



# Comprehensive **Annual Financial** Report

*Fiscal Years Ended June 30, 2018 and June 30, 2017*



**trsnyc** Teachers' Retirement System of the City of New York

A Fiduciary Fund of the City of New York

**TEACHERS' RETIREMENT SYSTEM OF THE CITY OF NEW YORK  
A FIDUCIARY FUND OF THE CITY OF NEW YORK**

**COMPREHENSIVE ANNUAL FINANCIAL REPORT  
FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017**

Prepared by Accounting Units for the

**QUALIFIED PENSION PLAN  
and  
TAX-DEFERRED ANNUITY PROGRAM**

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**TEACHERS' RETIREMENT SYSTEM  
OF THE CITY OF NEW YORK**  
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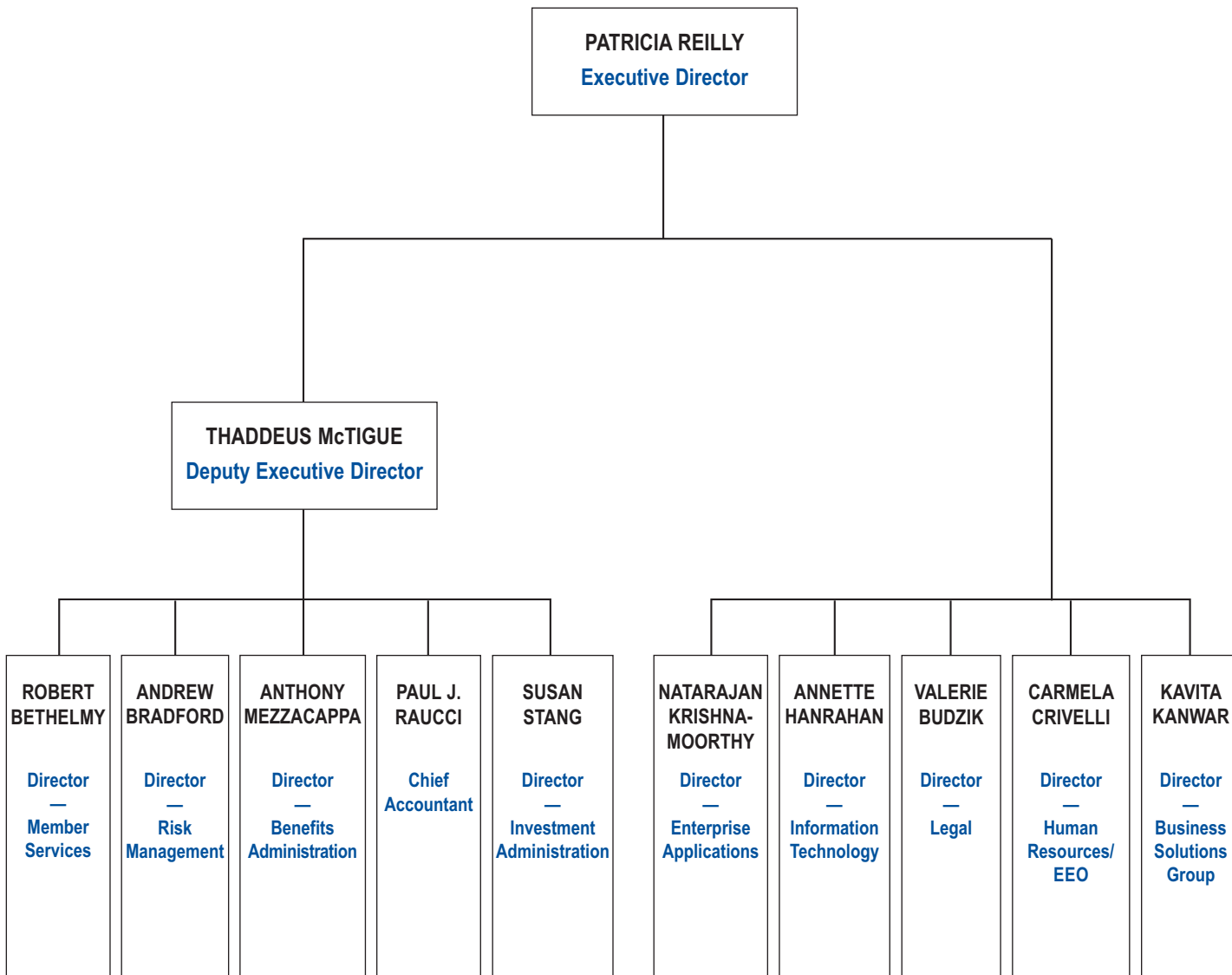
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# Introduction



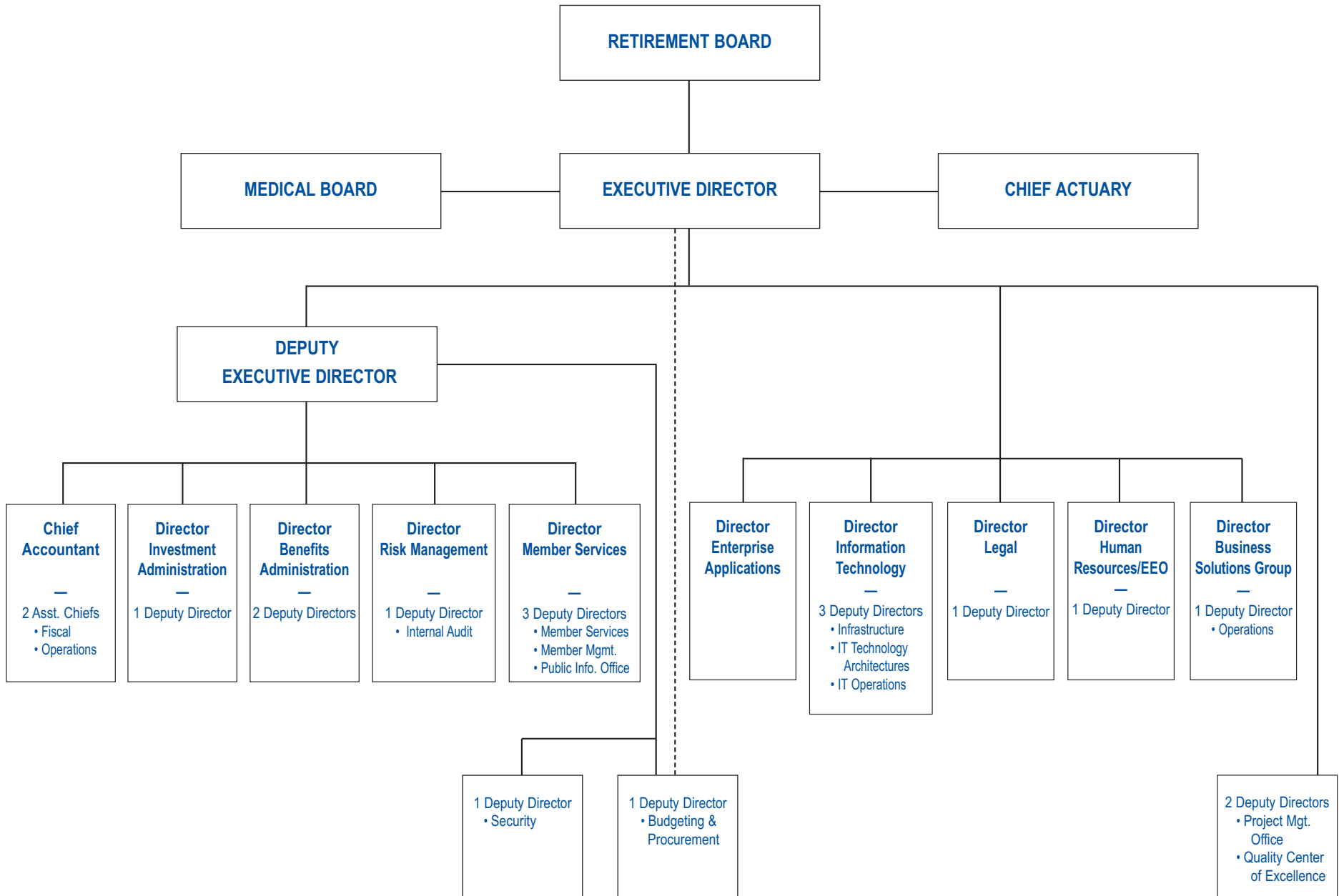
# PRINCIPAL OFFICIALS

as of June 30, 2018



# ORGANIZATION CHART

as of June 30, 2018





Government Finance Officers Association

Certificate of  
Achievement  
for Excellence  
in Financial  
Reporting

Presented to

**Teachers' Retirement System  
of the City of New York**

For its Comprehensive Annual  
Financial Report  
for the Fiscal Year Ended

**June 30, 2017**

*Christopher P. Morill*

Executive Director/CEO





**December 21, 2018**

Dear Members of the Board of Trustees:

We are pleased to present the Comprehensive Annual Financial Report of the Teachers' Retirement System of the City of New York (TRS) for the fiscal year ended June 30, 2018.

TRS was established as of August 1, 1917 under Chapter 303 of the Laws of 1917 and is governed by the Administrative Code of the City of New York and the New York State Retirement and Social Security Law.

TRS' pension plan became a tax-qualified retirement plan under Section 401(a) of the Internal Revenue Code (IRC) and is now known as our Qualified Pension Plan (QPP). The QPP is a cost-sharing, multiple employer defined-benefit pension plan. The QPP provides pension benefits to all the teachers and administrative personnel employed by the Department of Education and certain employees of New York City Charter Schools and the City University of New York.

TRS' Tax-Deferred Annuity (TDA) Program was established and is administered pursuant to IRC Section 403(b) and NYC Administrative Code section 13-582, and became effective February 1, 1970. The TDA Program is a voluntary defined-contribution savings option available to TRS members.

### **Member Profile**

Our programs impact nearly 210,000 in-service members, retirees, and beneficiaries. Our membership includes individuals of varying ages, membership tiers, and employment status. And although many TRS members are currently in active service, over 40% of them have retired. As of June 30, 2018, there were approximately 123,000 in-service members and approximately 86,000 retired members and beneficiaries receiving monthly benefits.

### **Participating Employers**

The participating employers that share the cost of the defined-benefit QPP plan are the New York City Department of Education (DOE), City University of New York (CUNY), and certain New York City Charter Schools that offer TRS benefits to their employees. Employees who become TRS members may participate in the TDA Program in addition to the QPP plan.

### **Initiatives**

As we embarked on our second century of serving New York City educators, TRS implemented a new phase of our ongoing modernization initiative: an enhanced login and registration process that provides industry-standard security for members who use the secure section of our website. We also completed much of the development work in the next phase of the project, planned for release in 2019.

During this fiscal year, TRS also changed our lineup of investment options for members, as we introduced the Balanced Fund to replace the Bond Fund. The Balanced Fund is a moderately conservative investment option that includes exposure to bonds and stocks. And, building on our strategy to increase member engagement and awareness through social media, we also added a YouTube channel featuring self-service tutorials and other informational videos.

## Financial Statements

The financial statements and notes along with Management's Discussion and Analysis in this report present and analyze the changes in TRS fiduciary net position for the fiscal year ended June 30, 2018. Since markets are dynamic and fluid, any judgment of the financial statements should also consider current market conditions.

## Funding

The Qualified Pension Plan's (QPP) funding objective is to meet long-term benefit promises through employer and member contributions, together with investment earnings. Annual funding by employer contributions is determined through an actuarial valuation of all liabilities to the QPP with adjustments to allow for an incremental phase-in of newly assumed actuarial liabilities. As such, employer contributions have been increasing steadily in line with current membership liabilities.

The QPP's funding ratios are also developed as part of the QPP's actuarial valuation. The funding ratios are determined at specific points in time, are usually expressed in various relationships of assets to obligations, and, over time, can provide insight into the long-term financial trend of the QPP.

One measure of the QPP's funded status, the ratio of the Actuarial Asset Value to the Entry Age Normal Actuarial Accrued Liability, determined as of June 30, 2016, is 58.6%. Please refer to the report's Actuarial Section for a detailed discussion of the Plan's measures of funded status.

Under Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans*, a defined-benefit pension plan is also required to report fiduciary net position as a percentage of the plan's total pension liability. This method reports assets at current fair value and, as such, is more sensitive to market volatility. As of June 30, 2018, the Qualified Pension Plan's fiduciary net position represents 74.5% of the QPP's total pension liability.

Funds needed to finance the QPP's long-term benefit are accumulated through the collection of employer and member contributions and through income from investments. Primary expenses include benefit and survivor payments as well as investment and administrative expenses, and refunds of contributions to terminated employees. An overview of revenue and expenses, as well as asset and liability information, is provided in the Management's Discussion and Analysis portion of the Financial Section.

## Management Responsibility for Financial Reporting and Internal Controls

The financial statements were prepared in accordance with accounting principles generally accepted in the United States of America and GASB pronouncements. Management is responsible for the integrity and fairness of the information presented in the financial statements, including data that, out of necessity, is based on estimates and judgments. Management is also responsible for establishing and maintaining an effective internal control structure. A system of internal controls provides reasonable, but not absolute, assurance that assets are properly safeguarded and that financial statements are reliable. The concept of reasonable assurance recognizes that first, the cost of a control should not exceed the benefits likely to be derived, and second, the valuation of the cost and benefits requires estimates and judgments by management. We believe that the internal controls currently in place support this purpose, and that the financial statements, accompanying schedules, and statistical tables are fairly presented in all material respects.

## Investments

Assets of the QPP and the TDA Program are invested together in the following investment funds: the Pension Fund, the Diversified Equity Fund, the Balanced Fund (formerly the Bond Fund), the International Equity Fund, the Inflation Protection Fund, and the Socially Responsive Equity Fund. The performance summary for Fiscal Year 2018 follows:

Rate of Return by Fund—Fiscal Year 2018		
Fund	ROR	Gross vs. Net Returns
Pension	8.12%	Net of Fees
Variable Fund	ROR	Gross vs. Net Returns
Diversified Equity Fund	12.12%	Net of Fees
Balanced Fund*	N/A	Net of Fees
International Equity Fund	7.13%	Net of Fees
Inflation Protection Fund	5.10%	Net of Fees
Socially Responsive Equity Fund	12.96%	Net of Fees

*\*As of January 1, 2018, the Bond Fund became the Balanced Fund, and thus there is no 1-year actual performance figure available. For the six-month period since the fund inception, the Balanced Fund returned -0.39%.*

For Funds other than the Pension Fund, members' accounts are valued on a monthly basis based on unit values. The unit values are based on each Fund's closing market value as of the end of the preceding month and are comparable to shares in mutual funds. TRS members who invest in these variable-return funds purchase units with their contributions.

The following table showing July unit values for 2018 and 2017 was based on the performance of the variable-return funds as of June 30. In addition to the changes in unit values, members' accounts are credited with a 4% increment factor increasing the number of units they hold, and their accounts are similarly discounted to offset this increase.

Unit Values for Fiscal Years 2018 and 2017		
Variable Fund	Unit Value July 2018	Unit Value July 2017
Diversified Equity Fund	\$95.605	\$88.681
Balanced Fund (formerly Bond Fund)	\$16.076	\$16.758
International Equity Fund	\$10.930	\$10.611
Inflation Protection Fund	\$10.292	\$10.185
Socially Responsive Equity Fund	\$17.711	\$16.308

The Administrative Code of the City of New York authorizes the investments of plan assets subject to the terms, conditions, limitations, and restrictions imposed by law. The New York State Retirement and Social Security Law and the Administrative Code establish the criteria for permissible investments. Plan assets are diversified over a range of investments, and multiple investment strategies are used to limit risk. Details concerning the criteria for TRS' investments may be found in the Notes to the Financial Statements. A detailed discussion of TRS' investment strategies, asset classes, and yield information is provided in the report's Investment Section.

## Actuarial Reports

The Actuarial Section contains the Actuary's certification letter, the Actuary's statements, a summary of actuarial assumptions, and the actuarial tables. The actuarial valuation provides a picture of the overall funding health of the QPP.

## Statistical Reports

Past and current data are contained in this section. The section includes tables that reflect the net position and demographic characteristics of the QPP and the TDA Program. Also captured in the tables, when applicable, is information comparing ten years of data. This look back shows overall trends in our programs and membership demographics that help to accurately forecast our future ability to meet our members' retirement needs.

## Independent Audit & Professional Services

State statutes require an annual audit by independent certified public accountants. TRS' auditor, Marks Paneth LLP, provides an Independent Auditor's Report on the financial statements and schedules in the Financial Section of this Report.

Investment professionals are appointed under the direction of the Teachers' Retirement Board. Investment administration services for the TRSNYC Pension Fund are provided by the New York City Office of the Comptroller. Investment administration services for TRS' Variable-Return Funds are performed by TRS. The Office of the Comptroller and TRS hire consultants and other investment professionals to perform additional investment services. The Summary of Investment Managers and Fees and the Schedule of Payments of Commissions to Brokers, can be found starting on pages 100 and 107, respectively.

Legal services to TRS are provided by the City's Corporation Counsel and Groom Law Group.

Actuarial services are provided by the Office of the Actuary of the City of New York, which is employed by the City's five major pension systems.

## Awards

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to TRS for its Comprehensive Annual Financial Report for the Fiscal Year ended June 30, 2017. This was the 30<sup>th</sup> consecutive year that TRS was accorded this prestigious award. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized Comprehensive Annual Financial Report. This report must satisfy both the generally accepted accounting principles and the applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current comprehensive annual financial report continues to meet the Certificate of Achievement Program's requirements, and we are submitting it to the GFOA for its consideration.

## Acknowledgements

The compilation of the Report reflects the efforts of the TRS staff under the leadership of the Board of Trustees. It is intended to provide complete and reliable information as a basis for making management decisions, as a means of determining compliance with legal provisions, and as a means for determining responsible stewardship for the assets contributed by the members and their employers.

Finally, we would like to take this opportunity to express our gratitude to the staff, the advisors, and the many people who have worked diligently to ensure the successful operation of TRS.

Sincerely,



Patricia M. Reilly  
Executive Director



Paul J. Raucci  
Chief Accountant

## SUMMARY OF PLAN PROVISIONS

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## SUMMARY OF PLAN PROVISIONS

TRS' principal benefit provisions correspond to the tier structure established by applicable New York State Law<sup>1</sup>.

### Tiers III, IV, VI

Members with a date of membership of July 27, 1976 or later are covered by the following provisions:

#### SERVICE RETIREMENT

##### *Normal Service Retirement*

###### **Eligibility:**

A member is eligible to retire at age 62 (age 63 for Tier VI) with immediate payability after 5 or more years of service (10 or more years of service for Tier VI and for members represented by the UFT, joining after December 10, 2009 under the 55/27 plan).

Current members as of February 27, 2008 (excluding CUNY employees) were provided a 180-day period during which they were allowed to join a plan that permitted them to retire at age 55 and later with immediate payability and without reduction after 25 years of service, provided they pay an additional 1.85% of future pay, subject to contribution obligations.

After February 27, 2008, new members (excluding CUNY employees) are eligible to retire at age 55 and later with immediate payability and without reduction after 27 years of service and are required to pay an additional 1.85% of future pay, subject to contribution obligations.

After December 10, 2009, new members in a position represented by the UFT under the 55/27 retirement program 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.

After March 31, 2012, new Tier VI members are required to make contributions in amounts ranging from 3% to 6% per annum, based on annual wages earned during a "plan year," originally defined as April 1 to March 31, but amended to January 1 to December 31 as of January 1, 2016.

###### **Benefits:**

- (1) For a member with fewer than 20 years of service, the benefit is  $1/60$  times FAS<sup>2</sup> multiplied by years of service.
- (2) For a member with at least 20 (Tier VI) but fewer than 30 years of service (Tier III/IV), the benefit is  $1/50$  times FAS multiplied by years of service (Tier III/IV) or 35% plus 2% times FAS multiplied by each additional year exceeding 20 years of service (Tier VI).
- (3) For a member with 30 or more years of service, the benefit is  $1/50$  times FAS for each of the first 30 years of service plus  $3/200$  times FAS for each additional year (Tier III/IV).

##### *Early Service Retirement*

###### **Eligibility:**

A member is eligible to retire at age 55 or later with immediate payability, after 5 or more years of service (10 or more years for Tier VI and for members represented by the UFT joining on or after December 10, 2009 under the 55/27 plan).

<sup>1</sup> Chapter 274 of the Laws of 1970 (Tiers I/II), as restricted by RSSL Article 11; RSSL Articles 14 and 15 (Tiers III/IV); Chapter 18 of the Laws of 2012 (Tier VI).

<sup>2</sup> Final Average Salary (FAS) is the average earned during any three consecutive years (any five consecutive years for Tier VI) providing the highest average salary. However, if salary earned during any year included in the three-year period (five-year period for Tier VI) exceeds the average of the previous two years by more than 10%, the amount in excess of 10% will be excluded.

**Benefits:**

The pension is calculated similarly to the pension of a Normal Service Retirement, but it is reduced as follows:

- (1) For a Tier III/IV member who retires prior to age 62 with less than 30 years of service and is not a member of an Age 55 Plan, his/her pension for service is reduced by 0.5% for each of the first 24 months that the payability date precedes age 62, and by 0.25% for each additional month.
- (2) A Tier III/IV member with 30 or more years of service receives no reduction in benefits because of early retirement.
- (3) For a Tier VI member who retires prior to age 63, the retirement allowance is reduced by 6.5% per year.

***Deferred Vested Benefit***

**Eligibility:**

A member who has 5 or more years of credited service upon termination of employment (10 or more years under Tier VI, and for members represented by the UFT under the 55/27 plan who joined on or after December 10, 2009) is entitled to a deferred vested benefit payable at age 55 or later. A member who elects payability before age 62 (age 63 for Tier VI) will receive a reduced benefit unless they have 30 years of service under Tier III/IV or meet the eligibility requirements of their retirement plan.

**Benefits:**

The benefit formulas are the same as those set forth under a Normal Service Retirement and an Early Service Retirement. Should a member who elected to receive a vested deferred retirement allowance die before the attainment of payability age and had at least 10 years of service, the death benefit is 1/2 of the Ordinary Death Benefit in force on the last day of active service.

**DISABILITY RETIREMENTS**

***Ordinary Disability Retirement***

**Eligibility:**

A member is eligible for Ordinary Disability Retirement benefits if (s)he has completed 10 or more years of service and is incapacitated for performance of gainful employment. If the disability is judged to be the result of an accident in the performance of duty, the 10-year requirement is waived.

**Benefits:**

The benefit is the greater of: (a) 1/3 of FAS (2/3 of FAS for a member if the disability is judged to be the result of an accident in the performance of duty); or (b) 1/60 times FAS multiplied by the credited service.

A lump-sum disability benefit equals the in-service death benefit amount for members with:

- (a) a terminal illness with a life expectancy of one year or less; or
- (b) a medical condition of a long, continued, and indefinite duration requiring extraordinary care and treatment, regardless of life expectancy.

***Accident Disability Retirement***

**Eligibility:**

A member is entitled to an accident disability retirement allowance upon the occurrence of a disability caused by an accident in the actual performance of duty.

**Benefits:**

The retirement allowance will consist of a pension equal to two-thirds (60% under Tier III) of FAS.

## DEATH BENEFITS

### *Ordinary Death Benefits*

#### **Benefits:**

For members joining TRS after January 1, 2001, Death Benefit #2 below would be payable if a member dies before the effective date of retirement. For members joining prior to that date, the greater of the two death benefits described below would be payable.

#### **Death Benefit 1:**

This benefit provides one month's salary for each year of service up to a maximum of three years' salary. If the member would have been eligible to receive an unreduced retirement allowance at the time of his/her death, the benefit is a lump sum that is actuarially equivalent to the retirement allowance which would have been payable had the member retired on the day before his/her death, if greater.

#### **Death Benefit 2:**

This benefit provides one year's salary for each year of service up to a maximum of three years' salary after three years of service. The benefits reduce after age 60 at the rate of 5% per year, to a maximum reduction of 50% of the benefit in effect at age 60.

A benefit is also payable upon death after retirement and is expressed as follows:

- If death occurs in the first year after retirement, 50% of the benefit in force immediately before retirement.
- If death occurs in the second year following retirement, 25% of the benefit in force immediately before retirement.
- If death occurs subsequently, 10% of the benefit in force at age 60 or immediately before retirement if retirement was earlier than age 60.

If retirement occurs after age 60, the minimum death benefit payable after retirement is 10% of the death benefit in force at age 60.

The death benefit for a vested member with at least 10 years of credited service, who died while inactive before retirement, is equal to 50% of the death benefit that would have been payable had the member died on their last day of active service, in addition to a refund of the member contributions.

The Rules and Regulations adopted by the Teachers' Retirement Board in accordance with Chapter 581 of the Laws of 1970 provide that the first \$50,000 of each benefit on account of death in active service is payable from the Group Term Life Insurance Plan. Only the amount in excess of \$50,000, if any, is payable by TRS.

#### **Beneficiaries:**

The latest named beneficiary, duly designated with TRS, will receive the death benefits. If there is no eligible beneficiary on file, the benefits will be paid to the member's estate.

### *Accidental Death Benefits*

#### **Eligibility:**

A beneficiary is entitled to the benefit if the member died before the effective date of retirement as a natural and proximate result of an accident sustained in the performance of duty, and if the accident was not caused by the member's willful negligence.

#### **Benefits:**

The latest named beneficiary, duly designated with TRS, will receive the death benefits. The beneficiary receives a benefit equal to 50% of the wages the member earned during the last year of actual service.

If there is no eligible beneficiary on file, the benefits will be paid to the member's estate.



## **Tiers I, II**

Members with a date of membership before July 27, 1976 are covered by the following provisions:

### **SERVICE RETIREMENT**

#### ***Twenty-Year Pension Plan***

##### **Eligibility:**

- (1) A member who joined TRS under Tier I and who elects the Twenty-Year Pension Plan is eligible to retire after having completed 20 years of service, with benefits to begin on the latter of: a) the day they cease active employment, b) age 55, or c) the date they could have completed 25 years of service had they remained active. Regardless of the number of years of service, such a member who has elected the Twenty-Year Pension Plan and who is at least 55 years of age may retire with benefits payable immediately by canceling his/her election of the Twenty-Year Pension Plan, thereby becoming eligible for the benefits under the Age-55-Increased-Benefits Pension Plan.
- (2) A member who joined TRS under Tier II must also have rendered five years of continuous service immediately prior to retiring and must have attained age 55.

##### **Benefits:**

The service retirement allowance for a member who joined under Tier I is the sum of the following:

- (1) 50% of the average salary<sup>3</sup>, reduced by an annuity which is the actuarial equivalent of the minimum accumulation<sup>4</sup>;
- (2) an annuity which is the actuarial equivalent of the accumulated contributions; and
- (3) for service in excess of 20 years, (a) a pension for Increased-Take-Home-Pay<sup>5</sup> which is the actuarial equivalent of the Reserve for Increased-Take-Home-Pay credited in such years, and (b) 1.2% of the average salary for each such year prior to July 1, 1970 and 1.7% of the average salary for each such year beginning on that date.

If a member who joined TRS under Tier II retires prior to age 62 with less than 30 years of service, his/her pension for service is reduced by 0.5% for each of the first 24 months that the payability date precedes age 62, and by 0.25% for each additional month.

Current members as of February 27, 2008 who joined under Tier II (excluding CUNY employees) were provided a 180-day period during which they were allowed to join a plan that permitted them to retire at age 55 and later with immediate payability and without reduction after 25 years of service, provided they pay an additional 1.85% of future pay.

#### ***Age-55-Increased-Benefits Pension Plan***

##### **Eligibility:**

- (1) A member who joined TRS under Tier I, and who either elects the Age-55-Increased-Benefits Pension Plan or who cancels his/her election of the Twenty-Year Pension Plan may retire after having attained age 55 with benefits payable immediately upon retirement.
- (2) A member who joined TRS under Tier II must also have rendered five years of continuous service immediately prior to retiring and must have attained age 55.

<sup>3</sup> For a member who joined under Tier I, salary earnable in the last year of the most recent three-year period during which (s)he held no more than one position, or the average annual salary earnable in any five consecutive years designated by the member. For a member who joined under Tier II, the average salary earned during any three consecutive years which provides the highest salary. However, if salary earned during any year included in the three-year period exceeds the average of the previous two years by more than 20%, the amount in excess of 20% will be excluded.

<sup>4</sup> The difference between (1) the amount of required contributions during the member's first 20 years of city service, accumulated with interest to the member's payability date, and (2) the amount of the reserve for Increased-Take-Home-Pay on the date such period of 20 years is completed.

<sup>5</sup> Increased-Take-Home-Pay consists of special contributions made by the employer at 2.5%, 5%, or 8% of salary, with applicable interest.

**Benefits:**

The service retirement allowance consists of a pension for service, a pension for Increased-Take-Home-Pay, and an annuity.

The pension for service is equal to 1.2% of the average salary multiplied by years of service prior to July 1, 1970, plus 1.53% of the average salary multiplied by years of service after June 30, 1970. The pension for Increased-Take-Home-Pay is the actuarial equivalent of the Reserve for Increased-Take-Home-Pay, and the annuity is the actuarial equivalent of the member's accumulated deductions.

If a member who joined TRS under Tier II retires prior to age 62 with less than 30 years of service, his/her pension for service is reduced by 0.5% for each of the first 24 months that the payability date precedes age 62, and by 0.25% for each additional month.

Current members as of February 27, 2008 who joined under Tier II (excluding CUNY employees) were provided a 180-day period during which they were allowed to join a plan that permitted them to retire at age 55 and later with immediate payability and without reduction after 25 years of service, provided they pay an additional 1.85% of future pay.

**VESTED DEFERRED RETIREMENT ALLOWANCE****Eligibility:**

A member who either resigns or is dismissed from service would receive a benefit equal to his/her accumulated deductions. However, a member who is eligible for benefits under the Age-55-Increased-Benefits Pension Plan and who has at least 5 years of service immediately preceding resignation may instead elect to receive a deferred vested allowance.

**Benefits:**

This allowance is computed in the same manner as the retirement allowance for service retirement under the Age-55-Increased-Benefits Pension Plan, except that the allowance is deferred to age 55. Should a member who elected to receive a vested deferred retirement allowance and who had 10 years of service die before the attainment of age 55, the death benefit is 1/2 of the Ordinary Death Benefit in force on the last day of service.

**DISABILITY RETIREMENTS*****Ordinary Disability Retirement*****Eligibility:**

Regardless of the Plan elected, a member who has completed 10 or more years of City service preceding the occurrence of disability, for causes other than an accident in the actual performance of duty, is entitled to an ordinary disability retirement allowance.

**Benefits:**

If, at the time of becoming disabled, the member could have retired for service with benefits payable immediately, the ordinary disability allowance will be the same as the service retirement allowance without reduction on account of age. For all other members, the ordinary disability allowance is computed in the same manner as though the member had been eligible for service retirement under the Age-55-Increased-Benefits Pension Plan with benefits payable immediately, but never less than the allowance that would have been payable under the provisions in effect prior to July 1, 1970.

### ***Accident Disability Retirement***

**Eligibility:**

A member is entitled to an accident disability retirement allowance upon the occurrence of a disability caused by an accident in the actual performance of duty.

**Benefits:**

The retirement allowance will consist of a pension equal to 3/4 of the average salary in the last 5 years, plus a pension which is the actuarial equivalent of the Reserve for Increased-Take-Home-Pay, and an annuity purchased with the member's accumulated deductions.

## **DEATH BENEFITS**

### ***Ordinary Death Benefits***

**Benefits:**

Upon the death of a member in active service, a benefit is paid to his/her estate or to such person(s) as (s)he shall have nominated.

**Members who joined TRS under Tier I**

- If a member completed less than 10 years of City Service, the benefit is equal to the compensation earnable by the member in the 6 months immediately preceding death.
- If the total number of years of City Service is greater than 10, but less than 20, the benefit is equal to the compensation earnable by the member during the 12 months immediately preceding death.
- If the total number of years of City Service exceeds 20, the benefit is equal to twice the compensation earnable by the member during the 12 months immediately preceding death.
- In addition, the member's accumulated deductions and the Reserve for Increased-Take-Home-Pay are paid to the member's estate or to the designated beneficiary.

The benefits payable on account of such a member who, at the time of his/her death, would have been eligible for service retirement is either the benefit described above or a lump sum that is actuarially equivalent to the retirement allowance which would have been payable had the member retired on the day before his/her death, whichever is larger.

**Members who joined TRS under Tier II** must choose between the two following death benefits so that, upon the member's death, benefits are paid pursuant to the member's election:

**Death Benefit 1:** This benefit provides one month's salary for each year of service, up to a maximum of three years' salary. In addition, the member's accumulated deductions are payable. If the member would have been eligible to receive an unreduced retirement allowance at the time of his/her death, the benefit is a lump sum that is actuarially equivalent to the retirement allowance which would have been payable had the member retired on the day before his/her death, if greater.

**Death Benefit 2:** In addition to a refund of the member's accumulated deductions, this benefit provides one year's salary for each year of service up to a maximum of three years' salary after three years of service. The benefit reduces after age 60 at the rate of 5% per year, to a maximum reduction of 50% of the benefits in effect at age 60.

A benefit is also payable upon death after retirement and is expressed as follows:

- If death occurs in the first year after retirement, 50% of the benefit in force immediately before retirement.
- If death occurs in the second year following retirement, 25% of the benefit in force immediately before retirement.
- If death occurs subsequently, 10% of the benefit in force at age 60 or immediately before retirement if retirement was earlier than age 60.

If retirement occurs after age 60, the minimum death benefit payable after retirement is 10% of the death benefit in force at age 60.

The death benefit for a vested member with at least 10 years of credited service, who died while inactive before becoming eligible for unreduced retirement benefits, is equal to 50% of the death benefit that would have been payable had the member died on their last day of active service, in addition to a refund of the member contributions.

The Rules and Regulations adopted by the Teachers' Retirement Board in accordance with Chapter 581 of the Laws of 1970 provide that the first \$50,000 of each benefit on account of death in active service is payable from the Group Term Life Insurance Plan. Only the amount in excess of \$50,000, if any, is payable by TRS.

**Beneficiaries:**

The latest named beneficiary, duly designated with TRS, will receive the death benefits. If there is no eligible beneficiary on file, the benefits will be paid to the member's estate.

***Accidental Death Benefits***

**Eligibility:**

A member is entitled to accidental death benefits upon the occurrence of death caused by an accident in the actual performance of duty and not the result of willful negligence.

**Benefits:**

The accidental death benefits are (a) a lump-sum equal to the Reserve for Increased-Take-Home-Pay and (b) a pension equal to one-half of the average salary in the last five years payable annually to the widow until remarriage or death, or if there is no widow, to a child or children until the attainment of age 18 of the youngest child, or if there is no widow, or child, to the dependent parents, and (c) a lump-sum equal to the member's accumulated deductions and Reserve for Increased-Take-Home-Pay payable to the member's estate or to the designated beneficiary. Alternatively, if the member joined TRS under Tier I, the beneficiary may elect to receive a lump sum that is actuarially equivalent to the retirement allowance which would have been payable if the member had retired on the day before the member's death, provided that the death occurred after the member became eligible to retire for service.

## **Cost-of-Living Adjustments**

### **Eligibility:**

Automatic annual Cost-of-Living Adjustments (COLA) are applicable to retired members in all tiers. COLA are payable to members who are either (1) at least age 62 and have been retired for at least 5 years or (2) at least age 55 and have been retired for at least 10 years. Additionally, COLA are payable to members who retired for disability after being retired for 5 or more years and beneficiaries receiving accidental death benefits who have been receiving them for at least 5 years.

### **Benefits:**

Starting with benefits for September 2001, the annual increase for COLA is equal to 50% of the increase in the Consumer Price Index for all Urban Consumers (CPI-U) based on the year ending March 31, rounded to the next higher .1%, not less than 1% nor greater than 3% of the first \$18,000 of the sum of maximum retirement allowance and prior COLA.

COLA are payable during the life of the retired member. One half of the amount is also payable after the member's death and during the life of the spouse beneficiary if such retired member had elected one of the options under the Administrative Code which provides that benefits are to be continued for the life of such spouse after the death of the retired member, and where the death of such retired member occurred or occurs more than 30 days after the effective date of the retirement of such member.

## **Options on Retirement**

A member, upon retirement, may receive his/her basic retirement allowance in monthly installments throughout life with all payments ending at death, or may elect to receive the actuarial equivalent in the following optional forms.

- (1) A joint-and-survivor allowance under which reduced payment will be made during life, with a provision that upon the member's death, the same payments or one-half of such payments shall be continued throughout the life of other such person(s) as the member shall have designated.  
(Applicable to members under Tiers I and II.)
- (2) A joint-and-survivor allowance under which reduced payments will be made during life, with a provision that upon the member's death, 100% or less (*i.e.*, in 10% increments) of such payments shall be continued throughout the life of such other person(s) as the member shall have designated.  
(Applicable to members under Tier III.)
- (3) A joint-and-survivor allowance under which reduced payments will be made during life, with a provision that upon a member's death, 100% or less (*i.e.*, in 25% increments) of such payments shall be continued throughout the life of such other person(s) as the member shall have designated.  
(Applicable to members under Tiers IV and VI.)
- (4) A joint-and-survivor allowance under which reduced payments will be made during life, with a provision that in the event of a member's death prior to the death of the designated beneficiary, the person designated would receive a percentage of the payments under the applicable plan, which had been received by the member under that plan. Should the designated beneficiary predecease the member, the member's retirement allowance "pops up" to the amount which would have been payable, had no optional modification of the retirement allowance been in effect. (All Tiers)

- (5) A ten-year or five-year certain and life allowance under which reduced payments will be made during life, with a provision that in case of death within ten or five years of retirement, the balance that would have been payable had the member survived for ten or five years, shall continue to be paid to the designated beneficiary or estate. (All Tiers)
- (6) A cash refund allowance under which reduced payment will be made during life, with a provision that, in case of death before such payments have equaled the present value of the retirement allowance at the time of retirement, the balance shall be paid to the designated beneficiary or estate in a lump-sum. (Applicable to members under Tier I.)
- (7) A cash refund allowance under which reduced payments will be made during life, with a provision that, in case of death before such payments have equaled the present value of the retirement allowance at the time of retirement, the balance from the annuity portion of the retirement allowance shall be paid to the designated beneficiary or estate in a lump-sum. (Applicable to members under Tier II.)
- (8) A cash refund allowance under which reduced payment will be made during life, with a provision that, upon the member's death, a sum specified by the retiree at the time of retirement, would be paid to the designated beneficiary or estate. (Applicable to members under Tiers I and II, by resolution of the Teachers' Retirement Board.)
- (9) Such other actuarial equivalent optional forms as may be certified by the Actuary and approved by the Teachers' Retirement Board. (All Tiers)

### **Annuitization Options for Beneficiaries of a Death Benefit**

Upon a member's death, the beneficiary may elect to receive the actuarial equivalent of a lump-sum death benefit, otherwise payable, in one of the following forms: 1) An annual amount payable for life in monthly installments, all payments ending at death; (This is only available to the beneficiary of a member who joined under Tiers I and II.) or 2) A cash refund allowance under which reduced payments will be made during life, with a provision that, in case of death before such payments have equaled the lump-sum payable upon the member's death, the balance shall be paid to the designated beneficiary or estate. (This is only available to the beneficiary of a member joined under Tier I.)

# Financial



## INDEPENDENT AUDITORS' REPORT

To the Retirement Board of the  
 Teachers' Retirement System of The City of New York:

### ***Report on the Combining Financial Statements***

We have audited the accompanying combining statements of fiduciary net position of the Teachers' Retirement System of The City of New York Qualified Pension Plan ("QPP") and the Teachers' Retirement System of The City of New York Tax-Deferred Annuity ("TDA") Program, which collectively comprise the Teachers' Retirement System of The City of New York, (the "Systems"), a fiduciary fund of The City of New York, as of June 30, 2018 and 2017, 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, 2018 and 2017, 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 Supplementary 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 and Schedule 5, 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 Section, Investment Section, Actuarial Section, and Statistical Section 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.



October 26, 2018

(except for the Other Supplementary Information,  
as to which the date is December 20, 2018)

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

This narrative discussion and analysis of the Teachers' Retirement System of the City of New York's ("TRS" or the "System") financial performance provides an overview of the System's combining financial activities for the Fiscal Years ended June 30, 2018 and 2017. It is meant to assist the reader in understanding TRS' combining financial statements by providing an overall review of the combining financial activities during the years and the effects of significant changes, as well as a comparison with prior years' activity and results. This discussion and analysis is intended to be read in conjunction with the System's combining financial statements. TRS administers the TRS Qualified Pension Plan ("QPP") and the TRS Tax-Deferred Annuity ("TDA") Program. The QPP is a cost-sharing, multiple-employer defined-benefit pension plan. The QPP provides pension benefits to City public school teachers and certain other personnel, participating Charter Schools and participating City University of New York ("CUNY") teachers and other personnel. The TDA Program is a tax-deferred annuity program described in Internal Revenue Code section 403(b) and is available as a supplemental savings option to QPP members.

**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 Programs, 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 of accounting.
- **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 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 ("RSI")** — as required by GASB, the RSI includes the management discussion and analysis (this section) and information presented following the notes to the combining financial statements.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

**HIGHLIGHTS AND RECENT DEVELOPMENTS****Employer Information**

Employers that participate in TRS include the Department of Education ("DOE"), City University of New York ("CUNY") both Junior and Senior Colleges and New York City Charter Schools that elect to participate. All employers may participate in the QPP and the TDA Program.

The following schedule provides the 2018 QPP summary information of the employer groups.

	<b>Members Active</b>	<b>Contribution Employer</b>	<b>Contribution Member</b>	<b>Members Retired</b>	<b>Pension Payments</b>
DOE	115,000	\$ 3.7 billion	\$ 183 million	83,000	\$ 4.2 billion
CUNY	7,700	\$ 148 million	\$ 11 million	2,600	\$ 132 million
Charter Schools	600	\$ 7.4 million	\$ 1.2 million	less than 50	\$ 1.4 million

**UFT Contract**

The collective bargaining agreement of the United Federation of Teachers ("UFT"), the primary union for the DOE's employees, was ratified in June 2014 and expires in February 2019. The current agreement includes retroactive and regular wage increases. The wage increases impact employer contributions, member contributions, and payments to retirees.

**FINANCIAL HIGHLIGHTS****QPP Fiduciary Net Position**

The QPP's net position restricted for benefits is held in trust for the payment of future benefits to members and pensioners. The QPP's net position restricted for benefits was \$54.5 billion, \$50.1 billion, and \$43.6 billion as of June 30, 2018, 2017, and 2016, respectively. The System's employer contributions amounted to \$3.9 billion, \$3.9 billion, and \$3.8 billion, for Fiscal Years 2018, 2017, and 2016, respectively. The QPP's benefit payments totaled \$4.4 billion, \$4.2 billion, and \$4.1 billion, for Fiscal Years 2018, 2017, and 2016, respectively. Below is a summary of the QPP's net position and changes in net position.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

**QPP Fiduciary Net Position**  
**June 30, 2018, 2017, and 2016**  
(In thousands)

	2018	2017	2016
Cash	\$ 75,847	\$ 101,499	\$ 5,157
Receivables for investments sold	839,544	989,725	1,772,521
Receivables for accrued interest and dividends	273,387	164,163	151,330
Member loan receivables	312,219	298,146	275,704
Investments, at fair value	78,901,469	72,404,290	64,406,187
Collateral from securities lending	1,117,592	1,610,321	1,858,682
Other assets	62,852	38,932	49,873
	<u>81,582,910</u>	<u>75,607,076</u>	<u>68,519,454</u>
Accounts payable	643,567	529,059	417,408
Payable for investments purchased	1,568,064	1,353,803	2,308,523
Accrued benefits payable	13,858	13,987	12,563
Investments due to TDA Program	23,707,352	22,004,183	20,292,733
Payable for securities lending	1,117,593	1,610,321	1,858,682
	<u>27,050,434</u>	<u>25,511,353</u>	<u>24,889,909</u>
Net position restricted for benefits	<u>\$ 54,532,476</u>	<u>\$ 50,095,723</u>	<u>\$ 43,629,545</u>

Cash balances amounted to \$75.8 million at June 30, 2018, a decrease of \$25.7 million (-25.3%) from June 30, 2017. As of June 30, 2017, cash balances amounted to \$101.5 million, an increase of \$96.3 million (1,868.2%) from June 30, 2016. Cash balances consist of advances to investment managers' accounts, accounts used to process reimbursement transfers between the System's investment programs, and bank accounts associated with the collections of loan insurance premiums and loan service charges. As of June 30, 2018, the largest cash balances consisted of the International and Private Equity investment managers of the TRSNYC Pension fund with \$30.3 million and \$24.1 million, respectively. Large cash balances held by an investment manager are due to a recent sale or the general investment cycle. For example, Private Equity's investment cycle generally begins with cash from assets sold during the month and ends with subsequent purchases following month-end.

Receivables for investment securities sold amounted to \$839.5 million at June 30, 2018, a decrease of \$150.2 million (-15.2%) from June 30, 2017. Receivables for investment securities sold amounted to \$989.7 million at June 30, 2017, a decrease of \$782.8 million (-44.2%) from June 30, 2016. These balances are principally composed of receivables for securities that have been sold but have not yet settled (*i.e.*, the cash has not been collected). The decreases resulted primarily from timing differences between trade and settlement dates. Trades typically do not settle until a few days after the trade date.

Receivables for accrued interest and dividends amounted to \$273.4 million as of June 30, 2018, an increase of \$109.2 million (66.5%) from June 30, 2017. Receivables for accrued interest and dividends amounted to \$164.2 million as of June 30, 2017, an increase of \$12.8 million (8.5%) from June 30, 2016. Changes in accrued earnings are impacted primarily by the cumulative value of the interest or dividend bearing securities, as well as by changes in discount rates, and interest-payable dates.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)  
JUNE 30, 2018 AND 2017**

At June 30, 2018, member loan receivables amounted to \$312.2 million, an increase of \$14.1 million (4.7%) from the previous year. At June 30, 2017, member loan receivables amounted to \$298.1 million, an increase of \$22.4 million (8.1%) from the previous year. The increases primarily reflect interest accrued on loans receivables for Tiers III, IV, and VI members as new loans have kept pace with loan repayments.

Investments at June 30, 2018 were \$78.9 billion compared to \$72.4 billion at June 30, 2017, an increase of \$6.5 billion (9.0%) from June 30, 2017. As of June 30, 2018, the QPP's total investment portfolio, including both the TRSNYC Pension and Variable-Return Funds, consisted of 54% equity investments, 35% fixed income securities and 11% alternative investments (primarily private equity and real estate investments). The \$6.5 billion annual increase in investments is the result of \$6.3 billion in net investment income plus a \$364.4 million net increase in the year-over-year payables for investment securities purchased and investment receivables sold. More generally, investments as of June 30, 2018, in comparison with investment values as of June 30, 2017, reflect the equity and fixed income market's annual returns. For the year ended June 30, 2018, the Russell 3000 Index, a broad measure of U.S. equity markets, returned 14.8%. The Morgan Stanley Capital International Index for Europe, Australasia and Far East ("MSCI EAFE") returned 7.7%. The NYC Core + 5, a composite index maintained by New York City's Office of the Comptroller and a broad measure of the U.S. fixed income markets, returned -0.5%. The Dow Jones U.S. Select Real Estate Securities Index returned 4.2%. Investments at June 30, 2017 were \$72.4 billion compared to \$64.4 billion at June 30, 2016, an increase of \$8.0 billion (12.4%) from June 30, 2016. As of June 30, 2017, the QPP's total investment portfolio consisted of 60% equity investments, 30% fixed income securities and 10% alternative investments (primarily private equity and real estate investments). For the twelve-month period ended June 30, 2017, the Russell 3000 Index returned 18.5%, the MSCI EAFE returned 20.8%, the NYC Core +5 returned -0.2%, and the Dow Jones Select Real Estate Securities Index returned -2.4%

Other assets at June 30, 2018 totaled \$62.9 million, a \$24.0 million (61.4%) increase from June 30, 2017. Other assets at June 30, 2017 totaled \$38.9 million, a \$10.9 million (-21.9%) decrease from June 30, 2016. The year-over-year change in other assets, as of June 30, 2018, was primarily due to an \$11.6 million City University of New York (CUNY) receivable, subsequently received in July 2018, and a \$10.0 million (83.6%) increase in assets allocated for future administrative expenses.

Accounts payable at June 30, 2018 amounted to \$643.6 million, a \$114.5 million (21.6%) increase from June 30, 2017. The \$114.5 million increase was primarily due to a \$319.3 million increase in balances due to depositories less a \$209.4 million decrease in accrued investment expenses. The \$319.3 million increase in balance due to depositories included \$284.8 million Electronic Fund Transaction (EFT) payments outstanding on Saturday, June 30<sup>th</sup> 2018, and subsequently paid on Monday, July 2<sup>nd</sup> 2018. Accounts payable as of June 30, 2018 consisted of balances due to depositories (72.9%), reserve for expenses (12.8%), accrued investment expenses (5.1%), unclaimed funds (4.2%), and other payables (5.0%). Accounts payable at June 30, 2017 amounted to \$529.1 million, a \$111.7 million (26.7%) increase from June 30, 2016. Accounts payable as of June 30, 2017 consisted of accrued investment expenses (45.7%), balances due to depositories (28.3%), reserve for expenses (16.4%), unclaimed funds (5.4%), and other payables (4.2%). The \$111.7 million increase in accounts payable was primarily due to a \$16.0 million net increase in balances due to depositories and a \$96.1 million increase in accrued investment expenses.

Payables for investments purchased at June 30, 2018 amounted to \$1.6 billion, a \$214.3 million (15.8%) increase from June 30, 2017. Payables for investments purchased at June 30, 2017 amounted to \$1.4 billion, a \$954.7 million (-41.4%) decrease from June 30, 2016. Investments purchased are accounted for on a trade-date basis. The increase resulted from timing differences between settlement dates and trade dates, similar to receivables for investments sold discussed earlier.

Accrued benefits payable at June 30, 2018 amounted to \$13.9 million, a \$129.0 thousand (-0.9%) decrease from June 30, 2017. The \$129.0 thousand decrease is primarily attributed to a decrease of pending refunds/withdrawals due at year-end. Accrued benefits payable at June 30, 2017 amounted to \$14.0 million, a \$1.4 million (11.3%) increase from June 30, 2016. The \$1.4 million increase is primarily attributed to an increase of pending benefits payable to new retirees at year-end.

**TEACHERS' RETIREMENT SYSTEM OF THE CITY OF NEW YORK  
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Investments due to the TDA Program reflect the TDA Program's share of assets of the TRSNYC Pension Fund/Fixed Fund investments. Assets in the TDA Program's Fixed Return Fund are pooled with the QPP assets as System assets in the TRSNYC Pension Fund for investment purposes only. The amounts owned by the TDA Program are equal to member contributions, inter-fund transfers from other TDA program's passport funds, and earnings applied in accordance with statutory-interest rates (7% for members of the UFT and 8.25% for certain other participants). See Note 2 for a full description of the TDA Fixed Return Fund investment program.

**QPP Changes in Fiduciary Net Position  
Years Ended June 30, 2018, 2017, and 2016  
(In thousands)**

	2018	2017	2016
Additions:			
Member contributions	\$ 195,241	\$ 180,076	\$ 173,696
Employer contributions	3,949,689	3,945,768	3,760,714
Net receipts from other retirement systems	(3,534)	(2,291)	1,233
Net securities lending income	15,325	17,446	17,347
Net investment income	6,259,790	8,115,834	942,920
Payment of statutory-interest to TDA Program	<u>(1,595,462)</u>	<u>(1,466,615)</u>	<u>(1,354,207)</u>
Total additions	<u>8,821,049</u>	<u>10,790,218</u>	<u>3,541,703</u>
Deductions:			
Administrative expenses	65,076	60,790	59,367
TDA Rebalance	(32,704)	43,938	-
Benefits payments and withdrawals	<u>4,351,924</u>	<u>4,219,312</u>	<u>4,107,455</u>
Total deductions	<u>4,384,296</u>	<u>4,324,040</u>	<u>4,166,822</u>
Net (decrease) increase in net position	<u>\$ 4,436,753</u>	<u>\$ 6,466,178</u>	<u>\$ (625,119)</u>
Net position restricted for benefits			
Beginning of year	<u>50,095,723</u>	<u>43,629,545</u>	<u>44,254,664</u>
End of year	<u>\$ 54,532,476</u>	<u>\$ 50,095,723</u>	<u>\$ 43,629,545</u>

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

TRS received \$195.2 million in member contributions in Fiscal Year 2018, a \$15.1 million (8.4%) increase from Fiscal Year 2017. TRS received \$180.1 million in member contributions in Fiscal Year 2017, a \$6.4 million (3.7%) increase from Fiscal Year 2016. The \$15.1 million increase in Fiscal Year 2018 and the \$6.4 million increase in Fiscal Year 2017 were both primarily due to salary increases resulting from the 2014 UFT contract and a larger active Tier VI membership.

Employer contributions during Fiscal Year 2018 were \$3.9 billion, a \$3.9 million (0.1%) increase from Fiscal Year 2017. Employer contributions during Fiscal Year 2017 were \$3.9 billion, a \$185.1 million (4.9%) increase from Fiscal Year 2016. The increase was primarily due to increases in the amortization payments for the 2010 initial unfunded liability and a net actuarial gain. The June 30, 2016 (Lag) actuarial valuation and June 30, 2015 (Lag) actuarial valuation were used to determine Fiscal Year 2018 and 2017 employer contributions, respectively.

The QPP's net investment income for Fiscal Year 2018 was \$6.3 billion, a \$1.8 billion (-22.9%) decrease from Fiscal Year 2017. The QPP's net investment income of \$6.3 billion consisted of \$2.4 billion in dividend and interest income plus a net gain of \$4.2 billion on the appreciation in fair value of the QPP's investments less \$350.7 million in investment expenses. Net investment income for the QPP portion of the TRSNYC Pension Fund, QPP portion of the Diversified Equity Fund, QPP portion of the Balanced Fund (before January 1, 2018 Bond Fund), QPP portion of the International Equity Fund, QPP portion of the Inflation Protection Fund, and QPP portion of the Socially Responsive Fund totaled \$5.5 billion, \$728.9 million, \$927 thousand, \$1.1 million, \$354 thousand, and \$1.6 million, respectively. The QPP's net investment income for Fiscal Year 2017 was \$8.1 billion, a \$7.2 billion (760.7%) increase from Fiscal Year 2016. The QPP's net investment income of \$8.1 billion consisted of \$1.9 billion in dividend and interest income plus a net gain of \$6.5 billion on the appreciation in fair value of the QPP's investments less \$313.8 million in investment expenses. Net investment income for the QPP portion of the TRSNYC Pension Fund, QPP portion of the Diversified Equity Fund, QPP portion of the Bond Fund, QPP portion of the International Equity Fund, QPP portion of the Inflation Protection Fund, and QPP portion of the Socially Responsive Fund totaled \$7.3 billion, \$796.9 million, \$906.6 thousand, \$2.3 million, \$84.2 thousand, and \$1.7 million, respectively.

Payments of statutory-interest due to the TDA from its investment in the TRSNYC Pension Fund Assets (Fixed Return Fund) during Fiscal Year 2018 were \$1.6 billion, an increase of \$128.8 million (8.8%) from Fiscal Year 2017. Payments of statutory-interest due to the TDA from its investment in the TRSNYC Pension Fund Assets (Fixed Return Fund) during Fiscal Year 2017 were \$1.5 billion, an increase of \$112.4 million (8.3%) from Fiscal Year 2016.

For Fiscal Year 2018, the QPP's effective net investment income for the QPP portion of the TRSNYC Pension Fund increased due to investment returns attributable to the TDA Program's TRSNYC Pension Fund assets. The TDA Fixed Return Fund program resulted in approximately \$234.1 million more assets accruing to the QPP's Contingent Reserve Fund of Employer's Contributions, as a result of the TDA Program's investment returns being above the Statutory Rates. For Fiscal Year 2017, the TDA Fixed Return Fund program resulted in approximately \$951.1 million more assets accruing to the QPP's Contingent Reserve Fund of Employer's Contributions, as a result of the TDA Program's investment returns being above the Statutory Rates. The table below displays the TDA Program's impact on the QPP's Contingent Reserve Fund of Employer's Contributions for Fiscal Years 2018, 2017, and 2016.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

**Revenue (Expense) to Contingent Reserve Fund**

**TRSNYC Pension Fund Assets (QPP)\***

**Years Ended 2018, 2017, and 2016**

**(In thousands)**

	<b>2018</b>	<b>2017</b>	<b>2016</b>
Net Investment Income	\$ 5,541,133	\$ 7,327,841	\$ 981,061
TDA percent of Fixed Assets as of June 30	32.74%	33.30%	32.69%
TDA percent of Fixed Assets 6/30/15:			30.26%
TDA percent of Fixed Assets (average)	33.02%	32.99%	31.47%
Investment Income on account of TDA Investment	\$ 1,829,591	\$ 2,417,743	\$ 308,775
Less Statutory Interest to TDA	(1,595,462)	(1,466,615)	(1,354,207)
Revenue (Expense) to QPP Contingent Reserve	<u>\$ 234,129</u>	<u>\$ 951,128</u>	<u>\$ (1,045,432)</u>

\*Includes security-lending income

Administrative expenses during Fiscal Year 2018 were \$65.1 million, an increase of \$4.3 million (7.1%) from Fiscal Year 2017. In Fiscal Year 2014, the System began a phased implementation to replace its outdated IBM A/S 400 computer system with a system based on Microsoft's .NET programming framework. Sagitec, an outside vendor and a provider of Pension Database Systems, and Cognizant, a software testing company, have been assisting with this multi-year project. In Fiscal Year 2018, the System primarily worked on modernizing death benefit related processing. The change in administrative expenses also reflects the annual update in the System's administrative expenses attributed to the QPP. (See Note 8.) The QPP's total administrative expenses for Fiscal Year 2018 accounted for 74.3% of the System's administrative expenditures. The balance of \$22.5 million (25.7%) was expensed to the TDA Program. Administrative expenses during Fiscal Year 2017 were \$60.8 million, an increase of \$1.4 million (2.4%) from Fiscal Year 2016. In Fiscal Year 2017, the System updated its member enrollment process, enhanced its enterprise content management and member website platforms, and continued with other implementation initiatives. The QPP's total administrative expenses for Fiscal Year 2017 accounted for 64.1% of the System's administrative expenditures. The balance of \$34.0 million (35.9%) included \$33.0 million expensed to the TDA Program and also \$1.0 million charged against incoming loan service charge revenues. The System's administrative expenditures have been \$87.5 million, \$94.9 million, and \$92.4 million, for Fiscal Years 2018, 2017, and 2016, respectively.

The TDA rebalance during Fiscal Year 2018 resulted in \$32.7 million transfers to the TRSNYC Pension Fund from the TDA Program due to a surplus in the TDA Program's Variable Annuity and Pension Reserve Funds. The Administrative Code of the City of New York under sections 13-582 and 13-577 provide for certain internal transfer of funds. These transfers are intended to rebalance estimated actuarial liabilities with reported assets and follow liability reviews conducted by the Actuary of the City of New York. Also, \$83.4 million was transferred to fully fund the QPP Program's Variable Annuity and Pension Reserve Funds. The \$83.4 million transfer reduced the investments held by the QPP's TRSNYC Pension Fund and increased the investments held by the QPP Program's variable-return funds but did not impact net investments held by the QPP plan (see Note 2, Intra-Fund Payables). In Fiscal Year 2017, following liability reviews conducted by the Actuary of the City of New York and in concert with the Office of the Comptroller of the City of New York, \$43.9 million was transferred due to a deficit in the TDA Program's Variable Annuity and Pension Reserve Funds. Also, \$3.8 billion was transferred to fully fund the QPP Program's Variable Annuity and Pension Reserve Funds.

Benefit payments and withdrawals during Fiscal Year 2018 were \$4.4 billion, a \$132.6 million (3.1%) increase from Fiscal Year 2017. The \$132.6 million increase in benefit payments and withdrawals was primarily due to a \$134.0 million (3.2%) increase in payments to retirees. In total, benefit payments and withdrawals distributed during Fiscal Year 2018 were composed of 98.43% in retirement benefits and 1.57% in refund/withdrawals and survivor benefits. Benefit payments and withdrawals during Fiscal Year 2017 were \$4.2 billion, a \$111.9 million (2.7%) increase from Fiscal Year 2016. The \$111.9 million increase in benefit payments and withdrawals was primarily due to a \$110.3 million (2.7%) increase in



**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

payments to retirees. In total, benefit payments and withdrawals distributed during Fiscal Year 2017 were composed of 98.35% in retirement benefits and 1.65% in refund/withdrawals and survivor benefits.

**TDA Program Financial Highlights** — The TDA Program's net position restricted for benefits was \$33.4 billion, \$31.1 billion, and \$28.4 billion, as of June 30, 2018, 2017, and 2016, respectively. Member contributions amounted to \$856.3 million, \$743.7 million, and \$717.6 million, for Fiscal Years 2018, 2017, and 2016, respectively. Benefit payments and withdrawals totaled \$1.1 billion, \$1.0 billion, and \$917.2 million, for Fiscal Years 2018, 2017, and 2016, respectively. Below is a summary of the TDA program's net position and changes in net position.

**TDA Program's Fiduciary Net Position**  
**June 30, 2018, 2017, and 2016**

(In thousands)	2018	2017	2016
Cash	\$ 7,371	\$ 3,952	\$ 4,699
Receivables for investments sold	7,250	23,956	29,686
Receivables for accrued interest and dividends	15,580	12,777	13,282
Member loan receivables	386,804	376,016	367,864
Investments, at fair value	9,427,324	8,838,152	7,946,654
Investment in TRSNYC Pension Fund	23,707,352	22,004,183	20,292,733
Collateral from securities lending	95,170	108,414	282,602
Other assets	18,613	16,296	13,429
Total assets	<u>33,665,464</u>	<u>31,383,746</u>	<u>28,950,949</u>
Accounts payable	85,715	96,908	103,283
Payable for investment securities purchased	12,473	43,416	29,597
Accrued benefits payable	91,124	82,915	91,127
Payable for securities lending transactions	95,170	108,414	282,602
Total liabilities	<u>284,482</u>	<u>331,653</u>	<u>506,609</u>
Net position held in trust for benefits	<u>\$ 33,380,982</u>	<u>\$ 31,052,093</u>	<u>\$ 28,444,340</u>

Cash balances amounted to \$7.4 million at June 30, 2018, an increase of \$3.4 million (86.5%) from June 30, 2017. Cash balances amounted to \$4.0 million at June 30, 2017, a decrease of \$747.0 thousand (-15.9%) from June 30, 2016. Cash balances consist of accounts used to reimburse the funds of the Variable-Annuity Program or accounts used for advance funding of the variable-return funds' investment managers.

Receivables for investment securities sold at June 30, 2018 amounted to \$7.3 million, a decrease of \$16.7 million (-69.7%) from June 30, 2017. Receivables for investment securities sold at June 30, 2017 amounted to \$24.0 million, a decrease of \$5.7 million (-19.3%) from June 30, 2016. These balances are principally composed of receivables for securities that have been sold but have not yet settled (*i.e.*, the cash has not been collected). The year-over-year changes resulted from timing differences in trading and settlement dates. Trades typically do not settle until a few days after the trade date.

Receivables for accrued earnings at June 30, 2018 were \$15.6 million, an increase of \$2.8 million (21.9%) from June 30, 2017. Receivables for accrued earnings at June 30, 2017 were \$12.8 million, a decrease of \$505 thousand (-3.8%) from June 30, 2016. Changes in accrued earnings are impacted by the cumulative value of the interest or dividend-bearing securities, discount rates, and interest payable dates at fiscal year-end.

Member loan receivables at June 30, 2018 amounted to \$386.8 million, an increase of \$10.8 million (2.9%) from June 30, 2017. For Fiscal Year 2018, loan disbursements amounted to \$189.7 million and principal and interest payments amounted to \$197.5 million. Member loan receivables at June 30, 2017 amounted to \$376.0 million, an increase of \$8.2 million (2.2%) from June 30, 2016. For Fiscal Year 2017, loan disbursements amounted to \$186.7 million and principal and interest payments amounted to \$192.3 million.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

The variable-return funds' investments at June 30, 2018, including collateral received for securities lending, were \$9.5 billion, an increase of \$575.9 million (6.4%) from June 30, 2017. The variable-return funds' investments at June 30, 2017, including collateral received for securities lending, were \$8.9 billion, an increase of \$717.3 million (8.7%) from June 30, 2016.

Assets of the TDA Program's Fixed Return Fund invested in the TRSNYC Pension Fund at June 30, 2018 were \$23.7 billion, an increase of \$1.7 billion (7.7%) from June 30, 2017. In addition to the 7% statutory return for UFT members [and 8.25% for non-UFT members] for Fiscal Year 2018, contributions, withdrawals and investment transfers to (from) the Fixed Return Fund totaled \$591.8 million, -\$853.6 million and \$382.3 million, respectively. Assets of the TDA Program's Fixed Return Fund invested in the TRSNYC Pension Fund at June 30, 2017 were \$22.0 billion, an increase of \$1.7 billion (8.4%) from June 30, 2016. In addition to the 7% statutory return for UFT members [and 8.25% for non-UFT members] for Fiscal Year 2017, contributions, withdrawals and investment transfers to (from) the Fixed Return Fund totaled \$515.6 million, -\$760.7 million and \$515.0 million, respectively.

Other assets at June 30, 2018 were \$18.6 million, an increase of \$2.3 million (14.2%) over June 30, 2017. Other assets at June 30, 2017 were \$16.3 million, an increase of \$2.9 million (21.4%) over June 30, 2016. Other assets primarily represent assets already allocated for future administrative expenses.

Accounts payable at June 30, 2018 amounted to \$85.7 million, a decrease of \$11.2 million (-11.6%) from June 30, 2017. Accounts payable at June 30, 2017 amounted to \$96.9 million, compared to \$103.3 million at June 30, 2016, a decrease of -6.2%. The TDA Program's accounts payable balance primarily represents a reserve fund to pay the TDA Program's investment and administrative expenses.

Payables for investment securities purchased at June 30, 2018 amounted to \$12.5 million, a decrease of \$30.9 million (71.3%) from June 30, 2017. Payables for investment securities purchased at June 30, 2017 amounted to \$43.4 million, an increase of \$13.8 million (46.7%) from June 30, 2016. Investments purchased are accounted for on a trade-date basis. The changes resulted from timing differences in settlement and trade dates, similar to receivables for investments sold discussed earlier.

Accrued benefits payable at June 30, 2018 amounted to \$91.1 million, an increase of \$8.2 million (9.9%) from June 30, 2017. Accrued benefits payable at June 30, 2017 amounted to \$82.9 million, a decrease of \$8.2 million (-9.0%) from June 30, 2016. Changes in accrued benefits payable are attributed to changes in TDA withdrawal amounts processed in July and August (an estimate is used for August) after year-end.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

**Changes in TDA Program's Fiduciary Net Position**  
**Years Ended June 30, 2018, 2017, and 2016**  
**(In Thousands)**

	2018	2017	2016
<b>Additions:</b>			
Member contributions	\$ 856,294	\$ 743,663	\$ 717,566
Receipt of statutory-interest for portion of investment in TRSNYC Pension Fund	1,595,462	1,466,615	1,354,207
Net investment income	1,053,660	1,396,698	(14,858)
Net securities lending income	<u>1,531</u>	<u>1,802</u>	<u>3,664</u>
Total additions	<u>3,506,947</u>	<u>3,608,778</u>	<u>2,060,579</u>
<b>Deductions:</b>			
Administrative expenses	22,456	33,032	32,632
TDA rebalance	32,704	(43,938)	-
Benefits payments	<u>1,122,898</u>	<u>1,011,931</u>	<u>917,189</u>
Total deductions	<u>1,178,058</u>	<u>1,001,025</u>	<u>949,821</u>
Net increase in net position	<u>\$ 2,328,889</u>	<u>\$ 2,607,753</u>	<u>\$ 1,110,758</u>
<b>Net position restricted for benefits</b>			
Beginning of year	<u>31,052,093</u>	<u>28,444,340</u>	<u>27,333,582</u>
End of year	<u>\$ 33,380,982</u>	<u>\$ 31,052,093</u>	<u>\$ 28,444,340</u>

TRS's TDA Program received \$856.3 million in member contributions during Fiscal Year 2018, an increase of \$112.6 million (15.1%) from Fiscal Year 2017. There were 87,296 members contributing in Fiscal Year 2018 compared to 83,856 members contributing in Fiscal Year 2017. TRS's TDA Program received \$743.7 million in member contributions during Fiscal Year 2017, an increase of \$26.1 million (3.6%) from Fiscal Year 2016. There were 83,856 members contributing in Fiscal Year 2017 compared to 81,112 members contributing in Fiscal Year 2016.

Receipts of statutory-interest for the TDA Program's Fixed Return Fund portion in investments in the TRSNYC Pension Fund assets for Fiscal Year 2018 were \$1.6 billion, an increase of \$128.8 million (8.8%) from Fiscal Year 2017. Receipts of statutory-interest for the TDA Program's Fixed Return Fund portion in investments in the TRSNYC Pension Fund assets for Fiscal Year 2017 were \$1.5 billion, an increase of \$112.4 million (8.3%) from Fiscal Year 2016.

Net investment income for the TDA Program's variable-return funds for Fiscal Year 2018 decreased \$343.0 million (-24.6%) from Fiscal Year 2017. Net investment income for the TDA Program's variable-return funds for Fiscal Year 2017 increased \$1.4 billion from Fiscal Year 2016. Net investment gains/losses primarily reflect the appreciation/depreciation in fair value of the TDA Program's variable-return fund investments, including both realized and unrealized gains and losses.

Administrative expenses for the Fiscal Year ended June 30, 2018 totaled \$22.4 million, a decrease of \$10.6 million (-32.0%) from Fiscal Year 2017. Administrative expenses for the Fiscal Year ended June 30, 2017 totaled \$33.0 million, an increase of \$400 thousand (1.2%) from Fiscal Year 2016. The TDA Program accounted for a portion of the System's total administrative expenses; see QPP administrative expenses above and Note 8.

The TDA rebalance during Fiscal Year 2018 resulted in a \$32.7 million transfer to the TRSNYC Pension Fund from the TDA Program. The TDA rebalance during Fiscal Year 2017 resulted in a \$43.9 million transfer from the TRSNYC Pension Fund to the TDA Program. The Administrative Code of the City of New York under sections 13-582 and 13-577 provide for certain internal transfer of funds. These transfers are intended to rebalance estimated actuarial liabilities with reported assets; see Note 2, Intra-Fund Payables.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

Benefit payments and withdrawals for the Fiscal Year ended June 30, 2018 totaled \$1.1 billion, an increase of \$111.0 million (11.0%) from Fiscal Year 2017. Benefit payments and withdrawals for the Fiscal Year ended June 30, 2017 totaled \$1.0 billion, an increase of \$94.7 million (10.3%) from Fiscal Year 2016. Benefit payments and withdrawals consist primarily of total and partial withdrawals.

**Cash Flow**

Monthly contributions, loan repayments, and interest and dividends earned on investments less benefit payments, new loans, and investment and administrative expenses account for the System's non-investment cash flow. The table below provides a three-year summary.

Cash Flow Review (In thousands)	June 30, 2018		June 30, 2017		June 30, 2016	
	QPP	TDA	QPP	TDA	QPP	TDA
Contributions	\$ 4,144,930	\$ 856,294	\$ 4,125,844	\$ 743,663	\$ 3,934,410	\$ 717,566
Contributions — Loan adj.	-	(16)	-	(157)	-	(195)
Loan repayments (cash)	140,129	197,528	131,640	192,340	122,050	186,774
401(a) receipts/(payments)	(3,534)	-	(2,291)	-	1,233	-
Interest income	1,330,009	35,177	932,169	34,368	860,223	33,469
Interest income — Loan adj.	(21,407)	(26,615)	(20,450)	(26,192)	(19,857)	(25,701)
Dividend income	1,056,636	146,932	981,087	138,237	896,208	128,383
Investment expenses (net)	(350,668)	(2,148)	(313,801)	5,518	(215,068)	5,645
Benefits/withdrawals	(4,351,924)	(1,122,898)	(4,219,312)	(1,011,931)	(4,107,455)	(917,189)
Withdrawals — Loan adj.	17,713	8,511	16,559	13,069	19,639	9,221
New loans	(150,066)	(189,680)	(149,750)	(186,684)	(140,000)	(176,403)
Administrative expenses	(65,076)	(22,456)	(60,790)	(33,032)	(59,367)	(32,632)
	<u>\$ 1,746,742</u>	<u>\$ (119,371)</u>	<u>\$ 1,420,905</u>	<u>\$ (130,801)</u>	<u>\$ 1,292,016</u>	<u>\$ (71,062)</u>

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)  
JUNE 30, 2018 AND 2017**

**Investments**

TRS investment funds include both QPP and TDA Program assets. The table below details the QPP and TDA Program's portions of the funds.

**TRS Investment Funds  
by Plan Percentage**

	June 30, 2018		June 30, 2017		June 30, 2016	
	QPP	TDA	QPP	TDA	QPP	TDA
TRSNYC Pension Fund	67.3%	32.7%	66.7%	33.3%	67.3%	32.7%
Variable-Return Funds:						
Diversified equity*	40.6%	55.8%	41.4%	55.2%	22.1%	73.4%
Balanced fund**	18.8%	81.2%	22.1%	77.9%	7.5%	92.5%
International equity	7.9%	92.1%	9.7%	90.3%	8.0%	92.0%
Inflation protection	7.1%	92.9%	8.8%	91.2%	8.9%	91.1%
Socially responsive equity	6.3%	93.7%	7.4%	92.6%	6.5%	93.5%

\* Remaining portion is held by Board of Education Retirement System.

\*\* Bond Fund prior to January 1, 2018.

To rate investment performance, both the TRSNYC Pension Fund assets and variable-return funds' investments are monitored with various benchmarks.

In addition to other indices, the "policy index" is used to monitor the complete TRS NYC Pension Fund. As of June 30, 2018, the policy index includes the following:

**TRSNYC Pension Fund Policy Index as of June 30, 2018\***

<u>Investment Type</u>	<u>Benchmark</u>	<u>Percent</u>
U.S. Equity	Russell 3000	32.7%
International Developed EAFE Markets	MSCI World ex USA IMI Net	11.8%
Emerging Markets	FTSE Custom NYC Teachers Emerging Markets	9.0%
International Emerging Managers FoF	NYC Blended Custom Benchmark for FoF	0.5%
Private Equity	Russell 3000 + 300 b.p per annum	5.3%
Private Real Estate - Core	NFI - ODCE Net	2.4%
Private Real Estate - Non Core	NFI - ODCE Net + 200 bps	1.3%
Infrastructure	CPI + 4%	0.8%
US Treasury Long Duration	FTSE Treasury 10+	10.8%
Mortgage	FTSE Mortgage Index	4.3%
ETI	ETI Custom Benchmark	0.9%
Investment Grade Credit	NYC - Investment Grade Credit	5.2%
High Yield	FTSE BB&B	6.2%
Bank Loans	Credit Suisse Leveraged Loan	2.0%
TIPS	BBG BARC Gbl Inf-Lk: US TIPS (Dly)	4.3%
Opportunistic Fixed	OFI - JPMGHY / CSFB 50/50 Blend Plus 300 b.p. per annum	2.5%
		100.0%

\*Source: Teachers' Retirement System of New York City Performance Overview as of June 30, 2018, prepared by State Street.

Variable-return funds are benchmarked using the Russell 3000, Standard & Poor's 500, FTSE Global All Cap, Bloomberg Barclays 1-5 Year Government/Credit indices, as well as numerous other indices.

**MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**  
**JUNE 30, 2018 AND 2017**

TRS earns additional investment income by lending its investment securities. The borrowers provide collateral to TRS that is valued in excess of the securities loaned, and the collateral is invested in short-term interest-bearing funds. For the Fiscal Year ended June 30, 2018, net securities lending income amounted to \$16.8 million, a decrease of \$2.4 million from Fiscal Year 2017. For the Fiscal Year ended June 30, 2017, net securities lending income amounted to \$19.2 million, a decrease of \$1.7 million from Fiscal Year 2016. (See Note 2.)

Investments held by TRS, including collateral from securities-lending transactions, are listed according to their investment classification in the following table:

**Investment Summary (by Asset Class)**  
**(in thousands)**

	2018	2017	2016
Short-term investments	\$ 1,971,516	\$ 1,249,819	\$ 2,314,459
Debt securities	20,607,574	16,326,740	15,196,888
Equity securities	51,313,246	51,172,993	43,392,606
Alternative investments	8,926,759	7,523,885	6,872,850
Fixed income	5,509,698	4,969,005	4,576,038
Collateral from securities lending	<u>1,212,762</u>	<u>1,718,735</u>	<u>2,141,284</u>
Total	<u>\$ 89,541,555</u>	<u>\$ 82,961,177</u>	<u>\$ 74,494,125</u>

**Investment Summary (by Plan)**  
**(in thousands)**

	2018	2017	2016
<b>TRSNYC Pension Fund</b>			
QPP	\$ 48,704,639	\$ 44,080,037	\$ 41,782,211
TDA	<u>23,707,352</u>	<u>22,004,183</u>	<u>20,292,733</u>
Total	<u>72,411,991</u>	<u>66,084,220</u>	<u>62,074,944</u>
<b>Variable-Return Funds</b>			
QPP	6,489,478	6,320,070	2,331,243
TDA	<u>9,427,324</u>	<u>8,838,152</u>	<u>7,946,654</u>
Total	<u>15,916,802</u>	<u>15,158,222</u>	<u>10,277,897</u>
<b>Collateral for Security Lending</b>			
QPP Pension Fund	1,048,388	1,530,310	1,774,456
QPP Variable-Return Funds	69,204	80,011	84,226
TDA Variable-Return Funds	<u>95,170</u>	<u>108,414</u>	<u>282,602</u>
Total	<u>1,212,762</u>	<u>1,718,735</u>	<u>2,141,284</u>
<b>Total Investments</b>	<u>\$ 89,541,555</u>	<u>\$ 82,961,177</u>	<u>\$ 74,494,125</u>

**CONTACT INFORMATION**

This financial report is designed to provide a general overview of the Teachers' Retirement System's finances. Questions concerning any data provided in this report or requests for additional information should be directed to Mr. Paul J. Raucci, Chief Accountant, Teachers' Retirement System of The City of New York, 55 Water Street, New York, NY 10041.

\* \* \* \* \*

**COMBINING STATEMENTS OF FIDUCIARY NET POSITION**  
**JUNE 30, 2018**  
(In Thousands)

ASSETS:	QPP	TDA	Eliminations	Total
Cash	\$ 75,847	\$ 7,371	\$ -	\$ 83,218
Receivables:				
Investment securities sold	839,544	7,250	-	846,794
Accrued interest and dividends	273,387	15,580	-	288,967
Member loans (Note 6)	312,219	386,804	-	699,023
Total receivables	<u>1,425,150</u>	<u>409,634</u>	<u>-</u>	<u>1,834,784</u>
Investments — at fair value (Notes 2 and 3):				
TRSNYC Pension Fund Assets (Fixed-Return Fund):				
Short-term investment:				
Commercial paper	6,487	-	-	6,487
Short-term investment fund	1,578,263	-	-	1,578,263
Discount notes	111,733	-	-	111,733
Debt securities:				
U.S. Government	13,288,993	-	-	13,288,993
Corporate and Other	7,016,574	-	-	7,016,574
Equity securities	20,536,514	-	-	20,536,514
Alternative Investments	8,926,759	-	-	8,926,759
Collective Trust Funds:				
International equity	15,436,970	-	-	15,436,970
Mortgage debt security	555,508	-	-	555,508
Treasury inflation protected securities	3,106,109	-	-	3,106,109
Fixed income	1,848,081	-	-	1,848,081
Collateral from securities lending (Fixed-Return Fund)	1,048,388	-	-	1,048,388
Diversified Equity Fund:				
Short-term investments	135,558	126,684	-	262,242
Equity securities	6,125,780	8,424,180	-	14,549,960
Debt securities	127,150	174,857	-	302,007
Balanced Fund (formerly the Bond Fund):				
Short-term investments	849	3,667	-	4,516
Equity securities	70,562	304,711	-	375,273
Debt securities	-	-	-	-
International Equity Fund:				
Short-term investments	80	927	-	1,007
International equity	12,076	140,561	-	152,637
Inflation Protection Fund:				
Short-term investments	3	45	-	48
Equity securities	4,596	60,120	-	64,716
Socially Responsive Equity Fund:				
Short-term investments	453	6,767	-	7,220
Equity securities	11,654	174,104	-	185,758
International equity	717	10,701	-	11,418
Collateral from securities lending (Variable-Return Funds)	69,204	95,170	-	164,374
<b>Total investments</b>	<u>80,019,061</u>	<u>9,522,494</u>	<u>-</u>	<u>89,541,555</u>
TDA Investment in TRSNYC Pension Fund	-	23,707,352	(23,707,352)	-
Other assets	62,852	18,613	(32,538)	48,927
<b>Total assets</b>	<u>81,582,910</u>	<u>33,665,464</u>	<u>(23,739,890)</u>	<u>91,508,484</u>
<b>LIABILITIES:</b>				
Accounts payable	643,567	85,715	(32,538)	696,744
Payable for investment securities purchased	1,568,064	12,473	-	1,580,537
Accrued benefits payable	13,858	91,124	-	104,982
Due to TDA Program's Fixed Return Fund	23,707,352	-	(23,707,352)	-
Securities lending (Note 2)	1,117,593	95,170	-	1,212,763
Total liabilities	<u>27,050,434</u>	<u>284,482</u>	<u>(23,739,890)</u>	<u>3,595,026</u>
<b>NET POSITION RESTRICTED FOR BENEFITS</b>				
Benefits to be provided by QPP	54,532,476	-	-	54,532,476
Benefits to be provided by TDA Program	-	33,380,982	-	33,380,982
Total net position restricted for benefits	<u>\$ 54,532,476</u>	<u>\$ 33,380,982</u>	<u>\$ -</u>	<u>\$ 87,913,458</u>

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

**COMBINING STATEMENTS OF FIDUCIARY NET POSITION**  
**JUNE 30, 2017**  
**(In Thousands)**

ASSETS:	QPP	TDA	Eliminations	Total
Cash	\$ 101,499	\$ 3,952	\$-	\$ 105,451
Receivables:				
Investment securities sold	989,725	23,956	-	1,013,681
Accrued interest and dividends	164,163	12,777	-	176,940
Member loans (Note 6)	298,146	376,016	-	674,162
Total receivables	<u>1,452,034</u>	<u>412,749</u>	<u>-</u>	<u>1,864,783</u>
Investments — at fair value (Notes 2 and 3):				
TRSNYC Pension Fund Assets (Fixed-Return Fund):				
Short-term investment:				
Commercial paper	230,093	-	-	230,093
Short-term investment fund	557,945	-	-	557,945
Discount notes	282,248	-	-	282,248
Debt securities:				
U.S. Government	7,947,669	-	-	7,947,669
Corporate and Other	7,753,224	-	-	7,753,224
Equity securities	21,086,002	-	-	21,086,002
Alternative Investments	7,523,885	-	-	7,523,885
Collective Trust Funds:				
International equity	15,734,149	-	-	15,734,149
Mortgage debt security	495,540	-	-	495,540
Treasury inflation protected securities	2,682,432	-	-	2,682,432
Fixed income	1,791,033	-	-	1,791,033
Collateral from securities lending (Fixed-Return Fund)	1,530,310	-	-	1,530,310
Diversified Equity Fund:				
Short-term investments	65,825	87,693	-	153,518
Equity securities	6,031,258	7,978,749	-	14,010,007
Debt securities	106,307	141,623	-	247,930
Bond Fund:				
Short-term investments	3,576	12,643	-	16,219
Debt securities	83,333	294,584	-	377,917
International Equity Fund:				
Short-term investments	53	490	-	543
International equity	12,436	115,770	-	128,206
Inflation Protection Fund:				
Short-term investments	23	240	-	263
Equity securities	4,761	49,088	-	53,849
Socially Responsive Equity Fund:				
Short-term investments	662	8,328	-	8,990
Equity securities	11,320	142,456	-	153,776
International equity	516	6,488	-	7,004
Collateral from securities lending (Variable-Return Funds)	80,011	108,414	-	188,425
Total investments	<u>74,014,611</u>	<u>8,946,566</u>	<u>-</u>	<u>82,961,177</u>
TDA Investment in TRSNYC Pension Fund	-	22,004,183	(22,004,183)	-
Other assets	38,932	16,296	(27,165)	28,063
Total assets	<u>75,607,076</u>	<u>31,383,746</u>	<u>(22,031,348)</u>	<u>84,959,474</u>
LIABILITIES:				
Accounts payable	529,059	96,908	(27,165)	598,802
Payable for investment securities purchased	1,353,803	43,416	-	1,397,219
Accrued benefits payable	13,987	82,915	-	96,902
Due to TDA Program's Fixed Return Fund	22,004,183	-	(22,004,183)	-
Securities lending (Note 2)	1,610,321	108,414	-	1,718,735
Total liabilities	<u>25,511,353</u>	<u>331,653</u>	<u>(22,031,348)</u>	<u>3,811,658</u>
NET POSITION RESTRICTED FOR BENEFITS				
Benefits to be provided by QPP	50,095,723	-	-	50,095,723
Benefits to be provided by TDA Program	-	31,052,093	-	31,052,093
Total net position restricted for benefits	<u>\$ 50,095,723</u>	<u>\$ 31,052,093</u>	<u>\$ -</u>	<u>\$81,147,816</u>

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



**COMBINING STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION**  
**YEAR ENDED JUNE 30, 2018**  
(In Thousands)

	QPP	TDA	Total
ADDITIONS:			
Contributions:			
Member contributions (Note 4)	\$ 195,241	\$ 856,294	\$ 1,051,535
Employer contributions	3,889,710	-	3,889,710
Other employer contributions	59,979	-	59,979
Total contributions	<u>4,144,930</u>	<u>856,294</u>	<u>5,001,224</u>
Investment income (Note 2):			
Interest income	1,330,009	35,177	1,365,186
Dividend income	1,056,636	146,932	1,203,568
Net appreciation in fair value of investments	4,223,813	873,699	5,097,512
Total investment income	<u>6,610,458</u>	<u>1,055,808</u>	<u>7,666,266</u>
Less:			
Investment expenses	356,269	10,436	366,705
Net (decrease) in variable expense provision	<u>(5,601)</u>	<u>(8,288)</u>	<u>(13,889)</u>
Net investment income	<u>6,259,790</u>	<u>1,053,660</u>	<u>7,313,450</u>
Securities lending transactions:			
Securities lending income	16,654	1,706	18,360
Less - securities lending fees	<u>(1,329)</u>	<u>(175)</u>	<u>(1,504)</u>
Net securities lending income	<u>15,325</u>	<u>1,531</u>	<u>16,856</u>
Total additions	<u>10,420,045</u>	<u>1,911,485</u>	<u>12,331,530</u>
DEDUCTIONS:			
Benefit payments and withdrawals	4,351,924	1,122,898	5,474,822
Administrative expenses (Note 8)	65,076	22,456	87,532
Other:			
Net receipts to other retirement systems	3,534	-	3,534
Statutory Interest for TDA Program's Fixed Return Fund	1,595,462	(1,595,462)	-
TDA Rebalance	<u>(32,704)</u>	<u>32,704</u>	<u>-</u>
Total deductions	<u>5,983,292</u>	<u>(417,404)</u>	<u>5,565,888</u>
NET INCREASE IN NET POSITION	4,436,753	2,328,889	6,765,642
NET POSITION RESTRICTED FOR BENEFITS:			
Beginning of year	<u>50,095,723</u>	<u>31,052,093</u>	<u>81,147,816</u>
End of year	<u>\$ 54,532,476</u>	<u>\$ 33,380,982</u>	<u>\$ 87,913,458</u>

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

**COMBINING STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION**  
**YEAR ENDED JUNE 30, 2017**  
(In Thousands)

	QPP	TDA	Total
ADDITIONS:			
Contributions:			
Member contributions (Note 4)	\$ 180,076	\$ 743,663	\$ 923,739
Employer contributions	3,888,399	-	3,888,399
Other employer contributions	57,369	-	57,369
Total contributions	<u>4,125,844</u>	<u>743,663</u>	<u>4,869,507</u>
Investment income (Note 2):			
Interest income	932,169	34,368	966,537
Dividend income	981,087	138,237	1,119,324
Net appreciation in fair value of investments	6,516,379	1,218,575	7,734,954
Total investment income	<u>8,429,635</u>	<u>1,391,180</u>	<u>9,820,815</u>
Less:			
Investment expenses	316,180	12,478	328,658
Net (decrease) in variable expense provision	<u>(2,379)</u>	<u>(17,996)</u>	<u>(20,375)</u>
Net investment income	<u>8,115,834</u>	<u>1,396,698</u>	<u>9,512,532</u>
Securities lending transactions:			
Securities lending income	18,806	2,014	20,820
Less - securities lending fees	<u>(1,360)</u>	<u>(212)</u>	<u>(1,572)</u>
Net securities lending income	<u>17,446</u>	<u>1,802</u>	<u>19,248</u>
Total additions	<u>12,259,124</u>	<u>2,142,163</u>	<u>14,401,287</u>
DEDUCTIONS:			
Benefit payments and withdrawals	4,219,312	1,011,931	5,231,243
Administrative expenses (Note 8)	60,790	33,032	93,822
Other:			
Net receipts to other retirement systems	2,291	-	2,291
Statutory-interest for TDA Program's Fixed Return Fund	1,466,615	(1,466,615)	-
TDA Rebalance	43,938	(43,938)	-
Total deductions	<u>5,792,946</u>	<u>(465,590)</u>	<u>5,327,356</u>
NET INCREASE IN NET POSITION	6,466,178	2,607,753	9,073,931
NET POSITION RESTRICTED FOR BENEFITS:			
Beginning of year	43,629,545	28,444,340	72,073,885
End of year	<u>\$ 50,095,723</u>	<u>\$ 31,052,093</u>	<u>\$ 81,147,816</u>

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

**NOTES TO COMBINING FINANCIAL STATEMENTS  
JUNE 30, 2018 AND 2017**

**1. PLAN 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") and City laws). The City's five major actuarially-funded pension systems are the Teachers' Retirement System of the City of New York ("TRS" or the "System"), the New York City Employees' Retirement System ("NYCERS"), the New York City Board of Education Retirement System ("BERS"), 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 others.

TRS administers the TRS Qualified Pension Plan (the "QPP") and the TRS Tax-Deferred Annuity Program (the "TDA Program").

The QPP is a cost-sharing, multiple-employer pension plan. The QPP provides pension benefits for certain City public school teachers and certain other school and college teachers. The employers, in addition to The City, are The City University of New York ("CUNY") and several Charter Schools (collectively, the "Employers"). Substantially all teachers in the public schools of The City become members of the QPP, and certain other specified school and college personnel may become members on the first day of permanent employment.

The QPP functions in accordance with State and City laws, which establish benefit terms and Employer and member contribution requirements for the QPP. The QPP is a tax-qualified retirement plan under section 401(a) of the Internal Revenue Code ("IRC") that has received a favorable determination letter from the Internal Revenue Service ("IRS"). The QPP combines features of a defined-benefit pension plan with those of a defined-contribution pension plan, but is a defined-benefit pension plan for financial reporting purposes. Contributions are made by the Employers and the members.

The TDA Program was established and is administered pursuant to IRC Section 403(b) and NYC Administrative Code section 13-582 and became effective February 1, 1970. 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 contributions until after retirement or upon withdrawal of contributions. Contributions to the TDA Program are made by the members only and are voluntary. Benefits provided under the TDA Program are derived from members' accumulated contributions and earnings thereon. The TDA Program is a defined-contribution pension plan for financial reporting purposes.

The QPP and TDA Program are fiduciary funds of The City and are included in the Pension and Other Employee Benefit Trust Funds section of The City's Comprehensive Annual Financial Report ("CAFR").

**NOTES TO COMBINING FINANCIAL STATEMENTS  
JUNE 30, 2018 AND 2017**

**Board of Trustees**

The Teachers' Retirement Board, a seven-trustee Board, sets policy and oversees TRS' operations. Three TRS Board trustees are elected from and by the TRS membership. These trustees serve three-year terms. The Mayor appoints two Board trustees, one of whom must be a member of the Panel for Educational Policy. The City Comptroller and the Chair of the Panel for Education Policy are the other two Board trustees, each of which may designate a representative to act on his or her behalf.

**Membership Data**

The QPP's and TDA Program's membership, at June 30, 2018 and June 30, 2017 consisted of:

<b>QPP</b>	<b>2018 *</b>	<b>2017</b>
Retirees and beneficiaries receiving benefits	86,000	84,770
Terminated vested members not yet receiving benefits	16,000	15,279
Other inactives**	8,000	7,997
Active members	<u>123,000</u>	<u>120,826</u>
Total	<u><u>233,000</u></u>	<u><u>228,872</u></u>
<b>TDA Program</b>	<b>2018 *</b>	<b>2017</b>
Retirees receiving a TDA annuity	2,800	2,866
Retirees or Inactive members with TDA deferral	56,000	54,448
Active members with TDA	<u>95,000</u>	<u>87,694</u>
Total	<u><u>153,800</u></u>	<u><u>145,008</u></u>

\*Preliminary.

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

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**JUNE 30, 2018 AND 2017**

The QPP's and TDA Program's membership, at June 30, 2016 and June 30, 2015, the dates of the membership data used in determining Fiscal Year 2018 and Fiscal Year 2017 employer contributions, consisted of:

<b>QPP</b>	<b>2016</b>	<b>2015</b>
Retirees and beneficiaries receiving benefits	84,093	82,777
Terminated vested members not yet receiving benefits	14,393	13,482
Other inactives*	7,401	7,347
Active members	<u>118,201</u>	<u>114,652</u>
Total	<u><u>224,088</u></u>	<u><u>218,258</u></u>
<b>TDA Program</b>	<b>2016</b>	<b>2015</b>
Retirees receiving a TDA annuity	2,930	2,991
Retirees or Inactive members with TDA deferral	52,722	50,854
Active members with TDA	<u>84,907</u>	<u>81,184</u>
Total	<u><u>140,559</u></u>	<u><u>135,029</u></u>

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

### Summary of Benefits

#### *QPP Plan*

The State Constitution provides that the 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 and member contributions for employees joining the QPP on or after the effective date of such amendments. As such, benefits under the QPP fall into various categories (also referred to as "Tiers") based on the year when an employee joined the QPP. A brief overview follows:

- Members who joined prior to July 1, 1973 ("Tier I") are entitled to service retirement benefits of 50% of "final salary" (as defined within State and City laws) after 20 years of service; a portion is provided from member contributions, plus additional benefits equal to specified percentages (as defined within State and City laws) per year of service of "final salary" for years in excess of the 20-year minimum. These 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 Increased-Take-Home-Pay ("ITHP") contributions [accumulated after the twentieth year of member qualifying service]. ITHP represents amounts contributed by The City to members' QPP accounts 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.

**NOTES TO COMBINING FINANCIAL STATEMENTS  
JUNE 30, 2018 AND 2017**

In addition, these same members could elect a service retirement benefit with no minimum service requirement that 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 on attainment of age 55. This benefit is increased, where applicable, by an annuity attributable to the member’s contributions and by any benefits attributable to the Employers’ contributions with respect to such service under the ITHP contributions.

- Members who joined the QPP after June 30, 1973 and before July 27, 1976 (“Tier II”) have provisions similar to Tier I, except that the eligibility for retirement and the salary base for benefits are different and there is a limitation on the maximum benefit. This maximum limitation was subsequently eliminated under Chapter 574 of the Laws of 2000 for all Tier II members who retired after December 8, 2000. Members retiring prior to the age of 62 without 30 years of credited service are subject to an age-reduction factor in their retirement allowance. Effective February 27, 2008, active members were eligible to enroll in a 55 retirement age minimum and 25 credited years of service retirement option (“55/25 retirement option”) enabling them to eliminate any age-reduction factor in their retirement allowance (Chapter 19 of Laws of 2008). Those choosing the 55/25 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.

For Tier I and II members enrolled in the QPP prior to July 27, 1976, ITHP contributions made on their behalf, as well as their own contributions are invested, at their election, in the Fixed Return Fund or in variable-return funds. Members can elect to invest in multiples of 5% and change their elections on a quarterly basis. Members receive statutory returns, currently 8.25%, on member contributions or ITHP contributions to the Fixed Return Fund (“Fixed Annuity Program”).

Certain members of Tier I and Tier II have the right to make voluntary member contributions (“Voluntary Contributions”) in excess of their required member contributions (“Required Contributions”). Both the investment of the Voluntary Contributions and the Required Contributions are directed by each member. A member may invest in: (1) the QPP’s Fixed Return Fund in which it is credited with interest at the Statutory-Interest Rate (currently 8.25% for Tier I and Tier II contributions and 7.0% for UFT members and 8.25% for non-UFT members for TDA Contributions) and/or (2) in one or more of the QPP’s variable-return funds (see Note 2—Investment Programs). 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 \$56.0 million and \$62.5 million, for the years ended June 30, 2018 and 2017, respectively. Actuarial estimates of the impact of Excesses and Deficiencies are incorporated into calculation of the QPP’s net pension liability.

The variable-return funds include only member contributions and ITHP contributions made on their behalf, as described above, and are expressed in terms of units that are valued monthly based on investment experience. At retirement, monthly annuities attributable to member Voluntary Excess Contributions and ITHP contributions can be paid in both fixed and variable amounts, based on the member’s election, which can be changed quarterly. Other benefits are paid only in fixed amounts. Monthly annuities attributable to investments in the variable-return funds are not fixed in amount, but are based on investment experience through the preceding month.

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- Members who joined the QPP on or after July 27, 1976 and prior to September 1, 1983 ("Tier III") were later mandated into Tier IV. However, these members retain their Tier III rights. Tier III requires member contributions of 3.0% of salary for a ten-year period (Chapter 126 of the Laws of 2000) and generally provides for reducing benefits by one-half of the primary Social Security benefit attributable to service with the Employer and for an annual cost-of-living escalator in pension benefits of not more than 3.0%. Members retiring prior to the age of 62 without 30 years of credited service are subject to an age-reduction factor in their retirement allowance.
- Members who joined the QPP on or after September 1, 1983 ("Tier IV") were required to make contributions of 3.0% 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 completion of ten years of credited service, whichever is earlier (Chapter 126 of the Laws of 2000). The annual benefit is approximately 1.67% of "final average salary" per year of service for members with less than 20 years of service and 2.0% of "final average salary" per year of service for members with 20 to 30 years of service, plus a 1.5% addition of "final average salary" per year of service for service in excess of 30 years of service. Members retiring prior to the age of 62 without 30 years of credited service experience an age-reduction factor in their retirement allowance. Effective February 27, 2008, active members were eligible to enroll in a 55 retirement age minimum and 25 credited years of service retirement option enabling them to eliminate any age-reduction factor in their retirement allowance. 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. Members joining after February 27, 2008 are automatically enrolled in a 55 retirement age minimum and 27 credited years of service retirement program ("55/27 retirement program"). These members are required to make additional plan contributions of 1.85% of salary until they have accumulated 27 years of credited service.

Members under the 55/27 retirement program who joined after December 10, 2009, but before April 1, 2012, were 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.

- Members who join on and after April 1, 2012 ("Tier VI") are required to make contributions of 3.0% per year through March 31, 2013. Thereafter, contributions range from 3.0% to 6.0% in accordance with a schedule based on salary. Member contributions continue until retirement. Salary is limited to the New York State Governor's salary. Tier VI members are generally eligible to retire with unreduced benefits beginning at age 63 or with reduced benefits beginning at age 55, if vested.

Members enrolled in the QPP on or after July 27, 1976 ("Tier III, IV and VI") who resign or otherwise terminate from service prior to eligibility for a benefit, are refunded all of their member contributions with 5.0% interest (RSSL, Article 15). Tier III, IV and VI members who work for the Department of Education also receive a monthly supplemental contribution. The monthly supplemental contribution of \$550 per year for supervisors and administrators and \$400 per year for other eligible members is credited to the members' Annuity Savings Accumulation Fund ("ASAF").

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 and eligible for benefits upon the completion of five years of service. After December 10, 2009, new members who belong to the UFT, and all Tier VI members, become fully vested upon the completion of ten years of service.

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The QPP provides death benefits and retirement benefits on the occurrence of accidental or ordinary disability. In terms of payment options of the retirement annuity, the QPP provides a number of options depending on whether retirement payments, following death, will continue to an assigned beneficiary.

During the spring 2000 session, the State Legislature approved and the State Governor ("Governor") authorized automatic Cost-of-Living Adjustments ("COLAs") for certain retirees and beneficiaries (Chapter 125 of the Laws of 2000). COLA is payable to all members who are either: (1) at least age 62 and have been retired for at least five years or (2) at least age 55 and have been retired for at least ten years. Additionally, COLA is payable to members who retired for disability after being retired for five or more years and beneficiaries receiving accidental death benefits who have been receiving them for at least five years. COLA is one-half of the increase in the CPI-U based on the year ending March 31, rounding to the next higher 0.1%, not less than 1% nor greater than 3% of the first \$18,000 of the sum of the maximum retirement allowance and prior COLA.

*TDA Program*

The TDA Program is administered by the TRS Board. Contributions to the TDA Program are made by the members only and are voluntary. To participate in the Program, active members of the QPP are required to submit a salary-reduction agreement and enrollment request. Members may choose to stop contributions at any time. A participant may elect to exclude an amount (within the maximum allowed by the IRS) of compensation from current taxable income by contributing it to the TDA Program. This maximum amount is calculated based on various individual factors. Members can elect to invest in the Fixed Return Fund or the variable-return funds.

A participant may withdraw all or part of the balance of his/her account prior to or at the time of retirement. As of January 1, 1989, the tax laws restrict withdrawals of tax-deferred annuity contributions and accumulated earnings thereon for reasons other than retirement or termination. Contributions made after December 31, 1988 and investment earnings credited after December 31, 1988 may only be withdrawn upon attainment of age 59½ or for reasons of hardship (as defined by IRS regulations). Previously, hardship withdrawals were limited to contributions only and if hardship withdrawal occurred, the member was not able to contribute for a six-month period. The Budget Act of 2018 authorizes plans to remove these restrictions.

If a member dies while an in-service employee, the full value of his/her TDA Program account at the date of death is paid to the member's beneficiary or estate.

When a member resigns before attaining vested rights under the QPP, (s)he may withdraw the value of the account or may leave the account in the TDA Program for a period of up to seven school years after the date of resignation, provided (s)he does not withdraw his/her account from the QPP. If a member resigns after attaining vested rights under the QPP, (s)he may leave his/her account in the TDA Program, provided the member does not withdraw his/her QPP funds. Once a withdrawal is made from the QPP, the member's participation in the TDA Program is automatically terminated, and the value of the account in the TDA Program will be paid out to the member. Upon death, TDA balances are paid to the assigned beneficiaries or may be invested on behalf of the beneficiaries in the TDA Program's variable-return funds.

At retirement, several payment options are available to those who annuitize their TDA Program funds. Generally, payment options similar to the QPP are available under the TDA Program.



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See "Investments" below for a discussion of TDA investment programs.

**2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

**Basis of Accounting** — The QPP and the TDA Program use the accrual basis of accounting where the measurement focus is on the 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 the Employers make payroll deductions from members' salary. Employer contributions to the QPP are recognized when due and the employer has a legal obligation to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of 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 (the "IIF"), and Alternative Investment Funds (the "ALTINVF"). The IIF are private funds of publicly traded securities that are managed by various investment managers on behalf of the QPP and the TDA Program. Fair value is determined by TRS 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 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 the New York City Office of the Comptroller or TRS management based on information provided by the various GPs after review by an independent consultant and the custodial bank, State Street, for the System's TRSNYC Pension Fund assets.

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.

**Fair Value Measurement** — Government Accounting Standards Board ("GASB") Statement No. 72, *Fair Value Measurement and Application* requires the System to use valuation techniques which are appropriate under the circumstances and are either 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 were used for the fair value measurements.

**Investment Presentation** — The TDA Program Fixed Return Fund's portion of TRSNYC Pension Fund assets are shown as commingled with the QPP's portion of TRSNYC Pension Fund assets, and an offsetting liability is used to show the TDA Program's share of the funds. For Fiscal Year ended June 30, 2018, \$77.1 million and \$46.3 million of local securities from the QPP and TDA Program, respectively, were included with the short-term investments of the Diversified Equity Fund. For Fiscal Year ended June 30, 2017, \$84.6 million and \$56.6 million of local securities from the QPP and TDA Program, respectively, were included with the equity securities investments of the Diversified Equity Fund.

**Investment Programs** — Prior to July 1, 2008, investments were composed of the assets of the following investment programs: the TRSNYC Pension Fund (which includes a component, the Fixed

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Return Fund, which was previously referred to as the Fixed Annuity Program) and two variable-return funds — the Diversified Equity Fund and the Stable-Value Fund. As of July 1, 2008, the investment programs were expanded to include three new variable-return funds — the International Equity Fund, the Inflation Protection Fund and the Socially Responsive Equity Fund. On January 1, 2012, the Stable-Value Fund became the Bond Fund. On January 1, 2018 the Bond Fund became the Balanced Fund. The Balanced Fund objective is to seek current income and some capital appreciation by investing in a portfolio that includes both stocks and bonds. The six investment programs are collectively referred to as the TRS Passport Funds.

All investment programs excluding the TRSNYC Pension Fund are referred to as the variable-return funds. The TRSNYC Pension Fund includes System investments from QPP employer contributions, QPP Tier I and II members' and ITHP contributions, QPP Tier III, IV and VI members' contributions and ASAF contributions and TDA Program member contributions invested in the Fixed Return Fund. Investing in variable-return funds is available for both QPP Tier I and II members', ITHP contributions and TDA program investments.

In the Fixed Return Fund, deposits from members' TDA Program accounts are invested along with QPP assets and TDA Program accounts are credited with a fixed rate of return, determined by the New York State Legislature ("Statutory-Interest Rates"). Payment of the Statutory-Interest is an obligation of The City (NYC Admin. Code section 13-533). The Statutory-Interest Rates are as follows:

- 7% for TDA investments by members who are serving in (or resigned/retired from) titles represented by the United Federation of Teachers. The crediting rate of 7% has been in effect since December 11, 2009. The prior crediting rate of 8.25% had been in effect since July 1, 1988 to December 11, 2009.
- 8.25% for TDA investments by all other members. This crediting rate has been in effect since July 1, 1988.

TDA Program assets are pooled with QPP assets for investment purposes only. NYC Administrative Code section 13-582, subdivision [k], provides for the maintenance of TDA accounts in the Annuity Savings Funds ("Fixed Return Fund") and Variable Annuity Programs ("variable-return funds"), which are distinct from similar funds for the QPP. This is in accordance with requirements that assets of the TDA Program be accounted for separately from assets of the QPP Plan. Statutory Rates received by funds invested in the QPP Plan's and the TDA Plan's Annuity Savings Fund ("Fixed Return Fund") are set, respectively, by NYC Administrative Code sections 13-638.2 and 13-582 [d].

Assets in the TDA Fixed Return Fund are invested with assets of the QPP, on a pro rata basis consistent with the QPP's asset allocation policy. Earnings on these investments over (or under) the Statutory Rates are considered by the Actuary in determining employer contribution obligations. Earnings over the Statutory Rates accrue to the benefit of the QPP. Earnings under the Statutory Rates are considered by the Actuary in determining employer contributions to the QPP, such that the City is ultimately responsible for any deficiency. For financial reporting purposes, TDA fixed return assets invested alongside QPP assets are reflected as a receivable due from the QPP equal in amount to the aggregate original principal amounts contributed by TDA Program members to the fixed return program, plus accrued interest at the Statutory Rate adjusted for withdrawals and transfers to or from variable funds. This receivable is reported by the TDA Program as an Investment in the Fixed Return Fund and the corresponding liability is reported by the QPP as Fixed Return Funds due to TDA.

Assets of the variable-return funds of the QPP and the TDA Program Diversified Equity Fund are co-invested along with certain assets of the BERS. These financial statements reflect the QPP's and

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TDA Program's variable-return funds' proportionate shares of Diversified Equity Fund investments and the related activity. **Other Employer Contributions** — Include amounts for Contingent Reserve Funds for half (or employer's portion) of Additional Member Contributions (Chapter 19 1.85%), buyback payments for outside and military service, and DOE supplemental contributions for the ASAF and ASF funds. The employer portion of Additional Member Contributions is not part of the employer's appropriation amount and also not recoverable by member upon member's resignation.

**Investment Expenses** — The variable-return funds maintain a reserve for administrative and investment expenses. As of June 30, 2018, the reserve was \$82,384,850 for QPP and \$53,442,554 for TDA. The expense reserve and net investment expenses for 2018 were reduced by \$5,600,764 for QPP and \$8,288,135 for TDA. Similarly, in Fiscal Year 2017 the reserve for administrative and investment expenses totaled \$86,637,932 for QPP and \$61,098,894 for TDA. The expense reserve and net investment expenses for 2017 were reduced by \$2,379,262 for QPP and \$17,995,764 for TDA.

**Income Taxes** — Income earned by the QPP and TDA Program is not subject to Federal income tax.

**Accounts Payable** — Accounts payable is principally comprised of amounts owed to the System's banks due to depositories, unclaimed funds, reserves for investment and administrative expenses for the variable-return funds and investment expenses accrued to the QPP and TDA Program. The System's practice is to fully invest its day-end cash balances in a pooled short-term fund. A typical benefit payment bank account would show balance, since funds are only deposited as outstanding benefit checks are presented to the banks for payment each day.

**Intra-fund Payable / Receivable** — At fiscal year-end, intra-fund payables/receivables between the TRSNYC Pension Fund and the Variable-Return Funds are excluded from QPP and TDA Program assets. The Administrative Code of The City of New York (ACNY) Sections 13-577 and 13-582 provide for certain internal transfers of funds. These transfers are intended to rebalance estimated actuarial liabilities with reported assets. In Fiscal Year 2018, \$83.4 million was transferred from the QPP TRSNYC Pension Fund to the Variable-Return funds. In addition, in Fiscal Year 2018 \$32.7 million was transferred to the QPP from the TDA Program. In Fiscal Year 2017, \$3.8 billion was transferred from the QPP TRSNYC Pension Fund to the QPP Variable-Return funds. In Fiscal Year 2017, \$43.9 million was transferred from the QPP TRSNYC Pension Fund to the TDA Program.

**Payment of Statutory-Interest on the TDA Program's Fixed Return Fund** — The fixed interest, credited to TDA Program member account balances invested in the Fixed Return Fund (7.0% APR for UFT members after December 10, 2009; 8.25% APR for non-UFT members and for UFT members prior to December 10, 2009), and owed and transferred to the TDA Program, is reported as a transfer payment of interest by the QPP and transfer receipt of interest for the TDA Program.

**Inter-Plan Eliminations** — Included on the Combining Statements of Fiduciary Net Position and the Combining Statements of Changes in Fiduciary Net Position is an elimination column, the purpose of which is to remove from the statement any transactions involving dealings between reported entities. The eliminations include offsetting payables and receivables associated with the TDA Program's investment in the TRSNYC Pension Fund. In addition, payables and receivables between the QPP, the TDA Program and the System's administrative expense fund are eliminated.

**Securities-Lending Transactions** — State statutes and Board policies permit the Funds to lend their 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 Funds' agent lends the following types of securities: short-term securities, common stocks, long-term corporate bonds, U.S. Government and U.S. Government agency bonds, asset-backed securities, international equities and bonds held in collective investment funds. In return, the Funds receive collateral in the form of cash, U.S. Treasury and U.S. Government agency securities at 100% to 105% of the principal plus accrued interest for

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reinvestment. At June 30, 2018 and 2017, management believes that the Funds had no credit risk exposure to borrowers because the amounts the Funds owed the borrowers equaled or exceeded the amounts the borrowers owed the Funds. The contracts with the Funds' Custodian require the Securities Lending Agent to Indemnify the Funds as follows: 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 Funds or the borrowers. Cash collateral is invested by the securities lending agent using approved Lender's Investment guidelines. The weighted average maturity is 53.3 days for State Street's TRSNYC Pension Fund investments and 1.6 days for JP Morgan Chase's Variable-Return Fund investments. The securities-lending program in which the Funds participate only allows pledging or selling securities in the case of borrower default.

During Fiscal Year 2018, net earnings from the securities-lending program were \$16.8 million. Net earnings from QPP were \$15.3 million including \$14.2 million from TRSNYC Pension Fund and \$1.1 million from variable-return funds. The TDA net earnings from the Variable-Return funds securities-lending program amounted to \$ 1.5 million.

During Fiscal Year 2017, net earnings from the securities-lending program were \$19.2 million. Net earnings from QPP were \$17.4 million, including \$16.1 million from TRSNYC Pension Fund and \$1.3 million from variable-return funds. The TDA net earnings from the Variable-Return funds securities-lending program amounted to \$ 1.8 million.

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 Combining Statements of Fiduciary Net Position. Cash received as collateral on securities-lending transactions and investments made with that cash are reported as assets. As of the balance sheet date, the maturities of the investments made with cash collateral on average exceed the maturities of the securities loans by approximately 52.3 days for State Street's TRSNYC Pension Fund investments and 0.6 days for JP Morgan Chase's Variable-Return Fund investments. Securities received as collateral are also reported as assets if the government entity has the ability to pledge or sell them with a borrower default. Accordingly, the System records the investments purchased with the cash collateral from securities lending with a corresponding liability for securities lending. Securities on loan are carried at fair value; as of June 30, 2018 and 2017, the values on loan by the TRSNYC Pension Fund were \$1.1 billion and \$1.5 billion, respectively, and the values on loan by the variable-return funds were \$160.0 million and \$183.4 million, respectively. Collateral received related to securities lending as of June 30, 2018 and 2017 was \$1.1 billion (including \$1.0 billion of cash collateral) and \$1.5 billion, respectively, for the TRSNYC Pension Fund, and \$164.4 million and \$188.48 million, respectively, for the variable-return funds.

### **3. INVESTMENTS AND DEPOSITS**

The Comptroller of The City of New York (the "Comptroller") acts as an investment advisor to TRS and employs an independent consultant for the TRSNYC Pension Fund. In addition, TRS employs an independent investment consultant as an investment advisor for its variable-return funds. TRS utilizes investment managers to manage the long-term debt and equity portfolios. The managers are regularly reviewed, with regard to both their investment performance and their adherence to investment guidelines.

The State Retirement and Social Security Law ("RSSL") and Administrative Code of The City of New York ("NYCAC") authorize the investments of assets subject to the terms, conditions, limitations and restrictions imposed by law for investments by savings bank and domestic life insurance companies. The State Retirement and Social Security Law §§ 176-178(a), Banking Law § 235 and the ACNY

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establish the criteria for permissible equity investments. Investments up to 25% of total assets of the QPP and the TDA Program may be made in instruments not expressly permitted by the State RSSL.

QPP and TDA Program assets are diversified over a range of investments, and multiple strategies are used in an effort to limit overall risk.

TRS possesses investment policy statements for its QPP and TDA Program, and investment risk management is an inherent function of the asset allocation process. The System's assets are diversified over a broad range of asset classes and encompass multiple investment strategies aimed at limiting concentration risk. The asset allocation per investment program and targeted for Fiscal Years 2018 and 2017 included securities in the following categories. It is worth noting that the TRSNYC Pension Fund primarily holds QPP assets and the returns from this fund impact the funding of the QPP, a defined-benefit plan. The variable-return funds primarily relate to the TDA Program, a defined-contribution plan.

**TRSNYC Pension Fund  
Target Asset Allocations**

<b>Investment Type</b>	<b>Asset Allocation Percentages *</b>	
	<b>2018</b>	<b>2017</b>
Common stock	32.6%	33.1%
International investments – Non U.S.	12.2%	12.2%
International investments – Emerging Markets	9.1%	9.1%
Common stock – REITS	0.0%	0.0%
Alternative investments – Real Estate	3.6%	3.5%
Alternative investments – Private Equity	5.3%	5.0%
Alternative investments – Infrastructure	0.9%	0.6%
Alternative investments – Opportunistic Fixed Income	2.6%	2.5%
Fixed income	33.7%	34.0%
Total	100.0%	100.0%

\* Represents adjusted target policy percentages.

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**Variable-Return Funds**  
**Target Asset Allocations**

<b>Investment Type</b>	<b>Asset Allocation</b>	
	<b>Percentages</b>	
	<b>2018</b>	<b>2017</b>
Diversified Equity (Variable A):		
Common stock – Passive	55.0%	55.0%
Common stock – Active	15.0%	15.0%
Common stock – Defensive	10.0%	10.0%
International investments	20.0%	20.0%
Balanced Fund (formerly Bond Fund - Variable B):		
Fixed Income	70.0%	100.0%
Equity	30.0%	0.0%
International Equity (Variable C):		
International Investments	100.0%	100.0%
Inflation Protection Equity (Variable D):		
Inflation Protection Fidelity Strategic Real Return Mutual Fund	100.0%	100.0%
Socially Responsible (Variable E):		
Socially Responsible NB SRF	100.0%	100.0%

State Street is currently the custodian for essentially all securities of the TRSNYC Pension Fund. JPMorgan Chase is currently the custodian for essentially all securities of the variable-return programs.

The information reflected in the Credit Ratings and in the Years to Maturity is derived from the Custodians' Risk and Performance Analytics Reporting System.

**Concentrations** — The System's investment programs do not have investments in any one entity that represent 5% or more of the assets in the QPP or TDA Program's net position, with the exception of U.S. Government securities.

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**Credit Risk** — Portfolios other than U.S. Government and related portfolios have credit rating limitations. The quality ratings of the TRSNYC Pension Fund, by percentage of the rated portfolio, as described by nationally recognized statistical rating organizations, at June 30, 2018 and 2017, are as follows:

Investment Type Pension Fund June 30, 2018		Moody's Quality Ratings																	Total
Investment Type (in percent)	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1 & Below	Not Rated	Total
U.S. Government	60.49%	0.02%	0.03%	0.01%	0.02%	0.01%	0.08%	-	0.10%	-	-	-	-	-	-	-	-	0.31%	61.07%
Corporate bonds	0.70%	0.12%	0.12%	0.20%	0.53%	0.85%	1.74%	2.15%	2.14%	2.20%	1.73%	2.01%	3.27%	3.37%	2.68%	2.66%	1.63%	4.13%	32.23%
Short-term:																			
Commercial Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.12%	2.12%
Discount Notes & T-Bills	0.36%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.71%	1.07%
Pooled Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.51%	3.51%
Percent of Rated Portfolio	61.55%	0.14%	0.15%	0.21%	0.55%	0.86%	1.82%	2.15%	2.24%	2.20%	1.73%	2.01%	3.27%	3.37%	2.68%	2.66%	1.63%	10.78%	100.00%

Investment Type Pension Fund June 30, 2017		Moody's Quality Ratings																	Total
Investment Type (in percent)	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1 & Below	Not Rated	Total
U.S. Government	31.82%	0.05%	0.03%	-	-	0.01%	0.11%	-	0.08%	0.07%	0.01%	-	-	-	-	-	-	15.67%	47.85%
Corporate bonds	0.52%	0.21%	0.37%	0.45%	1.30%	1.38%	2.68%	4.54%	4.13%	4.87%	2.72%	1.97%	4.27%	3.26%	2.56%	3.62%	2.29%	5.48%	46.62%
Short-term:																			
Commercial Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.23%	1.23%
Pooled Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.99%	2.99%
Discount Notes & T-Bills	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.31%	1.31%
Percent of Rated Portfolio	32.34%	0.26%	0.40%	0.45%	1.30%	1.39%	2.79%	4.54%	4.21%	4.94%	2.73%	1.97%	4.27%	3.26%	2.56%	3.62%	2.29%	26.68%	100.00%

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**JUNE 30, 2018 AND 2017**

The quality ratings of the variable-return fund investments, both QPP and TDA, by percentage of the rated portfolio, as described by nationally recognized statistical rating organizations, at June 30, 2018 and 2017 are as follows:

Investment Type  
Variable Funds  
June 30, 2018

	Moody's Quality Rating																			Total	
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Not Rated		
U.S. Government	0.54%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54%	
Corporate bonds	-	-	-	-	-	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%
<b>Percent of rated portfolio</b>	<b>0.54%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.98%</b>	<b>0.18%</b>	<b>-</b>	<b>0.31%</b>	<b>0.46%</b>	<b>-</b>	<b>0.29%</b>	<b>1.27%</b>	<b>0.25%</b>	<b>-</b>	<b>0.49%</b>	<b>0.39%</b>	<b>-</b>	<b>-</b>	<b>94.84%</b>	<b>100.00%</b>

Investment Type  
Variable Funds  
June 30, 2017 \*

	Moody's Quality Ratings																			Total	
	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Not Rated		
U.S. Government	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corporate bonds	1.45%	0.93%	0.68%	0.66%	3.39%	2.15%	3.71%	3.78%	2.20%	3.21%	0.29%	1.10%	0.60%	0.16%	0.60%	0.26%	0.00%	0.06%	-	27.80%	53.03%
Yankee bonds	1.33%	-	0.07%	-	-	-	-	-	-	0.24%	-	-	-	-	-	-	-	-	-	-	1.64%
Municipal bonds	0.02%	0.22%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.24%
U.S Agencies	0.78%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78%
Short-term:																					
Money Market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44.31%	44.31%
Cash Equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Percent of rated portfolio</b>	<b>3.58%</b>	<b>1.15%</b>	<b>0.75%</b>	<b>0.66%</b>	<b>3.39%</b>	<b>2.15%</b>	<b>3.71%</b>	<b>3.78%</b>	<b>2.20%</b>	<b>3.45%</b>	<b>0.29%</b>	<b>1.10%</b>	<b>0.60%</b>	<b>0.16%</b>	<b>0.60%</b>	<b>0.26%</b>	<b>0.00%</b>	<b>0.06%</b>	<b>-</b>	<b>72.11%</b>	<b>100.00%</b>

\* U.S. Treasury Bonds and other securities that are obligations of the U.S. government or explicitly guaranteed by the U.S. government in 2017 were not considered by JP Morgan Chase, the Variable-Return Funds' Custodian, to have credit risk and are not included above.



**NOTES TO COMBINING FINANCIAL STATEMENTS  
JUNE 30, 2018 AND 2017**

**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 QPP and TDA Program will not be able to recover the value of their 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 or QPP and TDA Program and are held by either the counterparty or the counterparty's trust department or agent, but not in the System's name.

Investments are held by the TRSNYC Pension Fund and variable-return funds' custodians and registered in the System's or QPP and TDA Program's name.

All of the System's deposits are insured by the Federal Deposit Insurance Corporation or collateralized by securities held by a financial institution separate from their respective depository financial institution.

**Interest Rate Risk** — Interest rate risk is the risk that the fair value of investments could be adversely affected by the change in interest rates. Duration limits are used to control the portfolios' exposure to interest rate changes. In the investment grade core Fixed Income portfolios, duration is limited to a range of one year shorter than the benchmark duration to 0.75 years longer than the duration of the benchmark indices. Duration range is a measure of the overall portfolio, while statements of the stated maturity reflect the specific maturities of the individual securities held. TRS possesses investment policy statements for its QPP and TDA Program and investment risk management is an inherent function of the asset allocation process.

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**JUNE 30, 2018 AND 2017**

The lengths of investment maturities (in years) of TRSNYC Pension Fund investments, both QPP and TDA, as shown by the percent of the rated portfolio, at June 30, 2018 and 2017, are as follows:

**Years to Maturity**

<b>June 30, 2018</b>	<b>Investment Maturities</b>				
	<b>Fair Value</b>	<b>Less than One Year</b>	<b>One to Five Years</b>	<b>Six to Ten Years</b>	<b>More than Ten Years</b>
<b>Investment Type</b>					
<b>Pension Fund</b>					
U.S. Government	61.07 %	0.51 %	22.53 %	11.31 %	26.72 %
Corporate bonds	32.23	0.60	10.93	15.27	5.43
Short-term:					
Commercial paper	2.12	2.12	-	-	-
Pooled funds	3.51	3.51	-	-	-
Discount Notes and Treasury	<u>1.07</u>	<u>1.07</u>	<u>-</u>	<u>-</u>	<u>-</u>
Percent of rated portfolio	<u>100.00 %</u>	<u>7.81 %</u>	<u>33.46 %</u>	<u>26.58 %</u>	<u>32.15 %</u>

<b>June 30, 2017</b>	<b>Investment Maturities</b>				
	<b>Fair Value</b>	<b>Less than One Year</b>	<b>One to Five Years</b>	<b>Six to Ten Years</b>	<b>More than Ten Years</b>
<b>Investment Type</b>					
<b>Pension Fund</b>					
U.S. Government	47.85 %	0.93 %	8.38 %	7.75 %	30.79 %
Corporate bonds	46.62	1.76	14.74	20.36	9.76
Short-term:					
Commercial paper	1.23	1.23	-	-	-
Pooled funds	2.99	2.99	-	-	-
Discount Notes and Treasury	<u>1.31</u>	<u>1.31</u>	<u>-</u>	<u>-</u>	<u>-</u>
Percent of rated portfolio	<u>100.00 %</u>	<u>8.22 %</u>	<u>23.12 %</u>	<u>28.11 %</u>	<u>40.55 %</u>

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**JUNE 30, 2018 AND 2017**

The lengths of investment maturities (in years) of the variable-return funds' for QPP and TDA, as shown by the percent of the rated portfolio, at June 30, 2018 and 2017, are as follows:

**Years to Maturity**

June 30, 2018 Investment Type Variable Funds	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	0.54 %	0.54 %	- %	- %	- %
Corporate bonds	51.02	2.89	27.60	15.20	5.33
Yankee bonds	-	-	-	-	-
Municipal bonds	-	-	-	-	-
U.S. Agencies	-	-	-	-	-
Short-term:					
Money Market Funds	48.33	48.33	-	-	-
Cash Equivalent	0.11	0.11	-	-	-
Percent of rated portfolio	100.00 %	51.87 %	27.60 %	15.20 %	5.33 %

**Years to Maturity**

June 30, 2017 Investment Type Variable Funds	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	21.19 %	0.73 %	19.34 %	1.12 %	- %
Corporate bonds	41.79	3.75	28.81	4.93	4.30
Yankee bonds	1.29	-	1.29	-	-
Municipal bonds	0.19	-	0.19	-	-
U.S. Agencies	0.62	-	0.62	-	-
Short-term:					
Money Market Funds	34.92	34.92	-	-	-
Cash Equivalent	-	-	-	-	-
Percent of rated portfolio	100.00 %	39.40 %	50.25 %	6.05 %	4.30 %

**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 stock and/or bonds. The currency markets are diversifiers in a total portfolio context; therefore, the TRSNYC Pension Fund 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.

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**JUNE 30, 2018 AND 2017**

In addition, the TRSNYC Pension Fund and variable-return funds have investments in foreign stocks and/or bonds denominated in foreign currencies. Foreign currency exposures as of June 30, 2018 and 2017 are as follows (amounts in thousands of U.S. dollars):

<b>Trade Currency (in thousands)</b>	<b>Pension Fund June 30, 2018</b>	<b>Variable-Return Funds June 30, 2018</b>	<b>Pension Fund June 30, 2017</b>	<b>Variable-Return Funds June 30, 2017</b>
Euro Currency	\$ 2,923,910	\$ 779,856	\$ 2,768,970	\$ 203,980
Japanese Yen	1,964,182	544,484	1,896,715	109,155
British Pnd Sterling	1,604,375	438,376	1,540,467	106,423
South Korean Won	1,284,166	75,314	1,311,912	86,007
Indian Rupee	966,612	52,587	945,837	53,586
New Taiwan Dollar	979,440	42,043	1,036,049	51,731
Swiss Franc	751,385	201,809	789,798	69,747
South African Rand	646,706	28,719	578,274	24,009
Brazilian Real	498,524	15,757	484,833	15,283
Canadian Dollar	408,646	23,176	313,530	32,829
Hong Kong Dollar	364,691	83,457	470,622	22,440
Australian Dollar	280,588	141,509	306,102	19,785
Mexican Nuevo Peso	271,175	6,807	302,743	7,815
Thai Baht	256,975	17,512	192,893	14,567
Danish Krone	239,095	39,163	219,133	11,278
Indonesian Rupiah	228,356	6,328	227,390	3,187
Swedish Krona	213,840	51,730	271,809	5,607
Malaysian Ringgit	191,489	12,626	182,270	12,742
Singapore Dollar	139,334	37,241	135,264	16,597
Turkish Lira	131,251	9,865	160,477	12,131
Polish Zloty	130,079	3,688	122,453	2,213
Philippines Peso	111,469	1,840	130,522	1,993
Chilean Peso	105,781	1,946	95,645	893
Norwegian Krone	104,159	21,193	81,229	7,498
Colombian Peso	48,093	-	45,587	-
UAE Dirham	38,464	2,350	39,763	2,134
Hungarian Forint	37,077	2,130	38,518	-
Czech Koruna	26,853	116	22,318	113
Qatari Rial	26,162	-	20,609	-
Egyptian Pound	20,455	213	22,244	79
Israeli Shekel	18,089	6,129	17,907	2,713
Peruvian Nuevo Sol	12,122	-	9,845	-
New Zealand Dollar	8,356	4,333	20,702	909
<b>Total</b>	<b>\$ 15,031,899</b>	<b>\$ 2,652,297</b>	<b>\$ 14,802,430</b>	<b>\$ 897,444</b>

NOTES TO COMBINING FINANCIAL STATEMENTS  
JUNE 30, 2018 AND 2017

Securities Lending Transactions

*Credit Risk* — The quality ratings of investments held as collateral for Securities Lending by the TRSNYC Pension Fund at June 30, 2018 and 2017 are as follows (in thousands):

Investment Type and Fair Value  
of Securities Lending Transactions - Pension Fund  
(in thousands)  
June 30, 2018

	Moody's Quality Ratings							Total
	Aaa	Aa3	A1	A2	A3	Baa2	Not Rated	
Government	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate bonds	-	-	-	-	-	-	-	-
Yankee bonds	-	-	-	-	-	-	-	-
Short-term:								
Repurchase Agreements	-	-	-	-	-	-	-	-
Reverse Repurchase Agreements	-	-	-	3,961	194,097	54,048	283,390	535,496
Money Market	119,471	-	-	-	-	-	-	119,471
US Treasury	-	-	-	-	-	-	-	-
US Agency	-	-	-	-	-	-	291,751	291,751
Cash or Cash Equivalent	-	-	100,098	-	-	-	-	100,098
Payable/Receivable	-	-	-	-	-	-	-	-
Uninvested	-	-	-	-	-	-	1,572	1,572
<b>Total</b>	<b>\$ 119,471</b>	<b>\$ -</b>	<b>\$ 100,098</b>	<b>\$ 3,961</b>	<b>\$ 194,097</b>	<b>\$ 54,048</b>	<b>\$ 576,713</b>	<b>\$ 1,048,388</b>
Percent of securities lending portfolio	<u>11.40%</u>	<u>0.00%</u>	<u>9.55%</u>	<u>0.38%</u>	<u>18.51%</u>	<u>5.15%</u>	<u>55.01%</u>	<u>100.00%</u>

June 30, 2017

	Moody's Quality Ratings							Total
	Aaa	Aa3	A1	A2	A3	Baa2	Not Rated	
Government	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate bonds	-	-	-	-	-	-	-	-
Yankee bonds	-	-	-	-	-	-	-	-
Short-term:								
Repurchase Agreements	-	-	-	-	-	-	-	-
Reverse Repurchase Agreements	-	151,446	-	320,634	109,206	-	635,982	1,217,268
Money Market	8,000	-	-	-	-	-	-	8,000
US Treasury	-	-	-	-	-	-	-	-
US Agency	-	-	-	-	-	-	149,982	149,982
Cash Equivalent	-	-	152,222	-	-	-	-	152,222
Payable/Receivable	-	-	-	-	-	-	1,572	1,572
Uninvested	-	-	-	-	-	-	1,266	1,266
<b>Total</b>	<b>\$ 8,000.00</b>	<b>\$ 151,446</b>	<b>\$ 152,222</b>	<b>\$ 320,634</b>	<b>\$ 109,206</b>	<b>\$ -</b>	<b>\$ 788,802</b>	<b>\$ 1,530,310</b>
Percent of securities lending portfolio	<u>0.52%</u>	<u>9.89%</u>	<u>9.95%</u>	<u>20.95%</u>	<u>7.14%</u>	<u>0.00%</u>	<u>51.55%</u>	<u>100.00%</u>

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

The quality ratings of investments held as collateral for Securities Lending under the variable-return funds at June 30, 2018 and 2017 are as follows (in thousands):

**Investment Type and Fair Value of  
 Securities Lending Transactions - Variable Return Funds  
 (In thousands)  
 June 30, 2018**

	<b>Moody's Quality Ratings</b>			
	<b>Aaa</b>	<b>A3</b>	<b>Not Rated</b>	<b>Total</b>
Government	\$ 22,299	\$ -	\$ -	\$ 22,299
Corporate bonds	-	-	-	-
Yankee bonds	-	-	-	-
Short-term:				
Repurchase Agreements	32,763	19,273	90,029	142,065
Reverse Repurchase Agreements	-	-	-	-
Money Market	-	-	-	-
US Treasury	-	-	-	-
US Agency	-	-	-	-
Cash Equivalent	-	-	-	-
Payable/Receivable	-	-	-	-
Uninvested	-	-	10	10
<b>Total</b>	<b>\$ 55,062</b>	<b>\$ 19,273</b>	<b>\$ 90,039</b>	<b>\$ 164,374</b>
Percent of securities lending portfolio	<u>33.50%</u>	<u>11.73%</u>	<u>54.77%</u>	<u>100.00%</u>

**June 30, 2017**

	<b>Moody's Quality Ratings</b>			
	<b>Aaa</b>	<b>A3</b>	<b>Not Rated</b>	<b>Total</b>
Government	\$ 43,264	\$ -	\$ -	\$ 43,264
Corporate bonds	-	-	-	-
Yankee bonds	-	-	-	-
Short-term:				
Repurchase Agreements	131,442	-	13,719	145,161
Reverse Repurchase Agreements	-	-	-	-
Money Market	-	-	-	-
US Treasury	-	-	-	-
US Agency	-	-	-	-
Cash Equivalent	-	-	-	-
Payable/Receivable	-	-	-	-
Uninvested	-	-	-	-
<b>Total</b>	<b>\$ 174,706</b>	<b>\$ -</b>	<b>\$ 13,719</b>	<b>\$ 188,425</b>
Percent of securities lending portfolio	<u>92.72%</u>	<u>0.00%</u>	<u>7.28%</u>	<u>100.00%</u>

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

*Interest Rate Risk* — The lengths of investment maturities (in years) of the collateral for Securities Lending held by the TRSNYC Pension Fund at June 30, 2018 and 2017 are as follows (in thousands):

**Years to Maturity**

Investment Type - Pension Fund June 30, 2018	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate bonds	-	-	-	-	-
Short-term:					
Repurchase agreements	-	-	-	-	-
Reverse repurchase agreements	535,496	535,496	-	-	-
Money market	119,471	119,471	-	-	-
U.S. Agency	291,751	291,751	-	-	-
Cash equivalents	100,098	100,098	-	-	-
Payable/Receivable	-	-	-	-	-
Uninvested	1,572	1,572	-	-	-
Total	<u>\$ 1,048,388</u>	<u>\$ 1,048,388</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Percent of Securities Lending Portfolio	<u>100.00 %</u>	<u>100.00 %</u>	<u>- %</u>	<u>- %</u>	<u>- %</u>

Investment Type - Pension Fund June 30, 2017	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Corporate bonds	-	-	-	-	-
Short-term:					
Repurchase agreements	-	-	-	-	-
Reverse repurchase agreements	1,217,268	1,217,268	-	-	-
Money market	8,000	8,000	-	-	-
U.S. Agency	149,982	149,982	-	-	-
Cash equivalents	152,222	152,222	-	-	-
Payable/Receivable	1,572	1,572	-	-	-
Uninvested	1,266	1,266	-	-	-
Total	<u>\$ 1,530,310</u>	<u>\$ 1,530,310</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Percent of Securities Lending Portfolio	<u>100.00 %</u>	<u>100.00 %</u>	<u>- %</u>	<u>- %</u>	<u>- %</u>

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

The lengths of investment maturities (in years) of the collateral for Securities Lending held under the variable-return funds at June 30, 2018 and 2017 are as follows (in thousands):

**Years to Maturity**

Investment Type - Variable Return Funds (in thousands) June 30, 2018	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
Government	\$ 22,299	\$ 6,579	\$ 11,423	\$ 2,008	\$ 2,289
Corporate Bonds	-	-	-	-	-
Short-term:					
Repurchase agreements	142,065	142,065	-	-	-
Reversal purchase agreements	-	-	-	-	-
Certificates of deposit	-	-	-	-	-
Commercial paper	-	-	-	-	-
Variable rate demand notes	-	-	-	-	-
U.S. Treasury	-	-	-	-	-
U.S. Agency	-	-	-	-	-
Time deposit	-	-	-	-	-
Uninvested	10	10	-	-	-
<b>Totals</b>	<b>\$ 164,374</b>	<b>\$ 148,654</b>	<b>\$ 11,423</b>	<b>\$ 2,008</b>	<b>\$ 2,289</b>
Percent of securities lending portfolio	100.00 %	90.44 %	6.95 %	1.22 %	1.39 %

Investment Type - Variable Return Funds (in thousands) June 30, 2017	Investment Maturities				
	Fair Value	Less Than One Year	One to Five Years	Six to Ten Years	More Than Ten Years
Government	\$ 43,264	\$ 6,007	\$ 17,249	\$ 10,856	\$ 9,152
Corporate Bonds	-	-	-	-	-
Short-term:					
Repurchase agreements	145,161	145,161	-	-	-
Reversal purchase agreements	-	-	-	-	-
Certificates of deposit	-	-	-	-	-
Commercial paper	-	-	-	-	-
Variable rate demand notes	-	-	-	-	-
U.S. Treasury	-	-	-	-	-
U.S. Agency	-	-	-	-	-
Time deposit	-	-	-	-	-
Uninvested	-	-	-	-	-
<b>Totals</b>	<b>\$ 188,425</b>	<b>\$ 151,168</b>	<b>\$ 17,249</b>	<b>\$ 10,856</b>	<b>\$ 9,152</b>
Percent of securities lending portfolio	100.00 %	80.23 %	9.15 %	5.76 %	4.86 %

**Rate of Return** — For the years ended June 30, 2017 and 2016, the annual money-weighted rate of return on the TRSNYC Pension Fund was 12.50% and 1.66%, respectively. The money-weighted rate of return expresses investment performance, net of investment expense adjusted for the changing amounts actually 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 generally accepted accounting principles. 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, 2017 and June 30, 2016:



**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

**GASB 72 Disclosure (Pension Fund)**

June 30, 2018

(In thousands)

	2018			Total
	Level One	Level Two	Level Three	
<b>INVESTMENTS — at fair value</b>				
Short-term investments:				
Commercial paper	\$ -	\$ 6,487	\$ -	\$ 6,487
Short-term investment fund	48,888	1,529,375	-	1,578,263
Discount notes	-	111,733	-	111,733
Debt securities:				
U.S. Government	-	13,288,993	-	13,288,993
Corporate and Other	-	7,016,306	268	7,016,574
Equity securities	20,534,746	56	1,712	20,536,514
Alternative investments	14,652	-	8,912,107	8,926,759
Collective trust funds:				
International equity	15,436,384	-	586	15,436,970
Mortgage debt security	-	154,234	401,274	555,508
Treasury inflation protected securities	-	3,106,109	-	3,106,109
Fixed income	-	1,848,081	-	1,848,081
Total Pension Fund investments	<u>\$ 36,034,670</u>	<u>\$ 27,061,374</u>	<u>\$ 9,315,947</u>	<u>\$ 72,411,991</u>

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

**GASB 72 Disclosure (Pension Fund)**

June 30, 2017

(In thousands)

	2017			
	Level One	Level Two	Level Three	Total
<b>INVESTMENTS — at fair value</b>				
Short-term investments:				
Commercial paper	\$ -	\$ 230,093	\$ -	\$ 230,093
Short-term investment fund	-	557,945	-	557,945
Discount notes	-	282,248	-	282,248
Debt securities:				
U.S. Government	-	7,947,669	-	7,947,669
Corporate and Other	-	7,588,353	164,871	7,753,224
Equity securities	21,084,444	135	1,423	21,086,002
Alternative investments	-	-	7,523,885	7,523,885
Collective trust funds:				
International equity	15,407,833	315,906	10,410	15,734,149
Mortgage debt security	-	95,737	399,803	495,540
Treasury inflation protected securities	-	2,682,432	-	2,682,432
Fixed income	595	195,193	1,595,245	1,791,033
Total Pension Fund investments	<u>\$ 36,492,872</u>	<u>\$ 19,895,711</u>	<u>\$ 9,695,637</u>	<u>\$ 66,084,220</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 hierarchy 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.

**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 non-public equity securities are valued by the GP using one or more valuation methodologies outlined in 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.

**NOTES TO COMBINING FINANCIAL STATEMENTS  
YEARS ENDED JUNE 30, 2018 AND 2017**

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 redemption restrictions have a material effect on the fair value of the portfolio investments.

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

**GASB 72 Disclosure****Variable-Return Funds****June 30, 2018**

(in thousands)

**INVESTMENTS- at fair value**

## Diversified Equity Fund:

Short-term investments

2018			
Level One	Level Two	Level Three	Total
\$ -	\$ 262,242	\$ -	\$ 262,242
14,216,058	332,339	1,563	14,549,960
-	302,005	2	302,007
Balanced Fund:			
Short-term investments			
-	4,516	-	4,516
Equity securities			
-	375,273	-	375,273
International Equity Fund:			
Short-term investments			
-	1,007	-	1,007
International equity			
149,135	3,486	16	152,637
Inflation Protection Fund:			
Short-term investments			
-	48	-	48
Equity securities			
64,716	-	-	64,716
Socially Responsive Equity Fund:			
Short-term investments			
-	7,220	-	7,220
Equity securities			
185,758	-	-	185,758
International equity			
11,418	-	-	11,418
<b>\$ 14,627,085</b>	<b>\$ 1,288,136</b>	<b>\$ 1,581</b>	<b>\$ 15,916,802</b>

Equity securities

Debt securities

## Balanced Fund:

Short-term investments

Equity securities

## International Equity Fund:

Short-term investments

International equity

## Inflation Protection Fund:

Short-term investments

Equity securities

## Socially Responsive Equity Fund:

Short-term investments

Equity securities

International equity

Total Variable-Return Funds Investments

**NOTES TO COMBINING FINANCIAL STATEMENTS**  
**YEARS ENDED JUNE 30, 2018 AND 2017**

**GASB 72 Disclosure****Variable-Return Funds****June 30, 2017**

(in thousands)

**INVESTMENTS - at fair value**

Diversified Equity Fund:

	Level One	Level Two	Level Three	Total
Short-term investments	\$ -	\$ 153,518	\$ -	\$ 153,518
Equity securities	11,620,340	2,389,568	99	14,010,007
Debt Securities	-	245,983	1,947	247,930

Bond Fund:

Short-term investments	-	16,219	-	16,219
Debt Securities	-	377,917	-	377,917

International Equity Fund:

Short-term investments	-	543	-	543
International equity	107,420	20,785	1	128,206

Inflation Protection Fund:

Short-term investments	-	263	-	263
Equity securities	53,849	-	-	53,849

Socially Responsive Equity Fund:

Short-term investments	-	8,990	-	8,990
Equity securities	153,776	-	-	153,776
International equity	7,004	-	-	7,004

Total Variable-Return Funds Investments	\$ 11,942,389	\$ 3,213,786	\$ 2,047	\$ 15,158,222
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Equity securities classified in Level 1 of the fair value hierarchy (above) are valued using prices quoted in active markets for those securities.

Equity and debt securities classified in Level 2 of the fair value hierarchy (above) are valued using a matrix pricing technique. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices.

Securities are classified in Level 3 (above) when inputs to the valuation methodology are unobservable and significant to the fair value measurement. Instruments are often based on internally developed models of the custodian's, in which there are few, if any, external observations. Generally, Level 3 includes distressed securities or alternative investments.

**4. QPP CONTRIBUTIONS**

The financial objective of the QPP is to fund members' retirement benefits during their active service and to establish Employer contribution rates that, expressed as a percentage of annualized covered payroll, will remain approximately level from year to year. The Employers contribute amounts that, together with Member Contributions and investment income, are intended to ultimately be sufficient to accumulate assets to pay benefits when due.

**NOTES TO COMBINING FINANCIAL STATEMENTS  
YEARS ENDED JUNE 30, 2018 AND 2017**

**Member Contributions** — Members who joined prior to July 27, 1976 contribute by salary deductions on the basis of a normal rate of contribution that is assigned by the QPP at membership. This member normal rate, which is dependent upon age, years of prior service and actuarial tables in effect at the time of membership, is determined so as to provide approximately one-fourth of the service retirement allowance at the earliest age for service retirement. For age at membership equal to 20 and with no prior service, the member normal rate is equal to 4.6%. For age at membership equal to 40 with no prior service, the member normal rate is equal to 3.6%.

Members who joined on or after July 27, 1976 are mandated to contribute 3% of salary. Effective October 1, 2000, these members are not required to make contributions after the tenth anniversary of their membership date or completion of ten years of credited service, whichever is earlier.

Effective February 27, 2008, active members were eligible to enroll in a 55 retirement age minimum and 25 credited years of service retirement option (“55/25 retirement option”) enabling them to eliminate any age-reduction factor in their retirement allowance. Those choosing the age 55/25 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. Members joining after February 27, 2008 are automatically enrolled in a 55 retirement age minimum and 27 credited years of service retirement program (“55/27 retirement program”). These members are required to make additional pension contributions of 1.85% of salary until they have accumulated 27 years of credited service. Chapter 504 of the Laws of 2009 (“Chapter 504/09”) provides that individuals joining after December 10, 2009, who participate in the 55/27 retirement program, are required to make pension contributions of 4.85% of salary until they have 27 years of credited service and contributions of 1.85% of salary thereafter.

Also, under Chapter 504/09, all members represented by the UFT who join the QPP on and after December 10, 2009 will become vested after ten years of credited service.

Under Chapter 18 of the Laws of 2012, members who join on and after April 1, 2012 are automatically enrolled in Tier VI. These members are required to make contributions ranging from 3.0% (based on a salary of \$45,000 and less) to 6.0% (based on a salary above \$100,000) until separation from service or retirement.

**Employer Contributions** — Statutorily-required contributions (“Statutory Contributions”) to the QPP, determined by the City’s Chief Actuary of the Office of the Actuary (the “Actuary”) in accordance with the State statutes and City laws, are generally funded by the Employers within the appropriate fiscal year. These contributions consider any expected deficiencies between the statutory rates of interest on TDA Program deposits in the Fixed Return Fund and on statutory rates of interest credited to QPP members and actual investment earnings on such funds. The Statutory Contribution for the year ended June 30, 2018, based on an actuarial valuation as of June 30, 2016, was \$3,890 million, and the Statutory Contribution for the year ended June 30, 2017, based on an actuarial valuation as of June 30, 2015, was \$3,888 million. The Statutory Contributions for Fiscal Years 2018 and 2017 were equal to the Actuarial Contributions. Refer to the Schedule of Employers’ Contributions in the accompanying required supplementary information for more information on the actuarial methods and assumptions applied by the Actuary to determine the Statutory Contributions.

**NOTES TO COMBINING FINANCIAL STATEMENTS  
YEARS ENDED JUNE 30, 2018 AND 2017**

**5. QPP NET PENSION LIABILITY**

The components of the net pension liability of the Employers at June 30, 2018 and 2017 were as follows:

	<b>(in millions)</b>	
	<b>2018</b>	<b>2017</b>
Total pension liability	\$73,244	\$73,323
Fiduciary net position *	\$54,533	\$50,096
Employers' net pension liability	\$18,711	\$23,227
Fiduciary net position as a percentage of the total pension liability	74.5%	68.3%

\*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, 2018 and 2017 were determined by actuarial valuations as of June 30, 2016 and June 30, 2015, 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.

Mortality tables for Service and Disability pensioners were developed from an experience study of the QPP and the predecessor QPP's pensioners. The mortality tables for beneficiaries were developed from an experience review.

Pursuant to Section 96 of the New York City Charter, a study of the actuarial assumptions used to value liabilities of the QPP is conducted every two years.

**Expected Rate of Return on Investments**

The long-term 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 long-term 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 allocations and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

**NOTES TO COMBINING FINANCIAL STATEMENTS  
YEARS ENDED JUNE 30, 2018 AND 2017**

<b>Asset Class</b>	<b>Target Asset Allocation</b>	<b>Long-Term Expected Real Rate of Return</b>
U.S. Public Markets Equities	29.0%	6.3%
International Public Markets Equities	12.0%	7.0%
Emerging Public Markets Equities	9.0%	9.5%
Private Market Equities	6.0%	10.4%
Fixed Income (Core, TIPS, High Yield, Opportunistic, Convertibles)	33.0%	2.2%
Alternatives (Real Assets, Hedge Funds)	11.0%	5.5%
Total	100.0%	

### Discount Rate

The discount rate used to measure the total pension liability was 7.0%. The projections 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 non-active QPP members. Therefore, the long-term 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 one-percentage point lower (6.0%) or one-percentage point higher (8.0%) than the current rate:

<b>(in thousands)</b>	<b>1% Decrease (6%)</b>	<b>Discount Rate (7%)</b>	<b>1% Increase (8%)</b>
Employers' Net Pension Liability — June 30, 2018	\$ 27,250,531	\$ 18,711,455	\$ 11,480,118

## 6. MEMBER LOANS

The balance of member loans receivable for the QPP at June 30, 2018 and 2017 is \$312.2 million and \$298.1 million, respectively. QPP members are permitted to borrow up to 75% of their own contributions, including accumulated interest. Outstanding loan balances are insured in order to protect members' balances in case of death. In return for insurance coverage, Tiers III, IV, and VI members supplement their loan interest payments of 7.0% APR with a 0.2% ("APR") insurance fee. Tiers I and II members pay loan interest payments of 6.0% APR and are not subject to the insurance fee. Upon termination of employment before retirement, certain QPP members are entitled to refunds of their own contributions, including accumulated interest, less any loans outstanding.

The balance of member loans receivable for the TDA Program at June 30, 2018 and 2017 is \$386.8 million and \$376.0 million, respectively. Members of the TDA Program are permitted to borrow up to 75% of their own contributions, including accumulated interest. TDA Program members supplement their member loans' interest payments (7.0% for UFT, 8.25% for all other members) with a 0.3% ("APR") insurance fee. This fee funds a reserve, which is used to repay members' loan balances outstanding in case of death. Upon termination of employment before retirement, members are



**NOTES TO COMBINING FINANCIAL STATEMENTS  
YEARS ENDED JUNE 30, 2018 AND 2017**

entitled to refunds of their own contributions, including accumulated interest, less any loans outstanding.

**7. RELATED PARTIES**

The Comptroller has been appointed by law as custodian for the assets of the QPP and TDA Program with discretionary authority. Securities are held by certain banks under custodial agreements with the Comptroller. The Comptroller, the Financial Information Services Agency ("FISA"), and the Office of Payroll Administration ("OPA") provide cash receipt and cash disbursement services and financial services; the Office of Management and Budget ("OMB") provides budget review services; and the City's Corporation Counsel provides legal services to TRS. The cost of providing such services amounted to \$11.8 million and \$10.9 million in Fiscal Years 2018 and 2017, respectively. In addition, actuarial services are provided to TRS by the New York City Office of the Actuary. The City also provides other administrative services.

**8. ADMINISTRATIVE EXPENSES**

Chapter 593 of the Laws of 1996 ("Chapter 593/96"), effective July 1, 1996, authorized the Board of Trustees to draw upon its assets to pay the administrative expenses incurred by TRS. Prior to Fiscal Year 1997, The City and Variable Annuity Programs had paid all administrative expenses. After Chapter 593/96, administrative expenses incurred by the System is attributed to the QPP and the variable-return funds of the TDA Program. The cost sharing is weighted and depends on an assessment of the prior year's administrative activities. Total TRS administrative expenses, attributable to the QPP and TDA Program, amounted to \$87.5 million and \$93.8 million for Fiscal Years 2018 and 2017, respectively. In addition to TRS' administrative expenses, other City agencies attribute the cost for services rendered by them during the fiscal year; see Note 7 above.

In November 2015, the System amended and extended its lease agreement to rent office space. The agreement will expire on May 31, 2039. The future minimum rental payments required under this operating lease are as follows:

Years Ending June 30,	Amount
2019	\$ 8,018,000
2020	8,760,000
2021	8,760,000
2022	8,760,000
2023	9,480,000
Thereafter	190,314,000

Rent expenses under the lease agreement for the years ended June 30, 2018 and 2017, were approximately \$7.9 million, less \$1.9 million rent credit, and \$7.4 million, respectively.

**9. CONTINGENT LIABILITIES AND OTHER MATTERS**

**Contingent Liabilities** — The QPP and TDA Program have certain contingent liabilities. TRS management, on advice from legal counsel, believes that such proceedings and contingencies will not have a material effect on the fiduciary net position of the QPP or cause changes in its fiduciary net position. Under the State statutes and City laws that govern the functioning of the QPP, increases in the obligation of the QPP to members and beneficiaries ordinarily result in increases in the obligations of the Employers to the QPP.

**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 ("QPP Net Pension Liability") for the results of the most recent actuarial audits for the QPP.

**NOTES TO COMBINING FINANCIAL STATEMENTS  
YEARS ENDED JUNE 30, 2018 AND 2017**

**Revised Actuarial Assumptions and Methods** — In accordance with the ACNY and with appropriate practice, the Boards of Trustees of the five actuarially-funded NYCERS are to periodically review and adopt actuarial assumptions as proposed by the Actuary for use in the determination of Employer Contributions. The most recent reports were issued by Segal and Hay in February 2012 and by Gabriel, Roeder, Smith & Company (GRS) in October 2015. A current study is being undertaken by Bolton Partners.

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

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

Chapter 3 of the Laws of 2013 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 expenses, continued it and other interest rates until June 30, 2016, and defined the amortization of Unfunded Actuarial Accrued Liabilities (“UAAL”).

Chapter 489 of the Laws of 2013 (“Chapter 489/13”) 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 who are otherwise eligible to receive retirement service credit for such service. Such members would not be required to make member contributions to receive such credit.

Chapter 510 of the Laws of 2015 clarifies for Tier VI 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.

\* \* \* \* \*

**REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)**  
**QUALIFIED PENSION PLAN**  
**SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY AND RELATED RATIOS**  
(In Thousands)

SCHEDULE 1

	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
Total pension liability:					
Service cost	\$ 1,436,617	\$ 1,386,674	\$ 1,274,308	\$ 1,223,158	\$ 1,205,662
Interest	5,071,481	5,147,042	4,131,177	4,027,139	4,407,702
Changes of benefit terms	-	-	-	-	-
Differences between expected and actual experience	(2,235,673)	1,008,249	1,229,501	1,507,964	-
Changes of assumptions	-	-	2,432,878	-	-
Benefit payments/withdrawals	(4,351,924)	(4,219,312)	(4,107,455)	(4,024,272)	(3,818,248)
Net change in total pension liability	(79,499)	3,322,653	4,960,409	2,733,989	1,795,116
Total pension liability – beginning	73,323,430	70,000,777	65,040,368	62,306,379	60,511,262
Total pension liability – ending (a)	<u>73,243,931</u>	<u>73,323,430</u>	<u>70,000,777</u>	<u>65,040,368</u>	<u>62,306,378</u>
Plan fiduciary net position:					
Contributions - Employer	3,889,710	3,888,399	3,760,714	3,325,528	3,054,424
Contributions - Other Employer*	59,979	57,369	n/a	n/a	n/a
Contributions - Employee	195,241	180,076	173,696	158,590	154,962
Net investment income	6,275,115	8,133,280	960,267	1,611,929	9,435,906
Benefit payments/withdrawals	(4,351,924)	(4,219,312)	(4,107,455)	(4,024,272)	(3,818,248)
Payment of Interest on TDA Fixed Funds	(1,595,462)	(1,466,615)	(1,354,207)	(1,248,988)	(1,147,923)
Administrative expenses	(65,076)	(60,790)	(59,367)	(58,391)	(46,042)
Other Changes	29,170	(46,229)	1,233	329	404
Net change in plan fiduciary net position	4,436,753	6,466,178	(625,119)	(235,275)	7,633,483
Plan fiduciary net position – beginning	50,095,723	43,629,545	44,254,664	44,489,939	36,856,456
Plan fiduciary net position – ending (b)**	<u>54,532,476</u>	<u>50,095,723</u>	<u>43,629,545</u>	<u>44,254,664</u>	<u>44,489,939</u>
Employer's net pension liability – ending (a)-(b)	<u>\$ 18,711,455</u>	<u>\$ 23,227,707</u>	<u>\$ 26,371,232</u>	<u>\$ 20,785,704</u>	<u>\$ 17,816,440</u>
Plan fiduciary net position as a percentage of the total pension liability	<u>74.45%</u>	<u>68.32%</u>	<u>62.33%</u>	<u>68.04%</u>	<u>71.41%</u>
Covered Payroll	<u>\$ 9,200,180</u>	<u>\$ 8,818,537</u>	<u>\$ 8,256,100</u>	<u>\$ 8,074,522</u>	<u>\$ 7,996,942</u>
TRS' Net Pension Liability as a Percentage of covered payroll	<u>203.38%</u>	<u>263.40%</u>	<u>319.42%</u>	<u>257.42%</u>	<u>222.79%</u>

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

\*Includes amounts for member's portion of Additional Member Contributions and supplemental contributions for the ASAF and ASF Funds.

\*\*Such amounts represent the preliminary Systems' fiduciary net position and may differ from the Systems' final fiduciary net position.

See Independent Auditors' report.

**REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)**  
**QUALIFIED PENSION PLAN**  
**SCHEDULE OF EMPLOYERS' CONTRIBUTIONS**

(In Thousands)

**SCHEDULE 2**

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Actuarially determined contribution	\$ 3,889,710	\$ 3,888,399	\$ 3,702,569	\$ 3,270,007	\$ 2,998,694	\$ 2,855,640	\$ 2,673,078	\$ 2,468,973	\$ 2,484,074	\$ 2,223,644
Contributions in relation to the actuarially determined contribution	<u>3,889,710</u>	<u>3,888,399</u>	<u>3,702,569</u>	<u>3,270,007</u>	<u>2,998,694</u>	<u>2,855,640</u>	<u>2,673,078</u>	<u>2,468,973</u>	<u>2,484,074</u>	<u>2,223,644</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	\$ 9,200,180	\$ 8,818,537	\$ 8,256,100	\$ 8,074,522	\$ 7,996,942	\$ 7,833,329	\$ 7,920,935	\$ 7,935,248	\$ 7,859,999	\$ 7,221,499
Contributions as a percentage of covered payroll <sup>1</sup>	42.279%	44.093%	44.846%	40.498%	37.498%	36.455%	33.747%	31.114%	31.604%	30.792%

<sup>1</sup>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 adjusted, where applicable, to be consistent with collective bargaining agreements estimated to be achieved.

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 2018 contributions were determined using an actuarial valuation as of June 30, 2016). The methods and assumptions used to determine the actuarially determined contributions are as follows:

See Independent Auditors' report.

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)  
 QUALIFIED PENSION PLAN  
 SCHEDULE OF EMPLOYERS' CONTRIBUTIONS

(In Thousands)

SCHEDULE 2 (CONTINUED)

Valuation Dates	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, 2007
Actuarial cost method	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Entry Age	Frozen Initial Liability <sup>1</sup>
Amortization method for Unfunded Actuarial Accrued Liabilities:								
Initial Unfunded	Increasing Dollar	Increasing Dollar	Increasing Dollar	Increasing Dollar	Increasing Dollar	Increasing Dollar	Increasing Dollar	NA <sup>2</sup>
Post-2010 Unfundeds	Level Dollar	Level Dollar	Level Dollar	Level Dollar	Level Dollar	Level Dollar	Level Dollar	NA <sup>2</sup>
Remaining amortization period:								
Initial Unfunded	16 years (closed)	17 years (closed)	18 years (closed)	19 years (closed)	20 years (closed)	21 years (closed)	22 years (closed)	NA <sup>2</sup>
2010 ERI	0	1 year (closed)	2 years (closed)	3 years (closed)	4 years (closed)	5 years (closed)	NA	NA <sup>2</sup>
2011 Actuarial Gain/Loss	10 years (closed)	11 years (closed)	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA <sup>2</sup>
2012 Actuarial Gain/Loss	11 years (closed)	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA <sup>2</sup>
2013 Actuarial Gain/Loss	12 years (closed)	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA	NA <sup>2</sup>
2014 Actuarial Gain/Loss	13 years (closed)	14 years (closed)	15 years (closed)	NA	NA	NA	NA	NA <sup>2</sup>
2015 Actuarial Gain/Loss	14 years (closed)	15 years (closed)	NA	NA	NA	NA	NA	NA <sup>2</sup>
2016 Actuarial Gain/Loss	15 years (closed)	NA	NA	NA	NA	NA	NA	NA <sup>2</sup>
Actuarial Asset Valuation (AAV) Method <sup>3</sup>	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, 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.

See Independent Auditors' report.

**REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)  
QUALIFIED PENSION PLAN  
SCHEDULE OF EMPLOYERS' CONTRIBUTIONS**

(In Thousands)

**SCHEDULE 2 (CONTINUED)**

Valuation Dates	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, 2007
<b>Actuarial assumptions:</b>								
Assumed rate of return <sup>4</sup>	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 Retirement Board during Fiscal Year 2016	Tables adopted by Retirement Board during Fiscal Year 2016	Tables adopted by Retirement Board during Fiscal Year 2016	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012
Active service: withdrawal, death, disability, service retirement	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2012	Tables adopted by Retirement Board during Fiscal Year 2006	Tables adopted by Retirement Board during Fiscal Year 2000
Salary increases <sup>4</sup>	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.	In general, merit and promotion increases plus assumed General Wage Increases of 3.0% per year.
Cost-of-Living Adjustments <sup>4</sup>	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

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.

<sup>1</sup> 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.

<sup>2</sup> Developed using a long-term Consumer Price Inflation assumption of 2.5% per year.

<sup>3</sup> As of the June 30, 2014 (Lag) valuation, the AAV is constrained to be no more than 20% from Fair Value.

See Independent Auditors' report.

**REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)  
QUALIFIED PENSION PLAN  
SCHEDULE OF INVESTMENT RETURNS**

**SCHEDULE 3**

The following table displays the annual money-weighted rate of return, net of investment expense, for TRSNYC Pension Fund investments for each of the past five fiscal years:

<b>Fiscal Year-Ended</b>	<b>Money-weighted Rate of Return</b>
June 30, 2018	8.14%
June 30, 2017	12.50%
June 30, 2016	1.66%
June 30, 2015	2.81%
June 30, 2014	17.60%

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

**ADDITIONAL SUPPLEMENTARY INFORMATION  
SCHEDULE OF ADMINISTRATIVE EXPENSES  
Year Ended June 30, 2018**

## SCHEDULE 4

	Total	QPP	TDA
<b>PERSONNEL SERVICES</b>			
Staff Salaries	\$ 30,889,707	\$ 24,965,061	\$ 5,924,646
Social Security	1,765,907	1,427,206	338,701
Insurance (Health)	4,899,364	3,959,666	939,698
Welfare Benefit Fund	1,365,912	1,103,930	261,982
TOTAL PERSONNEL SERVICES	<u>38,920,890</u>	<u>31,455,863</u>	<u>7,465,027</u>
<b>PROFESSIONAL SERVICES</b>			
Data Processing Support and Licenses	4,729,036	3,822,007	907,029
Temporary and Consultant Staffing	8,663,174	7,001,577	1,661,597
Outside Professional Services	526,665	425,651	101,014
TOTAL PROFESSIONAL SERVICES	<u>13,918,875</u>	<u>11,249,235</u>	<u>2,669,640</u>
<b>MODERNIZATION INITIATION</b>			
Personnel Services	63,500	36,843	26,657
Consultants and Temporary Costs	7,191,971	4,172,760	3,019,211
IT Vendor Development Costs	14,103,841	8,183,006	5,920,835
QA Vendor Non-IT Costs	2,948,149	1,710,507	1,237,642
Equipment Costs	542,569	314,797	227,772
Other Expenses	4,813	2,792	2,021
TOTAL MODERNIZATION INITIATION * * *	<u>24,854,843</u>	<u>14,420,705</u>	<u>10,434,138</u>
<b>RENTALS</b>			
Office Space	6,027,724	4,871,606	1,156,118
Real Estate Taxes & Operating Expenses	473,526	382,704	90,822
Equipment Leasing	236,343	191,013	45,330
TOTAL RENTALS	<u>6,737,593</u>	<u>5,445,323</u>	<u>1,292,270</u>
<b>COMMUNICATION</b>			
Telephone	168,573	136,241	32,332
Postage	798,436	645,296	153,140
Local Traveling Expenses *	59,001	47,685	11,316
Non-Local Traveling Expenses * *	79,391	64,164	15,227
TOTAL COMMUNICATION	<u>1,105,401</u>	<u>893,386</u>	<u>212,015</u>
<b>OTHER OPERATING EXPENSES</b>			
Utilities	380,951	307,885	73,066
Supplies and Materials	117,105	94,644	22,461
Maintenance, Repairs, and Services	552,104	446,211	105,893
Office Equipment and Furniture	13,733	11,099	2,634
Storage	271,588	219,497	52,091
Printing	296,933	239,981	56,952
Training Programs	308,599	249,410	59,189
Dues and Subscriptions	36,403	29,421	6,982
Miscellaneous	16,984	13,726	3,258
TOTAL OTHER OPERATING EXPENSES	<u>1,994,400</u>	<u>1,611,874</u>	<u>382,526</u>
<b>TOTAL ADMINISTRATIVE EXPENSES * * * *</b>	<u>\$ 87,532,002</u>	<u>\$ 65,076,386</u>	<u>\$ 22,455,616</u>

\* Total TRS Local Traveling Expenses include Local Travel Fare \$28,314, Meals & Refreshments \$15,072, and Conferences \$15,615.

\*\* Total TRS Non-Local Traveling Expense include Hotels & Meals \$37,456, Travel Fare \$20,506, and Conferences \$21,429.

\*\*\* The QPP Fixed Return Fund's annual modernization expense amounted to \$7.0 million. The Variable Return Fund's annual modernization expenses amounted to \$7.4 million and \$10.4 million for QPP and TDA, respectively.

\*\*\*\* The QPP Fixed Return Fund's annual administrative expense amounted to \$49.3 million. The Variable Return Fund's annual administrative expenses amounted to \$15.8 million and \$22.4 million for QPP and TDA, respectively.

The schedule shows total expenses paid by TRS. Other administrative expenses of \$ 11,782,401 were paid on TRS' behalf by other City agencies under Regulation 85 of the New York State Superintendent of Insurance Regulations.

See Note 8 of Financial Statements for the Administrative Expenses

See Independent Auditors' report.



**ADDITIONAL SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF INVESTMENT EXPENSES AND SERVICES (QPP & TDA)**  
**Year Ended June 30, 2018**

**SCHEDULE 5**

	<b>ASSETS UNDER MANAGEMENT</b>		<b>INVESTMENT EXPENSES AND SERVICES</b>
<b>INVESTMENT CATEGORY</b>			
Pension Fund	\$ 72,411,990,350		\$ 339,164,524
Diversified Equity and Int'l Equity Funds	15,267,853,320		16,017,698
Balanced Fund	379,788,520		364,254
Inflation Protection Fund	64,764,204		393
Socially Responsive Equity Fund	204,395,793		750,101
<b>OTHER INVESTMENT SERVICES</b>			
NYC Office of Comptroller (Fixed-Return Fund)			4,351,410
Consultant			4,247,927
Legal			1,782,369
Other (Variable Return Fund) Services			26,599
Provision for Expense Reduction			(13,888,900)
	<b>\$ 88,328,792,187</b>	<b>*</b>	<b>\$ 352,816,375</b>

\* Excludes \$1,212,762,137 in securities lending

See Independent Auditors' report.

# Investment



## REPORT ON INVESTMENT ACTIVITY

The below report on investment activity was prepared by Rocaton Investment Advisors. Fund summaries of the System's Investment Options follow it. After the reports are disclosures of sector returns, asset class allocation, investment management and other service fees, and bond and equity holdings. The disclosures supplement the investment information of the Financial Section.

**Prepared by Rocaton Investment Advisors, LLC,  
Investment Consultant to the Teachers' Retirement System of the City of New York**

As of June 30, 2018, TRS offered six investment program options to its membership: the Fixed Return Fund, the Diversified Equity Fund, the Balanced Fund, the International Equity Fund, the Inflation-Protection Fund, and the Socially Responsive Equity Fund. State Street and JP Morgan Chase are the custodians of the assets of these investment programs. The custodian calculates the return information using time-weighted compound return. The structure of each of these programs differs depending upon its investment objective. These six programs and their objectives are described below.

The pooled New York City Pension Fund includes a) all funds that Tier I/II members invested in the Fixed Return Fund and b) Employer Contribution assets for Tier I/II members c) all Tier III/IV/VI QPP funds d) all TDA funds invested in the Fixed Return Fund. The Fixed Return Fund currently provides Tier I/II participants with an 8.25% return. Tier III/IV/VI members are credited 5% in their QPP accounts. UFT members and non UFT members with TDA funds invested in the Fixed Return Fund are provided with 7.0% and 8.25% returns, respectively. The combined QPP and TDA Fixed Return Funds assets totaled \$72.4 billion as of June 30, 2018. The overall Pension Fund had a net of fee return of 8.1% for the fiscal year ending June 30, 2018. As of June 30, 2018, the Fund had 28% U.S. equity investments, 21% non-U.S. equity investments, 12% in private investments, 1% REITs, 37% fixed income investments and short-term investments (due to rounding, percentages do not add to 100%). The Fund's long-term asset allocation policy is based on the Fund's long-term investment horizon of more than 20 years. The investment structure has a significant emphasis on risk control. For example, as of June 30, 2018, approximately 97% of U.S. equity assets were invested in indexed or risk-controlled strategies. This emphasis on indexed and risk-controlled strategies also enables the program to more effectively control costs. The Fund's fixed income holdings are primarily high quality U.S. securities with smaller allocations to sectors such as enhanced yield and convertibles securities.

The Diversified Equity Fund's objective is to provide participants with a diversified equity investment portfolio. As of June 30, 2018, the Diversified Equity Fund, including both QPP and TDA assets had \$15.1 billion in assets and had a net of fee return of 12.1% for the fiscal year ending June 30, 2018. This portfolio's target structure is a mixture of U.S. equities (70%), non-U.S. equities (20%), and defensive strategies (10%). The defensive sector is made up of convertible bond strategies, conservatively-oriented equity strategies and tactical asset allocation strategies. Tactical asset allocation strategies shift allocations to and within asset classes such as stocks, bonds and cash depending upon the managers' analysis of market conditions. The diversification of this portfolio beyond U.S. equities is intended to broaden diversification and help protect participants against significant market downturns within a single asset class (*i.e.*, U.S. stocks). Again, risk control and cost-effectiveness are a very important focus of the investment structure. For example, as of June 30, 2018, 70% of the assets within the Diversified Equity Fund were invested in indexed strategies.

On January 1, 2018, the Bond Fund became the Balanced Fund. The objective of this fund is to seek current income and some capital appreciation. The Balanced Fund invests in both stocks and bonds and targets a conservative mix of approximately 70% bonds and 30% stocks. The Fund's bond allocation is passively managed and includes allocations to short-term U.S. Treasuries, Agencies, short-term investment-grade Corporate Bonds, and some foreign securities. The Fund's stock allocation is passively managed and is composed of U.S. and non-U.S. companies located in developed and emerging markets, traded on a variety of stock exchanges and denominated in a variety of currencies around the world. As of June 30, 2018, the combined QPP and TDA Balanced Funds' assets totaled \$379.8 million and the Fund earned a net of fee return of -0.39% for the six-month period since the fund was inception on January 1, 2018.

The International Equity Fund invests primarily in the stocks of non-U.S. companies located in both developed and emerging markets. The objective of this fund is to provide a return comparable to the return of the non-U.S. developed equity markets over a full market cycle. As of June 30, 2018, the combined QPP and TDA International Equity Funds' assets totaled \$153.6 million. For the fiscal year ending June 30, 2018, the International Equity Fund returned 7.1%, net of fees.

## TEACHERS' RETIREMENT SYSTEM OF THE CITY OF NEW YORK

The Inflation Protection Fund seeks exposure to multiple asset classes and markets. The objective of this fund is to provide a rate of return that exceeds inflation over a full market cycle. As of June 30, 2018, the combined TDA and QPP Inflation Protection Funds' assets totaled \$64.8 million. For the fiscal year ending June 30, 2018, the Inflation Protection Fund returned 5.1%, net of fees.

The Socially Responsive Equity Fund invests primarily in stocks of large and mid-cap U.S. and non-U.S. companies that meet certain financial and social criteria. The objective of this fund is to provide a rate of return comparable to the broad equity market while reflecting social priorities. As of June 30, 2018, the combined QPP and TDA Socially Responsive Equity Funds' assets totaled \$204.4 million. For the fiscal year ending June 30, 2018, the Socially Responsive Equity Fund returned 13.0%, net of fees.

The investment strategies of these investment managers are monitored periodically for consistency with TRS' overall investment objectives.

### ECONOMIC REVIEW

Interest rates rose in the U.S. during the one-year period ending June 30, 2018 with the 10-year Treasury note yielding 2.7% at the end of June, an increase of 58 basis points from June 30, 2017. The returns of investment grade fixed income sectors generated mixed results over the trailing one-year period, with corporates returning -1.0% while treasuries returned 0.1%. U.S. equities (proxied by the S&P 500) gained 14.4% during the trailing one-year period, outperforming non-U.S. developed markets (proxied by the MSCI EAFE Index) which returned 6.8%. Additionally, emerging market equities (proxied by the MSCI Emerging Markets Index) posted a return of 8.2% for the one year ending June 30, 2018. The return on the broad fixed income market (proxied by the Bloomberg Barclays U.S. Aggregate Bond Index) during the trailing one-year period was -0.4%. High yield fixed income (below investment grade bonds) outperformed higher quality domestic fixed income during the one-year period ending June 30, 2018, returning 2.6% (proxied by the Bloomberg Barclays U.S. High Yield Index), while emerging markets debt (proxied by the J.P. Morgan EMBI Global Diversified Index) underperformed high yield fixed income, returning -1.6%.

### U.S. MARKETS REVIEW

Most major domestic equity indices rose during the one-year period ending June 30, 2018 with smaller market capitalization companies, as represented by the Russell 2000 Index, outperforming their larger counterparts, as represented by the Russell 1000 Index. The Russell 2000 Index returned 17.6% during the one-year period ending June 30, 2018 versus the Russell 1000 Index return of 14.5% for the same period. The Russell 3000 Index, a broad measure of the U.S. equity markets, returned 14.8% for the one-year period ending June 30, 2018. For the 12 months ending June 30, 2018 growth stocks outperformed value stocks as the Russell 3000 Growth Index returned 22.5% versus the Russell 3000 Value Index's return of 7.3% over the same period.

For the year ending June 30, 2018, the Bloomberg Barclays U.S. Aggregate Bond Index, a broad index of U.S. investment grade bonds, returned -0.4%.

### INTERNATIONAL MARKETS REVIEW

The return for the MSCI EAFE Index, a measure of the developed international equity markets, was 6.8% in U.S. dollar terms for the one-year period ending June 30, 2018. Of the following four regions: Japan, Pacific ex-Japan, U.K. and Europe ex-U.K., Japan had the strongest performance for the one-year period, with a return of 10.9%. U.K. followed with a return of 10.1% for the one-year period while the Pacific ex-Japan and Europe ex-U.K. markets returned 8.8%, and 4.2%, respectively. International small cap stocks outperformed foreign large cap companies for the 12-month period ending June 30, 2018 with the MSCI EAFE Small Cap Index's return of 12.5%. The MSCI Emerging Markets Index returned 8.2% for the one-year period ending June 30, 2018. All of the performance information regarding non-U.S. markets is provided from the perspective of U.S.-based investors and as such were translated at fiscal year-end and reviewed as US dollar denominations.

#### *Rocaton Investment Advisors, LLC*

20 Glover Avenue  
Norwalk, Connecticut 06850

*Performance information for MSCI non-U.S. equity indices represents Total Return Net Dividends in U.S. Dollar Terms.*

## INVESTMENT OPTIONS

Below is a depiction of the investment programs in the QPP and the TDA Program available to members. The programs' portfolios are structured differently to allow members to diversify their investments. Please see pages 87-91 for detailed descriptions of the investment programs.

PENSION FUND	DIVERSIFIED EQUITY FUND	BALANCED FUND
(Member Contributions, Pension Reserve Funds & ITHP Contributions)	(Member Contributions & ITHP Contributions)	(Member Contributions & ITHP Contributions)
Tiers I/II QPP funds in the Fixed Return Fund + All Tiers III/IV/VI QPP Funds + All Tiers' TDA funds in the Fixed Return Fund	Tiers I/II QPP funds in the Diversified Equity Fund + All Tiers' TDA funds in the Diversified Equity Fund	Tiers I/II QPP funds in the Balanced Fund + All Tiers' TDA funds in the Balanced Fund
INTERNATIONAL EQUITY FUND	INFLATION PROTECTION FUND	SOCIALLY RESPONSIVE EQUITY FUND
(Member Contributions & ITHP Contributions)	(Member Contributions & ITHP Contributions)	(Member Contributions & ITHP Contributions)
Tiers I/II QPP funds in the International Equity Fund + All Tiers' TDA funds in the International Equity Fund	Tiers I/II QPP funds in the Inflation Protection Fund + All Tiers' TDA funds in the Inflation Protection Fund	Tiers I/II QPP funds in the Socially Responsive Equity Fund + All Tiers' TDA funds in the Socially Responsive Equity Fund

*Note: Members' QPP accounts receive additional contributions from their employer: "Pension Reserve" funds, which are invested in the Pension Fund, are provided to all members on a statutory basis consistent with generally accepted actuarial principles; actuarial variations are performed annually as of June 30. "Increased-Take-Home Pay" (ITHP) funds, provided by the City of New York to Tier I and Tier II members only, are invested according to member designation in any combination of the six investment programs.*

The table below compares accumulations as of June 30, 2018, based on assumed contributions of \$100.00 per month into each of the Fixed Return, Diversified Equity, Balanced, International Equity, Inflation Protection, and Socially Responsive Equity Funds.

**10-YEAR COMPARISON OF ACCUMULATIONS  
IN TRS' INVESTMENT PROGRAMS**  
*As of June 30, 2018*

MONTHS OF PARTICIPATION	12	24	36	48	60	72	84	96	108	120
Fixed Return Fund (TDA/UFT) <sup>1</sup>	\$1,239	\$2,564	\$3,982	\$5,499	\$7,122	\$8,859	\$10,718	\$12,709	\$14,837	\$17,138
Fixed Return Fund (All others) <sup>1</sup>	\$1,245	\$2,594	\$4,053	\$5,633	\$7,343	\$9,194	\$11,198	\$13,366	\$15,714	\$18,228
Diversified Equity Fund <sup>2</sup>	\$1,251	\$2,723	\$4,356	\$5,975	\$7,812	\$10,060	\$12,640	\$15,399	\$18,582	\$22,235
Balanced Fund <sup>3</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
International Equity Fund <sup>4</sup>	\$1,194	\$2,631	\$4,173	\$5,628	\$7,140	\$8,925	\$10,866	\$12,769	\$14,880	\$17,489
Inflation Protection Fund <sup>5</sup>	\$1,230	\$2,499	\$3,841	\$5,098	\$6,407	\$7,748	\$9,226	\$10,779	\$12,549	\$14,601
Socially Responsive Equity Fund <sup>6</sup>	\$1,274	\$2,748	\$4,396	\$6,055	\$7,951	\$10,359	\$13,033	\$15,858	\$19,243	\$23,066

**1 Fixed Return Fund**

*QPP: Tiers I/II members are credited with 8.25% annually on QPP investments in the Fixed Return Fund; this rate has been in effect since July 1, 1988.*

*TDA: Members who are represented by the United Federation of Teachers (UFT) are credited with 7% annually on TDA investments. This rate has been in effect since December 11, 2009; the previous rate was 8.25%. Members who are not represented by the UFT are credited with 8.25% annually on TDA investments in the Fund; this rate has been in effect since July 1, 1988. The numbers in the chart represent the accumulation for a UFT member.*

**2** Based on July 2018 unit value of \$95.605

**3** Based on July 2018 unit value of \$16.076. *Balanced Fund commenced on 1/1/18, so no 12-month figure is available.*

**4** Based on July 2018 unit value of \$10.930

**5** Based on July 2018 unit value of \$10.292

**6** Based on July 2018 unit value of \$17.711

**PENSION FUND  
Fund Summary  
Fiscal Year 2018**

**Return: 8.12%**

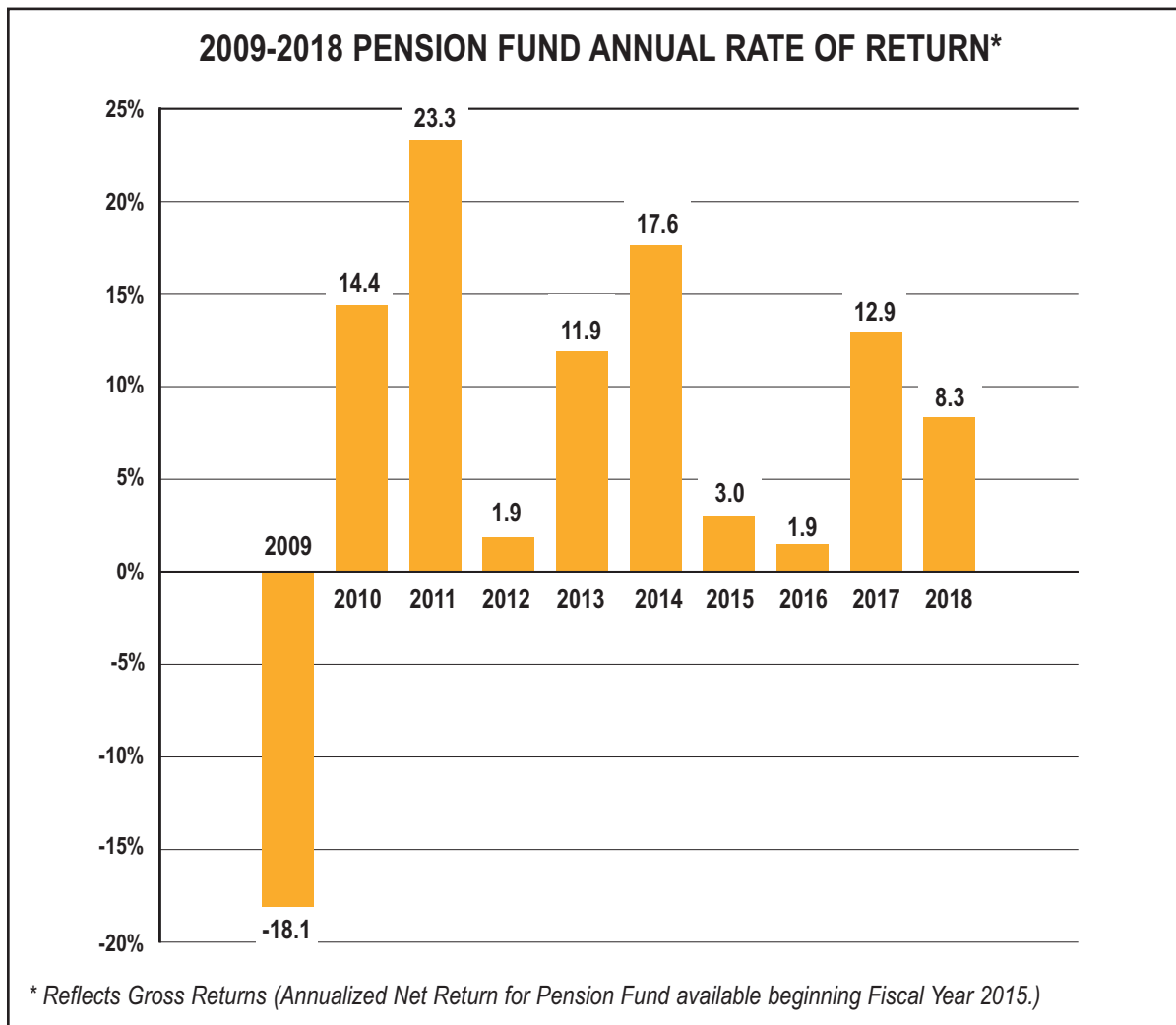
**Total Investments: \$72.412 Billion**

During Fiscal Year 2018, the Pension Fund’s portfolio, consisting primarily of equities and fixed-income investments, yielded a net return of 8.12% and a gross return of 8.33%. The 8.33% gross return was a decrease from the 12.89% return for Fiscal Year 2017.

The Pension Fund includes a) all funds that Tier I/II members invested in the Fixed Return Fund; b) Employer Contribution assets for Tier I/II members; c) all Tier III/IV/VI Qualified Pension Plan (QPP) funds; and d) all Tax-Deferred Annuity (TDA) Program funds invested in the Fixed Return Fund. The Fixed Return Fund

provides an annual rate of return that is set by the New York State Legislature in accordance with applicable laws. The combined QPP and TDA Fixed Return Fund assets totaled \$72.412 billion as of June 30, 2018.

The Comptroller of the City of New York invests the Pension Fund’s holdings in a diversified portfolio, as authorized by the Teachers’ Retirement Board. This portfolio consists of U.S. and international equities and fixed-income instruments, with smaller allocations to private equity and real estate investments.



## DIVERSIFIED EQUITY FUND

### Fund Summary

Fiscal Year 2018

**Return: 12.12%**

**Total Investments: \$15.114 Billion**

For the 12-month period ending June 30, 2018, the U.S. equity market, as measured by the Russell 3000 Index, returned 14.78%. The Russell 3000 Index includes no fees and provides a passive representation of the overall U.S. stock market. For the same 12-month period ending June 30, 2018, the Diversified Equity Fund returned 12.12%, after fees. The Fund invests in a diversified blend of investment strategies that historically have made the Diversified Equity Fund less volatile over long time periods than the overall U.S. equity market. The Hybrid Benchmark, which includes no fees, is constructed based upon a passive reflection of the Diversified Equity Fund's target asset allocation among domestic stocks, domestic fixed-income securities, and international equities. As of June 30, 2018, the Hybrid Benchmark was 70% Russell 3000 Index, 20% International Composite Benchmark and 10% Defensive Strategies benchmark. Over the 12-month period ending June 30, 2018, the Diversified Equity Fund underperformed the Hybrid Benchmark's return of 12.84%.

For the three-year period ending June 30, 2018 the Diversified Equity Fund returned 9.58% on an annualized basis after fees, trailing the Russell 3000 Index's annualized return of 11.58% and the Hybrid Benchmark's annualized returns of 10.48% over the same period. For the five-year period ending June 30, 2018, the Diversified Equity Fund returned 11.26%, annualized after fees, behind the Russell 3000 Index's annualized return of 13.29% and the Hybrid Benchmark's annualized returns of 12.01%. Due to its diversified structure, the Diversified Equity Fund has exhibited less performance volatility than the Russell 3000 Index over the same five-year period.

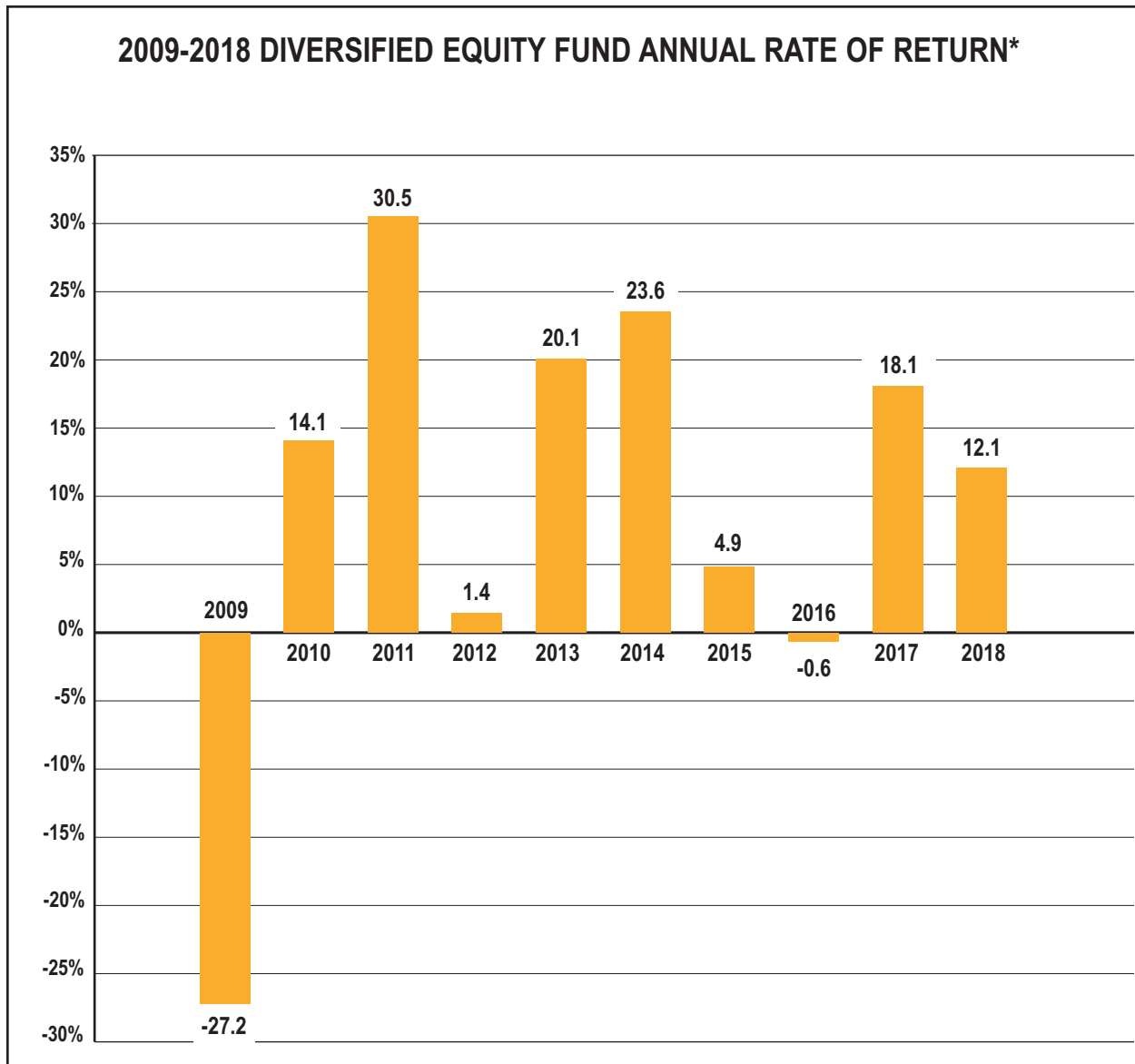
As of June 30, 2018, approximately 75% of the Diversified Equity Fund's portfolio was invested in the U.S. common stock market. The Diversified Equity Fund's portfolio also contained

approximately 19% in international stocks and approximately 6% in fixed income, cash-equivalents and other securities as of the fiscal year-end. The international stock and the fixed income allocations contribute to portfolio diversification.

The Diversified Equity Fund utilizes several different investment strategies managed by professional money management firms. These strategies are classified into the component sectors described here. Returns after fees for all of the Diversified Equity Fund's component sectors for the one-year period ending June 30, 2018 are as follows:

- The Passive Core (or index) sector is comprised of two index mandates.
- The Active Domestic Equity sector is comprised of strategies focused on particular market capitalization ranges and investment styles.
- The Defensive Strategies sector is designed to provide a diversification benefit to the overall fund and has generally been beneficial to the fund during periods of market decline. The sector is comprised of a variety of strategy types. The Tactical Asset Allocation manager within this sector, which can modify its mix of equity, bonds and cash equivalents, was positioned with approximately 63% equity exposure, and approximately 37% fixed income exposure in their portfolio as of June 30, 2018. The sector also includes two low volatility equity strategies, two convertible bond portfolios which exhibit a hybrid of equity and fixed income characteristics, and lastly, a global allocation fund which typically holds about 60% equities and 40% fixed income. The fixed income exposure of the overall Diversified Equity Fund comes from the Defensive Strategies sector.
- The International Equity sector is comprised of strategies focused on particular market capitalization ranges and investment styles across developed and emerging markets.





\* After expenses

## BALANCED FUND

### Fund Summary

Fiscal Year 2018

**Return: N/A**

**Total Investments: \$379.789 Million**

As of January 1, 2018, the Bond Fund became the Balanced Fund. Member balances in the Bond Fund as of December 31, 2017 were invested in the Balanced Fund as of January 1, 2018.

The Balanced Fund has targets of 70% U.S. short-term fixed income and 30% passive world

equity. The fund aims to passively track its benchmark, which is 70% Bloomberg Barclays U.S. Govt/Credit 1-5 Year Float Adjusted Index and 30% FTSE Global All Cap Index. For the six-month period since the fund was incepted on January 1, 2018 the fund has returned -0.39%.

## INTERNATIONAL EQUITY FUND

### Fund Summary

Fiscal Year 2018

**Return: 7.13%**

**Total Investments: \$153.644 Million**

As of June 30, 2018, the International Equity Fund was primarily comprised of a mix of active and passive management, implemented by 1 passive and 7 active non-U.S. equity managers which invest primarily in the stocks of non-U.S. companies located in developed and emerging markets. For the one-year period ending June 30, 2018 the International Equity Fund returned 7.13%, after fees outperforming the International Composite Benchmark, which returned 7.04%. For the

three-year period ending June 30, 2018 the International Equity Fund returned 6.53% outperforming the benchmark return of 6.31%. Over the longer five-year period ending June 30, 2018, the International Equity Fund has returned 7.18%, trailing the benchmark return of 7.48%. The total return of this option reflects performance of the underlying managers as well as the impact of cash flows into and out of the fund.

## INFLATION PROTECTION FUND

### Fund Summary

Fiscal Year 2018

**Return: 5.10%**

**Total Investments: \$64.764 Million**

The Inflation Protection Fund primarily invests in an actively managed mutual fund that seeks exposure to multiple asset classes including but not limited to various real return strategies with a goal of providing, over a full market cycle, a real rate of return that exceeds inflation. For the one-year period ending June 30, 2018 the Inflation Protection Fund returned 5.10%, after fees, versus the Inflation Protection Fund Benchmark's return of 4.04%. The Inflation Protection Fund Benchmark reflects a composition of 25% Bloomberg Commodity Index, 25% S&P/LSTA Leveraged Loan Index, 30% Barclays US TIPS Index,

12% Dow Jones Wilshire Real Estate Securities Index, and 8% BofAML US Real Estate Corporate Bond Index beginning December 2014. For the three-year period ending June 30, 2018 the Inflation Protection Fund returned 2.32%, underperforming the benchmark return of 1.86%. Over the longer five-year period ending June 30, 2018, the Inflation Protection Fund has outperformed the benchmark by 150 basis points, returning 2.56%. The total return of this option reflects performance of the underlying manager as well the impact of cash flows into and out of the fund.

## SOCIALLY RESPONSIVE EQUITY FUND

### Fund Summary

Fiscal Year 2018

**Return: 12.96%**

**Total Investments: \$204.396 Million**

The Socially Responsive Equity Fund primarily invests in an actively managed separate account with the goal of providing a return comparable to the large capitalization U.S. equity market over a full market cycle while reflecting social priorities. For the one-year period ending June 30, 2018, the Socially Responsive Equity Fund returned 12.96%, after fees, versus the S&P 500 Index's return of 14.37%. For the three-year period ending June 30, 2018 the Socially Responsive

Equity Fund returned 10.53%, underperforming the S&P 500 Index return of 11.93% for the same period. Over the longer five-year period ending June 30, 2018, the Socially Responsive Equity Fund has trailed the benchmark, returning 12.01% against the benchmark return of 13.42%. The total return of this option reflects performance of the underlying manager as well as the impact of cash flows into and out of the fund.

**ANNUALIZED INVESTMENT RESULTS<sup>1</sup>**

As of June 30, 2018

	Current Year 2018	3 Year	Annualized 5 Year	10 Year
<b>TRS Pension Fund<sup>2</sup></b>	8.33%	7.60%	8.58%	7.11%
Benchmark: Policy Index <sup>3</sup>	7.72%	7.58%	8.55%	7.20%
<b>TRS Diversified Equity Fund</b>	12.12%	9.58%	11.26%	8.45%
Hybrid Benchmark <sup>4</sup>	12.84%	10.48%	12.01%	9.22%
Benchmark: Russell 3000	14.78%	11.58%	13.29%	10.23%
<b>TRS Balanced Fund<sup>5</sup></b>	N/A	N/A	N/A	N/A
Benchmark: Custom Benchmark <sup>6</sup>	3.26%	3.29%	3.86%	3.81%
<b>TRS International Equity Fund</b>	7.13%	6.53%	7.18%	4.93%
Benchmark: International Equity Composite Benchmark <sup>7</sup>	7.04%	6.31%	7.48%	3.59%
<b>TRS Inflation Protection Fund</b>	5.10%	2.32%	2.56%	4.30%
Benchmark: Inflation Protection Fund Benchmark <sup>8</sup>	4.04%	1.86%	1.06%	2.18%
<b>TRS Socially Responsive Equity Fund</b>	12.96%	10.53%	12.01%	10.13%
Benchmark: Standard & Poor's 500	14.37%	11.93%	13.42%	10.17%

1 Performance calculations reflect time-weighted compound returns. Chart reflects TRS Pension Fund's gross returns. Investment results of variable-return funds are net of operational fees (advisory and custody) and administrative expenses.

2 Average crediting rates for the Fixed Annuity Program for the specified period. These rates are set by the New York State Legislature. QPP: Tier I/II members are credited with 8.25% annually on QPP investments. TDA: Members who are represented by the United Federation of Teachers (UFT) are credited with 7% annually on TDA investments. Members who are not represented by the UFT are credited with 8.25% annually on TDA investments in the Fund.

3 The "Policy Index" is a custom benchmark representing the weighted average return of the weighted benchmark indexes for each major investment program within the TRS Pension Fund. For the weights of the benchmark indexes, see the MD&A of the Financial Section.

4 The Hybrid Benchmark is rebalanced monthly to Variable A's target weights of 70% Russell 3000/ 20% International Equity Composite Benchmark/ 10% Defensive Strategies' Composite Benchmark. No fees reflected.

5 As of January 1, 2018, the Bond Fund became the Balanced Fund, and thus there is no 1-year actual performance figure available. For the 6 months ended 6/30/18, the Balanced Fund returned -0.39%.

6 The Custom Benchmark return is 70% Bloomberg Barclays U.S. Government/Credit 1-5 Year Float Adjusted Index and 30% FTSE Global All Cap Index.

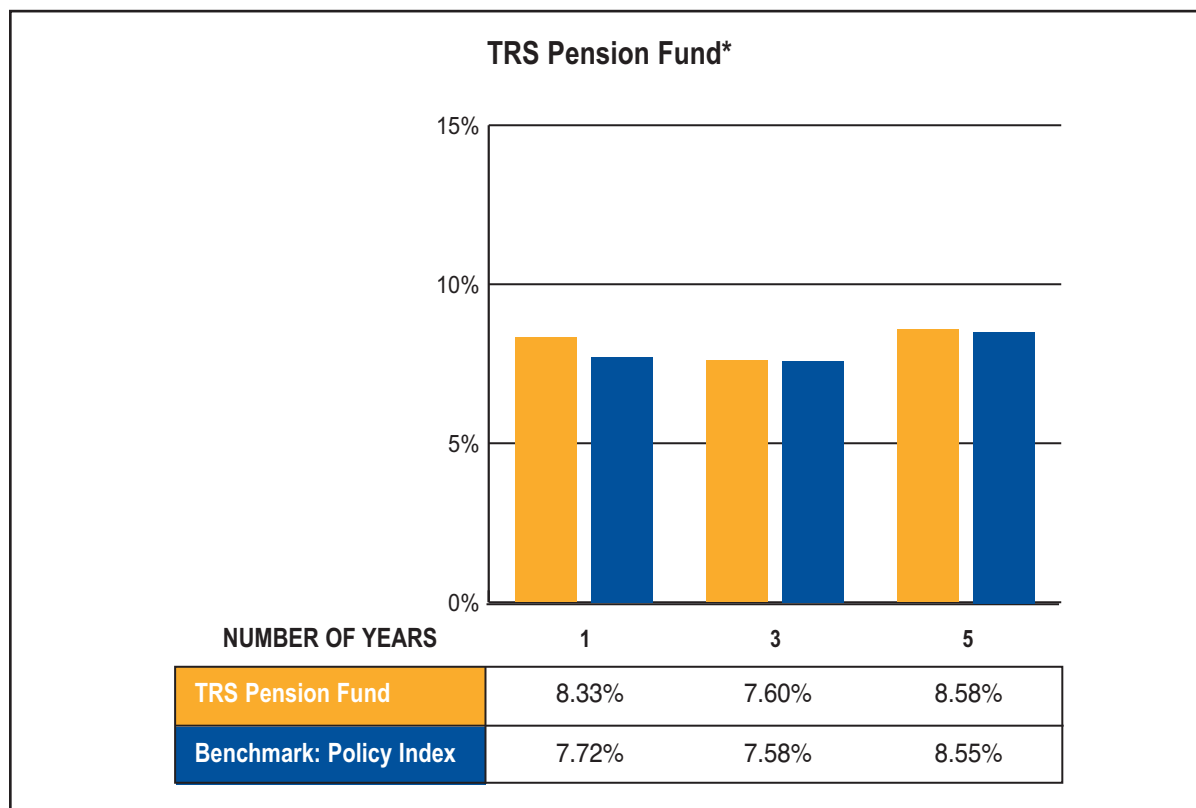
7 The International Equity Composite Benchmark is 86.5% MSCI EAFE/ 3.1% S&P Developed ex US Small Cap Index/ 10.4% Custom MSCI Emerging Markets Index. No fees reflected.

8 The Inflation Protection Fund Benchmark is currently comprised of 25% Bloomberg Commodity Index, 25% S&P/LSTA Leveraged Loan Index, 30% Barclays US TIPS Index, 12% Dow Jones Wilshire Real Estate Securities Index, and 8% BofAML US Real Estate Corporate Bond Index.

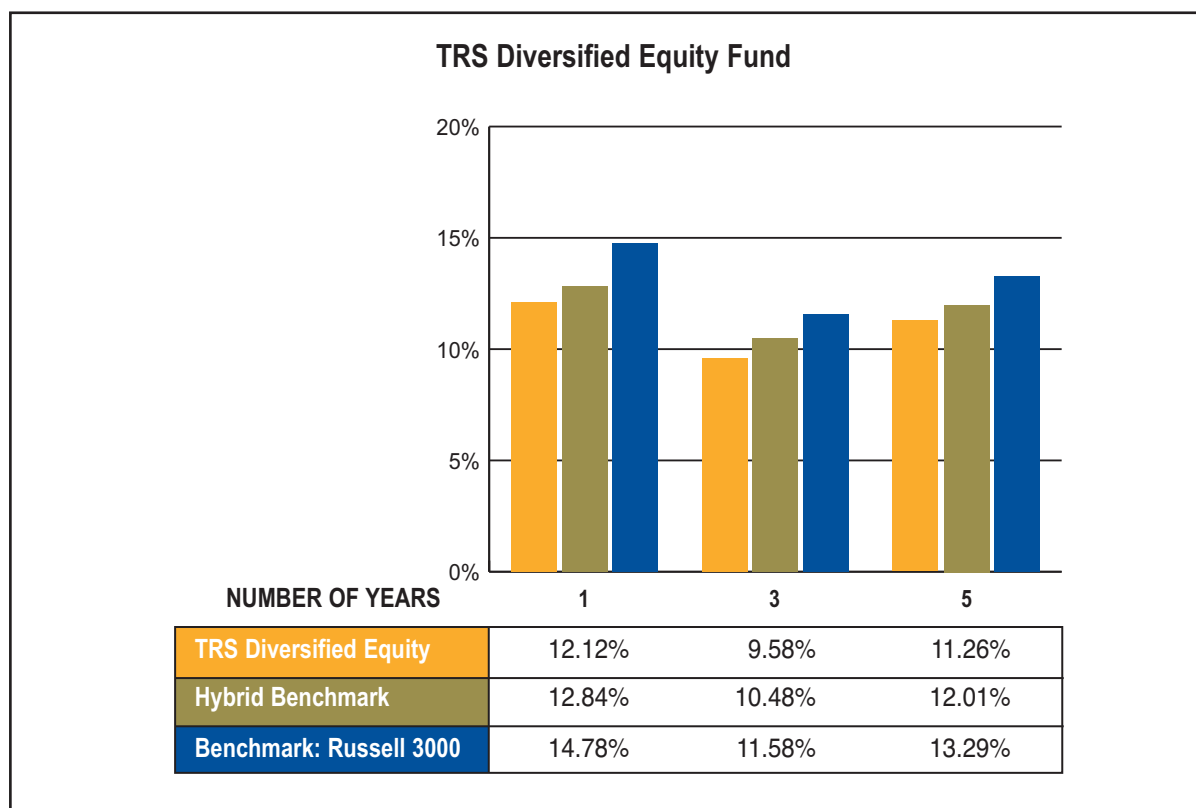
The above information has been gathered from reliable sources, but TRS can only take responsibility for the accuracy of the information concerning its own investment programs.

## ANNUALIZED INVESTMENT RESULTS

As of June 30, 2018

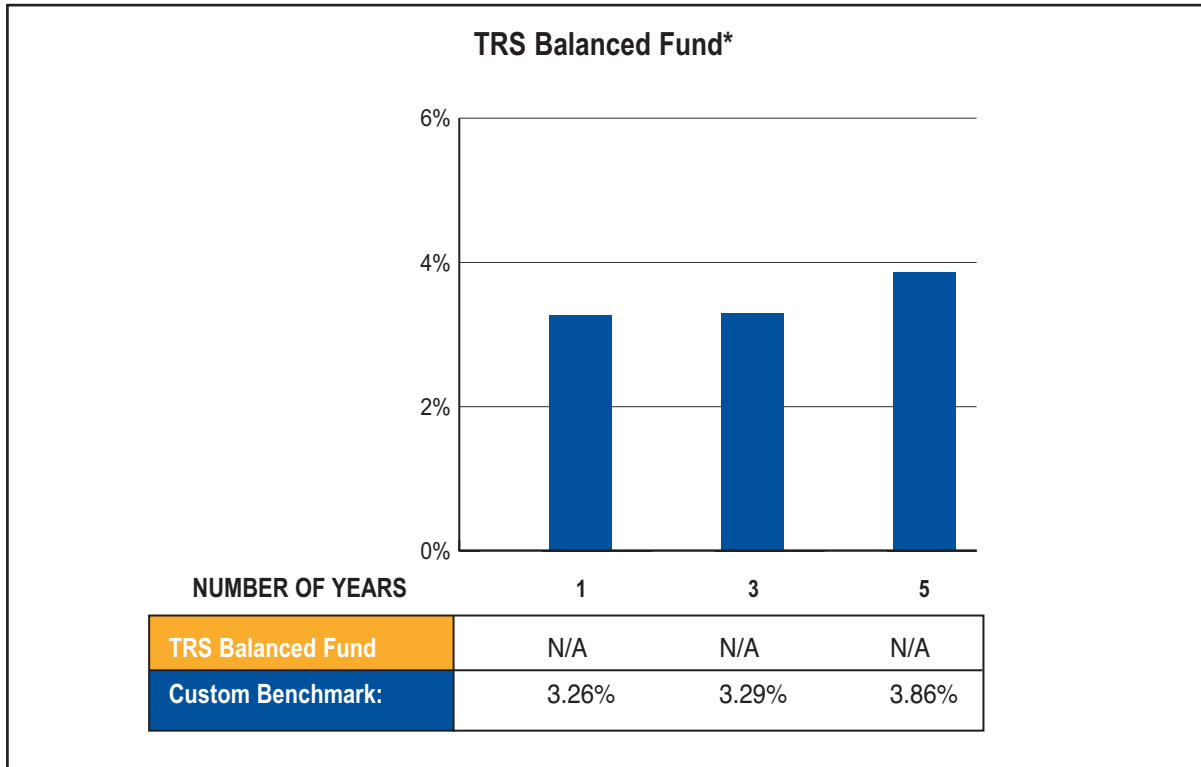


\* Reflects TRS Pension Fund's Gross Return.

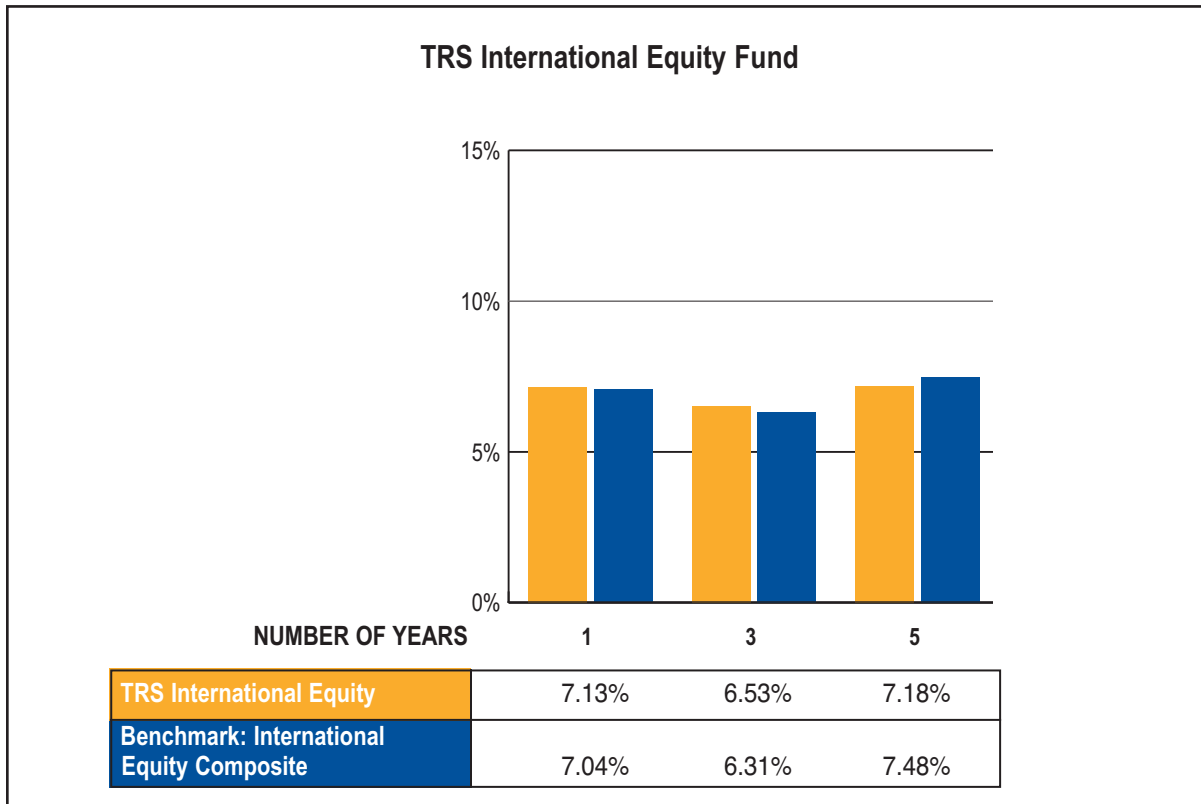


## ANNUALIZED INVESTMENT RESULTS (Continued)

As of June 30, 2018

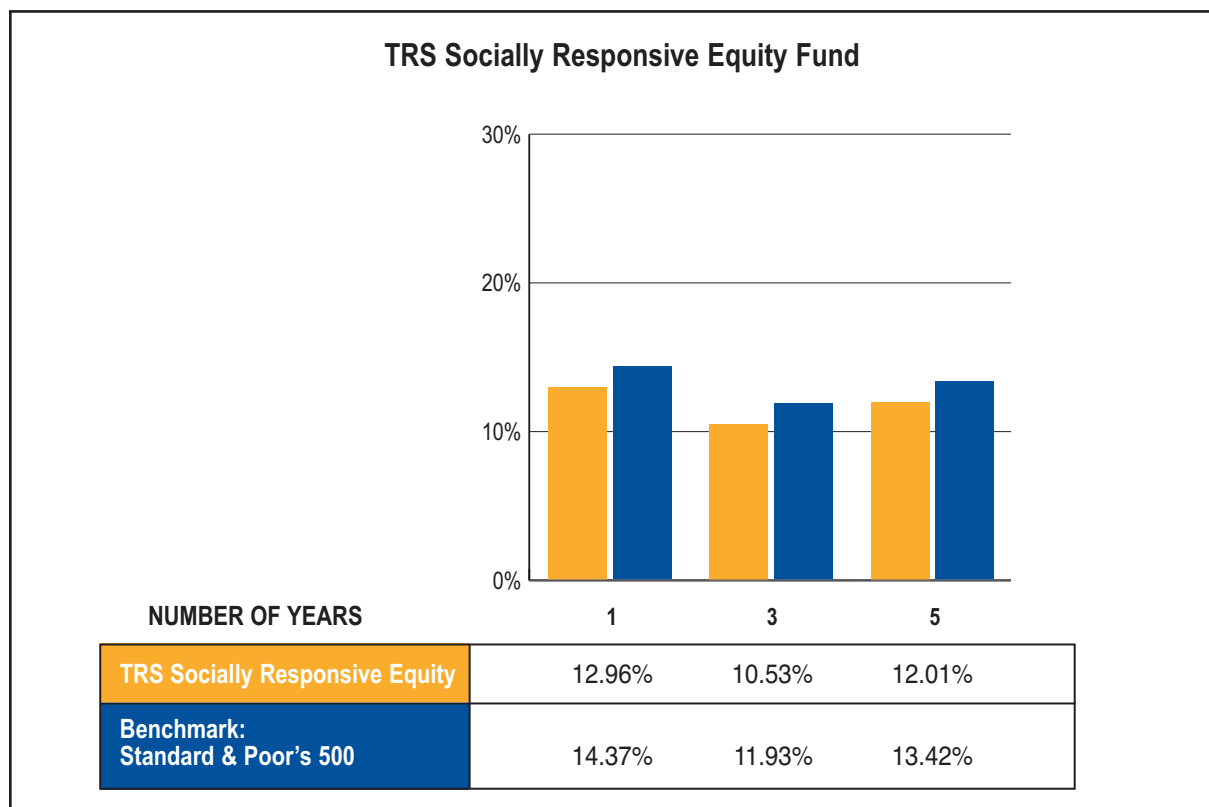
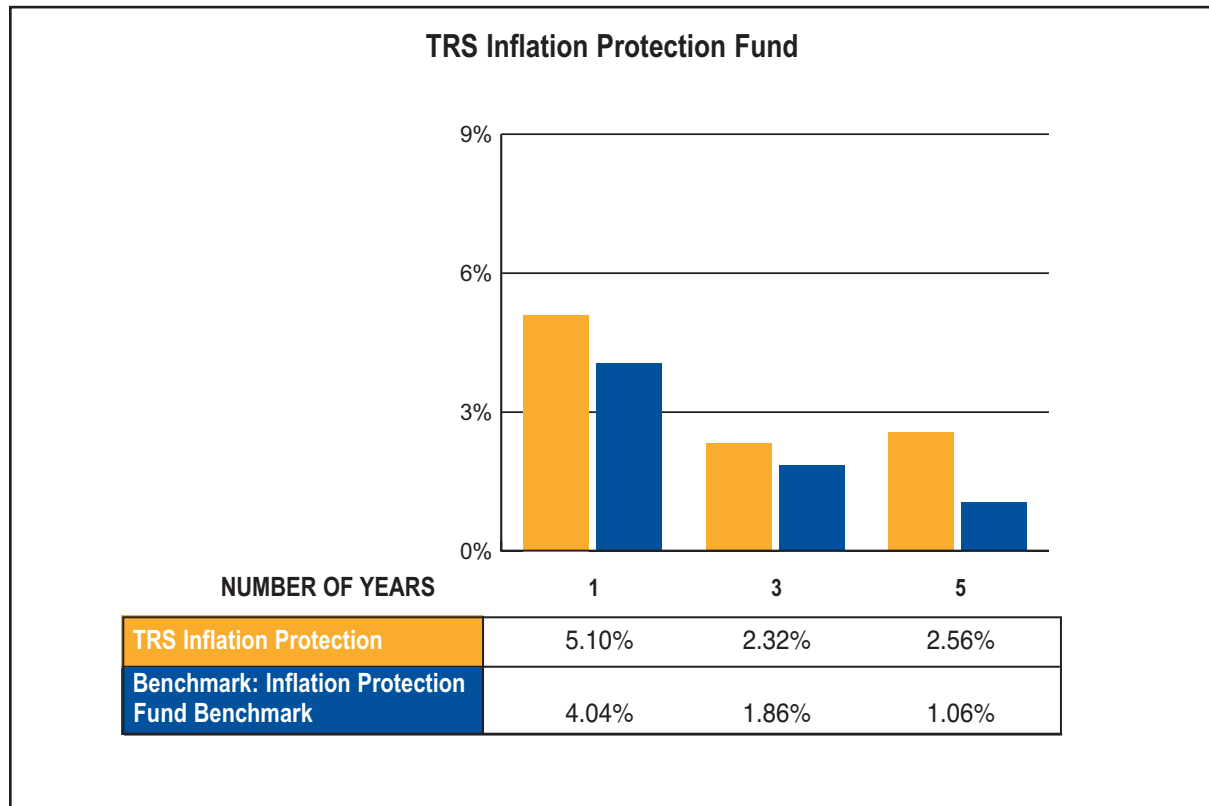


\*As of January 1, 2018, the Bond Fund became the Balanced Fund; thus there is no 1-yr actual performance data available. For the 6 months ended 6/30/18, the Balanced Fund returned -0.39%.



## ANNUALIZED INVESTMENT RESULTS (Continued)

As of June 30, 2018



### INVESTMENT SUMMARY (QPP & TDA)

As of June 30, 2018

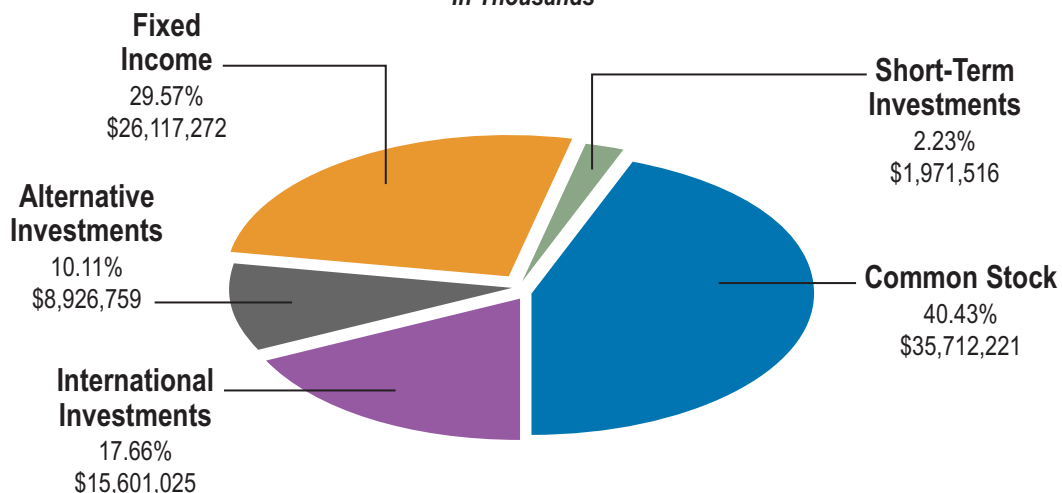
Type of Investment	Fair Value <i>In Thousands</i>	Percent of Total Fair Value
Fixed Income:		
Government Bonds	\$13,288,993	15.05%
Corporate Bonds	7,016,574	7.94
TIPS	3,106,109	3.52
Mortgages	555,508	0.63
Misc. Fixed Income	2,150,088	2.43
<b>Total Fixed Income</b>	<b>\$26,117,272</b>	<b>29.57%</b>
Common Stock:		
Financial & Utility	\$7,821,190	8.85%
Basic Industry	7,414,596	8.39
Consumer & Service	11,490,416	13.01
Technological	4,961,326	5.62
Miscellaneous	4,024,693	4.56
<b>Total Common Stock</b>	<b>\$35,712,221</b>	<b>40.43%</b>
<b>International Investments</b>	<b>\$15,601,025</b>	<b>17.66%</b>
<b>Alternative/Private-Equity Investments</b>	<b>\$8,926,759</b>	<b>10.11%</b>
<b>Short-Term Investments</b>	<b>\$1,971,516</b>	<b>2.23%</b>
<b>Total Investments</b>	<b>\$88,328,793*</b>	<b>100.00%</b>

\* Excludes \$1,212,762 in securities lending.

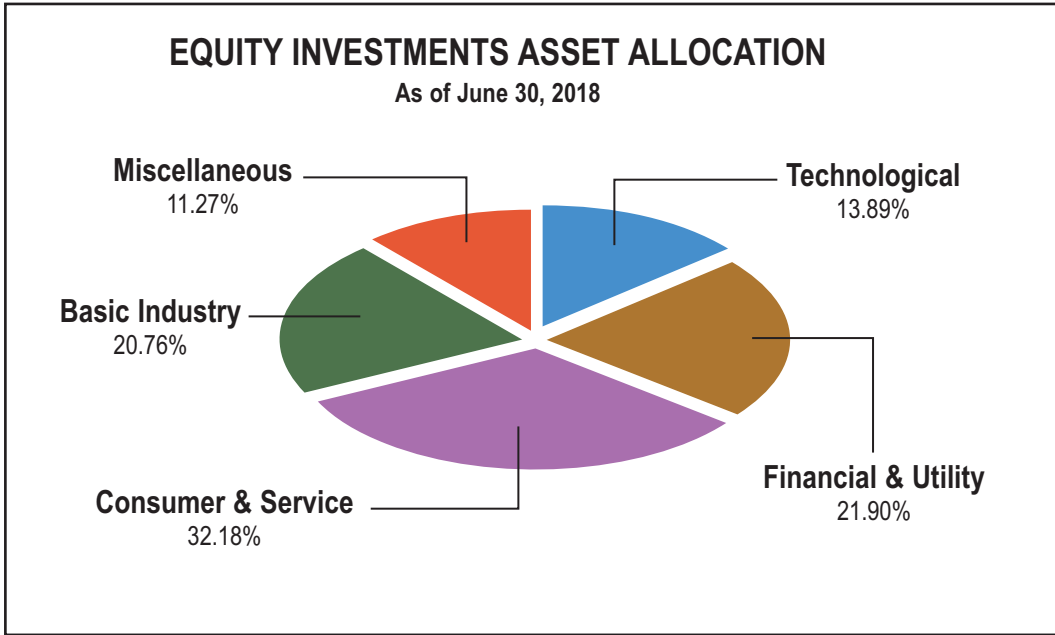
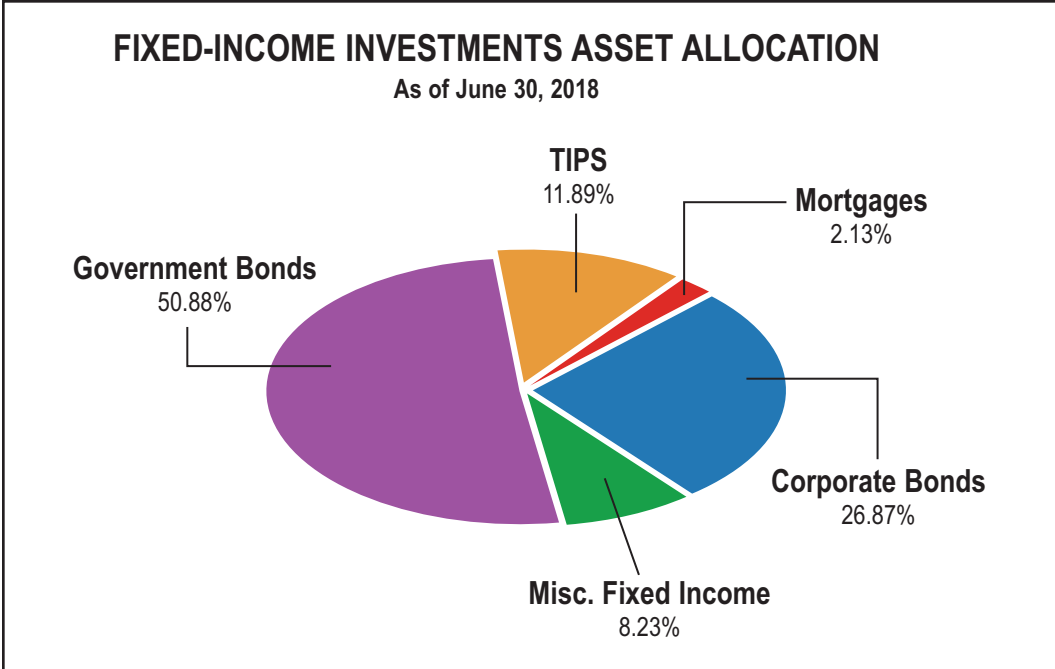
### TOTAL INVESTMENTS ASSET ALLOCATION\*

As of June 30, 2018

*In Thousands*



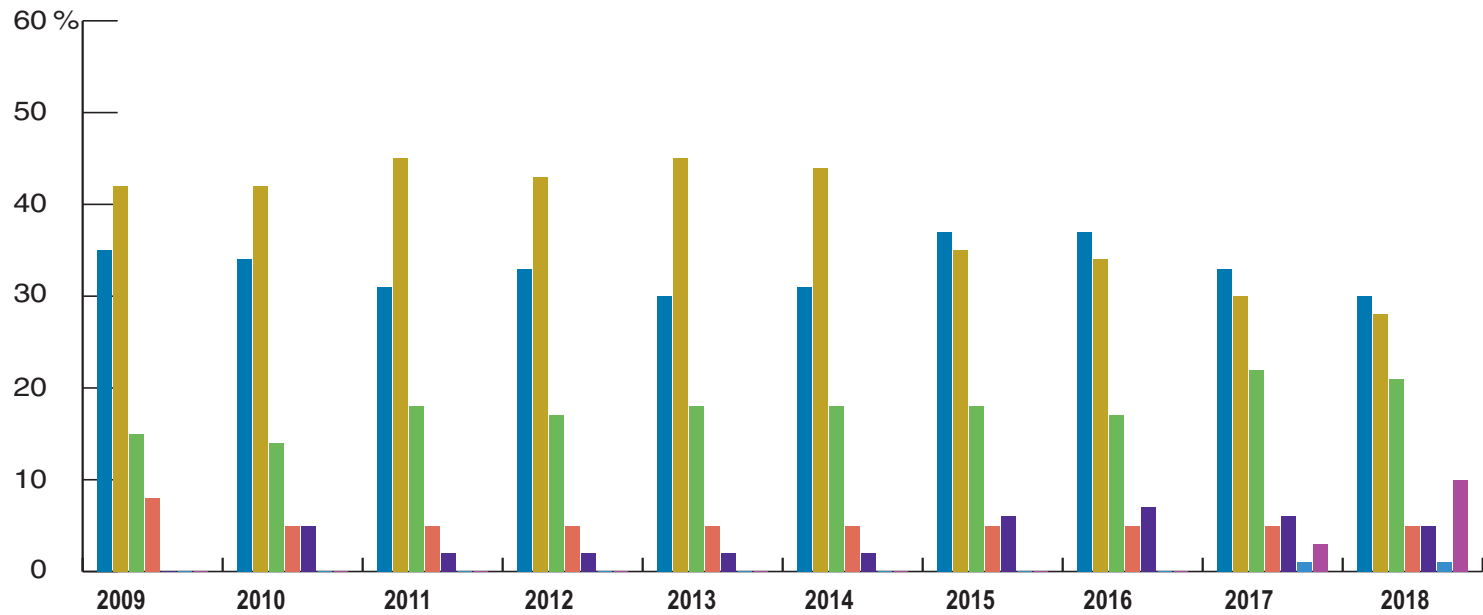




### CHANGES IN ASSET ALLOCATION BY PERCENTAGE FOR TRS PENSION FUND OVER 10-YEAR PERIOD

June 30, 2009 – June 30, 2018

■ U.S. Fixed Income    ■ U.S. Equity    ■ Non-U.S. Equity    ■ Private Equity  
■ Real Estate    ■ Infrastructure    ■ Alt Credit \*



\*For the Fiscal year 2018, Opportunistic Fixed Income has changed to Alternative Credit.

**LIST OF LARGEST BOND ASSETS HELD  
(BY FAIR VALUE)**

As of June 30, 2018

Par Value		Interest Rate	Due Date	Fair Value
\$312,860,000	United States Treasury Notes	3.375%	05/15/44	\$335,285,805
289,960,000	United States Treasury Notes	3.750	11/15/43	329,638,126
277,000,000	United States Treasury Notes	2.500	05/15/24	272,651,100
190,500,000	United States Treasury Notes	2.250	02/15/27	181,786,530
164,690,000	United States Treasury Notes	3.000	05/15/47	165,172,542
147,086,800	United States Treasury Notes	2.750	11/15/47	140,353,166
120,985,000	United States Treasury Notes	3.625	02/15/44	134,969,656
147,055,000	United States Treasury Notes	2.500	02/15/45	134,078,867
142,425,000	United States Treasury Notes	2.500	05/15/46	129,417,325
118,120,000	United States Treasury Notes	3.125	05/15/48	121,400,192

**LIST OF LARGEST EQUITY ASSETS HELD  
(BY FAIR VALUE)**

As of June 30, 2018

Company Name	Shares	Fair Value
Apple Inc	5,074,507	\$939,341,991
Microsoft Corp	7,967,010	785,626,856
Amazon.Com Inc	416,238	707,521,352
Facebook Inc	2,515,567	488,824,979
Berkshire Hathaway Inc	2,079,556	388,149,127
JPMorgan Chase & Co	3,540,390	368,908,638
Alphabet Inc - CL A	322,301	363,939,066
Exxon Mobil Corp	4,366,346	361,227,805
Alphabet Inc - CL C	311,166	347,152,348
Johnson & Johnson	2,777,918	337,072,570
Unitedhealth Group Inc	1,179,395	289,352,769
Bank of America Corp	10,112,383	285,068,077
Wells Fargo & Co	4,492,973	249,090,423
Chevron Corp	1,955,822	247,274,575
Intel Corp	4,886,948	242,930,185
AT&T Inc	7,561,502	242,799,829
Visa Inc	1,831,694	242,607,870
Pfizer Inc	6,517,330	236,448,732
Home Depot Inc	1,180,511	230,317,696
Verizon Communications Inc	4,280,486	215,351,251
Cisco Systems Inc	4,941,449	212,630,550
The Procter & Gamble Co	2,707,913	211,379,689
Citigroup Inc	2,982,231	199,570,899
Comcast Corp	5,877,944	192,855,343
Merck & Co Inc	3,141,227	190,672,479

**Note:** The above tables reflect assets of both the Qualified Pension Plan (QPP) and the Tax-Deferred Annuity (TDA) Program. The complete list of assets held by TRS' six investment programs is included in the publication Investment Portfolios.

<b>SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP &amp; TDA)</b>			
<b>YEAR ENDED JUNE 30, 2018</b>			
<b>INVESTMENT MANAGERS</b>		<b>QPP</b>	<b>TOTAL</b>
<b>FIXED ANNUITY PROGRAM</b>			
<b>Fixed Income</b>			
Advent Capital Management	Investment Manager	\$815,425	\$815,425
Barings	Investment Manager	1,403,359	1,403,359
Barrow Hanley	Investment Manager	788,259	788,259
Blackrock	Investment Manager	1,184,042	1,184,042
Credit Suisse	Investment Manager	983,328	983,328
Fort Washington	Investment Manager	421,622	421,622
GIA Partners	Investment Manager	118,907	118,907
Guggenheim BL	Investment Manager	1,717,324	1,717,324
Hillswick	Investment Manager	40,935	40,935
Integrity Fixed Income Management	Investment Manager	36,724	36,724
LM Capital	Investment Manager	112,938	112,938
Loomis Sayles	Investment Manager	1,324,358	1,324,358
Neuberger Berman	Investment Manager	2,967,096	2,967,096
New Century Advisors	Investment Manager	110,045	110,045
Oaktree	Investment Manager	1,375,936	1,375,936
Penn Capital Management	Investment Manager	718,330	718,330
Prudential	Investment Manager	597,419	597,419
Pugh Capital Management	Investment Manager	127,347	127,347
Ramirez Asset Management	Investment Manager	105,159	105,159
Shenkman Capital	Investment Manager	1,156,176	1,156,176
Smith Breeden Associates	Investment Manager	618,382	618,382
SSGA	Investment Manager	1,190,774	1,190,774
Stone Harbor	Investment Manager	1,878,393	1,878,393
T. Rowe Price	Investment Manager	3,804,314	3,804,314
Taplin Canida	Investment Manager	436,925	436,925
Victory	Investment Manager	412,799	412,799
Voya	Investment Manager	860,443	860,443
Wells	Investment Manager	762,883	762,883
<b>Domestic Equity</b>			
Adelante Capital Management	Investment Manager	1,071,056	1,071,056
Altravue Capital	Investment Manager	77,623	77,623
Blackrock	Investment Manager	505,517	505,517
Bowling Portfolio Management	Investment Manager	84,749	84,749
Bridge City Capital	Investment Manager	105,575	105,575
Brown Capital	Investment Manager	4,440,015	4,440,015
CenterSquare Investment Management	Investment Manager	965,999	965,999
Cohen & Steers	Investment Manager	981,135	981,135
Dean Capital Management	Investment Manager	106,069	106,069
Essex Investment Management	Investment Manager	95,191	95,191
Legato	Investment Manager	2,045	2,045
Lisanti Capital	Investment Manager	21,326	21,326
Pacific View Asset Management	Investment Manager	45,630	45,630
Security Capital	Investment Manager	678,627	678,627
SSGA	Investment Manager	392,520	392,520
<b>International Fund</b>			
Acadian Asset Management	Investment Manager	1,945,561	1,945,561
Algert Global	Investment Manager	31,447	31,447
Arga Investment Management	Investment Manager	231,921	231,921

Continued on page 101

**SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP & TDA)**  
**YEAR ENDED JUNE 30, 2018 (Continued)**

INVESTMENT MANAGERS		QPP	TOTAL
Ativo Capital Management	Investment Manager	\$265,468	\$265,468
Bailard	Investment Manager	300,841	300,841
Baillie Gifford	Investment Manager	19,594,976	19,594,976
Blackcrane Capital	Investment Manager	205,340	205,340
Blackrock	Investment Manager	8,936,285	8,936,285
Causeway	Investment Manager	5,674,020	5,674,020
Change Global Investments	Investment Manager	122,923	122,923
Denali Advisors	Investment Manager	217,153	217,153
Dimensional Fund Advisors	Investment Manager	10,723,194	10,723,194
Dundas Global Investors	Investment Manager	329,300	329,300
Eaton Vance	Investment Manager	8,619,508	8,619,508
F & C	Investment Manager	380,465	380,465
Global Alpha Capital Management	Investment Manager	40,490	40,490
Henry James International Management	Investment Manager	148,418	148,418
Herndon Capital Management	Investment Manager	62,170	62,170
John Hsu Capital Group	Investment Manager	126,043	126,043
Lazard Asset Management	Investment Manager	3,485,331	3,485,331
Leading Edge Investment Advisors	Investment Manager	7,330	7,330
Metis Global Partners	Investment Manager	57,109	57,109
Mondrian	Investment Manager	195	195
Morgan Stanley	Investment Manager	2,249,103	2,249,103
Osmosis Investment Management	Investment Manager	84,467	84,467
Pyramis Global	Investment Manager	2,612,174	2,612,174
Radin Capital Partners	Investment Manager	38,174	38,174
Redwood Investments	Investment Manager	165,535	165,535
Sprucegrove Investment Management	Investment Manager	4,023,613	4,023,613
SSGA	Investment Manager	2,260,634	2,260,634
Walter Scott	Investment Manager	5,579,618	5,579,618
CONY	Fee Refund	(2,867)	(2,867)
<b>TIPS MTA Fund</b>			
Blackrock	Investment Manager	402,961	402,961
SSGA	Investment Manager	108,857	108,857
<b>Mortgage Fund</b>			
ACS / RBC	Investment Manager	255,525	255,525
AFL-CIO	Investment Manager	1,139,344	1,139,344
<b>Alternative Investment</b>			
Acon	Investment Manager	147,921	147,921
Actis GP	Investment Manager	1,084,903	1,084,903
Aisling Capital	Investment Manager	106,505	106,505
Almanac Realty Securities	Investment Manager	1,293,760	1,293,760
Altaris Health Partners	Investment Manager	57,323	57,323
Amer Value Partners	Investment Manager	100,535	100,535
American Securities Partners	Investment Manager	12,507,276	12,507,276
Ampersand	Investment Manager	211,001	211,001
Angelo Gordon Partners	Investment Manager	1,295,342	1,295,342
Apax	Investment Manager	3,648,843	3,648,843
Apollo	Investment Manager	7,537,002	7,537,002
Ardian	Investment Manager	2,542,735	2,542,735
ARES	Investment Manager	11,951,315	11,951,315

*Continued on page 102*

<b>SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP &amp; TDA)</b>			
<b>YEAR ENDED JUNE 30, 2018 (Continued)</b>			
<b>INVESTMENT MANAGERS</b>		<b>QPP</b>	<b>TOTAL</b>
Arsenal Capital	Investment Manager	\$9,280	\$9,280
Artemis Real Estate Partners	Investment Manager	376,604	376,604
Avanath Capital	Investment Manager	133,017	133,017
Avista Capital Partners	Investment Manager	89,792	89,792
AXA	Investment Manager	6,494,323	6,494,323
Axium Infrastructure	Investment Manager	381,569	381,569
Basis Management Group	Investment Manager	126,987	126,987
BC	Investment Manager	1,530,607	1,530,607
BDCM	Investment Manager	221,371	221,371
Blackstone	Investment Manager	5,028,630	5,028,630
Blue Wolf	Investment Manager	158,034	158,034
Bridgepoint	Investment Manager	1,429,212	1,429,212
Brightwood	Investment Manager	3,085,747	3,085,747
Brookfield	Investment Manager	5,862,969	5,862,969
Canyon Johnson Urban	Investment Manager	158,587	158,587
Capital Partners	Investment Manager	434,229	434,229
Capri Urgan Investors	Investment Manager	175,516	175,516
Carlyle	Investment Manager	5,456,632	5,456,632
Carpenter	Investment Manager	904,311	904,311
Catterton	Investment Manager	199,663	199,663
CCMP Capital	Investment Manager	511,356	511,356
Centerbridge Capital	Investment Manager	769,384	769,384
Cinven Fourth Fund	Investment Manager	1,430,275	1,430,275
City Investment Fund (The)	Investment Manager	52,080	52,080
Clarion Partners	Investment Manager	835,666	835,666
Co-Investment Partners	Investment Manager	84,149	84,149
Coller Capital	Investment Manager	7,527	7,527
Colony Realty Partners	Investment Manager	335,900	335,900
Constellation Ventures	Investment Manager	62,418	62,418
Contrarian Capital	Investment Manager	959,126	959,126
Craton Equity	Investment Manager	37,635	37,635
Credit Suisse	Investment Manager	879,792	879,792
Crestview Partners	Investment Manager	1,656,750	1,656,750
CVC Capital Partners	Investment Manager	2,728,737	2,728,737
Divco West	Investment Manager	2,348,249	2,348,249
DRA	Investment Manager	3,095,001	3,095,001
EIG Credit Management	Investment Manager	95,376	95,376
Emmes Asset Management	Investment Manager	2,251,995	2,251,995
EQT	Investment Manager	4,288,710	4,288,710
Exeter	Investment Manager	561,976	561,976
Fairview Capital Partners	Investment Manager	159,570	159,570
FDG Capital Partners	Investment Manager	90,177	90,177
First Reserve	Investment Manager	2,085,672	2,085,672
Fortress Investment Group	Investment Manager	4,106,512	4,106,512
Freeman Spogli	Investment Manager	9,843	9,843
FT Ventures	Investment Manager	2,825,956	2,825,956
GF Capital Private Equity Fund	Investment Manager	15,921	15,921
GI Partners	Investment Manager	1,416,881	1,416,881
Global Infrastructure Management	Investment Manager	2,469,427	2,469,427
GoldenTree	Investment Manager	1,416,765	1,416,765
Green Equity Investors	Investment Manager	4,648,187	4,648,187

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**SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP & TDA)**  
**YEAR ENDED JUNE 30, 2018 (Continued)**

INVESTMENT MANAGERS		QPP	TOTAL
Grey Mountain Partners	Investment Manager	\$125,876	\$125,876
GSO Capital	Investment Manager	34,385	34,385
H/2 Capital Partners	Investment Manager	2,489,541	2,489,541
Halyard Capital	Investment Manager	51,412	51,412
Heitman America	Investment Manager	640,073	640,073
Hudson Separate Account	Investment Manager	638,732	638,732
ICV Partners	Investment Manager	388,388	388,388
Incline Equity Partners	Investment Manager	3,667	3,667
Industry Funds Management	Investment Manager	3,822,754	3,822,754
Intermedia Partners	Investment Manager	30,236	30,236
Intermediate Capital Group	Investment Manager	560,139	560,139
J.P. Morgan	Investment Manager	184,892	184,892
Jamestown	Investment Manager	3,693,739	3,693,739
JPMC	Investment Manager	1,768,055	1,768,055
KKR	Investment Manager	8,645,333	8,645,333
KTR Capital Partners	Investment Manager	60,123	60,123
Landmark Partners	Investment Manager	2,202,496	2,202,496
Lasalle Investment Management	Investment Manager	380,817	380,817
Leeds Equity Partners	Investment Manager	71,211	71,211
Leonard Green & Partners	Investment Manager	1,932,806	1,932,806
Levine Leichtman Capital Partners	Investment Manager	108,490	108,490
Lexington Investment	Investment Manager	2,203,242	2,203,242
Lincolnshire Management	Investment Manager	231,604	231,604
Lone Star	Investment Manager	6,123,460	6,123,460
Marathon Asset Management	Investment Manager	6,046,938	6,046,938
Metlife	Investment Manager	630,595	630,595
Midocean Patners	Investment Manager	5,566,798	5,566,798
Mill City Capital	Investment Manager	75,223	75,223
New MainStream Capital	Investment Manager	260,202	260,202
New Mountain Partners	Investment Manager	1,699,434	1,699,434
New York Fairview Emerging Managers	Investment Manager	50,932	50,932
NGN Biomed Opportunity	Investment Manager	105,706	105,706
NMS Capital	Investment Manager	112,741	112,741
Oak Hill	Investment Manager	2,313,114	2,313,114
Oaktree	Investment Manager	1,583,954	1,583,954
Olympus Partners	Investment Manager	2,752,935	2,752,935
ONEX Partners	Investment Manager	1,022,579	1,022,579
Paladin	Investment Manager	422,220	422,220
Palladium Equity Partners	Investment Manager	71,215	71,215
Patriot Partners	Investment Manager	453,707	453,707
PCG	Investment Manager	6,750	6,750
Pegasus Partners	Investment Manager	930,147	930,147
Pine Brook Capital Partners	Investment Manager	132,019	132,019
Platinum Equity Capital Partners	Investment Manager	6,065,113	6,065,113
Pramerica	Investment Manager	315,813	315,813
Prisa	Investment Manager	419,285	419,285
Prologis	Investment Manager	679,384	679,384
Prudential	Investment Manager	883,059	883,059
PW Real Estate Fund	Investment Manager	633,904	633,904
Quaker Bioventures	Investment Manager	123,270	123,270
Raine Partners	Investment Manager	603,785	603,785

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**SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP & TDA)**  
**YEAR ENDED JUNE 30, 2018 (Continued)**

INVESTMENT MANAGERS		QPP	TOTAL
RFM NYCERS Sandy	Investment Manager	\$1,762,196	\$1,762,196
Riverstone/Carlyle	Investment Manager	66,265	66,265
RLJ Equity Partners	Investment Manager	732,410	732,410
RRE Ventures	Investment Manager	84,112	84,112
RREEF America	Investment Manager	468,323	468,323
Silverpeak Legacy Partners	Investment Manager	15,946	15,946
Siris Capital Group	Investment Manager	431,739	431,739
Snow Phipps & Guggenheim	Investment Manager	68,327	68,327
Solera Partners	Investment Manager	36,426	36,426
Starvest Partners	Investment Manager	86,269	86,269
Stellex Capital Management	Investment Manager	438,995	438,995
Stockbridge Real Estate	Investment Manager	95,492	95,492
Taconic Investment Partners	Investment Manager	47,171	47,171
Thor Urban Property	Investment Manager	59,695	59,695
Torchlight	Investment Manager	3,241,854	3,241,854
Trilantic Capital Partners	Investment Manager	6,051,424	6,051,424
Tristan Capital Partners	Investment Manager	965,137	965,137
UBS	Investment Manager	1,354,010	1,354,010
United States Power Fund	Investment Manager	499,809	499,809
USAA Eagle Real Estate Fund	Investment Manager	492,839	492,839
Valor Equity	Investment Manager	1,006,676	1,006,676
Vista Equity Partners	Investment Manager	6,719,510	6,719,510
Warburg Pincus Private Equity	Investment Manager	4,729,718	4,729,718
Webster Capital	Investment Manager	243,911	243,911
Welsh, Carson, Anderson & Stowe	Investment Manager	3,065,541	3,065,541
Westbrook	Investment Manager	1,252,374	1,252,374
Yucaipa Companies	Investment Manager	426,059	426,059
Ernst and Young	Purchase Fees	212,184	212,184
Pricewaterhouse Coopers Taiwan	Purchase Fees	51,612	51,612
SSB - Tax adjustments	Purchase Fees	308	308
Bryan Cave	Legal Fees	14,561	14,561
Cox Castle Nicholson	Legal Fees	247,194	247,194
Day Pintney	Legal Fees	59,513	59,513
Foley & Lardner	Legal Fees	20,834	20,834
Foster Pepper	Legal Fees	289,557	289,557
Hitchcock	Legal Fees	600	600
Morgan Lewis Bockius	Legal Fees	874,404	874,404
Morris Nichols Arsht Tunnell	Legal Fees	1,500	1,500
Nixon Peabody	Legal Fees	27,328	27,328
Pillsbury Winthrop Shaw Pittman	Legal Fees	43,411	43,411
Reinhart Boerner Van Dueren	Legal Fees	98,039	98,039
Seward Kissel	Legal Fees	10,820	10,820
Squire Patton Boggs	Legal Fees	21,600	21,600
Aksia	Consultant Fees	1,388	1,388
BAM - Subscriptions	Consultant Fees	69,779	69,779
Courtland Partners	Consultant Fees	628,873	628,873
Hamilton Lane Advisors	Consultant Fees	747,592	747,592
Institutional Shareholders Services	Consultant Fees	7,100	7,100
Mercer Investment Advisors	Consultant Fees	91,463	91,463
MSCI Barra	Consultant Fees	355,252	355,252
MSCI ESG Research	Consultant Fees	6,885	6,885

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**SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP & TDA)**  
**YEAR ENDED JUNE 30, 2018 (Continued)**

INVESTMENT MANAGERS		QPP	TDA	TOTAL
NYC Office of Comptroller – BAM	Consultant Fees	\$4,351,410		\$4,351,410
Pacific Corporation Group	Consultant Fees	483,484		483,484
Principles for Responsible Investment	Consultant Fees	6,033		6,033
Rocaton Investment	Consultant Fees	451,250		451,250
Shareholder Research Services	Consultant Fees	159,231		159,231
Stepstone Group	Consultant Fees	698,410		698,410
Townsend Holdings	Consultant Fees	(27,323)		(27,323)
State Street Bank & Trust	Custodial Bank	1,062,001		1,062,001
<b>DIVERSIFIED EQUITY FUND AND INTERNATIONAL EQUITY FUND</b>			<b>TDA</b>	
Acadian Asset Management	Investment Manager	\$245,684	\$316,674	\$562,358
Advent Capital Management	Investment Manager	335,053	431,868	766,921
Amalgamated Bank	Investment Manager	22,733	29,302	52,035
Analytic Investors	Investment Manager	228,854	294,982	523,836
Baillie Gifford	Investment Manager	376,761	485,626	862,387
Blackrock	Investment Manager	222,790	287,166	509,956
Cardinal	Investment Manager	298,678	384,981	683,659
Clearbridge Investments	Investment Manager	654,062	843,054	1,497,116
Diamond Hill Capital Management	Investment Manager	106,617	137,424	244,041
GMO	Investment Manager	10,600	13,663	24,262
Intech	Investment Manager	149,509	192,710	342,219
MCM	Investment Manager	119,116	153,535	272,651
MFS Investment Advisors Intl Equity	Investment Manager	383,466	494,269	877,736
New South Capital Management	Investment Manager	615,102	792,837	1,407,939
Pyramis Global	Investment Manager	305,021	393,157	698,178
Shapiro Capital Management	Investment Manager	620,278	799,508	1,419,786
Sound Shore Management	Investment Manager	271,135	349,480	620,616
Sprucegrove Investment Management	Investment Manager	165,766	213,665	379,431
Walter Scott	Investment Manager	174,899	225,437	400,336
Wasatch Advisors	Investment Manager	537,471	692,774	1,230,245
Wellington Management	Investment Manager	410,713	529,389	940,102
Zazove Conv Bond	Investment Manager	438,976	565,819	1,004,795
Groom Law Group	Legal Fees	22,086	47,812	69,898
eVestment Alliance	Consultant Fees	4,840	10,478	15,318
Mercer Investment Advisors	Consultant Fees	11,092	24,011	35,103
Principles for Responsible Investment	Consultant Fees	1,768	3,828	5,596
Rocaton Investment Advisors	Consultant Fees	154,280	333,984	488,264
Broadridge Financial Solutions	Data Services	10,209	14,656	24,865
Supporting Services	Travel & Other	525	1,135	1,660
JP Morgan Chase Bank	Custodian Bank	304,547	392,546	697,093
<b>BALANCED FUND</b>				
NISA Investment Advisors	Investment Manager	68,933	290,820	359,753
Groom Law Group	Legal Fees	460	2,082	2,542
eVestment Alliance	Consultant Fees	101	456	557
Mercer Investment Advisors	Consultant Fees	231	1,046	1,277
Principles for Responsible Investment	Consultant Fees	37	167	204
Rocaton Investment Advisors	Consultant Fees	3,213	14,545	17,758
Supporting Services	Travel & Other	11	49	60
JPMorgan Chase Bank	Custodian Bank	863	3,638	4,501

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<b>SUMMARY OF INVESTMENT MANAGERS AND FEES (QPP &amp; TDA)</b>				
<b>YEAR ENDED JUNE 30, 2018 (Continued)</b>				
<b>INVESTMENT MANAGERS</b>		<b>QPP</b>	<b>TDA</b>	<b>TOTAL</b>
<b>INFLATION PROTECTION FUND</b>				
Fidelity Strategic R. Fund	Mutual Fund	-	-	-
Groom Law Group	Legal Fees	\$41	\$196	\$237
eVestment Alliance	Consultant Fees	9	43	52
Mercer Investment Advisors	Consultant Fees	21	98	119
Principles for Responsible Investment	Consultant Fees	3	16	19
Rocaton Investment Advisors	Consultant Fees	286	1,367	1,652
Supporting Services	Travel & Other	1	5	6
JPMorgan Chase Bank	Custodian Bank	25	368	393
<b>SOCIALLY RESPONSIVE EQUITY FUND</b>				
Neuberger Berman	Investment Manager	86,691	660,860	747,551
Groom Law Group	Legal Fees	44	289	333
eVestment Alliance	Consultant Fees	10	63	73
Mercer Investment Advisors	Consultant Fees	22	145	167
Principles for Responsible Investment	Consultant Fees	4	23	27
Rocaton Investment Advisors	Consultant Fees	306	2,020	2,326
Supporting Services	Travel & Other	1	7	8
JPMorgan Chase Bank	Custodian Bank	296	2,254	2,550
<b>Investment Expenses</b>	<b>Subtotal:</b>	<b>\$356,268,947</b>	<b>\$10,436,328</b>	<b>\$366,705,275</b>
Provision for Administrative Expenses	Administrative Fees	10,215,450	13,684,868	23,900,318
Reserve Transfer to Administrative expenses	Fund Transfer	(15,816,215)	(21,973,003)	(37,789,218)
<b>Net (decrease) in variable expense provision</b>	<b>Subtotal:</b>	<b>(\$5,600,765)</b>	<b>(\$8,288,135)</b>	<b>(\$13,888,900)</b>
<b>Total Investment Expenses</b>		<b>\$350,668,182</b>	<b>\$2,148,193</b>	<b>\$352,816,375</b>

**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (PENSION FUND)  
FISCAL YEAR ENDED JUNE 30, 2018**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Abel Noser	74,710	\$0.05	\$3,736
ABG Securities As (Stockholm)	58,484	0.01	573
ABG Securities Limited	59,961	0.02	977
ABN Amro Clearing Bank N.V.	1,865	0.01	27
Academy Securities Inc	197,044	0.02	2,956
Arqaam Capital Limited	202	0.04	7
Arqaam Capital South Africa	38,005	0.01	436
Arqaam Securities LLC	118,065	0.01	594
Auerbach Grayson and Co. Inc.	800	0.03	24
Autrepat-Div Re	39,216	0.05	2,107
Baader Bank Ag	3,777	0.07	269
Banco Itau SA	300,651	0.02	6,037
Banco Pactual S.A.	39,900	0.01	295
Banco Santander Central Hispano	3,696,140	0.01	38,634
Bank J.Vontobel Und Co. Ag	111,950	0.07	7,840
Bank of America Merrill Lynch Secur Inc	26,848	0.02	608
Bank of Nova Scotia - Scusa	5,000	0.01	59
Bankhaus Hermann Lampe	31,145	0.03	807
Barclays Capital	2,050	0.06	123
Barclays Capital Inc.	7,495,199	0.01	58,243
Barclays Capital Le	5,894,029	0.01	49,672
Barrington Research Associates	17,540	0.03	526
Bloomberg Tradebook LLC	1,247,900	0.01	15,728
BMO Capital Markets	461,907	0.02	9,344
BNP Paribas Securities (Asia) LTD.	132,796	0.03	4,561
BNP Paribas Securities Services	494,797	0.01	3,232
BNP Paribas Securities Services Austr Br	2,973,409	0.00	2,378
BNP Paribas Securities Services SA	112,198,979	0.00	54,222
BNP Paribas Securities Services, France	6,877,243	0.00	17,746
Bradesco S.A. Ctm	233,002	0.01	1,728
BTG Pactual Chile S.A. Corredores De Bol	2,544,493	0.00	2,432
BTIG, LLC	596,687	0.02	13,737
Cabrera Capital Markets LLC	58,421	0.01	615
Canaccord Genuity Limited	59,265	0.04	2,233
Canadian Imperial Bank of Commerce	263,589	0.01	2,024
Cantor Fitzgerald & Co.	879,566	0.02	16,641
Cantor Fitzgerald Europe	109,367	0.00	347
Cantor Fitzgerald/Cantor Clearing Serv	1,660,110	0.02	39,481
Capital Institutional Svcs Inc Equities	571,350	0.01	6,221
Carnegie AS	96,178	0.05	4,696
Carnegie Investment Bank Ab	125,338	0.01	873
CCB International Securities Limited	23,600	0.03	650
Ceska Sporitelna	40,815	0.07	2,975
Cheevers & Co. Inc.	1,060,013	0.01	10,600
China International Capital Co	553,600	0.01	3,153
CIBC World Mkts Inc	94,925	0.02	1,664
Citation Group	46,082	0.04	1,882
Citibank Na	189,627	0.04	7,184
Citibank of Colombia	5,771,874	0.00	294

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (PENSION FUND)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Citigroup Global Markets Asia LTD	90,730	\$0.00	\$16
Citigroup Global Markets Australia Pty	328,755	0.00	460
Citigroup Global Markets Inc	58,854,038	0.00	162,766
Citigroup Global Markets India	1,188,178	0.01	6,550
Citigroup Global Markets Korea Secs LTD	547,337	0.02	8,532
Citigroup Global Markets Limited	12,963,878	0.01	116,213
Citigroup Global Markets Taiwan	16,543,900	0.00	12,384
CL Securities Taiwan Company Limited	2,670,440	0.00	6,227
CLSA Americas	8,200	0.04	328
CLSA Australia Pty LTD	875,008	0.00	2,755
CLSA Securities (Thailand) LTD	219,200	0.01	1,265
CLSA Securities Korea LTD.	462,796	0.05	23,944
CLSA Securities Malaysia Sdn Bhd	1,440,900	0.00	2,545
CLSA Singapore Pte LTD	5,774,980	0.01	43,479
COL Financial Group, Inc.	3,267,621	0.00	1,106
Commerzbank Capital Markets Corporation	67,167	0.02	1,008
Convencao S/A Corretora De Valores	2,949,597	0.01	16,970
Convergex LLC	372,217	0.02	5,584
Cornerstone Macro LLC	3,790	0.05	190
Corredores Asociados SA	6,535,977	0.00	136
Cowen and Company, LLC	199,188	0.02	4,378
Cowen Execution Services LLC	35,475,431	0.00	170,872
Craig - Hallum	31,245	0.04	1,141
Credicorp Capital Colombia S.A.	756,196	0.00	1,869
Credit Agricole Securities (USA) Inc	17,300	0.04	692
Credit Lyonnais Securities (Asia)	30,700,280	0.00	22,072
Credit Lyonnais Securities (India)	4,773,748	0.01	27,082
Credit Lyonnais Securities (USA) Inc	666,000	0.01	3,651
Credit Suisse Canada	14,400	0.01	112
Credit Suisse First Boston	14,467,061	0.00	10,210
Credit Suisse First Boston (Europe)	37,803	0.35	13,126
Credit Suisse First Boston Sa Ctm	227,000	0.01	2,483
Credit Suisse International	277,553	0.00	325
Credit Suisse Secs India Private LTD	24,817,198	0.00	56,305
Credit Suisse Securities (Europe) LTD	33,685,507	0.00	59,033
Credit Suisse Securities (USA) LLC	120,775,460	0.00	121,048
Crest Depository Limited	46,898	0.00	105
CS First Boston (Hong Kong) Limited	1,018,532	0.00	4,092
CSFB Australia Equities LTD	360,257	0.00	646
Daiwa Sbcm Europe	178,400	0.07	13,188
Daiwa Securities (HK) LTD.	89,110	0.00	329
Daiwa Securities America Inc	2,484,000	0.02	41,448
Daiwa Securities Company LTD	70,352	0.01	482
Daiwa Securities Sb Capital Markets	13	8.32	110
Danareska Securities, Pt	10,058,026	0.00	1,029
Davy Stockbrokers	2,339,993	0.00	8,172
DBS Vickers (Hong Kong) Limited	609,000	0.01	5,127
DBS Vickers Securities (Singapore)	1,315,576	0.01	8,702
Den Norske Bank	30,973	0.01	218
Deposito Centralizado De Valores De Colo	15,480	0.01	141
Deutsche Bank Ag London	3,681,143	0.01	25,246

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (PENSION FUND)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Deutsche Bank Securities Inc	30,489,582	\$0.00	\$93,790
Deutsche Securities Asia LTD	2,914,751	0.01	27,790
Deutsche Wertpapierservice Bank Ag	26,870	0.04	1,004
DNB Nor Markets Custody DNB Norbank Asa	70,098	0.01	810
Dougherty & Company LLC	17,069	0.03	512
Drexel Hamilton LLC	10,002	0.02	222
DSP Merrill Lynch LTD	3,936,685	0.00	15,809
Dupont Gilbert SA	11,830	0.11	1,349
Edelweiss Securities Pvt. LTD	30,656,680	0.00	723
Euromobiliare Sim S.P.A.	89,880	0.02	1,692
Exane S.A.	943,830	0.02	20,285
FBR Capital Markets & Co.	129,883	0.02	2,598
Fidelity Capital Markets	1,165	0.03	35
Fidelity Clearing Canada	35,586	0.02	567
Fidentiis	2,772	0.01	24
Financial Brokerage Group (FBG)	736,866	0.00	3,592
FTN Financial Securities	225,250	0.01	2,073
GMP Securities LTD.	57,100	0.00	223
Goldman Sachs & Co	35,687,129	0.00	125,039
Goldman Sachs (Asia) LLC	8,466,920	0.00	7,784
Goldman Sachs (India)	1,193,859	0.01	15,154
Goldman Sachs Do Brasil Corretora	683,871	0.01	9,689
Goldman Sachs International	21,284,626	0.01	119,563
Goodbody Stockbrokers	191,503	0.01	1,004
Green Street Advisors (UK) LTD	13,518	0.01	86
Green Street Trading, LLC	1,202,463	0.04	43,808
Hongkong and Shanghai Banking Corporation	1,664,580	0.00	1,824
HSBC Bank PLC	29,737,952	0.00	133,482
HSBC Securities (USA) Inc.	1,417,421	0.00	5,912
HSBC Securities India Holdings	4,900,000	0.00	76
Icap Do Brasil DtvM LTDA	1,297,165	0.00	3,983
ICBCFS LLC	2,858,084	0.00	12,744
ICICI Brokerage Services	1,328,785	0.01	16,071
IM Trust S.A. Corredores De Bolsa	37,000,122	0.00	8,906
India Infoline LTD	141,452	0.01	780
Instinet	533,797	0.01	4,864
Instinet Australia Clearing SrvC Pty LTD	1,532,334	0.00	5,482
Instinet LLC	14,840,725	0.00	48,134
Instinet Pacific Limited	114,527,744	0.00	64,956
Instinet Singapore Services Pt	4,242,710	0.00	9,659
Instinet U.K. LTD	25,204,893	0.01	182,541
Interacciones Casa De Bolsa	57,842	0.00	200
Intesa Sanpaolo Spa	7,729	0.01	113
Investec Bank PLC	550,119	0.00	1,285
Investec Securities LTD	610,290	0.00	1,969
Investment Technology Group Inc.	1,207,256	0.02	28,101
Investment Technology Group LTD	7,781,517	0.01	48,674
Is Yatirim Menkul Degerler As	177,699	0.00	289
ISI Group Inc	1,235,406	0.03	40,428
ITAU USA Securities Inc	28,134	0.03	844
ITG Australia LTD.	50,008,282	0.00	36,886

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (PENSION FUND)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
ITG Canada	1,195,063	\$0.01	\$7,566
ITG Inc.	897,570	0.01	4,754
Ivy Securities, Inc.	1,769,584	0.04	70,147
J.P. Morgan	6,158	0.02	127
J.P. Morgan Clearing Corp.	13,427,021	0.01	78,145
J.P. Morgan India Private LTD	89,550	0.03	2,344
J.P. Morgan Securities (Asia Pacific) LTD	47,565,588	0.00	18,113
J.P. Morgan Securities (Australia) LTD	1,186,726	0.00	1,654
J.P. Morgan Securities (Far East) LTD Seoul	332,574	0.02	6,306
J.P. Morgan Securities (Taiwan) LTD	14,614,000	0.00	10,298
J.P. Morgan Securities Inc	12,727,794	0.00	25,672
J.P. Morgan Securities Limited	363,408	0.01	4,262
J.P. Morgan Securities LLC	1,705,339	0.03	43,339
J.P. Morgan Securities PLC	8,528,802	0.01	85,525
J.P. Morgan Securities Singapore	308,700	0.00	1,385
JB Capital Mkts Sociedad De Valores SA	96,574	0.01	1,046
Jefferies & Company Inc	2,232,810	0.02	38,487
Jefferies Hong Kong Limited	439,500	0.00	166
Jefferies India Private Limited	6,392,114	0.01	48,576
Jefferies International LTD	57,584,620	0.00	48,433
JMP Securities	32,953	0.03	1,036
Joh. Berenberg, Gossler & Co. Kg	1,741,915	0.02	34,959
Jonestrading Institutional Services LLC	1,712,523	0.02	28,579
Jyske Bank A.S	4,450	0.14	632
Kallpa Securities S.A.B	49,228	0.00	86
KAS-Associatie N.V.	8,675	0.00	37
KCG Americas LLC	469,737	0.01	3,991
Kempen & Co N.V.	322,796	0.02	5,359
Kepler Equities Paris	2,388	0.04	94
Keybanc Capital Markets Inc	945,468	0.02	20,842
Kim Eng Securities (Hk) LTD.	47,100	0.01	615
King, Cl, & Associates, Inc	69,178	0.05	3,426
Knight Securities International	135,092	0.01	1,137
Korea Investment and Securities Co., LTD	39,669	0.04	1,487
Larrain Vial	6,061,211	0.00	2,750
Leerink Partners LLC	6,574	0.04	263
Liquidnet Canada Inc	70,186	0.02	1,224
Liquidnet Inc	3,825,794	0.02	82,075
Loop Capital Markets	8,547,407	0.02	168,548
Loop Capital Markets LLC	1,103,286	0.01	8,667
Macquarie Bank Limited	14,331,975	0.00	30,548
Macquarie Capital (Europe) LTD	8,778	0.01	98
Macquarie Capital (USA) Inc.	222,575	0.01	2,772
Macquarie Sec Nz LTD	14,875	0.00	9
Macquarie Securities (USA) Inc	4,526	0.03	158
Macquarie Securities Korea Limited	652,989	0.01	7,376
Mainfirst Bank De	146,346	0.03	4,880
Maxim Group	86,200	0.02	1,724
Maybank Kim Eng Securities Pte LTD	303,000	0.00	1,191
Mediobanca Spa	250,198	0.02	4,508
Merrill Lynch and Co Inc	532,528	0.01	4,943

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (PENSION FUND)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Merrill Lynch Canada Inc	8,700	\$0.01	\$83
Merrill Lynch International	92,051,665	0.00	260,331
Merrill Lynch Japan Incorporated	4,900	0.04	187
Merrill Lynch, Pierce, Fenner & Smith Inc.	24,546,436	0.01	174,204
Mirae Asset Daewoo Co., LTD.	406,532	0.13	51,898
Mischler Financial Group, Inc-Equities	1,708,700	0.00	4,275
Mitsubishi UFJ Securities	40,300	0.04	1,612
Mitsubishi UFJ Securities (USA)	498,100	0.04	19,710
Mitsubishi UFJ Securities Int PLC	17,700	0.03	526
Mizuho International PLC	322,476	0.04	14,110
Mizuho Securities Asia Limited	6,500	0.02	123
Mizuho Securities USA Inc.	1,860,412	0.02	33,957
MKM Partners LLC	546,370	0.04	20,391
Morgan Stanley Co Incorporated	255,870,847	0.00	334,035
Morgan Stanley India Company Pvt LTD	4,490,891	0.00	20,874
Morgan Stanley Taiwan Limited	35,737,748	0.00	41,016
National Financial Services Corporation	7,169	0.04	251
National Financial Services LLC	1,633,697	0.01	14,951
Natixis Securities	561	0.16	92
Needham and Company LLC	23,963	0.04	1,047
Nesbitt Burns	12,307	0.02	285
NH Investment and Securities Co. LTD.	1,024,123	0.02	18,704
Nomura Financial Advisory & Sec India	2,788,027	0.00	9,955
Nomura Financial Investment Korea Co LTD	7,100	0.15	1,088
Nordea Bank Ab (Publ), Finnish Branch	441,622	0.00	644
Northland Securities Inc.	46,543	0.03	1,441
Numis Securities Inc.	8,986	0.01	119
Numis Securities Limited	229,394	0.00	237
OCBC Securities Private Limited	11,000	0.03	294
ODDO Et Cie	3,221	0.06	185
Okasan International (Asia) LTD	2,500	0.23	567
Oppenheimer & Co. Inc.	12,212	0.03	380
Parel	2,075	0.03	61
Pavilion Global Markets LTD	100,257	0.02	1,566
Peel Hunt LLP	80,560	0.00	246
Penserra Securities LLC	3,496,127	0.02	68,896
Pershing Securities Limited	5,845,235	0.01	31,604
Piper Jaffray & Co.	84,363	0.03	2,932
PT Mandiri Sekuritas	2,433,837	0.00	344
R.B.C. Dominion Securities Corporation	2,266	0.01	14
Raymond James and Associates Inc	21,990	0.02	440
Raymond James LTD	997,480	0.03	28,247
RBC Capital Markets, LLC	351,766	0.01	5,135
RBC Dominion Securities Inc.	5,339,647	0.01	49,510
Redburn (Europe) Limited	775,451	0.03	26,088
Restructure Non Cash	18,139	0.01	181
RHB Investment Bank Berhad	86,411	0.00	134
Robert W. Baird Co.Incorporated	440,910	0.03	11,965
Royal Bank of Canada	65,889	0.02	1,136
Royal Bank of Canada Europe LTD	1,086,627	0.01	7,615
Samsung Securities Co LTD	1,149,942	0.03	30,567

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (PENSION FUND)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Sanford C. Bernstein LTD	22,365,949	\$0.00	\$59,578
Scotia Capital Inc	26,493	0.01	176
Seaport Group Securities, LLC	14,275	0.02	214
SG Americas Securities LLC	336,680	0.01	2,219
SG Asia Securities (Inoia) Pvt LTD	3,194,275	0.00	11,345
SG Securities (London) LTD.	8,584,986	0.00	7,309
SG Securities HK	37,222,458	0.00	33,303
Shenyin Wanguo Securities (HK) LTD	6,500	0.00	22
Sidoti & Company LLC	37,934	0.04	1,517
Singer Capital Markets Limited	113,844	0.01	1,149
Skandinaviska Enskilda Banken	1,510	0.03	38
Skandinaviska Enskilda Banken London	5,618	0.02	103
Smbc Nikko Capital Markets Limited	2,386,400	0.02	36,968
Smbc Nikko Securities (Honk Kong) LTD	38,800	0.02	750
SMBC Securities Inc	46,683	0.03	1,248
Societe Generale	164,640	0.01	1,545
Societe Generale London Branch	10,028,187	0.01	65,436
State Street Bank and Trust Co.	649	0.13	86
State Street Global Markets, LLC	9,013	0.03	235
Stephens, Inc.	54,141	0.03	1,893
Stifel Nicolaus & Co Inc	1,067,084	0.03	30,199
Stifel Nicolaus Europe Limited	809,780	0.00	1,604
Strategas Securities LLC	19,395	0.03	582
Suntrust Capital Markets, Inc.	497,056	0.02	10,048
Svenska Handelsbanken	8,693	0.02	163
Taiwan Depository Clearing Corporation	2,331,000	0.00	9,068
Telsey Advisory Group LLC	32,835	0.05	1,642
The Fig Group, LLC	142,300	0.01	1,500
The Hongkong and Shanghai Bank	16,991	0.02	325
Toronto Dominion Securities Inc	638,921	0.01	4,127
UBS Ag	2,069,102	0.00	8,823
UBS Ag London	2,466,800	0.00	861
UBS Limited	77,932,240	0.00	250,247
UBS Securities Asia LTD	15,905,276	0.00	41,763
UBS Securities Canada Inc	907,741	0.01	6,175
UBS Securities India Private LTD	1,551,033	0.01	7,900
UBS Securities LLC	2,254,525	0.02	35,935
UBS Securities Pte. LTD	29,394	0.01	156
UBS Securities Pte.LTD., Seoul	476,556	0.02	9,471
UBS Warburg Australia Equities	492,670	0.00	1,115
UOB Kay Hian Pte Limited	478,300	0.00	983
Valores Bancolombia	5,800,000	0.00	80
Vandham Securities Corp	24,470	0.03	697
Virtu Americas LLC	634,625	0.03	16,009
Wedbush Morgan Securities Inc	19,190	0.03	480
Weeden & Co.	2,451,605	0.02	59,244
Wells Fargo Securities, LLC	1,243,476	0.03	32,467
William Blair & Company L.L.C	207,760	0.04	8,161
Williams Capital Group Lp (The)	2,599,727	0.01	18,847
Wilson HTM LTD	20,724	0.05	974



**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (VARIABLE-RETURN FUNDS)  
FISCAL YEAR ENDED JUNE 30, 2018**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Abel Noser Corp	5,203,700	\$0.03	\$169,607
ABG Securities Stockholm	13,894	0.01	159
Autonomous	9,874	0.04	395
Banco Santander S.A. New York	381,019	0.01	3,826
Bank J Vontobel Und Co	14,048	0.06	896
Bank of New York (Bony) / Goldman	1,984,106	0.02	36,647
Bankhaus Lampe Kg.	15,440	0.03	392
Banque Nationale Du Canada Montreal	65,662	0.02	1,546
Barclays Bank London	798,976	0.01	5,911
Barclays Capital Inc	24,058	0.01	227
Barclays Capital Inc/Le	536,562	0.01	3,854
Barclays Capital Le	1,021,548	0.02	20,260
Barclays Capital Securities LTD	128,357	0.02	2,792
Baypoint Trading LLC	549,114	0.03	16,353
Berenberg Bank Hamburg	225,344	0.01	1,945
Bloomberg Tradebook LLC	968,231	0.01	12,992
BMO Capital Markets Corp	58,141	0.01	528
BNP Paribas Securities (Asia) LTD	35,400	0.02	539
BNP Paribas Securities Services	430,991	0.01	3,704
BNP Paribas Security Svcs London	139,583	0.02	2,259
BNY Convergenx Execution Solutions	373,475	0.01	3,966
Bradesco S.A.	377,789	0.01	2,470
Broad Court Cap Corp Sub Div Merrill	269,300	0.03	8,079
Brockhouse & Cooper Inc Montreal	700	0.03	20
Cabrera Capital Markets LLC	13,339	0.02	293
Canaccord Capital Corp Vancouver	132,767	0.02	2,128
Canaccord Genuity Limited	1,700	0.01	10
Cantor Clearing Services	13,281	0.02	266
Cantor Fitzgerald & Co Inc	801,815	0.04	32,479
Carnegie AS	15,310	0.04	619
Celfin Capital SA Corredores De	80,836	0.00	39
CIBC London	8,450	0.03	215
CIBC New York	49,953	0.03	1,250
CIMB Securities (USA) Inc	700	0.04	31
Citadel Securities Institutional LLC	146,673	0.01	733
Citibank Europe PLC	8,500	0.01	75
Citibank Frankfurt	192,217	0.02	3,747
Citibank N.A.	1,329,706	0.01	12,422
Citibank New York	69,948	0.01	428
Citigroup Global Markets Inc	2,336,203	0.01	26,818
Citigroup Global Markets Limited	2,070,361	0.01	17,376
Citigroup Global Mkt Ind Pvt LTD	145,585	0.00	491
Citigroup Global Mkt Secs LTD	5,605	0.06	343
CJS Securities Inc	2,710	0.05	136
CLSA Australia Pty LTD	44,183	0.00	142
CLSA India LTD	400,791	0.01	2,242
CLSA LTD Hong Kong	904,684	0.00	1,117
CLSA Singapore Pte LTD	218,000	0.00	330
Collins Stewart LLC	123,515	0.02	2,470
Compass Point Research & Trading	86,327	0.04	3,844

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (VARIABLE-RETURN FUNDS)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Convencao S/A Corretora De Valores	262,400	\$0.01	\$1,355
Convergex LLC	188,266	0.02	3,850
Cornerstone Macro LLC	20,434	0.03	597
Cowen and Company LLC	1,042,681	0.03	33,987
Craig - Hallum	364,204	0.03	10,845
Credit Lyonnais Sec (USA) Inc NY	155,000	0.01	829
Credit Lyonnais Sec Seoul	12,708	0.13	1,661
Credit Lyonnais Secs Singapore	83,180	0.01	874
Credit Suisse Equities (Australia)	53,819	0.00	80
Credit Suisse First Boston HK	262,900	0.00	1,159
Credit Suisse First Boston SA	53,200	0.01	685
Credit Suisse Securities (Europe)	4,431,648	0.01	24,318
Credit Suisse Securities (USA) LLC	3,108,722	0.01	25,261
CSFB (Europe) LTD Seoul Secs Brnch	1,797	0.64	1,151
CSFB India (Secs) Pvt LTD Mumbai	258,505	0.02	4,035
CSFB Taipei Branch Taipei	3,194,300	0.00	2,426
D Carnegie Ab Stockholm	146,544	0.01	1,385
D.A. Davidson & Co (Davidson)	126,055	0.04	5,134
Daiwa Capital Markets America Inc	150,655	0.02	2,507
Daiwa Capital Markets Hong Kong	3,400	0.02	74
Daiwa Secs Seoul	2,001	0.01	19
Danske Bank A/S, Copenhagen	2,704	0.12	321
Davy Stockbrokers	55,401	0.01	690
DBS Vickers Secs (Sing) Pte LTD	105,000	0.00	429
Deutsche Bank (Intl Eq) Ldn	1,083,271	0.00	4,828
Deutsche Bank Securities Inc NY	2,374,882	0.01	26,612
Deutsche Secs Asia LTD Hong Kong	1,694,288	0.00	1,655
Deutsche Secs Asia Seoul	11,352	0.02	179
Deutsche Secs Aust LTD Sydney	33,082	0.00	127
Direct Trading Institutional Inc	153,437	0.02	2,843
Dougherty & Company LLC	74,223	0.04	3,200
Drexel Hamilton LLC	27,248	0.02	545
DSP Merrill Lynch LTD Mumbai	325,616	0.00	1,327
Exane Paris	660,681	0.00	551
Exane SA	78,251	0.04	3,135
Fidelity Capital Markets	227,693	0.01	2,416
Fidelity Clearing Canada ULC	75,300	0.02	1,506
First Analysis Securities Corp	49,303	0.02	986
First Union Capital Markets	145,891	0.03	4,621
Flow Corretora De Mercadorias LTDa	166,000	0.01	2,125
Fokus Bank A/S	444,327	0.00	1,044
Frank Russell Secs/Broadcort Cap Secs	289,724	0.02	5,794
French American Banking Corporation	6,638	0.03	199
Friedman Billings & Ramsey	225,132	0.04	8,540
Goldman Sachs	81,933	0.03	2,487
Goldman Sachs (Asia) LLC Seoul	4,409	0.06	257
Goldman Sachs (Asia) Taipei	2,254,600	0.00	2,120
Goldman Sachs (India) Securities	326,219	0.01	1,734
Goldman Sachs ** Euroclear **	800,000	0.00	158
Goldman Sachs Do Brasil Corretora	136,105	0.01	940

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (VARIABLE-RETURN FUNDS)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Goldman Sachs International	1,464,160	\$0.00	\$4,071
Goldman Sachs Intl London	106,052	0.01	692
Goldman Sachs New York	2,565,877	0.00	10,521
Goodbody Stockbrokers Dublin	26,711	0.01	274
Griffiths Mcburney & Ptrs Toronto	100,900	0.01	858
Guggenheim Capital Markets LLC	1,459	0.02	36
Guzman & Company	239,580	0.01	3,500
Hongkong & Shanghai Bnking Corp LTD	8,927	0.02	137
HSBC Bank Plc London	1,925,950	0.01	11,021
HSBC Brokerage (USA) Inc	341,867	0.00	1,130
HSBC Mexico S.A.	3,713	0.01	31
HSBC Secs & Cap Mkts India Priv LTD	85,949	0.01	1,193
HSBC Secs Taipei	435,000	0.00	1,262
HSBC Securities Brokers (Asia) LTD	126,700	0.00	28
HSBC Securities USA	232,700	0.00	658
Icap Do Brasil DtvM LTDa	57,800	0.01	475
Icici Brokerage Services Mumbai	819,410	0.01	5,419
Imperial Capital LLC	88,700	0.03	2,661
Instinet	1,699,672	0.01	15,115
Instinet Clearing Services Inc	40,503	0.02	728
Instinet Corp New York	406,080	0.01	2,314
Instinet Europe Limited	2,078,404	0.00	9,219
Instinet Pacific LTD Hong Kong	6,943,859	0.00	4,917
Instinet Singapore Services Pte LTD	175,500	0.00	491
Investec Henderson Crosthwaite Secs	217,442	0.00	552
Investment Technology Group Dublin	552,164	0.00	1,825
Investment Technology Group Inc	1,356,238	0.01	14,944
ISI Group Inc	1,197,410	0.02	22,310
ITG Australia Limited Melbourne	404,358	0.01	2,424
ITG Canada Corp Toronto	101,434	0.02	1,771
ITG Hong Kong	16,300	0.00	76
ITG Inc	124,352	0.02	2,948
ITG London	901,638	0.01	6,740
IXIS Securities	2,457	0.09	229
Janney Montgomery Scott Inc	69,015	0.05	3,289
Jefferies & Company	1,008,146	0.02	20,376
Jefferies India Private Limited	186,065	0.02	3,453
Jefferies International	261,066	0.01	1,980
Jefferies International London	35,589	0.01	325
JM Financial Institutional	105,770	0.02	1,871
JM Morgan Stanley Secs Pvt LTD	1,454,461	0.00	6,622
JNK Securities Inc	147,321	0.01	1,494
Johnson Rice & Company LLC	206,250	0.03	6,188
Jones Trading Institutional Services	1,373,302	0.03	43,039
JP Morgan Securities (Far East) Lt	574	0.04	22
JP Morgan Securities Australia Limited	103,807	0.00	346
JP Morgan Securities Limited	1,605,482	0.01	16,213
JP Morgan Securities Singapore	154,100	0.00	30
JPM Securities	140,887	0.02	3,296
JPMorgan Chase Bank	2,829,975	0.02	63,221

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**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (VARIABLE-RETURN FUNDS)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
JPMorgan Clearing Corp NY	18,182	\$0.01	\$118
JPMorgan Secs Inc NY	636,000	0.01	3,352
JPMorgan Secs London	105,334	0.01	1,090
JPMorgan Securities (Asia Pacific)	5,505,736	0.00	3,784
JPMorgan Chase / Custjpmcc	1,131,803	0.01	10,796
KCG Europe Limited	10,531	0.02	168
Kepler Capital Markets	14,171	0.10	1,449
Keybanc Capital Markets Inc	64,926	0.05	2,956
King C L & Associates Inc (Pershing)	46,805	0.05	2,176
Knight Equity Markets LP	145,059	0.02	2,574
Knight Execution & Clearing Services	275,870	0.00	700
Knight Securities L.P., Jersey City	2,000	0.03	54
Korea Investment and Securities Co	14,506	0.01	174
Larrain Vial Chile	38,110	0.02	765
Leerink Swann and Company	83,650	0.03	2,736
Liberum Capital Inc	226,970	0.00	426
Liquidnet Asia Limited Hong Kong	68,400	0.00	159
Liquidnet Canada Inc	49,159	0.03	1,353
Liquidnet Europe LTD London	611,103	0.00	2,065
Liquidnet Inc	1,622,681	0.03	47,650
Longbow Securities LLC	44,991	0.05	2,156
Luminex Trading and Analytics LLC	20,249	0.00	55
Macquarie Bank Limited	3,925,817	0.00	5,029
Macquarie Capital (Europe) LTD Ldn	364,367	0.00	1,142
Macquarie Capital (USA) Inc	1,105	0.02	20
Macquarie Securities (Singapore)	9,236	0.02	172
Macquarie Securities (USA) Inc	382,380	0.01	3,438
Macquarie Securities LTD Seoul	88,998	0.02	1,993
Macquarie Securities New Zealand	75,678	0.01	717
Mainfirst Bank Ag	15,121	0.04	549
Mediobanca Spa Milano Italy	37,900	0.00	111
Memo	355	2.00	710
Merrill Lynch & Co Inc (Atlas Gbl) NY	211,456	0.01	2,832
Merrill Lynch and Co Inc	16,244	0.04	583
Merrill Lynch International	6,000	0.04	230
Merrill Lynch International London	2,903,169	0.01	24,029
Merrill Lynch Pierce Fenner & Smith	2,651,006	0.01	26,846
Messel Use Cosmic	23	1.87	43
Mirae Asset Securities	37,577	0.13	4,882
Mitsubishi UFJ Securities (USA)	109,514	0.01	1,089
Mizuho Securities Asia LTD	11,900	0.01	129
Mizuho Securities Inc	198	0.65	129
Mizuho Securities Usa Inc.	5,817	0.02	103
Morgan Stanley & Co	9,071,691	0.01	64,405
Morgan Stanley and Co International	171,069	0.00	186
Morgan Stanley and Co Intl Taipei	3,093,994	0.00	4,083
Morgan Stanley Intl Seoul	21,129	0.05	1,051
National Financial Services LLC	2,043,002	0.00	9,466
National Finl Svcs Corp	293,653	0.04	11,023
NBC Clearing Services Inc	20,400	0.03	600

Continued on page 117

**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (VARIABLE-RETURN FUNDS)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Needham and Company LLC	62,136	\$0.03	\$1,939
Nesbitt Burns Toronto	23,916	0.01	265
Nomura Financial Advisory and Securities	2,802,472	0.00	5,163
Nomura Financial and Investment (Korea)	21,351	0.01	120
Nomura Securities	2,100	0.04	82
Northern Trust Co (The)	4,003,642	0.00	9,529
Northern Trust Securities Inc	20,991,801	0.01	120,974
Northland Securities Inc	36,440	0.03	1,093
Numis Securities London	16,363	0.00	57
Olivetree Securities Limited	10,511	0.02	225
Oppenheimer & Co Inc	117,428	0.05	5,801
Penserra Securities	69,655	0.01	697
Pershing LLC	322,212	0.02	6,140
Pershing Securities	11,193	0.03	309
Piper Jaffray & Co	118,414	0.04	4,735
Raymond James & Associates Inc	417,777	0.04	15,101
RBC Capital Markets Corporation	124,154	0.04	4,751
RBC Dominion Secs Toronto	149,834	0.01	2,020
Redburn (Europe) Limited	124,232	0.00	577
Redburn Partners LLP London	182,633	0.01	1,377
Robert W Baird & Co	240,910	0.03	7,633
Rosenblatt Securities Inc	778,288	0.01	10,701
Royal Bank of Canada Europe Limited	698,533	0.00	780
Salomon Smith Barney Taipei Brch	1,799,000	0.00	1,155
Samsung Securities	99,537	0.03	2,852
Sandler O'Neill & Partners L.P.	158,780	0.05	7,196
Sanford C Bernstein & Co Inc	1,479,397	0.02	28,564
Sanford C Bernstein LTD London	412,602	0.01	2,907
Sanford C. Bernstein and Co., LLC	1,306,399	0.00	3,592
Scotia Capital Mkts Toronto	44,511	0.02	737
Scotia Corredora De Bolsa	58,134	0.01	709
Scotia Mcleod New York	12,700	0.02	219
Seaport Group Securities LLC	47,912	0.05	2,348
Security Capital Brokerage Inc	13,500	0.03	405
SG Americas Securities LLC (Sgas)	836,809	0.01	6,522
SG Asia Sec (India) Prvt LTD Mumbai	1,695,164	0.00	3,525
SG Secs (London) LTD Taipei	1,444,000	0.00	1,537
SG Securities (Hk) LTD Hong Kong	2,662,213	0.00	1,391
Sidoti & Company LLC	136,357	0.02	2,727
Skandinaviska Enskilda Banken	100,037	0.03	3,246
SMBC Nikko Securities (Hong Kong)	19,400	0.01	207
SMBC Securities Inc	91,946	0.02	1,570
Societe Generale London Branch	3,055,147	0.00	13,428
Societe Generale Secs Corp New York	560,444	0.01	3,372
State Street Global Markets LLC	16,933	0.03	423
Stephens Inc (Cust)	217,594	0.05	9,829
Stifel Nicolaus & Co Inc	335,868	0.04	12,201
Suntrust Capital Markets Inc	134,256	0.05	6,598
Taiwan Depository Clearing Corporat	224,000	0.00	871
Taylor D W & Co LTD	178,917	0.01	1,789

Continued on page 118

**SCHEDULE OF PAYMENTS OF COMMISSIONS TO BROKERS (VARIABLE-RETURN FUNDS)**  
**FISCAL YEAR ENDED JUNE 30, 2018 (Continued)**

<b>BROKERAGE FIRM</b>	<b>NO. OF SHARES TRADED</b>	<b>COMMISSION PER SHARE</b>	<b>COMMISSION PAID</b>
Themis Trading LLC	252,035	\$0.01	\$2,624
Toronto Dominion Secs Toronto	9,946	0.01	144
UBS (International) LTD	140,974	0.01	970
UBS Ag (London Equities) London	736,453	0.00	1,000
UBS Ag Stamford Ct	1,224,279	0.01	6,786
UBS Limited	8,314,996	0.00	30,231
UBS Securities Asia LTD	2,278,049	0.00	6,864
UBS Securities Australia LTD	23,228	0.01	201
UBS Securities Canada Inc	21,354	0.01	134
UBS Securities Hong Kong LTD	28,000	0.00	3
UBS Securities LLC (Warburg)	1,196,631	0.01	16,632
UBS Warburg Secs India Pvt Mumbai	881,200	0.00	2,190
UBS Warburg Securities LTD Seoul	17,434	0.02	424
Wall St Access	56,600	0.00	248
Weeden and Co	3,314,431	0.01	30,612
Wells Fargo Securities LLC	30,196	0.04	1,107
William Blair & Company	298,765	0.03	9,237
Wolfe Trahan Securities	50,800	0.03	1,524
Woori Investment and Securities	53,644	0.04	2,031
XP Investimentos Cctvm SA	222,295	0.00	1,075

# Actuarial





## OFFICE OF THE ACTUARY

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 NEW YORK, NY 10007  
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**SHERRY S. CHAN**  
 CHIEF ACTUARY

December 3, 2018

Retirement Board  
 Teachers' Retirement System of the City of New York  
 55 Water Street, 16<sup>th</sup> Floor  
 New York, NY 10041

Re: Actuarial Information for the Comprehensive Annual Financial Report (CAFR) for the  
 Fiscal Year Ended June 30, 2018

Dear Members of the Retirement Board:

The financial objective of the Teachers' Retirement System of the City of New York - Qualified Pension Plan (TRS-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, 2016 (Lag) actuarial valuation to determine Fiscal Year 2018 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 2018, the Actuarial Contributions to TRS, 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.

During June 2012 the Governmental Accounting Standards Board (GASB) released two accounting standards for public pension plans, Statement No. 67 (GASB67) and Statement No. 68 (GASB68), collectively "GASB 67/68."

On September 28, 2018, the Actuary published the "GASB67/68 Report for the City of New York and the New York City Retirement Systems for Fiscal Year Ended June 30, 2018" (the Fiscal Year 2018 GASB67/68 Report). Appendix B of the Fiscal Year 2018 GASB67/68 Report contains information developed in accordance with GASB67 for TRS.



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Teachers' Retirement System of the City of New York  
December 3, 2018  
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### **Actuarial Assumptions and Methods**

The Actuary issued a Report entitled "Proposed Changes in Actuarial Assumptions and Methods for Determining Employer Contributions for Fiscal Years Beginning on and after July 1, 2011 for the New York City Teachers' Retirement System," dated February 10, 2012. Components of the Actuary's proposed changes required the enactment of legislation by the New York State Legislature and the Governor.

The Retirement Board of TRS adopted those changes that require Board approval during Fiscal Year 2012. The New York State Legislature and the Governor enacted Chapter 3 of the Laws of 2013 (Chapter 3/13) to provide for those changes in actuarial assumptions and methods that require legislation, including the Actuarial Interest Rate (AIR) assumption of 7.0% per annum, net of investment expenses. Together, this package of actuarial assumptions and methods is referred to as the "2012 A&M."

In Fiscal Year 2016, the Actuary proposed and the Retirement Board adopted, revised post-retirement mortality assumptions for use in determining employer contributions beginning in Fiscal Year 2016. In addition, beginning in Fiscal Year 2016, the Actuary revised the Actuarial Asset Valuation Method by constraining the Actuarial Value of Assets to be no more than 20% from the Market Value of Assets. The 2012 A&M reflecting these revisions is referred to herein as the "2016 A&M."

The "Summary of Actuarial Assumptions and Methods in Effect for the June 30, 2016 (Lag) Actuarial Valuation" provided later in this Actuarial Section of the CAFR presents the 2016 A&M. Beginning with the June 30, 2016 (Lag) actuarial valuation, 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. All other actuarial assumptions and methods are the same as those used in the prior year. These actuarial assumptions and methods (2016 A&M) used for funding purposes meet the parameters set 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, 2016 (Lag) actuarial valuation is shown earlier in the Introductory 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, 2016 (Lag) actuarial valuation is included in this CAFR. A summary of the census data used in the June 30, 2015 (Lag) actuarial valuation of the Plan is available in the Fiscal Year 2017 CAFR.

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Teachers' Retirement System of the City of New York  
December 3, 2018  
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## **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 10).

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 11), 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 being presented in a manner believed to be 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, 2016 (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.

Some items in the Financial Section and Statistical Section of the CAFR were also prepared by the OA.

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.

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Teachers' Retirement System of the City of New York  
December 3, 2018  
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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 (ERISA), 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: Ms. Dolores Capone - New York City Office of the Actuary  
Mr. Edward Hue - New York City Office of the Actuary  
Ms. Marlene Markoe-Boyd - New York City Office of the Actuary  
Mr. Thad McTigue - New York City Teachers' Retirement System  
Mr. Paul Raucci - New York City Teachers' Retirement System  
Ms. Patricia Reilly - New York City Teachers' Retirement System  
Mr. Sam Rumley - New York City Office of the Actuary  
Mr. Michael Samet - New York City Office of the Actuary  
Keith Snow, Esq. - New York City Office of the Actuary

## SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION

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 (ACCNYS), 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 Actuary issued a Report entitled "Proposed Changes in Actuarial Assumptions and Methods for Determining Employer Contributions for Fiscal Years Beginning on and After July 1, 2011 for the New York City Teachers' Retirement System," dated February 10, 2012. Components of the Actuary's proposed changes required the enactment of legislation by the New York State Legislature and the Governor.

The Retirement Board adopted those changes that require Board approval during Fiscal Year 2012. The New York State Legislature and the Governor enacted Chapter 3 of the Laws of 2013 (Chapter 3/13) to provide for those changes in actuarial assumptions and methods that require legislation, including the Actuarial Interest Rate (AIR) assumption of 7.0% per annum, net of investment expenses. Together, this package of actuarial assumptions and methods is referred to as the "2012 A&M."

In Fiscal Year 2016, the Actuary proposed and the Retirement Board adopted, revised post-retirement mortality assumptions for use in determining employer contributions beginning in Fiscal Year 2016. In addition, beginning in Fiscal Year 2016, the Actuary revised the Actuarial Asset Valuation Method by constraining the Actuarial Value of Assets to be no more than 20% from the Market Value of Assets. The 2012 A&M reflecting these revisions is referred to herein as the "2016 A&M."

Beginning with the June 30, 2016 (Lag) actuarial valuation, 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. All other actuarial assumptions and methods in effect for the June 30, 2016 (Lag) actuarial valuation are unchanged from those used in the June 30, 2015 (Lag) actuarial valuation.

2. The investment rate of return assumption is 7.0% per annum, net of investment expenses (4.0% per annum for benefits payable under the Variable Annuity Programs).

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)

3. The mortality tables for service and disability pensioners were based primarily on the experience of TRS (the Base Tables) and the application of Mortality Improvement Scale MP-2015, published by the Society of Actuaries in October 2015. Sample probabilities are shown in Table 1a. Mortality tables for beneficiaries were also developed from experience review and application of Mortality Improvement Scale 2015. Sample probabilities are shown in Table 1b.
4. Active Service tables are used to estimate various withdrawals from Active Service. Sample probabilities are shown in Table 2 for members withdrawing from Active Service due to Death or Disability, in Table 3 for members withdrawing for Other Than Death, Disability, or Service Retirement, and in Tables 4a and 4b for members withdrawing from Active Service after eligibility for Service Retirement.
5. A Salary Scale is used to estimate salaries at termination, retirement, or death. Sample percentage increases are shown in Table 5. 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. Beginning with the June 30, 2010 (Lag) actuarial valuation, 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 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 Actuarial Accrued Liability (AAL).

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

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

**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)**

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

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

The June 30, 2016 (Lag) actuarial valuation uses a June 30, 2016 valuation date to determine the Fiscal Year 2018 Employer Contributions.

This methodology requires adjustments to determine the Fiscal Year 2018 Employer Contributions:

- a. Present Value of Future Salary (PVFS): The PVFS at June 30, 2016 is reduced by the value of salary projected to be paid during Fiscal Year 2017.
  - b. Salary for Determining Employer Contributions: Salary used to determine the employer normal contribution is the salary projected to be paid during Fiscal Year 2018 to members on payroll at June 30, 2016.
  - c. UAAL payments: For determining the UAAL payments for Fiscal Year 2018, and to be consistent with OYLM, the UAAL as of June 30, 2016 is adjusted by the discounted value of employer normal contributions paid during Fiscal Year 2017 and the discounted value of the administrative expenses reimbursed during Fiscal Years 2017 and 2018.
10. Beginning with the June 30, 2008 (Lag) actuarial valuation, the AVA was recomputed to re-characterize amounts credited as interest on TDA Fixed Fund account balances as payouts instead of investment losses.

The Actuary reset the AVA to the Market Value of Assets (MVA) as of June 30, 2011.

Beginning with the June 30, 2012 (Lag) actuarial valuation, 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, respectively, (i.e. cumulative rates of 15%, 30%, 45%, 60%, 80%, and 100%).

**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)**

Beginning with the June 30, 2014 (Lag) actuarial valuation, the AVA is constrained to be within a 20% corridor of the MVA.

11. The PVFB as of June 30, 2016, used to determine Fiscal Year 2018 Employer Contributions, includes estimates of liabilities for:
  - a. World Trade Center Disability Benefits
  - b. World Trade Center Death Benefits

**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)**

<b>Table 1a</b>				
<b>Deaths among Service and Disability Pensioners Percentage of Pensioners Dying within the Next Year</b>				
<b>Age</b>	<b>Service Pensioners</b>		<b>Disability Pensioners</b>	
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>
40	0.0775%	0.0643%	1.1332%	1.2585%
45	0.1283	0.0956	1.2174	1.3409
50	0.2119	0.1702	1.5233	1.6253
55	0.3984	0.2580	2.2037	1.8735
60	0.6214	0.3587	2.4868	1.7559
65	0.9755	0.5118	2.5117	1.6557
70	1.5591	0.8472	2.8363	1.7240
75	2.3263	1.3856	3.4868	2.5617
80	3.7179	2.4420	4.8217	3.8173
85	6.5065	4.9200	8.3183	6.1574
90	11.3340	8.4842	14.8360	10.4201
95	20.8225	15.1652	24.5390	16.7001
100	30.7448	21.2515	33.4990	21.2515
105	36.9822	27.2744	37.1787	27.2744
110	96.4196	96.4583	96.4196	96.4583
115	100.0000	100.0000	100.0000	100.0000

Society of Actuaries Mortality Improvement Scale MP-2015 has been applied to these rates.



**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)**

<b>Table 1b</b>		
<b>Deaths among Beneficiaries</b>		
<b>Percentage of Beneficiaries Dying within the Next Year</b>		
<b>Age</b>	<b>Males</b>	<b>Females</b>
40	0.0775%	0.0643%
45	0.1283	0.0956
50	0.2119	0.1702
55	0.3984	0.2580
60	0.6214	0.3587
65	0.9755	0.5118
70	1.5591	0.8472
75	2.3263	1.3856
80	3.7179	2.4420
85	6.5065	4.9200
90	11.3340	8.4842
95	20.8225	15.1652
100	30.7448	21.2515
105	36.9822	27.2744
110	96.4196	96.4583
115	100.0000	100.0000

Society of Actuaries Mortality Improvement Scale MP-2015 has been applied to these rates.

**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION(Cont'd)**

<b>Table 2</b>						
<b>Withdrawals from Active Service (Due to Death or Disability) Percentage of Active Members Separating within Next Year</b>						
<b>Age</b>	<b>Accidental Disability</b>		<b>Ordinary Disability</b>		<b>Ordinary Death</b>	
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>
20	0.00%	0.00%	0.01%	0.01%	0.040%	0.020%
25	0.00	0.00	0.01	0.01	0.040	0.020
30	0.00	0.00	0.01	0.01	0.040	0.020
35	0.01	0.01	0.06	0.05	0.050	0.025
40	0.02	0.01	0.10	0.10	0.060	0.030
45	0.03	0.02	0.15	0.15	0.110	0.055
50	0.03	0.03	0.15	0.20	0.160	0.080
55	0.04	0.04	0.15	0.20	0.210	0.105
60	0.04	0.04	0.15	0.20	0.260	0.130
65	0.04	0.04	0.15	0.20	0.320	0.160
70 <sup>1</sup>	NA	NA	NA	NA	NA	NA

<sup>1</sup> Assumed to retire for service immediately at age 70.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
 IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)

<b>Table 3</b> <b>Withdrawals for Other Than Death, Disability, or Service Retirement</b> <b>Percentage of Active Members Withdrawing within Next Year</b>	
Years of Service	Probability of Withdrawal
0	9.00%
5	4.00
10	2.00
15	1.25
20	1.00

<b>Table 4a</b> <b>Withdrawals from Active Service (After Eligibility for Service Retirement)</b> <b>Members Not Electing an Optional Retirement Plan<sup>1</sup></b> <b>Percentage of Eligible Active Members Retiring within Next Year</b>									
Males					Females				
	Reduced Benefits	Unreduced Benefits				Reduced Benefits	Unreduced Benefits		
Age		Years of Service Since First Eligibility			Age		Years of Service Since First Eligibility		
		(0-1)	(1-2)	(2+)			(0-1)	(1-2)	(2+)
50	0.00%	0.00%	0.00%	0.00%	50	0.00%	0.00%	0.00%	0.00%
55	2.00	20.00	0.00	0.00	55	2.00	20.00	0.00	0.00
60	4.00	20.00	15.00	15.00	60	4.00	20.00	15.00	15.00
65	0.00	30.00	20.00	20.00	65	0.00	30.00	20.00	20.00
70	NA	100.00	100.00	100.00	70	NA	100.00	100.00	100.00

<sup>1</sup> Applies to members who did not voluntarily elect to participate in the 55/25 plan enacted under Chapter 19 of the Laws of 2008 and to members mandated into the 55/27 plan and into the Tier 6 plans.

**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS  
IN EFFECT FOR THE JUNE 30, 2016 (LAG) ACTUARIAL VALUATION (Cont'd)**

<b>Table 4b</b>									
<b>Withdrawals from Active Service (After Eligibility for Service Retirement) Members Electing an Optional Plan<sup>1</sup> Percentage of Eligible Active Members Retiring within Next Year</b>									
<b>Males</b>					<b>Females</b>				
	<b>Reduced Benefits</b>	<b>Unreduced Benefits</b>				<b>Reduced Benefits</b>	<b>Unreduced Benefits</b>		
<b>Age</b>		<b>Years of Service Since First Eligibility</b>			<b>Age</b>		<b>Years of Service Since First Eligibility</b>		
		<b>(0-1)</b>	<b>(1-2)</b>	<b>(2+)</b>			<b>(0-1)</b>	<b>(1-2)</b>	<b>(2+)</b>
50	0.00%	0.00%	0.00%	0.00%	50	0.00%	0.00%	0.00%	0.00%
55	2.00	30.00	0.00	0.00	55	2.00	30.00	0.00	0.00
60	4.00	30.00	20.00	20.00	60	4.00	30.00	20.00	20.00
65	0.00	40.00	30.00	30.00	65	0.00	40.00	30.00	30.00
70	NA	100.00	100.00	100.00	70	NA	100.00	100.00	100.00

<sup>1</sup> Applies to members who voluntarily elected to participate in the 55/25 plan enacted under Chapter 19 of the Laws of 2008.

<b>Table 5</b>	
<b>Salary Scale</b>	
<b>Years of Service</b>	<b>Assumed Annual Percentage Increases Within Next Year<sup>1</sup></b>
0	13.00%
5	8.00
10	4.00
15	4.00
20	4.00
25	4.00
30	4.00
35	4.00
40	4.00

<sup>1</sup> Salary Scale includes a General Wage Increase assumption of 3.0% per annum.

<b>Table 6</b>				
<b>Active Member Valuation Data</b>				
<b>As of June 30</b>	<b>Number</b>	<b>Annual Payroll</b>	<b>Annual Average Salary</b>	<b>Percentage Increase (Decrease) in Average Salary</b>
2007 (Lag)	109,868	\$7,222,471,073	\$65,738	3.6 %
2008 (Lag)	112,472	7,926,647,584	70,477	7.2
2009(Lag)	113,132	8,016,635,700	70,861	0.5
2010 (Lag) <sup>1</sup>	111,647	7,979,671,378	71,472	0.9
2011 (Lag)	109,636	7,888,203,642	71,949	0.7
2012 (Lag)	112,460	8,013,395,184	71,256	(1.0)
2013 (Lag)	112,481	8,128,378,071	72,264	1.4
2014 (Lag)	111,726	8,274,685,657	74,062	2.5
2015 (Lag)	114,652	8,844,650,633	77,143	4.2
2016 (Lag)	118,201	9,224,267,647	78,039	1.2

<sup>1</sup> Beginning with the June 30, 2010 (Lag) actuarial valuation, the annualized covered payroll is based on revised actuarial assumptions.

### SUMMARY OF PLAN MEMBERSHIP

As of the June 30, 2016 (Lag) and June 30, 2015 (Lag) actuarial valuations, the Plan's Membership consisted of:

<b>Table 7 Summary of Plan Membership</b>		
<b>Group</b>	<b>June 30, 2016 (Lag)</b>	<b>June 30, 2015 (Lag)</b>
Retirees and beneficiaries currently receiving benefits	84,093	82,777
Terminated vested members not yet receiving benefits	14,393	13,482
Other Inactives <sup>1</sup>	7,401	7,347
Active members	<u>118,201</u>	<u>114,652</u>
Total	224,088	218,258

<sup>1</sup> Represents members who are no longer on payroll but not otherwise classified.

**Table 8**  
**Retirees and Beneficiaries Added to and Removed from Rolls**

Year Ended June 30	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances <sup>1</sup>	Number	Annual Allowances	Number	Annual Allowances <sup>2</sup>		
2007	3,078	\$234,183,351	2,162	\$66,646,428	68,492	\$2,931,295,173	6.1 %	\$42,798
2008	3,252	75,074,813	1,969	64,757,835	69,775	2,941,612,151	0.4	42,159
2009	3,115	6,288,013	2,065	73,586,895	70,825	2,874,313,269	(2.3)	40,583
2010	3,534	207,981,284	2,003	64,538,942	72,356	3,017,755,611	5.0	41,707
2011	3,849	278,652,149	2,141	67,488,320	74,064	3,228,919,440	7.0	43,596
2012	4,684	200,786,572	2,209	62,805,438	76,539	3,366,900,574	4.3	43,989
2013	4,078	248,087,233	2,440	77,107,240	78,177	3,537,880,567	5.1	45,255
2014	4,356	275,947,759	2,114	67,585,789	80,419	3,746,242,537	5.9	46,584
2015	4,728	219,769,491	2,370	81,986,287	82,777	3,884,025,741	3.7	46,922
2016	3,808	157,518,432	2,492	86,890,450	84,093	3,954,653,723	1.8	47,027

<sup>1</sup> Balancing Item – Amounts shown include changes due to benefit finalization, changes in benefit type (e.g. Service to Accidental Disability), COLA increases, and other changes.

<sup>2</sup> 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.

<b>Table 9</b>			
<b>Statutory vs Actuarial Contributions</b>			
<b>Fiscal Year Ended June 30</b>	<b>Statutory Contribution<sup>1</sup></b>	<b>Actuarial Contribution</b>	<b>Employer Rate of Contribution<sup>2</sup></b>
2009	\$2,223,643,770	\$2,223,643,770	30.8%
2010	2,484,073,500	2,484,073,500	31.6
2011	2,468,973,357	2,468,973,357	31.1
2012	2,673,078,096	2,673,078,096	33.7
2013	2,855,639,947	2,855,639,947	36.5
2014	2,998,693,727	2,998,693,727	37.7
2015	3,270,006,920	3,270,006,920	40.5
2016	3,702,569,102	3,702,569,102	44.8
2017	3,888,399,470	3,888,399,470	44.1
2018	3,889,709,927	3,889,709,927	42.3

<sup>1</sup> Represents total employer contributions accrued for fiscal year.

<sup>2</sup> 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 adjusted, where applicable, to be consistent with collective bargaining agreements estimated to be achieved.



## 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 Unfunded Actuarial Accrued Liabilities (UAAL), actuarial gains and losses are financed over the working lifetimes of active participants and are not identified as separate UAAL.

The funding status and funding progress information provided in this Schedule 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 Actuarial Accrued Liability (AAL). Under the EAN cost method, the UAAL equals the AAL minus the Actuarial Value of Assets.

<b>Table 10</b>						
<b>Funded Status Based on Entry Age Normal Cost Method</b>						
<b>(Dollar Amounts in Thousands)</b>						
<b>Actuarial Valuation Date</b>	<b>Actuarial Value of Assets (a)</b>	<b>Entry Age Actuarial Accrued Liability (AAL) (b)</b>	<b>Entry Age Unfunded AAL (UAAL) (b-a)</b>	<b>Funded Ratio (a/b)</b>	<b>Covered Payroll (c)</b>	<b>UAAL as a Percentage of Covered Payroll ((b-a)/c)</b>
June 30, 2007 (Lag)	\$33,854,152	\$48,625,202	\$14,771,050	69.6%	\$7,222,471	204.5%
June 30, 2008 (Lag)	32,227,375	49,400,762	17,173,387	65.2	7,926,648	216.7
June 30, 2009 (Lag)	30,774,981	47,988,459	17,213,478	64.1	8,016,636	214.7
June 30, 2010 (Lag) <sup>1</sup>	32,477,527	55,138,366	22,660,839	58.9	7,979,671	284.0
June 30, 2011 (Lag) <sup>1</sup>	33,601,537	57,702,731	24,101,194	58.2	7,888,204	305.5
June 30, 2012 (Lag) <sup>1</sup>	33,871,180	58,783,399	24,912,219	57.6	8,013,395	310.9
June 30, 2013 (Lag) <sup>1</sup>	35,186,072	61,988,933	26,802,861	56.8	8,128,378	329.7
June 30, 2014 (Lag) <sup>1</sup>	37,521,424	67,309,977	29,788,553	55.7	8,274,686	360.0
June 30, 2015 (Lag) <sup>1</sup>	39,290,072	69,625,608	30,335,536	56.4	8,844,651	343.0
June 30, 2016 (Lag) <sup>1</sup>	41,015,087	69,964,412	28,949,325	58.6	9,224,268	313.8

This schedule is based on actuarial assumptions used for determining Employer Contributions.

<sup>1</sup> Reflects revised actuarial assumptions and methods based on experience review, including an AIR assumptions of 7.0% per annum, net of investment expenses.

**Table 11**  
**Comparative Summary of Accrued Liabilities Funded by Actuarial Value of Assets**  
**Solvency Test**  
(Dollar Amounts in Thousands)

As of June 30	Accrued Liabilities for			Actuarial Value of Assets	Percentage of Accrued Liabilities Funded by Actuarial Value of Assets		
	Accumulated Member Contributions	Current Retirees and Beneficiaries	Active Members' Employer Financed Portion		(A)	(B)	(C)
	<b>(A)</b>	<b>(B)</b>	<b>(C)</b>	<b>(D)</b>			
2007 (Lag)	\$2,927,133	\$29,528,062	\$13,957,521	\$33,854,152	100%	100%	10%
2008 (Lag)	2,898,027	29,182,084	14,743,596	32,227,375	100	100	1
2009 (Lag)	2,823,873	27,862,679	14,620,140	30,774,981	100	100	1
2010 (Lag)	2,962,696	32,264,333	17,529,345	32,477,527	100	91	1
2011 (Lag)	3,167,737	34,317,270	17,770,140	33,601,537	100	89	1
2012 (Lag)	3,122,720	35,575,735	17,558,791	33,871,180	100	86	0
2013 (Lag)	3,330,541	37,451,527	18,565,932	35,186,072	100	85	0
2014 (Lag)	3,547,779	40,753,340	20,193,955	37,521,424	100	83	0
2015 (Lag)	3,646,765	42,095,109	20,888,473	39,290,072	100	85	0
2016 (Lag)	3,765,740	41,651,524	21,465,314	41,015,087	100	89	0

See following "SOLVENCY TEST - NOTES."

## COMPARATIVE SUMMARY OF ACCRUED LIABILITIES FUNDED BY ACTUARIAL VALUE OF ASSETS

### 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 (ERISA).

The values in the Table are dependent upon census data, benefit levels (which have changed on occasion over the past years), and the actuarial assumptions and methods employed at each valuation date. The two most recent changes in assumptions and methods occurred in the June 30, 2014 (Lag) valuation used to compute the Employer Contributions for Fiscal Year 2016 and in the June 30, 2010 (Lag) valuation used to compute the Employer Contributions for Fiscal Year 2012. These underlying bases can be found within the Comprehensive Annual Financial Report for each respective year.

Beginning with the June 30, 2008 (Lag) actuarial valuation the AVA was recomputed retroactive to June 30, 1999, by re-characterizing amounts credited as interest on TDA Fixed Fund account balances as payouts instead of investment losses.

To fully evaluate trends in financial soundness, changes in assumptions need to be evaluated. Beginning with the June 30, 2010 (Lag) actuarial valuation, the Actuarial Interest Rate (AIR) assumption equals 7.0% per annum, net of investment expenses, and the General Wage Increase (GWI) 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.

## CONTRIBUTIONS

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

### A. MEMBER CONTRIBUTIONS

#### 1. Coordinated Retirement Plan (Article 15):

A Tier III/IV member of this Plan is mandated to contribute 3% of annual wages during all the years of coverage. If a member resigns or is otherwise terminated from City Service prior to eligibility for a benefit, all of his or her contributions with 5% interest will be refunded upon request.

Beginning October 1, 2000, Tier III and IV members are not required to make basic required contributions after the 10th anniversary of their membership date or completion of 10 years of City Service, whichever is earlier. Effective February 27, 2008, active members were eligible to enroll in a 55/25 plan (age 55 with 25 years of service). Those that chose the 55/25 plan were required to contribute an additional 1.85% of pay from February 28, 2008 until June 29, 2008, or until they have accumulated 25 years of service, whichever is later. New members joining after February 27, 2008 are automatically enrolled in a 55/27 plan (age 55 with 27 years of service). These members are required to pay an additional 1.85% of pay for the first 27 years of service. New members after December 10, 2009 who are represented by the UFT are required to contribute 4.85% of salary for the first 27 years of service and 1.85% of salary thereafter.

A Tier VI member is mandated to contribute between 3.0% and 6.0% of salary until the later of separation from service or retirement.

#### 2. Twenty-Year Pension Plan:

A member of this Plan is required to contribute a percentage of salary which, if paid from the date of entry until the date of completion of 20 years of City Service, would provide at the payability date, an annuity of approximately one-eighth of the member's final salary as of the completion of 20 years of City Service. Tier II members who elected to join the 55/25 plan pay an additional 1.85% of pay.

#### 3. Age-55-Increased-Benefits Pension Plan:

A member of this Plan is required to contribute a percentage of salary, which if paid to the age for service retirement under the law in effect prior to July 1, 1970, would provide an annuity equal to approximately 1% of the average annual compensation during the last five years of service multiplied by years of service. Tier II members who elected to join the 55/25 plan pay an additional 1.85% of pay.

Member contributions are accumulated with interest in individually maintained accounts. Except under Article 15, upon retirement, the amount to the member's credit (*i.e.*, Accumulated Deductions) is used to purchase his or her annuity on the basis of the tables adopted by the Teachers' Retirement Board. Upon death in service, the death benefits, including the Accumulated Deductions, are paid to the beneficiary and, on termination of employment other than by death or retirement, the Accumulated Deductions are returned to the member.

Beginning July 1, 1960, on a year-to-year basis, the required contributions of members were reduced by an Increased-Take-Home-Pay factor initially equal to 2.5% of salary. The following table shows effective periods and Increased-Take-Home-Pay factors.

PERIOD	INCREASED-TAKE-HOME-PAY FACTOR
<b>Board of Education Employees</b>	
07/01/60 - 06/30/61	2.5%
07/01/61 - 08/31/67	5.0%
09/01/67 - 08/31/68	8.0%
<b>Board of Higher Education Employees</b>	
09/01/67 - 08/31/68	5.0%
<b>Twenty-Year and Age-55-Increased-Benefits Pension Plan Members</b>	
09/01/68 - 06/30/70	8.0%
07/01/70 - 12/31/75	5.0%
01/01/76 and later	2.5%
<b>Article 15 Members</b>	
All	0.0%

**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.

# Statistical



## INTRODUCTION TO STATISTICAL SECTION

This part of the Comprehensive Annual Financial Report presents detailed information as a context for understanding how the information in the Financial Section relates to the Teachers' Retirement System's overall condition. The following are the categories of the various schedules that are included in this Section:

### **QPP Financial Trend Information**

Schedules 1 through 3 contain trend information to help the reader understand how the QPP's financial performance and condition have changed over time.

### **QPP Demographic and Economic Information of In-Service Members**

Schedules 4 through 7 offer demographic and economic information of in-service members to help the reader understand this segment of the QPP membership population.

### **QPP Benefit Payment and Demographic and Economic Information of Retired Members**

Schedules 8 through 16 present information to help the reader assess the QPP's current and future benefit payment obligations based on financial and demographic information of retired members.

### **QPP and TDA Operating Expense Information**

Schedule 17 contains trend information as it relates to investment and administrative expenses of the System.

### **TDA Financial Trend Information**

Schedules 18 through 20 contain trend information to help the reader understand how the TDA Program's financial performance and condition have changed over time.

### **TDA Membership Information of In-Service and Retired Members**

Schedules 21 through 25 present membership information to help the reader assess the TDA Program's demographics and financial activity.

**SCHEDULE 1: NET POSITION AND CHANGES IN NET POSITION—QPP***In Thousands*

Year Ended	Pension Fund	Diversified Equity	Balanced Fund*	International Equity	Inflation Protection	Socially Responsive Equity	Net Position	Changes in Net Position
2009	\$19,795,757	\$3,113,828	\$148,256	\$14,667	\$2,715	\$2,266	\$23,077,489	(\$9,220,375)
2010	23,140,827	3,107,689	129,595	13,803	3,754	2,742	26,398,410	3,320,921
2011	29,942,258	3,523,126	112,117	15,626	4,527	3,883	33,601,537	7,203,127
2012	29,611,995	3,053,466	80,952	16,802	5,937	5,609	32,774,761	(826,776)
2013	33,654,166	3,110,127	63,719	16,320	5,882	6,242	36,856,456	4,081,695
2014	41,199,953	3,210,248	48,507	17,082	5,662	8,487	44,489,939	7,633,483
2015	41,452,046	2,740,658	34,034	15,071	4,747	8,108	44,254,664	(235,275)
2016	41,440,456	2,142,217	22,786	12,262	3,930	7,894	43,629,545	(625,119)
2017	43,920,339	6,058,218	83,594	16,685	4,760	12,127	50,095,723	6,466,178
2018	48,172,801	6,256,312	69,477	16,458	4,553	12,875	54,532,476	4,436,753

\* Bond Fund prior to January 1, 2018 and Stable-Value Fund prior to January 1, 2012.

**SCHEDULE 2: 2018 CHANGES IN NET POSITION—QPP***In Thousands*

	Pension Fund	Diversified Equity	Balanced Fund	International Equity	Inflation Protection	Socially Responsive Equity	Total
2017 Net Position	\$43,920,339	\$6,058,218	\$83,594	\$16,685	\$4,760	\$12,127	\$50,095,723
Member Contributions	194,921	276	38	6	-	-	195,241
Employer Contributions	3,949,667	21	1	-	-	-	3,949,689
Interest & Misc Income	1,340,041	4,626	628	20	9	10	1,345,334
Dividend Income	946,672	108,367	725	478	76	318	1,056,636
Realized Profit/Loss	12,089,955	487,155	(473)	2,150	4	629	12,579,420
Unrealized Profit/Loss	(8,486,630)	132,742	(830)	(1,707)	152	666	(8,355,607)
Benefit Payments	(3,718,593)	(603,164)	(9,727)	(1,630)	(439)	(1,109)	(4,334,662)
Refunds & Withdrawals	(15,727)	(1,535)	-	-	-	-	(17,262)
Interest Paid to TDA Funds	(1,595,462)	-	-	-	-	-	(1,595,462)
Transfer to other Systems	(3,534)	-	-	-	-	-	(3,534)
Interfund Transfer	(83,387)	86,825	(4,278)	505	(3)	338	-
TDA Rebalance	32,704	-	-	-	-	-	32,704
Provision for Expenses*	(398,165)	(17,219)	(201)	(49)	(6)	(104)	(415,744)
<b>2018 Net changes</b>	<b>\$4,252,462</b>	<b>\$198,094</b>	<b>(\$14,117)</b>	<b>(\$227)</b>	<b>(\$207)</b>	<b>\$748</b>	<b>\$4,436,753</b>
<b>2018 Net Position</b>	<b>\$48,172,801</b>	<b>\$6,256,312</b>	<b>\$69,477</b>	<b>\$16,458</b>	<b>\$4,553</b>	<b>\$12,875</b>	<b>\$54,532,476</b>

\* Includes Administrative and Investment Expenses.



**SCHEDULE 3: CHANGES IN NET POSITION—QPP**  
*In Thousands*

	1	2	3	4	5	6	7	8	9	10	11
Year Ended June 30*	Net Member Contributions	Employer Contributions	Net Investment Income	Transfer from/to Other Systems	TDA Fixed Interest Payments	Total Retirement Benefits	Loans Closed at Retirement	Withdrawals	Other Benefits**	Administrative Expenses	Change in Net Position
2009	143,281	2,297,789	(7,838,259)	1,035	(767,007)	(2,874,313)	(33,042)	(12,592)	(99,628)	(37,639)	(9,220,375)
2010	138,075	2,566,288	4,778,159	(2,109)	(816,557)	(3,017,755)	(30,338)	(12,782)	(240,595)	(41,465)	3,320,921
2011	158,829	2,525,111	8,888,669	737	(854,073)	(3,228,940)	(39,998)	(10,593)	(197,066)	(39,549)	7,203,127
2012	164,361	2,732,263	803,007	853	(945,967)	(3,366,901)	(28,031)	(17,273)	(129,375)	(39,713)	(826,776)
2013	154,698	2,912,844	5,721,112	(44)	(1,047,979)	(3,537,881)	(24,006)	(12,690)	(44,677)	(39,682)	4,081,695
2014	154,962	3,054,424	9,435,906	404	(1,047,923)	(3,740,243)	(24,866)	(18,813)	(134,326)	(46,042)	7,633,483
2015	158,590	3,325,528	1,611,929	329	(1,248,988)	(3,884,026)	(28,775)	(14,312)	(97,159)	(58,391)	(235,275)
2016	173,696	3,760,714	960,267	1,233	(1,354,207)	(3,954,654)	(20,126)	(13,639)	(119,036)	(59,367)	(625,119)
2017	180,076	3,945,768	8,133,280	(2,291)	(1,466,615)	(4,097,646)	(16,958)	(13,493)	(135,153)***	(60,790)	6,466,178
2018	195,241	3,949,689	6,275,115	(3,534)	(1,595,462)	(4,250,309)	(17,935)	(17,262)	(33,714)***	(65,076)	4,436,753

**Total Retirement Benefits By Type**

Year Ended June 30*	6a Service Retirement Allowances	6b Ordinary Disability Retirement Allowances	6c Accident Disability Retirement Allowances	6d Death Benefits To Beneficiaries	Total Retirement Benefits
2009	(\$2,714,932)	(\$38,990)	(\$21,200)	(\$99,191)	(\$2,874,313)
2010	(2,851,639)	(40,327)	(22,809)	(102,980)	(3,017,755)
2011	(3,046,583)	(43,348)	(25,596)	(113,413)	(3,228,940)
2012	(3,178,074)	(46,071)	(27,811)	(114,945)	(3,366,901)
2013	(3,337,405)	(48,492)	(28,487)	(123,497)	(3,537,881)
2014	(3,531,071)	(51,484)	(23,087)	(134,601)	(3,740,243)
2015	(3,660,115)	(54,633)	(30,276)	(139,002)	(3,884,026)
2016	(3,721,783)	(56,624)	(30,912)	(145,335)	(3,954,654)
2017	(3,855,232)	(58,447)	(31,470)	(152,497)	(4,097,646)
2018	(3,991,975)	(62,620)	(33,404)	(162,310)	(4,250,309)

\* *Benefit Payment categories for 2009-2017 take into account retirement valuation reports.*

\*\* *Other Benefits consists of Retiree Advances, delayed interest payments, Active Death Payments, and excluding Fiscal Year 2018, adjustment of retirement benefits is based on retirement valuation reports. Also, Fiscal Year 2011 includes \$112,462 in Nager II benefit payments, and Fiscal Year 2010 includes \$149,406 minimum accumulation settlement.*

\*\*\* *Includes \$43,938 negative and \$32,704 positive adjustments in 2017 and 2018, respectively, for TDA rebalance transfers.*

**Note:** *Benefit payments and withdrawals include columns 6, 7, 8, and 9.*

**SCHEDULE 4: PARTICIPATING EMPLOYERS—QPP***As of June 30, 2016 (Lag)*

<b>Employer</b>			<b>Number of In-Service Members*</b>	<b>Annual Payroll*</b>
NYC Department of Education and City University of New York			111,842	\$8,839,012,860
City University of New York Senior Colleges & Community Colleges			5,796	342,544,012
Charter Schools**	<u>Start Date</u>	<u>Type</u>		
Beginning with Children***	09/2001	DOE Conversion - UFT	41	2,821,143
Future Leaders Institute	09/2005	DOE Conversion - UFT	43	2,809,418
Harriet Tubman	09/2005	DOE Conversion - Non Union	54	3,187,301
Kipp Academy	09/2000	DOE Conversion - UFT	89	6,816,819
Kipp Infinity	09/2005	Non Conversion - Non Union	46	4,308,082
Opportunity	09/2004	Non Conversion - UFT	68	4,983,941
Renaissance	09/2000	DOE Conversion - UFT	58	4,709,950
South Bronx	09/2015	Non Conversion - UFT	9	567,591
UFT Elementary	09/2005	Non Conversion - UFT	31	2,339,287
University Prep (formally UFT Green Dot)	09/2008	Non Conversion - UFT	42	3,982,243
Voice	09/2008	Non Conversion - Non Union	51	3,448,871
Wildcat	09/2000	DOE Conversion - UFT	31	2,736,129
<b>SUBTOTAL</b>			<b>563</b>	<b>\$42,710,775</b>
<b>TOTAL</b>			<b>118,201</b>	<b>\$9,224,267,647</b>

\* The number of in-service employees and their corresponding Annual Payroll include only current active members receiving salary as of each June 30<sup>th</sup>.

\*\* Charter Schools that were converted from the NYC Department of Education Schools became participating employers when they were first converted to Charter Schools. Unless restricted by a collective bargaining agreement, a non-conversion Charter School decision to participate is voluntary and at the discretion of the individual school.

\*\*\* Beginning with Children Charter School closed following the 2016 school year. South Bronx Early College Academy Charter School ("SBECACS") opened for the 2016 school year.

### SCHEDULE 5: ACTIVE MEMBERSHIP SUMMARY—QPP

Year	As of July 1	Contributors Registered	Payroll Updates	Contributors Withdrawn	As of June 30th
2008	109,868	11,234	(5,183)	(3,447)	112,472
2009	112,472	7,526	(4,015)*	(2,851)	113,132
2010	113,132	4,617	(3,378)	(2,724)	111,647
2011	111,647	4,779	(3,717)	(3,073)	109,636
2012	109,636	9,519	(3,135)	(3,560)	112,460
2013	112,460	7,101	(3,744)	(3,336)	112,481
2014	112,481	7,915	(4,032)	(4,638)	111,726
2015	111,726	8,727	(2,499)	(3,302)	114,652
2016	114,652	10,239	(2,519)	(4,171)	118,201
2017	118,201	9,466	(2,894)	(3,947)	120,826

\*Revised for FY 2010.

Active membership summary based on latest valuation reports. Estimated active memberships of 123,000 for 2018.

### SCHEDULE 6: TABLE OF AVERAGE SALARIES OF IN-SERVICE MEMBERS—QPP

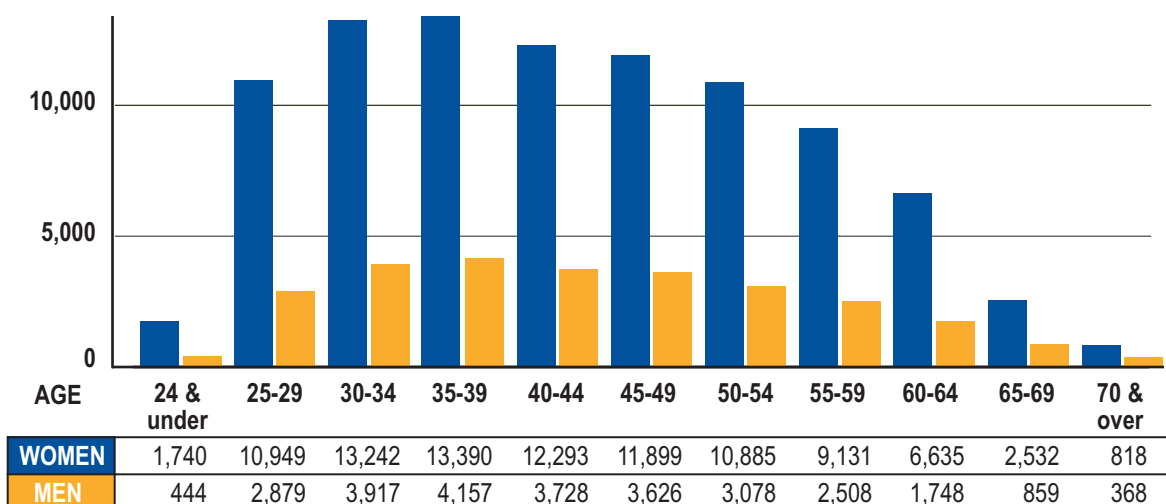
As of June 30, 2017

MEN			WOMEN		
Age	Number of In-Service Members*	Average Salaries*	Age	Number of In-Service Members*	Average Salaries*
24 & under	444	\$49,303	24 & under	1,740	\$51,343
25-29	2,879	61,997	25-29	10,949	63,544
30-34	3,917	75,354	30-34	13,242	75,508
35-39	4,157	86,285	35-39	13,390	83,265
40-44	3,728	93,111	40-44	12,293	86,048
45-49	3,626	95,923	45-49	11,899	86,287
50-54	3,078	98,715	50-54	10,885	85,278
55-59	2,508	96,384	55-59	9,131	83,404
60-64	1,748	93,440	60-64	6,635	82,637
65-69	859	86,228	65-69	2,532	80,645
70 & over	368	83,116	70 & over	818	72,707
<b>TOTAL</b>	<b>27,312</b>	<b>\$86,509</b>	<b>TOTAL</b>	<b>93,514</b>	<b>\$80,054</b>
TOTAL ANNUAL SALARIES		\$2,362,727,020	TOTAL ANNUAL SALARIES		\$7,486,172,212

\* The member count and the annual payroll include only those who were on the June 30<sup>th</sup> payroll.

### IN-SERVICE MEMBERS ON PAYROLL—DISTRIBUTION BY AGE

As of June 30, 2017



**SCHEDULE 7: IN-SERVICE MEMBERSHIP BY TIER AND BY TITLE—QPP**

Year	Average Age	IN-SERVICE MEMBERSHIP BY TIER					IN-SERVICE MEMBERSHIP BY TITLE					
		Tier I	Tier II	Tier III	Tier IV	Tier VI	Teachers	Paraprofessionals	Principals and Administrators	Full-Time CUNY Faculty	Adjunct CUNY Instructors	Others
2009	44.8	2.1%	1.0%	3.0%	93.9%	0.0%	68.9%	14.6%	5.3%	1.6%	1.1%	8.5%
2010	45.2	1.6%	0.8%	2.7%	94.9%	0.0%	67.9%	15.2%	5.4%	1.9%	1.1%	8.5%
2011	45.5	1.2%	0.6%	2.3%	95.9%	0.0%	67.2%	15.6%	5.5%	2.1%	1.3%	8.3%
2012	45.4	0.9%	0.5%	1.8%	96.6%	0.2%	65.1%	16.7%	5.4%	2.4%	2.4%	8.0%
2013	45.3	0.7%	0.4%	1.4%	91.4%	6.1%	64.9%	16.9%	5.5%	2.7%	2.4%	7.6%
2014	44.8	0.5%	0.2%	1.0%	86.3%	12.1%	64.7%	16.6%	5.7%	3.0%	2.4%	7.6%
2015	44.8	0.4%	0.2%	0.7%	81.3%	17.4%	64.5%	16.8%	5.4%	3.3%	2.3%	7.7%
2016	44.7	0.3%	0.2%	0.6%	81.0%	17.9%	63.6%	17.3%	5.6%	3.4%	2.3%	7.8%
2017	44.6	0.2%	0.1%	0.5%	71.6%	27.6%	62.9%	17.7%	5.6%	3.7%	2.3%	7.8%
2018	44.7	0.2%	0.1%	0.4%	67.7%	31.6%	62.9%	17.6%	5.6%	3.9%	2.3%	7.7%

### SCHEDULE 8: RETIREE SUMMARY—QPP

Year	As of July 1	Retirees Registered	Payroll Status Changes	Retirees Withdrawn	As of June 30th
2008	68,492	2,838	(307)	(1,248)	69,775
2009	69,775	2,626	(140)	(1,436)	70,825
2010	70,825	3,065	(404)	(1,130)	72,356
2011	72,356	3,285	(39)	(1,537)	74,065
2012	74,064	4,180	(412)	(1,293)	76,539
2013	76,539	3,541	(451)	(1,452)	78,177
2014	78,177	3,791	(186)	(1,363)	80,419
2015	80,419	4,171	(308)	(1,505)	82,777
2016	82,777	3,267	(16)	(1,935)	84,093
2017	84,093	3,030	(153)	(2,200)	84,770

Retiree membership summary based on latest valuation reports. Estimated retiree memberships of 86,000 for 2018.

### SCHEDULE 9: AVERAGE YEARS OF SERVICE OF NEW RETIREES—QPP

Average Years of Service

Year Ended June 30	Men	Women	Men and Women	Total Number of Retirees*
2008	28.3	25.8	26.4	2,838
2009	26.7	25.1	25.5	2,626
2010	26.6	25.8	26.0	3,065
2011	26.5	25.3	25.6	3,285
2012	25.8	25.2	25.3	4,180
2013	25.1	24.8	24.9	3,541
2014	24.2	24.7	24.6	3,791
2015	24.9	24.0	24.2	4,171
2016	24.5	24.3	24.4	3,267
2017	25.6	25.0	25.1	3,030

\*Total number of new retirees based on latest valuation reports.

### SCHEDULE 10: PAYMENT OPTIONS CHOSEN AT RETIREMENT—QPP

Year	Average Age	OPTIONS CHOSEN BY TIER I/II MEMBERS					OPTIONS CHOSEN BY TIER III/IV/VI MEMBERS			
		Maximum Payout	Pop-Up Payments	Continuing Payments	Lump-Sum Payment	Guaranteed Number of Payments	Maximum Payout	Pop-Up Payments	Continuing Payments	Guaranteed Number of Payments
2009	60.4	62.8%	20.8%	14.5%	0.8%	1.1%	73.2%	14.3%	10.2%	2.3%
2010	60.5	65.2%	20.3%	12.5%	0.8%	1.2%	71.4%	17.1%	9.3%	2.2%
2011	60.5	59.2%	24.5%	12.1%	2.8%	1.4%	71.0%	16.4%	10.5%	2.1%
2012	60.6	61.1%	24.8%	11.3%	1.1%	1.7%	71.4%	17.2%	9.7%	1.7%
2013	60.7	64.1%	21.5%	11.5%	1.3%	1.6%	68.9%	19.1%	10.3%	1.7%
2014	60.8	62.1%	25.2%	10.7%	1.1%	0.9%	69.2%	19.5%	9.6%	1.7%
2015	60.8	50.8%	25.4%	20.0%	1.5%	2.3%	68.5%	18.1%	10.6%	2.8%
2016	60.9	59.4%	20.3%	17.6%	0.7%	2.0%	68.2%	19.6%	10.7%	1.5%
2017	60.9	62.4%	23.7%	11.9%	0.0%	2.0%	67.8%	19.4%	10.9%	1.9%
2018	61.0	56.1%	27.1%	15.0%	0.9%	0.9%	66.6%	20.3%	11.6%	1.5%

## SCHEDULE 11: RETIREES' AVERAGE MONTHLY BENEFIT PAYMENTS AND FINAL AVERAGE SALARY ORGANIZED BY YEARS OF CREDITED SERVICE—QPP

	Year*	Survivor	Other**	Under 5 Yrs***	5 - 9 Yrs	10 - 14 Yrs	15 - 19 Yrs	20 - 24 Yrs	25 - 29 Yrs	30 - 35 Yrs	35 & up Yrs	Total
Retirees	2009	3,878	7,546	54	832	3,476	5,121	7,390	13,933	17,609	10,986	70,825
Retirees	2010	3,935	6,493	59	934	3,709	5,310	7,829	14,557	18,139	11,391	72,356
Retirees	2011	3,989	6,423	60	1,040	3,937	5,466	8,163	15,057	18,401	11,529	74,065
Retirees	2012	4,071	5,882	63	1,165	4,382	5,720	8,786	15,942	18,786	11,742	76,539
Retirees	2013	4,118	5,386	64	1,270	4,704	5,862	9,371	16,634	19,064	11,727	78,177
Retirees	2014	4,257	8,208	65	1,377	5,054	6,011	9,600	16,671	18,140	11,036	80,419
Retirees	2015	4,403	4,620	68	1,481	5,543	6,374	10,588	18,260	19,649	11,791	82,777
Retirees	2016	4,564	4,989	67	1,516	5,794	6,535	10,854	18,568	19,536	11,670	84,093
Retirees	2017	4,635	3,879	69	1,566	5,975	6,713	11,266	19,106	19,912	11,649	84,770
Retirees	2018****	4,651	2,969	67	1,679	6,290	6,909	11,720	19,784	20,279	11,652	86,000

	Year*	Under 5 Yrs***	5 - 9 Yrs	10 - 14 Yrs	15 - 19 Yrs	20 - 24 Yrs	25 - 29 Yrs	30 - 34 Yrs	35 & up Yrs
Avg Monthly Benefit	2009	\$998	\$519	\$855	\$1,379	\$2,095	\$3,348	\$4,451	\$5,774
Avg Monthly Benefit	2010	\$1,073	\$609	\$872	\$1,336	\$2,172	\$3,466	\$4,592	\$5,976
Avg Monthly Benefit	2011	\$1,194	\$568	\$951	\$1,459	\$2,394	\$4,004	\$5,451	\$7,556
Avg Monthly Benefit	2012	\$1,265	\$588	\$987	\$1,504	\$2,331	\$3,682	\$4,798	\$6,286
Avg Monthly Benefit	2013	\$1,292	\$597	\$993	\$1,478	\$2,417	\$3,822	\$4,969	\$6,532
Avg Monthly Benefit	2014	\$1,322	\$614	\$1,005	\$1,531	\$2,451	\$3,897	\$5,100	\$6,764
Avg Monthly Benefit	2015	\$1,324	\$606	\$1,046	\$1,541	\$2,609	\$4,054	\$5,279	\$7,350
Avg Monthly Benefit	2016	\$1,290	\$681	\$1,118	\$1,555	\$2,601	\$4,065	\$5,202	\$6,895
Avg Monthly Benefit	2017	\$1,360	\$648	\$1,112	\$1,626	\$2,693	\$4,198	\$5,368	\$7,061
Avg Monthly Benefit	2018****	\$1,442	\$995	\$1,219	\$1,714	\$2,792	\$4,266	\$5,481	\$7,240

	Year*	Under 5 Yrs***	5 - 9 Yrs	10 - 14 Yrs	15 - 19 Yrs	20 - 24 Yrs	25 - 29 Yrs	30 - 34 Yrs	35 & up Yrs
Final Average Salary	2009	\$27,306	\$38,280	\$40,348	\$42,379	\$51,881	\$58,811	\$69,802	\$79,190
Final Average Salary	2010	\$28,056	\$39,632	\$41,401	\$43,566	\$53,567	\$61,429	\$71,226	\$80,400
Final Average Salary	2011	\$28,895	\$40,803	\$42,607	\$44,701	\$55,226	\$63,830	\$72,377	\$81,273
Final Average Salary	2012	\$30,270	\$42,741	\$44,943	\$46,367	\$57,724	\$66,782	\$73,787	\$82,267
Final Average Salary	2013	\$31,076	\$43,539	\$46,381	\$47,698	\$59,738	\$69,113	\$74,985	\$82,940
Final Average Salary	2014	\$30,646	\$43,911	\$47,700	\$48,561	\$60,661	\$70,338	\$75,376	\$83,206
Final Average Salary	2015	\$30,946	\$44,441	\$49,831	\$50,645	\$63,802	\$73,796	\$77,860	\$84,692
Final Average Salary	2016	\$30,465	\$44,767	\$51,350	\$52,142	\$65,096	\$75,755	\$78,660	\$85,340
Final Average Salary	2017	\$30,945	\$45,569	\$52,882	\$54,286	\$67,606	\$78,798	\$80,914	\$86,726
Final Average Salary	2018****	\$32,029	\$45,696	\$53,990	\$55,783	\$69,233	\$80,890	\$82,536	\$87,830

\* Retiree figures for 2009-2017 take into account retirement valuation reports.

\*\* Refers to retirees with a payment setup processed by a previous database system. The current payment system was initiated in 1998.

\*\*\* Retirees include Service Retirement, Accidental Disability, and Ordinary Disability. The majority of retirees with under 5 years of service are Accidental Disability retirees.

\*\*\*\* Retiree figures for 2018 include Service or FAS retirement revision cases previously categorized as "Other."

**Note:** If elected, total monthly benefits for Tier I and Tier II members depend on current unit value.

**SCHEDULE 12: AVERAGE ANNUAL BENEFIT PAYMENT AMOUNTS—QPP**

Year Ended June 30	SERVICE RETIREMENT BENEFITS		ORDINARY (NON-DUTY) DISABILITY BENEFITS		ACCIDENTAL (DUTY) DISABILITY BENEFITS		SURVIVORS' BENEFITS	
	Number	Average Annual Allowance	Number	Average Annual Allowance	Number	Average Annual Allowance	Number	Average Annual Benefit
2008	63,343	45,603	2,043	20,883	573	39,478	3,822	29,109
2009	64,281	42,235	2,037	19,141	589	35,993	3,918	25,317
2010	65,734	43,381	2,068	19,500	619	36,849	3,935	26,170
2011	67,253	45,300	2,153	20,134	670	38,202	3,989	28,432
2012	69,515	45,718	2,242	20,549	711	39,116	4,071	28,235
2013	71,017	46,994	2,299	21,093	713	39,954	4,148	29,773
2014	73,069	48,325	2,379	21,641	714	40,738	4,257	31,619
2015	75,251	48,639	2,481	22,020	732	41,360	4,313	32,229
2016	76,346	48,749	2,541	22,284	745	41,492	4,461	32,579
2017	76,973	50,086	2,549	22,929	744	42,299	4,504	33,858

**SCHEDULE 13: SERVICE RETIREMENT ALLOWANCES—QPP***As of June 30, 2017*

MEN			WOMEN		
Age	Number of Retirees	Average Annual Allowance	Age	Number of Retirees	Average Annual Allowance
under 30	-	-	under 30	-	-
30-34	-	-	30-34	-	-
35-39	-	-	35-39	-	-
40-44	-	-	40-44	-	-
45-49	-	-	45-49	-	-
50-54	-	-	50-54	-	-
55-59	738	\$53,850	55-59	2,116	\$52,900
60-64	1,837	52,300	60-64	6,267	49,058
65-69	4,649	59,222	65-69	13,356	52,183
70-74	6,569	63,172	70-74	12,662	50,362
75-79	3,471	57,081	75-79	8,134	43,532
80-84	2,331	55,458	80-84	5,428	38,808
85-89	1,578	53,753	85-89	3,970	37,903
90 & over	880	49,384	90 & over	2,987	34,888
<b>TOTAL</b>	<b>22,053</b>	<b>\$58,124</b>	<b>TOTAL</b>	<b>54,920</b>	<b>\$46,858</b>

TOTAL ANNUAL ALLOWANCES PAID \$1,281,798,170      TOTAL ANNUAL ALLOWANCES PAID \$2,573,433,801

**SCHEDULE 14: ORDINARY DISABILITY RETIREMENT ALLOWANCES—QPP***As of June 30, 2017*

MEN			WOMEN		
Age	Number of Retirees	Average Annual Allowance	Age	Number of Retirees	Average Annual Allowance
under 30	-	-	under 30	-	-
30-34	-	-	30-34	-	-
35-39	2	\$18,148	35-39	6	\$27,213
40-44	11	28,780	40-44	35	22,836
45-49	18	27,808	45-49	86	25,453
50-54	38	27,389	50-54	156	26,709
55-59	69	28,249	55-59	302	24,372
60-64	97	23,365	60-64	364	22,411
65-69	121	26,004	65-69	439	22,191
70-74	121	25,722	70-74	298	21,051
75-79	41	23,289	75-79	158	16,521
80-84	21	19,539	80-84	74	17,127
85-89	10	26,496	85-89	38	17,660
90 & over	7	31,430	90 & over	37	22,388
<b>TOTAL</b>	<b>556</b>	<b>\$25,573</b>	<b>TOTAL</b>	<b>1,993</b>	<b>\$22,192</b>
<b>TOTAL ANNUAL ALLOWANCES PAID \$14,218,818</b>			<b>TOTAL ANNUAL ALLOWANCES PAID \$44,228,276</b>		

**SCHEDULE 15: ACCIDENT DISABILITY RETIREMENT ALLOWANCES—QPP***As of June 30, 2017*

MEN			WOMEN		
Age	Number of Retirees	Average Annual Allowance	Age	Number of Retirees	Average Annual Allowance
under 30	-	-	under 30	-	-
30-34	1	\$37,648	30-34	1	\$39,908
35-39	-	-	35-39	3	30,616
40-44	6	45,104	40-44	7	47,986
45-49	6	51,974	45-49	14	46,848
50-54	4	41,365	50-54	33	40,661
55-59	15	50,476	55-59	57	41,510
60-64	23	54,069	60-64	86	41,334
65-69	44	44,866	65-69	124	40,341
70-74	59	46,981	70-74	100	40,029
75-79	25	50,004	75-79	37	43,901
80-84	11	40,915	80-84	39	31,461
85-89	7	37,912	85-89	18	39,154
90 & over	8	43,213	90 & over	16	42,471
<b>TOTAL</b>	<b>209</b>	<b>\$47,098</b>	<b>TOTAL</b>	<b>535</b>	<b>\$40,424</b>
<b>TOTAL ANNUAL ALLOWANCES PAID \$9,843,542</b>			<b>TOTAL ANNUAL ALLOWANCES PAID \$21,626,919</b>		



**SCHEDULE 16: SURVIVORS' BENEFITS—QPP***As of June 30, 2017*

MEN			WOMEN		
Age	Number of Beneficiaries	Average Annual Benefit	Age	Number of Beneficiaries	Average Annual Benefit
under 30	4	\$26,451	under 30	5	\$24,300
30-34	5	9,440	30-34	4	10,114
35-39	11	29,290	35-39	17	21,953
40-44	12	21,849	40-44	14	16,709
45-49	15	15,718	45-49	21	18,776
50-54	29	14,667	50-54	46	14,603
55-59	34	17,523	55-59	87	23,873
60-64	55	25,765	60-64	115	31,321
65-69	130	29,662	65-69	301	40,905
70-74	210	36,420	70-74	484	40,818
75-79	176	31,200	75-79	490	41,328
80-84	177	28,159	80-84	508	38,727
85-89	191	26,459	85-89	512	36,088
90 & over	253	25,561	90 & over	598	29,426
<b>TOTAL</b>	<b>1,302</b>	<b>\$28,350</b>	<b>TOTAL</b>	<b>3,202</b>	<b>\$36,098</b>
<b>TOTAL ANNUAL BENEFITS PAID</b>		<b>\$36,911,554</b>	<b>TOTAL ANNUAL BENEFITS PAID</b>		<b>\$115,585,083</b>

**SCHEDULE 17: NUMBER AND COST OF INVESTMENT AND ADMINISTRATIVE SERVICES (QPP & TDA)**

Year Ended	Investment Agent Count	Investment Expenses	TRS Employees Count*	Administrative Expenses
2009	200	\$111,203,770	374	\$51,090,690
2010	206	\$139,101,694	365	\$51,929,857
2011	188	\$136,300,683	364	\$49,428,933
2012	221	\$122,647,913	368	\$50,064,502
2013	227	\$151,401,872	373	\$49,877,929
2014	230	\$169,736,553	376	\$63,230,181
2015	228	\$205,719,517	370	\$84,173,556
2016	230	\$209,422,244	365	\$91,998,934
2017	221	\$308,283,033	351	\$93,821,614
2018	227	\$352,816,375**	347	\$87,532,002

\* Employee count does not include Consultants, Temporary Employees, and Summer Interns.

\*\* 2018 details are found in the schedule: Summary of Investment Managers and Fees of the Investment Section.

**SCHEDULE 18: NET POSITION AND CHANGES IN NET POSITION—TDA PROGRAM***In Thousands*

Year Ended	Pension Fund	Diversified Equity	Balanced Fund*	International Equity	Inflation Protection	Socially Responsive Equity	Net Position	Changes in Net Position
2009	\$10,605,577	\$4,499,663	\$278,335	\$39,046	\$7,644	\$7,457	\$15,437,722	(\$830,151)
2010	11,884,377	4,999,750	293,448	51,831	11,978	12,441	17,253,825	1,816,103
2011	13,118,153	6,293,322	308,666	71,674	19,833	22,145	19,833,793	2,579,968
2012	14,554,722	5,975,066	301,727	57,905	22,590	30,087	20,942,097	1,108,304
2013	16,021,066	6,762,476	304,675	71,621	28,001	41,837	23,229,676	2,287,579
2014	17,450,769	7,909,321	304,788	96,028	37,488	75,095	25,873,489	2,643,813
2015	18,922,602	7,869,896	302,816	97,942	39,437	100,889	27,333,582	1,460,093
2016	20,511,536	7,365,430	312,613	96,081	41,444	117,236	28,444,340	1,110,758
2017	22,223,301	8,194,607	310,195	120,211	50,138	153,641	31,052,093	2,607,753
2018	23,963,722	8,704,088	316,507	143,858	60,281	192,526	33,380,982	2,328,889

\* Bond Fund prior to January 1, 2018 and Stable-Value Fund prior to January 1, 2012.

**SCHEDULE 19: CHANGES IN NET POSITION—TDA PROGRAM***In Thousands*

Year Ended	1 Net Member Contributions	2 Fixed Interest from TRSNYC Pension Fund	3 Net Investment Income	5 Withdrawals	6 Other Benefits*	7 Annuitized Payments	8 Administrative Expenses	9 Change in Net Position
2009	\$639,170	\$767,007	(\$1,849,614)	(\$263,692)	(\$80,563)	(\$29,008)	(\$13,451)	(\$830,151)
2010	640,370	816,557	683,726	(212,307)	(72,051)	(29,727)	(10,465)	1,816,103
2011	631,840	854,073	1,585,111	(369,370)	(80,565)	(31,241)	(9,880)	2,579,968
2012	627,159	945,967	109,651	(431,412)	(98,606)	(34,103)	(10,352)	1,108,304
2013	633,900	1,047,979	1,216,793	(460,659)	(104,402)	(35,837)	(10,195)	2,287,579
2014	638,979	1,147,923	1,631,411	(577,102)	(139,759)	(40,451)	(17,188)	2,643,813
2015	662,601	1,248,988	435,632	(658,504)	(157,994)	(44,847)	(25,783)	1,460,093
2016	717,566	1,354,207	(11,194)	(708,466)	(164,389)	(44,334)	(32,632)	1,110,758
2017	743,663	1,466,615	1,398,500	(781,276)	(139,690)**	(47,027)	(33,032)	2,607,753
2018	856,294	1,595,462	1,055,191	(882,994)	(220,931)**	(51,677)	(22,456)	2,328,889

\* Other Benefits consists of active death payments and delayed interest payments.

\*\* Includes \$43,938 positive and \$32,704 negative adjustments in 2017 and 2018, respectively, for TDA rebalance transfers.

**SCHEDULE 20: 2018 CHANGES IN NET POSITION—TDA PROGRAM***In Thousands*

	Pension Fund	Diversified Equity	Balanced Fund	International Equity	Inflation Protection	Socially Responsive Equity	Total
2017 Net Position	\$22,223,301	\$8,194,607	\$310,195	\$120,211	\$50,138	\$153,641	\$31,052,093
Member Contributions	591,781	197,886	22,287	15,459	7,888	20,993	856,294
Payment of interest on TDA fixed return funds	1,595,462	-	-	-	-	-	1,595,462
Interest & Misc Income	26,615	5,811	3,895	177	135	75	36,708
Dividend Income	-	136,146	3,057	4,151	1,154	2,424	146,932
Realized Profit/Loss	-	612,031	(1,996)	18,659	64	4,793	633,551
Unrealized Profit/Loss	-	242,488	(3,629)	(14,341)	1,429	14,201	240,148
Benefit Payments	(166,229)	(78,075)	(2,820)	(368)	(337)	(586)	(248,415)
Refunds & Withdrawals	(687,371)	(169,487)	(7,907)	(2,987)	(2,629)	(4,102)	(874,483)
Interfund Transfer	382,333	(383,126)	(6,206)	3,193	2,354	1,452	-
TDA Rebalance	(2,170)	(32,354)	893	186	173	568	(32,704)
Provision for Expenses*	-	(21,839)	(1,262)	(482)	(88)	(933)	(24,604)
<b>2018 Net changes</b>	<b>\$1,740,421</b>	<b>\$509,481</b>	<b>\$6,312</b>	<b>\$23,647</b>	<b>\$10,143</b>	<b>\$38,885</b>	<b>\$2,328,889</b>
<b>2018 Net Position</b>	<b>\$23,963,722</b>	<b>\$8,704,088</b>	<b>\$316,507</b>	<b>\$143,858</b>	<b>\$60,281</b>	<b>\$192,526</b>	<b>\$33,380,982</b>

\* Includes Administrative and Investment Expenses.

**SCHEDULE 21: TDA PROGRAM SUMMARY (EXCLUDES ANNUITANTS)**

Year	As of July 1	Contributors Registered	Payroll Status Changes	Contributors Withdrawn	As of June 30th
2008	71,113	1,841	3,023	(3,079)	72,898
2009	72,898	1,121	3,768	(2,638)	75,149
2010	75,149	458	3,041	(2,731)	75,917
2011	75,917	845	2,617	(3,022)	76,357
2012	76,357	1,435	2,965	(3,513)	77,244
2013	77,244	1,834	2,095	(3,400)	77,773
2014	77,773	1,914	1,587	(3,569)	77,705
2015	77,705	2,751	3,168	(2,440)	81,184
2016	81,184	3,367	3,464	(3,108)	84,907
2017	84,907	2,851	3,037	(3,101)	87,694

*Active membership summary based on latest valuation reports.*

### SCHEDULE 22: TDA PROGRAM ANNUITANTS SUMMARY

Year	As of July 1	Annuitants Registered	Payroll Status Changes	Annuitants Withdrawn	As of June 30th
2008	4,140	69	(57)	(295)	3,857
2009	3,857	51	7	(311)	3,604
2010	3,604	63	(81)	(167)	3,419
2011	3,419	86	10	(264)	3,251
2012	3,251	140	(42)	(165)	3,184
2013	3,184	97	(50)	(176)	3,055
2014	3,055	120	(5)	(134)	3,036
2015	3,036	105	(18)	(132)	2,991
2016	2,991	86	16	(163)	2,930
2017	2,930	97	3	(164)	2,866

*Annuitant membership summary based on latest valuation reports.*

### SCHEDULE 23: MEMBERSHIP BY AGE (ACTIVE, DEFERRAL & BENEFICIARY ACCOUNTS AS OF JUNE 30, 2018)—TDA PROGRAM

Age	Contributing		Non-Contributing		Deferred*		Beneficiary		Loans**	
	Count	Fund Balance	Count	Fund Balance	Count	Fund Balance	Count	Fund Balance	Count	Loan Balance
=<25	8,866	\$108,201,562	522	\$2,664,324	1	\$40,645	25	\$1,691,944	598	\$2,375,320
30	11,589	327,045,609	1,118	27,337,724	57	2,058,224	17	1,828,886	2,571	15,109,912
35	13,169	776,734,274	1,812	82,094,507	243	13,195,044	22	3,280,576	6,192	41,459,003
40	12,489	1,142,806,305	1,173	66,198,684	352	24,607,035	35	9,152,541	8,647	58,344,820
45	12,182	1,539,740,210	953	58,566,858	494	46,059,502	58	15,935,546	9,527	62,526,000
50	10,752	1,769,392,332	887	70,802,656	607	71,122,242	85	17,307,355	8,642	59,914,199
55	8,807	1,661,013,500	637	57,373,928	3,063	844,548,433	128	25,624,489	7,441	50,720,225
60	6,281	1,317,635,082	399	30,611,693	6,878	2,172,615,600	118	28,687,898	5,388	40,642,529
65	2,444	582,484,109	166	13,987,319	13,353	5,323,050,792	143	47,721,993	3,960	36,005,816
70	568	186,223,123	71	9,949,545	14,859	7,050,948,243	142	59,089,000	2,302	21,672,653
75	103	46,882,917	28	4,377,428	8,540	3,833,108,341	146	50,966,537	971	8,534,648
80	28	15,146,793	13	6,414,400	4,493	1,853,110,397	102	40,260,800	303	2,873,340
85	4	4,927,515	5	603,438	2,219	806,912,128	62	15,638,068	114	1,016,763
90	2	438,881	1	68,910	715	176,552,805	22	5,824,715	11	110,936

Source: TRS query reports

\* Includes inactive memberships.

\*\* Loan balances include interest and insurance receivable amounts.

**SCHEDULE 24: WITHDRAWALS BY AGE (FROM ACTIVE, DEFERRAL & BENEFICIARY ACCOUNTS, FISCAL YEAR 2018)—TDA PROGRAM**

Age	Partial Withdrawals*		401(a) Service Purchase		RMD Withdrawals**		Total Withdrawals***		Survivors' Payments ****	
	Count	Distribution	Count	Distribution	Count	Distribution	Count	Distribution	Count	Distribution
=<25	11	\$171,540	8	\$14,442	19	\$22,385	164	\$1,728,183	1	\$1,193
30	50	495,720	29	87,649	15	26,045	317	6,007,857	1	50,516
35	141	1,913,828	37	149,777	15	65,299	331	7,597,188	5	178,944
40	277	4,807,270	67	230,234	25	153,258	271	6,517,227	6	322,760
45	281	4,155,145	68	336,873	52	340,132	262	6,935,828	20	1,822,699
50	375	5,023,668	108	537,180	68	451,395	167	3,959,896	20	1,438,395
55	2,026	37,007,170	137	703,378	92	622,293	146	6,892,781	54	4,082,836
60	4,902	64,636,258	109	613,792	74	692,185	208	6,456,007	109	13,314,771
65	4,746	69,125,224	36	165,508	85	1,328,371	190	10,964,792	212	30,881,950
70	3,644	56,564,674	11	96,398	11,728	202,008,105	102	12,881,769	280	55,583,447
75	1,309	20,332,125	5	45,203	7,417	149,428,503	35	5,227,511	273	31,331,839
80	517	10,456,780	1	7,983	3,960	91,098,973	25	3,369,252	353	42,495,380
85	169	3,880,304	-	-	2,006	51,603,339	12	1,976,076	308	30,943,787
90	31	537,191	-	-	551	12,797,734	8	813,428	132	8,860,442

Source: TRS query reports

\* Includes 135 Partial Withdrawals to Beneficiaries.

\*\* Includes 809 RMD Withdrawals to Beneficiaries.

\*\*\* Includes 25 Total Withdrawals to Beneficiaries.

\*\*\*\* Includes the establishment of 193 (\$41.6 million) new Beneficiary accounts.

**SCHEDULE 25: FUND CONVERSION OF INVESTMENT BALANCES BY AGE  
(FISCAL YEAR 2018)—TDA PROGRAM**

From	To	=<25	30	35	40	45	50	55	60	65	70	75	80	85	90+
FX	VA	21.2%	26.2%	21.0%	11.7%	8.5%	4.5%	5.1%	7.2%	5.6%	4.6%	6.2%	2.3%	0.0%	0.0%
FX	VB	0.8%	0.6%	0.6%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FX	VC	2.0%	3.5%	1.3%	1.7%	1.4%	1.0%	0.7%	0.9%	0.6%	0.4%	0.5%	0.2%	0.0%	0.0%
FX	VD	0.3%	0.1%	0.2%	0.1%	0.1%	0.3%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
FX	VE	4.0%	7.6%	3.6%	2.9%	1.7%	1.5%	0.8%	2.5%	1.0%	0.4%	0.1%	0.2%	0.0%	0.0%
VA	FX	33.1%	34.4%	50.1%	63.5%	75.1%	82.0%	85.0%	78.9%	86.4%	91.7%	90.0%	92.2%	97.7%	89.0%
VA	VB	0.0%	0.0%	0.0%	0.3%	0.4%	0.5%	0.1%	0.1%	0.7%	0.2%	0.3%	0.0%	0.0%	0.0%
VA	VC	0.4%	0.0%	0.6%	0.8%	0.2%	0.8%	0.3%	0.1%	0.1%	0.4%	0.4%	1.3%	0.3%	3.2%
VA	VD	0.0%	0.0%	0.0%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
VA	VE	0.0%	0.6%	2.0%	1.1%	0.8%	0.8%	0.4%	0.5%	0.3%	0.1%	0.1%	0.0%	0.4%	0.0%
VB	FX	6.9%	4.0%	4.1%	5.0%	3.6%	2.6%	3.4%	3.0%	1.7%	0.6%	1.1%	1.6%	1.0%	4.1%
VB	VA	1.6%	0.6%	1.6%	2.0%	0.7%	0.3%	0.4%	0.4%	0.2%	0.0%	0.1%	1.2%	0.0%	1.8%
VB	VC	0.2%	0.1%	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VB	VD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VB	VE	0.6%	0.0%	0.2%	0.2%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VC	FX	8.7%	6.1%	3.2%	3.6%	1.5%	1.2%	0.8%	2.0%	0.7%	0.6%	0.5%	0.5%	0.4%	0.0%
VC	VA	1.6%	1.6%	1.0%	0.5%	0.5%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VC	VB	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
VC	VD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VC	VE	0.0%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VD	FX	5.4%	1.9%	0.9%	1.0%	0.6%	0.4%	0.4%	0.5%	0.1%	0.0%	0.1%	0.0%	0.1%	1.9%
VD	VA	1.8%	1.2%	0.3%	0.2%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VD	VB	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VD	VC	0.3%	0.4%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VD	VE	0.3%	0.3%	0.5%	0.1%	0.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VE	FX	7.1%	8.2%	5.6%	4.0%	2.6%	1.7%	1.6%	3.0%	1.8%	0.8%	0.2%	0.5%	0.1%	0.0%
VE	VA	3.6%	1.4%	1.9%	0.3%	0.7%	1.1%	0.3%	0.1%	0.6%	0.1%	0.2%	0.0%	0.0%	0.0%
VE	VB	0.0%	0.2%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VE	VC	0.1%	0.3%	0.5%	0.1%	0.2%	0.2%	0.1%	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
VE	VD	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: TRS query reports

- FX** refers to the Fixed Return Fund
- VA** refers to the Diversified Equity Fund
- VB** refers to the Balanced Fund
- VC** refers to the International Equity Fund
- VD** refers to the Inflation Protection Fund
- VE** refers to the Socially Responsive Equity Fund



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