



**Comprehensive
Annual
Financial
Report**

**of the Qualified Pension Plan
and the Tax Deferred Annuity Program**

For the Years Ended June 30, 2019 and June 30, 2018



**Board of Education Retirement System
of the City of New York**

A Pension Trust Fund of the City of New York



**Board of Education Retirement System
of the City of New York**

A Fiduciary Fund of the City of New York

Comprehensive Annual Financial Report
of the Qualified Pension Plan and the
Tax Deferred Annuity Program

For the Fiscal Years Ended
June 30, 2019 and June 30, 2018

Prepared by
Sanford R. Rich, Executive Director
Jean-Daniel Desmornes, Director of Fiscal Operations



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BUILDING
EXCELLENT
RETIREMENT
SECURITY

BERS SLOGAN

INTRODUCTORY

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SANFORD R. RICH
EXECUTIVE DIRECTOR
DANIEL D. MILLER
DEPUTY EXECUTIVE DIRECTOR

BOARD OF EDUCATION RETIREMENT SYSTEM
OF THE CITY OF NEW YORK
65 COURT STREET – 16th FLOOR
BROOKLYN, NEW YORK 11201- 4965

929-305-3800
OUTSIDE NEW YORK STATE
1-800-843-5575

December 19, 2019

Board of Trustees
Board of Education Retirement System
City of New York
65 Court Street, 16th Floor
Brooklyn, NY 11201

Ladies and Gentlemen:

I am pleased to present the Comprehensive Annual Financial Report (CAFR) of the New York City Board of Education Retirement System (“BERS”) for the fiscal years ended June 30, 2019 and June 30, 2018. BERS administers the BERS Qualified Pension Plan (the “QPP”) and the BERS Tax Deferred Annuity Program (the “TDA Program”).

The QPP is a cost sharing, multiple employer Public Employee Retirement System (PERS) that was created on August 31st, 1921. The QPP provides pension benefits to non-pedagogical employees of the Department of Education, certain other specific schools, school crossing guards employed by the New York City Police Department, and certain employees of the New York City School Construction Authority. The QPP combines features of a defined benefit pension plan with those of a defined contribution plan and functions in accordance with existing State statutes and City laws.

The TDA Program became operational on February 1st, 1970 and is administered pursuant to the Internal Revenue Code Section 403(b) and existing State statutes and City laws. Certain members of the QPP have the option to participate in the TDA Program, which provides a means of deferring income tax payments on their voluntary tax-deferred contributions until the period after retirement or upon withdrawal of contributions. Contributions to the TDA Program are made by the members only. The TDA Program is maintained as a separate plan.

The responsibility for the accuracy of the data, and the completeness and fairness of the presentation, including all disclosures, rests with BERS. All disclosures necessary to enable the reader to gain an understanding of the system's financial activities have been included. Analysis of the changes that affected BERS fiduciary net position is presented in the Management's Discussion and Analysis section of this report.

MAJOR LEGAL INITIATIVES - July 1, 2017 through June 30, 2019

Chapter 71 of 2017

This act continues for Fiscal Year 2019, the Actuarial Interest Rate assumption of 7.00% per annum used to determine employer contributions to the New York City Pension Funds and Retirement Systems. This act also extends through Fiscal Year 2019, the interest rate of 8.25% per annum to credit interest on Tier 1 and Tier 2-member contributions and Increased-Take-Home-Pay (ITHP) Reserves.

Chapter 266 of 2018

Extends the time for members or eligible beneficiaries to file a Notice of Participation in World Trade Center Rescue, Recovery, and Cleanup Operations to September 11, 2022. This law takes effect immediately and is deemed to have been in full force and effect on and after September 11, 2001.

Chapter 59 of 2019

Revises the composition of the Board of Education of the City of New York, and hence the BERS Board of Trustees, to include one additional mayoral appointee and one member to be elected by community district education council presidents. This provision takes effect on July 1, 2020.

FUNDING

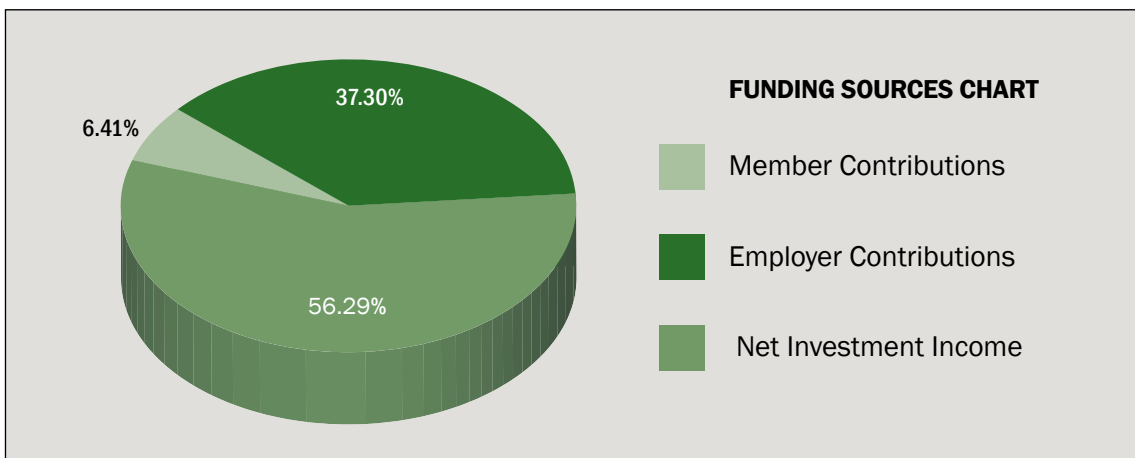
The financial objective of the QPP is to fund members' retirement benefits during their active service. The Employer contributes amounts that, together with member contributions and investment income, would ultimately be sufficient to accumulate assets to pay benefits when due.

The Office of the Actuary establishes employer contribution rates which, expressed as a percentage of annualized covered payroll, remain approximately level from year to year. An adequate funding level provides assurance and security for payment of future benefits. In fiscal year 2019, BERS sought to maintain a level of funding within the established guidelines of the Government Accounting Standards Board (GASB). As per GASB 67, a defined benefit pension plan is required to report fiduciary net position as a percentage of plan's total pension liability. As of June 30th, 2019, the QPP's fiduciary net position represents 94.79% of the total pension liability. The funded status of the QPP is expressed by the relationship of assets to liabilities. The ratio of actuarial value of assets to the Entry Age Actuarial Accrued liability, stands at 69.3% as of June 30th, 2017. Funding status has been discussed in detail in the actuarial section of this report.

Funding Sources

The chart below summarizes the contribution funding sources for fiscal year 2019 for the QPP.

Funds	Percentage	Contribution (In thousands)
Member Contributions	6.41%	\$ 46,304
Employer Contributions	37.30%	\$269,637
Net Investment Income	56.29%	\$406,879
Total	100.00%	\$722,820



Contributions to the TDA program are made on a voluntarily basis by certain eligible members of the QPP. TDA members who elect to participate in a fixed return fund investment program accounts are credited with the statutory annual rate of interest, currently 7% for members represented by the United Federation of Teachers and 8.25% for all other members. Members can also elect to participate in a variable return fund program.

INVESTMENTS

Investment Summary

The System's assets are invested in two investment programs. These are the fixed return fund, which is managed by BERS, and the variable return fund, consisting primarily of equity securities, which is managed by the Teachers' Retirement System (TRS).

The Board of Education Retirement System Total Fund from the fixed return program returned 6.99%, net of management fees, for the fiscal year ending June 2019, compared to 7.30% for the Board of Education Policy Benchmark, against which it is measured. Performance for the fiscal year ranked better than 69% of a peer group of public funds. The Fund increased in value and ended the fiscal year at \$6.45 billion (compared

to \$5.99 billion last year). Over the 5-year time period ending June 2019, the Fund remains ahead of its benchmarks, with a 7.07% average annual return versus 6.6% for the benchmark. The 5-year performance ranks in the top 5% of peers.

As of June 2019, the variable investments held at TRS, excluding variable collateral security lending, increased to \$599.34 million from \$565.82 million in FY2018, an increase of 5.92%. During FY2019, the variable return fund performance was +6.83 % versus +10.95 % during FY2018.

Investment Description¹

Asset allocation is the percentage of fund assets that are in stocks, bonds and private market alternatives. The Trustees establish a target asset mix after considering the long-term growth prospects of a diversified portfolio of investments and the expected costs of the Plan participants' benefits. In order to participate in the broad market performance while keeping Fund expenses low, the Fund uses passive, index strategies for most of its public equity allocation. During FY 2019, the implementation plan for the asset allocation approved during FY2016 has progressed with additions to Private Equity, Real Estate and Infrastructure investments, while reducing U.S. equities and developed market non-U.S. equities. These are long-term commitments expected to improve the risk and return profile of the fund. The Fund's target asset mix is 50% Equity (including US and Non-US), 22% Alternative Private Markets (including Private equities, Real Estate and Infrastructure) and 28% Fixed Income. Over the long-term, which is the framework for considering the term structure of the Plans' liabilities, we expect our asset allocation will continue to meet the benefit needs while providing growth and preservation of principal.

Investment Policy

BERS' investment policy statement, ratified by the Board of Trustees in January 2009 and amended in October 2011, in January 2013, in February 2015 and in June 2016, addresses investment objectives, investment philosophy and strategy, monitoring and evaluating performance, risk management, security lending protocol and rebalancing investment mix. The investment policy is available upon request.

Investment Valuation

Investments are reported at fair value. Securities purchased pursuant to agreements to resell are carried at the contract price, exclusive of interest, at which the securities will be resold. Fair value is defined as the quoted market value on the last trading day of the period, except for the Short-Term Investment fund ("STIF") (a money market fund), International Investment funds ("IIF") and Alternative Investment funds ("ALTINVF"). The IIF are private funds of publicly traded securities which are managed by various investment managers on behalf of BERS. Fair value is determined by BERS management based on information provided by the various investment managers. The investment managers determine fair value using the last available quoted price for each security owned adjusted by any contributions to or withdrawals from the fund during the period. The ALTINVF are investments for which exchange quotations are not readily available and are valued at estimated

¹ Michael Wright, Segal Marco Advisors, Report on Investment Activity

fair value as determined in good faith by the General Partner (“GP”). These investments are initially valued at cost with subsequent adjustments that reflect third party transactions, financial operating results and other factors deemed relevant by the GP. Fair value is determined by BERS management based on information provided by the various GP’s after review by an independent consultant and the custodian bank for the fund. Purchases and sales of securities are reflected on the trade date. Dividend income is recorded on the ex-dividend date. Interest income is recorded as earned on an accrual basis.

No investment in any one security represents 5% or more of QPP’s net position restricted for benefits.

ECONOMIC AND MARKET COMMENT²

Real US economic growth as measured by the US Gross Domestic Product (“GDP”) at June 30th, 2019, was at a rate of 2.0% compared to a 4.2% rate at the end of the 2018 fiscal year. The lower growth in the U.S. economy has been sustained by low unemployment, low inflation, a tax cut for many businesses and consumers, moderate wage growth and increased personal consumption for both goods and services. This combination has provided a business environment that has benefitted the fund. Interest rates and inflation are also important measures that affect the pension fund’s performance and prospects. The US Federal Reserve Bank (the “Fed”) followed through on its plans to raise interest rates in the second half of the FY. These increases were anticipated and positioned the Fed to continue its wind down of the quantitative easing started after the 2008 financial crisis. The Fed, like other Central Banks, raises interest rates to help manage inflation expectations and to balance growth and unemployment in the economy.

OTHER INFORMATION

Internal Control

The Executive Director is responsible for establishing and maintaining an internal control structure designed to provide reasonable assurance that the assets of the system are safeguarded and to ensure that adequate accounting data are compiled to allow for the preparation of financial statements in conformity with generally accepted accounting principles. The system’s internal control practices are designed to provide reasonable assurance that these objectives are met.

The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits likely to be derived and that the valuation of costs and benefits requires estimates and judgments by management.

Accounting and Reporting

This CAFR has been prepared in conformity with principles of governmental accounting and reporting, promulgated by the Governmental Accounting Standards Board (“GASB”), and according to guidelines adopted and published by the Government Finance Officers Association of the United States and Canada (“GFOA”).

² Michael Wright, Segal Marco Advisors, Report on Investment Activity

The QPP as well as the TDA Program use the accrual basis of accounting where the measurement focus is on a flow of economic resources. Revenues are recognized in the accounting period in which they are earned, and expenses are recognized in the period incurred. Contributions from members are recognized when respective employers make payroll deductions from the QPP members and the TDA Program participants. Employer contributions to the QPP are recognized when due, and the employer has made a formal commitment to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of governing the QPP and the TDA Program.

Independent Audit

The five major retirement systems of the City of New York are required to undergo an annual audit by a firm of certified public accountants, in accordance with generally accepted auditing standards. Marks Paneth LLP, whose opinion is presented in the Financial Section of this report, conducted the audit of the financial statements of BERS for the fiscal years ended June 30, 2019 and June 30, 2018. The five New York City retirement systems also undergo a five-year audit conducted by the New York State Department of Financial Services. During the fiscal year 2015, BERS went through an audit covering fiscal year 2009 thru Fiscal Year 2014.

Professional Services

The Chief Actuary provides actuarial services for the five major pension systems maintained by the City. The Chief Actuary's actuarial report and certification are included in this annual report. The New York City Comptroller and the Teachers' Retirement System retain investment managers to assist in the execution of investment policy in accordance with statutory authority, Retirement Board decisions and standard governing fiduciary practices.

BERS went live with the new Enterprise Resource Planning software, known as the Comprehensive Pension Management System ("CPMS") on May 31st, 2017. We have moved into the next phase of the project (known as "Velocity") which will expand CPMS to enable members to perform transactions online and will also increase the security and stability of the system by moving to cloud-based hosting. This will be a multiyear project. The services of Vitech Systems Group Incorporated have been retained to guide BERS through this phase.

As BERS is modernizing its services to members, BERS requested an analysis from CEM benchmarking. The results of the analysis for FY2018 showed that BERS' pension administration cost was at \$160 per active member and annuitant. This was \$130 below the peer average of \$290.

Additional details about the consulting and professional services are mentioned in the introductory section, page 12. Details of the brokerage firms are found in the investment section, page 86.

Awards

The GFOA awarded a Certificate of Achievement for Excellence in Financial Reporting to BERS for its CAFR for the fiscal year ended June 30, 2018. The Certificate of Achievement is a prestigious national award, recognizing conformance with the highest standards for preparation of a state and local government finance reports. To be awarded a Certificate of Achievement, a government unit must publish an easily readable and efficiently organized comprehensive annual financial report, whose contents conform to program standards. The CAFR must satisfy both generally accepted accounting principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. BERS has received a Certificate of Achievement over the last thirty-two consecutive years. We believe our current report continues to conform to the Certificate of Achievement program requirements and it will be submitted to the GFOA.

Acknowledgments

The dedicated service of the managers and staff of BERS made the preparation of this CAFR, on a timely basis, possible. In addition, our appreciation is extended to those members of the staffs of the Bureaus of Accountancy and Asset Management of the New York City Comptroller's Office and the Office of the Actuary who worked closely with the BERS personnel in the compilation of this report. We hope that the members of the Retirement Board, officials of the Department of Education of the City of New York, our members and the citizens of the City will find this report informative and helpful.

Respectfully submitted,



Sanford R. Rich
Executive Director



Jean-Daniel Desmornes
Director of Fiscal Operations



New York City Board of Education Retirement System

For the Fiscal Year Ended June 30, 2019

BOARD OF TRUSTEES

HON. Peter J. Calandrella
HON. Isaac Carmignani
HON. Richard Carranza, Chancellor
HON. Geneal Chacon
HON. April Chapman
HON. Deborah Dillingham
HON. Natalie Green Giles
HON. Michael Kraft
HON. Vanessa Leung
HON. Gary Linnen
HON. John Maderich
HON. Donald Nesbit
HON. Lori Podvesker
HON. Shannon Waite
HON. Miguelina Zorrilla-Aristy

CHANCELLOR'S DESIGNEES

HON. Russell Buckley
HON. Lindsey Oates

ALTERNATE EMPLOYEE-MEMBERS

HON. Christopher Attianese
HON. Shaun Francois

CO-CHAIRS

HON. John Maderich
HON. Lindsey Oates

Prepared By:

Sanford R. Rich, Executive Director
Jean-Daniel Desmornes, Director of Fiscal Operations

Actuary:

Sherry S. Chan, Chief Actuary

Custodian of the Funds:

Scott M. Stringer, Comptroller of the City of New York
Teachers' Retirement System of the City of New York

Headquarters Address:

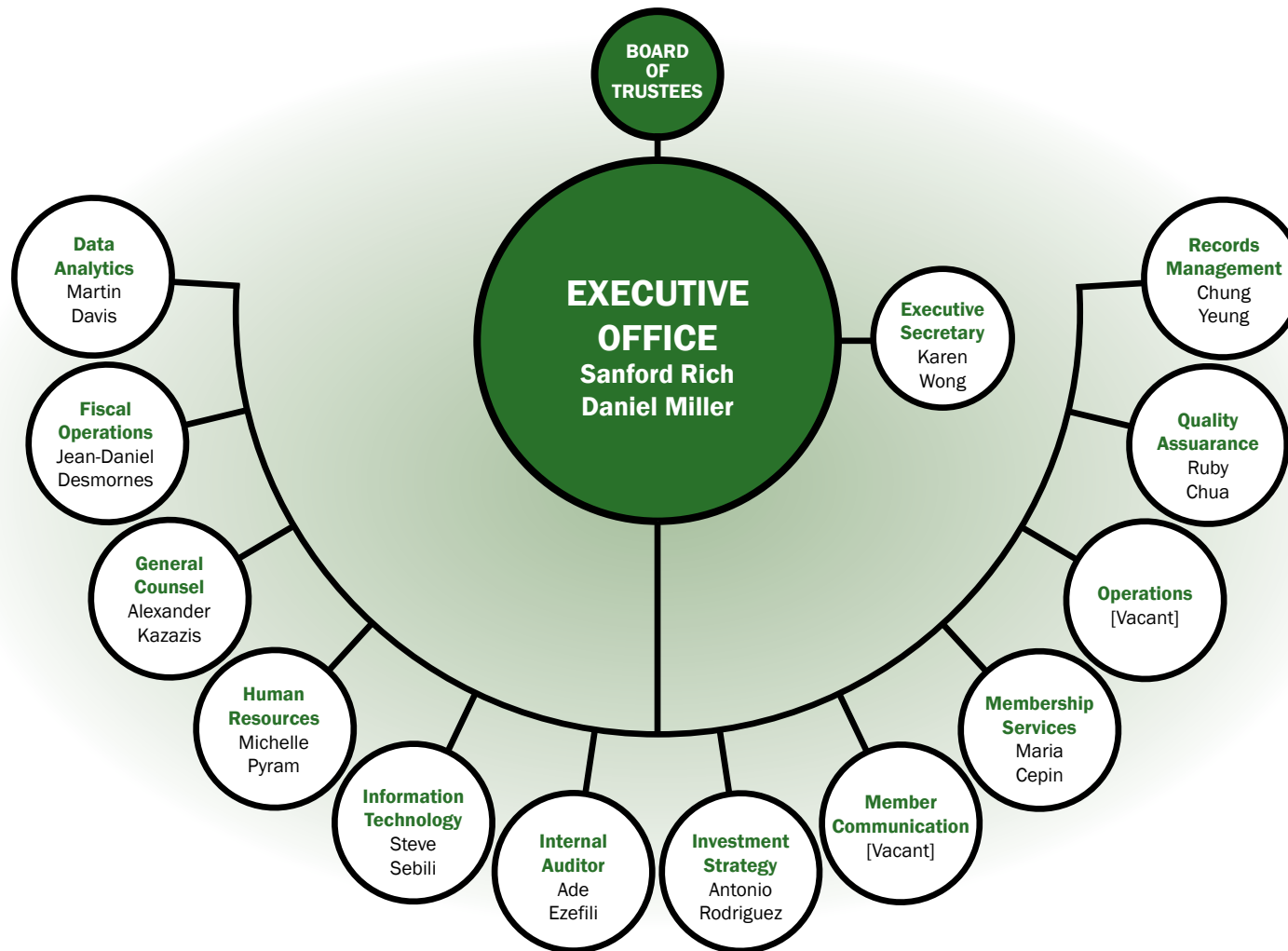
Board of Education Retirement System of the City of New York
65 Court Street, 16th Floor, Brooklyn, New York 11201



New York City Board of Education Retirement System

For the Fiscal Year Ended June 30, 2019

ORGANIZATION CHART





New York City Board of Education Retirement System

For the Fiscal Year Ended June 30, 2019

CONSULTING AND PROFESSIONAL SERVICES

Actuary

Office of the Actuary
255 Greenwich Street, 9th Floor
New York, NY 10007

Auditors

Marks Paneth, LLP
685 Third Avenue
New York, NY 10017

Custodians of Funds

Office of the Comptroller
1 Centre Street
New York, NY 10007

Teachers Retirement System
55 Water Street
New York, NY 10041

HR Research and Advisory Services

McLean & Company
3960 Howard Hughes Parkway, Suite 500
Las Vegas, NV, 89169

Investment Consultants

Cordatus, LLC
39 W 93rd Street, Suite 9
New York, NY 10025

Segal Marco Advisors
333 West 34th Street
New York, NY 10001

Legal Consultant

Groom Law Group, Chartered
Department #0589
Washington, DC 20073

Velocity Project Consultants

Gary Tunnicliffe & Jack Ziegler, LLC
321 Union Street, #4A
Brooklyn, NY 11231

Vitech Systems Group, Inc.
401 Park Avenue South, 12th Floor
New York, NY 10016

Unique Comp Inc
27-08 42nd Road
Long Island City, NY 11101



Government Finance Officers Association

**Certificate of
Achievement
for Excellence
in Financial
Reporting**

Presented to

New York City

Board of Education Retirement System

Qualified Pension Plan, New York

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

June 30, 2018

Christopher P. Morill

Executive Director/CEO



Securing your financial future today.

BERS MISSION

FINANCIAL

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INDEPENDENT AUDITORS' REPORT

To the Board of Trustees of the
New York City Board of Education Retirement System

Report on the Combining Financial Statements

We have audited the accompanying combining statements of fiduciary net position of the New York City Board of Education Retirement System Qualified Pension Plan ("QPP") and the New York City Board of Education Retirement System Tax-Deferred Annuity ("TDA") Program, which collectively comprise the New York City Board of Education Retirement System, (the "Systems"), a fiduciary fund of The City of New York, as of June 30, 2019 and 2018, and the related combining statements of changes in fiduciary net position for the years then ended, and the related notes to the combining financial statements, which collectively comprise the Systems' basic combining financial statements as listed in the table of contents.

Management's Responsibility for the Combining Financial Statements

Management is responsible for the preparation and fair presentation of these combining financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the combining financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express opinions on these combining financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the combining financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the combining financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the combining financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Systems' preparation and fair presentation of the combining financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Systems' internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the combining financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the combining financial statements referred to above present fairly, in all material respects, the combining fiduciary net position of the Systems as of June 30, 2019 and 2018, and the changes in combining fiduciary net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis, Schedule 1, Schedule 2, and Schedule 3, as listed in the table of contents, be presented to supplement the basic combining financial statements. Such information, although not a part of the basic combining financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of the financial reporting for placing the basic combining financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic combining financial statements, and other knowledge we obtained during our audits of the basic combining financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audits were conducted for the purpose of forming an opinion on the basic combining financial statements. The Introductory Section, Additional Supplementary Information, Investment Section, Actuarial Section, and Statistical Section, as listed in the foregoing table of contents, are presented for the purpose of additional analysis and are not a required part of the basic combining financial statements.

The Additional Supplementary Information Schedule 4, Schedule 5 and Schedule 6, as listed in the table of contents, is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic combining financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic combining financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic combining financial statements or to the basic combining financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Additional Supplementary Information is fairly stated, in all material respects, in relation to the basic combining financial statements taken as a whole.

The Introductory, Investment, Actuarial and Statistical Sections have not been subjected to the auditing procedures applied in the audits of the basic combining financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

MARKS PANETH LLP

October 24, 2019
(except for the Other Information,
as to which the date is December 19, 2019)

Management's Discussion and Analysis (Unaudited) Years Ended June 30, 2019 and 2018

This narrative discussion and analysis of the New York City Board of Education Retirement System's ("BERS" or the "System") financial performance provides an overview of the System's combining financial activities for the Fiscal Years ended June 30, 2019 and 2018. It is meant to assist the reader in understanding the System's combining financial statements by providing an overall review of the combining financial activities during the years, the effects of significant changes, and a comparison of the prior years' activities and results. This discussion and analysis is intended to be read in conjunction with the System's combining financial statements. The System administers the BERS Qualified Pension Plan (the "QPP") and the BERS Tax-Deferred Annuity Program (the "TDA Program").

OVERVIEW OF BASIC COMBINING FINANCIAL STATEMENTS

The following discussion and analysis is intended to serve as an introduction to the System's basic combining financial statements. The basic combining financial statements, which are prepared in accordance with Governmental Accounting Standards Board ("GASB") pronouncements and include the financial statements of the QPP and the TDA Program, are as follows:

- **The Combining Statements of Fiduciary Net Position**—presents the financial position of the System at fiscal year-end. It provides information about: the nature and amounts of resources with present service capacity that the System presently controls (assets); consumption of net assets by the System that is applicable to a future reporting period (deferred outflow of resources); present obligations to sacrifice resources that the System has little or no discretion to avoid (liabilities); and acquisition of net assets by the System that is applicable to a future reporting period (deferred inflow of resources) with the difference between assets/deferred outflow of resources and liabilities/deferred inflow of resources being reported as net position. Investments are shown at fair value. All other assets and liabilities are determined on an accrual basis.
- **The Combining Statements of Changes in Fiduciary Net Position**—presents the results of activities during the fiscal year. All changes affecting the assets/deferred outflow and liabilities/deferred inflow of the System are reflected on an accrual basis when the activity occurred, regardless of the timing of the related cash flows. In that regard, changes in the fair values of investments are included in the year's activity as net appreciation (depreciation) in fair value of investments.
- **The Notes to Combining Financial Statements**—provide additional information that is essential to a full understanding of the data provided in the combining financial statements. The notes present information about the System's accounting policies, significant account balances and activities, material risks, obligations, contingencies and subsequent events, if any.
- **Required Supplementary Information**—as required by GASB includes the management discussion and analysis and information presented after the notes to the combining financial statements.

FINANCIAL HIGHLIGHTS

QPP Fiduciary Net Position

QPP's net position restricted for benefits stood at \$4.99 billion during Fiscal Year 2019, an increase of 6.83% from Fiscal Year 2018. The increase was primarily due to an increase in the fair value of investments. Fair value of investments, which includes the collateral from security lending, increased from \$6.45 billion in Fiscal Year 2018 to \$6.90 billion in Fiscal Year 2019, an increase of 6.91%. Return on investments stood at 5.89%.

During Fiscal Year 2018, QPP's net position restricted for benefits stood at \$4.67 billion, an increase of 13.99% from Fiscal Year 2017. The increase in the net position during Fiscal Year 2018 was due to an increase in the fair value of investments. Fair value of investments, including the collateral from security lending, stood at \$6.45 billion, an increase of 13.14% from Fiscal Year 2017. Return on investments stood at 8.76%.

QPP Fiduciary Net Position
June 30, 2019, 2018, and 2017
(In thousands)

	2019	2018	2017
Assets:			
Cash	\$ 3,694	\$ 2,106	\$ 3,232
Receivables	240,378	149,067	155,750
Investments, at fair value	6,491,787	6,067,189	5,332,614
Collateral from securities lending	412,005	390,140	374,943
Other	<u>248,466</u>	<u>206,757</u>	<u>160,453</u>
Total assets	<u>7,396,330</u>	<u>6,815,259</u>	<u>6,026,992</u>
Liabilities:			
Accounts payable	43,333	34,454	13,884
Other liability	-	-	-
Payable for investment securities purchased	182,667	115,140	92,173
Accrued benefits payable	10,034	9,747	9,943
Due to the TDA Program's Fixed return fund from the System	1,756,459	1,592,875	1,436,478
Payables for securities lending	<u>412,005</u>	<u>390,140</u>	<u>374,943</u>
Total liabilities	<u>2,404,498</u>	<u>2,142,356</u>	<u>1,927,421</u>
Net position restricted for benefits	<u>\$ 4,991,832</u>	<u>\$ 4,672,903</u>	<u>\$ 4,099,571</u>

Management's Discussion and Analysis (Unaudited)
Years Ended June 30, 2019 and 2018
(Cont'd)

Total receivables increased from \$149.06 million in Fiscal Year 2018 to \$240.37 million in Fiscal Year 2019, an increase of 61.26%. Included in the total receivables are the receivables for investment, which increased from \$84.96 million in Fiscal Year 2018 to \$173.66 million in Fiscal Year 2019, an increase of \$88.70 million from Fiscal Year 2018. Payables for investments increased from \$115.14 million in Fiscal Year 2018 to \$182.66 million in Fiscal Year 2019, an increase of \$67.52 million from Fiscal Year 2018.

At the close of Fiscal Year 2018, total receivables decreased from \$155.75 million in Fiscal year 2017 to \$149.06 million, a decrease of 4.29%. The decrease in the receivables was caused by the decrease in the receivables for investment. Receivables for investments were at \$84.96 million in Fiscal Year 2018, a decrease of 13.90% from Fiscal Year 2017.

The QPP's receivables and payables for investments are primarily generated through the timing differences between the trade and settlement dates for investment securities purchased or sold.

Member loans stood at \$50.58 million in Fiscal Year 2019, a marginal increase of 1.10% from Fiscal Year 2018.

The account "Due to the TDA Program's Fixed return fund from the System" represents a liability to the TDA program, since the TDA Program assets are pooled with QPP assets for investment purposes. The liability for Fiscal Year 2019 stood at \$1.75 billion, an increase of 10.27% from Fiscal Year 2018. This liability includes the TDA member's account balances for deposits invested in fixed investment program.

Changes in QPP Fiduciary Net Position

During Fiscal Year 2019, the QPP member contributions increased to \$46.30 million, an increase of 13.36% from Fiscal Year 2018. In Fiscal Year 2018, the QPP member contributions increased to \$40.84 million, an increase of 2.57% from Fiscal Year 2017 contributions of \$39.82 million.

Changes in QPP Program Fiduciary Net Position Years Ended June 30, 2019, 2018, and 2017

(In thousands)

	2019	2018	2017
Additions:			
Member contributions	\$ 46,304	\$ 40,846	\$ 39,821
Employer contributions	269,637	318,643	288,233
Net investment income before securities lending transaction	404,959	561,877	856,632
Net securities lending income	1,920	3,700	5,878
TDA Program's interest income in the fixed return fund	(141,695)	(127,972)	(106,554)
Other - payments to other retirement systems and other revenues/expenses	35,624	51,024	(122,954)
Total additions	<u>616,749</u>	<u>848,118</u>	<u>961,056</u>
Deductions:			
Benefit payments and withdrawals	280,463	261,574	262,432
Administrative expenses	17,357	13,212	15,486
Total deductions	<u>297,820</u>	<u>274,786</u>	<u>277,918</u>
Net increase in net position	318,929	573,332	683,138
Net position restricted for benefits:			
Beginning of year	4,672,903	4,099,571	3,416,433
End of year	<u>\$ 4,991,832</u>	<u>\$ 4,672,903</u>	<u>\$ 4,099,571</u>

Employer contributions received through the QPP Program decreased from \$318.64 million in the Fiscal Year 2018 to \$269.63 million in Fiscal Year 2019, a decrease of 15.38%. The employer contributions are made on a statutory basis based on the one-year lag methodology.

The net investment income, which includes the security lending income, decreased from \$565.57 million in Fiscal Year 2018 to \$406.87 million in Fiscal Year 2019. Return on investments decreased from 8.76% in Fiscal Year 2018 to 5.89% in Fiscal Year 2019.

The benefit payments and withdrawals increased from \$261.57 million in Fiscal Year 2018 to \$280.46 million in Fiscal Year 2019, an increase of 7.22%. During Fiscal Year 2018, the benefits payments and withdrawals decreased by 0.33%, from \$262.43 million to \$261.57 million.

Administrative expenses increased from \$13.21 million in Fiscal Year 2018 to \$17.35 million in Fiscal Year 2019, a net increase of \$4.14 million. During Fiscal Year 2018, administrative expenses stood at \$13.21 million, a decrease of 14.68% from Fiscal Year 2017.

Management's Discussion and Analysis (Unaudited)
Years Ended June 30, 2019 and 2018
(Cont'd)

Interest to the TDA Program's fixed return fund represents the statutory interest credited on the TDA Program member account balances. The statutory rate of interest is currently 7.00% for UFT members and 8.25% for all other members. During Fiscal Year 2019, the interest to the TDA Program's fixed return fund stood at \$141.69 million, an increase of \$13.72 million from Fiscal Year 2018. The table below displays revenue (expenses) to the System due to any surplus or deficiency between the actual rate of return on the fixed investments and the statutory rate.

Net Investment Income (Loss) to the System from TDA Member Holdings in Fixed Return Fund*:
Years Ended June 30, 2019, 2018, 2017, 2016 and 2015

(In thousands)	2019	2018	2017	2016	2015
Net investment income	\$ 403,041	\$ 559,753	\$ 854,992	\$ 164,435	\$ 174,876
TDA percent of Fixed Assets (average)	25.26%	25.13%	25.63%	25.03%	23.77%
Investment Income on account of TDA investment	\$ 101,812	\$ 140,661	\$ 219,121	\$ 41,165	\$ 41,568
Less: Statutory Interest to TDA	<u>(141,695)</u>	<u>(127,972)</u>	<u>(106,554)</u>	<u>(94,789)</u>	<u>(85,104)</u>
Revenue (Expense) to the System	<u>\$ (39,883)</u>	<u>\$ 12,689</u>	<u>\$ 112,567</u>	<u>\$ (53,624)</u>	<u>\$ (43,536)</u>

*Includes security-lending income

TDA Program Fiduciary Net Position

The TDA program's net position restricted for benefits stood at \$2.12 billion during Fiscal Year 2019, a net increase of 8.06% from Fiscal Year 2018. The increase was primarily due to an increase in the fair value of investments, combined with an increase in the receivables from QPP towards TDA program. Fair value of TDA variable investments including collateral security lending stood at \$548.27 million in Fiscal Year 2019, an increase of 5.84% from Fiscal Year 2018. Receivables from QPP towards TDA program increased by 10.27% in Fiscal Year 2019; from \$1.59 billion in Fiscal Year 2018 to \$1.75 billion in Fiscal Year 2019.

During Fiscal Year 2018, the TDA Program's net position restricted for benefits increased to \$1.96 billion, a net increase of \$169.12 million or 9.40% from Fiscal Year 2017. The increase in Fiscal Year 2018 was primarily due to an increase in the fair value of investments and the receivables from QPP towards TDA program, which went up 11.85% and 10.89%, respectively. The TDA Program's fair value of variable investment including collateral security lending stood at \$518.04 million, an increase of 11.85% from Fiscal Year 2017. Receivable from QPP towards the TDA Program increased by 10.89% in Fiscal Year 2018, from \$1.43 billion for Fiscal Year 2017 to \$1.59 billion in Fiscal Year 2018.

TDA Program Fiduciary Net Position
June 30, 2019, 2018, and 2017

(In thousands)

Assets:

	2019	2018	2017
Cash	\$ 410	\$ 355	\$ 105
Receivables	48,205	44,831	42,281
Due to the TDA Program's Fixed return fund from the System	1,756,459	1,592,875	1,436,478
Investments, at fair value	544,694	512,426	457,248
Collateral from securities lending	3,583	5,618	5,917
Other	-	-	-
Total assets	<u>2,353,351</u>	<u>2,156,105</u>	<u>1,942,029</u>
Liabilities:			
Accounts payable	\$ -	\$ -	\$ -
Other liability	209,241	173,813	128,452
Payable for investment securities purchased	3,654	709	1,435
Accrued benefits payable	9,455	7,157	6,537
Payables for securities lending transactions	3,583	5,618	5,917
Total liabilities	<u>225,933</u>	<u>187,297</u>	<u>142,341</u>
Net position restricted for benefits	<u>\$ 2,127,418</u>	<u>\$ 1,968,808</u>	<u>\$ 1,799,688</u>

Total receivables increased by \$3.37 million in Fiscal Year 2019, an increase of 7.53% from Fiscal Year 2018. Member loan outstanding marginally increased from \$43.56 million in Fiscal Year 2018 to \$43.79 million in Fiscal Year 2019, an increase of 0.51% from Fiscal Year 2018.

During Fiscal Year 2019, receivables and payables for investment stood at \$3.45 million and \$3.65 million respectively. The TDA Program's receivables and payables are primarily generated through the timing differences between the trade and settlement dates for investment securities purchased or sold within the variable return fund.

At the end of Fiscal Year 2018, total receivables increased from \$42.28 million in Fiscal Year 2017 to \$44.83 million. Included in these receivables, the TDA Program's member loans outstanding went from \$40.75 million at the close of Fiscal Year 2017 to \$43.56 million at the close of Fiscal Year 2018, a 6.90% increase.

Management's Discussion and Analysis (Unaudited)
Years Ended June 30, 2019 and 2018
(Cont'd)

Changes in TDA Program Fiduciary Net Position

During Fiscal Year 2019, member contributions to the TDA Program increased to \$102.20 million, a 13.59% increase from \$89.97 million contribution in Fiscal Year 2018. The number of contributing members increased by 5.48%. Net investment income including net securities lending income decreased from \$59.16 million in Fiscal Year 2018 to \$40.08 million in Fiscal Year 2019, a net decrease of \$19.08 million.

Member contributions to the TDA Program increased to \$89.97 million during Fiscal Year 2018, a 4.90% increase from the \$85.76 million contributed in Fiscal Year 2017. Net investment income decreased from \$75.73 million in Fiscal Year 2017 to \$59.16 million in Fiscal Year 2018, a net decrease of \$16.57 million.

Changes in TDA Program Fiduciary Net Position
Years Ended June 30, 2019, 2018, and 2017
(In thousands)

	2019	2018	2017
Additions:			
Member contributions	\$ 102,203	\$ 89,972	\$ 85,765
Net investment income before securities lending transaction	40,008	59,075	75,633
Net securities lending income	79	93	106
TDA Program's interest income in the fixed return fund	141,695	127,972	106,554
Other - payments to other retirement systems and other revenues/expenses	<u>(43,842)</u>	<u>(54,240)</u>	<u>(48,113)</u>
Total additions	<u>240,143</u>	<u>222,872</u>	<u>219,945</u>
Deductions:			
Benefit payments and withdrawals	81,414	53,668	50,208
Administrative expenses	<u>119</u>	<u>84</u>	<u>125</u>
Total deductions	<u>81,533</u>	<u>53,752</u>	<u>50,333</u>
Net increase in net position	158,610	169,120	169,612
Net position restricted for benefits:			
Beginning of year	<u>1,968,808</u>	<u>1,799,688</u>	<u>1,630,076</u>
End of year	<u>\$ 2,127,418</u>	<u>\$ 1,968,808</u>	<u>\$ 1,799,688</u>

Benefit payments and withdrawals increased from \$53.66 million in Fiscal Year 2018 to \$81.41 million in Fiscal Year 2019, an increase of \$27.75 million. The increase was primarily due to an increase in the benefit payments towards death benefits and refund payments. The death benefit payments increased from \$10.85 million in Fiscal Year 2018 to \$25.49 million in Fiscal Year 2019, an increase of \$14.64 million from Fiscal Year 2018. The refund payments stood at \$55.49 million in Fiscal Year 2019, an increase of \$13.06 million from Fiscal Year 2018.

During Fiscal Year 2018, the benefit payments and withdrawals stood at \$53.66 million, an increase of \$3.46 million from Fiscal Year 2017. The increase was due to an increase in the death benefit payments from \$9.42 million in Fiscal Year 2017 to \$10.85 million in Fiscal Year 2018.

Investment Summary

Investments held by BERS' QPP and TDA Programs (which includes the fixed fund and the variable fund programs), including collateral from securities lending transactions from both programs, are listed according to their investment classification in the following table:

Investment Summary (In thousands) Fair Value	June 30, 2019	June 30, 2018	June 30, 2017
Short-term Investments	\$ 89,806	\$ 139,691	\$ 57,514
Debt Securities	1,853,710	1,542,859	1,111,952
U.S. Equity Securities	2,698,595	2,236,820	636,126
Alternative Investments	892,479	765,549	612,677
Collective Trust Funds	1,501,891	1,894,696	3,371,593
Promissory Notes	-	-	-
Collateral Securities Lending	415,588	395,758	380,860
Total	<u>\$ 7,452,069</u>	<u>\$ 6,975,373</u>	<u>\$ 6,170,722</u>

Because the QPP's liabilities are of a long-term nature, the assets of the QPP and the TDA Programs are invested with a long-term investment horizon. Assets are invested in a diversified portfolio of capital market securities. Investments in these assets are expected to produce higher returns but are also subject to greater volatility and may produce negative returns. The system's investments increased by 6.83% in FY 2019, 13.04% in FY 2018, increased by 13.64% in Fiscal Year 2017.

CONTACT INFORMATION

This financial report is designed to provide a general overview of the New York City Board of Education Retirement System's finances. Questions concerning any data provided in this report or requests for additional information should be directed to the Director of Fiscal Operations, New York City Board of Education Retirement System, 65 Court Street, 16th Floor, and Brooklyn, New York 11201.

Combining Statements of Fiduciary Net Position
June 30, 2019
(In thousands)

	QPP	TDA Program	Eliminations	TOTAL
ASSETS:				
Cash	\$ 3,694	\$ 410	\$ -	\$ 4,104
Receivables:				
Investment securities sold	173,665	3,459	-	177,124
Accrued interest and dividends	15,501	953	-	16,454
Member loans	50,586	43,793	-	94,379
Other	626	-	-	626
Total receivables	<u>240,378</u>	<u>48,205</u>	<u>-</u>	<u>288,583</u>
Investments — at fair value				
Fixed return funds:				
Short-term investments:				
Commercial paper	46,954	-	-	46,954
Short-term investment fund	26,625	-	-	26,625
Discount notes, U.S. Treasury bills and Agencies	11,108	-	-	11,108
Debt securities	1,841,703	-	-	1,841,703
Equity securities	2,116,377	-	-	2,116,377
Alternative Investments	892,479	-	-	892,479
Collective Trust Funds				
International equity	1,096,779	-	-	1,096,779
Domestic Equity	261,858	-	-	261,858
Mortgage debt security	20,203	-	-	20,203
Treasury Inflation protected securities	-	-	-	-
Fixed Income	123,051	-	-	123,051
Collateral from securities lending	411,646	-	-	411,646
Variable return funds:				
Short-term investments	467	4,652	-	5,119
Debt securities	1,095	10,912	-	12,007
Equities	53,088	529,130	-	582,218
Collateral from securities lending	359	3,583	-	3,942
Total investments	<u>6,903,792</u>	<u>548,277</u>	<u>-</u>	<u>7,452,069</u>
Due to the TDA Program's Fixed return fund from System	-	1,756,459	(1,756,459)	-
Other assets	248,466	-	(209,241)	39,225
Total assets	<u>7,396,330</u>	<u>2,353,351</u>	<u>(1,965,700)</u>	<u>7,783,981</u>
LIABILITIES:				
Accounts payable	43,333	-	-	43,333
Other liability	-	209,241	(209,241)	-
Payable for investment securities purchased	182,667	3,654	-	186,321
Accrued benefits payable	10,034	9,455	-	19,489
Due to the TDA Program's Fixed return fund from System	1,756,459	-	(1,756,459)	-
Payables for securities lending	412,005	3,583	-	415,588
Total liabilities	<u>2,404,498</u>	<u>225,933</u>	<u>(1,965,700)</u>	<u>664,731</u>
NET POSITION RESTRICTED FOR BENEFITS:				
Benefits to be provided by QPP (Qualified Pension Plan)	4,991,832	-	-	4,991,832
Benefits to be provided by TDA Program	-	2,127,418	-	2,127,418
TOTAL NET POSITION RESTRICTED FOR BENEFITS:	<u>\$ 4,991,832</u>	<u>\$ 2,127,418</u>	<u>\$ -</u>	<u>\$ 7,119,250</u>

The accompanying notes are an integral part of these combining financial statements.

Combining Statements of Fiduciary Net Position
June 30, 2018
(In thousands)

	QPP	TDA Program	Eliminations	TOTAL
ASSETS:				
Cash	\$ 2,106	\$ 355	\$ -	\$ 2,461
Receivables:				
Investment securities sold	84,962	400	-	85,362
Accrued interest and dividends	13,273	862	-	14,135
Member loans	50,038	43,569	-	93,607
Other	794	-	-	794
Total receivables	<u>149,067</u>	<u>44,831</u>	<u>-</u>	<u>193,898</u>
Investments — at fair value				
Fixed return funds:				
Short-term investments:				
Commercial paper	69,031	-	-	69,031
Short-term investment fund	56,088	-	-	56,088
Discount notes, U.S. Treasury bills and Agencies	9,331	-	-	9,331
Debt securities	1,531,460	-	-	1,531,460
Equity securities	1,687,635	-	-	1,687,635
Alternative Investments	765,549	-	-	765,549
Collective Trust Funds				
International equity	1,167,563	-	-	1,167,563
Domestic Equity	152,372	-	-	152,372
Mortgage debt security	34,966	-	-	34,966
Treasury Inflation protected securities	283,241	-	-	283,241
Fixed Income	256,554	-	-	256,554
Collateral from securities lending	389,554	-	-	389,554
Variable return funds:				
Short-term investments	495	4,746	-	5,241
Debt securities	1,076	10,323	-	11,399
Equities	51,828	497,357	-	549,185
Collateral from securities lending	586	5,618	-	6,204
Total investments	<u>6,457,329</u>	<u>518,044</u>	<u>-</u>	<u>6,975,373</u>
Due to the TDA Program's Fixed return fund from System	-	1,592,875	(1,592,875)	-
Other assets	206,757	-	(173,813)	32,944
Total assets	<u>6,815,259</u>	<u>2,156,105</u>	<u>(1,766,688)</u>	<u>7,204,676</u>
LIABILITIES:				
Accounts payable	34,454	-	-	34,454
Other liability	-	173,813	(173,813)	-
Payable for investment securities purchased	115,140	709	-	115,849
Accrued benefits payable	9,747	7,157	-	16,904
Due to the TDA Program's Fixed return fund from System	1,592,875	-	(1,592,875)	-
Payables for securities lending	390,140	5,618	-	395,758
Total liabilities	<u>2,142,356</u>	<u>187,297</u>	<u>(1,766,688)</u>	<u>562,965</u>
NET POSITION RESTRICTED FOR BENEFITS:				
Benefits to be provided by QPP (Qualified Pension Plan)	4,672,903	-	-	4,672,903
Benefits to be provided by TDA Program	-	1,968,808	-	1,968,808
TOTAL NET POSITION RESTRICTED FOR BENEFITS:	<u>\$ 4,672,903</u>	<u>\$ 1,968,808</u>	<u>\$ -</u>	<u>\$ 6,641,711</u>

The accompanying notes are an integral part of these combining financial statements.

Combining Statements of Changes in Fiduciary Net Position
For the Year Ended June 30, 2019
(In thousands)

	QPP	TDA Program	TOTAL
ADDITIONS:			
Contributions			
Member contributions	\$ 46,304	\$ 102,203	\$ 148,507
Employer contributions	269,637	-	269,637
Total contributions	<u>315,941</u>	<u>102,203</u>	<u>418,144</u>
Investment income			
Interest income	85,249	3,435	88,684
Dividend income	82,451	7,698	90,149
Net appreciation in fair value of investments	268,479	29,540	298,019
Total investment income	436,179	40,673	476,852
Less – investment expenses	(31,220)	(665)	(31,885)
Net investment income, before securities lending transactions	<u>404,959</u>	<u>40,008</u>	<u>444,967</u>
Securities lending transactions			
Securities lending income	2,124	88	2,212
Securities lending fees	(204)	(9)	(213)
Net securities lending income	<u>1,920</u>	<u>79</u>	<u>1,999</u>
Net investment income	<u>406,879</u>	<u>40,087</u>	<u>446,966</u>
Other – payments to other retirement systems and other revenues/expenses	35,624	(43,842)	(8,218)
TDA Program's interest income in the fixed return fund	(141,695)	141,695	-
Total additions	<u>616,749</u>	<u>240,143</u>	<u>856,892</u>
DEDUCTIONS:			
Benefit payments and withdrawals	280,463	81,414	361,877
Administrative expenses	17,357	119	17,476
Total deductions	<u>297,820</u>	<u>81,533</u>	<u>379,353</u>
NET INCREASE IN NET POSITION	318,929	158,610	477,539
NET POSITION RESTRICTED FOR BENEFITS:			
Beginning of year	<u>4,672,903</u>	<u>1,968,808</u>	<u>6,641,711</u>
End of year	<u>\$ 4,991,832</u>	<u>\$ 2,127,418</u>	<u>\$ 7,119,250</u>

The accompanying notes are an integral part of these combining financial statements.

**Combining Statements of Changes in Fiduciary Net Position
For the Year Ended June 30, 2018
(In thousands)**

	QPP	TDA Program	TOTAL
ADDITIONS:			
Contributions			
Member contributions	\$ 40,846	\$ 89,972	\$ 130,818
Employer contributions	318,643	-	318,643
Total contributions	359,489	89,972	449,461
Investment income			
Interest income	75,362	3,468	78,830
Dividend income	79,629	6,655	86,284
Net appreciation in fair value of investments	426,315	49,706	476,021
Total investment income	581,306	59,829	641,135
Less — investment expenses	(19,429)	(754)	(20,183)
Net investment income, before securities lending transactions	561,877	59,075	620,952
Securities lending transactions			
Securities lending income	3,995	103	4,098
Securities lending fees	(295)	(10)	(305)
Net securities lending income	3,700	93	3,793
Net investment income	565,577	59,168	624,745
Other — payments to other retirement systems and other revenues/expenses	51,024	(54,240)	(3,216)
TDA Program's interest income in the fixed return fund	(127,972)	127,972	-
Total additions	848,118	222,872	1,070,990
DEDUCTIONS:			
Benefit payments and withdrawals	261,574	53,668	315,242
Administrative expenses	13,212	84	13,296
Total deductions	274,786	53,752	328,538
NET INCREASE IN NET POSITION	573,332	169,120	742,452
NET POSITION RESTRICTED FOR BENEFITS:			
Beginning of year	4,099,571	1,799,688	5,899,259
End of year	<u>\$ 4,672,903</u>	<u>\$ 1,968,808</u>	<u>\$ 6,641,711</u>

The accompanying notes are an integral part of these combining financial statements.

1. SYSTEM DESCRIPTION

The City of New York (the “City”) maintains a number of pension systems providing benefits for employees of its various agencies (as defined within New York State (“State”) statutes and City laws). The City’s five major actuarially-funded pension systems are the New York City Board of Education Retirement System (“BERS” or the “System”), the New York City Employees’ Retirement System (“NYCERS”), the Teachers’ Retirement System of the City of New York (“TRS”), the New York City Police Pension Fund (“POLICE”), and the New York City Fire Pension Fund (“FIRE”). Each pension system is a separate Public Employee Retirement System (“PERS”) with a separate oversight body and is financially independent of the other.

BERS administers the BERS Qualified Pension Plan (the “QPP”) and the BERS Tax-Deferred Annuity Program (the “TDA Program”). BERS is the fiduciary for the QPP and the TDA Program, which are included under BERS in the Pension and Other Employee Benefit Trust Funds section of the City’s Comprehensive Annual Financial Report (“CAFR”).

The QPP is a cost-sharing, multiple-employer pension plan. The QPP provides pension benefits for non-pedagogical employees of the Department of Education and certain other specific schools and certain employees of the New York City School Construction Authority (collectively, the “Employer”). Substantially, all Department of Education non-pedagogical permanent employees, other than members of TRS, become members of the QPP on the first day of permanent employment. Employees classified as noncompetitive, exempt or provisional by Civil Service are eligible to enroll in the QPP voluntarily. Membership date is governed by the date of filing.

The QPP functions in accordance with existing State statutes and City laws, which establish and amend the benefit terms and the Employer and member contribution requirements. It combines features of a defined benefit pension plan with those of a defined contribution pension plan but is considered a defined benefit pension plan for financial reporting purposes. Contributions are made by the Employer and the members.

At June 30, 2019, June 30, 2018, June 30, 2017, June 30, 2016 and June 30, 2015, the QPP’s membership consisted of:

	2019*	2018	2017	2016	2015
Retirees and beneficiaries receiving benefits	18,549	18,041	17,425	16,937	16,438
Terminated vested members not receiving benefits	1,461	1,937	1,528	851	237
Other inactives**	2,418	6,006	2,618	2,629	3,972
Active members receiving salary	<u>30,468</u>	<u>25,864</u>	<u>25,794</u>	<u>25,864</u>	<u>24,903</u>
Total	<u>52,896</u>	<u>51,848</u>	<u>47,365</u>	<u>46,281</u>	<u>45,550</u>

* Preliminary figures.

** Represent members who are no longer on payroll but not otherwise classified.

BERS is a fiduciary component unit of the City and is reported and is included in the City’s Comprehensive Annual Financial Report as a Pension and Other Employee Benefit Trust fund.

The TDA Program was created and is administered pursuant to the Internal Revenue Code Section 403(b) and existing State statutes and City laws. Certain members of the QPP have the option to participate in the TDA Program, which provides a means of deferring income tax payments on members' voluntary tax-deferred contributions until the period after retirement or upon withdrawal of contributions. Contributions to the TDA Program are made by the members only. The TDA Program is maintained as a separate plan.

At June 30, 2019, June 30, 2018, June 30, 2017, June 30, 2016 and June 30, 2015, the TDA Program participants consisted of:

	2019	2018	2017	2016	2015
Contributing members	18,881	17,899	16,917	16,113	15,736
Retired members with TDA balances	6,798	6,484	6,673	5,844	5,530

Summary of Benefits

QPP Benefits

The State Constitution provides that pension rights of public employees are contractual and shall not be diminished or impaired. In 1973, 1976, 1983 and 2012, significant amendments made to the State Retirement and Social Security Law ("RSSL") modified certain benefits for employees joining the QPP on or after the effective date of such amendments. As such, benefits under the QPP fall into various categories based on the year when an employee joined the QPP. A brief overview follows:

- Members who joined prior to July 1, 1973 ("Tier 1") are entitled to service retirement benefits of 55% of "final salary" (as defined within State statutes and City laws) after 25 years of qualifying service and attainment of age 55, a portion of which is provided from member contributions. Additional benefits equal to a specified percentage per year of service of "final salary" are payable for years in excess of the 25-year minimum. These additional benefits are increased, where applicable, by an annuity attributable to accumulated member contributions in excess of the minimum required balance and by any benefits attributable to the Increased-Take-Home Pay ("ITHP") contributions accumulated after the 25th year of member qualifying service. ITHP represents amounts contributed by the City in lieu of members' own contributions. These amounts reduce the contributions that members would have to make to the QPP during their service and thereby increase their take-home pay. Members have the choice of waiving their ITHP reduction, which would reduce their take-home pay, but provide them with increased benefits upon retirement. Tier 1 members contribute on the basis of a normal rate of contribution which is assigned by the QPP at membership and which is dependent upon age and actuarial tables in effect at the time of membership.

In addition, these same members could elect a service retirement benefit with no minimum service requirement which provides an annual benefit for each year of service equal to a specified percentage (as described within State statutes and City laws) of "final salary", payable upon attainment of age 55. This benefit is increased, where applicable, by an annuity attributable to the member contributions and ITHP contributions.

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- For all members who enrolled in the QPP prior to July 27, 1976, (“Tier 1” and “Tier 2”), ITHP contributions made on their behalf as well as their own contributions are invested, at their election, in either the fixed return fund or the variable return fund, or 50% of such contributions in each. These investment elections can be changed every two years. The QPP guaranteed a 7.5% return on member contributions or ITHP contributions to the fixed return fund until June 30, 1982, increased the guaranteed return to 8% as of July 1, 1982, and to 8.25% as of July 1, 1988, for members who enrolled in the QPP prior to July 27, 1976 (5% on member contributions for members enrolled on or after July 27, 1976). The variable return fund includes only member contributions and ITHP contributions made on their behalf as described above and is expressed in terms of units, which are valued monthly, based on investment experience.
- Certain members of Tier 1 and Tier 2 have the right to make voluntary member contributions (“Voluntary Contributions”) in excess of their required member contributions (“Required Contributions”). The investment of the Voluntary Contributions and the Required Contributions is directed by each member. A member may invest: (1) in the QPP’s fixed return fund, which is credited with interest at the Statutory Interest Rate (currently 8.25% (7.0% for UFT members)), and/or (2) in the QPP’s variable return fund. At the time of retirement or refund of contributions, a member’s aggregate balance of actual Required Contributions and Voluntary Contributions, including the actual accumulated earnings thereon, less the outstanding balance of any member loans (“Net Actual Contributions”), may exceed (“Excess of Contributions”) or fall short of (“Deficiency of Contributions”) the member’s Expected Balance. The Expected Balance is the sum of the Required Contributions which a member should have made during his or her credited service, plus the earnings that would have accumulated thereon at the Statutory Interest rate. The amount of the member’s retirement annuity or the refund of contributions that he or she is entitled to is increased by any Excess of Contributions or reduced by any Deficiency of Contributions. The total value of active members’ Excess of Contributions, net of all Deficiencies of Contributions, is \$3.35 million and \$3.45 million, for the years ended June 30, 2019 and 2018, respectively. Actuarial estimates of the impacts of Excesses and Deficiencies are incorporated into calculation of the QPP’s net pension liability (see Note 5).
- Members who joined after July 1, 1973 and before July 27, 1976 (“Tier 2”) have provisions similar to Tier 1, except that the eligibility requirements for retirement and the salary base for benefits are different and there was a limitation on their maximum benefit. Also, certain members retiring prior to age 62 may have their benefit reduced by an age-based factor. This maximum benefit limitation was subsequently eliminated under Chapter 574 of the Laws of 2000 for all Tier 2 members who retired after December 8, 2000. Tier 2 members contribute on the basis of a normal rate of contribution which is assigned by the QPP at membership, and which is dependent upon age and actuarial tables in effect at the time of membership.
- Members who joined the QPP on or after July 27, 1976 and prior to September 1, 1983 (“Tier 3”) were originally entitled to a retirement benefit upon the completion of ten years of service at age 62. The formula for this benefit was 1.67% of “Final Average Salary” (“FAS”) per year of credited service for members with less than 20 years of service, or 2% of FAS per year of service for members with 20 to 30 years of service. Tier 3 benefits were reduced by one half of the primary Social Security benefit attributable to service with the employer and provided an annual cost-of-living escalator in pension benefits of not more than 3%. Tier 3 required member contributions of 3% of salary for a period not to exceed 30 years. After September 1, 1983, all Tier 3 members were mandated into the Tier 4 plan. However, these members retain their Tier 3 rights. Effective October 1, 2000, Tier 4 members with Tier 3 rights, like other Tier 4 members, are not

required to make contributions once the tenth anniversary of their membership date has passed, or upon completion of ten years of credited service, whichever is earlier, and are eligible for a pension upon the completion of five years of credited service at age 62.

- Members who joined the QPP on or after September 1, 1983 and prior to April 1, 2012 (“Tier 4”) are eligible for a pension upon the completion of five years of credited service at age 62. The annual benefit is 1.67% of FAS per year of service for members with less than 20 years of service, or 2% of FAS per year of service for members with 20 to 30 years of service, plus an addition of 1.5% of FAS per year of service for service in excess of 30 years of service. Tier 4 members were originally required to make contributions of 3% of salary until termination of service. As of October 1, 2000, these members are not required to make contributions after the tenth anniversary of their membership date or upon completion of ten years of credited service, whichever is earlier (Chapter 126 of Laws of 2000). Certain members retiring prior to age 62 have their benefit reduced by an age-based factor.
- Effective June 28, 1995, active Tier 2 and Tier 4 members, excluding those who hold a position represented by the recognized teacher organization for collective bargaining purposes (currently, the United Federation of Teachers or “UFT”), were eligible to enroll in an early retirement program permitting them to retire at age 55 with 25 years of credited service (“55/25”), with no age reduction factor to their retirement allowance, or at age 50 with 25 years of credited service in a physically taxing position (Chapter 96 of the Laws of 1995). Additionally, Tier 4 members in non-UFT positions who joined BERS on or after June 28, 1995 and before April 1, 2012 were mandated into an early retirement program permitting them to retire at age 57 with 5 years of credited service (“57/5”), with no age reduction factor to their retirement allowance, or at age 50 with 25 years of credited service in a physically taxing position. Participants in the 55/25 and 57/5 early retirement programs are required to remit additional contributions of 1.85%, or 3.83% for physically taxing positions.
- Effective February 27, 2008, active Tier 4 members who hold a position represented by the recognized teacher organization for collective bargaining purposes (currently, UFT) were eligible to enroll in an early retirement program permitting them to retire at age 55 with 25 years of credited service (“55/25 UFT”), with no age reduction factor to their retirement allowance (Chapter 19 of the Laws of 2008). Those choosing the age 55 retirement option are required to make additional contributions of 1.85% of salary from February 28, 2008 until June 29, 2008, or until they have accumulated 25 years of credited service, whichever is later. UFT members in eligible titles who joined after February 27, 2008, but before December 10, 2009 were automatically enrolled in the 55/27 retirement program. Participants in the 55/27 retirement may retire if they are at least age 55 as of their retirement date and have attained at least 27 years of credited service. These members are required to make additional plan contributions of 1.85% of salary until they have accumulated 27 years of credited service.
- UFT members in covered titles who joined the QPP after December 10, 2009 and prior to April 1, 2012 are covered by 55/27 UFT but are required to make contributions of 4.85% of salary until they have 27 years of credited service and contributions of 1.85% of salary thereafter (Chapter 504 of the Laws of 2009). Additionally, QPP benefits for this population vest in ten years, rather than five years, as for other Tier 4 members.

- Members who join the QPP on or after April 1, 2012 are subject to the provisions of Chapter 18 of the Laws of 2012 (“Chapter 18/12”), also known as “Tier 6”. BERS members in Tier 6 are eligible for a pension upon the completion of ten years of credited service at age 63. The annual benefit is 1.67% of FAS for the first 20 years of credited service, or 35% upon the attainment of 20 years of service plus an addition of 2% of FAS per year of service for service in excess of 20 years of service. Additionally, the FAS period is five years, rather than three, and a cap is imposed on the maximum permissible FAS. Tier 6 members are required to make Basic Member Contributions (“BMC”) until they separate from service or until they retire. The BMC rate is dependent on annual wages earned during a plan year and ranges from 3% for salaries less than \$45,000 to 6% for salaries greater than \$100,000. Tier 6 members become vested after ten years of service.
- Under all service retirement categories, annuities attributable to member contributions are reduced on an actuarial basis for any loans with unpaid balances outstanding at the date of retirement.
- Subject to certain conditions, members become fully vested as to QPP benefits upon the completion of five years of credited service, or ten years of credited service for Tier 4 55/27 UFT members who joined after December 10, 2009 and for Tier 6 members.
- The QPP provides death benefits and retirement benefits on the occurrence of accidental or ordinary disability.
- During the spring 2000 session, the State Legislature approved and the State Governor (“Governor”) signed laws that provide automatic Cost-of-Living Adjustments (“COLA”) for certain retirees and beneficiaries (Chapter 125 of the Laws of 2000). It also provides additional service credits for certain Tier 1 and Tier 2 members and reduced member contributions for certain Tier 3 and Tier 4 members (Chapter 126 of the Laws of 2000).

TDA Program Benefits

Contributions to the TDA Program are made by the participants only and are voluntary. In order to contribute to the TDA Program, certain active members of the QPP are required to submit a salary reduction agreement and TDA enrollment request. A participant may elect to exclude an amount of his or her compensation from current taxable income (within the maximum allowed by the Internal Revenue Service) by contributing it to the TDA Program. The basic contribution limit, as of 2019 is \$19,000. Participants, who have attained age 50, are permitted to make additional contributions. The additional contribution limit for 2019 is \$6,000. Additionally, participants can elect to invest their contributions in either the fixed return fund or the variable return fund.

Benefits provided under the TDA Program are derived from participants’ accumulated contributions and earnings on those contributions. No contributions are provided by the employer.

A participant may withdraw all or part of the balance of his or her account at the time of retirement, termination of employment, or under certain hardship conditions. Beginning January 1, 1989, the tax laws restricted withdrawals of TDA contributions and accumulated earnings thereon for reasons other than retirement or termination.

Contributions made after December 31, 1988, and investment earnings credited after that date, may only be withdrawn by active participants upon attainment of age 59½ or for reasons of hardship (as defined by Internal Revenue Service regulations). Hardship withdrawals are limited to contributions only.

Contributions made on or before December 31, 1989, and earnings credited on or before that date, may be withdrawn by active participants even before age 59½. A member who has received a withdrawal may not contribute to the TDA Program for the remainder of the current year.

If a member dies in active service or after retirement while his or her TDA account is in deferral, the full value of his or her account at the date of death is paid to the member's beneficiary(ies) or estate.

When a member resigns before attaining vested rights under the QPP, he or she may withdraw the value of his or her TDA Program account or leave the funds in the account for a period of up to five years after the date of resignation. If a member resigns after attaining vested rights under the QPP, he or she may leave his or her funds in the TDA Program account, accruing earnings until reaching the age at which minimum distributions are required by IRS regulations. Once a member withdraws from the QPP, participation in the TDA Program will cease, and the member will receive a refund of the value of his or her account in the TDA Program.

When a TDA Program participant applies to retire from the QPP and has a positive TDA Program account balance, the participant has three options:

- a. The participant may withdraw the total balance, either by receiving it as a taxable distribution or by rolling it over into an Individual Retirement Account (IRA);
- b. The participant may defer distribution of the account; or
- c. The participant may elect to receive the balance of the account as a life annuity. The available benefit options depend on the member's Tier.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND SYSTEM ASSET MATTERS

Basis of Accounting—The QPP as well as the TDA Program use the accrual basis of accounting where the measurement focus is on a flow of economic resources. Revenues are recognized in the accounting period in which they are earned, and expenses are recognized in the period incurred. Contributions from members are recognized when respective employers make payroll deductions from the QPP's members and the TDA Program participants. Employer contributions to the QPP are recognized when due and the employer has made a formal commitment to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of governing the QPP and the TDA Program.

Investment Valuation—Investments are reported at fair value. Securities purchased pursuant to agreements to resell are carried at the contract price, exclusive of interest, at which the securities will be resold. Fair value is defined as the quoted market value on the last trading day of the period, except for the Short-Term Investment fund ("STIF") (a money market fund), International Investment funds ("IIF") and Alternative Investment funds ("ALTINVF"). The IIF are private funds of publicly traded securities which are managed by various investment managers on behalf of BERS. Fair value is determined by BERS management based on information provided by the various investment managers. The investment managers determine fair value using the last available

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quoted price for each security owned adjusted by any contributions to or withdrawals from the fund during the period. The ALTINV are investments for which exchange quotations are not readily available and are valued at estimated fair value as determined in good faith by the General Partner (“GP”). These investments are initially valued at cost with subsequent adjustments that reflect third party transactions, financial operating results and other factors deemed relevant by the GP. Fair value is determined by BERS management based on information provided by the various GP’s after review by an independent consultant and the custodian bank for the fund.

Purchases and sales of securities are reflected on the trade date. Dividend income is recorded on the ex-dividend date. Interest income is recorded as earned on an accrual basis.

No investment in any one security represents 5% or more of QPP’s net position restricted for benefits.

Investment Programs—The System’s assets are invested in two investment programs. These are the fixed return fund, which is managed by BERS and the variable return fund (consisting primarily of equity securities), which is managed by TRS.

Under the fixed return program, members’ TDA Program accounts are credited with the statutory rate of interest, currently 7% for UFT members and 8.25% for all other members. TDA Program members and certain Tier 1 and 2 QPP members may transfer their balances between the fixed return fund and the variable investment fund on a quarterly basis.

The QPP’s assets within the variable return fund are co-invested with those assets of the TDA Program that are earmarked for the variable return fund. These financial statements reflect the QPP investment activity in the fixed return fund; as well as the variable return fund.

Income Taxes—Income earned by the QPP and the TDA Program is not subject to federal income tax until it is normally distributed. Other taxes apply in case of premature distributions.

Accounts Payable—Accounts payable is principally comprised of amounts owed by BERS for overdrawn bank balances. BERS’s practice is to fully invest cash balances in most bank accounts on a daily basis. Overdrawn balances result primarily from outstanding benefit checks that are presented to the banks for payment on a daily basis and these balances are routinely settled each day.

Interest (to) from TDA Program’s Fixed Return Fund—The statutory interest credited on TDA Program member account balances invested in the fixed return fund is reported as the “Interest (to) from TDA Program’s Fixed Return Fund.”

Securities Lending Transactions—State statutes and Board policies permit the System to lend its investments to broker-dealers and other entities for collateral, for the same securities in the future with a simultaneous agreement to return the collateral in the form of cash, treasury and U.S. Government securities. The Systems’ agent lends the following types of securities: short term securities, common stocks, longterm corporate bonds, U.S. Government and U.S. Government agency bonds, asset-backed securities, and international equities and bonds held in collective investment funds. In return, the System receives collateral in the form of cash, U.S. Treasury and U.S. Government agency securities at 100% to 108% of the principal plus accrued interest for

reinvestment. At June 30, 2019 and 2018, management believes that the System had no credit risk exposure to borrowers because the amounts the System owed the borrowers equaled or exceeded the amounts the borrowers owed the System. The contracts with the System's Custodian require the Securities Lending Agent to Indemnify the System. In the situation when a borrower goes into default, the Agent will liquidate the collateral to purchase replacement securities. Any shortfall before the replacement securities cost and the collateral value is covered by the Agent. All Securities loans can be terminated on demand within a period specified in each agreement by either the System or the borrowers. Cash collateral is invested by the securities lending agent using approved Lender's Investment guidelines. The weighted average maturity is 39.33 days.

The securities lending program in which the System participates only allows pledging or selling securities in the case of borrower default.

GASB Statement No. 28, *Accounting and Financial Reporting for Securities Lending Transactions*, requires that securities loaned as assets and related liabilities be reported in the statements of fiduciary net position. Cash received as collateral on securities lending transactions and investments made with that cash are reported as assets. Securities received as collateral are also reported as assets if the government entity has the ability to pledge or sell them without a borrower default. Accordingly, the System recorded the investments purchased with the cash collateral as collateral from securities lending with a corresponding liability for securities lending. Securities on loan are carried at market value, the values reported by the QPP as of June 30, 2019 and 2018 are \$409.64 million and \$400.62 million, respectively. As of net position date, the maturities of the investments made with cash collateral on average exceed the maturities of the securities loans by approximately 37.53 days.

GASB Statement No. 72, *Fair Value Measurement and Application*. GASB 72 requires the System to use valuation techniques which are appropriate under the circumstances and are a market approach, a cost approach or income approach. GASB 72 establishes a hierarchy of inputs used to measure fair value consisting of three levels. Level 1 inputs are quoted prices in active markets for identical assets or liabilities. Level 2 inputs are inputs, other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs, and typically reflect management's estimates of assumptions that market participants would use in pricing the asset or liability. GASB 72 also contains note disclosure requirements regarding the hierarchy of valuation inputs and valuation techniques that was used for the fair value measurements.

3. INVESTMENTS AND DEPOSITS

The Comptroller of the City of New York (the "Comptroller") acts as an investment advisor to BERS. In addition, BERS employs an independent investment consultant as an investment advisor. BERS utilizes several investment managers to manage the longterm debt and equity portfolios. The managers are regularly reviewed, with regard to both their investment performance and their adherence to investment guidelines.

The BERS investment policy statement was ratified by the Board of Trustees in January 2009 and amended in October 2011, January 2013, February 2015 and June 2016. It addresses investment objectives, investment philosophy and strategy, monitoring and evaluating performance, risk management, security lending protocol and rebalancing investment mix. Assets may be invested in fixed income, equity and other vehicles as permitted by New York State RSSL § 176-178(a) and Banking Law § 235, the New York City Administrative Code and the

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Legal Investments for New York Savings Banks list as published by the New York State Banking Department. However, investments up to 25% of total System assets may be made in instruments not expressly permitted by the RSSL.

The System does not possess an investment risk policy statement, nor does it actively manage its assets to specified risk targets. Rather, investment risk management is an inherent function of the System's asset allocation process. QPP and TDA Program assets are diversified over a broad range of asset classes and encompass multiple investment strategies aimed at limiting concentration risk.

State Street Bank and Trust Company is the primary custodian for the fixed return fund. The variable return fund assets are held in custody at Chase Bank.

Cash deposits are insured by the Federal Deposit Insurance Corporation for up to \$250,000 per member of the System and are, therefore, fully insured.

Concentration of Credit Risk—The System does not have any investments in any one entity that represent 5% or more of the System's net position restricted for benefits.

The legal requirements for the System's investments are as follows:

- a. Fixed income, equity and other investments may be made as permitted by New York State RSSL §§ 176-178(a) and Banking Law § 235, the New York City Administrative Code, and the Legal Investments for New York Savings Banks list as published by The New York State Banking Department, subject to Note 3(b).
- b. Investments up to 25% of total pension fund assets may be made in instruments not expressly permitted by the State RSSL.

The information reflected in the credit ratings and in the years to maturity is derived from the Custodian's Risk and Performance Analytics Reporting System. Such information is prepared as a result of the Custodian's Risk Management Analysis.

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Credit Risk—The plausible risk of a loss or default resulting from a borrower’s inability to repay a loan or fulfill its contractual debt obligations. Portfolios other than U.S. Government and related portfolios, have credit rating limitations. Investment grade portfolios are limited to mostly ratings of Baa2 and above, except that they are also permitted a 10% maximum exposure to Ba2 & B2 rated securities. While high yield non-investment grade managers primarily invest in Ba2 & B2 rated securities, they can also invest up to 10% of their portfolio in securities rated Caa2. The quality ratings of the Fund’s investments, by percentage of the rated portfolio, as described by nationally recognized rating organizations, at June 30, 2019 and 2018 are as follows:

Investment Type Fixed Funds June 30, 2019	Moody's Quality																	Caa & Below	NR	Total
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3				
U.S. Government	62.92%	0.03%	0.02%	0.01%	-%	0.01%	-%	0.03%	0.07%	-%	-%	-%	-%	-%	-%	-%	-%	0.31%	63.40%	
Corporate bonds	0.64	0.24	0.12	0.28	0.79	1.10	0.99	1.80	2.27	2.10	1.38	2.60	3.34	3.05	3.22	2.47	1.98	3.51	31.88	
Short-term:																				
Commercial Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.27	2.27
STIF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.45	2.45
Portfolio	<u>63.56%</u>	<u>0.27%</u>	<u>0.14%</u>	<u>0.29%</u>	<u>0.79%</u>	<u>1.11%</u>	<u>0.99%</u>	<u>1.83%</u>	<u>2.34%</u>	<u>2.10%</u>	<u>1.38%</u>	<u>2.60%</u>	<u>3.34%</u>	<u>3.05%</u>	<u>3.22%</u>	<u>2.47%</u>	<u>1.98%</u>	<u>8.54%</u>	<u>100.00%</u>	

Investment Type Fixed Funds June 30, 2018	Moody's Quality																	Caa & Below	NR	Total
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3				
U.S. Government	63.21%	0.03%	0.06%	0.01%	-%	0.01%	0.04%	-%	0.07%	-%	-%	-%	-%	-%	-%	-%	-%	0.49%	63.92%	
Corporate bonds	1.00	0.17	0.17	0.36	0.74	0.79	1.45	1.81	1.95	1.78	1.48	1.60	2.90	2.58	2.29	2.26	2.02	3.63	28.98	
Short-term:																				
Commercial Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.27	3.27
STIF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.83	3.83
Portfolio	<u>64.21%</u>	<u>0.20%</u>	<u>0.23%</u>	<u>0.37%</u>	<u>0.74%</u>	<u>0.80%</u>	<u>1.49%</u>	<u>1.81%</u>	<u>2.02%</u>	<u>1.78%</u>	<u>1.48%</u>	<u>1.60%</u>	<u>2.90%</u>	<u>2.58%</u>	<u>2.29%</u>	<u>2.26%</u>	<u>2.02%</u>	<u>11.22%</u>	<u>100.00%</u>	

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The quality ratings of investments of the variable return fund, by percentage of the rated portfolio, as described by nationally recognized statistical rating organizations, at June 30, 2019 and 2018, are as follows:

Investment Type Variable Funds June 30, 2019	Moody's Quality																			Total	
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	NR		
U.S. Government	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	
Corporate bond	-	-	-	-	-	0.49	-	0.42	-	0.72	0.30	-	0.74	0.22	0.30	-	-	-	49.53	52.72	
Yankee bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Municipal bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
U.S. Agencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Short-term:																					
U.S. Treasury Bills	0.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	
Money Market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.85	46.85	
Cash Equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.13	
Portfolio	<u>0.30%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.49%</u>	<u>0.00%</u>	<u>0.42%</u>	<u>0.00%</u>	<u>0.72%</u>	<u>0.30%</u>	<u>0.00%</u>	<u>0.74%</u>	<u>0.22%</u>	<u>0.30%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>96.51%</u>	<u>100.00%</u>

Investment Type Variable Funds June 30, 2018	Moody's Quality																			Total
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	NR	
U.S. Government	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	-%	0.54%	0.54%
Corporate bond	-	-	-	-	-	0.98	0.18	-	0.31	0.46	-	0.29	1.27	0.25	-	0.49	0.39	-	46.40	51.02
Yankee bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Municipal bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U.S. Agencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Short-term:																				
Money Market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.33	48.33
Cash Equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.11
Portfolio	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.98%</u>	<u>0.18%</u>	<u>0.00%</u>	<u>0.31%</u>	<u>0.46%</u>	<u>0.00%</u>	<u>0.29%</u>	<u>1.27%</u>	<u>0.25%</u>	<u>0.00%</u>	<u>0.49%</u>	<u>0.39%</u>	<u>0.00%</u>	<u>95.38%</u>	<u>100.00%</u>

Custodial Credit Risk—Deposits are exposed to custodial credit risk if they are uninsured and uncollateralized. Custodial credit risk is the risk that, in the event of a failure of the counterparty, the System will not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the System and are held by either the counterparty or the counterparty’s trust department or agent but not in the System’s name. Whereas the systems invest in commingled funds the assets within the fund are held in the name of the trustee of the fund and not in the name of the System. All of the System’s cash deposits are insured by FDIC or collateralized by securities held by a financial institution separate from their corresponding financial institution.

Interest Rate Risk—The risk that the value of debt securities will be affected by fluctuations in market interest rates. Although there is no formal interest rate risk management policy, the duration of the portfolio, relative to the duration of the portfolio’s benchmark, is monitored by the Bureau of Asset Management. The lengths of investment maturities for fixed return fund (in years), as shown by the percent of the rated portfolio, at June 30, 2019 and 2018 are as follows:

Years to Maturity Investment Type June 30, 2019	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
U.S Government	63.40%	1.30%	17.69%	22.24%	22.17%
Corporate Bonds	31.88	0.43	12.14	13.26	6.05
Short-term:					
Commercial Paper	2.27	2.27	-	-	-
STIF	2.45	2.45	-	-	-
Portfolio	<u>100.00%</u>	<u>6.45%</u>	<u>29.83%</u>	<u>35.50%</u>	<u>28.22%</u>

Years to Maturity Investment Type June 30, 2018	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
U.S Government	63.92%	0.84%	28.84%	16.38%	17.86%
Corporate Bonds	28.98	0.68	10.65	11.83	5.82
Short-term:					
Commercial Paper	3.27	3.27	-	-	-
STIF	3.83	3.83	-	-	-
Portfolio	<u>100.00%</u>	<u>8.62%</u>	<u>39.49%</u>	<u>28.21%</u>	<u>23.68%</u>

Notes to Combining Financial Statements
June 30, 2019 and 2018
(Cont'd)

The lengths of investment maturities (in years) of the variable return fund, as shown by the percent of the rated portfolio, at June 30, 2019 and 2018 are as follows:

Years to Maturity Investment Type June 30, 2019	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
U.S. Government	0.00%	0.00%	0.00%	0.00%	0.00%
Corporate bonds	52.72	1.83	33.77	13.31	3.81
Yankee Bonds	-	-	-	-	-
Municipal Bonds	-	-	-	-	-
U.S. Agencies	-	-	-	-	-
Short-term:					
U.S. Treasury Bills	0.30	0.30	-	-	-
Money Market	46.85	46.85	-	-	-
Cash Equivalent	0.13	0.13	-	-	-
Portfolio	<u>100.00%</u>	<u>49.11%</u>	<u>33.77%</u>	<u>13.31%</u>	<u>3.81%</u>

Years to Maturity Investment Type June 30, 2018	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
U.S. Government	0.54%	0.54%	0.00%	0.00%	0.00%
Corporate bonds	51.02	2.89	27.60	15.20	5.33
Yankee Bonds	-	-	-	-	-
Municipal Bonds	-	-	-	-	-
U.S. Agencies	-	-	-	-	-
Short-term:					
Money Market	48.33	48.33	-	-	-
Cash Equivalent	0.11	0.11	-	-	-
Portfolio	<u>100.00%</u>	<u>51.87%</u>	<u>27.60%</u>	<u>15.20%</u>	<u>5.33%</u>

Foreign Currency Risk—Foreign currency risk is the risk that changes in the exchange rates will adversely impact the fair value of an investment. Currency risk is present in underlying portfolios that invest in foreign stocks and/or bonds. The currency markets have proven to be good diversifiers in a total portfolio context; therefore, the System has numerous managers that invest globally. In general, currency exposure is viewed as a benefit for its diversification reasons and not as an inherent risk within the portfolio. The System has no formal risk policy.

In addition, the System has investments in foreign stocks and/or bonds denominated in foreign currencies. The System's foreign currency exposures as of June 30, 2019 and 2018 in the fixed return fund are as follows (amounts in thousands of U.S. dollars):

Trade Currency	June 30, 2019	June 30, 2018
Euro Currency	\$ 323,243	\$ 263,722
Hong Kong Dollar	185,711	162,239
Japanese Yen	138,122	128,349
British Pound Sterling	125,382	112,793
South Korean Won	72,510	80,477
Swiss Franc	54,401	51,079
Indian Rupee	41,860	46,999
New Taiwan Dollar	38,707	44,247
Brazilian Real	36,591	29,791
Swedish Krona	23,981	25,835
Canadian Dollar	23,943	16,616
South African Rand	23,621	31,233
Australian Dollar	21,747	14,004
Danish Krone	21,475	20,724
Thailand Baht	20,275	21,747
Singapore Dollar	19,293	20,155
Turkish Lira	18,191	17,399
Norwegian Krone	17,078	16,844
Indonesian Rupiah	13,056	14,414
Polish Zloty	11,172	9,865
Malaysian Ringgit	9,448	14,363
Mexican Peso (New)	4,029	4,864
Chinese Yuan Renminbi	3,725	504
Chilean Peso	3,363	1,998
Qatari Rial	3,335	4,638
Hungarian Forint	2,754	931
UAE Dirham	2,381	1,550
Philippine Peso	2,213	2,017
New Israeli Sheqel	2,000	1,406
Colombian Peso	1,125	1,462
New Zealand Dollar	464	113
Egyptian Pound	386	428
Czech Koruna	208	456
Peruvian Nouveau Sol	122	221
Pakistan Rupee	37	108
Chinese Yuan (Offshore)	5	-
Moroccan Dirham	1	1
Total	\$ 1,265,955	\$ 1,163,592

Notes to Combining Financial Statements
June 30, 2019 and 2018
(Cont'd)

The foreign currency exposures of the variable return funds as of June 30, 2019 and 2018 are as follows (amounts in thousands of U.S. dollars):

Trade Currency	June 30, 2019	June 30, 2018
Euro Currency	\$ 31,919	\$ 29,135
Japanese Yen	22,009	20,342
British Pound Sterling	16,754	16,378
Swiss Franc	9,554	7,540
Australian Dollar	5,890	5,287
Hong Kong Dollar	3,731	3,118
South Korean Won	2,630	2,814
Indian Rupee	2,387	236
Swedish Krona	2,223	1,933
Danish Krone	1,774	1,463
Singapore Dollar	1,526	1,391
Taiwan Dollar	1,480	1,571
Brazilian Real	1,267	589
Canadian Dollar	1,084	866
South African Rand	941	1,073
Norwegian Krone	803	792
Thailand Baht	610	654
Turkish Lira	403	369
Malaysian Ringgit	321	472
Mexican Nuevo Peso	284	254
Indonesian Rupiah	283	1,965
Israeli Shekel	279	229
Polish Zloty	256	138
UAE Dirham	232	88
New Zealand Dollar	205	162
Hungarian Forint	106	80
Chilean Peso	78	73
Egyptian Pound	36	8
Czech Koruna	3	4
Philippine Peso	2	69
Total	\$ 109,070	\$ 99,093

Notes to Combining Financial Statements
June 30, 2019 and 2018
(Cont'd)

Securities Lending Transactions: Credit Risk— The quality ratings of investments held as collateral for Securities Lending at June 30, 2019 and 2018 are as follows:

Investment Type and Fair Value - Fixed Return Fund Securities Lending Transactions (In thousands) June 30, 2019	Moody's Quality											Total
	Aaa	Aa	A1	A2	A3	Baa	Ba	B	Caa	Ca	NR	
U.S. Government	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate bonds	-	-	-	-	-	-	-	-	-	-	-	-
Yankee bonds	-	-	-	-	-	-	-	-	-	-	-	-
Short-term:												
Reverse Repurchase Agreements	-	-	-	21,472	125,411	6,195	-	-	-	-	196,132	349,210
Money Market	6,644	-	-	-	-	-	-	-	-	-	11,721	18,365
Bank Notes	-	-	-	-	-	-	-	-	-	-	-	-
US Agency	-	-	-	-	-	-	-	-	-	-	3,978	3,978
Cash or Cash Equivalent	-	-	40,093	-	-	-	-	-	-	-	-	40,093
Uninvested	-	-	-	-	-	-	-	-	-	-	-	-
Total	\$ 6,644	\$ -	\$ 40,093	\$ 21,472	\$ 125,411	\$ 6,195	\$ -	\$ -	\$ -	\$ -	\$ 211,831	\$ 411,646
Percentage of securities lending portfolio	1.61%	0.00%	9.74%	5.22%	30.47%	1.50%	0.00%	0.00%	0.00%	0.00%	51.46%	100.00%

Investment Type and Fair Value - Fixed Return Fund Securities Lending Transactions (In thousands) June 30, 2018	Moody's Quality											Total
	Aaa	Aa	A1	A2	A3	Baa	Ba	B	Caa	Ca	NR	
U.S. Government	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate bonds	-	-	-	-	-	-	-	-	-	-	-	-
Yankee bonds	-	-	-	-	-	-	-	-	-	-	-	-
Short-term:												
Reverse Repurchase Agreements	-	-	-	10,968	72,442	102,100	-	-	-	-	153,184	338,694
Money Market	11,560	-	-	-	-	-	-	-	-	-	-	11,560
Bank Notes	-	-	-	-	-	-	-	-	-	-	1,649	1,649
Cash or Cash Equivalent	-	-	37,651	-	-	-	-	-	-	-	-	37,651
Uninvested	-	-	-	-	-	-	-	-	-	-	-	-
Total	\$ 11,560	\$ -	\$ 37,651	\$ 10,968	\$ 72,442	\$ 102,100	\$ -	\$ -	\$ -	\$ -	\$ 154,833	\$ 389,554
Percentage of securities lending portfolio	2.97%	0.00%	9.66%	2.81%	18.60%	26.21%	0.00%	0.00%	0.00%	0.00%	39.75%	100.00%

Notes to Combining Financial Statements
June 30, 2019 and 2018
(Cont'd)

Investment Type and Fair Value Variable Return Fund Securities Lending Transactions (In thousands) June 30, 2019	Moody's Quality																		Total	
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa	NR		
	U.S. Government	\$ 850	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -
Corporate bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Yankee bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Short-term:																				
U.S. Treasury Bills	91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91	
Repurchase Agreements	2,678	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	323	3,001
Uninvested	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	<u>\$ 3,619</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 323</u>	<u>\$ 3,942</u>
By Percent	<u>91.81%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>8.19%</u>	<u>100.00%</u>

Investment Type and Fair Value Variable Return Fund Securities Lending Transactions (In thousands) June 30, 2018	Moody's Quality																		Total	
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa	NR		
	U.S. Government	\$ 842	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -
Corporate bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Yankee bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Short-term:																				
Repurchase Agreements	1,237	-	-	-	-	-	727	-	-	-	-	-	-	-	-	-	-	-	3,398	5,362
Uninvested	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	<u>\$ 2,079</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 727</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 3,398</u>	<u>\$ 6,204</u>
By Percent	<u>33.51%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>11.72%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>54.77%</u>	<u>100.00%</u>

Interest Rate Risk—The lengths of investment maturities (in years) of the collateral for Securities Lending at June 30, 2019 and 2018 are as follows:

Years to Maturity Fixed Return Fund (In thousands) June 30, 2019	Investment Maturities (in years)				
	Fair Value	Less than One Year	One to Five Years	Six to Ten Years	More than Ten Years
U.S. Government	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate Bonds	-	-	-	-	-
Yankee Bonds	-	-	-	-	-
Short-term					
Repurchase Agreements	-	-	-	-	-
Reverse Repurchase Agreements	349,210	349,210	-	-	-
Certificate of Deposits	-	-	-	-	-
Commercial Paper	-	-	-	-	-
Money Market	18,365	18,365	-	-	-
Bank Notes	-	-	-	-	-
US Treasury	-	-	-	-	-
US Agency	3,978	3,978	-	-	-
Time Deposit	-	-	-	-	-
Cash or Cash Equivalent	40,093	40,093	-	-	-
Uninvested	-	-	-	-	-
Total	<u>\$ 411,646</u>	<u>\$ 411,646</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
By Percent	<u>100.00%</u>	<u>100.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>

Years to Maturity Fixed Return Fund (In thousands) June 30, 2018	Investment Maturities (in years)				
	Fair Value	Less than One Year	One to Five Years	Six to Ten Years	More than Ten Years
U.S. Government	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate Bonds	-	-	-	-	-
Yankee Bonds	-	-	-	-	-
Short-term					
Repurchase Agreements	-	-	-	-	-
Reverse Repurchase Agreements	338,694	338,694	-	-	-
Certificate of Deposits	-	-	-	-	-
Commercial Paper	-	-	-	-	-
Money Market	11,560	11,560	-	-	-
Bank Notes	1,649	1,649	-	-	-
US Treasury	-	-	-	-	-
US Agency	-	-	-	-	-
Time Deposit	-	-	-	-	-
Cash or Cash Equivalent	37,651	37,651	-	-	-
Uninvested	-	-	-	-	-
Total	<u>\$ 389,554</u>	<u>\$ 389,554</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
By Percent	<u>100.00%</u>	<u>100.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>

Notes to Combining Financial Statements
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Years to Maturity Variable Return Fund (In thousands) June 30, 2019	Investment Maturities (in years)				
	Fair Value	Less than One Year	One to Five Years	Six to Ten Years	More than Ten Years
U.S. Government	\$ 850	\$ 48	\$ 626	\$ 93	\$ 83
Corporate Bonds	-	-	-	-	-
Yankee Bonds	-	-	-	-	-
Short Term					
Repurchase Agreements	3,001	3,001	-	-	-
Reverse Repurchase Agreements	-	-	-	-	-
Certificate of Deposits	-	-	-	-	-
Commercial Paper	-	-	-	-	-
Money Market	-	-	-	-	-
Bank Notes	-	-	-	-	-
US Treasury	91	91	-	-	-
US Agency	-	-	-	-	-
Time Deposit	-	-	-	-	-
Cash or Cash Equivalent	-	-	-	-	-
Uninvested	-	-	-	-	-
Total	<u>\$ 3,942</u>	<u>\$ 3,140</u>	<u>\$ 626</u>	<u>\$ 93</u>	<u>\$ 83</u>
By Percent	<u>100.00%</u>	<u>79.65%</u>	<u>15.88%</u>	<u>2.36%</u>	<u>2.11%</u>

Years to Maturity Variable Return Fund (In thousands) June 30, 2018	Investment Maturities (in years)				
	Fair Value	Less than One Year	One to Five Years	Six to Ten Years	More than Ten Years
U.S. Government	\$ 842	\$ 249	\$ 431	\$ 76	\$ 86
Corporate Bonds	-	-	-	-	-
Yankee Bonds	-	-	-	-	-
Short Term					
Repurchase Agreements	5,362	5,362	-	-	-
Reverse Repurchase Agreements	-	-	-	-	-
Certificate of Deposits	-	-	-	-	-
Commercial Paper	-	-	-	-	-
Money Market	-	-	-	-	-
Bank Notes	-	-	-	-	-
US Treasury	-	-	-	-	-
US Agency	-	-	-	-	-
Time Deposit	-	-	-	-	-
Cash or Cash Equivalent	-	-	-	-	-
Uninvested	-	-	-	-	-
Total	<u>\$ 6,204</u>	<u>\$ 5,611</u>	<u>\$ 431</u>	<u>\$ 76</u>	<u>\$ 86</u>
By Percent	<u>100.00%</u>	<u>90.43%</u>	<u>6.95%</u>	<u>1.23%</u>	<u>1.39%</u>

For the years ended June 30, 2019 and 2018, the annual money-weighted rate of return on the System's fixed return fund investments, net of investment expense on the System's fixed return fund, was 7.00% and 10.31%, respectively. The money-weighted rate of return expresses investment performance, net of investment expense adjusted for the changing amounts invested.

In Fiscal Year 2015, the System adopted GASB Statement No. 72 ("GASB 72"), *Fair Value Measurement and Application*. GASB 72 was issued to address accounting and financial reporting issues related to fair value measurements.

The System categorizes its fair value measurements within the fair value hierarchy established by GAAP. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs. The System has the following recurring fair value measurements as of June 30, 2019 and June 30, 2018:

Fixed Return Funds GASB 72 Disclosure (In thousands)	June 30, 2019			
	Level 1	Level 2	Level 3	QPP Total
INVESTMENTS — At fair value				
Short-term investments:				
Commercial paper	\$ -	\$ 46,954	\$ -	\$ 46,954
Discount notes	-	1,576	-	1,576
Short-term investment fund	-	26,625	-	26,625
U.S. Treasury Bills and Agencies	-	9,532	-	9,532
Debt securities:				
Bank loans	-	7,390	-	7,390
Corporate and Other	-	487,820	-	487,820
Mortgage debt securities	-	197,830	17,723	215,553
Treasury inflation protected securities	-	312,116	-	312,116
U.S. Government and Agency	-	818,824	-	818,824
Equity securities	2,116,353	-	24	2,116,377
Alternative investments	-	-	892,479	892,479
Collective Pooled funds				
Bank Loans	-	118,705	574	119,279
Corporate and Other	-	3,772	-	3,772
Domestic equity	260,619	-	1,239	261,858
International equity	1,096,708	-	71	1,096,779
Mortgage debt securities	-	9,448	10,755	20,203
Treasury inflation protected securities	-	-	-	-
	<u>\$ 3,473,680</u>	<u>\$2,040,592</u>	<u>\$ 922,865</u>	<u>\$ 6,437,137</u>

Notes to Combining Financial Statements
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Fixed Return Funds GASB 72 Disclosure (In thousands)	June 30, 2018			
	Level 1	Level 2	Level 3	QPP Total
INVESTMENTS — At fair value				
Short-term investments:				
Commercial paper	\$ -	\$ 69,031	\$ -	\$ 69,031
Discount notes	-	-	-	-
Short-term investment fund	-	56,088	-	56,088
U.S. T-Bills & Agencies	3,699	5,632	-	9,331
Debt securities:				
Bank loans	-	5,691	-	5,691
Corporate and Other	-	455,064	-	455,064
Mortgage debt securities	-	193,178	-	193,178
U.S. Government and Agency	-	877,527	-	877,527
Equity securities	1,687,625	10	-	1,687,635
Alternative investments	-	-	765,549	765,549
Collective Pooled funds:				
Bank Loans	-	113,634	-	113,634
Corporate and Other	-	142,920	-	142,920
Domestic equity	151,429	-	943	152,372
International equity	1,167,550	-	13	1,167,563
Mortgage debt securities	-	9,777	25,189	34,966
Treasury inflation protected securities	-	283,241	-	283,241
	<u>\$ 3,010,303</u>	<u>\$2,211,793</u>	<u>\$ 791,694</u>	<u>\$ 6,013,790</u>

Equity and Fixed Income Securities—Equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets issued by pricing vendors for these securities. Debt and equity securities classified in Level 2 of the fair value hierarchy are valued using prices determined by the use of matrix pricing techniques maintained by the various pricing vendors for these securities. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices. Debt and equity securities classified in Level 3 of the fair value are securities whose stated market price is unobservable by the marketplace; many of these securities are priced by the issuers or industry groups for these securities. Fair value is defined as the quoted market value on the last trading day of the period. These prices are obtained from various pricing sources by our custodian bank. Collective Trust funds are reported using NAV. The Debt and equity securities held in Collective Trust Funds are held in those funds on behalf of the pension system and there is no restriction on the use and or liquidation of those assets for the exclusive benefit of the funds participants.

Alternative Investments—Alternative investments include private equity, real estate, opportunistic fixed income and infrastructure investments. These are investments for which exchange quotations are not readily available and are valued at estimated fair value, as determined in good faith by the General Partner (“GP”). These investments are initially valued at cost with subsequent adjustments that reflect third party transactions, financial operating results and other factors deemed relevant by the GP. The assets in our alternative investment program are classified as Level 3 assets. A more detailed explanation of the Level 3 valuation methodologies follows:

Investments in nonpublic equity securities are valued by the GP using one or more valuation methodologies outlined in FASB Accounting Standard Codification (“ASC”) 820, depending upon the availability of data required by each methodology. In some cases, the GP may use multiple approaches to estimate a valuation range. For the immediate time period following a transaction, the determination of fair value for equity securities, in which no liquid trading market exists, can generally be approximated based on the transaction price (absent any significant developments). Thereafter, or in the interim, if significant developments relating to such portfolio company or industry occur which may suggest a material change in value, the GP should value each investment by applying generally accepted valuation methods including: (1) the market approach (such as market transaction and comparable public company multiples, which are based on a measurement of the company’s historical and projected financial performance with typical metrics including enterprise value/latest 12 months EBITDA or projected fiscal year EBITDA) or (2) the income or discounted cash flow approach.

In the market approach, valuation multiples that are relevant to the industry and company in the investments held should be considered and relied upon. Valuation multiples should be assessed and may be adjusted on a go-forward basis based on the business risk associated with the subject company in which the investment is held. In addition, the implied entry multiples should be considered as benchmarks in valuing unlisted equity. In circumstances where no financial performance metrics are available, the GP should rely on other non-financial related metrics applicable to relevant progress from the original investment date to the valuation date. In the income or discounted cash flow approach, forecasted cash flows that may be generated by the subject company are discounted to present value at an appropriate discount rate. These methodologies can be utilized to determine an enterprise value (“Enterprise Valuation Methodologies”) from which net debt is subtracted to estimate equity value.

The determination of fair value using these methodologies should take into consideration a range of factors, including but not limited to, the price at which the investment was acquired, the nature of the investment, local market conditions, trading values on public exchanges for comparable securities, current and projected operating performance and financing transactions subsequent to the acquisition of the investment. Because of the subjective nature of estimated fair value of the private investments, such value may differ significantly from the values that would have been used had a ready market existed for these investments. These financial instruments have been classified as Level 3 in the fair value hierarchy.

Certain alternative investments have additional future commitments. Others have redemption notice requirements and redemption restrictions. Management does not believe these commitments, notice requirements and redemptions restrictions have a material effect on the fair value of the portfolio of investments.

Notes to Combining Financial Statements
June 30, 2019 and 2018
(Cont'd)

Variable Return Funds GASB 72 Disclosure (In thousands)	June 30, 2019			
	Level 1	Level 2	Level 3	Total
Variable Return Funds:				
Short-term Investments	\$ -	\$ 5,119	\$ -	\$ 5,119
Debt Securities	-	12,007	-	12,007
Equities	555,938	19,298	6,982	582,218
Total	<u>\$ 555,938</u>	<u>\$ 36,424</u>	<u>\$ 6,982</u>	<u>\$ 599,344</u>

Variable Return Funds GASB 72 Disclosure (In thousands)	June 30, 2018			
	Level 1	Level 2	Level 3	Total
Variable Return Funds:				
Short-term Investments	\$ -	\$ 5,241	\$ -	\$ 5,241
Debt Securities	-	11,399	-	11,399
Equities	536,582	12,544	59	549,185
Total	<u>\$ 536,582</u>	<u>\$ 29,184</u>	<u>\$ 59</u>	<u>\$ 565,825</u>

Level One – Valued using prices quoted in active markets

Level Two – Valued using a matrix pricing technique: based on relationship to benchmark quoted prices

Level Three – Valued using discounted cash flow techniques

4. CONTRIBUTIONS AND ACTUARIAL ASSUMPTIONS

The financial objective of the QPP is to fund members' retirement benefits during their active service and to establish employer contribution rates which, expressed as a percentage of annualized covered payroll, will remain approximately level from year to year. The employer contributes amounts that, together with member contributions and investment income, would ultimately be sufficient to accumulate assets to pay benefits when due.

Contributions to the TDA program are made on a voluntary basis by certain members of the QPP.

Member Contributions

- Members who joined the QPP prior to July 1, 1973 ("Tier 1") contribute on the basis of a normal rate of contribution which is assigned by the QPP at membership, and which is dependent upon age and actuarial tables in effect at the time of membership. Tier 1 members can also make Increased Take Home Pay ("ITHP") contributions, for which they can receive an additional annuity after retirement.
- Members who joined after July 1, 1973 and before July 27, 1976 ("Tier 2") also contribute on the basis of a normal rate of contribution which is assigned by the QPP at membership, and which is dependent upon age and actuarial tables in effect at the time of membership. Note that the actuarial tables are different in Tier 2. Tier 2 members can also make ITHP contributions, for which they can receive an additional annuity after retirement.

- Members who joined after July 27, 1976 and before April 1, 2012 (“Tier 4”) contribute 3% of salary until the earlier of the 10th anniversary of their membership date, or upon the completion of 10 years of credited service. Certain Tier 4 members are enrolled in special early retirement plans and must therefore also make Additional Member Contributions (“AMC”), depending on the specific plan.
- Members who joined on or after April 1, 2012 (“Tier 6”) are required to make Basic Member Contributions (“BMC”) until they separate from service or until they retire. The BMC rate is dependent on annual wages earned during a plan year and ranges from 3% for salaries less than \$45,000 to 6% for salaries greater than \$100,000. Certain Tier 6 members are enrolled in special early retirement plans and must therefore also make Additional Member Contributions (“AMC”), depending on the specific plan.

Employer Contributions—Statutorily-required contributions (“Statutory Contributions”) to the QPP, determined by the System’s Chief Actuary of the Office of the Actuary (the “Actuary”) in accordance with State statutes and City laws, are generally funded by the employer within the appropriate fiscal year.

5. QPP NET PENSION LIABILITY

The components of the net pension liability of the Employers at June 30, 2019 and 2018 were as follows:

	(In thousands)	
	2019	2018
Total pension liability	\$ 5,266,066	\$ 5,174,287
Fiduciary net position*	<u>4,991,832</u>	<u>4,672,903</u>
Employers’ net pension liability	<u>\$ 274,234</u>	<u>\$ 501,384</u>
Fiduciary net position as a percentage of the total pension liability	<u>94.79%</u>	<u>90.31%</u>

* Such amounts represent the preliminary System’s fiduciary net position and may differ from the final System’s fiduciary net position.

Actuarial Methods and Assumptions—The total pension liability as of June 30, 2019 and 2018 were determined by actuarial valuations as of June 30, 2017 and June 30, 2016, respectively, that were rolled forward to develop the total pension liability to the respective fiscal year end. The following actuarial assumptions were applied to all periods included in the measurement:

Projected Salary Increases*	In general, merit and promotion increases plus assumed general wage increases of 3.0% per annum.
Investment Rate of Return*	7.0% per annum, net of investment expenses.
COLAs*	1.5% per annum for Auto COLA 2.5% per annum for escalation.

* Developed assuming a long-term Consumer Price Inflation assumption of 2.5% per annum.

Notes to Combining Financial Statements
June 30, 2019 and 2018
(Cont'd)

Mortality tables for Service and Disability pensioners and beneficiaries were developed from an experience study of the QPP.

The Fiscal Year 2019 results reflect changes in the actuarial assumptions and methods since the prior year. The changes are primarily the result of an experience study performed by Bolton, Inc., which compared actual experience of the systems for the four and ten-year periods ending June 30, 2017 to that expected based on the prior set of actuarial assumptions and methods. These new actuarial assumptions and methods were adopted by the BERS Retirement Board during Fiscal Year 2019.

Pursuant to Section 96 of the New York City Charter, studies of the actuarial assumptions used to value liabilities of the five actuarially-funded New York City Retirement Systems (“NYCRS”) are conducted every two years.

Expected Rate of Return on Investments—The longterm expected rate of return on QPP investments was determined using a building-block method in which best-estimate ranges of expected real rates of return (i.e., expected returns, net of QPP investment expenses and inflation) are developed for each major asset class. These ranges are combined to produce the longterm expected rate of return by weighting the expected real rates of return by the target asset allocation percentage and by adding expected inflation. The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Asset Allocation	Long-Term Expected Real Rate of Return
U.S. public market equities	30.0%	6.8%
International public market equities	13.0	7.4
Emerging public market equities	7.0	10.3
Private market equities	9.0	10.8
Fixed income (Core, TIPS, Opportunistic)	28.0	2.4
Alternatives (Real assets, Hedge funds)	13.0	5.6
Total	<u>100.0%</u>	

Discount Rate—The discount rate used to measure the total pension liability was 7%. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the rates applicable to the current Tier for each member and that Employer contributions will be made at rates as determined by the Actuary. Based on those assumptions, the QPP’s fiduciary net position was projected to be available to make all projected future benefit payments of current active and nonactive QPP members. Therefore, the longterm expected rate of return on QPP investments was applied to all periods of projected benefit payments to determine the total pension liability.

The following presents the net pension liability of the Employers, calculated using the discount rate of 7.0%, as well as what the Employers' net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.0 percent) or 1-percentage-point higher (8.0 percent) than the current rate:

	(In thousands)		
	1% Decrease (6%)	Discount Rate (7%)	1% Increase (8%)
Employers' net pension liability June 30, 2019	\$927,727	\$274,234	\$(274,944)

6. MEMBER LOANS

Members of the QPP are permitted to borrow up to 75% of their employee contribution account balances, including accumulated interest, subject to the limitations of Section 72 of the Internal Revenue Code. The balance of QPP member loans receivable at June 30, 2019 and 2018 is \$50.58 million and \$50.03 million, respectively. When a member withdraws from the QPP with an outstanding QPP loan balance, this outstanding QPP loan balance will be deducted from the refund of the member's contribution balance. When a member retires with an outstanding QPP loan balance, the member's retirement benefit will be reduced by the actuarial value of the amount of the outstanding QPP loan balance, unless this balance is paid off.

Members of the TDA Program are permitted to borrow up to 75% of their TDA Program account balances, including accumulated interest, subject to the limitations of Section 72 of the Internal Revenue Code. The balance of TDA Program member loans receivable at June 30, 2019 and 2018 is \$43.79 million and \$43.56 million, respectively.

7. RELATED PARTIES

The Comptroller has been appointed by law as custodian for the assets of the QPP and the TDA Program. QPP fixed return fund securities are held by certain banks under custodial agreements with the Comptroller. The Comptroller also provides cash receipt and cash disbursement services to the System. Actuarial services are provided to the System by the New York City Office of the Actuary. The City's Corporation Counsel provides legal services to the System. Other administrative services are also provided by the City. Costs of \$1.55 million and \$1.48 million were incurred on behalf of the System by other City agencies, primarily the Comptroller's Office for 2019 and 2018, respectively. The fixed return fund assets of the QPP are co-invested with those of the TDA Program. The variable return fund assets of the QPP are co-invested with those of the TDA Program and TRS (see Note 2). TRS holds the assets of the variable return fund.

8. ADMINISTRATIVE EXPENSES

In Fiscal Years 2019 and 2018, as per Chapter 307 of the New York State Laws of 2002, The Plan provided BERS with Corpus funding for administrative expenses in the amount of \$17.47 million and \$13.29 million, respectively.

In August 2019, the System entered into a Sub-sublease agreement for office space. The agreement is for a term of six years and seven months and requires a total commitment of approximately \$11,180,000 over the term of the lease.

9. CONTINGENT LIABILITIES AND OTHER MATTERS

Contingent Liabilities—The System has claims pending against it and has been named as a defendant in lawsuits and also has certain other contingent liabilities. Management of the System, on the advice of legal counsel, believes that such proceedings and contingencies will not have a material effect on the net position of the System or changes in the net position of the System. Under the existing State statutes and City laws that govern the functioning of the System, increases in the obligations of the System to members and beneficiaries ordinarily result in increases in the obligations of the New York City Board of Education to the System.

Actuarial Audit—Pursuant to Section 96 of the New York City Charter, studies of the actuarial assumptions used to value liabilities of the five actuarially-funded New York City Retirement Systems (“NYCRS”) are conducted every two years.

Refer to Note 5 for the results of the most recent actuarial audits for the QPP.

Revised Actuarial Assumptions and Methods—In accordance with the ACNY and with appropriate practice, the Boards of Trustees of the five actuarially-funded NYCRS are to periodically review and adopt actuarial assumptions as proposed by the Actuary for use in the determination of Employer Contributions.

The most recently completed study was published by Bolton, Inc., dated June 2019. Bolton analyzed experience for the four and ten-year periods ending June 30, 2017 and made recommendations with respect to the actuarial assumptions and methods based on their analysis. Based in part on these recommendations, the Actuary proposed new assumptions and methods for use in determining Employer Contributions for Fiscal Years beginning on and after July 1, 2018. These assumptions and methods have been adopted by the Board of Trustees during Fiscal Year 2019.

Previously, Gabriel, Roeder, Smith & Company (GRS) published their study in October 2015.

New York State Legislation (only significant laws since Fiscal Year 2012 included)

Chapter 18 of the Laws of 2012 (“Chapter 18/12”) placed certain limitations on the Tier 3 and Tier 4 benefits available to participants hired on and after April 1, 2012 in most New York State PERS, including BERS. These changes are sometimes referred to as Tier 6.

Chapter 3 of the Laws of 2013 (“Chapter 3/13”) implemented changes in the actuarial procedures for determining Employer Contributions beginning Fiscal Year 2012. In particular, Chapter 3/13 continued the One-Year Lag Methodology (“OYLM”), employed the Entry Age Actuarial Cost Method (“EAACM”), established an Actuarial Interest Rate (“AIR”) assumption of 7.0% per annum, net of investment expenses, and defined the amortization of Unfunded Actuarial Accrued Liabilities (“UAAL”).

Chapter 489 of the Laws of 2013 extended the Notice of Participation filing deadline to September 11, 2014 for vested members to file a sworn statement indicating participation in the World Trade Center Rescue, Recovery and Clean-up Operations.

Chapter 427 of the Laws of 2014 (“Chapter 427/14”) provides non-contributory retirement service credit for members called to active military duty on or after September 11, 2001 and prior to January 1, 2006 who did not receive their full salary from a participating employer and are otherwise eligible to receive retirement service credit for such service. Such member would not be required to make member contributions to receive such credit.

Chapter 510 of the Laws of 2015 (“Chapter 510/15”) clarifies for Tier 6 the definition of multiple employers for the purpose of exclusion of wages and changes the plan year for contributions from plan year April 1 to March 31 to plan year January 1 to December 31.

Chapter 41 of the Laws of 2016 was enacted on May 31, 2016. This amendment removes the specified periods of time, medal requirements, and theaters of operation in which military service would had to have been rendered for a service purchase pursuant to New York State Retirement and Social Security Law (“RSSL”) § 1000. Accordingly, for a member to be eligible to purchase service credit pursuant to RSSL § 1000 for pre-membership military service, the member need only have been honorably discharged from the military; all other requirements of RSSL § 1000 remain the same. This law is not retroactive and does not permit retired members to purchase service credit.

Chapter 326 of the Laws of 2016, enacted on September 11, 2016, extends the deadline to file a Notice of Participation in the World Trade Center Rescue, Recovery and Clean-up Operations to September 11, 2018. Proper filing of a Notice of Participation is a requirement for a member to be eligible for a World Trade Center disability or death benefit.

Chapter 438 of the Laws of 2016, enacted on November 14, 2016, amends Retirement and Social Security Law Section 43 to eliminate restrictions upon transferring between public retirement systems.

Chapter 71 of the Laws of 2017, enacted on June 29, 2017, continues for Fiscal Year 2019, the Actuarial Interest Rate assumption of 7.0% per annum used to determine employer contributions to the New York City Pension Funds and Retirement Systems. This act also extends through Fiscal Year 2019, the interest rate of 8.25% per annum to credit interest on Tier 1 and Tier 2 member contributions and Increased-Take-Home-Pay (ITHP) Reserves.

Chapter 266 of 2018 extends the time for members or eligible beneficiaries to file a Notice of Participation in World Trade Center Rescue, Recovery, and Cleanup Operations to September 11, 2022.

Required Supplementary Information (Unaudited)
Qualified Pension Plan
Schedule 1

SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY AND RELATED RATIOS
(In thousands)

	2019	2018	2017	2016	2015
Total pension liability:					
Service cost	\$ 168,501	\$ 176,110	\$ 168,625	\$ 153,107	\$ 147,898
Interest	366,084	350,999	346,510	320,315	299,592
Change of benefit terms	-	-	-	-	-
Differences between expected and actual experience	152,160	(164,587)	19,938	(75,907)	50,148
Changes of assumptions	(314,503)	-	-	183,677	-
Benefit payments and withdrawals	(280,463)	(261,574)	(262,432)	(240,727)	(223,244)
Net change in total pension liability	91,779	100,948	272,641	340,465	274,394
Total pension liability—beginning	5,174,287	5,073,339	4,800,698	4,460,233	4,185,839
Total pension liability—ending (a)	5,266,066	5,174,287	5,073,339	4,800,698	4,460,233
Plan fiduciary net position:					
Employer contributions	269,637	318,643	288,233	265,532	258,099
Member contributions	46,304	40,846	39,821	38,581	39,564
Net investment income	406,879	565,577	862,510	164,144	177,166
Payment of interest on TDA program fixed return funds	(141,695)	(127,972)	(106,554)	(94,789)	(85,104)
Benefit payments and withdrawals	(280,463)	(261,574)	(262,432)	(240,727)	(223,244)
Administrative expenses	(17,357)	(13,212)	(15,486)	(12,818)	(10,956)
Other	35,624	51,024	(122,954)	(157,499)	(52,021)
Net change in plan fiduciary net position	318,929	573,332	683,138	(37,576)	103,504
Plan fiduciary net position—beginning	4,672,903	4,099,571	3,416,433	3,454,009	3,350,505
Plan fiduciary net position—ending (b)	4,991,832	4,672,903	4,099,571	3,416,433	3,454,009
BERS's net pension liability—ending (a)-(b)	<u>\$ 274,234</u>	<u>\$ 501,384</u>	<u>\$ 973,768</u>	<u>\$ 1,384,265</u>	<u>\$ 1,006,224</u>
Plan fiduciary net position as a percentage of the total pension liability	<u>94.79 %</u>	<u>90.31 %</u>	<u>80.81 %</u>	<u>71.17 %</u>	<u>77.44 %</u>
Covered payroll ¹	<u>\$ 1,264,079</u>	<u>\$ 1,102,184</u>	<u>\$ 1,052,171</u>	<u>\$ 1,008,056</u>	<u>\$ 1,016,822</u>
BERS's net pension liability as percentage of covered payroll	<u>21.69 %</u>	<u>45.49 %</u>	<u>92.55 %</u>	<u>137.32 %</u>	<u>98.96 %</u>

Additionally, in accordance with GASB No. 67, Paragraph 50, such information was not readily available for periods prior to 2014.

1. Projected employee payroll at time 1.0 under previous roll-forward methodology through 2018. Actual employee payroll at valuation date (time = 0) beginning in 2019.

See Independent Auditors' Report.

Required Supplementary Information (Unaudited)
Qualified Pension Plan
Schedule 2

SCHEDULE OF EMPLOYERS' CONTRIBUTIONS
(In thousands)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined contribution	\$ 269,637	\$ 318,643	\$ 288,233	\$ 265,532	\$ 258,099	\$ 214,590	\$ 196,246	\$ 213,651	\$ 180,191	\$ 147,349
Contributions in relation to the actuarially determined contribution	<u>269,637</u>	<u>318,643</u>	<u>288,233</u>	<u>265,532</u>	<u>258,099</u>	<u>214,590</u>	<u>196,246</u>	<u>213,651</u>	<u>180,191</u>	<u>147,349</u>
Contribution deficiency (excess)	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Covered payroll ¹	<u>\$1,264,079</u>	<u>\$1,102,184</u>	<u>\$1,052,171</u>	<u>\$1,008,056</u>	<u>\$1,016,822</u>	<u>\$ 989,168</u>	<u>\$ 886,186</u>	<u>\$ 879,476</u>	<u>\$ 880,656</u>	<u>\$ 826,782</u>
Contributions as a percentage of covered-employee payroll	<u>21.33 %</u>	<u>28.91 %</u>	<u>27.39 %</u>	<u>26.34 %</u>	<u>25.38 %</u>	<u>21.69 %</u>	<u>22.15 %</u>	<u>24.29 %</u>	<u>20.46 %</u>	<u>17.82 %</u>

¹Projected employee payroll at time 1.0 under previous roll-forward methodology through 2018. Actual employee payroll at valuation date (time = 0) beginning in 2019. (Continued)

See Independent Auditors' Report.

NOTES TO SCHEDULE OF EMPLOYERS' CONTRIBUTIONS

The above actuarially determined contributions were developed using a One-Year Lag Methodology, under which the actuarial valuation determines the employer contribution for the second following fiscal year (e.g. Fiscal Year 2019 contributions were determined using an actuarial valuation as of June 30, 2017). The methods and assumptions used to determine the actuarially determined contributions are as follows:

¹ Under this actuarial cost method, the Initial Liability was reestablished as of June 30, 1999, by the Entry Age Actuarial Cost Method but with the unfunded actuarial accrued liability (UAAL) not less than \$0. The financial results using this Frozen Initial Liability Actuarial Cost Method are the same as those that would be produced using the Aggregate Actuarial Cost Method.

² In conjunction with Chapter 85 of the Laws of 2000, there is an amortization method. However, the June 30, 1999 UAAL for the QPP equaled \$0 and no amortization period was required.

³ Developed using a long-term Consumer Price Inflation assumption of 2.5% per year.

⁴ As of June 30, 2014 (Lag) valuation, the AAV is constrained to be no more than 20% of Market Value.

Valuation Dates	June 30, 2017	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013	June 30, 2012	June 30, 2011	June 30, 2010	June 30, 2009– June 30, 2008
Actuarial cost method	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Frozen Initial Liability ¹
Amortization method for unfunded actuarial accrued liabilities:									
Initial unfunded	Increasing dollar	Increasing dollar	Increasing dollar	Increasing dollar	Increasing dollar	Increasing dollar	Increasing dollar	Increasing dollar	NA ²
Post-2010 unfundeds	Level dollar	Level dollar	Level dollar	Level dollar	Level dollar	Level dollar	Level dollar	Level dollar	NA ²
Remaining amortization period:									
Initial unfunded	15 years (closed)	16 years (closed)	17 years (closed)	18 years (closed)	19 years (closed)	20 years (closed)	21 years (closed)	22 years (closed)	NA ²
2010 ERI	0 year (closed)	0 year (closed)	1 year (closed)	2 years (closed)	3 years (closed)	4 years (closed)	5 years (closed)		
2011 Actuarial gain/loss	9 years (closed)	10 years (closed)	11 years (closed)	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA ²
2012 Actuarial gain/loss	10 years (closed)	11 years (closed)	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA ²
2013 Actuarial gain/loss	11 years (closed)	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA	NA ²
2014 Actuarial gain/loss	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA	NA	NA ²
2015 Actuarial gain/loss	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA	NA	NA	NA ²
2016 Actuarial gain/loss	14 years (closed)	15 years (closed)	NA	NA	NA	NA	NA	NA	NA ²
2017 Actuarial gain/loss	15 years (closed)	NA	NA	NA	NA	NA	NA	NA	
2017 Assumption Change	20 years (closed)	NA	NA	NA	NA	NA	NA	NA	
2017 Method Change	20 years (closed)	NA	NA	NA	NA	NA	NA	NA	
Actuarial Asset Valuation (AAV) method³	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2010 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2010 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2010 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2010 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2011 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2011 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2011 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 2011. The June 30, 2010 AAV is defined to recognize Fiscal Year 2011 investment performance.	Modified six-year moving average of market values with a "Market Value Restart" as of June 30, 1999.
Actuarial assumptions:									
Assumed rate of return⁴	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	7.0% per annum, net of investment expenses	8.0% per annum, gross of investment expenses
Post-retirement mortality	Tables adopted by Board of Trustees during Fiscal Year 2019	Tables adopted by Board of Trustees during Fiscal Year 2016	Tables adopted by Board of Trustees during Fiscal Year 2016	Tables adopted by Board of Trustees during Fiscal Year 2016	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2006
Active service: withdrawal, death, disability, service retirement	Tables adopted by Board of Trustees during Fiscal Year 2019	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2012	Tables adopted by Board of Trustees during Fiscal Year 2006 ⁴
Salary increases⁴	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.	In general, merit and promotion increases plus assumed general increases of 3.0% per year.
Cost-of-living adjustments⁴	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.5% per annum for Auto COLA. 2.5% per annum for Escalation.	1.3% per annum

See Independent Auditors' Report.

Required Supplementary Information (Unaudited)
Qualified Pension Plan
Schedule 3

SCHEDULE OF INVESTMENT RETURNS

The following table displays annual money-weighted rate of return from fixed investments for each of the past six fiscal years:

Fiscal Year Ended	Money-Weighted Rate of Return
June 30, 2019	7.00%
June 30, 2018	10.31%
June 30, 2017	15.33%
June 30, 2016	0.20%
June 30, 2015	3.15%
June 30, 2014	19.51%

Note: In accordance with GASB No. 67, paragraph 50. Such information was not readily available for periods prior to 2014.

See Independent Auditors' Report.



SCHEDULE OF INVESTMENT EXPENSES

FUND MANAGER	CATEGORY	AMOUNT (IN \$)
1 Fixed Investment Expenses (net)		
Actis Energy 4	Alternative Invt - Infrastructure	207,000
Ardian Infra Fund V	Alternative Invt - Infrastructure	3
ASF VII Infrastructure B LP	Alternative Invt - Infrastructure	152,585
AxInfra US II L.P.	Alternative Invt - Infrastructure	45,983
Axiom Infrastructure Canada II (Intl) L.P.	Alternative Invt - Infrastructure	1,719
Brookfield Infrastructure Fund II	Alternative Invt - Infrastructure	65,624
Brookfield Infrastructure Fund III	Alternative Invt - Infrastructure	109,630
Brookfield Infrastructure Fund III Co-Invest	Alternative Invt - Infrastructure	19
EIG Energy Partners	Alternative Invt - Infrastructure	3,986
EQT Infrastructure III	Alternative Invt - Infrastructure	205,712
Global Energy & Power Infrastructure Fund II	Alternative Invt - Infrastructure	245,490
Global Infrastructure Partners III	Alternative Invt - Infrastructure	206,554
IFM Global Infrastructure	Alternative Invt - Infrastructure	612,698
KKR Global Infrastructure Investors II, L.P.	Alternative Invt - Infrastructure	193,483
KKR Global Infrastructure Investors III	Alternative Invt - Infrastructure	135,304
American Securities Partners VII, L.P.	Alternative Invt - Private Equity	155,220
Apax Partners IX	Alternative Invt - Private Equity	300,875
Apollo Investment Fund VIII	Alternative Invt - Private Equity	239,559
Apollo IX	Alternative Invt - Private Equity	425,288
Ares Corporate Opportunities Fund V, L.P.	Alternative Invt - Private Equity	152,846
ASF VI B	Alternative Invt - Private Equity	111,729
ASF VI B NYC Co-Invest L.P.	Alternative Invt - Private Equity	5,770
ASF VII B NYC Co-Invest L.P.	Alternative Invt - Private Equity	3,191
ASF VII B, L.P.	Alternative Invt - Private Equity	124,810
ASF VIII B, L.P.	Alternative Invt - Private Equity	130,018
BC European Capital X	Alternative Invt - Private Equity	131,582
BC European Capital X Co-Investment	Alternative Invt - Private Equity	7,489
Bridgepoint Europe V Co-Investment	Alternative Invt - Private Equity	2,984
Bridgepoint Europe V L.P.	Alternative Invt - Private Equity	70,582
Bridgepoint Europe VI L.P.	Alternative Invt - Private Equity	227,134
Capital Partners Private Equity Income Fund III, L.P.	Alternative Invt - Private Equity	48,070
Carlyle Partners VI, L.P.	Alternative Invt - Private Equity	113,659
Carlyle Partners VI, L.P. (Side Car)	Alternative Invt - Private Equity	983
Centerbridge Capital Partners III, L.P.	Alternative Invt - Private Equity	70,923
Crestview Partners III (Co-Investment B), L.P.	Alternative Invt - Private Equity	7,378
Crestview Partners III, L.P.	Alternative Invt - Private Equity	233,835
CVC Capital Partners VI	Alternative Invt - Private Equity	185,676
CVC Capital Partners VII	Alternative Invt - Private Equity	325,688
EQT VII, L.P.	Alternative Invt - Private Equity	246,698
EQT VIII	Alternative Invt - Private Equity	247,617
EQT VIII Co-Investment	Alternative Invt - Private Equity	12,359
FTV V, LP	Alternative Invt - Private Equity	89,323
Grain Communications Opportunities Fund II	Alternative Invt - Private Equity	161,113

Additional Supplementary Information

Qualified Pension Plan and Tax Deferred Annuity Program | Fiscal Year Ended June 30, 2019 Schedule 4 (Cont'd)

SCHEDULE OF INVESTMENT EXPENSES (CONT'D)

FUND MANAGER	CATEGORY	AMOUNT (IN \$)
Green Equity Investors VII	Alternative Invt - Private Equity	144,899
ICV Partners IV, L.P.	Alternative Invt - Private Equity	70,737
KKR Americas Fund XII L.P.	Alternative Invt - Private Equity	82,643
Landmark Equity Partners XV	Alternative Invt - Private Equity	250,937
Landmark NYC Fund I	Alternative Invt - Private Equity	3,917
Lexington Capital Partners VIII, L.P.	Alternative Invt - Private Equity	323,927
Mesirow Financial Private Equity Fund III	Alternative Invt - Private Equity	235,264
Mesirow Financial Private Equity Fund IV	Alternative Invt - Private Equity	127,760
Mesirow Financial Private Equity Fund V	Alternative Invt - Private Equity	240,662
Mill City Capital II	Alternative Invt - Private Equity	19,743
New MainStream Capital II	Alternative Invt - Private Equity	19,865
New MainStream Capital III	Alternative Invt - Private Equity	41,950
New York Fairview Private Equity, L.P.	Alternative Invt - Private Equity	89,757
Palladium V	Alternative Invt - Private Equity	454,922
Patriot Financial Partners II	Alternative Invt - Private Equity	74,035
Patriot Financial Partners III	Alternative Invt - Private Equity	49,460
Platinum Equity Capital Partners III, LP	Alternative Invt - Private Equity	753,315
Platinum Equity Capital Partners IV - SC	Alternative Invt - Private Equity	1,544
Platinum Equity Capital Partners IV, LP	Alternative Invt - Private Equity	229,335
Platinum Equity Partners Small Cap I	Alternative Invt - Private Equity	95,354
Raine Partners II	Alternative Invt - Private Equity	47,958
Raine Partners III	Alternative Invt - Private Equity	62,119
Siris Partners III	Alternative Invt - Private Equity	131,256
Siris Partners IV	Alternative Invt - Private Equity	38,374
Stellex Capital Management LP	Alternative Invt - Private Equity	65,800
Valor Equity III	Alternative Invt - Private Equity	69,672
Valor Equity Partners IV	Alternative Invt - Private Equity	94,392
Vista Equity Partners Fund V, L.P.	Alternative Invt - Private Equity	2,234,662
Vista Equity Partners Fund VI, L.P.	Alternative Invt - Private Equity	227,487
Vista VII	Alternative Invt - Private Equity	30,948
Warburg Pincus Financial Sector Fund	Alternative Invt - Private Equity	272,645
Warburg Pincus Global Growth, L.P.	Alternative Invt - Private Equity	45,862
Warburg Pincus Private Equity XI, LP	Alternative Invt - Private Equity	643,796
Warburg Pincus Private Equity XII, LP	Alternative Invt - Private Equity	338,600
Webster Capital III	Alternative Invt - Private Equity	32,258
Welsh, Carson, Anderson & Stowe XII, L.P.	Alternative Invt - Private Equity	185,729
Welsh, Carson, Anderson & Stowe XIII, L.P.	Alternative Invt - Private Equity	50,572
Aermont Capital Real Estate Fund IV	Alternative Invt - Real Estate	86,673
Almanac Fund VIII	Alternative Invt - Real Estate	72,682
Almanac VIII Sidecar	Alternative Invt - Real Estate	5,644
Artemis Co-Investment (Artemis Mach II, LLC)	Alternative Invt - Real Estate	94,347
Blackstone Real Estate Partners Europe IV, L.P.	Alternative Invt - Real Estate	637,473
Blackstone Real Estate Ptnrs VIII	Alternative Invt - Real Estate	235,780

SCHEDULE OF INVESTMENT EXPENSES (CONT'D)

FUND MANAGER	CATEGORY	AMOUNT (IN \$)
Brookfield Premier Real Estate Partners	Alternative Invt - Real Estate	121,210
Brookfield Strategic Real Estate	Alternative Invt - Real Estate	810,007
Brookfield Strategic Real Estate Partners III	Alternative Invt - Real Estate	72,417
Carlyle Realty Partners VII	Alternative Invt - Real Estate	565,328
Clarion Lion Industrial Trust	Alternative Invt - Real Estate	138,061
DivcoWest Fund V	Alternative Invt - Real Estate	145,789
DRA Growth and Income Fund IX	Alternative Invt - Real Estate	136,607
Exeter Core Industrial Club Fund II, L.P.	Alternative Invt - Real Estate	53,348
Exeter Industrial Value Fund IV LP	Alternative Invt - Real Estate	126,210
Franklin Templeton Private Real Estate Fund of Funds	Alternative Invt - Real Estate	106,126
H/2 Special Opportunities III L.P.	Alternative Invt - Real Estate	209,294
H/2 Special Opportunities IV L.P.	Alternative Invt - Real Estate	62,142
Heitman Credit	Alternative Invt - Real Estate	24,963
Hudson Superstorm Sandy Rebuilding Fund (NYC Asset Investor #3 LLC)	Alternative Invt - Real Estate	71,118
Jamestown Premier Fund	Alternative Invt - Real Estate	56,404
KKR Real Estate Credit Opp Prtnrs Agg I	Alternative Invt - Real Estate	133,982
KKR Real Estate Partners Americas II LP	Alternative Invt - Real Estate	103,034
Lasalle US Property Fd	Alternative Invt - Real Estate	266,882
Lone Star RE Partner V, L.P.	Alternative Invt - Real Estate	513,516
MetLife Core Property	Alternative Invt - Real Estate	117,838
NYC Vanbarton Interborough Fund LLC (NYC Asset Investors #1 LLC)	Alternative Invt - Real Estate	331,878
Pramerica Real Estate VI, LP	Alternative Invt - Real Estate	63,363
PW Real Estate Fund III LP	Alternative Invt - Real Estate	95,042
RFM NYCERS Sandy LLC (NYC Asset Investors #2 -Related)	Alternative Invt - Real Estate	123,186
Tristan European Property Investors Special Opportunities 4	Alternative Invt - Real Estate	233,905
UBS Trumbull Property Fd	Alternative Invt - Real Estate	450,273
USAA Eagle Real Estate Fund	Alternative Invt - Real Estate	83,802
Westbrook Real Estate Fund X Co-Investment	Alternative Invt - Real Estate	167,793
Cash Account (C/D - Fail Float Earnings)	BNY-Mellon - CD	59
BlackRock US LMC R1000 Core	Domestic Equity	28,037
LEGATO-ALTRAVUE SCV	Domestic Equity	8,098
LEGATO-BOWLING SCV	Domestic Equity	8,290
LEGATO-BRIDGE CITY SCG	Domestic Equity	13,163
LEGATO-DEAN SCV	Domestic Equity	10,765
LEGATO-ESSEX SCG	Domestic Equity	10,668
LEGATO-LISANTI-SCG	Domestic Equity	6,821
SSGA Russell Top 200	Domestic Equity	22,295
Wellington Mgmt MCC	Domestic Equity	1,485,892
Blackrock - Mortgage	Fixed Income	90,691
Loomis Sayles - High Yield	Fixed Income	(1,788)
Mackay Shields High Yield	Fixed Income	323,611
Nomura High Yield	Fixed Income	385,176
Prudential - Credit	Fixed Income	103,422

Additional Supplementary Information

Qualified Pension Plan and Tax Deferred Annuity Program | Fiscal Year Ended June 30, 2019 Schedule 4 (Cont'd)

SCHEDULE OF INVESTMENT EXPENSES (CONT'D)

FUND MANAGER	CATEGORY	AMOUNT (IN \$)
Securities Lending	Fixed Income	197,214
Shenkman - High Yield	Fixed Income	174,561
SSGA IT Treasury 1-10Y	Fixed Income	194
SSGA LI Treasury	Fixed Income	177,990
SSGA ST Treasury 1-3Y	Fixed Income	42,333
SSGA TIPS Passive	Fixed Income	10,777
Taplin Canida - Credit	Fixed Income	98,921
Short Term Accounts	Fixed Income Short Term	15,210
Acadian EM	International Equity	2,410,243
Acadian WorldxUS SCC	International Equity	449,817
Algert EAFE SCC	International Equity	63,580
Baillie Gifford WorldxUS LMCC	International Equity	1,103,849
Fiera Capital - Global	International Equity	288,115
FIS-ALGERT EAFE SC	International Equity	7,813
FIS-ATIVO EAFE	International Equity	41,325
FIS-AUBREY EM	International Equity	26,006
FIS-CHANGE GLOBAL EM	International Equity	48,255
FIS-DENALI EAFE	International Equity	39,936
FIS-DUNDAS EAFE	International Equity	45,113
FIS-MARTIN-EAFE	International Equity	8,397
FIS-METIS EAFE	International Equity	20,711
FIS-OSMOSIS EAFE	International Equity	46,669
FIS-REDWOOD INVESTMENTS	International Equity	8,626
FIS-TRANSITION	International Equity	2,048
Morgan Stanley - Global	International Equity	268,409
Sprucegrove WorldxUS LMCC	International Equity	1,007,431
Transition US Global	International Equity	4
Blackrock R2000 Growth	Mutual Fund Equity	4,566
Blackrock R2000 Value	Mutual Fund Equity	6,139
BlackRock US LC R1000 Value	Mutual Fund Equity	128
Barings Bank Loans	Mutual Fund Fixed Income	401,904
BlackRock Passive MSCI EM Core	Mutual Fund Fixed Income	499,942
SSGA TIPS Passive	Mutual Fund Fixed Income	3,626
AFL-CIO Housing Investment Trust	Mutual Fund Mortgage	63,054
RBC Access MBS	Mutual Fund Mortgage	17,432
Sub total		<u>30,512,000</u>

SCHEDULE OF INVESTMENT EXPENSES (CONT'D)

FUND MANAGER	CATEGORY	AMOUNT (IN \$)
Legal Fees		
Bryan Cave Leighton Paisner LLP		717
Cox Castle Nicholson LLP		6,509
Day Pitney LLP		3,339
Foley And Lardner LLP		7,420
Foster Pepper PLLC		10,232
Hitchcock Law Firm PLLC		3,610
Morgan Lewis Bockius LLP		11,827
Nixon Peabody LLP		30
Pillsbury Winthrop Shaw Pittman LLP		2,798
Reinhart Boerner Van Dueren		18,459
Seward Kissel LLP		140
Squire Patton Boggs (US) LLP		4,396
	Sub total	<u><u>69,477</u></u>
Consultant Fees		
Courtland Partners LTD		8,191
Ernst & Young Us LLP		136
Ernst And Young LLP		1,818
Hamilton Lane Advisors LLC		241,500
Mercer		6,088
Msci - Esg Research LLC		2,890
Msci Barra LLC		24,754
Msci-Investment Property Databank LTD		8,307
Pricewaterhousecoopers Taiwan		673
Segal Rogercasey		195,000
Stepstone Group LLC		12,667
Stepstone Group Real Estate LP		34,081
The Burgiss Group		8,513
Townsend Holdings		9,753
	Sub total	<u><u>554,371</u></u>
Others		
GT Analytics		402
EVALUATION SERVICES		
Institutional Shareholder Services		4,085
SHAREHOLDER RESEARCH SERVICES		
Statpro Inc		831
SUBSCRIPTIONS		
Zeno Consulting Group Inc		149
EVALUATION SERVICES		
	Sub total	<u><u>5,467</u></u>
2	Variable Investment Expenses	
	Qualified Pension Plan	78,951
	Tax-Deferred Annuity	665,192
	Investment Expenses FY 2019	<u><u>31,885,458</u></u>

Additional Supplementary Information
Qualified Pension Plan and Tax Deferred Annuity Program | Fiscal Year Ended June 30, 2019
Schedule 5

SCHEDULE OF ADMINISTRATIVE EXPENSES

EXPENSE TYPE	AMOUNT (in \$)
1 ADMINISTRATIVE EXPENSES (QPP):	
Consumable Supplies and Materials	158,063
Contractual Services	3,235,233
Furniture and Equipment	110,551
General Services	339,178
Salaries paid to Plan Personnel	13,514,836
Sub-Total	<u>17,357,861</u>
2 ADMINISTRATIVE EXPENSES (TDA):	
Contractual Services	119,474
Sub-Total	<u>119,474</u>
3 MISCELLANEOUS EXPENSES:	
Related Parties Administrative Expenses (Adm expenses made by the Comptroller on our behalf. Charged on investment)	1,551,417
Sub-Total	<u>1,551,417</u>
Total Administrative Expenses for FY 2019:	<u><u>\$ 19,028,752</u></u>

SCHEDULE OF DIRECT PAYMENTS TO CONSULTANTS

INDIVIDUAL OR FIRM NAME	NATURE OF SERVICES	AMOUNT (in \$)
McLean & Company 3960 Howard Hughes Parkway, Suite 500 Las Vegas, NV, 89169	HR Research and Advisory Services	12,256
Cordatius, LLC 39 W 93rd Street, Suite 9 New York, NY 10025	Investment Consultant	28,000
Segal Marco Advisors 333 West 34th Street New York, NY 10001	Investment Consultant	195,000
Groom Law Group, Chartered Department #0589 Washington, DC 20073	Legal Consultant	14,923
Gary Tunnicliffe & Jack Ziegler, LLC 321 Union Street, #4A Brooklyn, NY 11231	Velocity Project Consultant	694,404
Unique Comp Inc 27-08 42nd Road Long Island City, NY 11101	Velocity Project Consultant	164,159
Vitech Systems Group, Inc. 401 Park Avenue South, 12th Floor New York, NY 10016	Velocity Project Consultant	5,478,515
Total Consulting Fees for FY 2019		<u>\$ 6,587,257</u>

BERS VISION

To foster an environment of trust and security for our stakeholders through education, continuous improvement, and best practices.

INVESTMENT

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INTRODUCTION

The investment section presents the following:

- Investment report for FY 2019, prepared by Segal Marco Advisors, investment consultant for BERS.
- The investment schedules following the investment report supplement the investment information presented in the financial section and the investment report as presented by the investment consultant.

Schedules are presented for the following categories

- a. Consolidated investment performance
- b. Asset Pie: focusing on the current fiscal year asset composition
- c. Asset Allocation: presents 10 year comparison of the invested assets
- d. Investment Holdings
- e. Management fees and brokers commission
- f. Investment Summary

The investment section has been prepared based on data provided by:

- The Comptroller of the City of New York through BAM;
- Teachers' Retirement System of The City of New York;
- Segal Marco, independent investment advisor for BERS;
- Custodians of investments; and the
- Investment managers.

To: New York City Board of Education Retirement System (BERS)
From: Michael C. Wright
Date: November 25, 2019
Re: Report of Investment Activity for Fiscal Year 2019

Dear Members of the New York City Board of Education Retirement System:

Fund Summary of investment performance

The Board of Education Retirement System (“BERS”) Total Fund returned +6.99%, net of fees, for the Fiscal Year (FY) ending June 2019 compared to +7.30% for the BERS Policy Benchmark¹, against which it is measured. Performance for the FY ranked better than 69% of a peer group of public funds. The Fund increased in value and ended the fiscal year at \$6.45 billion (compared to \$5.99 billion last year). The one-year performance was very good. It is important to note that a pension fund is a long-term investment established to pay for participants’ benefits. Over the long term, the expected return used for the actuarial valuation is 7%. Over the 5-year time period ending June 2019, the Fund remains ahead of its benchmarks, with a + 7.17% average annual return versus +6.6% for the benchmark. The 5-year performance also ranks in the top 5% of peers.

Economic and Market Comment

There are a series of factors to consider regarding the economy and market for pension fund investing. The change in the U.S. Gross Domestic Product (“GDP”) is a useful measure of the growth and strength of the U.S. economy, which supports pension fund performance. Real U.S. economic growth as measured by the GDP at June 30, 2019, was at a rate of 2.0% compared to a 4.2 % rate at the end of the 2018 fiscal year. While growing slower the U.S. economy has been sustained by low unemployment, low inflation, a tax cut for many businesses and consumers, moderate wage growth and increased personal consumption for both goods and services. This combination has provided a business environment that has benefitted the Fund. Interest rates and inflation are also an important measures that affect the pension Fund’s performance and prospects. The U.S. Federal Reserve Bank (the “Fed”) followed through its plans to raise interest rates in the first half of the FY and subsequently held interest rates steady during the second half of the FY. The increases were anticipated and positioned the Fed to continue its wind down of the quantitative easing which started after the 2008 financial crisis. The Fed, like other Central Banks, raises interest rates to help manage inflation expectations and to balance growth and unemployment in the economy and reduces rates to stimulate growth. Indeed inflation has remained historically low, about at the Fed’s target of 2.5%. In the second half of the FY, the Fed did not increase rates due to uncertainty surrounding economic growth

¹ The Board of Education Policy Benchmark is a custom index representing the weighted average return of the benchmarks for each major investment program in the Fund. The Policy Benchmark as of 6/30 consisted of: 34.7% Russell 3000, 14.6% MSCI EAFE, 6.7% MSCI Emerging Markets, 5.91% Russell 3000 + 300 bps, 5.6% NFI ODCE Net + 100 bps, 1.2% Infrastructure index, 18.6% fixed income, 4.7% Barclays Capital US TIPS, 6.0% Citigroup BB&B Index, and 2.0% Credit Suisse Leveraged Loan Index.

and the effects of trade tensions between the U.S. and China and gave every indication it would reduce rates in the second half of calendar 2019.

The fund is diversified across U.S. and non-U.S. markets. In the first half of 2019, U.S. equities continued to rebound from the late 2018's downturn. Year to date through June 30, 2019, U.S. equities have posted double-digit gains. The U.S. stock market, as measured by the benchmark, Russell 3000 Index, returned 18.7% for the Fiscal Year 2019. Performance in the U.S. was fueled by optimism about the future U.S. China trade relations. In the U.S., top performing sectors were financials, materials and technology. The Fed's dovish pivot and an ensuing decline in longer interest rates drove performance in the defensive sectors, real estate and utilities.

Similarly, Non-U.S. developed equities also continued to rise after a volatile 2018. The non-U.S. equity market, as measured by the MSCI EAFE Index, returned +1.08%, while the custom NYC Developed Equity benchmark returned +0.16% for the Fiscal Year 2019. Switzerland, Australian and Germany have been top returning countries thus far in 2019. Brexit continues to loom over U.K. stocks, with lingering fears of an abrupt "no deal" exit from the European Union ("EU"). European ex-U.K. stocks also gained solidly with global trade tensions staying relatively stable and with European Central Bank President Mario Draghi hinting at further monetary easing to come. Within non-U.S. developed, cyclical sectors (technology, consumer discretionary and industrials) have performed better than defensive sectors (utilities, healthcare and consumer staples).

Emerging markets stocks had a very strong first quarter of 2019, but the returns did slowdown in the second half of the YTD period. Emerging market stocks fell sharply in May 2019 after trade talks between the U.S. and China broke down. Stocks then recovered in June after the G20 meeting, when hopes for new trade talks emerged. The emerging market asset class as measured by the benchmark, MSCI Emerging Markets Index, returned +1.21% for the Fiscal Year 2019.

As mentioned during the last Fiscal Year report on investment activity, continued caution is advised. While pension plans, including BERS, have benefitted from these periods of stronger U.S. stock and bond returns since the 2008 financial crisis, they are unlikely to continue at those levels over the long term. The BERS fund is very well diversified across all public and private equity, fixed income and real estate capital markets. Both, international developed and emerging markets returned less than U.S. and less than expected primarily due to volatility in those regions given tariff discussions, and political instability. Fixed income investments also rewarded risk taking with the high yield, below investment grade, bond index, returning +7.2%. Private Equity and Real Estate investments also had superior returns. Pension Fund investors such as the BERS Fund have long term horizons over which benefits will be paid. Therefore, BERS and its peers diversify to these investments where the invested capital is not needed over the 3 to 5 year period. Private market investments are not similarly affected by short-term interest rates and inflation and did well in FY 2019 but not as well as U.S. equities. The NCREIF NFI ODCE net + 100 bps (real estate benchmark) returned +6.51% and a Private Equity benchmark returned +12.01%. For BERS and its peers, diversification to lower risk assets did not add the expected level of value when looking at the very short term FY 2019.

Fund Description

Asset allocation is the percentage of Fund assets that are in stocks, bonds and private markets investments. During this most recent FY, the Fund's allocation hurt relative performance versus the Policy benchmark. As mentioned, the Fiscal Year return was +6.99% versus the benchmark return of +7.30%. The Trustees establish an Investment Policy with a target asset mix after considering the long-term growth prospects of a diversified portfolio of investments and the expected costs of the Plan participants' benefits. In order to

participate in the broad market performance, while keeping Fund expenses low, the Fund uses passive, index strategies for the majority of its public equity allocation. During the 2019 FY, the implementation plan for the asset allocation approved during the 2016 FY has progressed with additions to Private Equity, Real Estate and Infrastructure investments, while reducing U.S. equities and developed market non-U.S. equities. For BERS, diversification and the focus on low investment expenses and fees are very important to our long term planning, For the FY period, the private market investments did not do as well as U.S. stocks however they are critical to the implementation of the approved Investment Policy and we continue to commit to these investments. .

The Fund's target asset mix is 50% Public Equity (including U.S. and Non U.S.), 22% Alternative Private Markets (including Private Equity, Real Estate and Infrastructure) and 28% Fixed Income. Over the long-term, which is the framework for considering the term structure of the Plans' liabilities, we expect the asset allocation will continue to meet the benefit needs while providing growth and preservation of principal.

For the FY ending June 2019, the asset allocation detracted value and the manager selection did not add enough to offset that effect. The passive managers matched their benchmarks while active manager selection in U.S. stocks was unable to keep up with the benchmark (8.95% vs. 8.98% for the index. Non-U.S. equity also performed relatively poorly with a -1.11% return versus a +0.16% return for the benchmark. Most of the underperformance within the non-U.S. equity came from the emerging market sub-component. The Total Fixed Income (excl. ETI) return of +7.26% also underperformed the custom benchmark with structured fixed income, high yield and bank loans performing lower than their respective benchmarks. As part of our ongoing monitoring, we review the manager contributions and the structure of the Fund in order to achieve the expected levels of returns net of fees. The Fund's current level of diversification into alternative assets did help performance in FY 2019, as the Private Equity, Real Estate and Infrastructure investments out performed their respective benchmarks and also the fixed income and non-U.S. public investments .

Market conditions and fund performance will continue to be monitored closely to accomplish the goal of providing the benefits as promised to participants.

Sincerely,



Michael Wright
Senior Vice President



Vanessa Vargas Guijarro
Senior Consultant

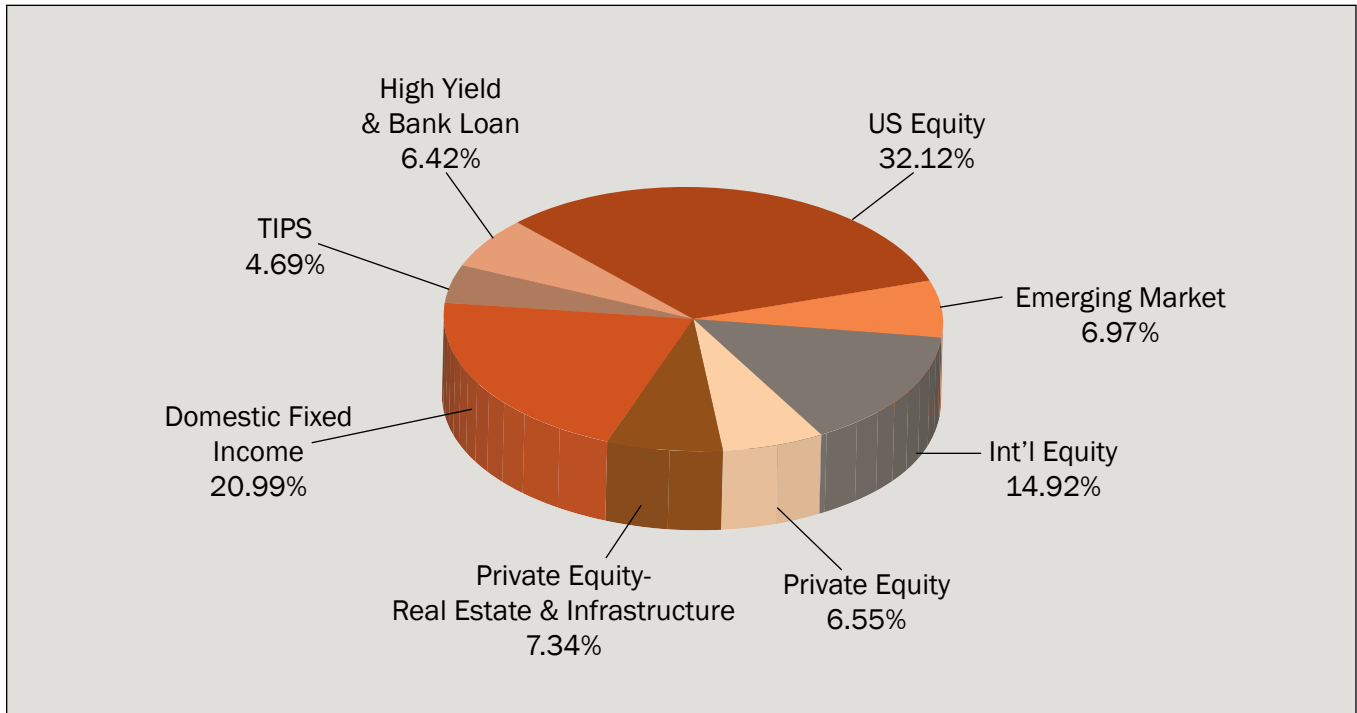
Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Investment Returns (Fixed) | Annualized Investment Results (Unaudited)
Fiscal Year Ended June 30, 2019

	3 Mos Apr-19 Jun-19 %	6 Mos Jan-19 Jun-19 %	1 Yr Jul-18 Jun-19 %	3 Yrs Jul-16 Jun-19 %	5 Yrs Jul-14 Jun-19 %	10 Yrs Jul-09 Jun-19 %
Domestic Equity	4.09	18.99	8.95	14.53	10.17	14.73
Russell 3000 Index	4.10	18.71	8.98	14.02	10.19	14.67
International Equity	3.37	17.35	-1.11	13.40	4.46	9.74
NYC Developed Equity Benchmark	3.50	14.39	0.16	9.02	2.20	6.88
Active Emerging Markets	1.00	9.18	-1.42	11.07	3.03	6.47
MSCI Emerging Markets	0.61	10.58	1.21	10.66	2.49	5.81
Private Equity	4.73	5.02	16.26	17.06	15.59	15.34
Russell 3K + 300bps	14.85	-0.80	12.01	16.86	13.64	19.77
Private Equity Real Estate and Infrastructure						
Real Estate	2.04	4.50	9.92	11.59	12.56	0.00
NCREIF NFI-ODCE NET + 100 BP	1.02	2.48	6.51	7.67	9.84	0.00
Infrastructure	2.96	5.04	12.55	16.33	13.94	0.00
CPI + 4%	1.45	3.02	5.86	6.16	5.55	0.00
Total Fixed Income	3.05	6.73	7.26	3.57	3.27	5.64
Structured Fixed Income	3.45	6.55	8.19	2.65	3.29	4.92
NYC Custom Structured Index - BERS	3.92	7.46	9.47	-	-	0.00
TIPS	2.85	6.18	4.83	2.08	1.84	3.78
BBG BARC GBL INF - LK: US TIPS (DLY)	2.86	6.15	4.84	2.08	1.76	3.64
High Yield	2.28	9.35	7.07	7.03	4.12	9.12
High Yield Custom Benchmark	2.50	9.94	7.48	7.06	4.41	8.24
Bank Loans	0.95	4.75	2.98	4.87	3.52	0.00
CSFB Leveraged Loan Index	1.58	5.42	4.15	5.43	3.85	0.00
Targeted Investments	3.70	6.59	9.21	2.77	3.89	4.12
BERS Custom Benchmark	2.60	5.16	7.20	2.40	2.94	3.67
Short-term Investments	0.38	1.00	2.10	1.41	1.03	0.78
Total Portfolio	3.36	11.80	6.99	10.84	7.07	10.63
BERS's Policy Benchmark	4.09	11.61	7.30	9.74	6.62	10.20

Yield data were obtained from the NYCBERS Performance Overview as of June 30, 2019

These returns are calculated using a time weighted rate of return based on the market value of the portfolio, for time periods greater than one year the returns are annualized.

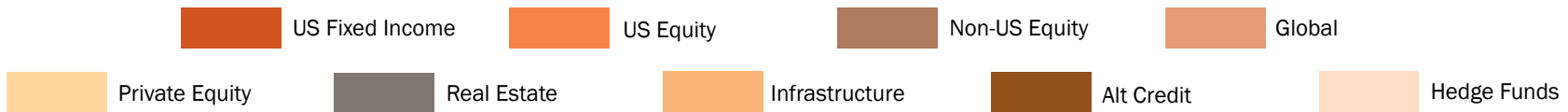
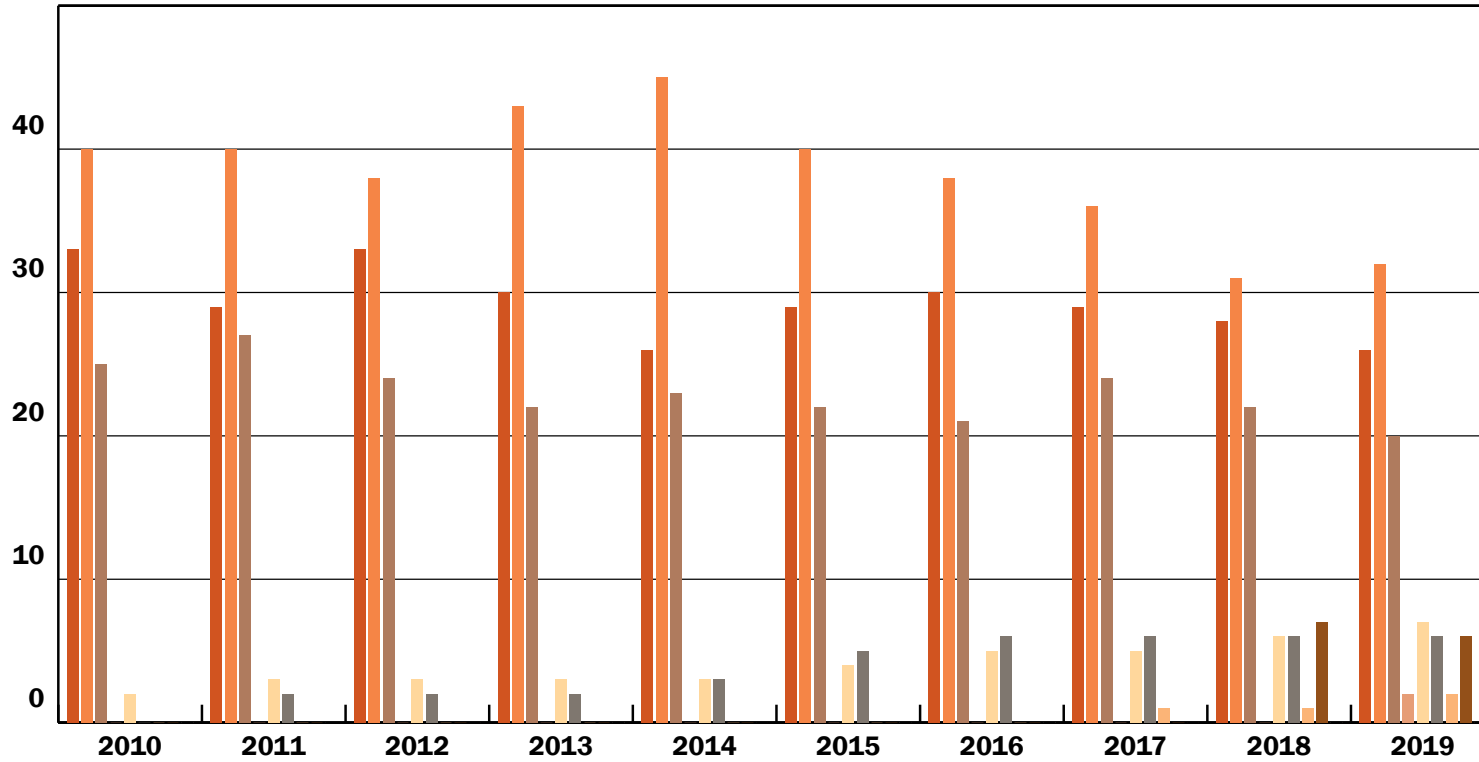
Qualified Pension Plan and Tax Deferred Annuity Program
Asset Allocation (Fixed)
Fiscal Year Ended June 30, 2019



Years	Domestic Fixed Income	TIPS	High Yield & Bank Loan	US Equity	Emerging Market	Int'l Equity	Private Equity	Private Equity-Real Estate & Infrastructure
6/30/10	25.27	2.72	3.66	36.22	8.46	21.67	2.00	0.00
6/30/11	22.63	2.62	3.43	39.97	5.37	21.51	2.81	1.66
6/30/12	24.81	2.46	6.00	37.79	4.48	19.03	3.28	2.15
6/30/13	20.01	3.91	5.60	42.90	4.56	17.59	3.04	2.39
6/30/14	16.69	3.38	6.19	44.72	4.67	18.27	3.25	2.83
6/30/15	20.67	3.16	5.48	40.15	4.94	17.06	4.07	4.47
6/30/16	19.50	5.00	5.50	37.00	5.00	17.00	4.97	6.03
6/30/17	20.37	4.81	6.00	36.49	7.98	12.76	5.01	6.58
6/30/18	22.87	4.73	7.11	30.74	7.54	14.24	5.91	6.86
6/30/19	20.99	4.69	6.42	32.12	6.97	14.92	6.55	7.34

Qualified Pension Plan and Tax Deferred Annuity Program
Asset Allocation (Fixed) | Fiscal Years Ended June 30, 2010 - June 30, 2019

% of
Portfolio
 50



Qualified Pension Plan and Tax Deferred Annuity Program
List of 50 Largest Equity Holdings (Fixed)
Fiscal Year Ended June 30, 2019

NAME OF EQUITY SECURITIES	COST	FAIR VALUE
1 MICROSOFT CORP	\$ 48,832,631	\$ 70,251,705
2 APPLE INC	55,324,469	63,183,585
3 AMAZON.COM INC	46,791,029	58,183,675
4 FACEBOOK INC CL A	29,875,769	33,689,887
5 BERKSHIRE HATHAWAY INC CL B	27,547,538	28,923,758
6 JOHNSON & JOHNSON	25,865,503	27,790,956
7 ALPHABET INC CL C	25,310,358	25,052,251
8 JPMORGAN CHASE & CO	24,952,106	24,989,648
9 SAMSUNG ELECTRONICS CO LTD	12,180,329	24,028,823
10 ALPHABET INC CL A	24,282,072	23,867,078
11 MASTERCARD INC CL A	16,399,722	23,523,330
12 FERRARI NV	5,862,027	23,225,222
13 VISA INC CLASS A SHARES	16,393,055	23,058,894
14 EXXON MOBIL CORP	21,702,305	22,524,699
15 ASML HOLDING NV	10,781,892	21,783,307
16 AIA GROUP LTD	10,391,665	21,414,661
17 ALIBABA GROUP HOLDING SP ADR	13,248,583	20,738,979
18 TENCENT HOLDINGS LTD	7,433,104	19,098,942
19 PROCTER & GAMBLE CO	13,604,945	18,801,466
20 BANK OF AMERICA CORP	18,321,225	17,293,802
21 SOFTBANK GROUP CORP	10,405,646	17,022,463
22 AT&T INC	17,804,121	16,968,057
23 WALT DISNEY CO	11,959,075	16,901,048
24 KERING	6,494,007	16,862,002
25 PFIZER INC	14,096,470	16,714,372
26 CISCO SYSTEMS INC	13,379,723	16,709,562
27 CHEVRON CORP	15,122,113	16,471,003
28 VERIZON COMMUNICATIONS INC	13,934,773	16,416,591
29 UNITEDHEALTH GROUP INC	14,878,083	16,009,496
30 HOME DEPOT INC	13,460,429	15,902,010
31 MERCK & CO. INC.	10,005,399	14,977,874
32 INTEL CORP	15,550,358	14,880,964
33 PEPSICO INC	12,100,901	14,324,510
34 PING AN INSURANCE GROUP CO	11,823,263	14,107,988
35 COCA COLA CO	11,602,613	13,540,595
36 BOEING CO	11,986,020	13,348,247
37 WELLS FARGO & CO	15,241,580	13,281,872
38 COMCAST CORP CL A	10,933,737	13,186,540
39 ADOBE INC	9,186,833	12,107,169
40 ZALANDO SE	8,378,391	11,965,536
41 CHINA CONSTRUCTION BANK	10,772,901	11,693,396
42 INDUSTRIA DE DISENO TEXTIL	8,100,403	11,437,594
43 CITIGROUP INC	11,254,209	11,214,674
44 MCDONALD S CORP	8,585,785	11,054,157
45 WALMART INC	8,524,944	10,796,420
46 L OREAL	5,938,685	10,767,640
47 NETFLIX INC	8,938,343	10,712,153
48 SPOTIFY TECHNOLOGY SA	11,640,157	10,698,933
49 ORACLE CORP	9,141,963	10,578,076
50 M3 INC	5,748,563	10,569,767

NOTE: Full listing of holdings can be obtained at
 NYC Board of Education Retirement System
 65 Court Street, 16th Floor, Brooklyn, NY 11201

Qualified Pension Plan and Tax Deferred Annuity Program
List of 50 Largest Debt Securities Holdings (Fixed)
Fiscal Year Ended June 30, 2019

NAME OF DEBT SECURITIES	INTEREST RATE	MATURITY DATE	PAR VALUE	FAIR VALUE
1 US TREASURY N/B	2.25%	2/15/2027	\$ 67,250,000	\$ 68,915,783
2 US TREASURY N/B	3.13%	8/15/2044	32,900,000	36,705,214
3 US TREASURY N/B	2.38%	5/15/2029	24,240,000	25,049,616
4 US TREASURY N/B	3.38%	5/15/2044	18,175,000	21,119,895
5 US TREASURY N/B	3.00%	8/15/2048	18,150,000	19,905,468
6 US TREASURY N/B	2.00%	2/15/2025	18,900,000	19,092,024
7 US TREASURY N/B	3.00%	10/31/2025	17,350,000	18,546,283
8 US TREASURY N/B	3.00%	5/15/2042	16,850,000	18,450,750
9 US TREASURY N/B	2.75%	8/31/2025	16,950,000	17,851,740
10 US TREASURY N/B	2.25%	8/15/2046	18,000,000	17,005,860
11 US TREASURY N/B	2.50%	2/15/2045	15,545,000	15,486,084
12 US TREASURY N/B	2.38%	8/15/2024	15,005,000	15,444,647
13 US TREASURY N/B	1.88%	8/31/2024	14,250,000	14,321,250
14 US TREASURY N/B	2.88%	8/15/2028	13,250,000	14,238,583
15 US TREASURY N/B	3.00%	5/15/2047	13,000,000	14,237,600
16 US TREASURY N/B	1.63%	5/15/2026	14,000,000	13,779,080
17 US TREASURY N/B	1.75%	11/30/2021	13,500,000	13,504,185
18 TSY INFL IX N/B	1.00%	2/15/2049	12,331,000	13,242,962
19 US TREASURY N/B	2.88%	5/31/2025	12,000,000	12,706,440
20 US TREASURY N/B	2.50%	1/31/2025	11,500,000	11,925,845
21 US TREASURY N/B	3.13%	2/15/2042	10,230,000	11,440,004
22 TSY INFL IX N/B	0.13%	4/15/2022	10,789,000	11,246,165
23 TSY INFL IX N/B	0.63%	4/15/2023	10,787,000	11,226,541
24 TSY INFL IX N/B	0.63%	1/15/2024	10,040,000	11,185,509
25 TSY INFL IX N/B	0.38%	7/15/2023	10,041,000	11,112,969
26 TSY INFL IX N/B	0.13%	1/15/2023	10,050,000	11,061,681
27 TSY INFL IX N/B	0.13%	7/15/2022	9,968,000	11,041,599
28 TSY INFL IX N/B	0.38%	7/15/2025	10,044,000	10,939,778
29 US TREASURY N/B	3.50%	2/15/2039	9,200,000	10,928,220
30 TSY INFL IX N/B	0.25%	1/15/2025	10,043,000	10,845,703
31 TSY INFL IX N/B	0.13%	7/15/2024	10,049,000	10,794,411
32 TSY INFL IX N/B	0.13%	4/15/2021	9,991,000	10,670,380
33 TSY INFL IX N/B	0.13%	1/15/2022	9,508,000	10,665,784
34 GNMA II TBA 30 YR	4.40%	7/22/2049	10,061,000	10,429,635
35 US TREASURY N/B	1.63%	2/15/2026	10,500,000	10,346,595
36 US TREASURY N/B	6.25%	5/15/2030	7,125,000	10,052,378
37 TSY INFL IX N/B	0.63%	1/15/2026	9,062,000	9,978,331
38 TSY INFL IX N/B	0.63%	7/15/2021	8,568,000	9,772,860
39 US TREASURY N/B	2.38%	5/15/2027	9,435,000	9,754,563
40 US TREASURY N/B	2.50%	5/15/2046	9,500,000	9,445,090
41 TSY INFL IX N/B	1.13%	1/15/2021	7,829,000	9,215,232
42 TSY INFL IX N/B	0.38%	1/15/2027	8,568,000	9,124,442
43 TSY INFL IX N/B	0.75%	7/15/2028	8,568,000	9,086,089
44 TSY INFL IX N/B	0.13%	7/15/2026	8,568,000	9,070,426
45 TSY INFL IX N/B	0.50%	1/15/2028	8,574,000	9,025,615
46 FNMA TBA 30 YR	4.50%	8/13/2049	8,588,000	8,971,368
47 TSY INFL IX N/B	0.88%	1/15/2029	8,114,000	8,641,847
48 US TREASURY N/B	3.00%	2/15/2049	7,863,000	8,635,776
49 TSY INFL IX N/B	0.38%	7/15/2027	8,074,000	8,510,957
50 US TREASURY N/B	2.50%	6/30/2020	8,000,000	8,041,840

NOTE: Full listing of holdings can be obtained at
 NYC Board of Education Retirement System
 65 Court Street, 16th Floor, Brooklyn, NY 11201

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Investment Management Fees (Fixed)
Fiscal Year Ended June 30, 2019**

FUND MANAGER	CATEGORY	ASSETS UNDER MANAGEMENT AS OF 06/30/19 (in \$)	MANAGEMENT FEES (in \$)
AMERICAN SECURITIES PARTNERS VII, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	4,965,354	155,220.00
APAX PARTNERS IX	ALTERNATIVE INVT - PRIVATE EQUITY	8,158,547	300,875.00
APOLLO INVESTMENT FUND VIII	ALTERNATIVE INVT - PRIVATE EQUITY	17,380,764	239,559.00
APOLLO IX	ALTERNATIVE INVT - PRIVATE EQUITY	2,514,519	425,288.00
ARES CORPORATE OPPORTUNITIES FUND V, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	6,670,194	152,846.00
ASF VI B	ALTERNATIVE INVT - PRIVATE EQUITY	9,224,705	111,685.33
ASF VI B NYC CO-INVEST L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	2,246,852	5,770.00
ASF VII B, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	3,747,784	124,804.00
ASF VII B NYC CO-INVEST L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	4,359,428	3,191.00
ASF VIII B, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	73,061	130,018.00
BC EUROPEAN CAPITAL X	ALTERNATIVE INVT - PRIVATE EQUITY	5,684,260	131,042.81
BC EUROPEAN CAPITAL X CO-INVESTMENT	ALTERNATIVE INVT - PRIVATE EQUITY	3,376,083	7,177.96
BRIDGEPOINT EUROPE V L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	8,882,056	70,127.05
BRIDGEPOINT EUROPE V CO-INVESTMENT	ALTERNATIVE INVT - PRIVATE EQUITY	4,169,286	2,807.78
BRIDGEPOINT EUROPE VI L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	656,863	226,978.29
CAPITAL PARTNERS PRIVATE EQUITY INCOME FUND III, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	750,963	48,070.00
CARLYLE PARTNERS VI, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	18,362,537	113,658.50
CARLYLE PARTNERS VI, L.P. (SIDE CAR)	ALTERNATIVE INVT - PRIVATE EQUITY	1,544,766	983.24
CENTERBRIDGE CAPITAL PARTNERS III, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	1,548,516	70,923.17
CRESTVIEW PARTNERS III, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	11,834,669	233,835.00
CRESTVIEW PARTNERS III (CO-INVESTMENT B), L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	5,751,624	7,378.00
CVC CAPITAL PARTNERS VI	ALTERNATIVE INVT - PRIVATE EQUITY	18,107,680	184,878.52
CVC CAPITAL PARTNERS VII	ALTERNATIVE INVT - PRIVATE EQUITY	3,788,834	325,114.08
EQT VII, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	16,629,162	245,815.16
EQT VIII	ALTERNATIVE INVT - PRIVATE EQUITY	2,178,438	247,291.75
EQT VIII CO-INVESTMENT	ALTERNATIVE INVT - PRIVATE EQUITY	1,137,994	12,223.70
NEW YORK FAIRVIEW PRIVATE EQUITY, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	5,375,912	89,757.00
FTV V, LP	ALTERNATIVE INVT - PRIVATE EQUITY	3,012,278	89,323.00
GRAIN COMMUNICATIONS OPPORTUNITIES FUND II	ALTERNATIVE INVT - PRIVATE EQUITY	637,428	161,112.67
GREEN EQUITY INVESTORS VII	ALTERNATIVE INVT - PRIVATE EQUITY	6,390,394	144,898.83
ICV PARTNERS IV, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	378,154	70,737.00
KKR AMERICAS FUND XII L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	6,184,091	82,643.00
LANDMARK EQUITY PARTNERS XV	ALTERNATIVE INVT - PRIVATE EQUITY	7,088,404	250,936.83
LANDMARK NYC FUND I	ALTERNATIVE INVT - PRIVATE EQUITY	3,653,685	3,917.00
LEXINGTON CAPITAL PARTNERS VIII, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	14,831,840	323,926.67
MESIROW FINANCIAL PRIVATE EQUITY FUND III	ALTERNATIVE INVT - PRIVATE EQUITY	11,636,855	235,263.98
MESIROW FINANCIAL PRIVATE EQUITY FUND IV	ALTERNATIVE INVT - PRIVATE EQUITY	10,992,512	127,760.04
MESIROW FINANCIAL PRIVATE EQUITY FUND V	ALTERNATIVE INVT - PRIVATE EQUITY	35,963,238	240,662.21
MILL CITY CAPITAL II	ALTERNATIVE INVT - PRIVATE EQUITY	670,058	19,743.00
NEW MAINSTREAM CAPITAL II	ALTERNATIVE INVT - PRIVATE EQUITY	1,234,467	19,864.83
NEW MAINSTREAM CAPITAL III	ALTERNATIVE INVT - PRIVATE EQUITY	357,363	41,950.00
PALLADIUM V	ALTERNATIVE INVT - PRIVATE EQUITY	1,255,512	454,921.67
PATRIOT FINANCIAL PARTNERS II	ALTERNATIVE INVT - PRIVATE EQUITY	3,345,812	74,034.84
PATRIOT FINANCIAL PARTNERS III	ALTERNATIVE INVT - PRIVATE EQUITY	962,618	49,460.12
PLATINUM EQUITY CAPITAL PARTNERS III, LP	ALTERNATIVE INVT - PRIVATE EQUITY	5,499,029	753,315.00

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Investment Management Fees (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

FUND MANAGER	CATEGORY	ASSETS UNDER MANAGEMENT AS OF 06/30/19 (in \$)	MANAGEMENT FEES (in \$)
PLATINUM EQUITY PARTNERS SMALL CAP I	ALTERNATIVE INVT - PRIVATE EQUITY	598,099	95,354.00
PLATINUM EQUITY CAPITAL PARTNERS IV, LP	ALTERNATIVE INVT - PRIVATE EQUITY	9,604,279	229,335.00
PLATINUM EQUITY CAPITAL PARTNERS IV - SC	ALTERNATIVE INVT - PRIVATE EQUITY	979,938	1,543.53
RAINE PARTNERS II	ALTERNATIVE INVT - PRIVATE EQUITY	2,852,833	47,957.50
RAINE PARTNERS III	ALTERNATIVE INVT - PRIVATE EQUITY	852,713	62,119.00
SIRIS PARTNERS III	ALTERNATIVE INVT - PRIVATE EQUITY	2,038,635	131,256.33
SIRIS PARTNERS IV	ALTERNATIVE INVT - PRIVATE EQUITY	1,409,819	38,374.00
STELLEX CAPITAL MANAGEMENT LP	ALTERNATIVE INVT - PRIVATE EQUITY	2,987,143	65,800.00
VALOR EQUITY III	ALTERNATIVE INVT - PRIVATE EQUITY	4,413,974	69,672.33
VALOR EQUITY PARTNERS IV	ALTERNATIVE INVT - PRIVATE EQUITY	3,867,798	94,392.21
VISTA EQUITY PARTNERS FUND V, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	28,808,341	2,234,662.00
VISTA EQUITY PARTNERS FUND VI, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	18,685,730	227,487.00
VISTA VII	ALTERNATIVE INVT - PRIVATE EQUITY	2,782,511	30,948.00
WELSH, CARSON, ANDERSON & STOWE XII, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	9,020,454	185,729.00
WELSH, CARSON, ANDERSON & STOWE XIII, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	19,777	50,572.00
WARBURG PINCUS FINANCIAL SECTOR FUND	ALTERNATIVE INVT - PRIVATE EQUITY	4,908,676	272,645.00
WARBURG PINCUS PRIVATE EQUITY XI, LP	ALTERNATIVE INVT - PRIVATE EQUITY	22,423,691	643,747.97
WARBURG PINCUS PRIVATE EQUITY XII, LP	ALTERNATIVE INVT - PRIVATE EQUITY	18,713,092	338,599.50
WARBURG PINCUS GLOBAL GROWTH, L.P.	ALTERNATIVE INVT - PRIVATE EQUITY	131,717	45,862.00
WEBSTER CAPITAL III	ALTERNATIVE INVT - PRIVATE EQUITY	2,928,066	32,257.50
AERMONT CAPITAL REAL ESTATE FUND IV	ALTERNATIVE INVT - REAL ESTATE	720,813	86,673.42
ALMANAC FUND VIII	ALTERNATIVE INVT - REAL ESTATE	387,337	72,681.50
ALMANAC VIII SIDECAR	ALTERNATIVE INVT - REAL ESTATE	353,973	5,643.67
ARTEMIS CO-INVESTMENT (ARTEMIS MACH II, LLC)	ALTERNATIVE INVT - REAL ESTATE	9,178,314	94,347.33
BLACKSTONE REAL ESTATE PARTNERS EUROPE IV, L.P.	ALTERNATIVE INVT - REAL ESTATE	16,614,459	637,473.33
BLACKSTONE REAL ESTATE PTNRS VIII	ALTERNATIVE INVT - REAL ESTATE	13,920,569	235,780.00
BROOKFIELD STRATEGIC REAL ESTATE	ALTERNATIVE INVT - REAL ESTATE	7,457,161	810,006.53
BROOKFIELD STRATEGIC REAL ESTATE PARTNERS III	ALTERNATIVE INVT - REAL ESTATE	2,223,424	72,417.04
BROOKFIELD PREMIER REAL ESTATE PARTNERS	ALTERNATIVE INVT - REAL ESTATE	12,806,469	121,210.17
CARLYLE REALTY PARTNERS VII	ALTERNATIVE INVT - REAL ESTATE	15,626,539	565,328.00
DIVCOWEST FUND V	ALTERNATIVE INVT - REAL ESTATE	5,181,308	145,788.83
DRA GROWTH AND INCOME FUND IX	ALTERNATIVE INVT - REAL ESTATE	7,970,496	136,606.83
NYC VANBARTON INTERBOROUGH FUND LLC (NYC ASSET INVESTORS #1 LLC)	ALTERNATIVE INVT - REAL ESTATE	8,816,721	331,878.17
EXETER CORE INDUSTRIAL CLUB FUND II, L.P.	ALTERNATIVE INVT - REAL ESTATE	9,454,916	53,347.50
EXETER INDUSTRIAL VALUE FUND IV LP	ALTERNATIVE INVT - REAL ESTATE	7,083,206	126,210.00
FRANKLIN TEMPLETON PRIVATE REAL ESTATE FUND OF FUNDS	ALTERNATIVE INVT - REAL ESTATE	5,473,908	106,126.13
H/2 SPECIAL OPPORTUNITIES III L.P.	ALTERNATIVE INVT - REAL ESTATE	8,084,984	209,293.83
H/2 SPECIAL OPPORTUNITIES IV L.P.	ALTERNATIVE INVT - REAL ESTATE	1,985,774	62,142.17
HEITMAN CREDIT	ALTERNATIVE INVT - REAL ESTATE	10,197,351	24,963.00
HUDSON SUPERSTORM SANDY REBUILDING FUND (NYC ASSET INVESTOR #3 LLC)	ALTERNATIVE INVT - REAL ESTATE	5,523,855	71,117.67
JAMESTOWN PREMIER FUND	ALTERNATIVE INVT - REAL ESTATE	4,534,072	56,404.17
KKR REAL ESTATE CREDIT OPP PRTNRS AGG I	ALTERNATIVE INVT - REAL ESTATE	11,518,539	133,981.50
KKR REAL ESTATE PARTNERS AMERICAS II LP	ALTERNATIVE INVT - REAL ESTATE	3,206,646	103,033.67

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Investment Management Fees (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

FUND MANAGER	CATEGORY	ASSETS UNDER MANAGEMENT AS OF 06/30/19 (in \$)	MANAGEMENT FEES (in \$)
LASALLE US PROPERTY FD	ALTERNATIVE INVT - REAL ESTATE	39,667,279	266,882.00
CLARION LION INDUSTRIAL TRUST	ALTERNATIVE INVT - REAL ESTATE	22,034,552	138,061.17
LONE STAR RE PARTNER V, L.P.	ALTERNATIVE INVT - REAL ESTATE	1,848,560	513,515.50
METLIFE CORE PROPERTY	ALTERNATIVE INVT - REAL ESTATE	19,097,985	117,837.83
PRAMERICA REAL ESTATE VI, LP	ALTERNATIVE INVT - REAL ESTATE	3,996,359	63,198.73
PW REAL ESTATE FUND III LP	ALTERNATIVE INVT - REAL ESTATE	8,165,346	94,701.94
RFM NYCRS SANDY LLC (NYC ASSET INVESTORS #2 - RELATED)	ALTERNATIVE INVT - REAL ESTATE	12,836,298	123,186.17
TRISTAN EUROPEAN PROPERTY INVESTORS SPECIAL OPPORTUNITIES 4	ALTERNATIVE INVT - REAL ESTATE	8,962,220	233,481.78
UBS TRUMBULL PROPERTY FD	ALTERNATIVE INVT - REAL ESTATE	45,131,182	450,272.50
USAA EAGLE REAL ESTATE FUND	ALTERNATIVE INVT - REAL ESTATE	17,832,520	83,802.11
WESTBROOK REAL ESTATE FUND X CO-INVESTMENT	ALTERNATIVE INVT - REAL ESTATE	5,614,471	167,793.17
AXIUM INFRASTRUCTURE CANADA II (INTL) L.P.	ALTERNATIVE INVT - INFRASTRUCTURE	7,634,422	293.78
AXINFRA US II L.P.	ALTERNATIVE INVT - INFRASTRUCTURE	4,684,275	45,982.50
ACTIS ENERGY 4	ALTERNATIVE INVT - INFRASTRUCTURE	5,768,000	207,000.00
ASF VII INFRASTRUCTURE B LP	ALTERNATIVE INVT - INFRASTRUCTURE	4,829,628	152,585.00
BROOKFIELD INFRASTRUCTURE FUND II	ALTERNATIVE INVT - INFRASTRUCTURE	9,739,238	65,624.37
BROOKFIELD INFRASTRUCTURE FUND III	ALTERNATIVE INVT - INFRASTRUCTURE	5,616,680	109,629.83
BROOKFIELD INFRASTRUCTURE FUND III CO-INVEST	ALTERNATIVE INVT - INFRASTRUCTURE	1,946,657	18.57
EIG ENERGY PARTNERS	ALTERNATIVE INVT - INFRASTRUCTURE	2,474,555	3,985.83
EQT INFRASTRUCTURE III	ALTERNATIVE INVT - INFRASTRUCTURE	8,883,814	204,705.22
GLOBAL ENERGY & POWER INFRASTRUCTURE FUND II	ALTERNATIVE INVT - INFRASTRUCTURE	12,220,720	245,490.00
GLOBAL INFRASTRUCTURE PARTNERS III	ALTERNATIVE INVT - INFRASTRUCTURE	9,803,487	206,554.00
IFM GLOBAL INFRASTRUCTURE	ALTERNATIVE INVT - INFRASTRUCTURE	21,078,589	612,697.99
KKR GLOBAL INFRASTRUCTURE INVESTORS II, L.P.	ALTERNATIVE INVT - INFRASTRUCTURE	19,541,843	193,357.33
KKR GLOBAL INFRASTRUCTURE INVESTORS III	ALTERNATIVE INVT - INFRASTRUCTURE	1,816,615	135,303.67
BLACKROCK US LMC R1000 CORE	DOMESTIC EQUITY	1,305,056,212	23,525.46
LEGATO-ALTRAVUE SCV	DOMESTIC EQUITY	1,576,408	8,097.51
LEGATO-BOWLING SCV	DOMESTIC EQUITY	1,610,692	8,263.56
LEGATO-BRIDGE CITY SCG	DOMESTIC EQUITY	2,716,545	13,162.85
LEGATO-DEAN SCV	DOMESTIC EQUITY	2,062,696	10,765.33
LEGATO-ESSEX SCG	DOMESTIC EQUITY	2,109,821	10,667.65
LEGATO-LISANTI-SCG	DOMESTIC EQUITY	1,409,937	6,820.83
SSGA RUSSELL TOP 200	DOMESTIC EQUITY	433,626,903	22,258.39
WELLINGTON MGMT MCC	DOMESTIC EQUITY	173,121,628	1,484,928.75
CASH ACCOUNT (C/D - FAIL FLOAT EARNINGS)	FAIL FLOAT	1,376	412,476.81
BLACKROCK - MORTGAGE	FIXED INCOME	195,006,297	83,909.97
MACKAY SHIELDS HIGH YIELD	FIXED INCOME	140,921,594	322,983.61
NOMURA HIGH YIELD	FIXED INCOME	138,854,834	384,438.24
PRUDENTIAL - CREDIT	FIXED INCOME	123,901,500	89,648.54
SHENKMAN - HIGH YIELD	FIXED INCOME	-	174,616.42
SSGA IT TREASURY 1-10Y	FIXED INCOME	5,113,587	194.39
SSGA LI TREASURY	FIXED INCOME	569,190,077	177,990.02
SSGA ST TREASURY 1-3Y	FIXED INCOME	247,743,063	42,332.80

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Investment Management Fees (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

FUND MANAGER	CATEGORY	ASSETS UNDER MANAGEMENT AS OF 06/30/19 (in \$)	MANAGEMENT FEES (in \$)
SSGA TIPS PASSIVE	FIXED INCOME	138,854,834	10,776.94
TAPLIN CANIDA - CREDIT	FIXED INCOME	102,404,108	97,408.23
ACADIAN EM	INTERNATIONAL EQUITY	309,827,183	1,012,461.27
ACADIAN WORLDXUS SCC	INTERNATIONAL EQUITY	74,652,902	286,542.19
ALGERT EAFE SCC	INTERNATIONAL EQUITY	26,202,458	39,765.94
BAILLIE GIFFORD WORLDXUS LMCC	INTERNATIONAL EQUITY	350,287,727	762,449.27
FIERA CAPITAL - GLOBAL	INTERNATIONAL EQUITY	55,870,209	278,449.33
FIS-ALGERT EAFE SC	INTERNATIONAL EQUITY	-	5,520.73
FIS-ATIVO EAFE	INTERNATIONAL EQUITY	9,005,574	28,987.63
FIS-AUBREY EM	INTERNATIONAL EQUITY	8,475,318	21,105.48
FIS-CHANGE GLOBAL EM	INTERNATIONAL EQUITY	6,788,900	24,537.98
FIS-DENALI EAFE	INTERNATIONAL EQUITY	5,569,592	27,886.64
FIS-DUNDAS EAFE	INTERNATIONAL EQUITY	9,020,026	33,116.94
FIS-MARTIN-EAFE	INTERNATIONAL EQUITY	4,730,352	6,453.74
FIS-METIS EAFE	INTERNATIONAL EQUITY	2,570,973	14,925.15
FIS-OSMOSIS EAFE	INTERNATIONAL EQUITY	8,569,949	27,883.53
FIS-REDWOOD INVESTMENTS	INTERNATIONAL EQUITY	5,370,196	7,379.18
FIS-TRANSITION	INTERNATIONAL EQUITY	-	1,537.63
MORGAN STANLEY - GLOBAL	INTERNATIONAL EQUITY	50,757,669	255,930.34
SPRUCEGROVE WORLDXUS LMCC	INTERNATIONAL EQUITY	339,675,963	666,474.63
BLACKROCK R2000 GROWTH	MUTUAL FUND EQUITY	75,671,669	3,117.42
BLACKROCK R2000 VALUE	MUTUAL FUND EQUITY	69,503,700	2,987.00
BARINGS BANK LOANS	MUTUAL FUND FIXED INCOME	123,051,374	401,471.41
BLACKROCK PASSIVE MSCI EM CORE	MUTUAL FUND FIXED INCOME	139,018,092	36,729.03
SSGA TIPS PASSIVE	MUTUAL FUND FIXED INCOME	-	3,625.53
AFL-CIO HOUSING INVESTMENT TRUST	MUTUAL FUND MORTGAGE	17,109,602	63,053.86
RBC ACCESS MBS	MUTUAL FUND MORTGAGE	9,555,384	17,429.80

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Payments of Commissions to Brokers (Fixed)
Fiscal Year Ended June 30, 2019**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
ABEL NOSER CORP	46,497	2,243.40	0.048
ACTINVER CASA DE BOLSA SA DE CV	55,800	141.83	0.003
ALLEN & COMPANY LLC	12,237	292.72	0.024
ARQAAM CAPITAL SOUTH AFRICA (PTY)	29,882	779.85	0.026
B.RILEY & CO., LLC	4,472	101.83	0.023
BAADER BANK AG	7,182	179.49	0.025
BANCO BICE	45,295	205.66	0.005
BANCO ITAU SA	43,200	1,222.75	0.028
BANCO SANTANDER (BRASIL) S.A.	800	29.47	0.037
BANCO SANTANDER CHILE	3,545	13.48	0.004
BANK J.VONTOBEL UND CO. AG	13,560	2,100.66	0.155
BANK OF AMERICA CORPORATION	37,363	1,001.02	0.027
BANK OF AMERICA MERRILL LYNCH SECUR INC	143,700	584.39	0.004
BANQUE PARIBAS	4,281	87.02	0.020
BARCLAYS CAPITAL	243,104	150.85	0.001
BARCLAYS CAPITAL INC./LE	211,953	2,110.29	0.010
BARCLAYS CAPITAL LE	3,634	94.74	0.026
BATLIVALA & KARANI SECS INDIA PVT. LTD	213	7.20	0.034
BLOOMBERG TRADEBOOK LLC	3,661	107.15	0.029
BMO CAPITAL MARKETS	38,788	722.98	0.019
BNP PARIBAS SECURITIES SERVICES	325,446	2,816.84	0.009
BNP PARIBAS SECURITIES SERVICES SA	284,478	3,130.99	0.011
BOFA SECURITIES, INC.	2,297,476	13,801.44	0.006
BRDESCO S.A. CTVM	125,980	499.72	0.004
BTG PACTUAL CHILE S.A. CORREDORES DE BOL	45,005	4.01	0.000
BTIG, LLC	28,500	784.05	0.028
CABRERA CAPITAL MARKETS LLC	57,700	181.26	0.003
CANACCORD GENUITY INC.	13,878	441.93	0.032
CANADIAN IMPERIAL BANK OF COMMERCE	65,031	1,534.10	0.024
CANTOR FITZGERALD & CO.	5,659	168.50	0.030
CAPITAL INSTITUTIONAL SVCS INC EQUITIES	120	2.40	0.020
CARNEGIE A S	21,607	1,288.67	0.060
CARNEGIE SECURITIES FINLAND	21,854	963.95	0.044
CASTLEOAK SECURITIES L.P.	2,600	30.38	0.012
CHINA FORTUNE SECURITIES.,LTD	26,398	13.94	0.001
CHINA INTERNATIONAL CAPITAL CO	46,000	77.45	0.002
CHINA INTERNATIONAL CAPITAL CORPORATION	47,918	271.99	0.006
CIBC WORLD MKTS INC	71	1.61	0.023
CITIBANK BERHAD	49,518	43.46	0.001
CITIBANK N.A. ISTANBUL	5,349	38.25	0.007
CITIBANK N.A. SPAIN	333	3.92	0.012
CITIBANK NA LIMA	27,056	125.54	0.005
CITIBANK OF COLOMBIA	3,384	33.07	0.010

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Payments of Commissions to Brokers (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
CITIGROUP GLBL MARKET KOERA SECS LTD	910	16.74	0.018
CITIGROUP GLOBAL MARKETS INC	75,429	1,131.30	0.015
CITIGROUP GLOBAL MARKETS INC.	562,118	868.23	0.002
CITIGROUP GLOBAL MARKETS INDIA	32,993	55.73	0.002
CITIGROUP GLOBAL MARKETS LIMITED	2,339,463	5,993.36	0.003
CITIGROUP GLOBAL MARKETS TAIWAN	2,426,269	741.49	0.000
CL SECURITIES TAIWAN COMPANY LIMITED	21,596	477.91	0.022
CLSA AMERICAS	1,359	16.70	0.012
CLSA AUSTRALIA PTY LTD	1,168,602	760.90	0.001
CLSA SECURITIES KOREA LTD.	40,137	1,464.46	0.036
CLSA SECURITIES MALAYSIA SDN BHD	1,164,801	247.08	0.000
CLSA SINGAPORE PTE LTD.	718,800	7,529.28	0.010
COL FINANCIAL GROUP, INC.	669,000	91.20	0.000
COMMERCE INTL MERCHANT BANKERS	7,374	4.91	0.001
COMMERCIAL BANK OF QATAR, LTD.	56,673	422.73	0.007
CONVERGEX LLC	3,188	47.88	0.015
CORNERSTONE MACRO LLC	1,950	97.50	0.050
COWEN AND COMPANY, LLC	82,099	1,590.50	0.019
COWEN EXECUTION SERVICES LLC	2,237,528	6,693.68	0.003
CRAIG - HALLUM	7,763	349.17	0.045
CREDIBOLSA SOCIEDAD AGENTE	330	8.65	0.026
CREDICORP CAPITAL COLOMBIA S.A.	7,862	69.24	0.009
CREDIT AGRICOLE CIB	581	5.31	0.009
CREDIT LYONNAIS SECURITIES INDIA	2,351,969	11,664.07	0.005
CREDIT LYONNAIS SECURITIES (ASIA)	23,638,654	12,108.87	0.001
CREDIT SUISSE FIRST BOSTON	2,933,201	1,066.71	0.000
CREDIT SUISSE FIRST BOSTON (EUROPE)	1,846	10.76	0.006
CREDIT SUISSE FIRST BOSTON SA CTVM	173	0.04	0.000
CREDIT SUISSE SECS INDIA PRIVATE LTD	19,981	106.46	0.005
CREDIT SUISSE SECURITIES (EUROPE) LTD	3,113,424	11,574.83	0.004
CREDIT SUISSE SECURITIES (USA) LLC	7,779,406	13,087.95	0.002
CS FIRST BOSTON (HONG KONG) LIMITED	33,063	163.06	0.005
CUTTONE & CO. INC.	3,600	36.00	0.010
DAIWA SECURITIES AMERICA INC	41,495	3,141.05	0.076
DAIWA SECURITIES SMBC CATHY CO	98,658	30.83	0.000
DANARESKA SECURITIES, PT	293,900	516.22	0.002
DAVY STOCKBROKERS	34,960	993.56	0.028
DBS VICKERS (HONG KONG) LIMITED	10,809	191.07	0.018
DBS VICKERS SECURITIES (SINGAPORE)	146,273	1,041.81	0.007
DEUTSCHE BANK AG	761,984	775.32	0.001
DEUTSCHE BANK SECURITIES INC	345,942	2,010.68	0.006
DEUTSCHE EQ IN PRVT LIM DB	436	14.61	0.034
DEUTSCHE SECURITIES ASIA LIMITED	150,035	62.28	0.000

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Payments of Commissions to Brokers (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
DEUTSCHE SECURITIES ASIA LTD	703	8.85	0.013
DOLAT CAPITAL MARKETS LTD	107	3.88	0.036
DOUGHERTY & COMPANY LLC	4,826	160.27	0.033
DSP MERRILL LYNCH LTD	6,719	63.07	0.009
EDELWEISS SECURITIES PVT. LTD	85	1.13	0.013
ERSTE BANK BEFEKTETESI RT.	9,732	525.13	0.054
EXANE S.A.	9,996	1,032.98	0.103
FBR CAPITAL MARKETS & CO.	504	10.08	0.020
FIDELITY CAPITAL MARKETS	804	20.12	0.025
FIDELITY CLEARING CANADA	423	2.34	0.006
FIDELITY CLEARING CANADA ULC	86,785	1,735.69	0.020
FINANCIAL BROKERAGE GROUP (FBG)	69,755	127.58	0.002
FLOW CORRETORA DE MERCADORIAS LTDA.	641,875	2,304.35	0.004
GOLDMAN SACHS (ASIA) L.L.C.	2,697,033	685.53	0.000
GOLDMAN SACHS (ASIA) LLC	83,790	933.56	0.011
GOLDMAN SACHS (INDIA)	118,611	212.44	0.002
GOLDMAN SACHS & CO INTL	22,600	85.02	0.004
GOLDMAN SACHS & CO LLC	10,784,208	15,800.92	0.001
GOLDMAN SACHS DO BRASIL CORRETORA	300,404	574.96	0.002
GOLDMAN SACHS INTERNATIONAL	655,764	590.13	0.001
GREEN STREET TRADING, LLC	8,151	211.41	0.026
GUGGENHEIM CAPITAL MARKETS LLC	14,262	352.78	0.025
HAITONG SECURITIES	11,307	3.94	0.000
HEIGHT SECURITIES, LLC	4,008	80.16	0.020
HILLTOP SECURITIES INC	863	34.52	0.040
HSBC BANK PLC	2,736,433	5,499.20	0.002
HSBC BANK USA	33,738	203.21	0.006
HSBC BROKERAGE (USA) INC.	10,372	181.51	0.018
HSBC SECURITIES (USA) INC.	10,436,634	3,730.23	0.000
HSBC SECURITIES INDIA HOLDINGS	222,702	1,358.38	0.006
ICBC STANDARD BANK PLC	890	154.71	0.174
ICBCFS LLC	75	3.75	0.050
ICICI BROKERAGE SERVICES	2,367,876	5,950.47	0.003
INDIA INFOLINE LTD	246	3.18	0.013
INDUSTRIAL & COMMERCIAL BNK OF CHNA FS LLC	29,231	584.62	0.020
INSTINET	34,014	353.10	0.010
INSTINET AUSTRALIA CLEARING SRVC PTY LTD	1,015,088	908.71	0.001
INSTINET LLC	5,644,609	8,388.61	0.001
INSTINET PACIFIC LIMITED	23,133,087	9,227.26	0.000
INSTINET SINGAPORE SERVICES PT	368,911	599.58	0.002
INSTINET U.K. LTD	4,843,029	25,939.36	0.005
INVESTEC BANK PLC	264	4.87	0.018
INVESTMENT TECHNOLOGY GROUP INC.	105,915	1,819.63	0.017

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Payments of Commissions to Brokers (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
INVESTMENT TECHNOLOGY GROUP LTD	1,681,999	9,884.31	0.006
IPOPEMA SECURITIES S.A.	1,652	63.61	0.039
IS YATIRIM MENKUL DEGERLER AS	287,107	613.65	0.002
ISI GROUP INC	31,802	521.80	0.016
ITG AUSTRALIA LTD.	7,734,237	2,953.73	0.000
ITG CANADA	14,502	150.15	0.010
ITG INC	2,087,323	1,120.60	0.001
ITG INC.	9,734	150.14	0.015
IXE CASA DE BOLSA SA DE CV	56,700	151.73	0.003
J P MORGAN INDIA PRIVATE LTD	40,272	105.31	0.003
J P MORGAN SECURITIES INC	909,367	1,845.62	0.002
J.P. MORGAN CLEARING CORP.	27,494	176.69	0.006
J.P. MORGAN SECURITIES (TAIWAN) LTD	964,412	407.07	0.000
J.P. MORGAN SECURITIES LIMITED	2,366	9.40	0.004
J.P. MORGAN SECURITIES LLC	189,873	3,268.13	0.017
J.P. MORGAN SECURITIES PLC	321,804	7,253.50	0.023
J.P.MORGAN SECURITIES(FAR EAST)LTD SEOUL	27,000	194.56	0.007
JANNEY MONTGOMERY, SCOTT INC	2,100	42.00	0.020
JEFFERIES & COMPANY INC	574,746	3,942.58	0.007
JEFFERIES HONG KONG LIMITED	3,803	0.65	0.000
JEFFERIES INTERNATIONAL LTD	326,752	1,947.10	0.006
JM FINANCIAL INSTITUTIONAL SECURITIES PR	328,469	2,894.35	0.009
JMP SECURITIES	3,506	80.28	0.023
JOH. BERENBERG, GOSSLER & CO. KG	182,529	2,111.99	0.012
JONESTRADING INSTITUTIONAL SERVICES LLC	68,398	1,365.04	0.020
JONESTRADING INSTITUTIONAL SERVICES, LLC	81,859	372.46	0.005
JP MORGAN SECURITIES AUSTRALIA LTD	69,559	87.57	0.001
JP MORGAN SECURITIES SINGAPORE	1,151,988	90.45	0.000
JPMORGAN SECURITIES (ASIA PACIFIC) LTD	11,071,201	3,188.56	0.000
KEEFE BRUYETTE & WOODS INC	2,611	78.33	0.030
KEPLER EQUITIES PARIS	831	78.60	0.095
KEYBANC CAPITAL MARKETS INC	7,718	334.05	0.043
KGI SECURITIES CO. LTD	67,000	269.00	0.004
KING, CL, & ASSOCIATES, INC	12,296	472.19	0.038
LEERINK PARTNERS LLC	2,069	78.17	0.038
LIQUIDNET INC	222,461	1,353.52	0.006
LOOP CAPITAL MARKETS	1,711,913	10,368.83	0.006
LOOP CAPITAL MARKETS LLC	172,912	598.02	0.003
LUMINEX TRADING AND ANALYTICS LLC	2,969	29.69	0.010
MACQUARIE BANK LIMITED	8,109,424	6,733.57	0.001
MACQUARIE CAPITAL (USA) INC	2,975	16.84	0.006
MACQUARIE CAPITAL (USA) INC.	2,464	32.61	0.013
MACQUARIE SECURITIES (INDIA) PVT LTD	2,285	4.10	0.002

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Payments of Commissions to Brokers (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
MACQUARIE SECURITIES (USA) INC	262	7.86	0.030
MACQUARIE SECURITIES KOREA LIMITED	23,498	147.98	0.006
MAINFIRST BANK DE	12,749	773.10	0.061
MEDIOBANCA SPA	7,981	232.32	0.029
MERRILL LYNCH	3,550	239.45	0.067
MERRILL LYNCH EQUITIES (AUSTRALIA)	400	1.53	0.004
MERRILL LYNCH FAR EAST LTD	3,600	7.50	0.002
MERRILL LYNCH INTERNATIONAL	11,038,419	10,490.38	0.001
MERRILL LYNCH INTL LONDON	4,500	10.12	0.002
MERRILL LYNCH PIERCE FENNER AND S	581,560	2,014.25	0.003
MIRABAUD SECURITIES LLP	4,785	184.45	0.039
MIRAE ASSET SEC USA	1,295	64.75	0.050
MITSUBISHI UFJ SECURITIES (USA)	1,639	60.79	0.037
MIZUHO INTERNATIONAL PLC	4,800	28.57	0.006
MIZUHO SECURITIES USA INC	200	92.02	0.460
MIZUHO SECURITIES USA INC.	1,447	57.88	0.040
MORGAN STANLEY AND CO INTERNATIONAL	82,371	1,745.62	0.021
MORGAN STANLEY AND CO. INTERNATIONAL	5,870,980	15,913.33	0.003
MORGAN STANLEY ASIA LTD	41,146	34.91	0.001
MORGAN STANLEY CO INCORPORATED	12,103,064	12,819.25	0.001
MORGAN STANLEY INDIA COMPANY PVT LTD	343,035	1,110.69	0.003
MORGAN STANLEY TAIWAN LIMITED	20,230	41.74	0.002
MOTILAL OSWAL SECURITIES LIMITED	3442	119.04	0.035
NATIONAL FINANCIAL SERVICES CORPORATION	20,398	152.50	0.007
NEEDHAM AND COMPANY LLC	6,504	308.02	0.047
NESBITT BURNS	7,662	231.86	0.030
NOMURA FINANCIAL ADVISORY & SEC INDIA	459,467	1,205.76	0.003
NORTH SOUTH CAPITAL LLC	10,710	210.06	0.020
NORTHLAND SECURITIES INC.	1,215	48.60	0.040
O NEIL, WILLIAM AND CO. INC / BCC CLRG	2,282	45.64	0.020
OPPENHEIMER & CO. INC.	5,397	126.38	0.023
PAREL	10,069	404.19	0.040
PAVILION GLOBAL MARKETS LTD	150,023	1,359.33	0.009
PEEL HUNT LLP	745,168	60.33	0.000
PENSERRA SECURITIES	209,069	2,090.69	0.010
PENSERRA SECURITIES LLC	1,306,741	3,997.22	0.003
PERSHING LLC	78,920,744	30,947.84	0.000
PERSHING SECURITIES CANADA LIMITED	200,000	62.30	0.000
PERSHING SECURITIES LIMITED	137,908	1,103.50	0.008
PICKERING ENERGY PARTNERS, INC	6,213	124.26	0.020
PICTET AND CIE	7,783	114.36	0.015
PIPER JAFFRAY & CO.	18,712	672.72	0.036
R.B.C. DOMINION SECURITIES CORPORATION	55,082	1,107.28	0.020

**Qualified Pension Plan and Tax Deferred Annuity Program
Schedule of Payments of Commissions to Brokers (Fixed)
Fiscal Year Ended June 30, 2019 (Cont'd)**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
RAYMOND JAMES AND ASSOCIATES	17,750	957.08	0.054
RAYMOND JAMES AND ASSOCIATES INC	45,014	1,554.43	0.035
RAYMOND JAMES LTD	3,856	120.68	0.031
RBC CAPITAL MARKETS, LLC	137,521	1,786.76	0.013
RBC DOMINION SECURITIES INC.	75,990	1,466.01	0.019
REDBURN (EUROPE) LIMITED	98,351	3,233.91	0.033
ROBERT W. BAIRD CO.INCORPORATED	139,027	4,446.20	0.032
ROYAL BANK OF CANADA EUROPE LTD	313,984	3,026.49	0.010
SANFORD C BERNSTEIN CO LLC	112,586	1,338.67	0.012
SANFORD C. BERNSTEIN AND CO. LLC	298,231	1,472.79	0.005
SANFORD C. BERNSTEIN LTD	420,896	7,489.09	0.018
SBICAP SECURITIES LIMITED	14,467	463.17	0.032
SCOTIA CAPITAL (USA) INC	36,680	72.90	0.002
SEAPORT GROUP SECURITIES, LLC	18,616	306.18	0.016
SG AMERICAS SECURITIES LLC	2,734,161	3,319.53	0.001
SG ASIA SECURITIES (INDIA) PVT LTD	146,260	140.21	0.001
SG SECURITIES (LONDON) LTD.	628,419	151.33	0.000
SG SECURITIES HK	5,849,319	852.34	0.000
SHENYIN WANGUO SECURITIES (HK) LTD	725,189	476.75	0.001
SIDOTI & COMPANY LLC	811	24.33	0.030
SMBC SECURITIES INC	200	4.05	0.020
SOCIETE GENERALE	73,379	92.97	0.001
SOCIETE GENERALE LONDON BRANCH	1,457,565	7,843.44	0.005
SPARK CAPITAL ADVISORS (INDIA) PRIV LTD	366	13.08	0.036
STATE STREET BANK AND TRUST COMPANY	2,965	76.80	0.026
STEPHENS, INC.	17,278	773.96	0.045
STIFEL NICOLAUS & CO INC	30,598	901.99	0.029
STIFEL NICOLAUS EUROPE LIMITED	561	5.14	0.009
SUNTRUST CAPITAL MARKETS, INC.	19,230	659.49	0.034
TELSEY ADVISORY GROUP LLC	4,420	221.00	0.050
THE FIG GROUP, LLC	1,200	148.07	0.123
THE HONGKONG AND SHANGHAI BANK	152,830	1,375.93	0.009
TULLET & TOKYO SECS	1,179	23.58	0.020
UBS AG	5,321,107	8,300.90	0.002
UBS AG LONDON BRANCH	39,114	388.83	0.010
UBS LIMITED	1,080,034	7,759.45	0.007
UBS SECURITIES ASIA LTD	2,440,019	1,225.95	0.001
UBS SECURITIES CANADA INC	7,733	16.83	0.002
UBS SECURITIES INDIA PRIVATE LTD	50,542	99.65	0.002
UBS SECURITIES LLC	250,475	1,960.43	0.008
UBS SECURITIES PTE.LTD	296,008	127.39	0.000
UBS SECURITIES PTE.LTD., SEOUL	17,618	70.26	0.004
UBS WARBURG LLC	4,760	41.88	0.009

**Qualified Pension Plan and Tax Deferred Annuity Program
 Schedule of Payments of Commissions to Brokers (Fixed)
 Fiscal Year Ended June 30, 2019 (Cont'd)**

INDIVIDUAL OR BROKERAGE FIRM	# OF SHARES	COMMISSION PAID (in \$)	COMMISSION PER SHARE (in \$)
VIRTU AMERICAS LLC	55,322	1,352.49	0.024
WALL STREET ACCESS	20,982	128.15	0.006
WEDBUSH MORGAN SECURITIES INC	615	12.30	0.020
WEEDEN & CO.	319,997	2,361.68	0.007
WELLS FARGO SECURITIES LLC	13,843	247.90	0.018
WELLS FARGO SECURITIES, LLC	13,273	367.87	0.028
WILLIAM BLAIR & COMPANY L.L.C	46,444	2,354.21	0.051
WILLIAMS CAPITAL GROUP LP	998,384	5,018.76	0.005
WOLFE TRAHAN SECURITIES	1,767	35.34	0.020
XP INVESTIMENTOS CCTVM SA	219,328	358.25	0.002

**Qualified Pension Plan and Tax Deferred Annuity Program
Investment Summary (Fixed and Variable) | Fiscal Year Ended June 30, 2019
(In thousands)**

<u>Type of Investments</u>	<u>Fair Value</u>	<u>Percentages</u>
Short Term Investments	\$ 89,806	1.20 %
Debt Securities	1,853,710	24.88
Domestic Equity	2,698,595	36.21
Alternative Investments	892,479	11.98
Collective Trust Funds		
International Equity	1,096,779	14.72
Domestic Equity	261,858	3.51
Mortgage Debt Security	20,203	0.27
Fixed Income	123,051	1.65
Total Collective Trust Funds	1,501,891	20.15
Collateral From Securities Lending	415,588	5.58
Total Investments	<u>\$ 7,452,069</u>	<u>100.00</u>

People and Culture

Develop and support a culture of workforce excellence and effective leadership practices. Promote a positive work environment that encourages open communication, collaboration and transparency among leaders and staff.

Member Experience

Establish an effective communication program that informs, educates, and builds trust among members and BERS.

Execution Excellence

Deliver benefits processing and member services equitably, correctly, timely, and efficiently.

Develop a fully functional, modern, and cost-effective investment office with the ability to source, allocate, and monitor investments independently. To achieve a return greater than or equal to our actuarial assumption to enable BERS to pay all current and future earned benefits.

System & Data Integrity

Contributions and data received from employers and members will be processed and managed efficiently and effectively.

ACTUARIAL

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BERS GOALS



OFFICE OF THE ACTUARY

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SHERRY S. CHAN
CHIEF ACTUARY

December 6, 2019

Board of Trustees
New York City Board of Education Retirement System
65 Court Street
Brooklyn, NY 11201

Re: Actuarial Information for the Comprehensive Annual Financial Report (CAFR) for the
Fiscal Year Ended June 30, 2019

Dear Members of the Board of Trustees:

The financial objective of the New York City Board of Education Retirement System - Qualified Pension Plan (BERS-QPP or the Plan) is to fund members' retirement benefits during their active service by establishing employer normal contribution rates that, expressed as a percentage of active member annualized covered payroll, would remain approximately level over the future working lifetimes of those active members and, together with member contributions and investment income, are intended to ultimately be sufficient to accumulate assets to pay benefits when due.

An actuarial valuation of the Plan is performed annually as of the second June 30 preceding each fiscal year to determine the Employer Contributions to be paid for that fiscal year (i.e. June 30, 2017 (Lag) actuarial valuation to determine Fiscal Year 2019 Employer Contributions (the Actuarial Contributions)).

The funding policy of the City of New York (the City) is to contribute statutorily-required contributions (Statutory Contributions) and these contributions are generally funded by the City within the appropriate fiscal year.

For Fiscal Year 2019, the Actuarial Contributions to BERS, are equal to those recommended by the Actuary of the New York City Pension Funds and Retirement Systems (the Actuary) and represent the Statutory Contributions.

Pursuant to the Government Accounting Standards Board (GASB) Statement No. 67 (GASB67) and Statement No. 68 (GASB68), on September 27, 2019, the Actuary published the "Fiscal Year 2019 GASB 67/68 Report for the City of New York and the New York City Retirement Systems" (the Fiscal Year 2019 GASB67/68 Report). Appendix C of The Fiscal Year 2019 GASB67/68 Report contains information developed in accordance with GASB67 for BERS.

Actuarial Assumptions and Methods

The Actuary issued a Report entitled “Proposed Changes in Actuarial Assumptions and Methods Used in Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2018 for the New York City Board of Education Retirement System,” dated January 24, 2019. The actuarial assumptions and methods described in that report were adopted by the Board of Trustees at the February 27, 2019 Board meeting and are referred to as the “2019 A&M.” These new actuarial assumptions are effective beginning with Fiscal Year 2019.

These actuarial assumptions and methods meet the parameters set forth by the Actuarial Standards of Practice (ASOPs).

Benefits and Census Data

A summary of the benefits applicable to Plan members included in the June 30, 2017 (Lag) actuarial valuation is shown in the Financial Section of the CAFR. There were no changes in any of the plan provisions since the prior year.

Census data is submitted by the Plan’s administrative staff and by the employers’ payroll facilities and is reviewed by the Office of the Actuary (OA) for consistency and reasonability.

A summary of the census data used in the June 30, 2017 (Lag) actuarial valuation is included in this CAFR. A summary of the census data used in the June 30, 2016 (Lag) actuarial valuation of the Plan is available in the Fiscal Year 2018 CAFR.

Funded Status

The funded status of the Plan is usually expressed by the relationship of assets to liabilities.

With respect to the funded status of the Plan, included in the Actuarial Section of the CAFR is a schedule of funded status based on the Entry Age Normal cost method (Table 11).

Also included in the Actuarial Section of the CAFR is a Solvency Test (i.e. Comparative Summary of Accrued Liabilities Funded by Actuarial Value of Assets) (Table 12), as prescribed by the Government Finance Officers Association (GFOA). This Solvency Test represents an alternative approach to describing progress toward funding objectives.

Presentation Style and Sources of Information

The actuarial information herein is believed to be presented in a manner consistent with the requirements of the GFOA and, where applicable, with GASB67.

The following items in the Actuarial Section of the CAFR were prepared by the OA:

- Summary of Actuarial Assumptions and Methods in Effect for the June 30, 2017 (Lag) Actuarial Valuation.
- Active Member Valuation Data.
- Summary of Plan Membership.
- Retirees and Beneficiaries Added to and Removed from Rolls.
- Statutory vs. Actuarial Contributions.
- Funded Status Based on Entry Age Normal Cost Method.
- Comparative Summary of Accrued Liabilities Funded by Actuarial Value of Assets - Solvency Test.
- Contributions.

The following items in the Financial Section of the CAFR were also prepared by the OA:

- Membership Data.
- Net Pension Liability.
- Actuarial Assumptions and Methods.
- Schedule of Changes in Employers' Net Pension Liability and Related Ratios.
- Schedule of Employer Contributions.

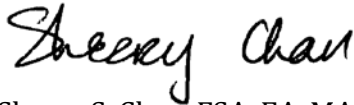
If you have any questions about any of the information in this Actuarial Section or any of the actuarial information presented elsewhere in this CAFR, please do not hesitate to contact Mr. Michael J. Samet, Mr. Edward Hue, or me.

Board of Trustees
New York City Board of Education Retirement System
December 6, 2019
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Acknowledgment of Qualification

I, Sherry S. Chan, am the Chief Actuary for, and independent of, the New York City Retirement Systems and Pension Funds. I am a Fellow of the Society of Actuaries, an Enrolled Actuary under the Employee Retirement Income and Security Act of 1974, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. To the best of my knowledge, the results contained herein have been prepared in accordance with generally accepted actuarial principles and procedures and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Respectfully submitted,



Sherry S. Chan, FSA, EA, MAAA, FCA
Chief Actuary

SSC/eh

Att.

cc: Mr. Craig Chu – New York City Office of the Actuary
Mr. Jean-Daniel Desmornes – New York City Board of Education Retirement System
Mr. Edward Hue – New York City Office of the Actuary
Mr. Michael Hunter – New York City Office of the Actuary
Mr. Sanford Rich – New York City Board of Education Retirement System
Mr. Michael Samet – New York City Office of the Actuary
Keith Snow, Esq. – New York City Office of the Actuary

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

1. Pursuant to Section 96 of the New York City Charter, studies of the actuarial assumptions used to value liabilities of the five actuarially-funded New York City Retirement Systems (NYCRS) are conducted every two years.

Also, in accordance with the Administrative Code of the City of New York (ACCNY), the Boards of Trustees of the five actuarially-funded NYCRS are to periodically review and adopt actuarial assumptions as proposed by the Actuary for use in the determination of Employer Contributions.

Based on the most recent actuarial experience study and recommendations prepared by Bolton, Inc. in their 10-year experience study ending on June 30, 2017, the Actuary issued a Report entitled "Proposed Changes in Actuarial Assumptions and Methods Used in Determining Employer Contributions for Fiscal Years Beginning on and after July 1, 2018 for the New York City Board of Education Retirement System," dated January 24, 2019. The actuarial assumptions and methods described in that report were adopted by the Board of Trustees at the February 27, 2019 Board meeting and are referred to as the "2019 A&M." These new actuarial assumptions and methods are effective beginning with Fiscal Year 2019.

2. The Actuarial Interest Rate assumption is 7.0% per annum, net of investment expenses (4.0% per annum for benefits payable under the Variable Annuity Program).
3. Active service tables are used to estimate various withdrawals from active service. Probabilities are shown in Table 1 for members withdrawing from active service for service retirement, Table 2 for members terminating from active service without employer-provided benefits or with vested benefits, and in Tables 3 and 4 for members withdrawing from active service due to disability or death, respectively.
4. The service retiree mortality, disabled retiree mortality, and beneficiary mortality base tables are projected from 2012 using mortality improvement scale MP-2018. The base tables are also multiplied by adjustment factors to convert them from lives-weighted to amounts-weighted tables to reflect socioeconomic effects on mortality. Base table probabilities for service and disability pensioners are shown in Tables 5a and 5b respectively, and for beneficiaries in Table 5c.
5. A salary scale is used to estimate salaries at termination, retirement, or death. Percentage increases are shown in Table 6. The salary scale includes a General Wage Increase (GWI) assumption of 3.0% per annum.
6. The economic assumptions (i.e. the assumed investment return rate, GWI rate, and Cost-of-Living Adjustments (COLA)) were developed assuming a long-term Consumer Price Inflation (CPI) assumption of 2.5% per annum. The assumption is 1.5% per annum for Auto COLA and 2.5% per annum for escalation.
7. The valuation assumes a closed group of members.
8. The Entry Age Normal (EAN) cost method of funding is used by the Plan's Actuary to calculate Employer Contributions.

Under this method, the Present Value (PV) of Future Benefits (PVFB) of each individual included in the actuarial valuation is allocated on a level basis over the earnings between the age a member enters the plan

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

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 a valuation date by the PV of Future Employer Normal Costs or future member contributions is the Accrued Liability (AL).

The excess, if any, of the AL over the Actuarial Value of Assets (AVA) is the Unfunded Accrued Liability (UAL).

Under this method, actuarial gains and losses, as they occur, reduce and increase the UAL, respectively, and are explicitly identified and amortized.

Increases or decreases in obligations due to benefit changes, actuarial assumption changes, and actuarial method changes are also explicitly identified and amortized.

A cost is added to each year's Normal Cost for providing a guaranteed 8.25% return on the TDA Fixed Fund for non-UFT members.

9. One-Year Lag Methodology (OYLM) uses a June 30, XX-2 valuation date to determine Fiscal Year XX Employer Contributions.

This methodology requires adjustments to certain components used to determine Fiscal Year XX employer contributions.

- a. Normal Cost: The normal cost as of June 30, XX-2 is rolled forward with the AIR of 7.0% to derive the mid-year normal cost for Fiscal Year XX.
- b. UAL Payments: For determining the UAL payments for Fiscal Year XX, and to be consistent with the OYLM, the UAL as of June 30, XX-2 is adjusted by the discounted value of employer normal cost and UAL payments paid during Fiscal Year XX-1 and the discounted value of Administrative Expenses reimbursed during Fiscal Years XX-1 and XX.

10. The Actuarial Asset Valuation Method (AAVM) recognizes investment returns greater or less than expected over a period of six years.

In accordance with this AAVM, actual Unexpected Investment Returns (UIR) are phased into the AVA at rates of 15%, 15%, 15%, 15%, 20%, and 20% per year, (i.e. cumulative rates of 15%, 30%, 45%, 60%, 80%, and 100% over a period of six years).

The AVA is further constrained to be within a corridor of 80% to 120% of the Market Value of Assets (MVA).

11. Obligations attributable to the WTC Disability Law and to the WTC Death Benefits Law are determined through the use of explicit assumptions in the 2019 A&M, and through estimation techniques for post-retirement reclassifications.

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation**

**Table 1
PROBABILITIES OF SERVICE RETIREMENT**

Age	Reduced Service Retirement	Unreduced Service Retirement Probabilities For Members Who Did Not Elect an Improved Retirement Program		Unreduced Service Retirement Probabilities For Members Who Elected an Improved Retirement Program	
		Year 1	Ultimate	Year 1	Ultimate
55	2.50%	15.00%	0.00%	35.00%	0.00%
56	2.50%	15.00%	6.50%	35.00%	12.00%
57	2.50%	15.00%	6.50%	35.00%	12.00%
58	2.50%	15.00%	6.50%	35.00%	12.00%
59	3.75%	15.00%	6.50%	35.00%	12.00%
60	5.00%	15.00%	6.50%	35.00%	12.00%
61	6.25%	15.00%	10.00%	35.00%	12.00%
62	7.50%*	20.00%/15.00%**	10.00%	50.00%	20.00%
63	0.00%	15.00%/20.00%***	10.00%	35.00%	15.00%
64	0.00%	15.00%	10.00%	35.00%	15.00%
65	0.00%	20.00%	15.00%	50.00%	20.00%
66	0.00%	15.00%	10.00%	35.00%	15.00%
67	0.00%	15.00%	10.00%	35.00%	15.00%
68	0.00%	15.00%	10.00%	35.00%	15.00%
69	0.00%	15.00%	10.00%	35.00%	15.00%
70	0.00%	20.00%	20.00%	35.00%	15.00%
71	0.00%	20.00%	20.00%	35.00%	15.00%
72	0.00%	20.00%	20.00%	35.00%	15.00%
73	0.00%	20.00%	20.00%	35.00%	15.00%
74	0.00%	20.00%	20.00%	35.00%	15.00%
75	0.00%	20.00%	20.00%	35.00%	15.00%
76	0.00%	20.00%	20.00%	35.00%	15.00%
77	0.00%	20.00%	20.00%	35.00%	15.00%
78	0.00%	20.00%	20.00%	35.00%	15.00%
79	0.00%	20.00%	20.00%	35.00%	15.00%
80+	NA	100.00%	100.00%	100.00%	100.00%

* 7.50% only applies to Tier 6 members; 0.00% otherwise.

** 20.00% for Tier 1, 2, & 4 members and 15.00% for Tier 6 members.

*** 15.00% for Tier 1, 2, & 4 members and 20.00% for Tier 6 members.

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

**Table 2
PROBABILITIES OF TERMINATION**

Years of Service	Males	Females
0	8.40%	5.60%
1	7.70%	5.30%
2	7.20%	5.00%
3	6.70%	4.70%
4	6.20%	4.50%
5	5.70%	4.20%
6	5.20%	3.90%
7	4.70%	3.60%
8	4.30%	3.30%
9	3.90%	3.00%
10	3.50%	2.80%
11	3.20%	2.60%
12	2.90%	2.50%
13	2.60%	2.40%
14	2.30%	2.20%
15	2.10%	2.10%
16	1.90%	1.90%
17	1.80%	1.80%
18	1.70%	1.70%
19	1.50%	1.50%
20+	1.40%	1.40%

**Qualified Pension Plan
 Summary of Actuarial Assumptions and Methods
 In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

**Table 3
 PROBABILITIES OF DISABILITY RETIREMENT**

Age	Ordinary Disability		Accidental Disability	
	Males	Females	Males	Females
15	0.20%	0.20%	0.030%	0.025%
16	0.20%	0.20%	0.030%	0.025%
17	0.20%	0.20%	0.030%	0.025%
18	0.20%	0.20%	0.030%	0.025%
19	0.20%	0.20%	0.030%	0.025%
20	0.20%	0.20%	0.030%	0.025%
21	0.20%	0.20%	0.030%	0.025%
22	0.20%	0.20%	0.030%	0.025%
23	0.20%	0.20%	0.030%	0.025%
24	0.20%	0.20%	0.030%	0.025%
25	0.20%	0.20%	0.030%	0.025%
26	0.20%	0.20%	0.030%	0.025%
27	0.20%	0.20%	0.030%	0.025%
28	0.20%	0.20%	0.030%	0.025%
29	0.20%	0.20%	0.030%	0.025%
30	0.20%	0.20%	0.030%	0.025%
31	0.22%	0.20%	0.030%	0.025%
32	0.24%	0.20%	0.030%	0.025%
33	0.26%	0.20%	0.030%	0.025%
34	0.28%	0.20%	0.030%	0.025%
35	0.30%	0.20%	0.030%	0.025%
36	0.32%	0.21%	0.030%	0.025%
37	0.34%	0.22%	0.030%	0.025%
38	0.36%	0.23%	0.030%	0.025%
39	0.38%	0.24%	0.030%	0.025%
40	0.40%	0.25%	0.030%	0.025%
41	0.42%	0.26%	0.030%	0.025%
42	0.44%	0.27%	0.030%	0.025%
43	0.46%	0.28%	0.030%	0.025%
44	0.48%	0.29%	0.030%	0.025%
45	0.50%	0.30%	0.030%	0.025%
46	0.52%	0.34%	0.030%	0.025%
47	0.54%	0.38%	0.030%	0.025%
48	0.56%	0.42%	0.030%	0.025%
49	0.58%	0.46%	0.030%	0.025%
50	0.60%	0.50%	0.030%	0.025%
51	0.62%	0.54%	0.030%	0.025%
52	0.64%	0.58%	0.030%	0.025%
53	0.66%	0.62%	0.030%	0.025%
54	0.68%	0.66%	0.030%	0.025%
55	0.70%	0.70%	0.030%	0.025%
56	0.70%	0.70%	0.030%	0.025%
57	0.70%	0.70%	0.030%	0.025%
58	0.70%	0.70%	0.030%	0.025%
59	0.70%	0.70%	0.030%	0.025%
60	0.70%	0.70%	0.030%	0.025%
61	0.70%	0.70%	0.030%	0.025%
62	0.70%	0.70%	0.030%	0.025%
63	0.70%	0.70%	0.030%	0.025%
64	0.70%	0.70%	0.030%	0.025%
65	0.70%	0.70%	0.030%	0.025%
66	0.70%	0.70%	0.030%	0.025%
67	0.70%	0.70%	0.030%	0.025%
68	0.70%	0.70%	0.030%	0.025%
69	0.70%	0.70%	0.030%	0.025%
70	0.70%	0.70%	0.030%	0.025%
71	0.70%	0.70%	0.030%	0.025%
72	0.70%	0.70%	0.030%	0.025%
73	0.70%	0.70%	0.030%	0.025%
74	0.70%	0.70%	0.030%	0.025%
75	0.70%	0.70%	0.030%	0.025%
76	0.70%	0.70%	0.030%	0.025%
77	0.70%	0.70%	0.030%	0.025%
78	0.70%	0.70%	0.030%	0.025%
79	0.70%	0.70%	0.030%	0.025%
80+	NA	NA	NA	NA

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

**Table 4
PROBABILITIES OF ACTIVE MEMBER MORTALITY**

Age	Ordinary Death		Accidental Disability
	Males	Females	
15	0.027%	0.020%	0.000%
16	0.027%	0.020%	0.000%
17	0.027%	0.020%	0.000%
18	0.027%	0.020%	0.000%
19	0.027%	0.020%	0.000%
20	0.027%	0.020%	0.000%
21	0.027%	0.020%	0.000%
22	0.027%	0.020%	0.000%
23	0.027%	0.020%	0.000%
24	0.027%	0.020%	0.000%
25	0.027%	0.020%	0.000%
26	0.029%	0.021%	0.000%
27	0.032%	0.023%	0.000%
28	0.035%	0.024%	0.000%
29	0.037%	0.025%	0.000%
30	0.040%	0.027%	0.000%
31	0.043%	0.028%	0.000%
32	0.045%	0.029%	0.000%
33	0.048%	0.031%	0.000%
34	0.051%	0.032%	0.000%
35	0.053%	0.033%	0.000%
36	0.056%	0.035%	0.000%
37	0.059%	0.036%	0.000%
38	0.061%	0.037%	0.000%
39	0.064%	0.039%	0.000%
40	0.067%	0.040%	0.000%
41	0.073%	0.045%	0.000%
42	0.080%	0.051%	0.000%
43	0.087%	0.056%	0.000%
44	0.093%	0.061%	0.000%
45	0.100%	0.067%	0.000%
46	0.107%	0.073%	0.000%
47	0.113%	0.080%	0.000%
48	0.120%	0.087%	0.000%
49	0.127%	0.093%	0.000%
50	0.133%	0.100%	0.000%
51	0.147%	0.107%	0.000%
52	0.160%	0.113%	0.000%
53	0.173%	0.120%	0.000%
54	0.187%	0.127%	0.000%
55	0.200%	0.133%	0.000%
56	0.213%	0.140%	0.000%
57	0.227%	0.147%	0.000%
58	0.240%	0.153%	0.000%
59	0.253%	0.160%	0.000%
60	0.267%	0.167%	0.000%
61	0.280%	0.173%	0.000%
62	0.293%	0.180%	0.000%
63	0.307%	0.187%	0.000%
64	0.320%	0.193%	0.000%
65	0.333%	0.200%	0.000%
66	0.360%	0.213%	0.000%
67	0.387%	0.227%	0.000%
68	0.413%	0.240%	0.000%
69	0.440%	0.253%	0.000%
70	0.500%	0.300%	0.000%
71	0.580%	0.350%	0.000%
72	0.660%	0.400%	0.000%
73	0.740%	0.450%	0.000%
74	0.820%	0.500%	0.000%
75	0.900%	0.550%	0.000%
76	1.020%	0.640%	0.000%
77	1.140%	0.730%	0.000%
78	1.260%	0.820%	0.000%
79	1.380%	1.000%	0.000%
80+	NA	NA	NA

Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)

Table 5a
PROBABILITIES OF MORTALITY FOR SERVICE RETIREES
BASE TABLE

Age	Males	Females	Age	Males	Females
15	0.0105%	0.0090%	68	1.6659%	0.9362%
16	0.0142%	0.0110%	69	1.7932%	1.0193%
17	0.0191%	0.0120%	70	1.9258%	1.1035%
18	0.0222%	0.0130%	71	2.0702%	1.2437%
19	0.0240%	0.0140%	72	2.2162%	1.3853%
20	0.0251%	0.0142%	73	2.3643%	1.5280%
21	0.0268%	0.0150%	74	2.5141%	1.6727%
22	0.0284%	0.0158%	75	2.6665%	1.8182%
23	0.0301%	0.0168%	76	3.0461%	2.0628%
24	0.0315%	0.0179%	77	3.4300%	2.3088%
25	0.0327%	0.0191%	78	3.8175%	2.5551%
26	0.0342%	0.0204%	79	4.2104%	2.8024%
27	0.0354%	0.0217%	80	4.6069%	3.0489%
28	0.0371%	0.0231%	81	5.1554%	3.4450%
29	0.0394%	0.0247%	82	5.7232%	3.8502%
30	0.0427%	0.0265%	83	6.3098%	4.2655%
31	0.0495%	0.0316%	84	6.9124%	4.6895%
32	0.0562%	0.0360%	85	7.5337%	5.1258%
33	0.0625%	0.0398%	86	8.3597%	5.8556%
34	0.0682%	0.0427%	87	9.1919%	6.5878%
35	0.0743%	0.0455%	88	10.0369%	7.3277%
36	0.0780%	0.0474%	89	10.8896%	8.0720%
37	0.0818%	0.0497%	90	11.7567%	8.8218%
38	0.0861%	0.0521%	91	13.4856%	10.1869%
39	0.0917%	0.0551%	92	15.2819%	11.5772%
40	0.0997%	0.0588%	93	17.1377%	13.0290%
41	0.1422%	0.0633%	94	19.0983%	14.4884%
42	0.1848%	0.0702%	95	21.2134%	16.0080%
43	0.2279%	0.0792%	96	23.2990%	17.8232%
44	0.2725%	0.0907%	97	25.4356%	19.4807%
45	0.3194%	0.1052%	98	27.7079%	20.8097%
46	0.3686%	0.1228%	99	29.9402%	21.7553%
47	0.4207%	0.1427%	100	32.1584%	22.1859%
48	0.4752%	0.1652%	101	33.7521%	23.0680%
49	0.5320%	0.1896%	102	35.1259%	24.0803%
50	0.5908%	0.2151%	103	36.3671%	25.2770%
51	0.6563%	0.2401%	104	37.3834%	26.6309%
52	0.7203%	0.2647%	105	38.1051%	28.0912%
53	0.7821%	0.2889%	106	38.4698%	29.6244%
54	0.8405%	0.3120%	107	38.6325%	31.1943%
55	0.8938%	0.3338%	108	38.8076%	32.7579%
56	0.9368%	0.3689%	109	38.9794%	34.2712%
57	0.9718%	0.4030%	110	50.0000%	50.0000%
58	0.9982%	0.4360%	111	50.0000%	50.0000%
59	1.0164%	0.4677%	112	50.0000%	50.0000%
60	1.0277%	0.4987%	113	50.0000%	50.0000%
61	1.0989%	0.5398%	114	50.0000%	50.0000%
62	1.1606%	0.5722%	115	50.0000%	50.0000%
63	1.2158%	0.6041%	116	50.0000%	50.0000%
64	1.2656%	0.6395%	117	50.0000%	50.0000%
65	1.3111%	0.6785%	118	50.0000%	50.0000%
66	1.4252%	0.7529%	119	50.0000%	50.0000%
67	1.5432%	0.8397%	120	100.0000%	100.0000%

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

**Table 5b
PROBABILITIES OF MORTALITY FOR DISABILITY RETIREES
BASE TABLE**

Age	Males	Females	Age	Males	Females
15	0.3309%	0.3302%	68	2.8866%	2.3870%
16	0.4477%	0.4467%	69	2.9926%	2.4723%
17	0.6034%	0.6020%	70	3.1133%	2.5721%
18	0.7007%	0.6521%	71	3.2494%	2.6887%
19	0.7591%	0.7023%	72	3.4007%	2.8231%
20	0.7745%	0.7242%	73	3.5688%	2.9757%
21	0.8177%	0.7766%	74	3.7535%	3.1493%
22	0.8636%	0.8321%	75	3.9565%	3.3428%
23	0.9115%	0.8806%	76	4.1960%	3.5573%
24	0.9623%	0.9414%	77	4.4576%	3.7722%
25	1.0128%	0.9950%	78	4.7400%	4.0056%
26	1.0629%	1.0450%	79	5.0460%	4.2512%
27	1.1121%	1.1039%	80	5.3741%	4.5399%
28	1.1590%	1.1437%	81	5.7241%	4.8505%
29	1.2025%	1.1849%	82	6.0991%	5.1822%
30	1.2403%	1.2276%	83	6.5012%	5.5379%
31	1.2721%	1.2719%	84	6.9293%	5.9081%
32	1.2964%	1.2906%	85	7.5490%	6.6447%
33	1.3125%	1.3095%	86	8.3752%	7.3415%
34	1.3230%	1.3220%	87	9.2076%	8.0805%
35	1.3497%	1.3314%	88	10.0528%	8.8285%
36	1.3769%	1.3388%	89	10.9057%	10.1243%
37	1.4047%	1.3459%	90	11.7730%	11.4944%
38	1.4330%	1.3555%	91	13.5023%	12.9995%
39	1.4619%	1.3700%	92	15.2987%	14.4425%
40	1.4914%	1.3831%	93	17.1548%	15.8488%
41	1.5215%	1.3968%	94	19.1157%	17.6512%
42	1.5522%	1.4199%	95	21.2311%	19.4304%
43	1.5835%	1.4535%	96	23.3168%	20.7560%
44	1.6154%	1.4910%	97	25.4537%	21.5692%
45	1.6480%	1.5473%	98	27.7263%	22.0007%
46	1.6812%	1.6100%	99	29.9589%	23.0087%
47	1.7151%	1.6774%	100	32.1584%	23.1230%
48	1.7497%	1.7359%	101	33.7521%	23.6022%
49	1.7850%	1.7789%	102	35.1259%	24.0803%
50	1.8210%	1.8069%	103	36.3671%	25.2770%
51	1.8577%	1.8265%	104	37.3834%	26.6309%
52	1.8952%	1.8400%	105	38.1051%	28.0912%
53	1.9838%	1.8414%	106	38.4698%	29.6244%
54	2.0700%	1.8419%	107	38.6325%	31.1943%
55	2.1499%	1.8425%	108	38.8076%	32.7579%
56	2.2301%	1.8428%	109	38.9794%	34.2712%
57	2.2996%	1.8478%	110	50.0000%	50.0000%
58	2.3571%	1.8725%	111	50.0000%	50.0000%
59	2.4033%	1.9054%	112	50.0000%	50.0000%
60	2.4415%	1.9416%	113	50.0000%	50.0000%
61	2.4758%	1.9833%	114	50.0000%	50.0000%
62	2.5090%	2.0209%	115	50.0000%	50.0000%
63	2.5475%	2.0671%	116	50.0000%	50.0000%
64	2.5926%	2.1353%	117	50.0000%	50.0000%
65	2.6476%	2.2013%	118	50.0000%	50.0000%
66	2.7148%	2.2603%	119	50.0000%	50.0000%
67	2.7940%	2.3165%	120	100.0000%	100.0000%

**Qualified Pension Plan
 Summary of Actuarial Assumptions and Methods
 In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

**Table 5c
 PROBABILITIES OF BENEFICIARY MORTALITY
 BASE TABLE**

Age	Males	Females	Age	Males	Females
15	0.0105%	0.0092%	68	1.8256%	1.3605%
16	0.0142%	0.0112%	69	1.9386%	1.4332%
17	0.0191%	0.0122%	70	2.0542%	1.5007%
18	0.0222%	0.0133%	71	2.2359%	1.6745%
19	0.0240%	0.0143%	72	2.4230%	1.8463%
20	0.0251%	0.0145%	73	2.6165%	2.0157%
21	0.0268%	0.0153%	74	2.8157%	2.1838%
22	0.0284%	0.0161%	75	3.0220%	2.3492%
23	0.0301%	0.0171%	76	3.4928%	2.6652%
24	0.0315%	0.0183%	77	3.9787%	2.9831%
25	0.0327%	0.0195%	78	4.4792%	3.3011%
26	0.0342%	0.0208%	79	4.9963%	3.6207%
27	0.0354%	0.0221%	80	5.5282%	3.9391%
28	0.0371%	0.0236%	81	6.1051%	4.4386%
29	0.0394%	0.0252%	82	6.6894%	4.9473%
30	0.0427%	0.0270%	83	7.2805%	5.4665%
31	0.0495%	0.0330%	84	7.8749%	5.9942%
32	0.0562%	0.0384%	85	8.4753%	6.5354%
33	0.0625%	0.0431%	86	9.6136%	7.4659%
34	0.0682%	0.0471%	87	10.8005%	8.3995%
35	0.0743%	0.0511%	88	12.0443%	9.3428%
36	0.0780%	0.0542%	89	13.3397%	10.2918%
37	0.0818%	0.0579%	90	14.6958%	11.2477%
38	0.0861%	0.0618%	91	16.4185%	12.8868%
39	0.0917%	0.0666%	92	18.1416%	14.4887%
40	0.0997%	0.0719%	93	19.8574%	16.0801%
41	0.1394%	0.0775%	94	21.6187%	17.5854%
42	0.1774%	0.0859%	95	23.5884%	19.0626%
43	0.2143%	0.0968%	96	25.4266%	20.2474%
44	0.2507%	0.1111%	97	27.2119%	21.2937%
45	0.2875%	0.1287%	98	29.0202%	22.0663%
46	0.3207%	0.1501%	99	30.6654%	22.5443%
47	0.3534%	0.1748%	100	32.1584%	22.6473%
48	0.3849%	0.2022%	101	33.7521%	23.5294%
49	0.4150%	0.2319%	102	35.1259%	24.5619%
50	0.4431%	0.2633%	103	36.3671%	25.7825%
51	0.5156%	0.2999%	104	37.3834%	27.1635%
52	0.5928%	0.3376%	105	38.1051%	28.6530%
53	0.6740%	0.3762%	106	38.4698%	30.2169%
54	0.7583%	0.4151%	107	38.6325%	31.8182%
55	0.8440%	0.4540%	108	38.8076%	33.4131%
56	0.9048%	0.5132%	109	38.9794%	34.9566%
57	0.9604%	0.5735%	110	50.0000%	50.0000%
58	1.0101%	0.6353%	111	50.0000%	50.0000%
59	1.0536%	0.6981%	112	50.0000%	50.0000%
60	1.0919%	0.7631%	113	50.0000%	50.0000%
61	1.1835%	0.8329%	114	50.0000%	50.0000%
62	1.2676%	0.8908%	115	50.0000%	50.0000%
63	1.3473%	0.9493%	116	50.0000%	50.0000%
64	1.4238%	1.0146%	117	50.0000%	50.0000%
65	1.4985%	1.0876%	118	50.0000%	50.0000%
66	1.6059%	1.1681%	119	50.0000%	50.0000%
67	1.7146%	1.2609%	120	100.0000%	100.0000%

**Qualified Pension Plan
Summary of Actuarial Assumptions and Methods
In Effect For The June 30, 2017 (Lag) Actuarial Valuation (Cont'd)**

**Table 6
ANNUAL RATES OF MERIT AND SALARY INCREASE**

Years of Service	Merit Increase	Salary Scale
0	6.00%	9.00%
1	5.00%	8.00%
2	4.00%	7.00%
3	3.00%	6.00%
4	2.50%	5.50%
5	2.00%	5.00%
6	1.90%	4.90%
7	1.80%	4.80%
8	1.70%	4.70%
9	1.60%	4.60%
10	1.50%	4.50%
11	1.50%	4.50%
12	1.50%	4.50%
13	1.50%	4.50%
14	1.50%	4.50%
15	1.50%	4.50%
16	1.45%	4.45%
17	1.40%	4.40%
18	1.35%	4.35%
19	1.30%	4.30%
20	1.25%	4.25%
21	1.20%	4.20%
22	1.15%	4.15%
23	1.10%	4.10%
24	1.05%	4.05%
25+	1.00%	4.00%

Qualified Pension Plan

Schedule of Active Member Valuation Data and Summary of Plan Membership

Table 7

ACTIVE MEMBER VALUATION DATA

June 30 (Lag) Actuarial Valuation	Number	Annual Payroll	Annual Average Salary	Percentage Increase (Decrease) in Average Salary
2008	22,729	\$ 852,105,791	\$ 37,490	5.8
2009	23,303	910,609,483	39,077	4.2
2010	23,324	912,290,136	39,114	0.1
2011	23,131	920,369,154	39,789	1.7
2012	27,840	1,018,895,365	36,598	(8.0)
2013	25,848	1,051,571,168	40,683	11.2
2014	25,182	1,045,187,738	41,505	2.0
2015	24,903	1,093,962,316	43,929	5.8
2016	25,864	1,149,019,892	44,425	1.1
2017	25,794	1,201,925,550	46,597	4.9

Salaries reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

As of the June 30, 2017 (Lag) and June 30, 2016 (Lag) actuarial valuations, the Plan's Membership consisted of:

Table 8

SUMMARY OF PLAN MEMBERSHIP

Group	June 30, 2017 (Lag)	June30, 2016 (Lag)
Active members	25,794	25,864
Active off payroll ¹	2,618	2,629
Terminated vested members not yet receiving benefits	1,528	851
Retirees and beneficiaries currently receiving benefits	<u>17,425</u>	<u>16,937</u>
Total	<u><u>47,365</u></u>	<u><u>46,281</u></u>

¹ Represents members who are no longer on payroll but not otherwise classified.

**Qualified Pension Plan
Schedule of Retirees and Beneficiaries**

**Table 9
RETIRES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS**

June 30 (Lag) Actuarial Valuation	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances ¹	Number	Annual Allowances	Number	Annual Allowances ²		
2008	667	\$ 8,148,653	462	\$ 4,350,475	13,196	\$ 153,120,898	2.5	\$ 11,604
2009	936	10,879,798	491	4,135,086	13,641	159,865,610	4.4	11,719
2010	850	10,705,737	522	4,700,094	13,969	165,871,253	3.8	11,874
2011	901	14,977,636	471	4,325,573	14,399	176,523,316	6.4	12,259
2012	1,053	16,201,746	578	6,211,198	14,874	186,513,864	5.7	12,540
2013	1,110	16,977,455	529	4,957,022	15,455	198,534,297	6.4	12,846
2014	1,094	13,701,890	554	5,306,812	15,995	206,929,375	4.2	12,937
2015	1,002	16,482,509	559	4,979,621	16,438	218,432,263	5.6	13,288
2016	1,075	14,412,852	576	5,776,541	16,937	227,068,574	4.0	13,407
2017	1,061	17,321,922	573	6,234,174	17,425	238,156,322	4.9	13,668

¹ Amounts shown include changes due to benefit finalization, changes in benefit type (e.g. Service to Accident Disability), COLA increases, and other changes.

² Allowances shown are those used in the actuarial valuation as of the Year Ended date and are not adjusted for anticipated changes due to finalization of benefit calculation or contract settlements.

**Qualified Pension Plan
Schedule of Statutory vs Actuarial Contributions**

Table 10

STATUTORY VS. ACTUARIAL CONTRIBUTIONS

Fiscal Year Ended June 30	Statutory Contribution⁽¹⁾	Actuarial Contribution	Employer Rate of Contribution⁽²⁾
2010	\$147,348,563	\$147,348,563	17.8%
2011	180,191,397	180,191,397	20.5
2012	213,650,880	213,650,880	24.3
2013	196,245,777	196,245,777	22.1
2014	214,589,565	214,589,565	21.7
2015	258,099,327	258,099,327	25.4
2016	265,532,032	265,532,032	26.3
2017	288,233,217	288,233,217	27.4
2018	318,643,334	318,643,334	28.9
2019	269,636,601	269,636,601	22.8

¹ Represents total employer contributions accrued for fiscal year.

² The Employer Rate of Contribution equals the Statutory Contribution as a percentage of the salaries of members who were on payroll or projected to be on payroll (under One-Year Lag Methodology) as of the preceding June 30 and adjusted, where applicable, to be consistent with collective bargaining agreements estimated to be achieved.

**Qualified Pension Plan
Funded Status Based on Entry Age Normal Cost Method**

FUNDED STATUS BASED ON ENTRY AGE NORMAL COST METHOD

Prior to the June 30, 2010 (Lag) Actuarial Valuation, the Frozen Initial Liability (FIL) cost method was used to develop the funding requirements for the Plan. Under this method, following establishment of any Initial UAL, actuarial gains and losses are financed over the working lifetimes of active participants and are not identified as separate UAL.

The funding status and funding progress information provided in the schedule below has been prepared using the Entry Age Normal (EAN) cost method where the Present Value (PV) of any obligations of the Plan not provided by the PV of Future Contributions (Employer and Employee), as determined under the EAN cost method, equals the Accrued Liability (AL). Under the EAN cost method, the UAL equals the AL minus the Actuarial Value of Assets.

**Table 11
FUNDED STATUS BASED ON ENTRY AGE NORMAL COST METHOD
(\$ Thousands)**

June 30 (Lag) Valuation Date	(1) Actuarial Value of Assets (AVA)	(2) Accrued Liability (AL)	(3) Unfunded AL (UAL) (2) - (1)	(4) Funded Ratio (1)/(2)	(5) Covered Payroll	(6) UAL as a % of Covered Payroll (3)/(5)
2008	\$2,084,116	\$2,721,629	\$ 637,513	76.6%	\$ 852,106	74.8%
2009	1,963,719	2,858,115	894,396	68.7	910,609	98.2
2010	2,056,452	3,558,251	1,501,799	57.8	912,290	164.6
2011	2,323,629	3,681,694	1,358,065	63.1	920,369	147.6
2012	2,371,613	3,763,130	1,391,517	63.0	1,018,895	136.6
2013	2,277,791	4,015,080	1,737,289	56.7	1,051,571	165.2
2014	2,632,922	4,335,746	1,702,824	60.7	1,045,188	162.9
2015	2,772,466	4,585,781	1,813,315	60.5	1,093,962	165.8
2016	2,858,737	4,767,760	1,909,023	60.0	1,149,020	166.1
2017	3,289,191	4,743,881	1,454,690	69.3	1,201,926	121.0

Salaries shown are base salaries plus assumed overtime paid and reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

**Qualified Pension Plan
Comparative Summary of Accrued Liabilities
Funded by Actuarial Value of Assets**

**Table 12
SOLVENCY TEST
(\$ Thousands)**

June 30 (Lag) Valuation Date	Accrued Liabilities For			(D) Actuarial Value of Assets	Percentage of Accrued Liabilities Funded by Actuarial Value of Assets		
	(A) Accumulated Member Contributions	(B) Current Retirees and Beneficiaries	(C) Active Members' Employer-Financed Portion		(A)	(B)	(C)
2008	\$ 337,821	\$1,262,046	\$ 904,890	\$2,084,116	100	100	54
2009	359,122	1,303,453	965,681	1,963,719	100	100	31
2010	388,082	1,627,094	1,306,868	2,056,452	100	100	3
2011	409,625	1,714,099	1,319,938	2,323,629	100	100	15
2012	434,215	1,804,626	1,283,582	2,371,613	100	100	10
2013	469,312	1,918,824	1,372,542	2,277,791	100	94	0
2014	504,619	2,080,400	1,475,008	2,632,922	100	100	3
2015	527,781	2,200,281	1,569,097	2,772,466	100	100	3
2016	557,473	2,273,411	1,638,262	2,858,737	100	100	2
2017	593,952	2,364,059	1,433,790	3,289,191	100	100	23

See following "SOLVENCY TEST - NOTES."

SOLVENCY TEST - NOTES

The ultimate test of financial soundness in a retirement system is its ability to pay all of its promised benefits when due. The retirement system's progress in accumulating assets to pay all promised benefits can be measured by comparing the Actuarial Value of Assets of the retirement system with the Accrued Liabilities for:

- a. Accumulated Member Contributions;
- b. Current Retirees and Beneficiaries; and
- c. Active Members' Employer-Financed Portion.

The Accrued Liabilities are the PV of projected benefits produced by the projected benefit attribution approach prorated on service. The Accrued Liabilities were calculated in accordance with Governmental Accounting Standards Board Statement No. 5 (GASB 5).

This comparative summary allocated assets as if they were priority groups, somewhat similar to (but not identical to) the priority categories of Section 4044 of the Employee Retirement Income Security Act of 1974.

The values in the table are dependent upon census data, benefit levels (which have changed over the past years), and the actuarial assumptions and methods employed at each valuation date.

To fully evaluate trends in financial soundness, changes in assumptions need to be evaluated. Beginning with the June 30, 2010 (Lag) actuarial valuations, the Actuarial Interest Rate assumption equals 7.0% per annum, net of investment expenses, and the General Wage Increase assumption equals 3.0% per annum. Prior to the June 30, 2010 (Lag) actuarial valuation, the Actuarial Interest Rate assumption was 8.0% per annum, gross of expenses. The two most recent changes in assumptions and methods occurred in the June 30, 2017 (Lag) valuation used to compute the Employer Contributions for Fiscal Year 2019 and in the June 30, 2014 (Lag) valuation used to compute the Employer Contributions for Fiscal Year 2016.

Qualified Pension Plan Summary of Plan Provisions - Contributions

CONTRIBUTIONS

The benefits of the System are financed by employee and employer contributions and from investment earnings of the System.

A. MEMBER CONTRIBUTIONS

Tier 6

A member who joins BERS on or after April 1, 2012 (Tier 6) is required to contribute between 3.0% and 6.0% of salary, depending on salary level, for all years of service. Tier 6 members in the Automotive or Special Officers Programs also contribute Additional Member Contributions (AMC).

Tier 4

A Tier 4 member of Article 15 (Coordinated Retirement Plan) who joined BERS on or before March 31, 2012 is mandated to contribute 3% of salary during all years of coverage. Effective October 1, 2000, most Tier 4 members are not required to make contributions after the 10th anniversary of their membership date or completion of ten years of credited service, whichever is earlier. Tier 4 members of the Chapter 504 55/27 plan contribute Basic Member Contributions (BMC) for 27 years of service. For those who elected or were mandated into an Optional Retirement Plan or Special Officers Plan, AMC are required.

Tier 1 and Tier 2

A member who joined prior to July 27, 1976 contributes by salary deductions on the basis of a normal rate of contribution which is assigned by the System at the time he or she elects his or her plan. The normal contribution rate, which is dependent upon the member's age and plan, as well as the tables in effect for such purpose at the time he or she became a member, is determined to provide approximately one-third of the benefit on account of the first 25 years of service.

For Tier 1 and Tier 2 plans which permit retirement for service at age 55, the normal contribution rate is calculated to provide an annuity equal to 1% of final salary for each year of service at the earliest age for service retirement. For such plans, the normal contribution rate for members who enter at age 55 or over is the rate applicable to a member entering at age 54.

Member contributions are accumulated with interest on individually maintained ledger accounts. Upon retirement, the amount to his or her credit (i.e. accumulated deductions) is used to purchase an annuity on the basis of the tables adopted by the Board of Trustees. Upon death in service, the accumulated deductions are paid to the beneficiary.

Beginning July 1, 1960, on a year to year basis, the normal contribution rates of Tier 1 and Tier 2 members who joined before July 27, 1976 were reduced by an increased-take-home-pay rate of 2.5%, and of 5.0% beginning July 1, 1961. Between July 1, 1968 and December 31, 1975, an increased-take-home-pay rate of 4.0% was effective for all members. On January 1, 1976, an increased-take-home-pay rate of 2.0% became effective for all members. Following is a table showing the effective periods and increased-take-home-pay rate.

<u>Period</u>	<u>Increased-Take-Home-Pay Rate</u>
07/01/60 to 06/30/61	2.5%
07/01/61 to 06/30/68	5%
07/01/68 to 12/31/75	4%
01/01/76 and after	2%

At present the reduction is 2.0% for Tier 1 and Tier 2 members. In general, the retirement and death benefits payable to or on account of members are supplemented by the reserve for increased-take-home-pay, accumulated from City contributions equal to the increased-take-home-pay rate times salary so that in general, the total benefit is equal to the benefit which would have been paid if the members' rates of contribution had not been reduced. However, the reserve for increased-take-home-pay is not payable upon death of a member who joins after June 30, 1973.

B. EMPLOYER CONTRIBUTIONS

The Entry Age Normal cost method of funding is utilized by the Plan's Actuary to calculate the contributions required of the employers.

Employer contributions are accrued by the Plan and are funded by the employers on a current basis.



BERS MEMBERS

STATISTICAL

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INTRODUCTION:

The Statistical section presents three sets of data. The first group of data is comprised of six (6) schedules and accompanying graphs that provide a comparative horizontal base of the financials over a ten-year spread for the QPP and eight year spread for the TDA. The second group of data offers an analysis of the BERS benefit payments based on demographic information. The third and final group gives a comparative analysis of the contributors based on their salary and their provenance.

The schedules and graphs of the first group are:

- (A) Revenue by source for the QPP
- (B) Expenses by type for the QPP
- (C) Refunds by type for the QPP
- (D) Schedule of changes in QPP net position
- (E) Schedule of changes in TDA net position
- (F) Benefit expenses by type for the QPP

The second group of data is comprised of the following: QPP

- (A) Age and service retirement
- (B) Ordinary disability retirement
- (C) Accidental disability retirement
- (D) Accidental death retirement
- (E) Other beneficiaries
- (F) All pensioners and beneficiaries

The third group of data is comprised of the following: QPP

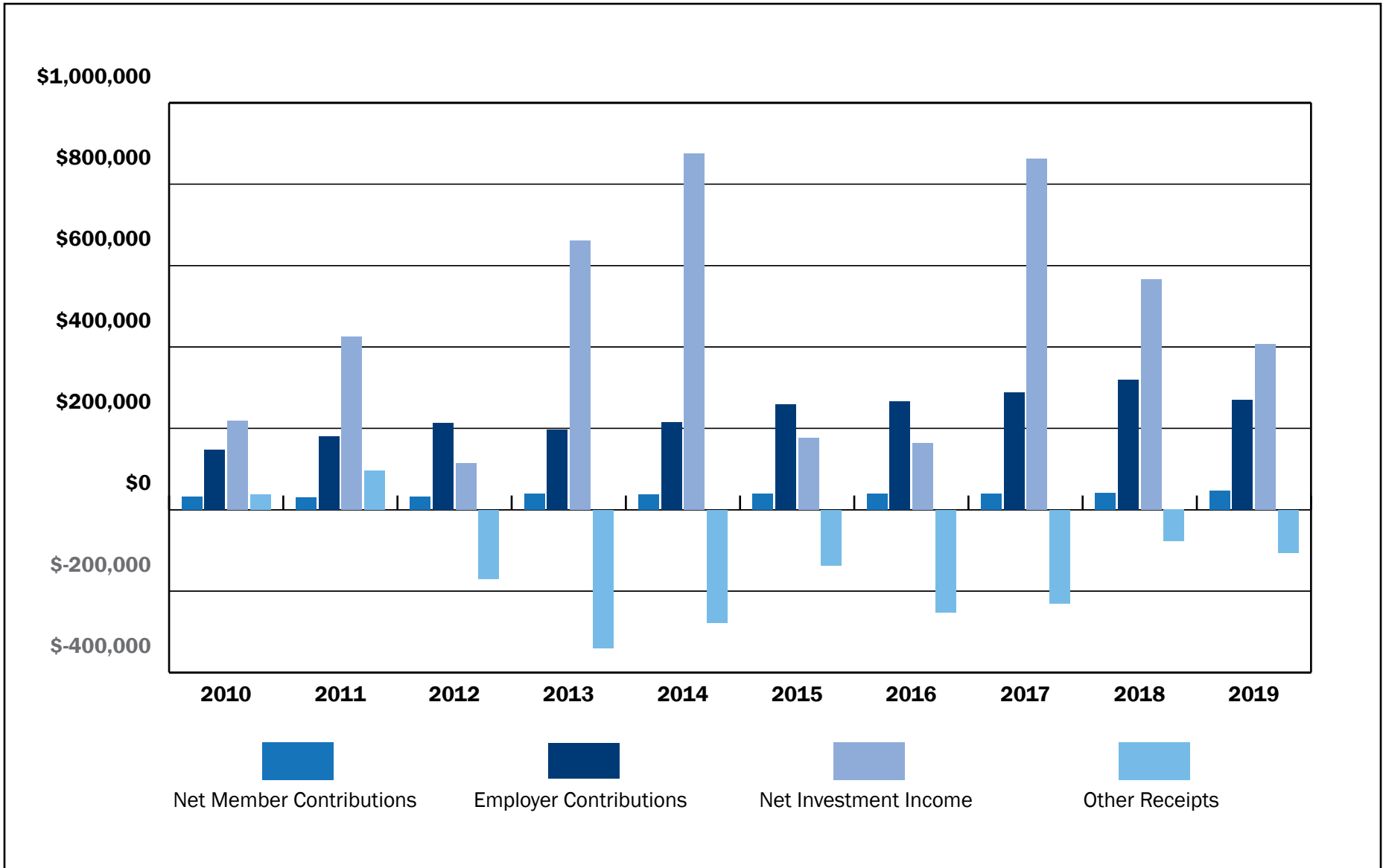
- (A) Summary of activities by Age and Service
- (B) Average annual benefit payments
- (C) Participating Employers

**Qualified Pension Plan
Schedule of Revenue by Source
(In thousands)**

Fiscal Year Ended June 30	Net Member Contributions	Employer Contributions	Net Investment Income	Net Receipts	Total	Employer Contributions as % of Payroll
2010	\$31,361	\$147,349	\$218,872	\$38,232	\$435,814	17.3
2011	\$31,008	\$180,191	\$425,690	\$95,958	\$732,847	19.8
2012	\$32,866	\$213,651	\$113,738	(\$170,091)	\$190,164	23.4
2013	\$39,056	\$196,246	\$660,827	(\$340,057)	\$556,072	21.3
2014	\$37,193	\$214,590	\$875,453	(\$277,531)	\$849,705	21.1
2015	\$39,564	\$258,099	\$177,166	(\$137,125)	\$337,704	24.5
2016	\$38,581	\$265,532	\$164,144	(\$252,288)	\$215,969	25.4
2017	\$39,821	\$288,233	\$862,510	(\$229,508)	\$961,056	26.3
2018	\$40,846	\$318,643	\$565,577	(\$76,948)	\$848,118	27.7
2019	\$46,304	\$269,637	\$406,879	(\$106,071)	\$616,749	22.4

The table offers a horizontal comparison base for the revenue sources of the Plan for the past 10 years.

**Qualified Pension Plan
Schedule of Revenue by Source
(In thousands)**

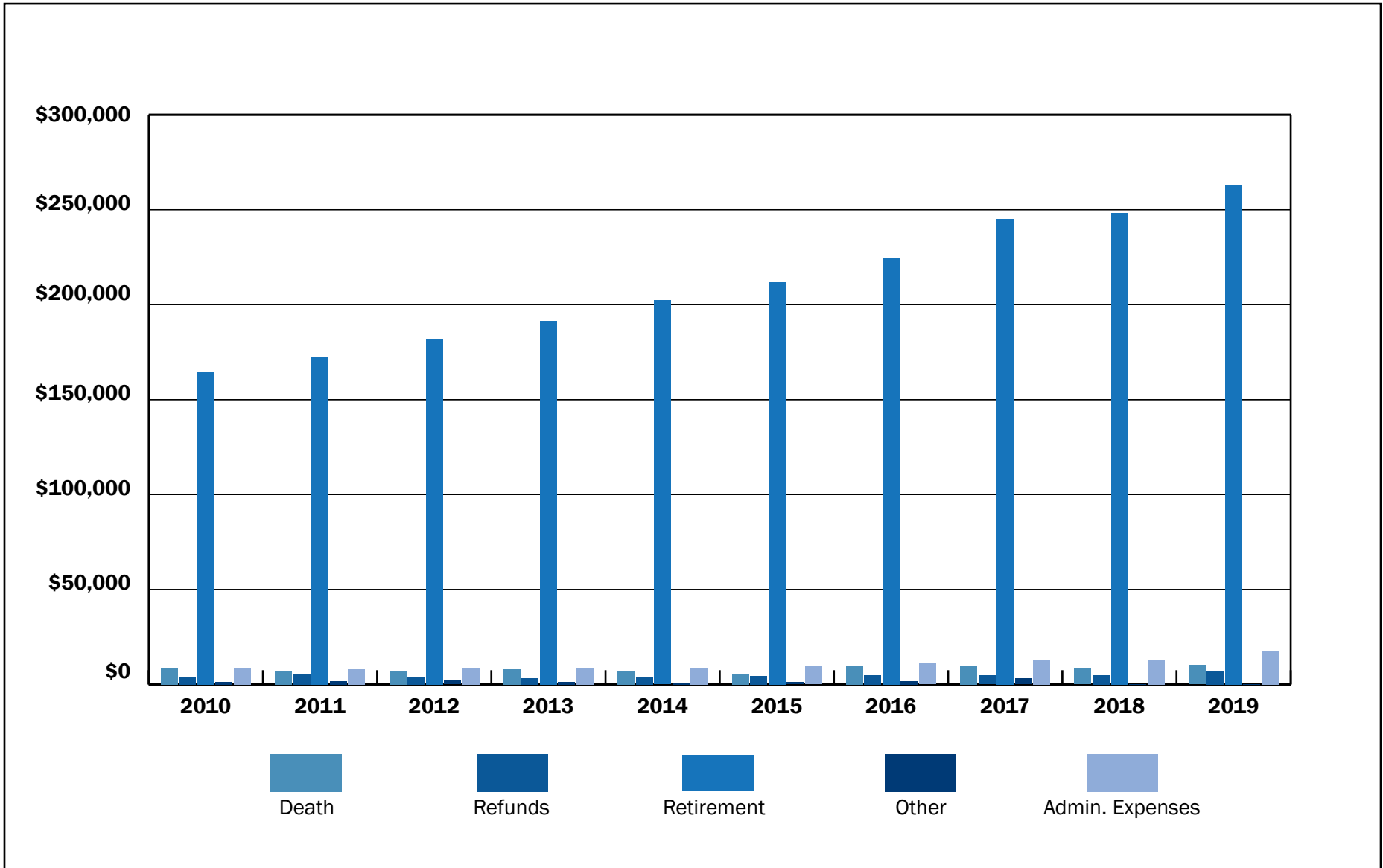


**Qualified Pension Plan
Schedule of Expenses by Type
(In thousands)**

Fiscal Year Ended June 30	Benefit Payments				Administrative Expenses	Total
	Death	Refunds	Retirement	Other		
2010	\$8,548	\$4,207	\$164,362	\$1,296	\$8,047	\$186,460
2011	\$6,686	\$5,237	\$172,680	\$1,663	\$8,892	\$195,158
2012	\$6,827	\$4,009	\$181,735	\$1,936	\$8,687	\$203,194
2013	\$7,858	\$3,360	\$191,463	\$1,412	\$8,927	\$213,020
2014	\$7,274	\$3,827	\$202,233	\$981	\$9,776	\$224,091
2015	\$5,765	\$4,614	\$211,693	\$1,172	\$10,956	\$234,200
2016	\$9,580	\$4,750	\$224,639	\$1,758	\$12,818	\$253,545
2017	\$9,570	\$4,687	\$245,066	\$3,109	\$15,486	\$277,918
2018	\$8,208	\$4,808	\$248,429	\$129	\$13,212	\$274,786
2019	\$10,161	\$7,231	\$262,804	\$267	\$17,357	\$297,820

The table offers a horizontal comparison base for the expense groups of the Plan for the past 10 years.

**Qualified Pension Plan
Schedule of Expenses by Type
(In thousands)**

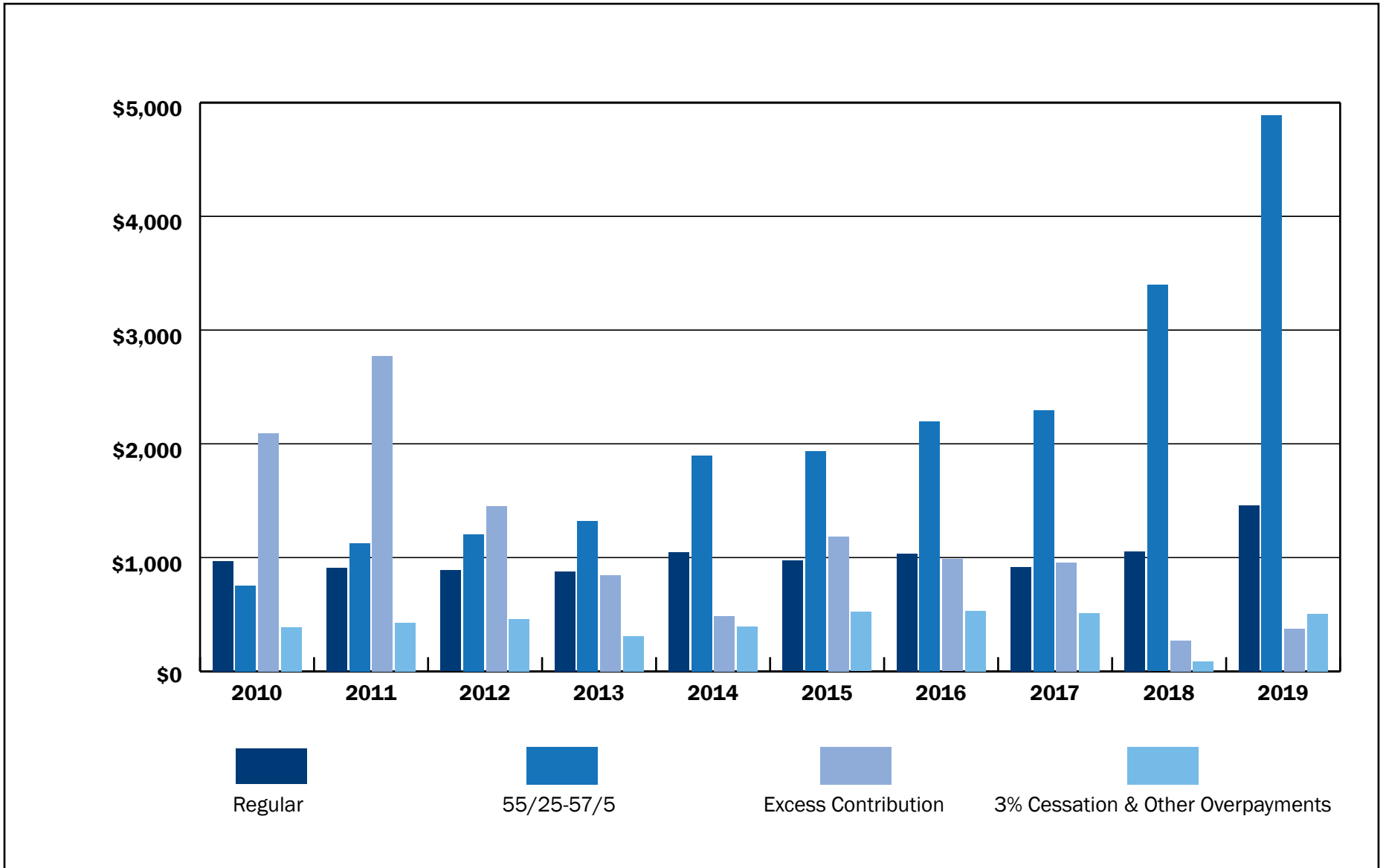


**Qualified Pension Plan
Schedule of Refunds by Type
(In thousands)**

Fiscal Year Ended June 30	Refunds				Total
	Regular Resignation	Add. Pension 55/25 - 57/5	Excess Contribution	3% Cessation & Other Overpayments	
2010	\$971	\$754	\$2,092	\$390	\$4,207
2011	\$909	\$1,129	\$2,772	\$427	\$5,237
2012	\$888	\$1,206	\$1,456	\$459	\$4,009
2013	\$880	\$1,322	\$846	\$312	\$3,360
2014	\$1,047	\$1,899	\$484	\$397	\$3,827
2015	\$973	\$1,933	\$1,186	\$522	\$4,614
2016	\$1,033	\$2,198	\$986	\$533	\$4,750
2017	\$920	\$2,295	\$957	\$515	\$4,687
2018	\$1,053	\$3,397	\$271	\$87	\$4,808
2019	\$1,459	\$4,887	\$378	\$507	\$7,231

The table offers a horizontal comparison base for the refund segment of the expense groups of the Plan for the past 10 years.
The refund segment is broken down by type.

**Qualified Pension Plan
Schedule of Refunds by Type
(In thousands)**

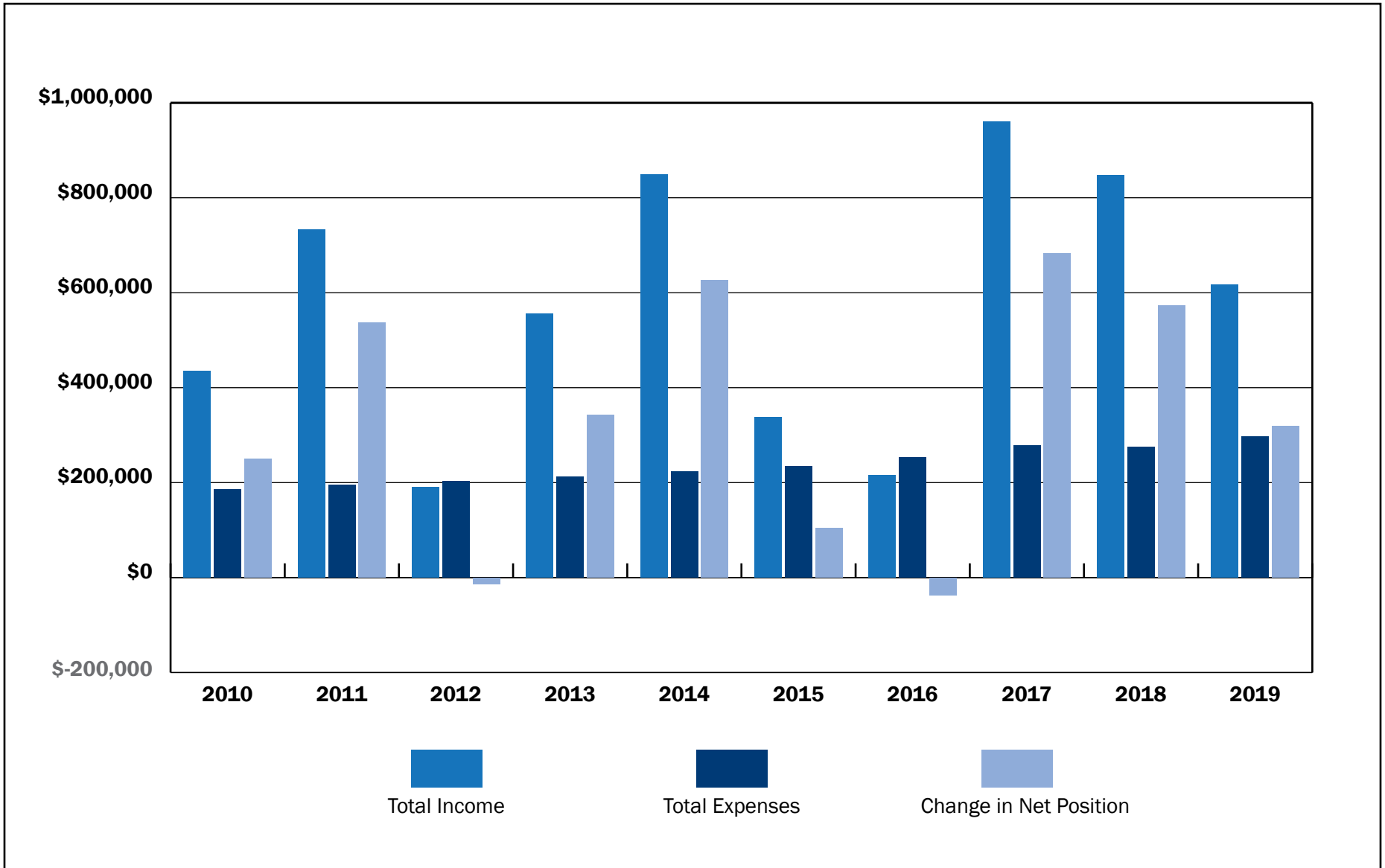


**Qualified Pension Plan
Schedule of Changes in Net Position
(In thousands)**

Year Ended	Member Contributions	Employer Contributions	Net Investment Income	Other Receipts	Total Income	Benefit Payments				Administrative Expenses	Total Expenses	Change in Net Position
						Death	Refund	Retirement	Other			
2010	\$31,361	\$147,349	\$218,872	\$38,232	\$435,814	\$8,548	\$4,207	\$164,362	\$1,296	\$8,047	\$186,460	\$249,354
2011	\$31,008	\$180,191	\$425,690	\$95,958	\$732,847	\$6,686	\$5,237	\$172,680	\$1,663	\$8,892	\$195,158	\$537,689
2012	\$32,866	\$213,651	\$113,738	(\$170,091)	\$190,164	\$6,827	\$4,009	\$181,735	\$1,936	\$8,687	\$203,194	(\$13,030)
2013	\$39,056	\$196,246	\$660,827	(\$340,057)	\$556,072	\$7,858	\$3,360	\$191,463	\$1,412	\$8,927	\$213,020	\$343,052
2014	\$37,193	\$214,590	\$875,453	(\$277,531)	\$849,705	\$7,274	\$3,827	\$202,233	\$981	\$9,776	\$224,091	\$625,614
2015	\$39,564	\$258,099	\$177,166	(\$137,125)	\$337,704	\$5,765	\$4,614	\$211,693	\$1,172	\$10,956	\$234,200	\$103,504
2016	\$38,581	\$265,532	\$164,144	(\$252,288)	\$215,969	\$9,580	\$4,750	\$224,639	\$1,758	\$12,818	\$253,545	(\$37,576)
2017	\$39,821	\$288,233	\$862,510	(\$229,508)	\$961,056	\$9,570	\$4,687	\$245,066	\$3,109	\$15,486	\$277,918	\$683,138
2018	\$40,846	\$318,643	\$565,577	(\$76,948)	\$848,118	\$8,208	\$4,808	\$248,429	\$129	\$13,212	\$274,786	\$573,332
2019	\$46,304	\$269,637	\$406,879	(\$106,071)	\$616,749	\$10,161	\$7,231	\$262,804	\$267	\$17,357	\$297,820	\$318,929

The table offers a 10 year horizontal comparison base for the operations of the BERS.

**Qualified Pension Plan
Schedule of Changes in Net Position
(In thousands)**

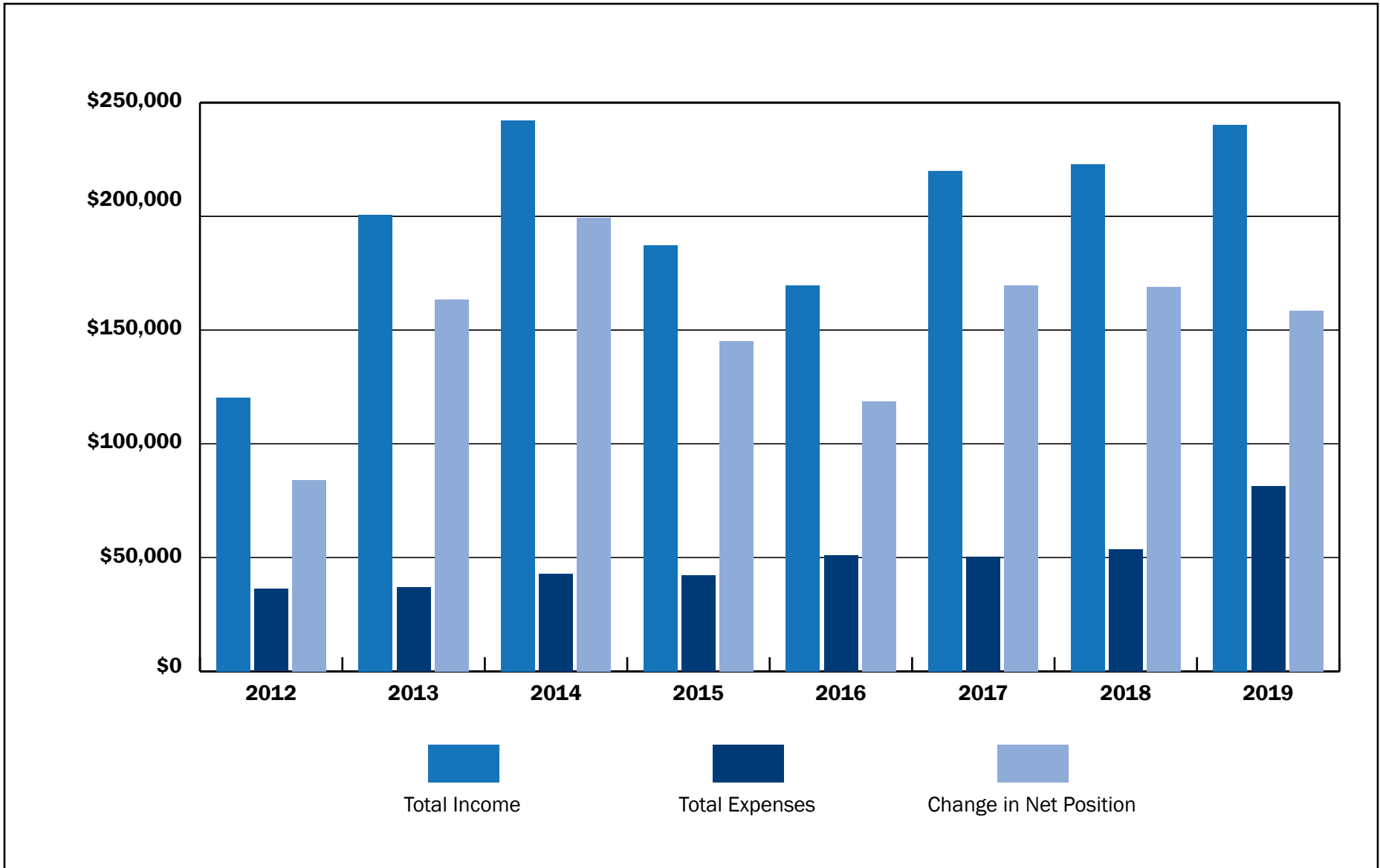


Tax Deferred Annuity Program
Schedule of Changes in Net Position
(In thousands)

Year Ended	Participant Contributions	Net Investment Income	Other Receipts	Transfer of Investment Income	Total Income	Benefit Payments				Administrative Expenses	Total Expenses	Change in Net Position
						Death	Refund	Retirement	Other			
2012	\$59,024	\$6,468	\$26,593	\$28,396	\$120,481	\$8,272	\$25,146	\$325	\$68	\$2,445	\$36,256	\$84,225
2013	\$61,550	\$62,134	(\$86,810)	\$163,756	\$200,630	\$6,523	\$27,802	\$301	\$31	\$2,455	\$37,112	\$163,518
2014	\$63,767	\$82,223	(\$110,273)	\$206,615	\$242,332	\$9,242	\$30,755	\$354	\$59	\$2,531	\$42,941	\$199,391
2015	\$74,890	\$22,950	\$4,448	\$85,104	\$187,392	\$4,133	\$34,707	\$370	\$12	\$3,033	\$42,255	\$145,137
2016	\$77,459	\$1,049	(\$3,541)	\$94,789	\$169,756	\$13,292	\$36,467	\$351	\$79	\$850	\$51,039	\$118,717
2017	\$85,765	\$75,739	(\$48,113)	\$106,554	\$219,945	\$9,415	\$40,371	\$323	\$99	\$125	\$50,333	\$169,612
2018	\$89,972	\$59,168	(\$54,240)	\$127,972	\$222,872	\$10,851	\$42,427	\$338	\$52	\$84	\$53,752	\$169,120
2019	\$102,203	\$40,087	(\$43,842)	\$141,695	\$240,143	\$25,490	\$55,492	\$336	\$96	\$119	\$81,533	\$158,610

The table offers a 8 year horizontal comparison base for the operations of the BERS TDA Program.

Tax Deferred Annuity Program
Schedule of Changes in Net Position
(In thousands)



Qualified Pension Plan
Schedule of Benefit Expenses by Type
(In thousands)

Fiscal Year Ended June 30	Age and Service Retirement Benefits	Disability Retirement Benefits		Lump Sum Payments		Total
		Duty	Non-Duty	Death In Service	Survivors	
2010	\$157,760	\$2,130	\$4,472	\$6,887	\$1,661	\$172,910
2011	\$165,580	\$2,291	\$4,810	\$5,328	\$1,357	\$179,366
2012	\$174,099	\$2,464	\$5,173	\$5,035	\$1,791	\$188,562
2013	\$183,250	\$2,649	\$5,564	\$5,890	\$1,968	\$199,321
2014	\$193,400	\$2,849	\$5,984	\$4,768	\$2,506	\$209,507
2015	\$202,193	\$3,065	\$6,435	\$3,642	\$2,124	\$217,459
2016	\$214,422	\$3,296	\$6,921	\$7,094	\$2,486	\$234,219
2017	\$234,057	\$3,551	\$7,458	\$6,571	\$2,999	\$254,636
2018	\$236,588	\$3,820	\$8,021	\$5,165	\$3,043	\$256,637
2019	\$250,070	\$4,108	\$8,626	\$9,720	\$441	\$272,965

The table offers a horizontal comparison base for the benefit segment of the expense groups of the Plan across the past 10 years. The benefit segment is broken down by type.

AGE AND SERVICE RETIREMENT

Age	Men		Women	
	Number of Retirants	Average Annual Allowance	Number of Retirants	Average Annual Allowance
49 & UNDER	0	\$0	2	\$13,874
50 - 54	8	46,613	4	19,417
55 - 59	91	31,390	261	10,526
60 - 64	347	30,058	1,225	12,605
65 - 69	642	29,664	2,607	11,438
70 - 74	618	28,303	2,764	10,912
75 - 79	481	28,828	2,084	9,510
80 - 84	389	26,329	1,507	8,728
85 - 89	260	24,200	1,134	8,383
90 & OVER	156	23,622	874	8,042
TOTALS	2,992	\$28,168	12,462	\$10,254

ORDINARY DISABILITY (NON-DUTY) RETIREMENT

Age	Men		Women	
	Number of Retirants	Average Annual Allowance	Number of Retirants	Average Annual Allowance
49 & UNDER	3	\$13,661	14	\$15,539
50 - 54	16	17,164	40	11,575
55 - 59	50	18,617	111	11,765
60 - 64	55	16,588	160	11,202
65 - 69	47	16,561	172	10,070
70 - 74	33	17,027	150	9,708
75 - 79	23	12,742	75	9,000
80 - 84	6	15,165	22	8,628
85 - 89	7	14,312	11	7,830
90 & OVER	2	15,912	2	7,643
TOTALS	242	\$16,592	757	\$10,480

NOTE: This schedule is based on 2017 data (LAG)

Qualified Pension Plan
Schedule of Retired Members by Type of Benefits
(Cont'd)

ACCIDENTAL DISABILITY (DUTY) RETIREMENT

Age	Men		Women	
	Number of Retirants	Average Annual Allowance	Number of Retirants	Average Annual Allowance
49 & UNDER	0	\$0	5	\$8,469
50 - 54	4	20,957	5	11,099
55 - 59	9	20,573	17	8,889
60 - 64	6	16,174	24	11,290
65 - 69	10	13,812	27	10,437
70 - 74	9	19,687	19	7,543
75 - 79	6	29,635	13	7,525
80 - 84	3	25,974	12	7,157
85 - 89	2	37,209	4	8,059
90 & OVER	4	22,771	3	8,958
TOTALS	53	\$20,803	129	\$9,208

ACCIDENTAL DEATH (DUTY) RETIREMENT

Age	Men		Women	
	Number of Retirants	Average Annual Allowance	Number of Retirants	Average Annual Allowance
49 & UNDER	0	\$0	0	\$0
50 - 54	0	0	0	0
55 - 59	1	6,061	0	0
60 - 64	0	0	0	0
65 - 69	0	0	0	0
70 - 74	0	0	0	0
75 - 79	0	0	0	0
80 - 84	1	9,385	0	0
85 - 89	0	0	0	0
90 & OVER	0	0	0	0
TOTALS	2	\$7,723	0	\$0

NOTE: This schedule is based on 2017 data (LAG)

**Qualified Pension Plan
Schedule of Retired Members by Type of Benefits
(Cont'd)**

OTHER BENEFICIARIES

Age	Men		Women	
	Number of Retirants	Average Annual Allowance	Number of Retirants	Average Annual Allowance
49 & UNDER	24	\$7,701	45	\$10,613
50 - 54	9	2,928	22	7,248
55 - 59	13	4,515	24	8,885
60 - 64	13	10,914	36	14,324
65 - 69	23	8,031	52	16,384
70 - 74	26	6,295	60	16,848
75 - 79	16	5,673	92	22,150
80 - 84	20	7,315	103	21,944
85 - 89	16	8,410	95	17,103
90 & OVER	10	6,475	89	16,790
TOTALS	170	\$7,038	618	\$17,226

ALL PENSIONERS AND BENEFICIARIES

Age	Men		Women	
	Number of Retirants	Average Annual Allowance	Number of Retirants	Average Annual Allowance
49 & UNDER	27	\$8,363	66	\$11,594
50 - 54	37	20,479	71	10,643
55 - 59	164	24,617	413	10,697
60 - 64	421	27,509	1,445	12,471
65 - 69	722	27,902	2,858	11,436
70 - 74	686	26,813	2,993	10,949
75 - 79	526	27,430	2,264	9,995
80 - 84	419	25,218	1,644	9,543
85 - 89	285	23,162	1,244	9,043
90 & OVER	172	22,515	968	8,849
TOTALS	3,459	\$26,195	13,966	\$10,565

NOTE: This schedule is based on 2017 data (LAG)

Qualified Pension Plan
Schedule of Summary of Actives by Age and Service: Male

DATA USED IN THE JUNE 30, 2017 (LAG) ACTUARIAL VALUATION
FOR DETERMINING FISCAL YEAR 2019 EMPLOYER CONTRIBUTIONS

Age \ Svc	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	All Years
Number:										
UNDER 20	4	0	0	0	0	0	0	0	0	4
20 TO 24	56	1	0	0	0	0	0	0	0	57
25 TO 29	282	37	2	0	0	0	0	0	0	321
30 TO 34	349	165	16	1	0	0	0	0	0	531
35 TO 39	296	227	92	19	0	0	0	0	0	634
40 TO 44	254	261	179	73	8	1	0	0	0	776
45 TO 49	266	226	206	118	49	13	2	0	0	880
50 TO 54	269	234	204	160	104	66	11	1	0	1,049
55 TO 59	240	186	155	166	115	109	52	9	1	1,033
60 TO 64	120	148	119	109	71	85	51	17	2	722
65 TO 69	37	63	60	48	23	14	11	9	9	274
70 & UP	30	30	37	27	10	7	2	0	3	146
TOTAL	2,203	1,578	1,070	721	380	295	129	36	15	6,427

Salaries (In thousands):										
UNDER 20	165	0	0	0	0	0	0	0	0	165
20 TO 24	2,025	51	0	0	0	0	0	0	0	2,076
25 TO 29	12,372	1,920	124	0	0	0	0	0	0	14,416
30 TO 34	17,585	9,367	949	34	0	0	0	0	0	27,935
35 TO 39	15,794	14,366	6,783	1,323	0	0	0	0	0	38,266
40 TO 44	13,720	17,837	14,565	5,632	763	86	0	0	0	52,601
45 TO 49	13,535	14,025	17,669	9,537	3,742	1,246	153	0	0	59,906
50 TO 54	14,169	14,720	16,752	13,183	8,502	6,127	880	79	0	74,413
55 TO 59	11,248	10,493	11,728	12,748	9,139	9,959	4,623	974	128	71,039
60 TO 64	5,998	8,384	8,643	8,667	6,279	7,790	5,279	1,874	79	52,993
65 TO 69	1,560	3,110	3,532	3,320	1,920	1,518	1,126	912	652	17,650
70 & UP	918	1,569	2,010	1,844	887	494	261	0	311	8,294
TOTAL *	109,089	95,841	82,755	56,288	31,232	27,219	12,323	3,839	1,169	419,755

Average Salaries: **										
UNDER 20	41,331	0	0	0	0	0	0	0	0	41,331
20 TO 24	36,169	50,700	0	0	0	0	0	0	0	36,424
25 TO 29	43,873	51,878	62,184	0	0	0	0	0	0	44,910
30 TO 34	50,387	56,768	59,339	34,101	0	0	0	0	0	52,609
35 TO 39	53,358	63,285	73,724	69,642	0	0	0	0	0	60,356
40 TO 44	54,014	68,340	81,366	77,152	95,349	85,653	0	0	0	67,785
45 TO 49	50,883	62,057	85,770	80,826	76,363	95,812	76,631	0	0	68,075
50 TO 54	52,674	62,908	82,116	82,392	81,754	92,833	80,042	79,356	0	70,938
55 TO 59	46,865	56,413	75,667	76,794	79,468	91,366	88,899	108,184	127,840	68,769
60 TO 64	49,987	56,652	72,627	79,511	88,444	91,644	103,512	110,211	39,272	73,397
65 TO 69	42,158	49,363	58,871	69,161	83,458	108,455	102,371	101,344	72,444	64,415
70 & UP	30,602	52,296	54,332	68,304	88,740	70,520	130,488	0	103,547	56,809
TOTAL	49,519	60,736	77,341	78,069	82,190	92,267	95,525	106,630	77,935	65,311

NOTE: Age is last birthday. Service is completed years.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Qualified Pension Plan
Schedule of Summary of Actives by Age and Service: Female

**DATA USED IN THE JUNE 30, 2017 (LAG) ACTUARIAL VALUATION
FOR DETERMINING FISCAL YEAR 2019 EMPLOYER CONTRIBUTIONS**

Age \ Svc	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	All Years
Number:										
UNDER 20	5	0	0	0	0	0	0	0	0	5
20 TO 24	102	0	0	0	0	0	0	0	0	102
25 TO 29	599	37	0	0	0	0	0	0	0	636
30 TO 34	741	268	23	1	0	0	0	0	0	1,033
35 TO 39	777	435	211	27	0	0	0	0	0	1,450
40 TO 44	857	504	325	130	11	1	0	0	0	1,828
45 TO 49	1,012	734	412	228	72	15	1	0	0	2,474
50 TO 54	1,116	974	757	403	130	80	28	1	0	3,489
55 TO 59	829	985	903	613	225	87	72	18	0	3,732
60 TO 64	439	691	722	574	284	104	47	20	10	2,891
65 TO 69	174	220	321	246	129	49	11	6	7	1,163
70 & UP	60	101	162	111	79	29	14	6	2	564
TOTAL	6,711	4,949	3,836	2,333	930	365	173	51	19	19,367

Salaries (In thousands):

UNDER 20	235	0	0	0	0	0	0	0	0	235
20 TO 24	3,479	0	0	0	0	0	0	0	0	3,479
25 TO 29	30,189	1,965	0	0	0	0	0	0	0	32,154
30 TO 34	37,705	16,895	1,408	50	0	0	0	0	0	56,058
35 TO 39	33,660	27,181	14,198	1,983	0	0	0	0	0	77,021
40 TO 44	30,093	26,884	21,083	8,461	733	96	0	0	0	87,350
45 TO 49	29,719	29,454	20,360	13,761	5,161	1,126	78	0	0	99,659
50 TO 54	31,351	33,784	30,177	18,511	8,436	5,857	2,246	54	0	130,417
55 TO 59	22,592	32,807	31,336	25,862	10,759	5,533	5,217	1,492	0	135,599
60 TO 64	12,136	22,152	24,050	22,430	12,738	5,637	3,362	1,609	778	104,892
65 TO 69	4,160	5,967	9,914	9,125	5,587	2,685	583	306	433	38,760
70 & UP	1,385	2,526	3,935	3,308	2,775	1,340	697	352	229	16,547
TOTAL *	236,704	199,615	156,461	103,492	46,189	22,273	12,184	3,814	1,439	782,171

Average Salaries: **

UNDER 20	47,015	0	0	0	0	0	0	0	0	47,015
20 TO 24	34,104	0	0	0	0	0	0	0	0	34,104
25 TO 29	50,399	53,096	0	0	0	0	0	0	0	50,556
30 TO 34	50,884	63,042	61,228	49,966	0	0	0	0	0	54,268
35 TO 39	43,320	62,484	67,291	73,429	0	0	0	0	0	53,118
40 TO 44	35,114	53,341	64,872	65,085	66,610	96,054	0	0	0	47,784
45 TO 49	29,366	40,128	49,418	60,356	71,683	75,055	77,960	0	0	40,283
50 TO 54	28,093	34,685	39,864	45,934	64,892	73,215	80,232	53,708	0	37,380
55 TO 59	27,252	33,307	34,702	42,189	47,817	63,596	72,459	82,917	0	36,334
60 TO 64	27,646	32,058	33,310	39,077	44,851	54,201	71,533	80,472	77,782	36,282
65 TO 69	23,908	27,122	30,884	37,095	43,313	54,787	53,017	51,011	61,806	33,327
70 & UP	23,086	25,014	24,288	29,800	35,129	46,209	49,802	58,655	114,261	29,338
TOTAL	35,271	40,334	40,788	44,360	49,665	61,023	70,427	74,777	75,736	40,387

NOTE: Age is last birthday. Service is completed years.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Qualified Pension Plan
Schedule of Summary of Actives by Age and Service: Male and Female
Male and Female

DATA USED IN THE JUNE 30, 2017 (LAG) ACTUARIAL VALUATION
FOR DETERMINING FISCAL YEAR 2019 EMPLOYER CONTRIBUTIONS

Age \ Svc	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	All Years
Number:										
UNDER 20	9	0	0	0	0	0	0	0	0	9
20 TO 24	158	1	0	0	0	0	0	0	0	159
25 TO 29	881	74	2	0	0	0	0	0	0	957
30 TO 34	1,090	433	39	2	0	0	0	0	0	1,564
35 TO 39	1,073	662	303	46	0	0	0	0	0	2,084
40 TO 44	1,111	765	504	203	19	2	0	0	0	2,604
45 TO 49	1,278	960	618	346	121	28	3	0	0	3,354
50 TO 54	1,385	1,208	961	563	234	146	39	2	0	4,538
55 TO 59	1,069	1,171	1,058	779	340	196	124	27	1	4,765
60 TO 64	559	839	841	683	355	189	98	37	12	3,613
65 TO 69	211	283	381	294	152	63	22	15	16	1,437
70 & UP	90	131	199	138	89	36	16	6	5	710
TOTAL	8,914	6,527	4,906	3,054	1,310	660	302	87	34	25,794

Salaries (In thousands):										
UNDER 20	400	0	0	0	0	0	0	0	0	400
20 TO 24	5,504	51	0	0	0	0	0	0	0	5,555
25 TO 29	42,561	3,884	124	0	0	0	0	0	0	46,570
30 TO 34	55,290	26,262	2,358	84	0	0	0	0	0	83,994
35 TO 39	49,454	41,546	20,981	3,306	0	0	0	0	0	115,287
40 TO 44	43,813	44,721	35,648	14,093	1,495	182	0	0	0	139,952
45 TO 49	43,254	43,479	38,029	23,299	8,903	2,371	231	0	0	159,565
50 TO 54	45,521	48,504	46,929	31,694	16,938	11,984	3,127	133	0	204,831
55 TO 59	33,840	43,300	43,064	38,610	19,898	15,492	9,840	2,466	128	206,637
60 TO 64	18,135	30,537	32,692	31,097	19,017	13,427	8,641	3,483	856	157,885
65 TO 69	5,720	9,077	13,446	12,445	7,507	4,203	1,709	1,218	1,085	56,410
70 & UP	2,303	4,095	5,945	5,152	3,663	1,834	958	352	539	24,841
TOTAL *	345,794	295,456	239,216	159,780	77,421	49,492	24,507	7,652	2,608	1,201,926

Average Salaries: **										
UNDER 20	44,489	0	0	0	0	0	0	0	0	44,489
20 TO 24	34,836	50,700	0	0	0	0	0	0	0	34,936
25 TO 29	48,310	52,487	62,184	0	0	0	0	0	0	48,662
30 TO 34	50,725	60,651	60,453	42,034	0	0	0	0	0	53,704
35 TO 39	46,089	62,759	69,244	71,865	0	0	0	0	0	55,320
40 TO 44	39,435	58,458	70,730	69,424	78,710	90,854	0	0	0	53,745
45 TO 49	33,845	45,290	61,535	67,337	73,578	84,692	77,074	0	0	47,575
50 TO 54	32,867	40,152	48,833	56,295	72,386	82,083	80,178	66,532	0	45,137
55 TO 59	31,655	36,977	40,704	49,563	58,523	79,040	79,353	91,339	127,840	43,366
60 TO 64	32,442	36,397	38,873	45,530	53,569	71,040	88,175	94,136	71,363	43,699
65 TO 69	27,108	32,073	35,292	42,330	49,387	66,713	77,694	81,211	67,790	39,255
70 & UP	25,591	31,262	29,874	37,333	41,152	50,936	59,888	58,655	107,832	34,987
TOTAL	38,792	45,267	48,760	52,318	59,100	74,988	81,148	87,958	76,706	46,597

NOTE: Age is last birthday. Service is completed years.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Qualified Pension Plan
Schedule of Annual Average Benefit Payment Amounts

Fiscal Year Ended June 30	Service Retirement Benefits			Ordinary (Non-Duty) Disability Benefits			Accidental (Duty) Disability Benefits			Survivor Benefits		
	Number	Average Annual Allowance	Average Monthly Allowance	Number	Average Annual Allowance	Average Monthly Allowance	Number	Average Annual Allowance	Average Monthly Allowance	Number	Average Annual Allowance	Average Monthly Allowance
2008 (Lag)	11,820	\$11,556	\$963	575	\$10,278	\$857	133	\$12,614	\$1,051	668	\$13,382	\$1,115
2009 (Lag)	12,176	\$11,665	\$972	627	\$10,547	\$879	118	\$13,036	\$1,086	720	\$13,448	\$1,121
2010 (Lag)	12,435	\$11,844	\$987	671	\$10,655	\$888	133	\$12,700	\$1,058	730	\$13,356	\$1,113
2011 (Lag)	12,841	\$12,244	\$1,020	698	\$10,975	\$915	138	\$12,559	\$1,047	722	\$13,724	\$1,144
2012 (Lag)	13,218	\$12,520	\$1,043	731	\$11,393	\$949	148	\$12,490	\$1,041	777	\$13,969	\$1,164
2013 (Lag)	13,662	\$12,811	\$1,068	795	\$11,620	\$968	153	\$12,809	\$1,067	845	\$14,579	\$1,215
2014(Lag)	14,150	\$12,932	\$1,078	853	\$11,680	\$973	156	\$12,268	\$1,022	836	\$14,435	\$1,203
2015(Lag)	14,572	\$13,303	\$1,109	890	\$12,208	\$1,017	159	\$12,341	\$1,028	817	\$14,391	\$1,199
2016(Lag)	15,034	\$13,420	\$1,118	937	\$11,957	\$996	168	\$13,377	\$1,115	798	\$14,869	\$1,239
2017(Lag)	15,454	\$13,722	\$1,144	999	\$11,960	\$997	182	\$12,585	\$1,049	790	\$15,010	\$1,251

**Qualified Pension Plan
Schedule of Participating Employers
As Of June 30, 2017 (Lag)**

Employer	As of June 30, 2017 (Lag)		As of June 30, 2008	
	Number of Employees	Annual Payroll	Number of Employees	Annual Payroll
NYC Department of Education*	25,137	\$ 1,134,959,018	22,229	\$ 806,982,375
NYC School Construction Authority	641	66,388,984	472	43,526,589
Charter Schools				
Beginning with Children	0	-	6	170,638
KIPP Academy	0	-	12	875,001
Renaissance	16	577,548	10	551,188
TOTAL	25,794	\$ 1,201,925,550	22,729	\$ 852,105,791

* A limited (de minimis) number of these employees have been reported as employed by employers other than those listed in the table. For actuarial valuation purposes, these employees are included with the NYC Department of Education pending confirmation of status.

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