following regarding the TDA:

> "In general, the employers make no contributions to the Tax-Deferred Annuity Program. However, if the member elects to annuitize his/her accumulated contributions, the employers will guarantee the benefit payments. The employers will also cover any shortfall when the assets do not earn the guaranteed rate of return on the Fixed Funds."

An October 25, 2018 letter from the System's general counsel to the Department again confirmed this by referencing to the annual statement filings. However, this appears to conflict with later statements by the System that indicated the QPP is providing the guarantee. This is discussed more in section 8G.

[4] ASOP No. 4 (Doc. No. 205), Section 2.16
[5] ASOP No. 4 (Doc. No. 205), Section 3.4.2

In addition, the System noted 26 CFR §1.403(b)-8(c)(3) as permitting the arrangement which states the following:

> (3) Special rule for certain contracts. This paragraph (c)(3) applies in the case of a contract issued under a State section 403(b) plan established on or before May 17, 1982, or for an employee who becomes covered for the first time under the plan after May 17, 1982, unless the Commissioner had before that date issued any written communication (either to the employer or financial institution) to the effect that the arrangement under which the contract was issued did not meet the requirements of section 403(b). **The requirement that the contract be issued by an insurance company qualified to issue annuities in a State does not apply to a contract described in the preceding sentence if one of the following two conditions is satisfied and that condition has been satisfied continuously since May 17, 1982—**
>
> **(i) Benefits under the contract are provided from a separately funded retirement reserve that is subject to supervision of the State insurance department; or**
>
> **(ii) Benefits under the contract are provided from a fund that is separate from the fund used to provide statutory benefits payable under a state retirement system and that is part of a State teachers retirement system (including a state university retirement system) to purchase benefits that are unrelated to the basic benefits provided under the retirement system, and the death benefit provided under the contract does not at any time exceed the larger of the reserve or the contribution made for the employee.[Emphasis added.]**

As highlighted above, the exception for requiring the annuity contract to be issued by a qualified insurance company only applies if (i) or (ii) are satisfied. However, QPP assets are not a separate fund or reserve if used to provide QPP and TDA annuity contract benefits. In addition, QPP and TDA assets are held in separate trusts and are subject to qualified trust requirements, which

includes the use of trust assets of a particular plan for the exclusive benefit of participants or their beneficiaries of the same particular plan.

Consequently, reflecting TDA asset shortfalls or excesses in the determination of the QPP employer contribution does not appear to follow previous System statements that TDA asset shortfalls are covered by employers or that the System is separately funding or using a separate fund for TDA guarantees. This raises the question as to how the arrangement satisfies the requirements (i) or (ii) of 26 CFR §1.403(b)-8(c)(3) and the appropriateness of including TDA related obligations as part of the QPP UAL. This is discussed further in section 8G.

Table 4 also noted that 11 of the 12 amortization bases listed in the June 30, 2017 actuarial valuation used a level dollar amortization amount. Only the IUAL is amortized using a 3% annual increasing dollar amount. The combined outstanding balance for the 11 level dollar amortization bases was roughly $3.508 billion as of June 30, 2017, while the outstanding balance for the IUAL base was approximately $20.728 billion as of June 30, 2017. The IUAL amortization payment of $1,896,480,672 represents over 51% of the entire statutory employer contribution of $3,696,685,559 for the fiscal year ended June 30, 2019.

Best practices from the Government Finance Officers Association ("GFOA") recommend a funding policy that provides reasonable assurance that the cost of those benefits will be funded in an equitable and sustainable manner.[6] This includes for consistently amortizing bases as either a level percentage of compensation (i.e., increasing dollar amount) or level dollar amount and to balance the equitable allocation of cost among generations with contribution volatility. While the IUAL amortization is required by statute, the IUAL amortization payment doesn't appear to follow GFOA best practices and poses funding concerns participating employers since it represents roughly 51% of the entire statutory employer contribution for the fiscal year ended June 30, 2019 and the IUAL amortization payment will continue to increase by 3% annually through the fiscal year ending June 30, 2032. The New York State and Local Retirement System, which effectively amortizes all valuation gains and losses over the remaining working lifetimes of its active members, notes these concerns on page 131 of its publicly available 2017 Annual Comprehensive Financial Report under its amortization policy which states: "the fact that the method does not allow arbitrary amortization periods or increasing payments is useful in a public setting, as budgetary pressures can inspire a temptation to fund benefits over time frames that extend beyond

[6] Core Elements of a Funding Policy for Governmental Pension and OPEB Plans.

the working lifetimes of the benefit recipients, and/or with back-loaded payments, which is not prudent and compromises intergenerational equity."

Recommendations:

While the law specifies how the System sets the IUAL, the System has discretion on how to set the UAL, subject to amortization, after that point. The System may want to consider revising the amortization method so that the UAL as of the valuation date is scheduled to be fully amortized. If the current amortization method is retained, then the actuarial valuation report should disclose that the UAL as of the valuation date is not expected to be fully amortized.

The System should also consider removing adjustments to increase or decrease the UAL as of the valuation date for TDA assets below or exceeding the present value of retiree TDA annuities when determining the required contribution for the QPP.

F. Contribution Allocation Procedure

The actuarial cost method determines the NC (annual cost allocation of future benefits and service) and AL (NCs attributed to the past), the asset valuation method determines the value of assets, and the amortization method determines the annual installments needed to eliminate any UAL (unfunded NCs attributed to the past). Together these components comprise the contribution allocation procedure or method of calculating the employer required contribution each year. The relationship of these components can be shown symbolically in the following equation and represent the basic funding formula[7] commonly employed by defined benefit pension plan actuaries.

$$PVFB = PVFNC + PVFAI + AVA$$

Where:

PVFB = Present Value of Future Benefits

PVFNC = Present Value of Future Normal Costs

PVFAI = Present Value of Future Annual Installments

AVA = Actuarial Value of Assets

When determining the annual required contribution for a given year this relationship reduces to:

[7] General rules for reasonable funding methods under 26 CFR §1.412(c)(3)-1(b)

$$ARC = NC + AI$$

Where:

ARC = Annual Required Contribution

NC = Normal Cost

AI = Annual Installment (i.e., net amortization payment for the year)

These relationships are commonly applied when calculating the required contribution for the year commencing on or immediately following the valuation date. However, the System uses the results from an actuarial valuation to determine the required contribution for the fiscal year starting one year after the valuation date under the OYLM. OYLM was revised by OA during the examination period with the old OYLM used for actuarial valuations prior to June 30, 2017 and the new OYLM used for actuarial valuations on and after June 30, 2017.

The calculation of the required employer contribution under the old OYLM for the fiscal years ended June 30, 2018 based on the June 30, 2016 actuarial valuation is summarized in Table 6 below:

Table 6: Fiscal Year Ending June 30, 2018 Required Employer Contribution (Old OYLM)			
For Fiscal Year Ending (FYE) June 30, 2018	($ in 1,000s)	How Derived	
Present Value of Future Benefits at June 30, 2016	$ 85,762,243	Actuarial Cost Method	1
Present Value of Future Employee Contributions at June 30, 2016	2,650,603	Actuarial Cost Method	2
Present Value of Future Employer Normal Costs at June 30, 2016	13,147,225	Actuarial Cost Method	3
Actuarial Accrued Liability at June 30, 2016	69,964,414	(1) - (2) - (3)	4
Actuarial Value of Assets at June 30, 2016	41,015,087	Asset Valuation Method	5
Unfunded Actuarial Accrued Liability at June 30, 2016	28,949,325	(4) - (5)	6
Present Value of Employer Normal Cost for FYE June 30, 2017	1,088,218	Normal Cost [A] ÷ sqrt(1.07)	7
Present Value of Reimbursed Expenses	100,403	See below [B]	8
Due to TDA	488,763	See below [C]	9
Adjusted Unfunded Actuarial Accrued Liability	28,249,467	(6) - (7) - (8) + (9)	10
Net Remaining Unfunded Actuarial Accrued Liability Balance	28,249,467	Actuarial Valuation	11
Annual Installment for FYE June 30, 2018	2,663,071	Actuarial Valuation	12
Present Value of Future Salaries at June 30, 2016	115,860,839	Actuarial Valuation	13
Mid-year Value of Projected Salaries for FYE June 30, 2017	9,178,822	Projected by Actuary	14
Adjusted Present Value of Future Salaries at June 30, 2016	106,987,337	(13) - [(14) ÷ sqrt(1.07)]	15
Normal Cost Percent (approximate)	12.29%	(3) ÷ (15)	16
Mid-year Value of Projected Salaries for FYE June 30, 2018	9,221,537	Projected by OA	17
Employer Normal Cost for FYE June 30, 2018	1,133,977	(16) × (17)	18
Term Cost for TDA Fixed Fund	38,184	See below [D]	19
Reimburse Administrative Expenses from FYE June 30, 2016	54,478	Expenses × (1.07)^(2)	20
Total Required Employer Contribution for FYE June 30, 2018	3,889,710	(12) + (18) + (19) + (20)	21

[A] = Employer normal cost ($1,125,661,295) for the fiscal year ending June 30, 2017 as determined in the June 30, 2015 actuarial valuation

[B] = Discounted value of previously paid administrative expenses with interest expected to be reimbursed in fiscal years ending June 30, 2017 [($52,943,611) ÷ (1.07)^(0.5)] and June 30, 2018 [($54,477,777) ÷ (1.07)^(1.5)]

[C] = Represents the difference between TDA assets and the actuarial present value of benefits for members receiving an annuity of their TDA funds as determined by OA.

[D] = Added to the employer normal cost each year to reflect the estimated cost of providing a guaranteed 8.25% return on the TDA Fixed Fund balances for non-UFT members. Cost determined by OA.

The calculation of the required employer contribution under the new OYLM for the fiscal year ended June 30, 2019 based on the June 30, 2017 actuarial valuation is summarized in Table 7 below:

Table 7: Fiscal Year Ended June 30, 2019 Required Employer Contribution (New OYLM)			
For Fiscal Year Ending (FYE) June 30, 2019	($ in 1,000s)	How Derived	
Present Value of Future Benefits at June 30, 2017	$ 86,010,300	Actuarial Cost Method	1
Present Value of Future Employee Contributions at June 30, 2017	3,097,158	Actuarial Cost Method	2
Present Value of Future Employer Normal Costs at June 30, 2017	13,360,762	Actuarial Cost Method	3
Actuarial Accrued Liability at June 30, 2017	69,552,380	(1) - (2) - (3)	4
Actuarial Value of Assets at June 30, 2017	44,381,706	Asset Valuation Method	5
Unfunded Actuarial Accrued Liability at June 30, 2017	25,170,674	(4) - (5)	6
Present Value of Employer Normal Cost for FYE June 30, 2018	1,133,171	Normal Cost [A] ÷ sqrt(1.07)	7
Present Value of Annual Installment for FYE June 30, 2018	2,574,488	Installment [B] ÷ sqrt(1.07)	8
Present Value of Reimbursed Expenses	105,290	See below [C]	9
Due to TDA	303,249	See below [D]	10
Adjusted Unfunded Actuarial Accrued Liability	21,660,974	(6) - (7) - (8) – (9) + (10)	11
Net Remaining Unfunded Actuarial Accrued Liability Balance	21,660,974	Actuarial Valuation	12
Annual Installment for FYE June 30, 2019	2,358,532	Actuarial Valuation	13
Employer Normal Cost for FYE June 30, 2018	1,136,161	See below [E]	14
Term Cost for TDA Fixed Fund	43,181	See below [F]	15
Estimated Employer Normal Cost for FYE June 30, 2019	1,305,408	[(14) + (15)] x (1.07)^(1.5)	16
Reimbursed Administrative Expenses from FYE June 30, 2017	58,246	Determined by OA	17
Adjustment for ASAF Credit	25,500	See below [G]	18
Total Required Employer Contribution for FYE June 30, 2019	3,696,686	(13) + (16) + (17) - (18)	19

[A] = Employer normal cost ($1,172,161,054) for the fiscal year ending June 30, 2018 as determined in the June 30, 2016 actuarial valuation

[B] = Annual installment ($2,663,071,096) for the fiscal year ending June 30, 2018

[C] = Discounted value of previously paid administrative expenses with interest expected to be reimbursed in fiscal years ending June 30, 2018 [($54,477,777) ÷ (1.07)^(0.5)] and June 30, 2019 [($58,245,643) ÷ (1.07)^(1.5)]

[D] = Represents the difference between TDA assets and the actuarial present value of benefits for members receiving an annuity of their TDA funds as determined by OA.

[E] = Employer normal cost for the fiscal year July 1, 2017 to June 30, 2018 based on the June 30, 2017 actuarial valuation by OA.

[F] = Added to the employer normal cost each year to reflect the estimated cost of providing a guaranteed 8.25% return on the TDA Fixed Fund balances for non-UFT members. Cost determined by OA.

[G] = Estimated contribution by the Department of Education to the Annuity Savings Accumulation Fund for the fiscal year ending June 30, 2019.

The primary difference between the old OYLM and the new OYLM was the calculation of the employer normal cost (lines 18 of Table 6 and line 16 of Table 7). The old OYLM for the fiscal year ended June 30, 2018 determined the required employer contribution using an aggregate approach where the combined member expected salaries for the period July 1, 2017 to June 30, 2018 were multiplied by a single normal cost rate. The new OYLM for the fiscal year ended June 30, 2019 determined the required employer contribution by summing the individually determined

employer normal cost for the period July 1, 2017 to June 30, 2018. The individually determined employer normal costs under the new OYLM for the period July 1, 2017 to June 30, 2018 also used expected salaries for the period July 1, 2017 to June 30, 2018 but then adjusted with interest (line 16) for 1.5 years to reflect the assumption that the employer normal cost contribution would be paid mid-year during the fiscal year July 1, 2018 to June 30, 2019. As a result, expected salaries from July 1, 2017 to June 30, 2018 were used to determine the employer normal cost contribution for the fiscal year ended June 30, 2018 and the fiscal year ended June 30, 2019.

NYCAC Section 13-527(b)(5) defines the normal contribution as the entry age normal contribution as determined by the actuary in a manner consistent with the entry age actuarial cost method that is designed to fund expected benefits on a level basis over the working lifetimes of members. As previously listed in section 8B, NYCAC Section 13-527(b)(5) describes two methods under the actuary's discretion for calculating the entry age normal contribution:

1) Multiply the entry age normal contribution rate determined for each individual member, by the salary expected to be paid to that member during the fiscal year that such normal contribution is payable. The entry age normal contribution is the sum of the individually determined amounts; or
2) Multiply the entry age normal contribution rate determined for all members in aggregate, by the aggregate amount of salaries expected to be paid to all members during the fiscal year in which the normal contribution is payable.

NYCAC Section 13-527(b)(5) does not describe other methods, but does allow the actuary to use other alternative methodologies but such methodologies must be consistent with the entry age actuarial cost method.

Observations:

The old and new OYLM do not appear to follow NYCAC Section 13-527(b)(5) and are not consistent with the entry age normal actuarial cost method due to the following:

1) As noted in section 8B, the actuarial cost method for calculating the AL and NCs does not appear to follow the entry age normal cost method as defined under the NYCAC or by the ASB.
2) The normal contribution determined under the old OYLM is not expected to fund benefits on a level basis even if all actuarial assumptions were exactly met. This is due to how the old OYLM reflects events after the valuation date as noted in section 8E. This is illustrated in the Table 6 above. Line 3 lists the present value of future employer normal costs on and after July 1, 2016. However, the employer normal cost rate (line 16) and the resulting employer normal cost contribution (line 18) is based on future salaries on and after July 1, 2017 which is one year less than the number of years of future employer normal costs. This is shown in line 15 which excludes salaries from July 1, 2016 to June 30, 2017. This means the employer normal cost contribution (line 18) for the fiscal year will be greater than the employer normal cost under the actuarial cost method discussed in section 8B for the same year since the costs are spread over a shorter number of years of salaries. Further, this difference is expected to grow as the number of years of future normal costs and salaries decreases. Consequently, the normal contribution each year is not expected to be level as required under NYCAC Section 13-527(b)(5).
3) The new OYLM does not base the normal contribution on salaries expected to be paid during the fiscal year in which the normal contribution is payable. As illustrated in Table 7, the normal contribution payable for the fiscal year ended June 30, 2019 is based on expected salaries to be paid for the fiscal year ended June 30, 2018. This does not appear to follow requirements under NYCAC Section 13-527(b)(5).
4) The new OYLM appears to effectively defers normal contributions for one-year which results in a member's benefit not being funded over their working lifetime. For example, if the member's last year of expected salaries is for the fiscal year ending June 30, 2018 (i.e., member is assumed to retire on June 30, 2018), the final normal contribution would be payable during the fiscal year ending June 30, 2018. However, as noted in 3) above, the new OYLM would determine a final normal contribution payable during the fiscal year ending June 30, 2019, after the member has retired. This

appears to be inconsistent with the intent and methods detailed under NYCAC Section 13-527(b)(5).

5) The change from the old OYLM to the new OYLM effectively charged participating employers a normal contribution twice for the same year of salaries (i.e., fiscal year ended June 30, 2018 salaries). This appears to be inconsistent with the intent and methods detailed under NYCAC Section 13-527(b)(5).

The required employer contribution determined under the old OYLM and new OYLM also includes an amount for reimbursement of previously paid administrative expenses. The System indicated that administrative expenses deducted from QPP assets are required to be reimbursed with the actuarial interest rate per state statute. However, no adjustment appears to have been made for administrative expenses to be paid in the future. Actuarial cost methods are often termed as "advance funding actuarial cost methods"[8] since the methods are intended to accumulate necessary assets before benefits are payable. Generally accepted actuarial principles and practices indicate that expenses borne or expected to be borne by the plan should be reflected in the actuarial cost method.[9] Often this is done by adding expected expenses for the year to the normal cost for the same year, but other adjustments may be appropriate.[10] The OYLM appears to only reflect the reimbursement of previously paid administrative expenses.

Based on these apparent inconsistencies, the required employer contribution determined under OYLM is expected to differ from what would be considered a reasonable actuarially determined contribution.[11] In addition, the implications of the OYLM on future expected employer and employee contributions and funded status were not disclosed in the actuarial valuation reports for the examination period.

Recommendations:

The System should consider determining the normal contribution from the explicitly calculated plan normal cost based on expected salaries for the same fiscal year in accordance with

[8] 29 U.S.C. Section 1002(31)
[9] ASOP 4 (Doc. No. 205) Sections 2.1, 2.2, 2.10, and 2.17
[10] ASOP 4 (Doc. No. 205) Section 3.13(c)
[11] ASOP 4 (Doc. No. 205) Section 3.21

NYCAC Section 13-527(b)(5). The System should also consider using the EAN actuarial cost method defined by the ASB for determining the explicitly calculated plan normal cost.

The System should consider adding an administrative expense assumption to the total employer required contribution for a fiscal year to fund future administrative expenses expected to be paid from plan assets in the same fiscal year.

The System should consider disclosing the implications of the System's contribution allocation procedure on the plan's funding over the short and long-term in the actuarial valuation reports.

The System should consider disclosing member contributions and the impact of expected member contributions towards the plan's overall funding in the actuarial valuation reports. Possible additions include listing expected member contributions as a separate component of the actuarial contribution for the fiscal year, disclosing expected member contributions as a percentage of salary for the fiscal year, or disclosing historical member contributions made each year. If member contributions are expected to increase or decrease in future years, disclosing the expected impact of changing member contributions on the plan's funding in the valuation report would provide useful information to any interested parties.

G. Allocation of Employer Contribution to Other Benefit Plans

Besides the QPP, the System administers the following benefit plans:

- New York City Teachers' Group Life Insurance Plan ("GLIP")
- Excess Benefit Plan ("EBP"); and
- TDA

These plans provide additional benefits to members not otherwise payable from the QPP. For instance, GLIP provides a tax-free death benefit of up to $50,000 upon a member's pre-retirement death while EBP provides replacement benefit payments for those retirees that have their retirement benefits from the QPP limited due to the maximum pension benefit requirements of IRC Section 415. Eligible members may elect to participate in the TDA, an IRC Section 403(b) plan enabling members to save additional money for retirement on a tax-deferred basis. The TDA offers a Fixed Return Fund which provides a guaranteed rate of return of 7% for United Federation

of Teachers members and 8.25% for other members. Members may also elect to receive an annuity of their TDA balance at retirement. Investment returns in TDA Fixed Return Fund and TDA annuities are guaranteed by participating employers of the System.

According to the applicable provisions governing each of these plans, each plan's assets must be separate from the QPP and the plan's assets may only be used to provide benefits for thatplan. However, the System's funding for these other benefit plans is done by either allocating a portion of the required employer contribution from the QPP or by transferring assets between the QPP and the other separate plan/fund(s). GLIP and EBP are funded by allocating a portion of the required employer contribution each year. Funding of the guaranteed 7% or 8.25% TDA Fixed Return Fund is done by first allocating the guaranteed return from the combined net investment income of the QPP and TDA Fixed Return Funds. Any remaining net investment income from the QPP and TDA Fixed Return Funds is then allocated to the QPP.

Table 8 below summarizes results for each benefit plan from the June 30, 2017 actuarial valuation report.

Table 8: Other Benefit Plan Results from June 30, 2017 Actuarial Valuation
(Results in $ Thousands)

Plan	AL	MVA	AVA	2019 Fiscal Year Contribution
QPP	$ 69,552,380	$ 50,095,723	$ 40,381,706	$ 3,696,686
GLIP	Not Disclosed [A]	Not Disclosed [A]	Not Disclosed [A]	Not Disclosed [A]
EBP	Not Disclosed [A]	Not Disclosed [A]	Not Disclosed [A]	Not Disclosed [A]
TDA	Not Disclosed [B]	Not Applicable [C]	Not Applicable [C]	Not Disclosed [D]

[A] – Included in QPP
[B] – Value of TDA annuities exceeding TDA assets for current pensioners is reflected in the QPP as a decrease in the UAL (see Table 7, line 10)
[C] – TDA assets are held in a separate trust
[D] – Included in QPP (see Table 7, line 15)

Liabilities and assets were not disclosed on an individual plan basis for the QPP, GLIP, and EBP. Contributions attributed to TDA guaranteed annuities for current TDA retirees and guaranteed 8.25% investment return under the TDA for non-retired TDA members were included in the QPP contribution.

Observations:

The System's administrative practices do not indicate the costs and required contributions attributed to each benefit plan or fund and don't appear to follow the applicable provisions for each plan. In addition, the System's administrative practices raise concerns that the transfer of assets between benefit plans may not comply with requirements under the IRC.

The Department notified the System of its concerns, and the System stated the following:

i) GLIP contributions and liabilities are accounted for separately from the QPP contributions and liabilities.

ii) Transfers between the QPP and TDA are reflective of a permissible investment by the TDA. The TDA effectively purchases an annuity contract from the QPP for the Fixed Return Fund under certain grandfathered rules under 26 CFR §1.403(b)-8(c)(3) similar to the purchase from an insurance company.

iii) If the investment return is lower than the guaranteed rate, the City contributes an amount equal to the difference so that the investment return to the TDA is always the guaranteed amount. If the investment return is higher than the guaranteed rate, the TDA receives only the guaranteed return with the excess effectively "contributed" by the City as guarantor of the QPP and retained in the QPP.

iv) Since no members have been identified by the System or OA as requiring a benefit from the EBP, the EBP has not been established or implemented. The System is in the process of implementing necessary policies and procedures for the EBP.

GLIP

OA's June 30, 2017 actuarial valuation report (page 59) stated "liabilities for group life lump sum death benefits are calculated under the One-Year Term Cost method." This means GLIP costs are determined for one-year of coverage only. However, the calculation of the fiscal year ended June 30, 2019 QPP contribution of $3,696,685,559 was determined using OA's OYLM, OA's entry age normal cost method (which included the present value of future GLIP benefits for all years), and the combined QPP and GLIP assets. Consequently, OA did not combine two separate calculations, but simply reallocated part of the QPP contribution to cover expected GLIP payments for the year.

The Department also requested in 2020 a reconciliation of GLIP contributions, benefit payments, investment income, and expenses. The System stated "GLIP is not accounted for separately from the QPP assets."

Including GLIP assets and liabilities when calculating the QPP contribution appears to be inconsistent with Section 1025.3 and Section 1025.5 of the New York City Teachers' Group Life Insurance Rules and Regulations. Section 1025.3 requires the GLIP to "be separate from and independent of the Retirement System and all funds of the Retirement System and shall be held in trust by the Retirement Board." Section 1025.3 further states that GLIP assets "shall consist of all premiums paid by the City and other monies received and paid into the fund for group term life insurance purposes, and of the investment earnings upon such monies, and shall be used only to pay the group term life insurance." Paragraphs (a) and (b) of Section 1025.5 then defined the GLIP premium as follows:

> (a) The Actuary shall investigate the Plan's claim experience in accordance with the methods of investigation provided by Section *13-514 of the Administrative Code*. On the basis of such investigation and upon recommendation of the Actuary, the Retirement Board shall certify the premium rates computed to be necessary to fund the group term life insurance authorized to be paid by the Plan.
> (b) The Retirement Board shall determine the premium which the City of New York is required to pay into the Reserve Fund to discharge the obligations of the Plan for each fiscal year of the City during which these Rules are effective.

Sections 1025.3 and 1025.5 show the GLIP is intended to be funded on a one-year term cost basis based solely on expected GLIP claims, GLIP premiums, and GLIP assets. However, OA's calculations do not appear to follow these rules. For example, OA's April 9, 2019 letter regarding the Preliminary Fiscal Year 2020 Employer Contribution to the System stated $37,298,696 as the present value as of June 30, 2019 of expected GLIP payments, not the employer contribution needed, as shown below.

> The Preliminary 2020 Employer Contribution includes an amount to fund the Group Life Insurance Plan. The present value as of June 30, 2019 of expected future payments to be paid from the Group Life Insurance Plan is $37,298,696. If necessary, a portion of the Fiscal Year 2019 contribution should be used to true-up the current reserve balance to this amount.

OA did not determine the required GLIP contribution. Instead, the actual contribution needed is dependent on the GLIP assets already accumulated (i.e., true-up the current reserve balance). If GLIP assets already exceeded $37,298,696 then no contribution would be needed. In addition, the reserve determined by OA appears to represent the present value of all future GLIP payments for current members rather than the expected GLIP claims to be paid for any particular fiscal year.

TDA

While the System stated that if the investment return is lower than the guaranteed rate the employers would contribute an amount equal to the difference, no separate employer contributions have been made to the TDA for years when investment returns fell short of the guaranteed rate. Instead QPP assets have been transferred to the TDA in such years. The transfer of assets between the QPP and TDA over the last three fiscal years as presented on page 32 of the 2022 Annual Comprehensive Financial Report is provided below.

Revenue (Expense) to Contingent Reserve Fund
TRSNYC Pension Fund Assets (QPP)*
Years ended June 30, 2022, 2021, and 2020
(In thousands)

	2022	2021	2020
Net investment income	$ (9,762,620)	$ 20,059,992	$ 3,759,578
TDA percent of fixed assets as of June 30	35.11%	29.18%	33.67%
TDA percent of fixed assets as of 6/30/19:			32.95%
TDA percent of fixed assets (average)	32.14%	31.42%	33.31%
Investment income on account of TDA investment	$ (3,138,080)	$ 6,303,326	$ 1,252,282
Less statutory interest to TDA	(2,140,639)	(1,998,388)	(1,846,173)
Revenue (expense) to QPP contingent reserve	$ (5,278,719)	$ 4,304,938	$ (593,891)

*Includes security-lending income

Over this three-year period, the net amount of QPP assets transferred to the TDA exceeded $1.5 billion. For the fiscal year ended June 30, 2022, a transfer of roughly $5.3 billion was made from the QPP to the TDA. This transfer exceeded the entire employer statutory contribution of approximately $3.3 billion for the year. This investment shortfall was not paid immediately by the participating employers.

Actuarial valuation reports issued during the examination period show no expected cost or employer contribution for providing a 7% fixed guaranteed investment return for assets held in the TDA Fixed Return Fund. During the Department's April 14, 2021 interview with OA, OA indicated no additional assets are assumed to be needed to provide a 7% fixed guaranteed return. OA's justification was that since the TDA interest is defined as 7%, the obligation would be treated as a defined benefit (similar to the QPP). Since OA also assumes a 7% return on QPP assets there is no assumed cost to provide a 7% fixed guaranteed return.

However, the TDA is a defined contribution plan described under Internal Revenue Code Section 403(b) and as such is not a defined benefit plan. The QPP is a defined benefit plan and, per the System, the TDA is effectively purchasing an annuity contract from the QPP for the Fixed Return Fund (that is, the QPP is effectively selling an annuity contract to the TDA for the guaranteed investment return in the TDA Fixed Return Fund). The inherent cost of providing the TDA guaranteed investment return is not indeterminable. A nonpartisan, nonprofit civic organization issued an October 2016 policy brief[12] regarding TDA guaranteed fixed return for TRSNYC estimating the TDA guaranteed fixed return cost for TRSNYC to be about $1.2 billion annually.

This arrangement results in the QPP effectively funding the TDA Fixed Return Fund and may result in the QPP being less funded than it would be otherwise. QPP assets are held in a separate trust from the TDA assets, but QPP and TDA assets are commingled for investment purposes, which raises the question as to whether QPP assets are being used for the exclusive benefit of QPP plan participants. For those retirement plans which are permitted to commingle assets for investment purposes, the exclusive benefit requirements still apply to each plan as illustrated in IRS Revenue Ruling 2011-1 which notes "plan assets are used for, or diverted to, purposes other than for the exclusive benefit of the plan participants and their beneficiaries if the assets of one group trust retiree benefit plan are used to provide benefits under another group trust

[12] An Expensive and Risky Benefit: How Low Interest Rates Cost New York City Taxpayers $1.2 Billion Annually.

retiree benefit plan even if the plan participant or beneficiary receiving the benefits is a participant or beneficiary under both plans." Revenue Ruling 2011-1 also notes "a transaction or accounting method which has the effect of directly or indirectly transferring value from the account of one adopting plan into the account of another adopting plan violates this separate accounting requirement." Lowering QPP assets by a transfer to the TDA appears contrary to the interests of the QPP and its participants, many of whom are obligated to make contributions each year to the QPP and may not be financially able to participate in the TDA. QPP members could be viewed as effectively funding TDA guaranteed benefits which are an obligation of the participating employers. Finally, as of June 30, 2022, the TDA Fixed Return Fund asset represent over 30% of the System's combined QPP and TDA net assets, representing perhaps the largest single investment or transaction for the QPP each year. Investment returns short of the guaranteed rate and the associated risk of achieving the guaranteed rate each year raises the question as to the appropriateness of this investment or transaction for the QPP.

Recommendations:

The System should consider establishing or maintaining separate accounts for each benefit plan or fund and account for distributions, contributions, and investment experience by plan or fund.

The System should consider ceasing asset transfers or benefit payments from the QPP to provide any non-QPP benefits.

The System should consider disclosing the assets and liabilities for each benefit plan or fund separately as well as separately determining the employer contribution for each benefit plan or fund in future actuarial valuation reports.

The System should consider establishing a separate fund for providing TDA guaranteed annuities and TDA fixed guaranteed returns in the Fixed Return Fund such that the QPP does not provide for any shortfalls in contribution requirements and any additional returns earned would not be transferred to the QPP.

H. Actuarial Assumptions

Actuarial valuations utilize numerous assumptions to value expected future distributions from the System. Actuarial assumptions commonly found for pension valuations include:

(i) Expected rates of decrement from active service for causes such as withdrawal from employment, mortality, disability and retirement;

(ii) Post-retirement mortality for healthy and disabled members and beneficiaries;

(iii) Actuarial interest rate or "AIR" (i.e., the expected long-term compound rate of return on the System's investments); and

(iv) Expected rates for salary increases including overtime.

The System's withdrawal rate of decrement and expected rates of salary increases vary by service. The remaining decrements, other than retirement, vary by age and gender. Retirement rates of decrement vary by (i) age; (ii) reduced or unreduced retirement; (iii) duration since first eligible for unreduced retirement; and (iv) retirement plan election (i.e., whether the member is participating in an improved retirement program).

Pursuant to NYCAC Section 13-514, the System's actuary must investigate "mortality and service experience" every five years and, as technical advisor to the System's Board, provide recommendations as to the AIR assumption. To assist in fulfilling those duties, during the examination period the System's actuary engaged the Gabriel Roeder Smith and Company ("GRS") to evaluate and make recommendations about the actuarial assumptions and methods being used.

In October 2015, GRS issued its experience study report, which covered experience over the four-year and ten-year periods ended June 30, 2013. Based on this analysis, the OA recommended changes to the post-retirement mortality assumptions to closer match the actual recent and expected future experience of the System. Specifically, new post-retirement mortality tables primarily based on member experience and a new mortality improvement projection assumption to reflect anticipated continued mortality improvements in the future. The Board adopted these assumptions changes effective with the fiscal year ending June 30, 2016. The OA established an amortization base of approximately $2.2 billion as of June 30, 2014 to reflect the increase in liability due to the assumption changes. This amortization base is recognized through annual installments of roughly $0.2 billion for the fiscal year ended June 30, 2016 through the fiscal year ending June 30, 2034.

Starting with the June 30, 2017 actuarial valuation, post-retirement mortality tables were adjusted from lives-weighted to amounts-weighted tables and the mortality improvement assumption was updated to reflect U.S. population mortality experience through 2016. These assumptions changes resulted in a reduction in liability of approximately $1.08 billion as of June 30, 2017 with an annual installment of roughly $(0.1) billion for the fiscal year ended June 30, 2019 through the fiscal year ending June 30, 2037.

Observations:

The examiner identified several assumptions not disclosed in the June 30, 2017 actuarial valuation report such as assumed forms of payment at retirement, salary increase timing, liability loads, and other assumptions.

The examiner noted several inconsistencies when applying the actuarial assumptions such as actual pensionable earnings were not used, there was no projected mortality improvement for pre-retirement, application of first annual September cost-of-living adjustment increase, and other applications.

Recommendations:

The System should consider re-evaluating certain actuarial assumptions and disclosing all the relevant assumptions in the actuarial valuation report.

I. Valuation Data

Each year census data as of June 30th is submitted to the OA from the System's administrative staff and the employer's payroll facilities. The OA then reviews the data for reasonableness and consistency. If portions of the data are missing or inconsistent the OA may make an approximation or assumption for the data element in question. Regular adjustments to the census data include using a minimum salary for active members without salary information provided and estimating service as of the valuation date. Adjustments to the data are generally intended to be used for only a short period of time and for unique situations when additional time is needed by the employer to research and resolve, normally the next year.

However, it appears that adjustments were commonly made an on-going basis for The City University of New York ("CUNY") members. Data issues researched by the OA for the June 30, 2017 valuation data noted the following:

i) OA set a minimum salary of $10,000 for 1,288 active members. Per OA, these are predominantly CUNY members. Historically, CUNY records fluctuate in salary more than other records.
ii) Roughly 4,000 members had service increase from the prior year by 2 or more years, another 10,000 records increased between 0 and 1 years, and 100 records had a drop in service. Per OA, CUNY service is not updated regularly and is a known issue for the System and the actuary.
iii) Roughly 9,500 continuing active members had salary increases of more than 20% or decreases of more than 25%. Per OA, CUNY salaries show a wide variation, and it is a known issue for the System.

OA also made known the following in later discussions with the Department:

a) Service provided by CUNY for its members was not used in the June 30, 2017 actuarial valuation. OA indicated CUNY provided service historically had not been reliable and OA opted to use estimated service on an elapsed time basis instead.
b) A load was added to liabilities to account for retroactive salary increases not yet reflected in the valuation data.

Observations:

The results of the actuarial valuation are highly dependent on the data used. As the actuarial valuation determines the statutory contribution by employer, adjustments to the data could have a significant impact on the employer statutory contribution, particularly for CUNY.

The examiner's review of historical pensionable earnings reported by the System for a sample of active members noted significant differences between the actual pensionable earnings and the estimated annual salary rates used for the actuarial valuation. As most benefits provided by the System are based on average pensionable earnings, not reflecting actual historical

pensionable earnings in the actuarial valuations increases the inaccuracy of the actuarial results, particularly for those members near retirement or no longer working.

Recommendations:

The System should consider reflecting actual historical pensionable earnings in the actuarial valuation and calculating final accrued benefits for members no longer working.

The System should consider developing and implementing new procedures or modifying existing procedures to monitor the reasonableness of member records and the actuarial valuation data. Examples include, but are not limited to, checking a member's status or service, checking missing data items such as member contribution balance or salary, and checking the reasonableness of large changes in data values.

J. Gain/Loss Analysis

The System incurs an actuarial gain or loss each year due to the difference between what was expected to happen and the actual events that occurred during the year. Expected experience is based on the actuarial assumptions, assets, and valuation data as of the prior valuation date projected to the current valuation date. Actual experience is based on the assets and valuation data as of the current valuation date.

An analysis of the gain/loss provides a better understanding of the underlying causes for the change in liability attributed to assumptions such as salary increases, cost of living increases, investment returns, rates of retirement, death, disability, withdrawal, and other assumptions.

The June 30, 2016 actuarial valuation report included the development of the actuarial gain or loss experience as summarized in Table 9 below:

Table 9: Development of Experience (Gain) / Loss at June 30, 2016		
1.	Expected Accrued Liability	(Results in $1,000s)
A	Accrued Liability at June 30, 2015	$ 69,625,608
B	Total Normal Cost and Administrative Expenses at June 30, 2015	1,230,945
C	Interest on 1a and 1b to June 30, 2016	4,959,959
D	Fiscal Year 2016 Benefit Payments with Interest to June 30, 2017	(4,248,784)
E	Expected Accrued Liability at June 30, 2016	$ 71,567,728
2.	Actual Accrued Liability at June 30, 2016 before changes	$ 69,964,412
3.	Expected Total Actuarial Value of Assets	
A	Total Actuarial Value of Assets at June 30, 2015	$ 38,804,067
B	Interest on 3a to June 30, 2016	2,716,285
C	Total Contribution Paid in Fiscal Year 2016	3,876,265
D	Interest on 3c to June 30, 2016	133,375
E	Fiscal Year 2016 Benefit Payments with Interest to June 30, 2016	(4,248,784)
F	Expected Total Actuarial Value of Assets at June 30, 2016	$ 41,281,208
4.	Actual Total Actuarial Value of Assets at June 30, 2016	$ 40,526,324
5.	Accrued Liability (Gain) / Loss [2. – 1.e]	$ (1,603,316)
6.	Actuarial Value of Asset (Gain) / Loss [3.f – 4.]	$ 754,884
7.	Total Actuarial (Gain) / Loss [5. + 6.]	$ (848,432)

The System experienced a lower than expected AL resulting in a liability gain of approximately $1.6 billion and lower than expected assets resulting in an asset loss of roughly $0.75 billion. However, the sources of the liability gain were not provided. OA has indicated it is developing a more detailed gain/loss analysis for future valuations.

Observations:

The development of the experience gain/loss provided above is based on the System's EAN actuarial cost method and therefore may not have been appropriate for measuring plan experience. For example, the AL as of June 30, 2016 under Governmental Accounting Standards Board Statement No. 67 (which uses EAN as defined by the ASB) was approximately $68.9 billion. However, OA's AL as of June 30, 2016 on Table 9, line 2, was roughly $70.0 billion. OA stated:

"the Funding AL of $69,964,411,998, reflects an adjustment of $1,055,152,544 for employee contributions."

Recommendations:

The System should consider re-evaluating the calculation of the experience gain/loss as of the valuation date.

The System should also consider including a more detailed gain/loss analysis and a reconciliation of the total AL in future valuation reports. Separate gain/loss analysis by plan (i.e., QPP, EBP, GLIP, etc.) and further breakdown of the AL gain or loss by source, such as salary increases, cost of living adjustments, decrements (separately for withdrawal, retirement, death, disability, etc.), and data changes would provide valuable insight to the Board and other interested parties. This follows GFOA best practices which urge fiduciaries to take such additional steps to enhance the reliability of their actuarial valuations.[13]

[13] Enhancing Reliability of Actuarial Valuations for Pension Plans

9. SUMMARY AND CONCLUSIONS

Below are the violations and recommendations contained in this report. Recommendations and comments regarding the investments and investment practices for the five New York City retirement systems are contained in a separate examination report, which is submitted with this report as referenced in section 7.

Item	Description	Page No(s).
A	The System violated Section 13-507 of Title 13, Chapter 4 of the Administrative Code of the City of New York (i.e., the System's by-laws) by failing to have seven members on its Board as required by the Code.	8
B	The System is directed to have seven board members as required by its Administrative Code.	8
C	The System should consider revising the actuarial cost method to follow the EAN actuarial cost method as defined by the ASB and described under NYCAC Section 13-527(b)(5).	25
D	The System should consider revising the asset valuation method to determine the investment gain or loss by comparing the actual net investment income on the MVA against the expected investment income on the MVA.	28
E	The System may want to consider revising the amortization method so that the UAL as of the valuation date is scheduled to be fully amortized. If the current amortization method is retained, then the actuarial valuation report should disclose that the UAL as of the valuation date is not expected to be fully amortized.	36
F	The System should also consider removing adjustments to increase or decrease the UAL as of the valuation date for TDA assets below or exceeding the present value of retiree TDA annuities when determining the required contribution for the QPP.	36
G	The System should consider determining the normal contribution from the explicitly calculated plan normal cost based on expected salaries for the same fiscal year in accordance with NYCAC Section 13-527(b)(5). The System should also consider using the EAN actuarial cost method defined by the ASB for determining the explicitly calculated plan normal cost.	42

Item	Description	Page No(s).
H	The System should consider adding an administrative expense assumption to the total employer required contribution for a fiscal year to fund future administrative expenses expected to be paid from plan assets in the same fiscal year.	43
I	The System should consider disclosing the implications of the System's contribution allocation procedure on the plan's funding over the short and long-term in the actuarial valuation reports.	43
J	The System should consider disclosing member contributions and the impact of expected member contributions towards the plan's overall funding in the actuarial valuation reports.	43
K	The System should consider establishing or maintaining separate accounts for each benefit plan or fund and account for distributions, contributions, and investment experience by plan or fund.	49
L	The System should consider ceasing asset transfers or benefit payments from the QPP to provide any non-QPP benefits.	49
M	The System should consider disclosing the assets and liabilities for each benefit plan or fund separately as well as separately determining the employer contribution for each benefit plan or fund in future actuarial valuation reports.	49
N	The System should consider establishing a separate fund for providing TDA guaranteed annuities and TDA fixed guaranteed returns in the Fixed Return Fund such that the QPP does not provide for any shortfalls in contribution requirements and any additional returns earned would not be transferred to the QPP.	49
O	The System should consider re-evaluating certain actuarial assumptions and disclosing all the relevant assumptions in the actuarial valuation report.	51
P	The System should consider reflecting actual historical pensionable earnings in the actuarial valuation and calculating final accrued benefits for members no longer working.	53
Q	The System should consider developing and implementing new procedures or modifying existing procedures to monitor the reasonableness of member records and the actuarial valuation data.	53

Item	Description	Page No(s).
R	The System should consider re-evaluating the calculation of the experience gain/loss as of the valuation date.	55
S	The System should also consider including a more detailed gain/loss analysis and a reconciliation of the total AL in future valuation reports.	55

Respectfully submitted,

/s/
Courtney Williams
Supervising Insurance Examiner

STATE OF NEW YORK)
) SS:
COUNTY OF NEW YORK)

Courtney Williams, being duly sworn, deposes and says that the foregoing report, subscribed by him, is true to the best of his knowledge and belief.

/s/
Courtney Williams
Supervising Insurance Examiner

Subscribed and sworn to before me

this_____ day of _____

Jason Fesmire performed an actuarial review of the June 30, 2017, actuarial valuation report of the Teachers' Retirement System of the City of New York Qualified Pension Plan and Group Life Insurance Plan. The results of this review are provided in section 8 of this report.

The purpose of the actuarial review is to determine whether the plans noted above are being funded on an adequate basis using actuarial methods and assumptions that are reasonable, consistent, follow generally recognized and accepted actuarial principles and practices which are consistent with Actuarial Standards of Practice, and regarding actuarial matters whether the plans are in compliance with applicable law, plan provisions, and policies.

In preparing this report, Mr. Fesmire relied on, without audit, information provided by the Teachers' Retirement System of the City of New York and the New York City Office of the Actuary. This information included member data, financial information, plan provisions, policies, and actuarial and annual reports.

Jason Fesmire is a member of the American Academy of Actuaries, an Enrolled Actuary under ERISA, and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in section 8 of this report. This review was conducted in accordance with the applicable standards of practice prescribed by the Actuarial Standards Board.

Mr. Fesmire engaged the assistance of life actuaries within the New York State Department of Financial Services regarding actuarial matters associated with the Tax Deferred Annuity Program. The recommendations included in section 8G reflect their guidance.

This report was prepared under the direction of the New York State Department of Financial Services. The significant findings and recommendations are included herein.

STATE OF NEW YORK
COUNTY OF ALBANY

Jason Fesmire, being duly sworn, deposes and says that the foregoing report sections, subscribed by him, are true to the best of his knowledge and belief.

/s/
Jason Fesmire, EA, MAAA
Retirement Systems Actuary

STATE OF NEW YORK
COUNTY OF ALBANY

Sworn to before me this: _____ day of September 2025

_____
Notary Public

APPOINTMENT NO. 31867

NEW YORK STATE

DEPARTMENT OF FINANCIAL SERVICES

*I, **LINDA A. LACEWELL**, Superintendent of Financial Services of the State of New York, pursuant to the provisions of the Financial Services Law and the Insurance Law, do hereby appoint:*

COURTNEY WILLIAMS

as a proper person to examine the affairs of the

TEACHERS' RETIREMENT SYSTEM OF THE CITY OF NEW YORK

and to make a report to me in writing of the condition of said

RETIREMENT SYSTEM

with such other information as he shall deem requisite.

In Witness Whereof, I have hereunto subscribed my name and affixed the official Seal of the Department at the City of New York

this 12th day of February, 2019

LINDA A. LACEWELL
Superintendent of Financial Services

By: Mark McLeod

MARK MCLEOD
DEPUTY CHIEF - LIFE BUREAU

NEW YORK CITY PENSION SYSTEMS

INVESTMENT ANALYSIS REPORT

EXAMINER: **ROBERT D. SELVAGGIO, Ph.D.**

DATE OF REPORT: **SEPTEMBER 15, 2022**

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September 5, 2025

Honorable Adrienne A. Harris
Superintendent of Financial Services
New York, New York 10004

Dear Adrienne A. Harris:

In accordance with instructions contained in Appointments 32422; 32423; 32424; 32425 and 32426, dated July 21, 2022, respectively, and annexed hereto, a review and analysis was conducted on the investment portfolios and the investment practices of the five New York City Public Pension Funds ("the Systems"). These five pension funds comprising the Systems are the New York City Police Pension Fund ("POLICE"), the New York City Employees' Retirement System ("NYCERS"), the New York City Board of Education Retirement System ("BERS"), the New York City Fire Pension Fund ("FIRE"), and the Teachers' Retirement System of the City of New York ("TRS").

Wherever "Department" appears in this report, it refers to the New York State Department of Financial Services.

The report indicating the results of this review is respectfully submitted.

1. EXECUTIVE SUMMARY

The material recommendations and comments contained in this report are summarized below.

- We recommend that each of the Boards establish in writing formal risk appetite and risk tolerance statements for each benefit plan. (See item 4A of this report.)
- We recommend that each of the Systems follow the lead of BERS in developing formal Asset-Liability Matching ("ALM") reports. (See item 4B of this report.)
- We recommend that in the instances where the Chief Risk Officer ("CRO") position becomes vacant, the position be filled with as little gap as possible. (See item 4C of this report.)
- We recommend that the CRO have a direct reporting line to the NYC Comptroller and either a dotted reporting line to each of the five Boards or formal advisory responsibility. (See item 4C of this report.)
- We recommend that the System's actuary 1) adopt an approach to forecasting inflation that is consistent with economic theory and practice; and 2) adopt an approach to viewing portfolio returns in a manner more consistent with modern portfolio theory (i.e., the approach used by each of the System's general consultants). (See item 4E of this report.)
- We believe from a financial practice standpoint that the differing demographic factors and natures of these additional promised benefits outside the Qualified Pension Plans ("QPP") should be analyzed separately from the QPP to provide improved liability-driven investing and greater transparency of the costs and financial risks of providing additional Variable Supplements Funds ("VSF") and Tax Deferred Annuities ("TDA") benefits. (See item 4F of this report.)
- We recommend that each of the Systems prepare a Derivative Usage Policy Statement that lays out the acceptable uses of exchange-traded and over-the-counter derivatives and maintain an inventory listing which managers are employing derivatives and for what purpose (i.e., hedging, speculation, or arbitrage). (See item 4M of this report.)
- We recommend that the seven critical action recommendations from the 2015 Funston Group report be adopted as soon as practicable. (See item 4Q of this report.)

- It is our opinion that each Board would benefit from additional specific knowledge in banking, finance, or investments in performing its fiduciary duties. (See item 4Q of this report.)

2. SCOPE OF EXAMINATION

The Department conducted a risk-focused review of the investment portfolio management functions of the Systems. The analysis and review was done on a coordinated basis to the extent where common investment functions are carried out by the New York City Comptroller's Bureau of Asset Management ("Bureau of Asset Management or BAM") on behalf of the Systems.

The review consisted of document reviews, discussions with BAM personnel, Pension System personnel and consultants.

The review consisted of the following:

- Analysis of risk appetite and risk tolerance statements and how they are reflected in policies, guidelines, and strategic plans.
- Investment portfolio ALM and risk reports for comprehensiveness of metrics, and for consistency of limits outlined in risk tolerance statements and guidelines.
- Risk guidelines and an assessment of the methods for maintaining risk levels that comply with stated objectives as promulgated in the risk guidelines.
- Assessment and confirmation that the required risk signoffs and escalation procedures are adhered to as well as take into consideration the current market environment and the impact of COVID-19 on rate of return assumptions.
- Assessment and review of return targets
- Incorporation of the work of the Department's Life Bureau's pension actuary to opine on strategy and asset allocation and their appropriateness considering pension liability projections.
- Portfolio (option-adjusted) duration and convexity assessment for appropriateness of calculation methodology and consistency with stated risk/ALM tolerances.
- Liquidity haircuts applied to all investment asset categories confirmation for reasonableness.
- Comparison of stated return expectations with those from academic and institutional literature – for example, internal equity return expectations was compared to those from risk-free rates, betas and equity return premia published by New York University Professor

Aswath Damodaran[1] or Bloomberg. Consistency with macroeconomic assumptions driving return assumptions across asset classes was also assessed.

- Asset valuation performed in a manner specific to a given asset class.
- Security Lending practices.
- Portfolio credit risk metrics and management in aggregate and on an individual credit basis and the rationale for each internal rating or a substantial sample as well as the review frequency.
- Derivative usage plan, and an analysis of the hedge criteria and hedge effectiveness as well as derivative valuation methodologies.
- Evaluation of counterparty credit risk measurement (current and potential) and management, initial and variation margin processes, and readiness for LIBOR transition.
- Analysis of asset allocation and allocation among investment managers on a risk/return (cost/benefit) basis.
- Backgrounds of external investment managers and advisors (including analysis of possible conflicts of interest).

3. OVERVIEW

A. Bureau of Asset Management

The New York City Comptroller ("the Comptroller") is by law the custodian of City-held trust funds and the assets of the New York City Public Pension Funds. These five pension funds comprising the Systems are the New York City Employees' Retirement System, the Teachers' Retirement System of the City of New York, the New York City Police Pension Fund, the New York City Fire Pension Fund, and the New York City Board of Education Retirement System.

The Comptroller serves as Trustee on four of the five funds. Further, the Comptroller is delegated to serve as investment advisor by all five pension boards. The Bureau of Asset Management oversees the investment portfolio for each system and related defined contribution funds. In this role, the Comptroller provides investment advice, implements Board decisions, and reports on investment performance.

[1] See, in particular, links within https://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERP2022Formatted.pdf

Each of the five New York City Retirement Systems has its own Board of Trustees which, working with the Bureau of Asset Management and the Board's consultants, makes decisions on the funds' asset allocations based on factors including economic risk, return, performance, and beneficiary distributions. BAM advises the Boards on all investment-related topics, including investment policy and strategy, asset allocation, manager structure, manager selection and financial and economic developments that may affect the Systems.

B. Systems

The following are brief descriptions of the five pension funds comprising the Systems as detailed on the New York City Comptroller's website[2]:

Teachers' Retirement System of the City of New York

Teachers' Retirement System of the City of New York is a cost-sharing, multiple-employer public employee retirement system for pedagogical employees in New York City public schools, certain Charter Schools, and certain other specified school and college employees.

New York City Employees' Retirement System

New York City Employees' Retirement System is a cost-sharing, multiple-employer public employee retirement system for employees of the City not covered by one of the other Pension Systems, as well as employees of certain component units of the City and certain other government units.

New York City Police Pension Fund

New York City Police Pension Fund is a single-employer public employee retirement system for full-time uniformed employees of the Police Department.

[2] https://comptroller.nyc.gov/services/financial-matters/pension/overview/

New York City Fire Pension Fund

New York City Fire Pension Fund is a single-employer public employee retirement system for full-time uniformed employees of the Fire Department.

New York City Board of Education Retirement System

New York City Board of Education Retirement System is a cost-sharing, multiple-employer public employee retirement system for non-pedagogical employees of the Department of Education and certain Charter Schools, as well as certain employees of the School Construction Authority.

4. ANALYSIS SUMMARY

A. Risk Appetite

Risk appetites across the five Systems are currently expressed implicitly in: (1) the minimization of the modeled portfolio standard deviation given the 7% AIR/required expected return; and (2) the Basket Clause limits placed on certain asset classes, notably for private equity, junk bonds and alternatives exposures that are imposed to address the uncertainties surrounding the inputs to the optimization calculus.

The Boards can enhance their risk oversight practices by approving a risk appetite statement. For example, a formal written risk appetite statement aimed in part at shortfall probabilities would help guide decision making around the choice of target expected return.

Risk tolerances are currently articulated and are based only on permitted variances from target asset allocations. There are no formal limits on duration or convexity, stress tests or VaR-type metrics.

We recommend that each of the Boards establish in writing formal risk appetite and risk tolerance statements for each benefit plan.[3] A good starting point might be the risk appetite statement on page 87 of the "2021 Comprehensive Annual Report of the New York State and Local Retirement System."[4]

[3] See, for example, *Report of the NACD Blue Ribbon Commission, Risk Governance: Balancing Risk and Reward* (2014).

[4] https://www.osc.state.ny.us/files/retirement/resources/pdf/comprehensive-annual-financial-report-2021.pdf

B. Investment Portfolio Asset Liability Matching

ALM reports provide the Boards and other decision-makers with important information about how the impacts of economic, demographic, and other factors might differ between pension liabilities and assets so that allocation changes can be made as necessary to bring asset and liability exposures into balance.

Only BERS is developing formal ALM reports (with Segal Marco). We recommend that each of the Systems follow the lead of BERS in developing formal ALM reports.

C. Risk Guidelines and Practices

In May 2022 and subsequent to the time when we conducted two interviews with the BAM Risk team (the Senior Risk Officer), which was the *de facto* risk team for the five Pension Systems, Ed Berman joined BAM as CRO. Prior to that, the CRO position was vacant for the better part of two years posing what we consider a material weakness. The CRO's "second line of defense" function is a critical one,[5] typically encompassing:

- Evaluation of the funds' risk tolerances
- Establishment of risk limits (e.g., duration, convexity, stress test limits)
- Identification, measurement, and aggregation of risks
- Independent assessment of fund risk profiles
- Provision of risk reports to Chief Investment Officer ("CIO"), Comptroller and Boards.
- Monitoring of adequacy of the first line (i.e., the office of the CIO)

We recommend that in the instances where the CRO position becomes vacant, the position be filled with as little gap as possible.

Our interview with the then Risk team uncovered considerable confusion about to whom the office of the CRO should report; at the time it reported into the Deputy Chief Investment Officer and was more of an analytical support function than a second line of defense. The CIO indicated in our interview that when a new CRO is hired, that function will report into the Comptroller. Now that the CRO position has been filled, we recommend that the CRO have a

[5] Ibid.

direct reporting line to the NYC Comptroller and either a dotted reporting line to each of the five Boards or formal advisory responsibility.

The Senior Risk Officer provides a robust risk set of metrics that are reported to the various Boards, but the only formal limits/guidelines in place are tolerance bands around the Systems' asset allocation targets. The Risk Management team might consider conducting incremental risk/return impacts when evaluating new investments within the asset allocation tolerance bands (for example, those that go from the middle of bands to the top or bottom). That said, the BarraOne risk report the Senior Risk Officer prepares is a valuable tool. It reports the risk breakdown (risk contributions) of the portfolio asset classes to the portfolio and asset class returns relative to benchmarks. The report summarizes the duration, convexity, yield to worst and option adjusted spread to the swap curve for the fixed income portfolio. This is a state-of-the-practice set of metrics.

D. Required Risk Signoffs and Escalation Procedures

The Trustees adopt allocation limits (rebalancing bands) around each investment strategy, aimed at ensuring that the portfolio remains reasonably diversified. Asset allocations within these bands are monitored daily and are reviewed and discussed during every BAM rebalancing committee meeting. These meetings occur at least once monthly and during the pandemic have been held twice weekly. In the event one of these rebalancing bands is breached, the BAM rebalancing committee is convened, and the breach is immediately cured. We suggest that that the CRO should monitor compliance with asset allocation tolerance limits, supervise cures of breaches and sign off on glidepaths back to compliance. The CIO has authority to tailor allocations within their tolerance bands.

E. Return Targets

The pandemic itself has not changed return assumptions, and the average investment returns of each of the five pension funds has exceeded its 7% expected return target over the combined 2020 and 2021 fiscal years (each at least doubled the 7% expected return assumption).[6]

[6] Given the public equity market performance in 2022 in the face of negative GDP growth and inflation not seen in 40 years, it is likely the funds will report returns of well under 7% for the fiscal year ended 2022. The S&P500 index sank 20.6% in the first half of 2022, the worst first half on record for 52 years.

Our interview with the Chief Actuary from the New York City Office of the Actuary in the spring of 2021 revealed an intent to reduce the system-wide inflation assumption from 2.5% to 2.3% and the system-wide return assumption (actuarial interest rate or "AIR") from 7% to 6.8%. The Chief Actuary argued for invariant 4.5% "real return" assumption. We discussed with the Chief Actuary that we see the inflation analysis as making little sense in the 2021 market environment in which we are seeing strong monetary accommodation in the face of potentially massive amounts of government spending. At the time of our interview the running CPI inflation rate was over 5% year over year – which would have been the appropriate time **not** to be lowering the inflation assumption. (The current rate as of July 2022 is 9.1%.) The Chief Actuary could provide no justification for this decision other than "it is art, not science". We also questioned the validity of the Chief Actuary's use of an invariant 4.5% "real return" assumption that results in a 6.8% expected return given the Chief Actuary's proposed[7] 2.3% inflation assumption; expected return is a function of the point chosen on the efficient frontier or capital market line (as modified by allocation constraints) so there is a multiplicity of expected return/standard deviation pairs that can be chosen by the Pension Boards all of which are independent of any inflation assumption. There is simply no single expected return that applies to all asset allocations. Thus, the "return assumption" is a direct function of current asset allocation and the expected return, risk, and correlation assumptions about each asset class. The CIO indicated in our interview that despite the funds' target annual 7% expected return, the funds have generally fallen short of that target and the assumptions driving the model don't support that level of return. We disagree with both assertions. Our review of the data reveals that between the fiscal years ending 6/30/2012 and 6/30/2021, the fund returns were as follows:

[7] The Chief Actuary proposed to each System a revised inflation assumption of 2.5% in July 2021 noting "since the proposed Original 2021 A&M was introduced, uncertainty related to inflation assumptions due to recent economic conditions have unfolded, as indicated by the Chair of the Federal Reserve at its most recent Federal Open Market Committee meeting in June, that supports, especially considering the State legislature's failure to enact consistent changes to the AIR, a short-term continuation and subsequent reevaluation of the 2.5% inflation assumption." As of this report, each System continues to use a 7% assumed interest rate.

Annual Pension Returns

	Teachers	NYCERS	Police	Fire	BERS
FY ending 6/30/21	24.80%	26.63%	26.37%	24.86%	27.97%
FY ending 6/30/20	4.89%	3.58%	4.67%	4.81%	5.72%
FY ending 6/30/19	7.54%	7.13%	6.95%	7.11%	6.99%
FY ending 6/30/18	8.12%	8.56%	9.41%	9.30%	10.37%
FY ending 6/30/17	12.66%	12.99%	13.19%	12.82%	15.33%
FY ending 6/30/16	1.66%	1.52%	1.21%	1.41%	0.17%
FY ending 6/30/15	2.78%	3.11%	3.85%	3.29%	3.18%
FY ending 6/30/14	17.62%	17.03%	17.78%	17.40%	19.47%
FY ending 6/30/13	11.90%	12.24%	12.28%	11.90%	12.90%
FY ending 6/30/12	1.85%	1.32%	0.87%	1.10%	0.10%
Average (non-compounded)	**9.38%**	**9.41%**	**9.66%**	**9.40%**	**10.22%**
Average (Trim High Year and Low Year):	**8.40%**	**8.27%**	**8.67%**	**8.51%**	**9.27%**

The funds do not seem to be generally falling short of target. We also note that based on our independent analysis (see section H below) the 7% expected return is itself a function of those assumptions that drive the optimization models, i.e., the assumptions do indeed support that expected return and associated standard deviation.

Further, over the 10 years between June 2011 and June 2021, the inflation rate as measured by the "Consumer Price Index for All Urban Consumers: All Items" averaged about 1.86% per year, while the annual NYC pension investment returns averaged about 7.5% (i.e., not 4.5%) above that CPI inflation as demonstrated above. This does not support the Chief Actuary's assumption that nominal investment returns tend to a level of "inflation + 4.5%". Further, as we update this report in July 2022, we note the Actuary's use of this guideline would have suggested nominal investment returns of 13.6% over the past year based on the realized 9.1% inflation.

We believe that the Pension Systems need to develop a consistent view about the nature of Expect Return and its dependence on asset allocation and risk preference. There needs to be a single agreed-upon understanding of why a particular asset allocation (i.e., expected return, standard deviation pair) is selected. The Systems' actuaries also need to pay more attention to the news about CPI inflation and be prepared to discuss their inflation forecasts intelligently in the context of current fiscal and monetary policy.

We recommend that the System's actuary 1) adopt an approach to forecasting inflation that is consistent with economic theory and practice; and 2) adopt an approach to viewing portfolio returns in a manner more consistent with modern portfolio theory (i.e., the approach used by each of the System's general consultants).

The examiner notes that the system hired Milliman to conduct an independent actuarial review that was completed in November 2023. That review provided our recommended approach to determining an investment return assumption, i.e., mapping the system's target asset allocation to expected return estimates for each asset class. Milliman recommended that each of the systems should receive input from their investment advisors prior to a final decision being made about the investment return assumptions (we understand that each may have different asset allocations and each system's investment advisor may have unique expected return forecasts). We are encouraged that this is being considered, however, Milliman appears to have performed the investment return assumption analysis on a System basis only rather than determining separate investment return assumptions for each plan within the System. This is discussed further in item F below.

F. Actuarial

The interviews with the Systems' Chief Actuary were led by the examination's actuarial team. As explained above, the investment aspect of those interviews covered confusion about the relationship between AIR and expected portfolio returns and the assumptions underlying inflation projections. In particular, as explained in item D above, we do not agree with the Chief Actuary's rationale for the proposed 2.3% inflation assumption or the development of the expected return using inflation + 4.5%.

More importantly, the Actuarial team uncovered that the QPP are co-invested with the TDA or the VSF. VSFs and TDAs represent additional benefits provided by the city whose assets are held exclusively for providing such additional benefits. However, assets of the QPP are often used to fund these additional benefits. We believe from a financial practice standpoint that the differing demographic factors and natures of these additional promised benefits outside the QPP should be analyzed separately from the QPP to provide improved liability-driven investing and greater transparency of the costs and financial risks of providing additional VSF and TDA benefits.

G. Duration and Convexity

Duration (portfolio sensitivity to interest rate changes) and convexity (the change in portfolio sensitivity to interest rate changes as rates change) are reported in the BarraOne risk reports, but there are no formal stated risk tolerances for either. We suggest the establishment of a formal risk tolerance range for portfolio duration.

H. Liquidity Management

Liquidity Management is adequate. The Comptroller's Bureau of Accountancy is responsible for projecting employer contributions to the Systems and benefit payments to the beneficiaries (among other cash sources and uses). These liquidity sources and requirements are communicated to the Bureau of Asset Management's Head of the Short-term Trading Desk, under the purview of the Head of Fixed Income who in turn reports to the Deputy CIO. All three of these people are members of the Rebalancing Committee. The Head of the Short-term Trading Desk is responsible for ensuring that the Systems' liquidity needs are met and works in consultation with members of the Rebalancing Committee to affect asset transfers as needed.

I. Stated Return Expectations

Our review of the asset-class-level assumptions about return expectations, standard deviations, and correlations across each of the five Systems' general consultants in their independent asset allocation studies finds a high level of consistency. This provides general comfort with the reasonableness of these inputs to the respective asset allocation models. And it explains the very similar asset allocations among the funds (despite differing basket clause restrictions), each of which is targeting a 7% expected return:

System's Asset Allocations: September 2021

	Teachers	NYCERS	Police	Fire	BERS
U.S. Equity	28.15%	29.04%	32.33%	28.68%	32.60%
REITS	0.00%	0.00%	0.00%	0.00%	0.00%
World ex USA	10.57%	12.53%	8.85%	8.97%	9.71%
Infrastructure	1.32%	1.28%	1.33%	1.12%	2.04%
Emerging Markets	9.43%	5.27%	5.35%	6.17%	5.61%
INTL FOF	0.79%	0.73%	0.64%	0.51%	0.94%
Fixed Income	29.46%	28.62%	21.50%	25.54%	21.39%
Global Equity	0.42%	0.49%	0.00%	1.85%	2.03%
Alternative Credit	8.05%	7.47%	10.86%	9.15%	10.21%
Hedge Funds	0.00%	0.00%	5.66%	5.10%	0.00%
Private Equity	6.77%	8.39%	7.97%	7.62%	8.85%
Private Real Estate	4.11%	5.43%	5.35%	4.71%	5.90%
Cash	0.93%	0.76%	0.17%	0.57%	0.71%

Using our own asset allocation model, we were able to replicate the asset allocation for Police Retirement System based on its 7% target expected return and the inputs used by the general

consultant. Thus we find the asset allocation model and inputs to that model to be adequate for the purposes to which they are put.

J. Asset Valuation

BAM has adequate procedures in place to ensure proper valuation of Levels 1,2 and 3 assets.

Public markets securities are priced by an independent financial data vendor. These valuations may contain Level 1, 2 or 3 securities. In addition, the valuation policies for prospective managers are reviewed and discussed as part of the operational due diligence process. Investment managers with assets that are not priced by a vendor are required to have an annual audit that includes valuation testing as part of the agreed-upon procedures. Classifications for all valuations are compiled by BAM's Financial Reporting Group and reported in the Systems' ACFRs (Annual Comprehensive Financial Reports) under GASB 72.

K. Securities Lending

Securities Lending follows current preferred practices. Our review of Securities Lending procedures revealed:

- Debt of US Treasury securities: no limit
- Registered Money Market Mutual Funds and Similar pooling agreements: must be AAA rated, maximum amount of investment in any single approved fund shall not exceed 10% of the total value of the Lender's cash collateral at time of purchase.
- Reverse Repurchase Agreements: with counterparties rated at least A-2 or P-2 by Standard & Poor's or Moody's Investors Services respectively, or a 'Primary Dealer' in Government Securities as per the NY Federal Reserve Bank or an affiliate of any such dealer or any counterparty approved by the lender included on the approved counterparty/borrower list.
- Collateral must be marked to market daily with the following minimum margin levels:

Government, Agency GSE and Supranational debt securities	100%
All other Fixed Income Securities	102%
Equities	110%
Corporate Debt	108%
Non-Agency Residential Mortgage-Backed Securities (RMBS)	108%

- Investment Parameters

  - No Investment with a maturity longer than 2 years from settlement date, except for repurchase agreements which are limited to 1 year.
  - Maximum weighted average maturity of investment portfolio 1 year.
  - Maximum weighted average interest rate exposure of investment portfolio 180 days.
  - Maximum of 25% of portfolio at time of purchase can be invested in instruments with maturities greater than 1 year.
  - When purchasing an investment with a maturity of 397 days or less, the issuer's short-term credit rating must not be on negative credit watch (issuers rated A-1+ by S&P or F1+ by Fitch are excepted)
  - When purchasing an investment with a maturity of 397 days or less, the issuer's long-term credit rating must not be on negative credit watch (issuers rated AA or better are excepted)
- Prohibited Securities
  - Securities whose interest rate reset provision are:
  - Based on a formula that magnifies change in interest rates
  - Tied to long-term interest rates
  - Is not paid above certain level or cease to pay interest when a certain level is reached
  - Tied to more than one index
  - Tied to an index that materially lags short-term interest rates

- Security Monitoring
  - Any issue in the portfolio is downgraded by any rating agency
  - Any repurchase agreement counterparty in the Portfolio is downgraded by any rating agency
  - Any money market fund in the Portfolio is downgraded by any rating agency
  - Any issuer of an asset in the portfolio defaults on such asset

Note: Investment guidelines for TRS differs slightly from the other Systems, specifically TRS accepts only Collateral for reverse repo in the form of Government, Agency GSE and Supranational debt securities

L. Portfolio Credit Risk Metrics and Management

Credit Ratings are Attached to Virtually all Fixed Income Investments. The vast preponderance of fixed income investments is rated by an NRSRO. However, as with any large portfolio of fixed income investments, not all investments are covered. In these instances, managers generally support the credit quality using internal ratings. Credit quality is aggregated and reported daily in the "Risk Ribbon" report and monthly in the MSCI "Blue Box" reports as shown below. We are satisfied that credit quality is measured and aggregated in an adequate manner.

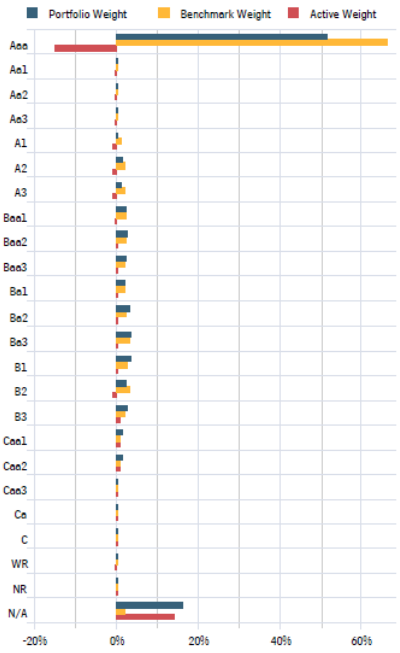
BarraOne Fixed Income Summary

COMPANY: NYCRS - BERS
PORTFOLIO: FIXED INCOME
BENCHMARK: Fixed Income
POSITIONS: 3,714
MODEL: BIM303L

CURRENCY: USD
ANALYSIS DATE: December 31, 2020
MARKET VALUE: 2,534,338,224
ACCEPTED: 3,695

Portfolio Allocation by Moody's Rating

Rating	Weight (%) Portfolio	Weight (%) Benchmark	Active	Cont. To Eff. Dur	Spread Duration	Total Risk	Active Risk CR	%CR to Active TR
Total	**100.00**	**100.00**	**-0.00**	**5.62**	**5.40**	**4.13**	**2.12**	**100.00**
Aaa	51.33	66.12	-14.79	3.20	6.67	3.74	1.38	65.25
Aa1	0.19	0.31	-0.12	0.02	8.31	7.72	0.00	0.04
Aa2	0.21	0.57	-0.36	0.03	13.00	11.86	-0.00	-0.16
Aa3	0.27	0.56	-0.29	0.03	10.87	9.82	-0.00	-0.21
A1	0.54	1.33	-0.79	0.05	9.12	8.03	-0.01	-0.34
A2	1.49	2.10	-0.62	0.12	8.09	7.55	-0.00	-0.12
A3	1.28	1.94	-0.66	0.11	8.43	8.23	-0.00	-0.16
Baa1	2.27	2.33	-0.06	0.17	7.55	8.82	0.02	0.81
Baa2	2.76	2.58	0.18	0.24	8.74	9.89	0.00	0.04
Baa3	2.43	1.96	0.47	0.20	8.31	11.62	-0.00	-0.08
Ba1	1.95	1.87	0.08	0.10	5.18	12.03	0.01	0.25
Ba2	3.02	2.59	0.43	0.13	4.29	12.39	0.03	1.19
Ba3	3.58	3.13	0.45	0.11	3.19	8.23	0.03	1.26
B1	3.50	2.93	0.57	0.11	3.13	9.84	0.04	1.86
B2	2.28	3.02	-0.74	0.06	2.77	9.17	-0.05	-2.20
B3	2.81	1.99	0.82	0.07	2.51	12.08	0.07	3.49
Caa1	1.81	0.98	0.83	0.04	2.38	15.60	0.09	4.19
Caa2	1.49	0.72	0.78	0.03	2.25	16.63	0.09	4.31
Caa3	0.37	0.24	0.13	0.01	2.24	15.62	0.01	0.57
Ca	0.13	0.08	0.05	0.00	2.33	19.83	0.01	0.25
C	0.02	0.02	0.00	0.00	2.38	19.75	-0.00	-0.05
WR	0.27	0.59	-0.32	0.01	2.18	12.68	-0.01	-0.53
NR	0.07	0.03	0.05	0.62	129.17	714.18	-0.13	-5.91
Not Rated	15.93	2.01	13.92	0.18	1.35	1.17	0.56	26.24



M. Derivatives

There is no BAM or System Derivatives Usage Plan as derivatives are generally not employed except in the case of several hedge funds that use derivatives in their speculative activities and several alternative credit funds with derivative hedging needs, and perhaps the use of credit default swaps ("CDS") in synthetic asset replication (their documentation does not limit the use of CDS to hedging). The hedge fund group reviews counterparty credit risk for a fund prior to making any recommendation to the BAM Investment Committee and Trustees, and once

an investment approved by the Boards is implemented, ongoing metrics are made available to BAM through the funds' shareholder reports including metrics and policies covering derivative counterparty risk.

We recommend that each of the Systems prepare a Derivative Usage Policy Statement that lays out the acceptable uses of exchange-traded and over-the-counter derivatives and maintain an inventory listing which managers are employing derivatives and for what purpose (i.e., hedging, speculation, or arbitrage). Page 16 of "The General Investment Policies for the New York State Common Retirement Fund" provides a good example of a basic Derivatives Usage Policy Statement[8] as does the New York State Teachers Retirement System Investment Policy Manual, page 13.[9]

The examiner notes that several of the systems have indicated an understanding of the importance of a Derivative Usage Policy and have agreed to undertake a process to explore the development of one.

N. LIBOR Transition

BAM's Chief Compliance Officer reported that the Systems are on a glide path to be fully prepared for LIBOR transition (fallbacks, etc.) by year-end 2021. As of July 2022, this goal has not been achieved. However, the Chief Compliance Officer assures us that, "*Consistent with our fiduciary duty, since 2019 BAM has actively monitored the retirement of the London Interbank Offered Rate (LIBOR) and the impact its retirement will have on the Systems. BAM believes the asset classes, securities lending, short term trading, and the Custodian Bank have proactive plans underway designed to mitigate the risk of the 2023 LIBOR transition.*" The examiner suggests a review of progress toward LIBOR transition with BAM at year-end 2022.

O. Asset Allocation

The examiner reviewed asset allocation on a risk/return basis. As highlighted above, we have replicated the asset allocation program of the Police Retirement System in an Excel program and verified outputs. The asset allocation process used by the general consultants is based on modern portfolio theory. Rocaton, for example, provides the relevant point of an efficient frontier

[8] https://www.osc.state.ny.us/files/common-retirement-fund/pdf/general-investment-policies.pdf
[9] https://www.nystrs.org/NYSTRS/media/PDF/IPM.pdf

to the Board (choices of expected return and minimum standard deviations for each) – there is no concept of a single "possible" expected return.

Each Board chooses its own expected return target and regardless of that choice, the consultant's optimizations will choose allocations that maximize risk adjusted return subject to "basket clause" allocation constraints. Perhaps unsurprisingly, all five Boards currently choose an expected return consistent with the Actuary's "AIR", 7%. Here is an explanation from the Police Penson Fund's Investment Policy Statement:

The AIR assumption is a key actuarial assumption affecting future NYCPPF funding rates and pension liabilities. Based on the actuarial assumptions and methods recommended by the Actuary and adopted by the Board, a 7.0% per annum return on assets, together with employee and annual employer contributions, is expected to fully fund the Plan over time to allow it to meet current and future benefit obligations. Investment performance that exceeds or underperforms the AIR assumption may materially affect future funding rates. The Board seeks to have long-term investment performance that will equal or exceed its AIR assumption.

This we believe is a very clear statement of how the Office of Chief Actuary should determine its AIR, rather than adding an inflation assumption to a "constant" 4.5% real return. The AIR assumption will drive to a large extent the System's asset allocations but should in no way represent a "return *possibility*". Of course, basket clause constraints are built into the optimizations and shadow prices of each are reported.

P. Backgrounds and Diligence of Investment Managers

The team interviewed BAM's Chief Compliance Officer who informed us that: (1) "Daily Alert Reports" capture deviations from investment guidelines by investment managers; and (2) the general consultants of each system provide manager screening including performance and any potential conflicts of interest, and Compliance is generally on top of the various operational risks (including conflicts of interest) of the Systems' portfolio of investment managers at their point of hiring and through their tenures.

Our review of ongoing diligence of investment managers performed by BAM revealed a considerable amount of activity applied to Public Equity, Fixed Income and Private Investment managers. This includes review of monthly and quarterly reports; periodic and ad hoc in-person

meeting and calls; periodic performance comparisons against benchmarks; and reviews of manager-supplied reports of compliance with investment guidelines.

While the above processes were fully adequate, we note that there is, however, no consolidated diligence report generated across each investment manager. We recommend that BAM create a report that consolidates a set of key data from the diligence materials for each of the 300 managers and update those data on a regular basis.

Q. Other

In addition to items in our work plan we observed the following:

(1) Several action recommendations (some critical) of a 2015 report by the Funston Group that was commissioned by the Comptroller with which we agree are still to be acted on and a number of these had been stalled due to the extended absence of a CRO. We recommend that the seven critical action recommendations from the 2015 Funston Group report be adopted as soon as practicable.

Funston Report	BAM Update
1. The Risk Management Division ("RMD") should adopt and implement a recognized enterprise-wide risk management framework to establish processes and tools to help identify and manage risks within BAM. Chartered and constructed in-house ERM platform.	Since 2015, the Risk department has implemented software, due diligence processes, and reports, all designed to identify and manage risks within BAM. BAM investment staff integrated risk management into their portfolio oversight. Risk improvements include but are not limited to: • BAM Risk Ribbon • MSCI • Quarterly Trustee Risk Reports • Risk Register • Operational Due Diligence for proposed investments
2.RMD should develop a Risk Management Division Charter which clearly outlines the roles and responsibilities of the Division (operations risk support and independent reassurance) and its relationships with operating management and the Boards of Trustees.	BAM has put this recommendation on hold until a Chief Risk Officer is hired, as we believe they should play a meaningful role in developing a Division Charter.
3. RMD should develop an Operational Risk Appetite policy statement to assist in the prioritization of identified operational risks, i.e., how much performance variability is acceptable.	BAM has put this recommendation on hold until a Chief Risk Officer is hired, as we believe they should play a meaningful role in developing a formal Risk Appetite policy statement.

Funston Report	BAM Update
4. RMD should continue their efforts to fill their two open positions as well as to identify its overall short and long-term staffing needs.	BAM understands the importance of these roles, and a search to fill all open Risk positions is underway. Postings for a Chief Risk Officer and a Risk Officer are on the Comptroller's job website (link), and BAM aims to fill both roles as soon as possible.
5. BAM should arrange or provide in-house training in specific areas of risk so BAM staff can retain or acquire professional certifications.	BAM encourages all employees in the Bureau to attend relevant educational workshops and conferences to learn about the industry and strengthen their skill sets. Prior to the work from home directive, the Risk staff attended conferences hosted by MSCI, and other Risk-focused industry groups. The Bureau expects in-person training to resume once it is safe to do so again.
6. BAM should develop or obtain relevant Risk Management training courses to ensure that all BAM employees are being provided with the most up-to-date understanding of their role in risk management activities.	BAM investment staff integrates risk management into their portfolio oversight. This is demonstrated in their investment memos, monthly portfolio meetings, investment committee discussions, and overall ongoing due diligence.
7. Create an Operational Risk Committee made up of the CIO's direct reports who would meet on a regular basis to review risk reports and coordinate bureau-wide and divisional responses to accelerate the reduction of operational risk.	Since 2016, BAM has implemented an Investment Committee and Rebalancing Committee, and both incorporate risk management into their discussions and focus. BAM will place this recommendation on hold until a Chief Risk Officer is hired so they can help determine the best way to design such a committee.

(2) After reviewing the backgrounds of the Systems' Board members to the extent possible given a degree of opacity regarding the compositions of Board meeting attendees, it is our opinion that each Board would benefit from additional specific knowledge in banking, finance, or investments in performing its fiduciary duties. A greater weight toward financial literacy relative to union or political representation would benefit the New York City taxpayers who are the ultimate guarantors of the defined benefit pension plans. The New York State Teachers' Retirement System Board of Trustees, for example, requires[10]:

a. Two present or former school board members, experienced in the fields of finance and investment, elected by the Board of Regents based on recommendations of the New York State School Boards Association. At least one of these individuals must have experience as an executive of an insurance company.

[10] https://nystrs.org/About-Us/Retirement-Board

b. One present or former bank executive elected by the Board of Regents.

Of course, the "school board member" requirement is specific only to this fund.

The examiner notes the NYCERS response detailing a considerable amount of available Board onboarding and continuing investment and risk education.

(3) While we recognize the long-standing literature showing that for long-term investments the asset allocation decision is far more important than the security selection decision, we did interview the portfolio managers for Private Equity ("PE") and Alternative Fixed Income, two asset types to which funds and insurers have pivoted for return enhancement in this low interest rate environment. These asset types are often associated with risk issues such as opacity, illiquidity, complexity, timing uncertainty of returns and funding drawdowns; thus, we thought it was important to understand the System's approach to these investments.

BAM's Private Equity team works with three special consultants to cover the five Systems. On an annual basis, the PE team and the special consultants present to the Boards an annual strategic plan, including planned investment amounts on various strategies, geographies, and managers. Once the strategic plan is approved, the team has bi-weekly pipeline calls to discuss investment opportunities and review the due diligence process throughout the year.

The process of manager due diligence is rigorous. The PE team interviews potential new managers, reviewing all their market materials, takes in the due diligence of the Investment, Risk and Compliance teams at BAM and of the special consultants, and produces a due diligence memo.

BAM maintains and monitors a zero-dollar gift policy, and the compliance office requires employees to report and disclose any expenses paid by the third party. This minimizes any untoward influence in the manager selection process.

The PE team and the special consultants monitor the performance (gross and net returns) and look for strategy drift. Each manager is assigned a public equity benchmark, e.g., the Russel 3000. The valuation methodologies are in preferred order: (1) trade data; (2) public market comparable or recent transactions; and (3) DCF (Discount Cash Flow) Analysis.

The Head of Private Equity noted that during his 6 years on the PE team only two deals could not close because of the "GP (General Partner) Expense Provision" that has the Systems refusing to agree to cover GP legal expenses. In 2020-2021, they added 4-5 new high performing managers and the Head of Private Equity notes he can access the managers with whom the team would like to invest. The PE team reports that it is mostly on track to achieve the investment target that the Boards have set for them. The feared inability to invest with top-flight GPs due to the GP Expense Provision has not materialized

Alternative Credit ("AC") includes Opportunistic Fixed Income, High Yield (i.e., below investment grade) and Bank Loans. The surveillance and due diligence processes conducted by the AC team, are like those conducted by the PE team. However, the AC team doesn't work with special consultants; they work with the Systems' general consultants. While general consultants can initiate a recommendation of a manager, it is our impression that the AC team at BAM does all the leg work, including monitoring performance (each manager is reviewed in a quarterly report). Given the size of the AC team of four people, it would be preferable to have a specialist consultant or two assigned by the Boards.

In terms the AC team's reporting slides, we do note that it would be helpful if the reports could have footnotes or an appendix to clarify various terms. A report should stand on its own and not rely on the reader to make assumptions or need to spend time trying to make educated guesses to decipher things. However, once the reader understands all the terms used in the report, it proves to comprehensive and informative.

5. SUMMARY AND CONCLUSIONS

Following are the recommendations and comments contained in this report:

Item	Description	Page No(s).
A	We recommend that each of the Boards establish in writing formal risk appetite and risk tolerance statements for each benefit plan.	7
B	We recommend that each of the Systems follow the lead of BERS in developing formal ALM reports.	8
C	We recommend that in the instances where the CRO position becomes vacant, the position be filled with as little gap as possible.	8
D	We recommend that the CRO have a direct reporting line to the NYC Comptroller and either a dotted reporting line to each of the five Boards or formal advisory responsibility.	8
E	We recommend that the System's actuary 1) adopt an approach to forecasting inflation that is consistent with economic theory and practice; and 2) adopt an approach to viewing portfolio returns in a manner more consistent with modern portfolio theory (i.e., the approach used by each of the System's general consultants).	11
F	We believe from a financial practice standpoint that the differing demographic factors and natures of these additional promised benefits outside the QPP should be analyzed separately from the QPP to provide improved liability-driven investing and greater transparency of the costs and financial risks of providing additional VSF and TDA benefits.	12
G	We recommend that each of the Systems prepare a Derivative Usage Policy Statement that lays out the acceptable uses of exchange-traded and over-the-counter derivatives and maintain an inventory listing which managers are employing derivatives and for what purpose (i.e., hedging, speculation, or arbitrage).	17
H	We recommend that the seven critical action recommendations from the 2015 Funston Group report be adopted as soon as practicable.	19

Item	Description	Page No(s).
I	It is our opinion that each Board would benefit from additional specific knowledge in banking, finance, or investments in performing its fiduciary duties. A greater weight toward financial literacy relative to union or political representation would benefit the New York City taxpayers who are the ultimate guarantors of the defined benefit pension plans.	20

Respectfully submitted,

Robert D. Selvaggio, Ph.D.
Rutter Associates, LLC

STATE OF NEW YORK)
) SS:
COUNTY OF ~~NEW YORK~~ Westchester)

Robert D. Selvaggio, being duly sworn, deposes and says that the foregoing report, subscribed by him, is true to the best of his knowledge and belief.

Robert D. Selvaggio

Subscribed and sworn to before me
this 2nd day of September

EMILY GRACE MANCINI
Notary Public, State of New York
Westchester County #01MA6442445
Commission Expires Oct. 11, 2026