REPORT ON EXAMINATION

OF THE

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM

AS OF JUNE 30, 2018

EXAMINER: **RORY CUMMINGS**

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. 31954, dated May 24, 2019, and annexed hereto, an examination has been made into the condition and affairs of the New York City Board of Education Retirement System, hereinafter referred to as "the System," or "BERS" at its home office located at 65 Court Street, Brooklyn, New York 11201.

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 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 Education Law Section 2575(16)(c)(4)(v). (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 Education Law Section 2575. 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.)
- To minimize the risk of errors, the System should consider revising current procedures or implementing new procedures that are documented and approved by its board of trustees (the "Board"). (See section 5D 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 the National Association of Insurance Commissioners' Examiners Handbook or such other 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

BERS is a retirement system for New York City Department of Education employees (except for appointed teachers), certain employees of the City School Construction Authority, and eligible employees of certain charter schools.

The System was established on September 1, 1921, pursuant to the provisions of New York Education Law Section 2575 and empowered to govern the affairs and manage the funding of the retirement of its members as prescribed in the System's Rules and Regulations (the "Bylaws"). In 2002, the Legislature reformed the System, granting it corpus funding pursuant to Chapter 307 of the Laws of 2002. By adopting a corpus funding configuration, the Legislature changed the System's funding structure to match that of three of the City's other pension plans: New York City Employees Retirement System ("NYCERS"), New York City Teacher's Retirement System ("TRS"), and the New York City Police Pension Fund.

The System administers and is the fiduciary for the QPP and the TDA. Substantially all Department of Education non-teaching, full time permanent employees are required to become members of the QPP on the first day of permanent employment. Contributions to the QPP are made by both the members and New York City in accordance with existing state and city statutes and the System's Bylaws. In addition to pension benefits, the System provides for death benefits and disability benefits.

Beginning January 1, 1970, members were given the option to participate in the TDA Program, which provides a means of deferring income tax payments on their voluntary contributions until after retirement or upon withdrawal. Section 6 of this report is dedicated to the TDA Program.

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

B. Management

The management of the System is vested in its Board. The Board, subject to the limitations of the Bylaws and applicable law, establishes the policies for the administration and transaction of the business of the System. The Board consists of 16 Panel for Educational Policy members (the Chancellor and eight other mayoral appointees and five Borough President appointees), and two employee-members elected by the membership. The term of each employee-member is four years beginning the first of January following a regular election. Each employee-member has an alternate, who will serve the duration of the term of office of the elected employee-member in the event of the death, disability, disqualification or withdrawal of the employee-member. As of June 30, 2018, the board members were:

Name	Principal Business Affiliation
Honorable Peter J. Calandrella	Staten Island Representative
Honorable Isaac Carmignani	Mayoral Representative
Honorable Richard Carranza	Mayoral Representative (Chancellor, New York City Department of Education)
Honorable Geneal Chacon	Bronx Representative
Honorable April Chapman	Brooklyn Representative
Honorable T. Jose Davila	Mayoral Representative
Honorable Deborah Dillingham	Queens Representative
Honorable Benjamin Shuldiner	Mayoral Representative
Honorable Michael Kraft	Manhattan Representative
Honorable Vanessa Leung	Mayoral Representative
Honorable Gary Linnen	Mayoral Representative
Honorable John Maderich	Employee Representative
Honorable Donald Nesbit	Employee Representative
Honorable Lori Podvesker	Mayoral Representative
Honorable Shannon Waite	Mayoral Representative
Honorable Miguelina Zorilla-Aristy	Mayoral Representative

T. Jose Davila and Benjamin Shuldiner resigned from the Board in July 2018 and March 2019, respectively. At the end of our onsite examination, both positions were still vacant.

The examiner reviewed Board and Board committee minutes. While there was quorum at each meeting, there were individual members that were frequently absent.

The System should consider having all board members and committee members attend scheduled meetings.

The System should consider documenting in each year's Board minutes any designee nominated to attend Board and Board committee meetings in place of board members.

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

Name	Title
Sanford R. Rich	Executive Director
John Cahalin	Director, Operations
Alexander Kazazis	General Counsel
Jean-Daniel Desmornes	Director, Fiscal Operations
Steve Sebili	Director, Information Technology
Maria Cepin	Director, Member Services
Chung Yeung	Director, Records Management

John Cahalin retired as Director of Operation in January 2019 and was replaced by Josaias Rodriguez in January 2019 as Acting Deputy Director, Operations. Josaias Rodriguez was elevated to Director of Operation in December 2019. Chung Yeung was appointed to Director of Records Management in January 2019.

Based on the examiner's review, the Bylaws do not appear to reflect the current operation of the System.

The System should consider developing procedures to ensure the Bylaws are periodically updated.

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 financial statements; and the statements of changes in plan net assets for each of the fiscal years under review.

A. STATEMENT OF PLAN NET ASSETS
QPP
FISCAL YEAR ENDED JUNE 30, 2018
(in thousands)

Assets	
Cash	$ 2,106
Receivables for investment securities sold	84,962
Member loans	50,038
Accrued interest and dividends	13,273
Investments at fair value	6,457,329
Other receivable	794
Other assets	206,757
Total assets	$6,815,259
Accounts payable	$ 34,454
Payables for investment securities purchased	115,140
Accrued benefits payable	9,747
Due to the TDA Program's Fixed return fund from the System	1,592,875
Payable for securities lending	390,140
Total liabilities	2,142,356
Plan net assets held in trust for benefits	$4,672,903

B. STATEMENT OF CHANGES IN PLAN NET ASSETS

QPP
FISCAL YEAR ENDING JUNE 30
(in thousands)

	2014	2015	2016	2017	2018
Additions:					
Contributions:					
Member contributions	$ 37,193	$ 39,564	$ 38,581	$ 39,821	$ 40,846
Employer contributions	214,590	258,099	265,532	288,233	318,643
Interest and dividend income	$ 104,354	$ 83,105	$ 96,110	$ 125,574	$ 154,991
Net appreciation in fair value of investments	781,671	101,496	79,014	760,262	426,315
Net securities lending income	914	2,663	3,316	5,878	3,700
Investment expenses	(11,486)	(10,098)	(14,296)	(29,204)	(19,429)
Net investment income	875,453	177,166	164,144	862,510	565,577
Net (payments to) or receipts from other systems	$(70,916)	$(52,021)	$(157,499)	$(122,954)	$ 51,024
TDA interest income in the fixed return fund	(206,615)	(85,104)	(94,789)	(106,554)	(127,972)
Total additions	$849,705	$337,704	$215,969	$961,056	$848,118

	2014	2015	2016	2017	2018
Deductions:					
Benefit payments and withdrawals	$ 214,315	$ 223,244	$ 240,727	$ 262,432	$ 261,574
Administrative expenses	9,776	(10,956)	12,818	15,486	13,212
Total deductions	$ 224,091	$ 234,200	$ 253,545	$ 277,918	$ 274,786
Net (decrease) or increase in plan net assets	$ 625,614	$ 103,504	$ (37,576)	$ 683,138	$ 573,332
Plan net assets held in trust for benefits:					
Beginning of year	$2,653,651	$3,279,265	$3,454,009	$3,416,433	$4,099,571
Prior year adjustment		71,240			
Beginning of year restated		3,350,505			
End of year	$3,279,265	$3,454,009	$3,416,433	$4,099,571	$4,672,903

C. STATEMENT OF PLAN NET ASSETS
TDA PROGRAM
FISCAL YEAR ENDED JUNE 30, 2018
(in thousands)

Assets

Cash	$ 355
Receivables for investment securities sold	400
Member loans	43,569
Accrued interest and dividends	862
Investments at fair value	518,044
Due to the TDA Program's Fixed return fund from the System	1,592,875
Total assets	$2,156,105
Other payable	173,813
Payables for investment securities purchased	709
Accrued benefits payable	7,157
Securities lending	5,618
Total liabilities	$ 187,297
Plan net assets held in trust for benefits	$1,968,808

D. STATEMENT OF CHANGES IN PLAN NET ASSETS

TDA PROGRAM
FISCAL YEAR ENDING JUNE 30,
(in thousands)

	2014	2015	2016	2017	2018
Additions:					
Contributions:					
Member contributions	$ 63,767	$ 74,890	$ 77,459	$ 85,765	$ 89,972
Interest and dividend income	8,470	8,718	9,328	18,374	10,123
Net (depreciation) appreciation in fair value of investments	74,351	14,804	(7,771)	58,720	49,706
Net securities lending income	87	181	194	106	93
Investment expenses	(685)	(753)	(702)	(1,461)	(754)
Net investment income	82,223	22,950	1,049	75,739	59,168
TDA Program's interest income in the fixed return fund	206,615	85,104	94,789	106,554	127,972
Net receipts from or (payments) to other retirement systems	$ (110,273)	$ 4,448	$ (3,541)	$ (48,113)	$ (54,240)
Total additions	$ 242,332	$ 187,392	$169,756	$ 219,945	$ 222,872

	2014	2015	2016	2017	2018
Deductions:					
Benefit payments and withdrawals	$ 40,410	$ 39,222	$ 50,189	$ 50,208	$ 53,668
Administrative expenses	2,530	3,033	850	125	84
Total deductions	42,940	42,255	51,039	50,333	53,752
Net increase in plan net assets	$ 199,392	$ 145,137	$ 118,717	$ 169,612	$ 169,120
Plan net assets held in trust for benefits:					
Beginning of year	$1,238,070	$1,437,462	$1,511,359	$1,630,076	$1,799,688
Prior year adjustments		(71,240)			
Beginning of year restated		1,366,222			
End of year	$1,437,462	$1,511,359	$1,630,076	$1,799,688	$1,968,808

The following table indicates the membership of the System during the period of examination:

	Fiscal Year Ended June 30				
	2014	2015	2016	2017	2018
Active members	25,182	24,903	25,864	25,794	25,864
Service pensioners	14,150	14,572	15,034	15,454	15,979
All other pensioners	1,845	1,866	1,903	1,971	2,062
Total	41,177	41,341	42,801	43,219	43,905

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.

A. Dormant Accounts

The examiner's review of member accounts found that there were $33.5 million in dormant accounts (QPP and TDA). Accounts become dormant after five years when a member who is not vested separates from employment. These accounts will accrue interest from the date of separation for five years at which point the account becomes dormant and stops accruing interest.

The examiner found that there were no policies and procedures to communicate the dormancy of these accounts and the current value of these accounts to members who separated from the System, or to their beneficiaries if the member is deceased.

The System should consider developing policies and procedures to communicate annually with members who had separated from the System about their dormant accounts. This communication should include the value of the accounts, the contact information for the System, and instruction on how to apply for these funds.

The System should consider using the Social Security Death Index Database or similar resource on a quarterly basis to verify if members who have separated from the System and have existing accounts are deceased. If a member is deceased, the System should communicate to the member's beneficiary the value of the dormant accounts, the contact information for the System, and instructions on how to apply for these funds.

B. Minimum Required Distributions

Section 13-638.6 of the New York City Administrative Code ("NYCAC") states in relevant part the following:

> "Notwithstanding any other provision of law to the contrary, the New York city employees' retirement system, the New York city police pension fund, subchapter two, the New York city fire department pension fund, subchapter two, the New

York city teachers' retirement system and the New York city board of education retirement system shall at all times comply with the requirements of section 401(a)(9) of the Internal Revenue Code, as amended from time to time, and, unless the Internal Revenue Code as hereafter amended provides otherwise,

(1) all distributions of retirement allowance benefits from any such retirement system or pension fund shall commence on or before the April first following the later of the calendar year in which the participant attains age seventy and one-half or retires; and

(2) where the distribution of the participant's entire interest is not made in a lump sum by any such retirement system or pension fund, the distribution shall be made in one or more of the following ways: over the life of the participant; over the life of the participant and a designated beneficiary; over a period certain not extending beyond the life expectancy of the participant; or over a period certain not extending beyond the joint life and last survivor expectancy of the participant and a designated beneficiary; and

***

(4) where the participant dies before distribution commences, the method of distribution of benefits from any such retirement system or pension fund shall satisfy the following requirements: (a) any remaining portion of the participant's interest that is not payable to a beneficiary designated by the participant shall be distributed within five years after the participant's death; and (b) any portion of the participant's interest that is payable to a beneficiary designated by the participant shall be distributed either (i) within five years after the participant’s death, or (ii) over the life of the beneficiary or over a period certain not extending beyond the life expectancy of the beneficiary, commencing not later than the end of the calendar year following the calendar year in which the participant dies (or, if the designated beneficiary is the participant's surviving spouse, commencing not later

than the end of the calendar year following the calendar year in which the participant would have attained age seventy and one-half).

The examiner found that the System did not have policies and procedures to comply with NYCAC Section 13-638.6(1), (2), and (4), which require distribution of these accounts when the participant reaches the age of seventy and one-half.

The System should consider developing policies and procedures to comply with NYCAC Section 13-638.6(1), (2), and (4) when the participant reaches the age of seventy and one-half.

C. Fraud Warning Statement

The examiner's review of the System's benefit payments revealed that the System's benefit or claim forms do not contain a statement that warns members or beneficiaries of the consequences of filing fraudulent claims.

The System should consider including a fraud warning statement on its benefits forms as a best practice.

D. Benefit Calculations

The examiner reviewed 20 benefit calculations and noted errors and undocumented procedures used. To minimize the risk of errors, the System should consider revising current procedures or implementing new procedures that are documented and approved by the Board.

6. TDA PROGRAM

According to the System's financial statements, contributions to 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 Section 403(b) of the Internal Revenue Code ("IRC"). The Internal Revenue Service ("IRS") established 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 by December 31 of each year.

Members may choose to invest their contributions in a variable fund (the TDA Variable Program) or in a non-variable fund (the TDA Fixed Program). The TDA Variable Program funds are pooled and invested in common with Variable Fund 'A' of the System. Variable fund earnings are credited to the members through unit values. Contributions in TDA Fixed Program funds are invested in common with the Annuity Savings Fund of the QPP. The Board determines the rate of interest credited to both the TDA Annuity Savings Funds and Annuity Savings Fund of the QPP. The rate 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. As of June 30, 2018, the TDA Program net assets totaled $1,968,809,408 and TDA Program liabilities totaled $187,298,907. (See sections 4C and 4D of this report for more TDA Program financial details.)

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 determine 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 costs for the System beginning with the June 30, 2010 actuarial valuation. Regarding EAN and the resulting normal contribution, Education Law Section 2575(16)(c)(4)(v) provides:

> (A) Notwithstanding the preceding items of this subparagraph 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 item 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 the administrative code of the city of New York.

(B) In calculating the entry age normal contribution payable in any such fiscal year pursuant to this item, 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 (1) 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, (2) on an aggregate basis for all members or (3) 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 sub-item.

(C) For each such fiscal year, the actuary, in his or her discretion, shall determine, in accordance with the provisions of sub-item (B) of this item, 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 sub-item (C) of this item may provide for the actuary to calculate the entry age normal contribution on an individual member basis by (1) 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 (2)

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 sub-item (B) of this item.

(E) In the alternative, the methodology determined by the actuary in accordance with sub-item (C) of this item 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 sub-item (B) of this item.

(F) In the alternative, the methodology determined by the actuary in accordance with sub-item (C) of this item 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 sub-item (B) of this item.

(G)(1) Where the methodology determined by the actuary in accordance with sub-item (C) of this item 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.

(2) Where the methodology determined by the actuary in accordance with sub-item (C) of this item 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 actuarial valuation report defines EAN actuarial cost method as:

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 between 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 are 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)	$ 5,615,650	$ 5,899,725	$ 6,132,588	$ 6,112,495
Present Value of Future Normal Costs (PVFNC)	1,279,904	1,313,945	1,364,828	1,368,613
Actuarial Accrued Liability (AL): [AL = PVFB – PVFNC]	4,335,746	4,585,781	4,767,760	4,743,881

It is important to note 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.

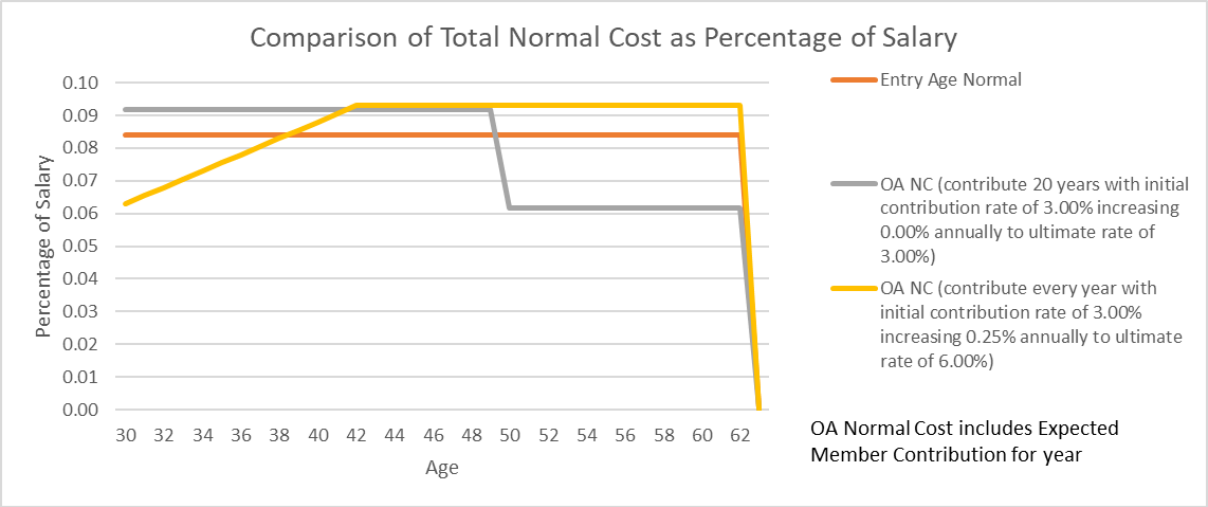
Observations:

The EAN actuarial cost method used by OA does not appear to follow the EAN actuarial cost method as defined under Education Law Section 2575(16)(c)(4)(v) 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)

The Education Law 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 Education Law Section 2575) 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 Education Law Section 2575(16)(c)(4)(v).

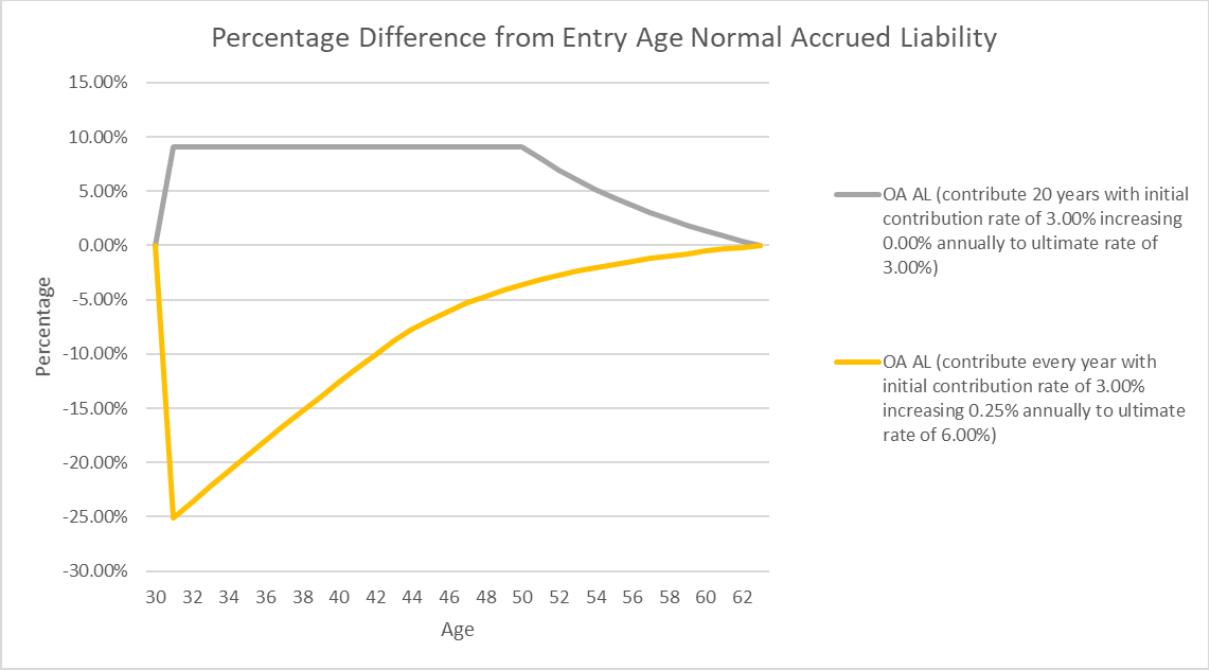
This is illustrated in the following example for an individual who enters the QPP at age 30 with a starting salary of $40,000, receives 3% annual salary increases, and retires at age 63 with a retirement benefit valued (present value) at $600,000 at retirement. The example also assumes an interest rate 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). Instead, 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 Education Law Section 2575.

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 Education Law Section 2575(16)(c)(4)(v).

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 Return 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 Fund 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	$ 3,302,951	$ 3,407,717	$ 3,373,846	$ 4,051,902
(2)	Actual Investment Return on MVA for fiscal year ending on the VD	866,017	174,776	164,346	854,840
(3)	Expected Investment Return on AVA for fiscal year ending on the VD	150,445	182,515	183,895	190,943
(4)	Unexpected Investment Return (UIR): [(2) – (3)]	715,572	(7,739)	(19,549)	663,897
(5)	Phase-in of current year and 5 prior year's UIR	919,667	741,326	557,696	932,861
(6)	Preliminary AVA: [(1) – (5)]	2,383,284	2,666,391	2,816,150	3,119,041
(7)	Minimum AVA: [80% x (1)]	2,642,361	2,726,174	2,699,077	3,241,522
(8)	Maximum AVA: [120% x (1)]	3,963,541	4,089,260	4,048,615	4,862,282
(9)	AVA (Fixed Return Fund Only): [(6), but not less than (7) and not greater than (8)]	2,642,361	2,726,174	2,816,150	3,241,522
Variable Return Funds					
(10)	MVA as of the VD	47,554	46,292	42,587	47,669
Total Assets					
(11)	Final MVA as of the VD: [(1) + (10)]	3,350,505	3,454,009	3,416,433	4,099,571
(12)	Final AVA as of the VD: [(9) + (10)]	$ 2,689,915	$ 2,772,466	$ 2,858,737	$ 3,289,191

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 the 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	$ 2,084,116	$ 2,721,629	$ 637,513	76.6%
2009	1,963,719	2,858,115	894,396	68.7%
2010	2,056,452	3,558,251	1,501,799	57.8%
2011	2,323,629	3,681,694	1,358,065	63.1%
2012	2,371,613	3,763,130	1,391,517	63.0%
2013	2,277,791	4,015,080	1,737,289	56.7%
2014	2,632,922	4,335,746	1,702,824	60.7%
2015	2,772,466	4,585,781	1,813,315	60.5%
2016	2,858,737	4,767,760	1,909,023	60.0%
2017	3,289,191	4,743,881	1,454,690	69.3%

The System has yet to regain the level of funded status from 2008 (76.6%) despite having the statutory required contribution paid each year.[4] In addition, the UAL increased from approximately $0.6 billion as of June 30, 2008 to over $1.4 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 $1,312,067,636 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 unfunded accrued liability ("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

[3] Results from Table VI-1 of the June 30, 2017 (lag) actuarial valuation report dated August 23, 2019 for valuation date on and after 2010. Results prior to 2010 are from BERS Comprehensive Annual Financial Report for the fiscal year ended June 30, 2018

[4] Page 111, Table 9 from the BERS Comprehensive Annual Financial Report for the fiscal year ended June 30, 2018

year from a first installment of approximately $99 million to a projected final installment of roughly $178 million 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	$ 1,325,093	15	$ 117,708*
(Gain)/Loss	6/30/2011	(145,292)	9	(21,559)
(Gain)/Loss	6/30/2012	31,719	10	4,366
(Gain)/Loss	6/30/2013	298,836	11	38,526
(Gain)/Loss	6/30/2014	81,772	12	9,953
Assumption Change	6/30/2014	167,323	17	16,568
Asset Method Change	6/30/2014	(278,405)	17	(27,567)
(Gain)/Loss	6/30/2015	131,219	13	15,178
(Gain)/Loss	6/30/2016	115,905	14	12,812
(Gain)/Loss	6/30/2017	(333,814)	14	0
Method Changes	6/30/2017	109,986	19	0
Assumption Change	6/30/2017	(222,122)	19	0
	Total	$ 1,282,221		$ 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	$ 165,986	$ 160,464
2019	118,811	107,344
2020	122,448	103,393
2021	126,194	99,585
2022	130,053	95,916
2023	134,027	92,381
2024	138,121	88,974
2025	142,337	85,692
2026	146,680	82,530
2027	172,712	90,819
2028	172,954	84,996
2029	139,173	63,921
2030	134,108	57,565
2031	123,965	49,730
2032	116,338	43,617
2033	(22,222)	(7,786)
2034	(22,222)	(7,277)
2035	(11,223)	(3,435)
2036	(11,223)	(3,210)
2037	(11,223)	(3,000)
	Total	$ 1,282,221

The discounted value of projected net amortization payments as of June 30, 2017 was approximately $1.282 billion. However, the UAL as of June 30, 2017 was approximately $1.455 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)	$ 4,335,746	$ 4,585,781	$ 4,767,760	$ 4,743,881
2. Actuarial Value of Assets (AVA)	2,632,922	2,772,466	2,858,737	3,289,191
3. Unfunded Accrued Liability (UAL): [(1) - (2)]	1,702,824	1,813,315	1,909,023	1,454,690
4. PV 1-year Adjusted Employer Contribution	114,830	118,963	121,755	293,857*
5. PV Future Administrative Expense Reimbursement	19,993	22,153	25,385	30,206
6. PV of retiree TDA annuities exceeding TDA assets	(1,982)	(1,773)	(2,005)	(8,871)
7. Adjusted UAL / Outstanding Amortization Balance: [(3) - (4) - (5) + (6)]	$ 1,566,019	$ 1,670,426	$ 1,759,878	$ 1,121,756

*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 toward 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[5] (i.e., valuation date) or appropriately reflecting events after the measurement date.[6]

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 acting general counsel to the Department again confirmed that *the benefit is guaranteed by the employers (principally the City of New York).* However, this appears to conflict with later statements by the System that indicated the QPP is providing the guarantee. This is discussed more fully in section 8G, below.

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[5] ASOP No. 4 (Doc. No. 205), Section 2.16
[6] 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 this 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 an 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 of (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 $(0.043) billion as of June 30, 2017, while the outstanding balance for the IUAL base was approximately $1.325 billion as of June 30, 2017. The IUAL amortization payment of $121,238,945 represents almost 45% of the entire statutory employer contribution of $269,636,601 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.[7] 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 for the participating employers since it represents roughly 45% 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

[7] 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[8] 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

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

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

$$ARC = NC + AI$$

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 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 year 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	$ 6,132,588	Actuarial Cost Method	1
Present Value of Future Employee Contributions at June 30, 2016	266,392	Actuarial Cost Method	2
Present Value of Future Employer Normal Costs at June 30, 2016	1,098,435	Actuarial Cost Method	3
Actuarial Accrued Liability at June 30, 2016	4,767,760	(1) - (2) - (3)	4
Actuarial Value of Assets at June 30, 2016	2,858,737	Asset Valuation Method	5
Unfunded Actuarial Accrued Liability at June 30, 2016	1,909,023	(4) - (5)	6
Present Value of Employer Normal Cost for FYE June 30, 2017	121,755	Normal Cost [A] ÷ sqrt(1.07)	7
Present Value of Reimbursed Expenses	25,385	See below [B]	8
Due to TDA	2,005	See below [C]	9
Adjusted Unfunded Actuarial Accrued Liability	1,759,878	(6) - (7) - (8) + (9)	10
Net Remaining Unfunded Actuarial Accrued Liability Balance	1,759,878	Actuarial Valuation	11
Annual Installment for FYE June 30, 2018	165,986	Actuarial Valuation	12
Present Value of Future Salaries at June 30, 2016	10,442,697	Actuarial Valuation	13
Mid-year Value of Projected Salaries for FYE June 30, 2017	1,115,996	Projected by Actuary	14
Adjusted Present Value of Future Salaries at June 30, 2016	9,363,823	(13) - [(14) ÷ sqrt(1.07)]	15
Normal Cost Percent (approximate)	11.731%	(3) ÷ (15)	16
Mid-year Value of Projected Salaries for FYE June 30, 2018	1,088,371	Projected by OA	17
Employer Normal Cost for FYE June 30, 2018	127,677	(16) × (17)	18
Term Cost for TDA Fixed Fund	10,306	See below [D]	19
Reimburse Administrative Expenses from FYE June 30, 2016	14,675	Expenses × (1.07)^(2)	20
Total Required Employer Contribution for FYE June 30, 2018	318,643	(12) + (18) + (19) + (20)	21

[A] = Employer normal cost ($125,944,833) 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 [($12,543,524) ÷ (1.07)^(0.5)] and June 30, 2018 [($14,675,328) ÷ (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 Ending 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	$ 6,112,495	Actuarial Cost Method	1
Present Value of Future Employee Contributions at June 30, 2017	318,172	Actuarial Cost Method	2
Present Value of Future Employer Normal Costs at June 30, 2017	1,050,441	Actuarial Cost Method	3
Actuarial Accrued Liability at June 30, 2017	4,743,881	(1) - (2) - (3)	4
Actuarial Value of Assets at June 30, 2017	3,289,191	Asset Valuation Method	5
Unfunded Actuarial Accrued Liability at June 30, 2017	1,454,690	(4) - (5)	6
Present Value of Employer Normal Cost for FYE June 30, 2018	133,393	Normal Cost [A] ÷ sqrt(1.07)	7
Present Value of Annual Installment for FYE June 30, 2018	160,464	Installment [B] ÷ sqrt(1.07)	8
Present Value of Reimbursed Expenses	30,206	See below [C]	9
Due to/ from TDA	8,871	See below [D]	10
Adjusted Unfunded Actuarial Accrued Liability	1,121,756	(6) - (7) - (8) - (9) - (10)	11
Net Remaining Unfunded Actuarial Accrued Liability Balance	1,121,756	Actuarial Valuation	12
Annual Installment for FYE June 30, 2019	118,811	Actuarial Valuation	13
Employer Normal Cost for FYE June 30, 2018	108,921	See below [E]	14
Term Cost for TDA Fixed Fund	11,330	See below [F]	15
Estimated Employer Normal Cost for FYE June 30, 2019	133,096	[(14) + (15)] x (1.07)^(1.5)	16
Reimburse Administrative Expenses from FYE June 30, 2017	17,730	Expenses × (1.07)^(2)	17
Total Required Employer Contribution for FYE June 30, 2019	269,637	(13) + (16) + (17)	18

[A] = Employer normal cost ($137,982,408) for the fiscal year ending June 30, 2018, as determined in the June 30, 2016 actuarial valuation.

[B] = Annual installment ($165,985,597) 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 [($14,675,328) ÷ (1.07)^(0.5)] and June 30, 2019 [($17,729,921) ÷ (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.

The primary difference between the old OYLM and the new OYLM was the calculation of the employer normal cost (line 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.

Education Law Section 2575(16)(c)(4)(v) 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, Education Law Section 2575 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.

Education Law Section 2575 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 Education Law Section 2575 and are not consistent with the entry age 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 Education Law 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 Education Law Section 2575.

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 Education Law Section 2575.
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 Education Law Section 2575.
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 Education Law Section 2575.

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"[9] 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.[10] 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.[11] 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.[12] 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 Education Law Section 2575. 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.

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

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 Board of Education Employees Group Life Insurance Plan ("GLIP")
- New York City Board of Education Retirement System 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 that plan. 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 or fund. 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	$ 4,743,881	$ 4,099,571	$ 3,289,191	$ 269,636
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 54) 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 $269,636,601 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 didn't combine two separate calculations but appears to have 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 Rules 3 and 5 of the System's rules and regulations. Rules 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." Rule 3 further states GLIP assets "shall consist of all premiums 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." Rule 5, paragraphs (a) and (b), then defines the GLIP premium as follows:

> (a) The Actuary shall investigate the Plan's claim experience in accordance with the methods of investigation provided by paragraph (2) of Section 5 of the Rules and Regulations of the Retirement System. 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 Board of Education 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.

Rules 3 and 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, page 11 of the June 30, 2017 actuarial valuation report noted the following regarding the total employer contribution of $269,636,601:

> If necessary, a portion of the Fiscal Year 2019 contribution should be used to true-up the Group Term Life Insurance (GTLI) Plan reserve to a total of $8,013,585. This amount represents the present value of benefits as of June 30, 2019, attributable to the GTLI.

OA stated no GLIP premium was calculated and GLIP claim experience was not applicable. OA provided the following, which shows the development of $8,013,585 GLIP reserve.

Year Beginning	PV on 6/30/2019 of Payments Expected in Year		Year Beginning	PV on 6/30/2019 of Payments Expected in Year
7/1/2019	886269.317		7/1/2050	12130.04965
7/1/2020	800640.0382		7/1/2051	10146.33572
7/1/2021	724127.6807		7/1/2052	8427.602129
7/1/2022	651507.6408		7/1/2053	6983.239133
7/1/2023	587296.4173		7/1/2054	5755.355413
7/1/2024	529902.3171		7/1/2055	4722.202461
7/1/2025	476466.7695		7/1/2056	3857.364292
7/1/2026	425799.6517		7/1/2057	3124.852647
7/1/2027	378258.9378		7/1/2058	2524.345425
7/1/2028	335159.3908		7/1/2059	2024.21614
7/1/2029	296259.9288		7/1/2060	1617.242947
7/1/2030	260847.0331		7/1/2061	1274.326705
7/1/2031	228896.1548		7/1/2062	997.7962108
7/1/2032	200455.2859		7/1/2063	769.6072621
7/1/2033	174402.5841		7/1/2064	581.3412632
7/1/2034	151924.904		7/1/2065	430.4787595
7/1/2035	131840.0276		7/1/2066	312.9050471
7/1/2036	114084.5293		7/1/2067	220.9445592
7/1/2037	98333.69526		7/1/2068	147.2638743
7/1/2038	84550.60006		7/1/2069	97.77397222
7/1/2039	72585.32129		7/1/2070	61.39366924
7/1/2040	62222.19697		7/1/2071	34.55391575
7/1/2041	53410.93281		7/1/2072	19.5618409
7/1/2042	45658.89393		7/1/2073	10.32104592
7/1/2043	38974.52212		7/1/2074	5.388359451
7/1/2044	33198.03084		7/1/2075	2.850980365
7/1/2045	28198.71876		7/1/2076	1.367080155
7/1/2046	23998.49841		7/1/2077	0.862205046
7/1/2047	20325.74423		7/1/2078	0.33899258
7/1/2048	17188.60055		7/1/2079	0.04821468
7/1/2049	14518.50495		7/1/2080	0
			TOTAL	8,013,585

This approach does not appear to follow Rule 5 as GLIP benefits are intended to be funded on a yearly basis based on a calculated premium each year. The calculation above shows the

$8,013,585 represents the reserve determined to provide all future GLIP payments for current members. Less than $1 million in GLIP claims were expected 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 five fiscal years as presented on page 22 of the 2022 Annual Comprehensive Financial Report is provided below.

Net Investment Income (Loss) to the System from TDA Member Holdings in Fixed Return Fund*:
Years ended June 30, 2022, 2021, 2020, 2019, and 2018
(In thousands)

	2022	2021	2020	2019	2018
Net investment income (loss)	$ (791,687)	$ 1,867,031	$ 364,638	$ 403,041	$ 559,753
TDA percent of fixed assets (average)	25.21%	24.60%	26.22%	25.26%	25.13%
Investment income (loss) on account of TDA investment	$ (199,622)	$ 459,255	$ 95,601	$ 101,812	$ 140,661
Less: Statutory interest to TDA**	(172,365)	(155,904)	(142,223)	(128,413)	(115,187)
Revenue (expense) to the System	$ (371,987)	$ 303,351	$ (46,622)	$ (26,601)	$ 25,474

*Includes security-lending income
** Prior amounts have been updated to conform to current year presentation and excludes amounts related to the variable return fund

Over this five-year period, the net amount of QPP assets transferred to the TDA exceeded $116 million. For the fiscal year ended June 30, 2022, a transfer of roughly $372 million was made from the QPP to the TDA. This transfer exceeded the entire employer statutory contribution of approximately $262 million 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[13] regarding a similar TDA guaranteed fixed return for TRS estimating the TDA guaranteed fixed return cost for TRS to be about $1.2 billion annually. While the TRS TDA guaranteed Fixed Return Fund is a much larger than BERS, this illustrates that there is an estimated cost to provide the TDA guaranteed fixed return.

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 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

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

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 assets represent over 27% of the System's combined QPP and TDA 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 Section 5(2) of the System's Bylaws, the System's actuary must investigate "mortality, service and compensation experience" every five years and, as technical advisor to the System's Board, provides 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 assumption changes effective with the fiscal year ending June 30, 2016. The OA established an amortization base of approximately $166 million 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 $17 million 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 assumption changes resulted in a reduction in liability of approximately $222 million as of June

30, 2017, with an annual installment of roughly $(22) million 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 ($5,000) for active members without salary information provided. 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.

Notable data issues researched by the OA for the June 30, 2017 valuation data included the following:

i) OA set a minimum salary of $5,000 for 111 active members;
ii) Approximately 2,000 continuing active members had salary increases of more than 10% or decreases of more than 25%; and

iii) Prior to the June 30, 2017 valuation, all continuing active members were assumed to earn one year of service from the prior year (last years' service plus one) and most new members had service estimated using elapsed time from the membership date. Starting with the June 30, 2017, valuation data actual service for most records was used.

The June 30, 2016 actuarial valuation report did not disclose assumed service was used for members and the June 30, 2017 actuarial valuation did not disclose the impact of using actual service. OA has since indicated using actual service resulted in a service change for roughly half of the active members, which then resulted in an accrued liability increase of approximately $100 million.

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's statutory contribution.

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 reported for each member 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.

The System indicated that OA had started incorporating historical pensionable salary into the actuarial valuation with the June 30, 2020 actuarial valuation.

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 AL 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, 2017 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, 2017		
1.	Expected Accrued Liability	(Results in $1,000s)
A	Accrued Liability at June 30, 2016	$ 4,767,760
B	Total Normal Cost and Administrative Expenses at June 30, 2016	178,133
C	Interest on 1a and 1b to June 30, 2017	346,213
D	Fiscal Year 2017 Benefit Payments with Interest to June 30, 2017	(271,462)
E	Expected Accrued Liability at June 30, 2017	$ 5,020,644
2.	Actual Accrued Liability at June 30, 2017 before changes	$ 4,855,985
3.	Expected Total Actuarial Value of Assets	
A	Total Actuarial Value of Assets at June 30, 2016	$ 2,860,742
B	Interest on 3a to June 30, 2017	200,252
C	Total Contribution Paid in Fiscal Year 2017	328,054
D	Interest on 3c to June 30, 2017	11,288
E	Fiscal Year 2017 Benefit Payments with Interest to June 30, 2017	(271,462)
F	Expected Total Actuarial Value of Assets at June 30, 2017	$ 3,128,874
4.	Actual Total Actuarial Value of Assets at June 30, 2017	$ 3,298,029

5.	Accrued Liability (Gain) / Loss [2. – 1.e]	$	(164,659)
6.	Actuarial Value of Asset (Gain) / Loss [3.f – 4.]	$	(169,155)
7.	Total Actuarial (Gain) / Loss [5. + 6.]	$	(333,814)

The System experienced a lower-than-expected accrued liability resulting in a liability gain of approximately $165 million and higher than expected assets resulting in an asset gain of roughly $169 million. 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 did not appear to appropriately measure plan experience as of the valuation date. The total normal cost and administrative expenses for determining the expected AL as of June 30, 2017 on line 1B was neither the NC attributed to the fiscal year ended June 30, 2017 nor entirely based on expected values as shown below (amounts are in thousands).

Aggregate Employer Normal Cost for Fiscal Year 7/1/2017 - 6/30/2018 *	+	Term Cost for TDA guaranteed interest for Fiscal Year 7/1/2017 – 6/30/2018 *	+	Actual Employee Contributions for Fiscal Year 7/1/2016 -6/30/2017 **	+	Actual Administrative Expenses for Fiscal Year 7/1/2016 – 6/30/2017 **	=	Total Normal Cost and Administrative Expenses at June 30, 2016
*Discounted 1.5 years at 7.00% annual interest								
**Discounted 0.5 years at 7.00% annual interest								
Values in $1,000s								
127,677*(1.07)^(-1.5)	+	10,306*(1.07)^(-1.5)	+	39,821*(1.07)^(-.5)	+	15,486*(1.07)^(-.5)	=	$178,133

In addition, the NC and AL were 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 $4.7 billion. However, OA's AL as of June 30, 2016 on Table 9, line 1, was approximately $4.8 billion.

Recommendations:

The System should consider reevaluating 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 (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.[14]

[14] Enhancing Reliability of Actuarial Valuations for Pension Plans.

9. SUMMARY AND CONCLUSIONS

Below are the 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 document, which is submitted with this report as referenced in section 7.

Item	Description	Page No(s).
A	The System should consider having all board members and committee members attend scheduled meetings.	7
B	The System should consider documenting in each year's Board minutes any designee nominated to attend Board and Board committee meetings in place of board members.	8
C	The System should consider developing procedures to ensure the Bylaws are periodically updated.	8
D	The System should consider developing policies and procedures to communicate annually with members who had separated from the System about their dormant accounts. This communication should include the value of the accounts, the contact information for the System, and instruction on how to apply for these funds.	16
E	The System should consider using the Social Security Death Index Database or similar resource on a quarterly basis to verify if members who have separated from the System and have existing accounts are deceased. If a member is deceased, the System should communicate to the member's beneficiary the value of the dormant accounts, the contact information for the System, and instructions on how to apply for these funds.	16
F	The System should consider developing policies and procedures to comply with NYCAC Section 13-638.6(1), (2), and (4) when the participant reaches the age of seventy and one-half.	18
G	The System should consider including a fraud warning statement on its benefits forms as a best practice.	18
H	To minimize the risk of errors, the System should consider revising current procedures or implementing new procedures that are documented and approved by the Board.	18

Item	Description	Page No(s).
I	The System should consider revising the actuarial cost method to follow the EAN actuarial cost method as defined by the ASB and described under Education Law Section 2575(16)(c)(4)(v).	27
J	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.	30
K	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.	38
L	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.	38
M	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 Education Law Section 2575. The System should also consider using the EAN actuarial cost method defined by the ASB for determining the explicitly calculated plan normal cost.	44
N	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.	44
O	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.	44
P	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.	45
Q	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.	52

Item	Description	Page No(s).
R	The System should consider ceasing asset transfers or benefit payments from the QPP to provide any non-QPP benefits.	52
S	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.	52
T	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.	52
U	The System should consider re-evaluating certain actuarial assumptions and disclosing all the relevant assumptions in the actuarial valuation report.	54
V	The System should consider reflecting actual historical pensionable earnings reported for each member in the actuarial valuation and calculating final accrued benefits for members no longer working.	55
W	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.	55
X	The System should consider reevaluating the calculation of the experience gain/loss as of the valuation date.	57
Y	The System should also consider including a more detailed gain/loss analysis and a reconciliation of the total AL in future valuation reports.	58

Respectfully submitted,

/s/
Rory Cummings
Associate Insurance Examiner

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

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

/s/
Rory Cummings

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 New York City Board of Education Retirement System 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 New York City Board of Education Retirement System 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. 31954

NEW YORK STATE

DEPARTMENT OF FINANCIAL SERVICES

I, LINDA A. LACEWELL, Acting 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:

RORY CUMMINGS

as a proper person to examine the affairs of the

BOARD OF EDUCATION 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 24th day of May, 2019

LINDA A. LACEWELL
Acting Superintendent of Financial Services

By: Mark M Leod

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.

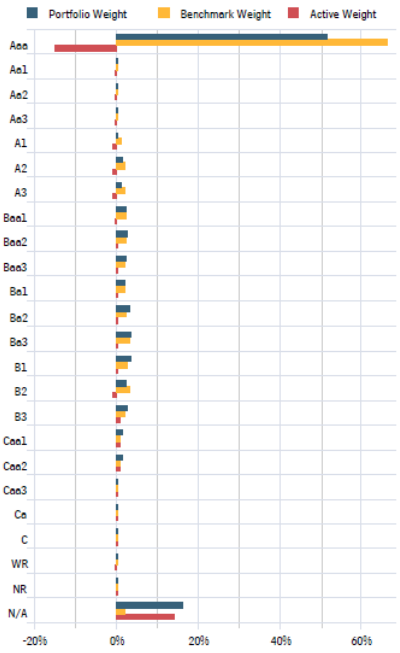
BarraOne Fixed Income Summary

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